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# Washington DC IT Service Management

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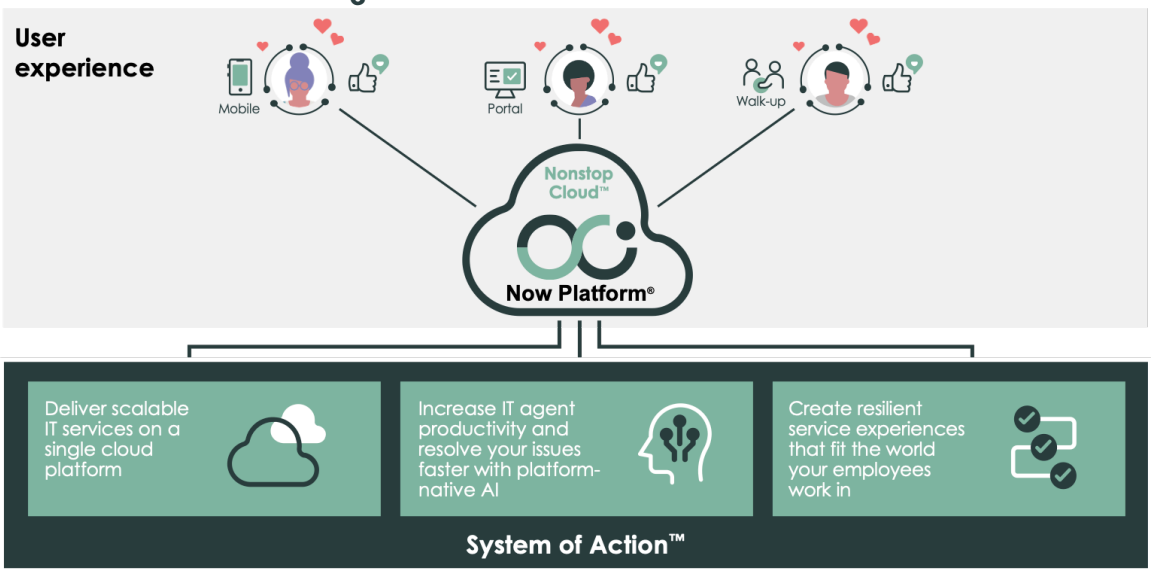
# IT Service Management

The IT Service Management (ITSM) solution provides scalable workflows to manage and deliver IT services to your users all through a single cloud-based platform.

The ITSM solution can help increase your agents' productivity, resolve issues quickly, and improve user satisfaction. Also, powered by platform native AI, you can quickly accelerate technology changes and view recommended actions for incoming tickets or requests and drive self-service and automation through enterprise chatbot technology. The ServiceNow AI Platform also provides users access to ITSM via mobile or web-portal interfaces.

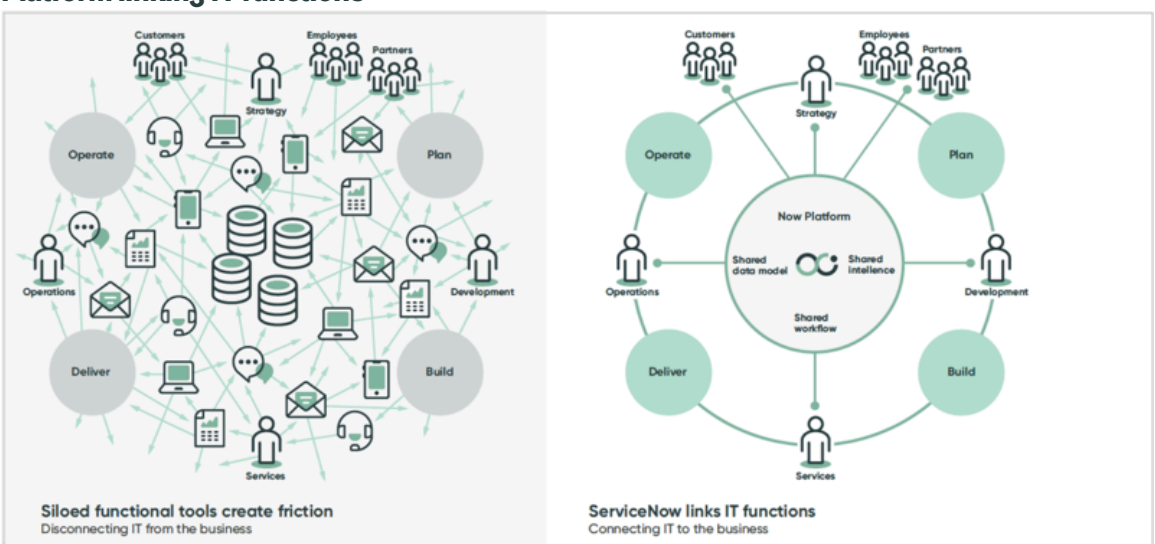
**ITSM is the foundation of digital transformation**




## Transform the impact, speed, and delivery of IT services

The ServiceNow AI Platform was built for the cloud and has its own shared data model, AI, and workflow automation that are leveraged by many IT applications. The combination of the ServiceNow platform and applications helps you increase productivity by automatically identifying and resolving issues, which reduces the negative business impacts of unplanned, non-strategic work.

**Comparing a typical IT department with scattered tools to the ServiceNow AI Platform linking IT functions**

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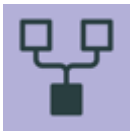
View and download the full infocard for a highlight of ITSM features.

| | |
|---|---|
|  | Enhance the service experience<br><br>Automate support for common requests with virtual agents powered by natural language understanding (NLU). Engage users with natural, human conversation to provide consistent good customer service experiences. |
|  | Consolidate IT services<br><br>Rapidly consolidate existing tools to a single system of action in the cloud. |
|  | Improve IT productivity<br><br>Use machine learning algorithms and virtual agents to automate routine tasks and increase the productivity of agents. |
|  | Gain visibility into processes and services<br><br>Get full visibility into any process or service with built-in dashboards and analytics providing real-time, actionable information to improve service quality. |
|  | Provide mobile connectivity<br><br>Enable employees to find answers and get work done from a modern mobile application. |

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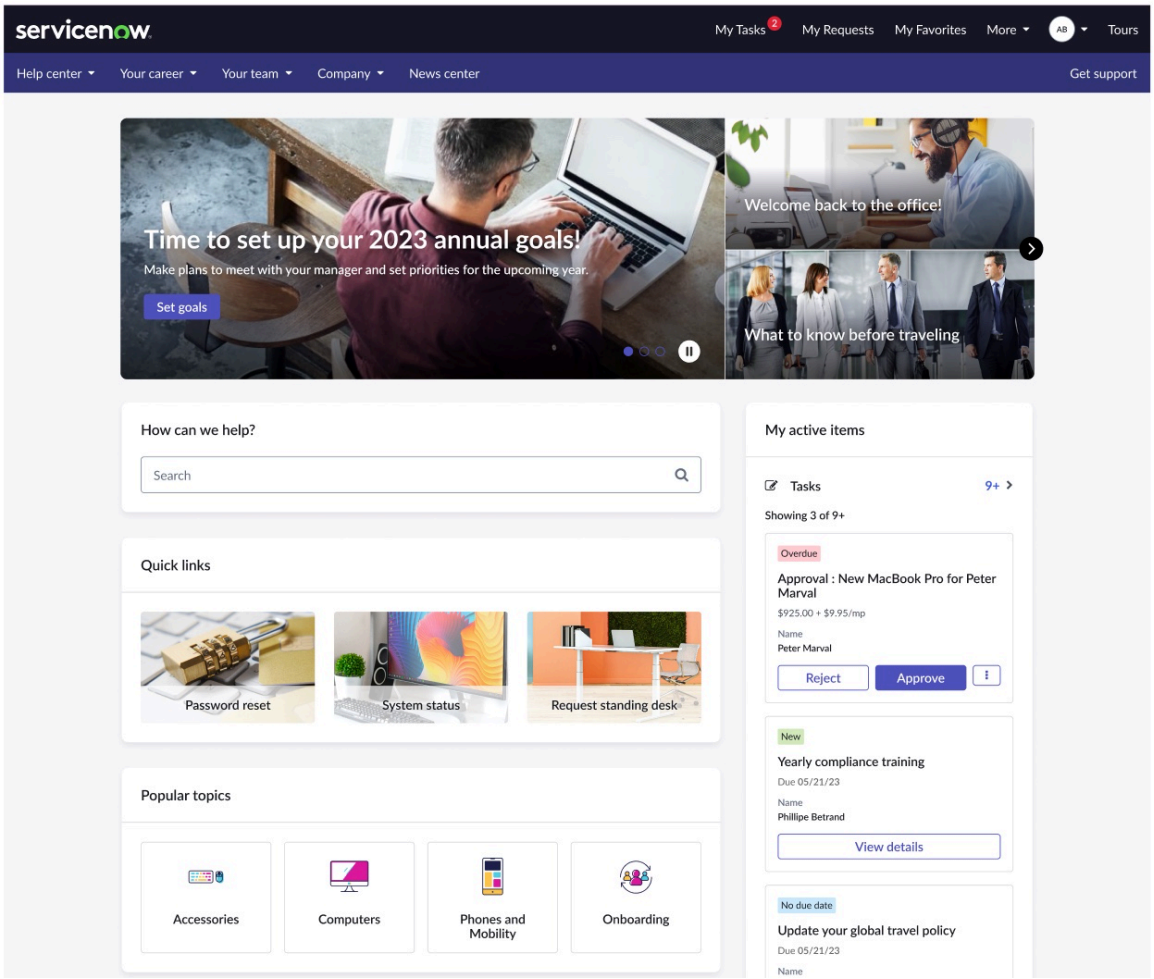
## Enhance the service experience




Automate routine agent interactions and increase the speed of resolution from the Employee Center portal. With supervised machine learning, you can automate incident categorization and assignment and eliminate bottlenecks created by manual incident triaging. Meet increasing demands without further adding staff and empower existing IT staff to focus on more meaningful work. For more information on the Employee Center portal and the features, see .

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## Consolidate IT services

### Consolidated IT services diagram




Reduce the number of separate tools your company uses to provide a consistent service experience regardless of the issue or the request. Consolidating IT services enables you to better manage and allocate resources and track performance. You can have a single reliable source of information where performance is monitored in real time and data is easy to capture and report.

## Improve IT productivity

Accelerate resolution with built-in machine learning. Chatbots provide immediate resolution to common questions. With ITSM Virtual Agent in action, you can have employees with 24*7 support service. Service desk agents can take advantage of machine-learning automation to resolve incidents and recommend resolutions for agents based on similar incidents solved in the past.

## Gain visibility into processes and services

### Gain visibility into processes and services




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Make smarter decisions with real-time analytics across the entire IT value chain. Get new insights into service performance using data trends and forecasts. With Performance Analytics, you can anticipate trends based on current conditions and past performance and identify areas where automation can increase efficiency.

### Provide mobile connectivity

Stay connected and access information in real time using the ITSM mobile agent. You can access work assigned to you or your group, receive push notifications, and approve or reject change requests and requested items. The ITSM mobile agent is available on the iOS platform from the Apple App Store or on the Android platform from the Google Play Store.

### Edge Encryption for ITSM Virtual Agent within ITSM

Edge encryption provides you with direct control over your data security. Encryption and key management are performed on your intranet between your browser and your ServiceNow instance.

See Understanding Edge Encryption.

Because edge encryption is enabled on a proxy server on your side of the network, there is significant planning, network administration and management, and setup required.

See Planning for Edge Encryption.

To install edge encryption, see Edge Encryption installation.

To configure edge encryption, see Edge Encryption configuration.

**Note:**
There are limitations when using edge encryption. See Edge Encryption limitations.

### Get started

- Set up the service management module for a modern ITSM experience. To learn more, see Customer Success Center.
- Learn about the different ITSM packages that work for your business on the ServiceNow Products website.
- Take an ITSM course to manage and deliver services to your users. To sign up, go to ServiceNow training and certification.
- Read the product documentation, beginning with IT Service Management.

### Learn

- What is a service desk?
- What is incident management?
- What is IT Support?
- What is an IT ticketing system?
- What is ITIL?
- What is ITSM?
- What is Workforce Optimization for ITSM?

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## Applications and features

- Machine learning solutions for IT Service Management
- Now Assist for IT Service Management (ITSM)
- Asset Management
- Benchmarks
- Change Management
- Coaching
- Collaboration services
- Continual Improvement Management
- Contract Management
- DevOps Change Velocity
- DevOps Config
- Digital Product Release
- Digital End-User Experience
- Digital Portfolio Management
- Expense Line
- Employee Center
- Incident Management
- Incident Communications Management
- ITSM Agent Workspace
- ITSM Virtual Agent
- ITSM Mobile Agent
- ITSM Success Dashboard
- ITSM Platform Analytics Solutions
- ITSM Predictive Intelligence Workbench
- On-call scheduling
- Operational Technology Incident Management
- Operational Technology Change Management
- Proactive Engagement
- Procurement
- Product Catalog
- Problem Management
- Recommendation Framework
- Release Management
- Request Management
- Service Operations Workspace for ITSM
- Service Portfolio Management
- Service Builder

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- Task Outage
- Task Intelligence for ITSM
- Vendor Management Workspace
- Walk-up Experience
- Workforce Optimization for ITSM

## Script includes and customization

Many Script Includes are provided by default with the ITSM products. You can call existing script includes from a script or create your own script includes.

You can find script includes by navigating to **Self Service** > **System Definition** or **Self Service** > **System UI**. To get the latest features and problem fixes without breaking the existing functionality during an upgrade, remember the following points:

To modify or customize an existing script include:

- Do not use the script includes that are suffixed by SNC. Those script includes are read-only and must not be customized. For example, the following script include must not be customized.

```
var ChangeProcessSNC = Class.create();
ChangeProcessSNC.prototype = {
    // SNC functions
    type: "
```

- Do not override methods that start with an underscore. Those methods indicate that the functions are private.

You can override the functions of the non-SNC script includes that extend the SNC scripts. For example, the following script include can be overridden.

```
var ChangeProcess = Class.create();
ChangeProcess.prototype = Object.extendsObject(ChangeProcessSNC,
{  // Customer overridden functions  type: "ChangeProcess" });
```

## Machine learning solutions for IT Service Management

Machine learning in IT service management helps to enhance business scalability and improve business operations for organizations.

Organizations face challenges in deriving meaningful information and business insights from overwhelming volumes of data. Machine learning offers solutions that are trained on your instance's historical data, using your choice of algorithms. These solutions can be deployed in flows and scripts to automate categorization and assignment of tickets, for example.

**Related topics**

Predictive Intelligence for Change Management

Task Intelligence

Task Intelligence for ITSM

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# Request Predictive Intelligence for Incident Management

Activate Predictive Intelligence for Incident Management by requesting the Predictive Intelligence for Incident Management plugin (com.snc.incident.ml_solution) through the Now Support Service Catalog.

## Before you begin

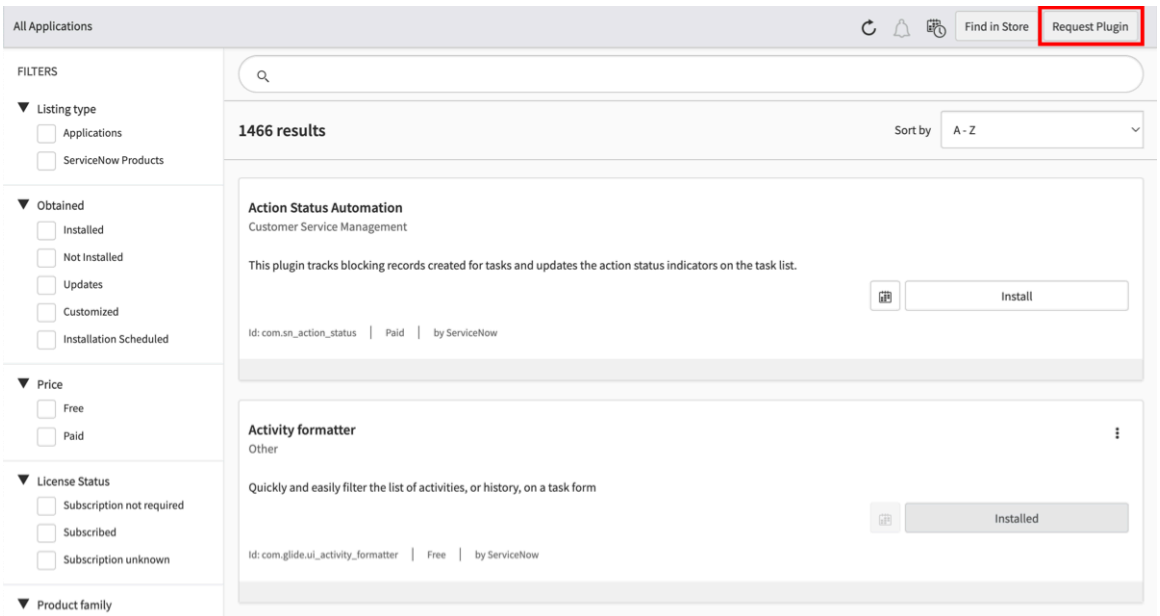
Predictive Intelligence for Incident Management requires a separate subscription from the rest of the ServiceNow AI Platform.

To purchase a subscription, contact your ServiceNow account manager. When you purchase a subscription, certain plugins are activated automatically. If a plugin doesn't appear in the instance, submit a request via the Now Support Service Catalog.

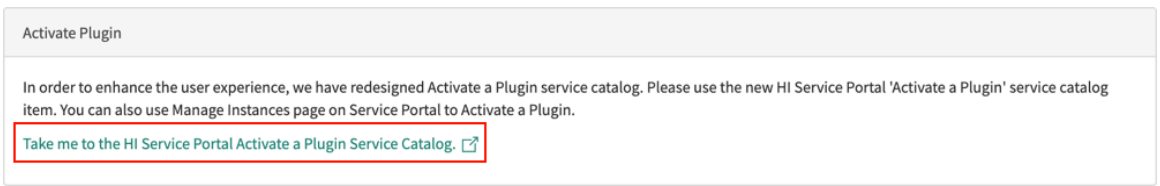
Role required: admin

## Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. On the All Applications page, select **Request Plugin** to open the **Activate Plugin** form on Now Support.




3. On Now Support, select the link to access the Now Support Service Portal Service Catalog.




4. On the form, fill in the fields.

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**Activate Plugin request form**

| Field | Description |
|---|---|
| What is your target instance | Instance on which to activate the plugin. |
| Plugin Name | Enter: |
| Select Maintenance Date and Time | The date and time to activate the plugin.<br>**Note:** Plugins are activated in two batches, once in the morning and once in the evening, on every business day in the US Pacific time zone. If the plugin must be activated at a specific time, enter the request in the **Reason/Comments** field. |

5. Select **Submit**.
   For additional details about requesting a plugin, see Requesting a Plugin from the Service Catalog [KB0751715] article in the Now Support Knowledge Base.

## Request Predictive Intelligence for Major Incident Management

Activate Predictive Intelligence for Major Incident Management by requesting the Predictive Intelligence for Major Incident Management plugin (com.snc.incident.mim.ml_solution) through the Now Support Service Catalog.

### Before you begin

Predictive Intelligence for Major Incident Management requires a separate subscription from the rest of the ServiceNow AI Platform.

To purchase a subscription, contact your ServiceNow account manager. When you purchase a subscription, certain plugins are activated automatically. If a plugin doesn't appear in the instance, submit a request via the Now Support Service Catalog.

Role required: admin

### About this task

The following plugins are installed with Predictive Intelligence for Major Incident Management:

- Incident Management - Major Incident Management (com.snc.incident.mim)
- Predictive Intelligence for Incident Management (com.snc.incident.ml_solution)

### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. On the All Applications page, select **Request Plugin** to open the **Activate Plugin** form on Now Support.

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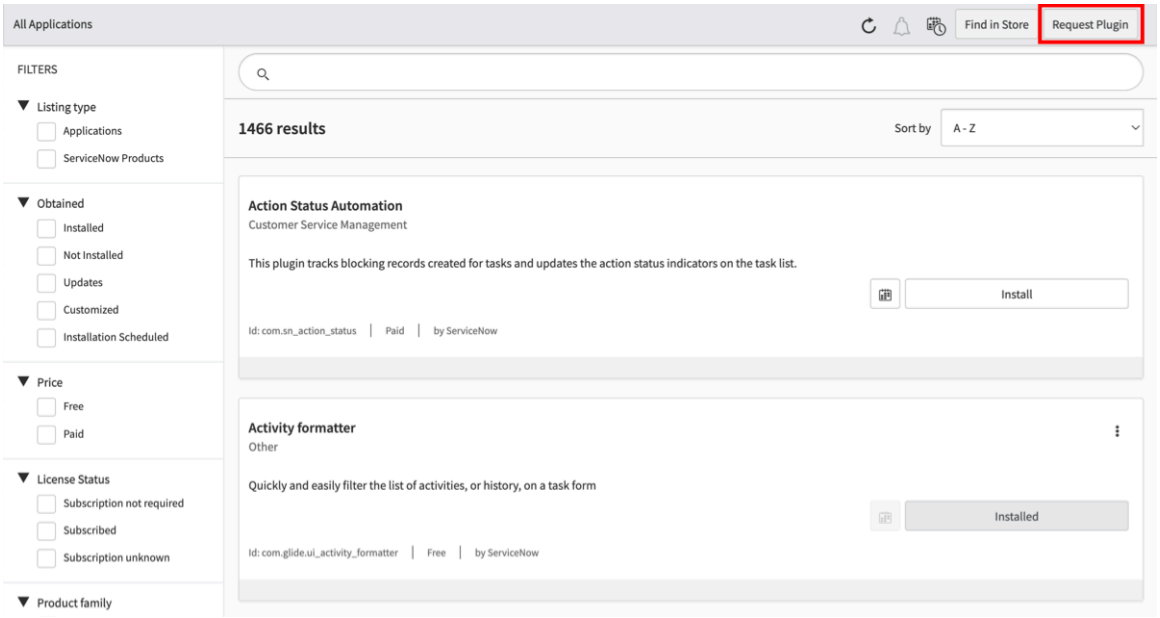
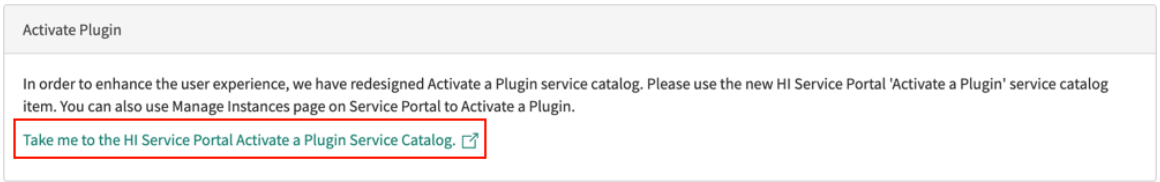



**3.** On Now Support, select the link to access the Now Support Service Portal Service Catalog.




**4.** On the form, fill in the fields.

### Activate Plugin request form

| Field | Description |
|---|---|
| What is your target instance | Instance on which to activate the plugin. |
| Plugin Name | Enter: |
| Select Maintenance Date and Time | The date and time to activate the plugin.<br><br>**Note:**<br>Plugins are activated in two batches, once in the morning and once in the evening, on every business day in the US Pacific time zone. If the plugin must be activated at a specific time, enter the request in the **Reason/Comments** field. |

**5.** Select **Submit**.
For additional details about requesting a plugin, see Requesting a Plugin from the Service Catalog [KB0751715] article in the Now Support Knowledge Base.

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# Predictive Intelligence for Incident Management

Use your instance records to build specific solutions for Incident Management.

## Solution definitions

These solution definitions are available as templates on instances where both Predictive Intelligence and Incident Management are active. Create your own solution definition records to customize the behavior.

### Solution Definitions for Incident Management

| Solution Definition | Solution Type | Description |
|---|---|---|
| Incident Assignment | Classification | Predicts the **Assignment group** field from the **Short description**. |
| Incident Categorization | Classification | Predicts the **Category** field from the **Short description**. |
| Incident Service | Classification | Predicts the **Service** field from the **Short description**. |
| Incident Configuration Item | Classification | Predicts the **Configuration item** field from the **Short description**. |
| Major Incident Detection | Similarity | Recommends similar active major incidents which the current incident can be linked to.<br><br>Recommends similar incidents to propose a major incident. |
| Similar Incidents (Major Incident Workbench) | Similarity | Recommends similar incidents that are not linked as child incidents to a major incident. |
| Similar Incidents | Similarity | Recommends similar incidents based on the **Short description** and **Description** fields, to help with incident investigation and resolution processes. |
| Similar Open Incidents | Similarity | Recommends similar open incidents based on the **Short description** and **Description** fields, that the current incident can be linked to. |
| Similar Closed Incidents | Similarity | Recommends similar closed incidents based on the **Short description** and **Description** fields, to help with incident |

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**Solution Definitions for Incident Management (continued)**

| Solution Definition | Solution Type | Description |
|---|---|---|
| | | investigation and resolution processes. |
| Similar Resolved Incidents | Similarity | Recommends similar resolved incidents to help with incident investigation and resolution processes. |

Solution definitions and the required plugins are as follows:

**Solution definitions and plugins**

| Solution definition | Plugins |
|---|---|
| • Incident Assignment<br>• Incident Categorization<br>• Incident Service<br>• Incident Configuration Item | The plugins com.glide.platform_ml and com.snc.incident.ml_solution must be active. |
| Similar Incidents (MIM) | The plugins com.glide.platform_ml and com.snc.incident.mim.ml_solution must be active. |
| Major Incident Recommendation | The plugins com.snc.contextual_search_ml and com.snc.incident.mim.ml_solution must be active. |
| • Similar Open Incidents<br>• Similar Resolved Incidents<br>• Similar Incidents<br>• Similar Knowledge Articles | The plugins com.snc.contextual_search_ml and com.snc.incident.mim.ml_solution must be active. |

For more information on classification and similarity solution, refer to Create solution definition and Create similarity solution.

## Business rule for classification solutions

This business rule applies only to the Incident Assignment and Incident Categorization solution definitions and is available only on instances where both Predictive Intelligence and Incident Management are active. Create your own business rules on the Incident table to customize prediction and reporting behaviors.

**Business rule for Incident Management**

| Business rule | Table | Description |
|---|---|---|
| Update Prediction Results | Incident | Updates the solution precision and coverage statistics. Runs |

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**Business rule for Incident Management (continued)**

| Business rule | Table | Description |
|---|---|---|
| | | when an incident record is closed. |

For more flexibility with classification solutions, consider using ITSM Predictive Intelligence Workbench.

### Upgrade Information

If your instance is running on the Kingston release and you are upgrading to the Washington DC release:

- In a global domain environment, use the new solutionNames array variable which requires that you explicitly provide the solutions that are called by the business rule.
- In a domain-separated environment, such as an MSP environment, refer to the commented code in the business rule template for easy customization.
- The business rule template now calls the applyPredictionForSolution() method to predict regardless of any changes to the default value.

### Maintaining prediction accuracy

You can manage prediction drift by retraining, modifying, or creating new solutions to reflect changes in your business conditions. Test and modify your business rule over time to ensure it works as desired across multiple consumption points and user Personas.

## Request Predictive Intelligence for Incident

To activate Predictive Intelligence for Incident, request the Predictive Intelligence for Incident plugin (com.snc.incident.ml) through the Now Support Customer Service system. This plugin activates related plugins if they are not already active.

### Before you begin

Role required: admin

### About this task

The Predictive Intelligence for Incident plugin activates these related plugins if they are not already active.

**Plugins for Predictive Intelligence for Incident**

| Plugin | Description |
|---|---|
| Predictive Intelligence for Contextual Search<br><br>[com.snc.contextual_search_ml] | Enables customers to leverage machine-learning algorithms for searching with Contextual Search. For example: Similar Open Incidents.<br><br>Activation of this plugin on production instances may require a separate license. Contact ServiceNow for details. |

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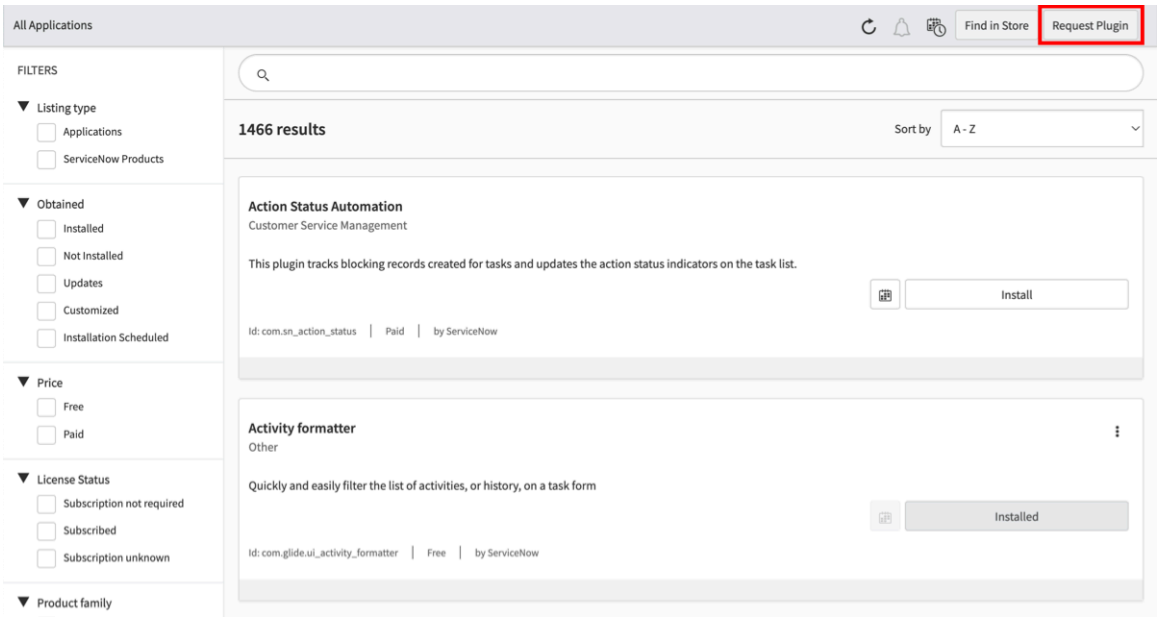
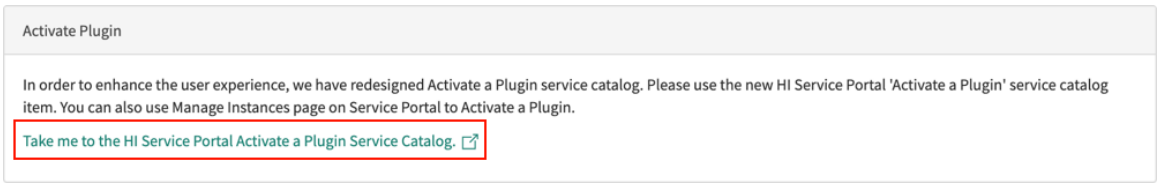
## Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. On the All Applications page, select **Request Plugin** to open the **Activate Plugin** form on Now Support.




3. On Now Support, select the link to access the Now Support Service Portal Service Catalog.




4. Select your instance.
5. Select **Actions > Activate Plugin**.
6. On the **Activate Plugin** form, provide the following information.

### Activate Plugin form

| Field | Description |
|---|---|
| What is your target instance | Instance on which to activate the plugin. |
| Which plugin would you like to activate | Name of the plugin to activate.<br><br>**Note:**<br>If the system does not list the plugin you want or if you are activating the plugin on an OEM or on-premise instance, select the **Plugin I'm looking for is not listed** check box and then enter the name of the plugin. |

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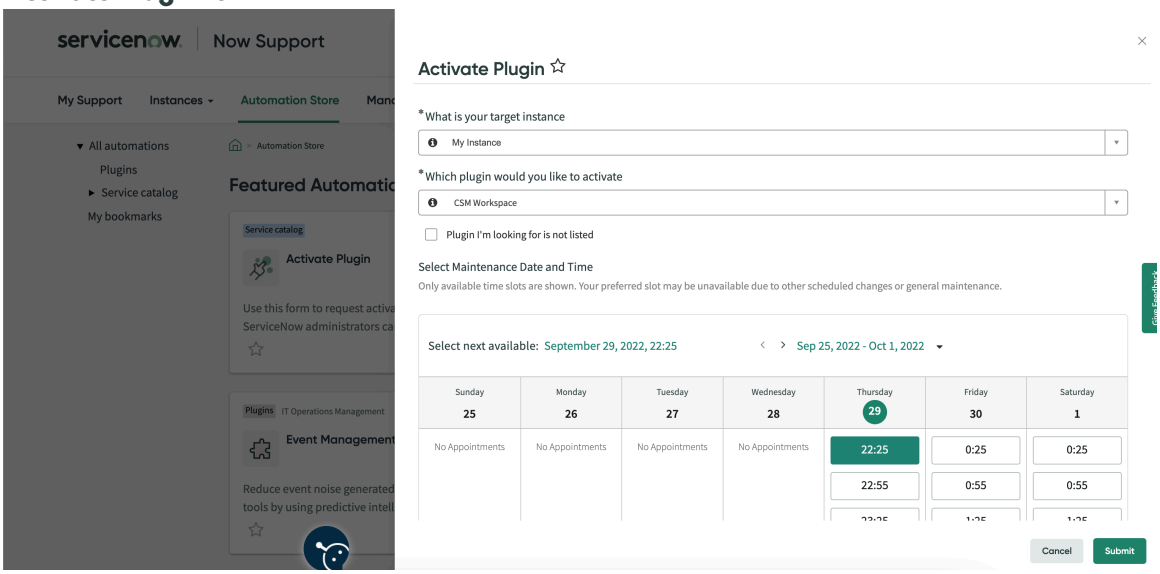
| Field | Description |
| --- | --- |
| Select Maintenance Date and Time | The date and time to activate the plugin.<br><br>**Note:**<br>Plugins are activated in two batches, once in the morning and once in the evening, on every business day in the US Pacific time zone. If the plugin must be activated at a specific time, enter the request in the **Reason/Comments** field. |

### Example

For example, see the following form to activate the CSM Workspace plugin on an instance named My Instance.

**Activate Plugin form**




7. Select **Submit**.
   For additional details about requesting a plugin, see Requesting a Plugin from the Service Catalog [KB0751715] article in the Now Support Knowledge Base.

### Related topics

List of plugins (Washington DC)

## Predictive Intelligence for Incident

Use your instance records to build Incident Management -specific solutions.

## Solution definitions

The solution definitions are available when you have the Predictive Intelligence for Incident plugin (com.snc.incident.ml) activated in your system.

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These solution definitions are available as templates on instances where both Predictive Intelligence and Incident Management are active. Create your own solution definition records to customize the behavior.

**Solution Definitions for Incident Management**

| Solution Definition | Solution Type | Description |
|---|---|---|
| Similar Open Problems | Similarity | Recommends similar open problems that the current incident can be linked to. By default, the similarity is inactive. |
| Similar Open Change Requests | Similarity | Recommends similar open change requests that the current incident can be linked to as a request for change. By default, the similarity is inactive. |

For more information on similarity solution, refer Create similarity solution.

# Asset Management

The ServiceNow® Asset Management application integrates the physical, technological, contractual, and financial aspects of information technology assets.

**Note:**
Beginning with the ServiceNow AI Platform® Washington DC release, we will provide limited support for the Asset Management Core UI interface. While it remains active in your instance, including when you upgrade to a new ServiceNow AI Platform release, we encourage you to move to the new workspace experience. For more information, see KB1584548, Exploring Asset Management Workspace and Next Experience UI.

Asset management business practices have a common set of goals.

- Control inventory that is purchased and used.
- Reduce the cost of purchasing and managing assets.
- Select the proper tools for managing assets.
- Manage the asset life cycle from planning to disposal.
- Achieve compliance with relevant standards and regulations.
- Improve IT service to end users.
- Create standards and processes for managing assets.

Most successful ITAM programs involve various people and departments, including IT, finance, services, and end users.

Asset Management and the Configuration Management Database (CMDB) are related, but have different goals. Asset Management focuses on the financial tracking of company property. Configuration management focuses on building and maintaining elements that create an available network of services.

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**Related topics**

Domain separation and Asset Management

# Mobile app for Hardware Asset Management

Use the ServiceNow Mobile and ServiceNow Agent apps to manage your assets.

## ServiceNow Agent app

Use the ServiceNow Agent app to create assets, look up assets, and receive assets from a purchase order.

### Create an asset

Use the ServiceNow Agent app to create an asset record by scanning the asset.

**Before you begin**
Download the ServiceNow Agent app from Apple App Store or Google Play Store.

Role required: asset

The Procurement plugin (com.snc.procurement) must be installed to get the procurement features in ServiceNow Agent app.

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## Procedure

1. Navigate to **Asset** and tap **Create Asset**.

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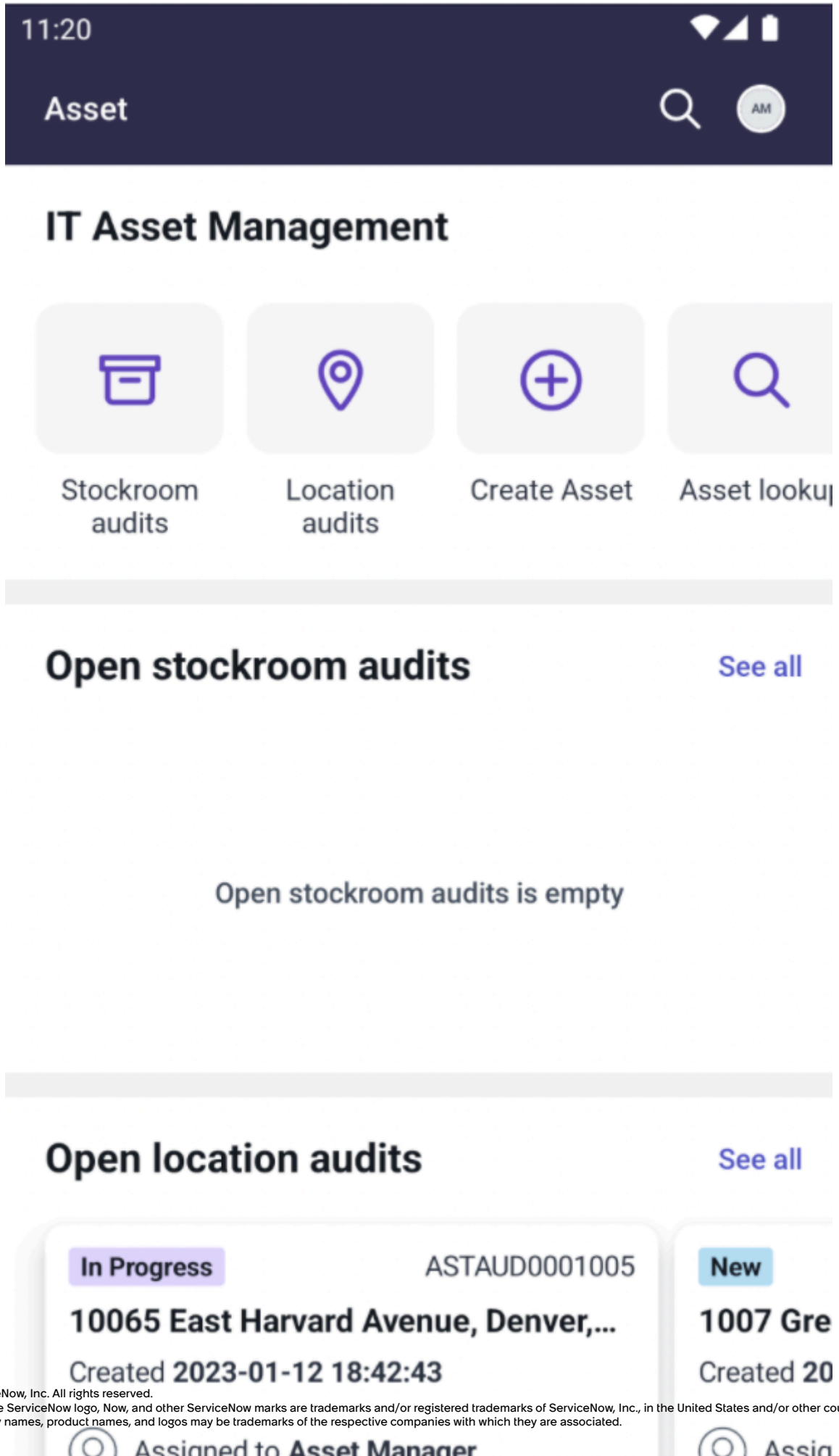


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2. Scan the asset serial number or asset tag, then tap **Search**.
   If the asset exists in your ServiceNow instance, an asset record is displayed. This information is to ensure that you don't create duplicate asset records.
3. **Optional:** To update an existing asset, select the asset and then tap **Update Asset**.
4. If no existing asset record is found, tap the action icon in the upper right and select **Create Asset**.
5. Scan or enter values for the **Asset Tag**, **Serial Number**, **Model** (non-software), **Stockroom**, **State**, and **Substate** fields.
6. Tap **Submit** to create the asset.

### Asset lookup

Search for an asset record in your ServiceNow instance by scanning the asset.

#### Before you begin

Role required: asset

#### Procedure

1. Navigate to **Asset** and tap **Asset lookup**.
2. Scan the asset tag, then tap **Search**.
3. An asset record is displayed if the asset exists in your ServiceNow instance.
   You can select the existing asset to update it or to create an incident related to it.

### Receive assets from a purchase order

Scan assets from a purchase order (PO) to verify that you received all assets from the order.

#### Before you begin

Role required: procurement_admin or procurement_user

#### Procedure

1. Navigate to **Procurement** and tap **POs Next 30 Days**.
2. Select a purchase order.
3. Tap **Related list**.
4. Tap the **PO Line Items** asset that you ordered and swipe **Receive** to receive the asset.

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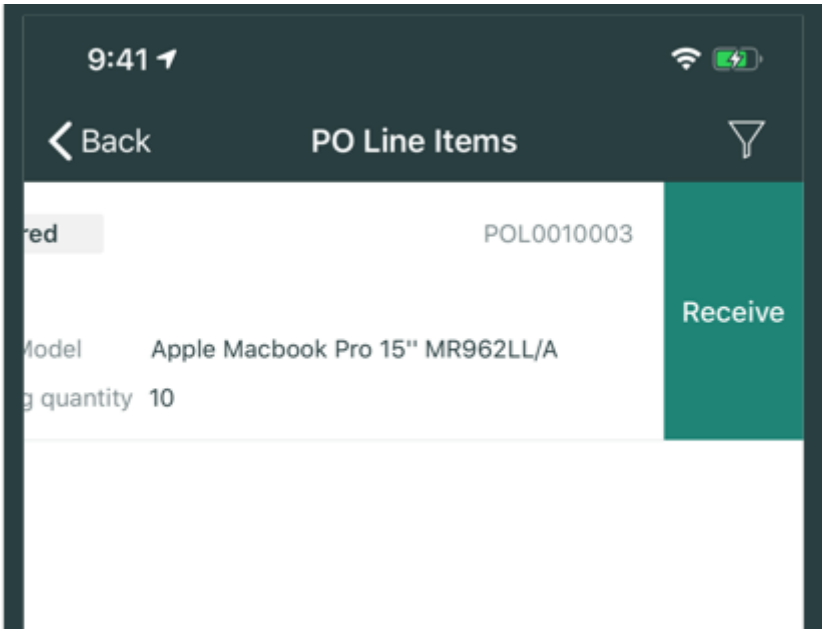


5. If you only need to receive a single purchase, on the Receive form, scan the QR code for either the asset tag or serial number.
6. If you need to receive multiple purchases, on the Receive form, tap **Scan next item** until you've scanned all of your purchases.
7. Tap **Submit**.

**Result**
The purchase order is marked as received.

## Now Mobile app

Use the Now Mobile app to view the assets that are assigned to you, to report any issues with your assets, and to remotely receive new assets. Create incidents to report any issues with your assets to your IT department.

Download the Now Mobile app from Apple App Store or Google Play Store.

The Now Mobile app provides different services for tasks and requests.

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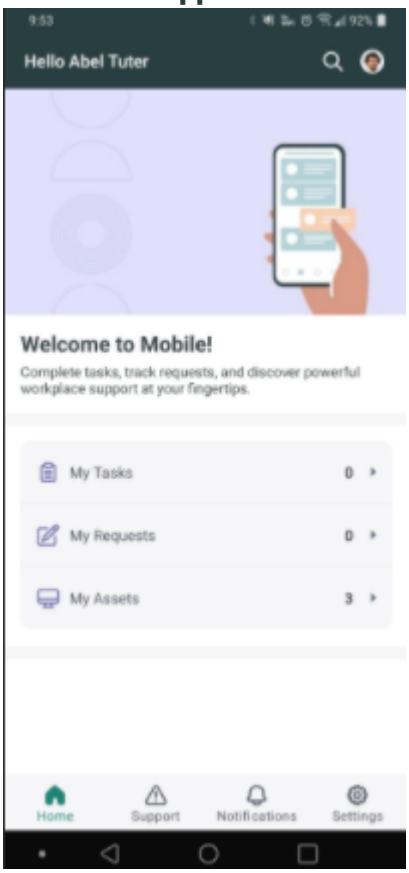
**Now Mobile app**




To view all the assets that are assigned to you, navigate to **My Items** > **My Assets** > **Hardware**. The tab shows the assets that have the State field set to In transit or In use, Sub-state set to Reserved, and the Reserved to field set to your name. You can create an incident for an asset that is in use.

When you are away from your office, you can remotely receive an asset that is in transit. Scan the QR code for the asset tag so that you can automatically notify the IT department that you have received the asset.

## Asset and CI management

Asset and configuration item (CI) management refers to creating assets, setting appropriate states and substates, synchronizing assets and CIs, managing consumables, and retiring assets.

### Relationship between asset and CI

It's important to manage the relationship between assets and associated CIs. Assets are tracked with the Asset Management application, which focuses on the financial aspects of owning property. Configuration items are stored in the CMDB, which is used to track items and make them available to users.

When an asset has a corresponding configuration item, the asset record and the configuration item record are kept synchronized with two business rules.

- *`Update CI fields on change`* (on the Asset [alm_asset] table)
- *`Update Asset fields on change`* (on the Configuration Item [cmdb_ci] table)

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**Note:**
Assets and CIs can be synchronized only if they're logically mapped.

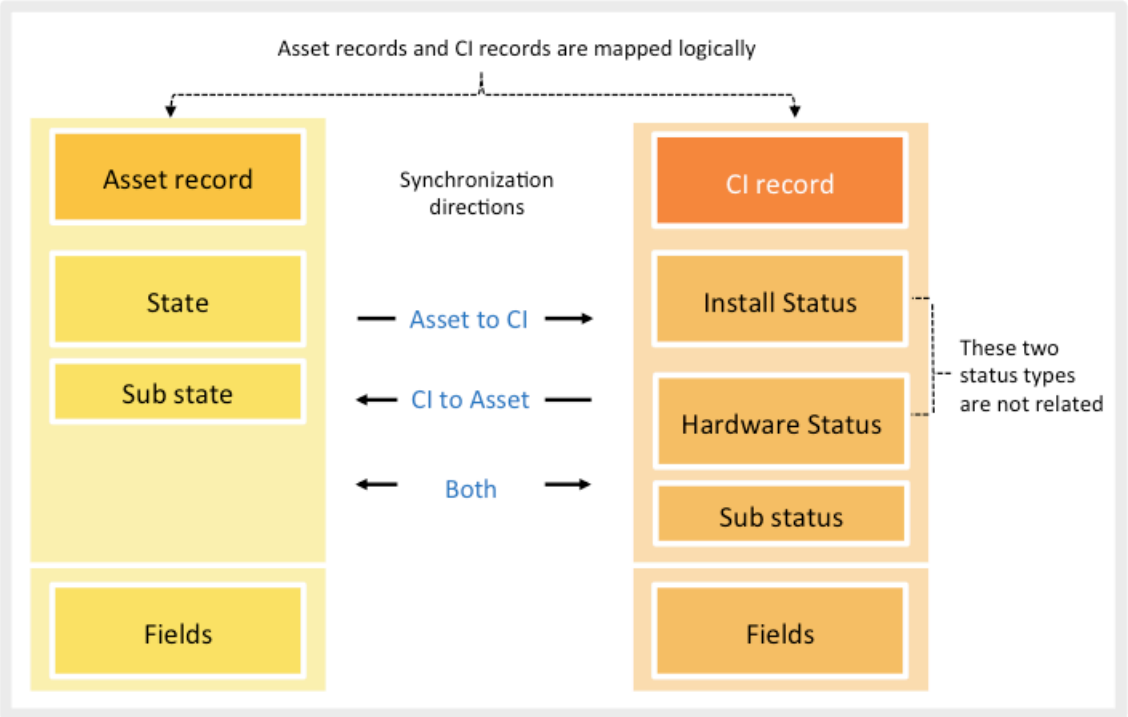
## Asset-CI mapping and synchronization

The State field of asset record and Status field of CI record are synchronized so that changes made on one form trigger the same update on the corresponding form, ensuring consistent reporting.

**Note:**
The ServiceNow AI Platform synchronizes updates between assets and configuration items only if the asset and configuration item are pointed toward each other.

The following diagram illustrates the concept of Asset-CI mapping and synchronization.

**Overview of Asset-CI mapping and synchronization**




This synchronization and mapping is based on the following factors:

- Asset state and CI status aren't mapped on one-to-one basis. Rather they're mapped to the most logical counterpart on the other table. For example, for a hardware asset set to state **In Stock - Pending disposal**, the corresponding CI is set to **In Disposition** with no substate.
- This synchronization happens between the asset's State field and the following CI fields:
  - Install Status field: Install Status doesn't have a sub status and must be used for non-hardware CIs.
  - Hardware Status and Sub status field: Hardware Status is visible only for Hardware CI.
- Drive changes by updating the state on the Asset form. The Asset-CI synchronization can be driven in the following ways:

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  - Asset to CI synchronization: Change to the asset's status updates the logically mapped CI's Install Status or Hardware Status and sub status.
  - CI to Asset: Change to the CIs Install Status or Hardware Status updates the logically mapped asset's states and sub states.
- For a CMDB hardware CI, if both Hardware Status and Install Status is updated, the Hardware Status change is considered for mapping the corresponding state of the asset.
- CIs Install Status and Hardware Status work independently, so the two fields aren't related. CI's Hardware Status change doesn't change CIs Install Status and vice versa. To avoid confusion, keeping both status for CMDB CI Hardware isn't recommended.

## List of the fields that get synced between Asset and CI

When changing any of the following fields on the asset or CI record, the same field on the corresponding record is automatically updated (except for the **Cost** field, which is informational-only on the CI record).

The following is a list of fields that are synchronized.

- Asset tag
- Assigned
- Assigned to
- Checked in
- Checked out
- Company
- Cost (synchronizes in only one direction: asset to CI)
- Cost center
- Delivery date
- Department
- Due in
- Due
- GL account
- Install date
- Invoice number
- Justification
- Lease id
- Location
- Managed by
- Model (model_id in CI)
- Order date
- Order received
- Ordered
- Owned by
- PO number

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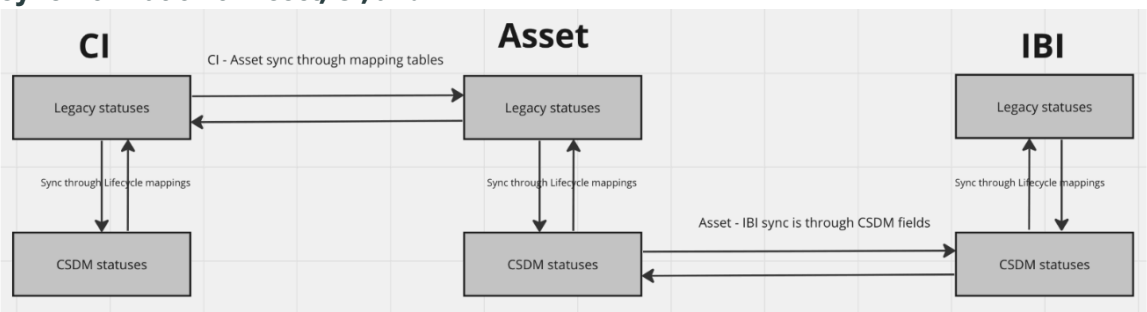
- Purchase date
- Purchased
- Serial number
- Support group
- Supported by
- Vendor
- Warranty expiration

## Asset, CI, and IBI synchronization

Any item that is provided as a service or sold to your customer is tracked as an Install Base Item (IBI). The Model category table associates Asset class, CI class, and Install Base Item (IBI) class.

The synchronization between the Asset and CI is through the legacy states and substate fields. However, the synchronization between the Asset and the IBI class is through the CSDM stage and status fields.

### Synchronization of Asset, CI, and IBI




#### Synchronization of updates from asset to IBI and CI

Updates made to the State or Substate fields of an asset are synchronized with the associated IBI and CI. For example, when the State field of the asset is updated to In use, synchronization happens as follows.

- The Life Cycle Stage and Life Cycle Stage Status of the asset are set to Operational and In use, these field values are then synchronized with Stage and Status fields of IBI asset.
- The Status and Substatus fields of the CI change to Installed and In use.

#### Synchronization of updates from IBI to asset and CI

Updates made to the Life Cycle Stage and Life Cycle Stage Status fields of an IBI asset are synchronized with the legacy State and Substate fields of the asset through the CSDM fields. The legacy fields of the asset are then synchronized with the associated CI. For example, when the life Life Cycle Stage and Life Cycle Stage Status fields of an IBI asset are updated to Defective and In Stock, synchronization happens as follows.

1. The Life Cycle Stage and Life Cycle Stage Status of the asset change to In Stock and Defective. These field values are synchronized with the State and Substate fields of the asset.
2. The State and Substate fields of the asset are then synchronized with the corresponding fields of the associated CI.

#### Synchronization of updates from CI to asset and IBI

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Updates made to the Status and Substatus fields of a CI are synchronized with the corresponding fields of the asset. The legacy fields of the asset are then synchronized with the Life Cycle Stage and Life Cycle Stage Status fields of the IBI asset through the CSDM fields. For example, when the Status and Substatus fields of a CI are updated to Retired and Donated, the corresponding fields of the asset change. The changes from the asset are synchronized with the IBI asset and the Life Cycle Stage and Life Cycle Stage Status fields change to End of Life and Retired.

## Asset and CI creation properties

### glide.create_alm_asset.async

The system property *glide.create_alm_asset.async* controls whether assets are created immediately when a configuration item (CI) is created, or are created after a delay. A delay in asset creation enables large numbers of CIs to be created quickly. When this property is set to **true**, assets are created by the *Asset - Create asset delayed sync* scheduled job that runs every 15 minutes. View the status of the scheduled job in the Asset Job Log table [asset_job_log]. To view assets waiting to be created and asset creation errors, navigate to **Asset** > **Administration** > **Asset Creation Queue**. To reprocess an error, update the state from **Error** to **Ready**. The next time the scheduled job runs, it reattempts to create the asset.

When the *glide.create_alm_asset.async* property is set to **false**, assets are created immediately from CIs.

**Note:**
If you upgrade to Washington DC from Orlando or earlier, the default value of this property is **false**. Before updating this property, review your processes that depend on an asset value present on a CI and make any necessary changes to account for delayed asset creation.

### glide.asset.create_ci_with_ire

The system property *glide.asset.create_ci_with_ire* enables CIs to be created from assets using the ServiceNow® Configuration Management Database (CMDB) Identification and Reconciliation engine (IRE). This property affects CI classes that have an identification rule on serial number and have no dependent relationships with other CI classes.

**Note:**
This property is applicable to CI classes that are extended from the hardware CI class [cmdb_ci_hardware].

CIs created with the IRE are named using the format `Serial number - Model name` and the source is `SNAssetManagement`. The **Serial number** field is required on assets with model categories that correspond to these CI classes. Asset creation fails if its serial number is present on an existing CI or asset. The **Serial number** field is also required to receive purchase order line items for model categories that correspond to these CI classes. The **Serial number** field isn't required to create pre-allocated assets, but the serial number must be provided when the asset is allocated.
The default value of this property is false if you upgrade to Washington DC from Orlando or earlier. Before updating this property, review the customizations on the Serial number field and any integrations or flows that use an existing serial number to create an asset.

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## Other Asset and CI system properties

**sn_itam_enable_cache_for_asset_ci_mapping**

The asset and CI fields are synchronized based on the mappings defined in the relevant mapping tables. Fetching these mappings on the update of an asset or CI has an impact on the performance. The *sn_itam_enable_cache_for_asset_ci_mapping* system property enables you to cache the following mappings:

- Asset and CI fields
- Asset state and CI install status
- Asset state and CI hardware status

Unless there isn't any change in the mapping tables, these cached mappings are fetched during the synchronization resulting in the improved system performance.

## Create assets

Create hardware, software, consumable, bundle, pallet, mobile, and facility assets using the Core UI or the Hardware Asset Workspace.

### Before you begin

Role required: asset

### Procedure

1. Create an asset.
2. On the Asset record fields form, fill in the fields.

   For a description of the field values, see Asset record fields.
3. Submit or save the asset form.

## Retire assets

You can retire an asset at any time.

### Before you begin

Role required: asset

### About this task

After you change the state of an asset to **Retired**, the **Substate** field is active. When you retire an asset, the status of related CIs also changes to **Retired**. Selecting a substate is not required, but can be helpful for tracking and reporting.

**Note:**
When you manually change the state of the asset from **Retired** to any other value such as **In use** the asset becomes active again.

### Procedure

1. Navigate to **All** > **Asset** > **Portfolios** > **All Assets**.
2. In **State**, select **Retired**.

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3. **Optional:** In **Substate**, select **Disposed**, **Sold**, **Donated**, or **Vendor Credit**.
4. Click **Update**.

## Delete assets

You can delete an asset at any time.

### Before you begin

**Note:**
If an asset is a part of an asset bundle, the asset cannot be deleted.

Role required: asset

### About this task

A confirmation must be accepted before the asset and components are permanently deleted. If a CI and asset are linked, deleting one also deletes the other.

Only delete an asset to clean up errors. For tracking purposes, the correct method for managing an asset that is no longer in use is to change the state of the asset to **Retired**.

### Procedure

1. Navigate to **All** > **Asset** > **Portfolios** > **All Assets**.
2. Select the check box to the left of the asset **Name**.
3. In the **Actions** choice list below the list, select **Delete**.

## Map asset and CI fields

When you map the asset and CI fields, synchronization happens both ways. Changes to either the asset or CI record are updated to the logically mapped record. You can synchronize custom mappings and mappings provided with the base instance.

### Before you begin

Role required: admin or asset

**Note:**
If you upgraded from a prior release and customized the `AssetAndCISynchronizer` script include before the upgrade, you must overwrite the customization and then recreate the custom mappings.

### About this task

You can conditionally map the fields for synchronization. For example, you can map the Location field only for a hardware asset and not for a software asset. So when an asset is updated, the **Location** field is synchronized only for the hardware asset.

**Note:**
You can't map the asset and CI fields if the asset value is present only in the Hardware [alm_hardware] table and not in the Asset [alm_asset] table.

### Procedure

1. Navigate to **All** > **Asset** > **Administration** > **Asset-CI Field Mapping** and click **New**.
2. From the **Asset field** list, select the field.
   This list refers to the alm_asset table.

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3. Select the logically associated field from the **Configuration Item field**list that refers to the cmdb_ci table.
4. To create conditions for the mapping, click the **Advanced view** related link.
   - To specify conditions for synchronizing the asset field with the CI field, use the **Asset mapping condition** builder.
   - To specify conditions for synchronizing the CI field with the asset field, use the **Configuration Item mapping condition** builder.
5. Select the **Active** check box to activate the mapping.
6. Select **Submit**.

## Map asset state and CI install status

Map the asset **State** and **Substate** fields to the **CI Install Status** field. The **Substatus** field of the **CI Install Status** field should not be used for hardware CIs.

### Before you begin

Role required: admin or asset

**Note:**
If you upgraded from a prior release and customized the `AssetAndCISynchronizer` script include before the upgrade, you must overwrite the customization and then recreate the custom mappings.

### About this task

Asset synchronization does not update this field when hardware assets are updated. When you create the mapping, you can set the synchronisation direction from Asset to CI, but not from CI to Asset. For non-Hardware CI classes, you can set the synchronisation in both the directions.

### Procedure

1. Navigate to **All** > **Asset** > **Administration** > **Asset-CI Install Status Mapping**.
   By default, only custom mappings display. The list of mappings uses the filter condition of **[Out of the box] [is] [False]**.
2. Click **New**.
3. From the **Asset State** list, select the state you want to map.
4. **Optional:** If available, select a substate from the **Asset Substate** list.
   Some of the asset states do not have a substate.
5. From the **Configuration Item Status** list, select the logically associated CI status you want to map.
6. From the **Sync direction** list, select the direction you want to drive the synchronization.
7. Select the **Active** check box to activate the mapping.
8. Click **Submit**.

## Map asset state and CI hardware status

Map the asset **State** and **Substate** fields to the **CI Hardware Status** field. Don't use the **Substatus** field on hardware CIs because the CI synchronization does not update the field when assets are updated. When you create the mapping, you can set the synchronization direction from the asset, CI, or both.

### Before you begin

Role required: admin or asset

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**Note:**
If you upgraded from a prior release and you've customized the `AssetAndCISynchronizer` script before the upgrade, overwrite the customization and then recreate the custom mappings.

### About this task
The **Install Status** and **Hardware Status** fields of a CI are independent of each other. There is no correlation between them. A change to the **Hardware Status** field does not change the **CI Install Status** field and vice versa.

### Procedure
1. Navigate to **All** > **Asset** > **Administration** > **Asset-CI Hardware Status Mapping**.
   By default, only custom mappings display. The list of mappings uses the filter condition of **[Out of the box] [is] [False]**.
2. Click **New**.
3. From the **Asset state** list, select the state you want to map.
4. **Optional:** If available, select a substate from the **Asset substate** list.
   Some of the asset states do not have a substate.
5. From the **Configuration Item status**list, select the logically associated CI state you want to map.
6. **Optional:** If available, select a substate from the **Configuration Item substatus** list.
   Some of the CI statuses do not have a substatus.
7. From the **Sync direction** list, select the direction you want to drive the synchronization.
8. Select the **Active** check box to activate the mapping.
9. Click **Submit**.

## Manage various assets through asset classes

The default asset classes are Hardware, Software License, Consumable, Bundle, Software Entitlement, and Facility. These general classes can be used to manage various assets.

If the general classes that are provided aren't appropriate for a specific group of assets, consider creating a new asset class. For example, a fleet of cars could be tracked in a custom asset class named Vehicle. Before creating new asset classes, analyze business needs to see if the general classes can be used. Managing a lot of asset classes can be difficult to maintain.

Built-in functionality allows you to use asset classes for financial tracking, in a model bundle, and as a pre-allocated asset.

### Create an asset class

Creating an asset class requires defining a new table and creating a corresponding application and module, then adding the new asset class to new or existing model categories. The default asset classes are Hardware, Software License, and Consumable. These general classes can be used to manage various assets.

#### Before you begin
Role required: asset or category_manager

#### About this task
If the general classes aren’t appropriate for a specific group of assets, consider creating an asset class. For example, a fleet of cars could be tracked in a custom asset class named Vehicle.

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Before creating asset classes, analyze business needs to see if the general classes can be used. A large number of asset classes can be difficult to maintain.

Built-in functionality allows you to use asset classes for financial tracking, in a model bundle, and as a pre-allocated asset.

Ensure that the model categories contain models. Use the Table form to extend an existing table.

### Procedure

1. Navigate to **All** > **System Definition** > **Tables & Columns** > **Create Table** and fill out the Table form fields with information on the new table.

| Field | Description |
|---|---|
| Label | Display name of table that can be localized.<br><br>For example, a custom asset class to track a fleet of cars can be labeled as Vehicle. |
| Name | Internal name of table that can't be changed later.<br><br>For example, the Vehicle asset class can be named alm_u_vehicle. |
| Extends table | Table that new table inherits fields from.<br><br>The Asset (alm_asset) table can be extended to create a custom asset class. |
| Application | Application that uses the record. |
| Create module | Check box for creating a module. |
| Create mobile module | Check box for creating a mobile module. |
| Add module to menu | Menu that module displays. |
| New menu name | New menu name. |

2. Click **Submit**.
3. Navigate to the new application (for example, **Asset** > **Vehicle**) and click **New**.
4. Configure the form to include **Model**, **Model Category**, and **Quantity**.
5. Create a model category and add the asset class you created to the **Asset class** field.
6. Create models and add them to the model category.

### What to do next

Now that the model category (associated with the new asset class) and the models are created, manage the models as assets. For example, use the model in a bundle.

## Add depreciation to an asset

Depreciation is the reduction in the value of an asset over time.

### Before you begin

Role required: asset

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### About this task

A depreciation schedule can be added to hardware assets. Based on the information specified in the asset record, the ServiceNow AI Platform calculates the depreciation amount using the **Calculate Depreciation** scheduled job. The following system properties determine when the **Calculate Depreciation** scheduled job should be triggered to calculate the depreciation amount:

- The *sn_itam_depreciation_job_last_run* system property stores the date on which the **Calculate Depreciation** scheduled job was last run.
- The *sn_itam_trigger_depreciation_job_after_days* system property determines the frequency (in days) at which the **Calculate Depreciation** scheduled job should be triggered.

> **Note:**
> By default, this system property is set to **7**. Therefore, the **Calculate Depreciation** scheduled job runs weekly to calculate depreciation amount.

The ServiceNow AI Platform calculates the read-only **Residual date** and **Residual value** fields based on the **Cost**, **Depreciation**, and **Depreciation effective date** fields. For example, if the asset **Cost** is $1000.00, the **Straight Line** depreciation method is selected, and exactly two years have passed, the **Residual value** would be $500.00.

When an asset is in the **In Use** state, the asset form populates a Deprecation effective date.

For more information about fixed assets and depreciation, see Using Depreciation with Fixed Assets.

### Procedure

1. Navigate to **All** > **Asset** > **Portfolios** > **Hardware Assets**.
2. Select an asset.
3. Fill in the **Depreciation**, **Depreciation effective date**, **Salvage Value**, and **Covered by fixed asset** fields as described in Create assets.
   Consider these points.
   - If the depreciation effective date is in the future, depreciation is 0 and the current residual value is the original purchase price. The system doesn't begin to calculate depreciation until the effective date is reached.
   - The salvage value must be less than or equal to the asset cost. If a salvage value greater than the cost is entered, a warning message appears and the record can't be saved.
4. Select and hold (or right-click) the header and select **Save**.
5. Select **Calculate Depreciation**.
   The **Residual date**, **Residual value**, and **Depreciated amount** fields are automatically calculated.

> **Important:**
> The **Calculate Depreciation** scheduled job calculates the depreciation amount weekly. If you perform this step before the next run date of the scheduled job, the recently calculated depreciation amount is displayed.

## Create license assets

You can manage your organization's software license assets.

### Before you begin

Role required: sam

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### About this task
Examples include a license to use a single copy of a desktop software program and an enterprise license to install a software program on multiple computers.

### Procedure
1. Navigate to **All** > **Asset** > **Portfolios** > **License Assets** and click **New**.
2. In the **Rights** field, type the number of entitlements to be granted by this license.
3. Complete the form as described in Create assets.

## Set asset states and substates

Use asset states and substates to track assets accurately and at a detailed level.

### Before you begin
Role required: asset

### About this task
Good asset information helps you with reporting, controlling assets, and lowering costs. For example, recording missing items using the **State** and **Substates** fields enables you to run reports and analyze the information. You can use this information to lower costs.

**Tip:**
You shouldn't modify state values. If the state values are supported and defined by the process, you can modify substates.

Some of the substate values are available with more than one state. For example, the substate **Pending disposal** is available with the state **In stock**, **In transit**, and **Retired**. The combination of the **State** and the **Substate** fields provide the correct asset tracking information. For example, an asset that is **In stock** and **Pending disposal** indicates that the asset is no longer used and is in the stockroom waiting to be disposed of.

### Procedure
1. Navigate to **All** > **Asset** > **Portfolios** > **All Assets**.
2. Select an asset.
3. Edit the **State** and **Substate** fields.

#### Asset states and substates definitions

| State | Available substates | Notes |
|---|---|---|
| On order | None | Asset is ordered but isn't received. |
| In stock | ○ Available: Asset is available for use.<br>○ Reserved: Asset is reserved for a user who requested it through a sourcing request.<br>○ Defective: Asset is faulty or inoperative.<br>○ Pending repair: Defective asset is marked for repair by the vendor.<br>○ Pending install: Asset is yet to be installed. | Asset is stored in a stockroom. Substate indicates if the asset can be put to use. |

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| State | Available substates | Notes |
|---|---|---|
| | ○ Pending disposal: Asset is marked for disposal because it's no longer required in the stockroom.<br>○ Pending transfer: Asset is being planned to be transferred through a transfer order.<br>○ Pre-allocated: Asset is ready to be allocated but isn't a financial liability until it's allocated to a user.<br>○ On hold: Asset isn't ready to be used because it's awaiting something. For example, necessary documentation is pending.<br>○ Legal hold: Asset is kept on hold because of some legal reasons.<br>○ Quarantine: Asset is kept in isolation in the stockroom.<br>○ Pending fulfillment: Asset is functional but awaiting business conditions such as billing and signoff.<br>○ Pending certificate: Asset is awaiting certificate for disposal.<br>○ Pending return: Asset that is leased is yet to be returned.<br>○ Test: Asset is in the testing phase and not yet operational.<br>○ End of support: Asset is no longer provided any support through incidents or contracts.<br>○ Pending Retirement: Asset has reached the end of life and can be sold, disposed, or donated.<br>○ Pending resale: Asset is awaiting resale.<br>○ Pending evaluation: Asset is yet to be evaluated or assessed to confirm if it can be used. | |
| In transit | ○ Available: Asset is available for use.<br>○ Reserved: Asset is reserved for a user who requested it through a sourcing request.<br>○ Defective: Asset is faulty or inoperative.<br>○ Pending install: Asset is yet to be installed. | Asset is being transported. |

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| State | Available substates | Notes |
|---|---|---|
| | ○ Pending disposal: Asset is marked for disposal because it's no longer required in your stockroom.<br>○ Pending donation: Asset is marked for donation because it's no longer required in your stockroom.<br>○ Pre-allocated: Asset is ready to be allocated but isn't a financial liability until it's allocated to a user.<br>○ Pending resale: Asset is awaiting resale. | |
| In use | ○ Pending fulfillment: Asset is functional but awaiting business conditions such as billing and signoff.<br>○ End of support: Asset isn't provided any support services.<br>○ Pending retirement: Asset is marked for retirement because it's no longer in service.<br>○ None | Asset is in use. This option is available for non-consumables only. |
| In maintenance | None | Asset is being repaired or undergoing maintenance. |
| Retired | ○ Disposed: Asset is disposed because it has reached end of life.<br>○ Pending disposal: Asset is marked for disposal because it's nearing the end of life.<br>○ Sold: Asset is sold.<br>○ Donated: Asset is donated to charity organization through asset donation orders.<br>○ Vendor credit: Old faulty asset is returned to the vendor for a replacement asset through Return Merchandise Authorization (RMA).<br>○ Lease return: Leased hardware asset is returned before the expiry of contract.<br>○ Obsolete: Asset is obsolete and should be disposed.<br>○ RMA: Faulty asset is returned to or replaced by the vendor through Return Merchandise Authorization (RMA). | Set the asset to a Retired state when the asset has reached the end of life. Only delete asset records if they were created erroneously. |

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| State | Available substates | Notes |
|---|---|---|
| | ○ Buy out: Leased hardware asset is bought before the expiry of contract.<br>○ Pending resale: Asset is awaiting resale. | |
| Missing | ○ Lost<br>○ Stolen | An asset that is missing or lost. |
| Build | None | Asset is being prepared. This state is used during the creation of an asset bundle.<br>**Note:** Hardware and consumables don't have a Build state. |

## Create fixed assets

Fixed assets are containers that can hold multiple assets. Fixed assets are commonly tracked at the corporate level by a finance or accounting department, but may contain IT assets such as hardware and software.

The **Fixed Asset** option in the Cost application shows the IT assets related to a fixed asset record. This link can help IT stay coordinated with the corporate asset system. Users with the financial_mgmt_admin and financial_mgmt_user roles can create fixed assets. After creating a fixed asset and adding assets, the residual value can be automatically calculated.

To create a fixed asset:

1. Navigate to **Cost** > **Fixed Assets**.
2. Click **New**.
3. Enter a name for the fixed asset.
4. Click **Submit**.

To add assets to a fixed asset:

1. Navigate to **Cost** > **Fixed Assets**.
2. Click a fixed asset.
3. In the **Covered assets** related list, click **Edit**.
4. In the **Collection** list, double-click an asset to add it to the **Covers Assets List**.
5. Click **Save**.

To sum the residual values of all assets in a fixed asset:

1. Navigate to **Cost** > **Fixed Assets**.
2. Click a fixed asset.

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3. Click **Sum Residual Value**.

   The ServiceNow platform calculates the**Residual Value**, **Total cost,** and **Total depreciation** based on information in the **Financial** and **Depreciation** sections on the individual asset records.

## Use depreciation with fixed assets

You can calculate depreciation for a fixed asset using a choice of depreciation schedules. Calculating depreciation for a fixed asset can help IT coordinate with the corporate fixed asset system to report correct valuation and book value.

### Before you begin

Role required: financial_mgmt_admin or financial_mgmt

### About this task

When creating a new depreciation schedule, select the **Declining Balance** or **Straight Line** depreciation **Category**. The two categories depreciate an asset by the same overall amount during the asset life cycle, but do so on different schedules.

- **Declining Balance**: depreciates an asset by a greater amount in earlier accounting periods than in later periods.
- **Straight Line**: depreciates an asset by an equal amount each accounting period.

The following example shows depreciated value on a $10,000.00 asset over five years using the two different methods.

**Using depreciation with fixed assets**

| Year | Declining balance | Straight line |
|---|---|---|
| 1 | $5000.00 | $8000.00 |
| 2 | $2500.00 | $6000.00 |
| 3 | $1250.00 | $4000.00 |
| 4 | $625.00 | $2000.00 |
| 5 | $0 | $0 |

### Procedure

1. To view a depreciation schedule, navigate to **Financial Management** > **Depreciation** and click the **Category**.
2. To create a new depreciation schedule, click **New**.
3. Enter a **Name**.
4. Select a **Category**.
5. Add a **Script** to calculate depreciation value.

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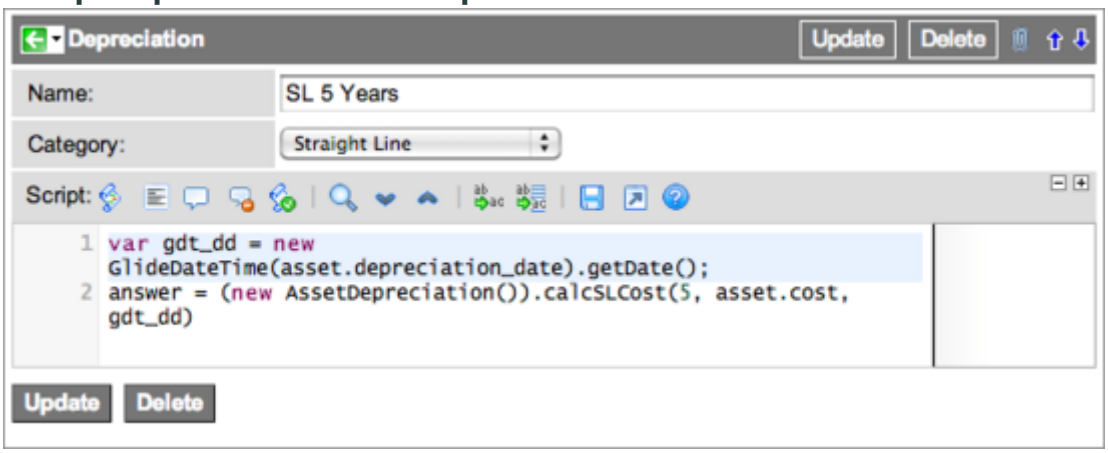
**Example depreciation schedule script**




6. Click **Submit**.
   The depreciation schedule is now available in the **Depreciation** field on the asset record.

## Consumables life cycle

Consumables are assets that are not tracked individually, but as a group of the same model.

The group of consumables has one or more of the following traits.

- Same location
- Same state
- Consumed by the same asset, typically as accessories or parts

Some common consumable assets include mouse devices, computer keyboards, and pencils. The base ServiceNow system includes the **Consumable** model category. The first step in working with models is to create a model within the model category for an individual consumable asset. Items such as monitors, keyboards, and mouse devices are often tracked as consumables. Consumables cannot be pre-allocated.

Consumable assets are stored in the Consumable [alm_consumable] table. Consumables follow a slightly different life cycle from other assets.

### Stages of consumables

The consumable lifecycle stages are as follows.

- On order
- In stock
- In transit
- Consumed
- In maintenance
- Retired
- Missing

### View consumable assets

Consumables are tracked as a group of the same model, but you can view individual consumables in the consumable model record.

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### Before you begin
Role required: model_manager

### Procedure
1. Navigate to **All** > **Product Catalog** > **Product Model** > **Consumable Models**.
2. Open a consumable model record.
3. View individual consumables in the **Consumables** related list.

## Create consumable assets

Create a consumable to track an asset as a group of the same model.

### Before you begin
Role required: asset

### Procedure
1. Navigate to **All** > **Asset** > **Portfolios** > **Consumables** and create a new record (see table for field descriptions).

**Consumable record form**

| Field | Description |
|---|---|
| Display name | Name of the asset. |
| Model category | Model category that controls if an asset is linked to a CI. |
| Model | Product model of the asset. |
| Quantity | Amount of items the asset represents. |
| General | |
| State | State of the asset. |
| Parent | Parent asset. When a parent asset is defined, the **Assignment** and **State** fields of the child asset are automatically populated based on the **Assignment** and **State** fields of the parent asset and are read-only. |
| Class | Type of asset. The system automatically sets the **Class** to **Consumable**. |
| Expenditure type | The type of expenditure. Choose from the following options:<br>○ **Capex**: Capital expenditure is a one-time expenditure, where the value is realized over the years. For example, a photocopier.<br>○ **Opex**: Operational expenditure is an on-going expenditure. For example, toners for the photocopier. |
| Substate | Substate of the asset. |
| Location | Location of the asset. |
| Cost | Price that the asset was purchased for. |
| Cost Center | Cost center financially responsible for the asset. |
| Disposal | |

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| Field | Description |
|---|---|
| Disposal order number | A unique number assigned to the asset disposal order.<br>**Note:** This field appears only if you have installed Hardware Asset Management from the ServiceNow Store. |
| Disposal vendor | The vendor assigned to carry out the asset disposal order.<br>**Note:** This field appears only if you have installed Hardware Asset Management from the ServiceNow Store. |
| Vendor disposal order ID | Order number assigned by the vendor assigned to carry out the asset disposal order.<br>**Note:** This field appears only if you have installed Hardware Asset Management from the ServiceNow Store. |
| Disposal date | The date when the asset disposal order process is completed.<br>**Note:** This field appears only if you have installed Hardware Asset Management from the ServiceNow Store. |
| Disposal reason | Text explaining why the asset is being retired. |
| Beneficiary | Organization that receives the asset when it is retired. |
| Resale price | Value of the asset when it is retired. For example, if the asset is donated, the value used when reporting taxes. |
| Scheduled retirement | Scheduled date on which the asset is retired. |
| Retired date | Actual date on which the asset was retired. |
| Activities | |
| Work Notes | Work notes related to the asset. |

2. Click **Submit**.

## Consume consumable assets

To consume consumable assets, they must have a state of **In Stock** and a substate of **Available**.

### Before you begin

Role required: asset

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### Procedure

1. Navigate to **All** > **Asset** > **Portfolios** > **Consumables**.
2. Click the **Display Name** of a consumable asset with a state of **In Stock** and a substate of **Available**.
3. Click **Consume**.
4. Enter the **Quantity** to consume.
5. In **Asset**, click the lookup icon and select the asset associated with the consumable.

   **Example**
   For example, a mouse tracked as a consumable asset can be associated with a non-consumable asset such as a computer.
6. In **User**, click the lookup icon and select a user associated with the consumable.
7. Click **OK**.
   On the **Consumable** form, the **Quantity** field shows the reduced number. The Consumables list contains two records for the consumable in the specific stockroom: one with a state and substate of **In Stock** and **Available** (if you did not consume the entire quantity), and one with a state of **Consumed**. If a consumable is not in the process of being transferred to a different stockroom and information in the data record is the same, similar records merge automatically. After a consumable is consumed, the record remains in the system for reporting purposes.

## Create pre-allocated assets

Create a pre-allocated asset that physically exists, but isn't yet a financial liability.

### Before you begin
Role required: asset

### Procedure

1. Navigate to **All** > **Asset** > **Portfolios** > **All Assets** and create a record (see table for field descriptions).

   **Note:**
   Category must have the **Allow pre-allocated** option selected.

**Consumable record form**

| Field | Description |
|---|---|
| Display name | Name of the asset. |
| Model category | Model category that controls whether an asset is linked to a CI. |
| Model | Product model of the asset. |
| Quantity | Number of items the asset represents. |
| General | |
| State | State of the asset. |
| Stockroom | Stockroom of the asset. This field is only available if the State field is set to **In stock**. |

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| Field | Description |
|---|---|
| Parent | Parent asset. When a parent asset is defined, the **Assignment** and **State** fields of the child asset are automatically populated based on the **Assignment** and **State** fields of the parent asset and are read-only. |
| Class | Type of asset. The system automatically sets the **Class** to **Consumable**. |
| Expenditure type | The type of expenditure. Choose from the following:<br>○ **Capex**: Capital expenditure is a one-time expenditure, where the value is realized over the years. For example, a photocopier.<br>○ **Opex**: Operational expenditure is an on-going expenditure. For example, toners for the photocopier. |
| Substate | Substate of the asset. |
| Location | Location of the asset. |
| Cost | Price that the asset was purchased for. |
| Cost Center | Cost center financially responsible for the asset. |
| Activities | |
| Work Notes | Work notes related to the asset. |

2. Select **Submit**.

## Allocate a pre-allocated asset

Assets can be allocated from pre-allocated asset records, which creates new asset records and reduces the **Quantity** in the original pre-allocated asset record.

### Before you begin
Role required: asset

### About this task
Allocating an asset makes it a financial liability. After all pre-allocated assets have been allocated, the pre-allocated asset record is removed from the asset list.

### Procedure
1. Navigate to **All** > **Asset** > **Portfolios** > **All Assets**.
2. Filter the **Substate** column to show only **Pre-allocated** assets.
3. Select the reference icon in the row containing the asset to allocate.
4. Select **Allocate** at the bottom of the form.

> **Note:**
> If the *glide.asset.create_ci_with_ire* property is set to `true`, a form appears when you click **Allocate**. On the form, fill in the **Asset tag**, **Serial number**, and **Reserved for** fields, then click **OK**.

### Result
The system creates and navigates to a new asset record, which has the same model and parent information as the pre-allocated asset. The new asset has a **Quantity** of one, while the pre-allocated asset's **Quantity** is reduced by one.

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### Split a pre-allocated asset

You can split a pre-allocated asset to create a group that can be moved to a different stockroom.

**Before you begin**
Role required: asset

**About this task**
For example, a group of 100 pre-allocated computers is in Stockroom A. Split the group into two groups of 50 and move one group to Stockroom B. Allocate the computers from the two different stockrooms.

**Procedure**

1. Navigate to **All** > **Asset** > **Portfolios** > **All Assets**.
2. Filter the **Substate** column to show only **Pre-allocated** assets.
3. Select the reference icon in the row containing the asset to split.
4. Select **Split**.
5. Enter a **Quantity to Split** and select **OK**.
   The pre-allocated asset is split into two groups and the **Quantity** field on each record indicates the number in each group.

## Stockrooms

Stockrooms are places to which assets are assigned.

When stock is low on a particular asset, stock rules can either notify an asset manager or automatically transfer inventory from one stockroom to another.

Stockrooms are separate, standalone entities in the Asset Management application.

### Create a stockroom

You can create a stockroom.

**Before you begin**
Role required: inventory_admin

**Procedure**

1. Navigate to **All** > **Inventory** > **Stock** > **Stockrooms** and create a new record (see table for field descriptions).

| Fields | Description |
|---|---|
| Name | Display name and identifier of the stockroom. |
| Assignment group | Group that primarily uses the stockroom. |
| External | Whether this stockroom is managed internally (check box is cleared) or is managed externally by a third party (check box is selected). |
| Location | Physical location of the stockroom. |
| Type | Type of stockroom, such as Field Agent or On site. |

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| Fields | Description |
|---|---|
| Manager | Person in charge of the stockroom. Receives restocking notifications and requests for the stockroom's stock rules. |

2. Click **Submit**.

## Delete a stockroom with assets

You can delete a stockroom. If the stock room has assets, you must remove the assets from the stockroom first.

### Before you begin

Role required: inventory_admin

### Procedure

1. Navigate to **All** > **Asset** > **All Assets**.
2. Personalize the list to add the **Stockroom** column.
3. Filter the list to show only the assets in the stockroom that you want to delete.
4. Change or remove the stockroom for all of the asset records.
5. After removing assets from the stockroom you want to delete, continue with the instructions for deleting a stockroom with no assets.

## Delete a stockroom with no assets

You can delete a stockroom that has no assets.

### Before you begin

Incomplete transfer orders must be deleted before you delete the stockroom.

Role required: inventory_admin

### Procedure

1. Navigate to **All** > **Inventory** > **Stock** > **Stockrooms**.
2. Select the check box beside the stockroom name.
3. In the **Actions** list, select **Delete**.

> **Note:**
> Transfer order history is deleted when you delete the stockroom.

## Stockroom types

Stockroom types are categories of stockrooms.

The stockroom type has two significant characteristics.

- **Priority**: Order of stockrooms the parts should be sourced from. For example, if a personal stockroom (priority 2) contains the required part, the personal stockroom receives priority over the Central Stockroom (priority 7) because the part in the personal stockroom doesn't require delivery.
- **Shipment Required**: Informs the system if a transfer order must be created when the part is sourced from a stockroom of the given type. For example, a part in a personal stockroom doesn't require shipment, so no transfer order is needed.

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**Stockroom types defined in the base system**

| Value | Name | Priority | Shipment Required | Description | Comment |
|---|---|---|---|---|---|
| on_site | On Site | 1 | False | Stockroom at the customer site. | Close to the users and doesn't require shipping. |
| field_agent | Field Agent | 2 | False | Virtual, personal stockroom linked with a field service agent (FSA) directly, used for delivery. | Used to indicate to the system that the part has been delivered and is with the FSA. |
| fsl | FSL | 4 | True | Forward Shipping Location. | Small stockrooms where the parts can typically be shipped via overnight delivery. |
| pudo | PUDO | 5 | True | Pick Up/Drop out location. | This type is sometimes called a by-box. Can be a postal box that can receive new and returned parts that are often near major customer sites. |
| stockroom | Warehouse | 6 | True | | A regional stockroom. |
| central_stockroom | Central Warehouse | 7 | True | | A central stockroom, usually a large facility from which most parts are shipped. |

## Create a new stockroom type

If you need stockroom types that are not included in the base system, you can create a custom stockroom type.

### Before you begin

Role required: inventory_admin

### About this task

Check the priority level of the stockroom types provided in the base instance to ensure that you assign the correct priority level to any new stockroom types you create. You can also modify the stockroom types included in the base system.

### Procedure

1. Navigate to **All** > **Inventory** > **Stock** > **Stockroom Types** and create a new record (see table for field descriptions).

| Field | Description |
|---|---|
| Name | Display name of the stockroom type. |

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| Field | Description |
|---|---|
| Description | General information about the stockroom type. |
| External stockroom | Whether stockrooms of this type are managed internally (check box cleared) or managed externally by a third party (check box selected). |
| Priority | Level of precedence for this type of stockroom. |
| Shipment required | Option that determines if stockrooms of this type require shipment by default. |
| Value | Internal identifier of the stockroom type. |

2. Click **Submit**.

## Stock rules

Stock rules are defined criteria stating that when the inventory of a particular asset in a particular stockroom reaches a specified threshold, a certain number should either be transferred from another stockroom or ordered from a vendor.

For example, a specific model of computer keyboard reaches an inventory of 10 in a particular stockroom and, because a stock rule is in place, a transfer order is automatically created to transfer 50 from a different stockroom. Because there can be multiple assets of a model within a stockroom, stock rules enable you to check all assets fitting the criteria and view a total count.

There are two restocking options:

- Email notifications can be sent to the stockroom manager (specified in the **Manager** field on the stockroom record) through the **Asset Restocking** email action when the inventory of a particular asset in the stockroom reaches a specified threshold. You can customize this email notification by updating the details in the following tabs:
  - **When to send**: Set the conditions under which the email should be triggered.
  - **Who will receive**: Specify the recipients of the email.
  - **What it will contain**: Define the content and information included in the email.

  A task is automatically created for the stockroom manager or, if Procurement is active, a purchase order and a purchase order line item are created.
- A transfer order can be generated automatically to restock the item from another stockroom.

## Stock Rule Runner job

The Stock Rule Runner job runs everyday to check if the inventory in the stockroom has reached the threshold set by the stock rule. The job then triggers tasks or workflows to restock the inventory. This job creates tasks for stockroom managers and also sends email notifications to them.

**Important:**
If restocking is in progress, the system doesn't create duplicate email messages or duplicate transfer orders. It's important to act on it promptly.

By default, the *glide.sc.checkout.twostep* system property that's set to **false**, results in the automatic submission of requests when items are added to the Service Catalog cart. Also, with this setting of the system property, the Stock Rule Runner job triggers the creation of tasks, purchase orders, transfer orders, and Service Catalog requests.

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If the value of the *glide.sc.checkout.twostep* system property is set to **true**, then the *CartJS* API adds items to the cart but the requests aren't submitted automatically. Instead, the request submission requires additional actions to be performed, affecting the automatic flow of the Stock Rule Runner job.

The **pending_delivery** is used to indicate whether a stock rule is awaiting fulfillment or delivery. The pending_delivery can be set to any of the following values:

- When this flag is set to **true**, the stock rule is in progress, and the system doesn't generate duplicate tasks or orders for the same item.
- When this flag is set to **false**, the system reprocesses the stock rule and triggers the creation of tasks and orders again.

**Note:**
Make sure that the pending_delivery flag is updated to false when a stock rule has been processed, enabling the Stock Rule Runner job to run without redundancy.

Based on the Stock rule type and the plugin activated on your ServiceNow instance, the Stock Rule Runner job creates purchase orders, transfer orders, Service Catalog requests, or tasks.

**Important:**

If the Procurement plugin and the Hardware Asset Management application aren't activated, the Stock Rule Runner job creates a task instead of a purchase order or a Service Catalog request. This task prompts the stockroom manager to take the necessary actions to replenish the inventory.

**Stock Rule Runner job behavior**

| Stock rule type | Orders/Requests created |
|---|---|
| Stockroom | A transfer order is created automatically when the inventory in a stockroom reaches the threshold set by the stock rule.<br><br>The transfer order is created to transfer stock from another stockroom to replenish the inventory.<br><br>**Note:**<br>If a transfer order is already in progress, then additional transfer orders aren't created. |
| Vendor | When the Procurement plugin (com.snc.procurement) is activated, a purchase order and corresponding purchase order line items are created.<br><br>Purchase orders and purchase order line items are created when the inventory in a stockroom reaches the defined threshold and needs replenishment directly from the vendor.<br><br>**Note:**<br>You must have a procurement_user role to access the purchase order and purchase order line item. |
| Vendor or Service Catalog | When the Hardware Asset Management application is installed and the stock rule is set to Vendor or Service Catalog, then note the following points: |

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**Stock Rule Runner job behavior (continued)**

| Stock rule type | Orders/Requests created |
|---|---|
| | • The Stock Rule Runner job submits a Service Catalog request instead of creating a purchase order.<br>• The Service Catalog request is automatically submitted for stock replenishment through the Service Catalog. The items are added to the Service Catalog cart for the Stockroom manager to review and approve.<br>• The pending_delivery flag is used to track the status of the Service Catalog requests. This flag guarantees that the Service Catalog requests are processed correctly, avoiding duplicate actions. |

### Related topics

Create a stock rule

## Create a stock rule

You can create a stock rule to control what happens when the inventory of a particular asset in a particular stockroom reaches a specified threshold.

### Before you begin

Role required: inventory_admin

### Procedure

1. Navigate to **All** > **Inventory** > **Stock** > **Stock Rules** and create a new record (see table for field descriptions).

| Field | Description |
|---|---|
| Model | Product model to which the rule applies. |
| Threshold | Quantity that the stock must reach to trigger restocking. For example, enter a threshold of 10 for a laptop computer that should be restocked when inventory drops below 10 in the specified stockroom.<br>**Note:** If a stock rule is created for a hardware or software model reaches the threshold limit, a notification is sent to the stockroom manager and a stock order request is automatically created. |
| Restocking option | Location where additional supplies should come from.<br>If Procurement isn't active, then restocking option is **Stockroom** only. Otherwise, select one of the following:<br>○ **Stockroom**: Creates a transfer order to obtain the asset from another stockroom.<br>○ **Vendor**: Sends an email to the stockroom manager to order from a vendor. In addition to the email notification, a purchase order and purchase order line item are created. |

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| Field | Description |
|---|---|
| | **Important:** Once a transfer order, purchase order, or purchase order line item is created, it's important to act on it promptly. Any email notifications or reminders won't be sent for these actions. |
| Active | Option for enabling the stock rule for restocking automatically. |
| Stockroom | Current physical location of the asset. |
| Order size | Minimum order quantity for stockroom transfers or vendor purchases. ServiceNow calculates the smallest multiple of the order size needed to restock the item above the threshold.<br><br>For example, there are 3 laptops in stock with a threshold of 10 and the **Stockroom** option selected. If the order size is set to 4, the system creates a transfer order for 8 laptops to exceed the threshold and satisfy the rule (3 in stock + 8 ordered = 11). When restocking from a vendor, ServiceNow sends an email to the stockroom manager showing the total number of items to order, as multiples of the order size. |

2. Select **Submit**.

**Related topics**

Stock rules

## Transfer orders for Asset Management

Transfer orders move assets between company stockrooms.

The Asset Management application enables asset managers to create transfer orders for moving assets between company stockrooms.

Consumable assets and non-consumable assets can be transferred as follows:

- If an asset is consumable, it can be transferred and the quantity can be greater than one. Consumable parts are tracked by the system qualitatively.
- If an asset is non-consumable, it must be transferred as a single entity with a quantity of one. Non-consumable parts correspond to assets defined in the system.

**Important:**
The Transfer Order Line workflow in the Asset Management application handles the processing of transfer order lines. However, if the Service Management Core plugin is also activated on your ServiceNow instance, the Transfer Order Line SM core workflow will process the transfer order lines instead. For more information, see Move an asset through the transfer process.

### Transfer order lines

Transfer Order Lines is a new module under Inventory with Template Tasks and Template Subtasks as the sub modules. Transfer order lines allow the transfer of multiple assets on one transfer order. Actions such as shipment preparation can take place at the transfer order line level. Pre-allocated assets can be included in a transfer order line, but can only be transferred

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in their full quantity. A business rule prevents the same asset from being transferred on two different transfer orders at the same time.

**Note:**
The Transfer Order and the Transfer Order Line workflows have moved from the Procurement plugin to the Asset Management plugin. The Transfer Order Line workflow runs only if no other workflows are matched or running on a specific record.

## Transfer order line tasks

When you create a transfer order line, based on the model category specified in the asset, a transfer order line task is automatically created. Transfer order line tasks are created to move transfer order lines from one stage to the other. Transfer order line tasks also help you to track service levels and the time frame needed to complete a transfer order.

Default template tasks are available with the Asset Management application. The template tasks are based on model categories. Default template tasks cannot be deleted or modified. If required, you can also create your own customized template tasks. For more information, see Create a customized template task. When you create a transfer order line and select an asset, that asset corresponds to a model category. If a customized template task exists for that model category then that template task is added to the transfer order line as a transfer order line task. If no customized template task match is found for the asset you selected, then the default template task is added as a transfer order line task.

Closing a transfer order line task completes the task and creates the next task in the process. For example, once you close the Ready for fulfillment task, the state for this task appears as **Closed Complete** and a new task is opened for the next stage, Ready for Shipment. This process continues till you close all the tasks required for completing the transfer order line. As you close a task and as a task moves from one stage to the next, the asset gets automatically updated too. For example, when the transfer order line moves from Ready to Fulfillment to Prepare for Shipment, the asset's status also moves from available to reserved.

**Note:**

If you skip a transfer order line task and select **Closed Skipped**, the asset is not updated automatically. Once the asset is received or delivered, you can make the update manually.

If you are upgrading from any previous release to the New York release, and you have an open transfer order line that is still being processed, all the transfer order line tasks associated with that transfer order line are simultaneously created and displayed in the transfer order line form layout. Based on the stage of the transfer order line, the tasks that still need to be processed will be open; all the other tasks that have already been completed will be closed. Based on the order, if you close a later transfer order line task, all the previous tasks, which are currently open, automatically will be **Closed Skipped**.

## Transfer order line subtasks

To further add granularity and efficiency to the process, you can also create subtasks for each transfer order line task. Each transfer order line task can have multiple subtasks. For example, before preparing for shipment, for a computer, you may want to create subtasks for imaging the computer or adding additional software. If subtasks have been defined for a particular transfer order line task, then the subtasks are automatically added to the transfer order line task. Once all the subtasks are closed, the transfer order line task is automatically closed. For more information, see Create a template subtask.

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## Transfer assets using transfer orders

Transfer assets from one location to the other by moving the assets through the transfer order process. You create a transfer order and move it from its initial **Draft** status to the final **Received** status.

### Before you begin

Role required: inventory_user

The inventory_user, asset, or procurement_user role can only access the Transfer Order [alm_transfer_order] reports. You must activate the Procurement (com.snc.procurement) plugin for the inventory_user, asset, and procurement_user roles.

### Procedure

1. Navigate to **All** > **Inventory** > **Transfer Orders** > **Create Transfer Order**.
2. In the **From Stockroom** list, select a stockroom from which you want to ship the items.
3. In the **To Stockroom** list, select a stockroom where you want to ship the items.

   **Note:**
   If you select the same stockroom in both the From Stockroom and To Stockroom fields, the transfer order automatically moves from **Draft** to **Received** when a transfer order line is added.

4. Select a date and time for the delivery from the **Delivery by date** date picker.
5. Select **Submit**.
6. Open the transfer order.
7. Next to **Transfer Order Lines**, click **New**.
8. Select a model for the transfer order line.
9. If the model is a consumable, specify a quantity in **Quantity Requested**.
10. Click **Submit**.
    After creating transfer order lines, the transfer order and all the transfer order lines are in the draft stage. While a transfer order or a transfer order line is in the draft stage, it can be deleted.

    **Note:**
    When an asset is part of a transfer order set to **Draft**, the asset record updates to show the asset as reserved. You can't request or transfer the asset while it's reserved.

    When you create a transfer order line, based on the model category specified in the asset, a transfer order line task is automatically created. The transfer order line task helps you to progress through the various stages of the transfer order line. Each transfer order line task represents a particular stage in the transfer process. As you close a task, a new task is created and the transfer process moves to the next stage.
11. Open the transfer order line task and click **Close Task**.
    The transfer order line task is completed and a new transfer order line task is opened.

### What to do next

Keep closing each task until you reach the last stage (Received). After you close the task for the Received stage, the transfer order line is completed and closed. All transfer order lines and the transfer order are marked **Delivered**.

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## Summary of transfer order line tasks

As assets move through the transfer process, the stage of a transfer order is always based on the individual transfer order lines tasks.

### Transfer order line tasks

| Transfer order line stages | Description |
|---|---|
| Draft | When a transfer order line is created.<br><br>On the asset form, the **State** field value remains **In stock**, and the **Substate** field value is updated to **Pending transfer**. |
| Requested | This task is created first for the transfer order line.<br><br>On the asset form, the **State** field value remains **In stock**, and the **Substate** field value remains **Pending transfer**. |
| Shipment Preparation | After the **Requested** task is closed, this task is created. This task deals with preparing the transfer order line for shipment. Specify the values for the shipment tracking fields such as **Shipping carrier**, **Vendor**, **Tracking number**, and **Ship date**.<br><br>On the asset form, the **State** field value remains **In stock**, and the **Substate** field value remains **Pending transfer**. |
| In Transit | After the **Shipment Preparation** task is closed, this task is created.<br><br>On the asset form, the **State** field value changes to **In transit**, and the **Substate** field value is updated to **Reserved**. |
| Received | After the **In Transit** task is closed, this task is created.<br><br>On the asset form, the **State** field value changes to **In stock**, and the **Substate** field value is updated to **Available**. The **Stockroom** field value is updated as the asset is received in the destination stockroom. |
| Delivered | After the **Received** task is closed, this task is created. After you close the **Delivered** task, the transfer order line is completed.<br><br>On the asset form, the **State** field value remains **In stock** and the **Substate** field value is updated to **Reserved**. |

## Delete a transfer order

You can delete a transfer order only if the transfer order is still in the draft stage.

### Before you begin

Role required: inventory_user

The inventory_user, asset, or procurement_user role can only access the Transfer Order [alm_transfer_order] reports. You must install the Procurement (com.snc.procurement) plugin for the inventory_user, asset, and procurement_user roles.

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### Procedure

1. Navigate to **All** > **Inventory Management** > **Transfer Orders** > **Transfer Orders**
2. Select the check box beside a transfer order.
3. From the Actions on the selected rows menu at the bottom of the list, select **Delete**.

#### Related topics

Delete a transfer order line

Return items received in a transfer order

## Delete a transfer order line

You can delete a transfer order line only if it's still in the draft stage.

### Before you begin

Role required: inventory_user

The inventory_user, asset, or procurement_user role can only access the Transfer Order [alm_transfer_order] reports. You must install the Procurement (com.snc.procurement) plugin for the inventory_user, asset, and procurement_user roles.

### Procedure

1. Open a transfer order.
2. Select the check box beside a transfer order line.
3. From the Actions on the selected rows menu at the bottom of the list, select **Delete**.

   Alternatively, you can cancel a transfer order or a transfer order line while it is in **Requested** or **Shipment Preparation** stage. Once all the lines are canceled, the transfer order is automatically canceled.

#### Related topics

Delete a transfer order

Return items received in a transfer order

## Return items received in a transfer order

When you receive a transfer order and if there's a problem with all or some of the items, you can return the transfer order.

### Before you begin

Role required: inventory_user

The inventory_user, asset, or procurement_user role can only access the Transfer Order [alm_transfer_order] reports. You must activate the Procurement (com.snc.procurement) plugin for the inventory_user, asset, and procurement_user roles.

### About this task

Items in a transfer order must be received before they can be returned.

### Procedure

1. Navigate to **All** > **Inventory Management** > **Transfer Orders**.
2. Select a transfer order that is in the **Received** stage.

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3. Click the transfer order line **Number** of the item to return.
4. Click **Return**.
5. Enter a quantity to return.
6. Enter a reason for the return.
7. Select the **Defective** check box to return items that are broken.

   Defective items are returned to the stockroom from which they were delivered, but aren't added to available stock. Instead, they're tracked in the separate category named "Defective" so they can't be requested or transferred again.
8. Click **OK**.
9. Click **Update**.

   A new transfer order line is automatically created.

   A new corresponding parent transfer order is also automatically created with the new transfer order line on it.
10. If you're returning a consumable, navigate to the transfer order line record, and click the model name to open the model record.

    The model record shows which stockrooms contain the model. The one defective model is listed.

    **Note:**
    The defective model is still at the stockroom to which it was delivered. The defective model must be transferred back to the stockroom where it originated.
11. Move the new transfer order through the regular transfer order process.
    Items are automatically returned to the stockroom from which they were delivered. A transfer order line item that has been returned can't be delivered later.

    If you return another defective model from the same, original order, the two defective returns are merged into one line item.

## Create a transfer order for Asset Management

Create a transfer order in order to transfer assets from one location to the other.

### Before you begin

Role required: inventory_user

### Procedure

1. Navigate to **All** > **Inventory Management** > **Transfer Orders** > **Create Transfer Order**.
2. Click the **From stockroom** list to select a stockroom from which the item(s) is to be shipped.
3. Click the **To stockroom** list to select a stockroom where the item(s) is to be shipped.
4. Click **Submit**.
   Once the transfer order is created, you can create transfer order lines to specify the items that the transfer order comprises of. See Create a transfer order line .

## Create a transfer order line

Transfer order lines specify the exact items that comprise a transfer order.

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### Before you begin
Role required: inventory_user

### About this task
A transfer order can contain one or more transfer order lines. Under a single transfer order, all transfer order lines will have the same From location and To location. Each line contains an asset to transfer and the quantity to transfer. The item to transfer is identified by asset name and model name. A transfer order line can involve one quantity of a non-consumable asset or multiple quantities of a consumable asset. A bundled model can be transferred.

### Procedure

After creating a transfer order, click **New** in the **Transfer Order Lines** related list and fill in the fields as appropriate.

| Field | Description |
|---|---|
| Number | Internal unique number identifying the transfer order line. |
| Transfer Order | The transfer order to which the transfer order line belongs. |
| Model | Model of the items requested by the transfer order line. For example, a printer. If the Asset field is filled out first, the Model field is automatically filled in with the model corresponding to the asset. |
| Quantity requested | Number of items requested by the transfer order line. For example, 3 computers are requested to be transferred. |
| Quantity received | Number of items already received. For example, 3 keyboards are transferred, 2 are received. |
| Stage | Current stage of the transfer order. Transfer order lines can only be created when a transfer order is in **Draft** stage. |
| Request line | Requested item to associate with the transfer order line. |
| Asset | Asset requested by the transfer order line. For example, a specific printer. The asset can filter on stockrooms. |
| Quantity remaining | Number of items yet to be received. For example, 3 keyboards had been requested, 2 are received, 1 is remaining. |
| Quantity returned | Number of items that already needed to be returned. |

## Create a customized template task

Create customized template tasks to configure your specific task workflow for transfer order lines. Default template tasks are available with the Asset Management application. You can't modify or delete a default template task.

### Before you begin
Role required: inventory_user

### About this task
Template tasks help you progress through the various stages of the transfer order line. Custom template tasks are stored in the Custom Template Task [alm_custom_template_task] table. The template tasks are based on model categories. For example, when you create a customized template task for the Application model category, whenever a transfer order line is created for the

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Application model category, the template tasks associated with the Application model category are used as transfer order line tasks. When you create customized template tasks, make a copy of the Transfer Order Line workflow and update the workflow accordingly. For example, if you need only four tasks out of five, you can delete the additional task from the workflow.

**Note:**
Two template tasks can't be created when they're based on the same model category, the same order number and the same stage. The model category, the order, and the stage have to be unique for each template task. For example, you can't create two template tasks for Prepare for Shipment, based on the Application model category, order number 200, and the stage as Requested. If you try to create an identical template task as mentioned in the example, an error message is displayed.

### Procedure

1. Navigate to **All** > **Inventory** > **Transfer Order Lines** > **Template Tasks**.
   All the default template tasks that are available with the Asset Management application are listed.
2. Click **New**.
   You can also customize a template task by copying a default template task. Click **Copy Default Template** and select a model category.
3. Fill out the form fields (as shown in the table).

| Field | Description |
|---|---|
| Task name | Name of the template task |
| Model category | Model category this template task is based on. |
| Order | Order in which the template task is added to the transfer order line. |
| Short description | Brief description about this template task. |
| Next stage | Stage that this template task gets executed. |

4. Click **Submit**.

## Create a template subtask

Create template subtasks to add granularity to the transfer order line tasks. For example, before preparing for shipment, for a computer, you may want to create sub tasks for imaging the computer or adding additional software.

### Before you begin
Role required: inventory_user

### About this task
The template subtasks that you create are stored in the Template Subtask [alm_template_subtask] table. When a transfer order line task is created and if subtasks are defined for that transfer order line task, then the subtasks are automatically added to the transfer order line task.

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### Procedure

1. Navigate to **All** > **Inventory** > **Transfer Order Lines** > **Template Subtasks**.
2. Click **New** and fill out the form fields (as shown in the table).

| Field | Description |
|---|---|
| Short Description | A brief description of the subtask. |
| Subtask name | A name for the subtask. |
| Task | The task that this subtask is associated to. |

3. Click **Submit**.

## Perform bulk updates for transfer order lines

Update tasks for multiple transfer order lines at one go to streamline the transfer order process.

### Before you begin

Transfer order lines enable the transfer of multiple assets on a transfer order. When you create a transfer order line, a transfer order line task is automatically created. Transfer order line tasks are created to move transfer order lines from one stage to the other. Each transfer order line can have multiple tasks such as **Requested**, **Shipment Preparation**, **In Transit**. For information on the stages of a transfer order line task, see Summary of transfer order line tasks.

Role required: inventory_user

### Procedure

1. Navigate to **All** > **Inventory** > **Transfer Order**.
2. Select **Bulk Update** next to the Transfer Order Lines related list.
   The system property *sn_itam_tol_bulk_update_max_count* determines the maximum count of transfer order lines that would be processed during a single bulk update operation.
   The Bulk Update - Transfer Order Line dialog box appears.
3. In the **Select a stage** field, select the stage that you want to move this task to.
   All transfer order lines, along with the asset display names that are in the selected stage appear in the **Available** box.
4. In the **Assigned to** field, select the person you want to assign this task to.
   The **Assigned to** field defaults to the logged-in user.
5. Select the transfer order lines in the **Available** box and move them to the **Selected** box.
   When you select the transfer order lines, you can view the model and asset display names for hardware and consumable assets. For consumable assets, you can view additional details such as quantity requested and quantity received.
6. Select **Update**.
   All the selected transfer order line tasks and associated subtasks for the selected stage are closed and the next task in the process is created. For example, all the transfer order line tasks in the **Requested** stage are closed and the next task in the process **Shipment Preparation**, is created.
7. Return to the Bulk Update - Transfer Order Line dialog box to continue this process until you close all the tasks required for completing the transfer order line.

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# Transfer order line asset tracking

As transfer order line actions are triggered, the stock information and states of any affected assets are updated. Consumables and non-consumables are tracked differently.

When an asset is included in a transfer order line, the following takes place:

- A substate field on the asset form changes to reflect the transfer order line states
- The Active TO option on the asset form is automatically selected to show that the asset is part of a transfer order and cannot be added to multiple transfer orders
- The asset is removed from the pool of available assets and changed to a state of *In Stock Pending Transfer*

**Related topics**

Delete a transfer order

Delete a transfer order line

Return items received in a transfer order

## Transfer order line asset tracking of non-consumables

When transfer order line stages change for non-consumables, it affects asset substates.

| Transfer order line stage | Affect on asset substate |
|---|---|
| Draft | Asset moves to **In Stock** > **Pending Transfer** (from the current stockroom). If the asset is a consumable, the quantity can be edited. |
| Requested | Asset stays in **In Stock** > **Pending Transfer**. |
| Shipment Preparation | Asset stays in **In Stock** > **Pending transfer**. |
| In Transit | Asset moves to **In Transit** > **Reserved**. |
| Received | Asset moves to **In Stock** > **Available** (in the destination stockroom). |
| Delivered | Asset moves to **In Stock** > **Reserved**. |

**Related topics**

Delete a transfer order

Delete a transfer order line

Return items received in a transfer order

## Transfer order line asset tracking consumables

When a consumable is added to a transfer order line, the stock for the consumable is split into two records and the transfer order links to the newly created stock line.

For example:

1. Stockroom A has ten keyboards in stock.
2. A transfer order line named TOL1 transfers three keyboards from stockroom A to stockroom B.
3. The stock of ten keyboards in A is split into two records: seven shown as **In stock** > **Available** and three shown as **In Stock** > **Pending Transfer**.

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4. Another transfer order is created with a transfer order line named TOL2 that transfers two keyboards from stockroom A to stockroom B.

5. The seven remaining keyboards are split into another two lines: five **In stock** > **Available** and two **In stock** > **Pending Transfer**.

   **Note:**
   The three **In Stock** > **Pending Transfer** and the two **In Stock** > **Pending Transfer** are not merged together because they are not part of the same transfer order line and not necessarily from the same person.

6. As TOL2 for two keyboards moves from *Draft* to *Requested* to *Shipment Preparation*, TOL1 for the three keyboards remains **In Stock** > **Pending Transfer**.
7. When TOL1 for the three keyboards moves to the *In Transit* stage, the three keyboards are changed to the **In Transit** > **Reserved** stage. The same happens for TOL2 with two keyboards.
8. When TOL1 is *Received*, the three keyboards move to **In stock** > **Available** in stockroom B.
9. When TOL2 is received in stockroom B, the two keyboards move to **In stock** > **Available** and are merged with the three keyboards that are also **In Stock** > **Available** in B.
10. At the end, stockroom B shows five keyboards are **In Stock** > **Available**.

**Related topics**

Delete a transfer order

Delete a transfer order line

Return items received in a transfer order

## Example Asset Management process

The best method for managing assets depends on business needs and how your business is organized.

### Before you begin

Role required: asset

### About this task

These steps are one possible process for getting started with Asset Management.

### Procedure

1. Identify assets in your system.

   A key component of asset management is the initial and ongoing inventory or discovery of what you own. The ServiceNow platform provides the following options for asset discovery.

   - The separate, robust Discovery tool.
   - For organizations that want to use the discovery technologies they have deployed already, such as SMS, Tally NetCensus, LanDesk, or others, ServiceNow can support integration to those technologies via web services. Scanned data can be mapped directly into the Configuration Management Database (CMDB).

2. Clean up information in the CMDB.
   Remove information that is obsolete or invalid. Ensure that all remaining information is accurate and complete. Add any necessary information.
3. Create categories of asset models such as computers, servers, printers, and software.

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4. Create asset models.
   Models are specific versions or various configurations of an asset, such as a MacBook Pro 17".
5. Create individual assets, such as hardware, consumables, and software licenses.
   If you used a discovery tool, you may already have many assets identified accurately.
6. Manage assets by counting software licenses, viewing assets that are in stock, setting asset states and substates, and analyzing unallocated software.

## CSDM framework for HAM

Common Service Data Model (CSDM) is a standard and consistent set of terms and definitions to adopt across all ServiceNow products on the ServiceNow AI Platform.

Using CSDM standard and consistent set of terms and definitions helps to effectively track assets through their life cycle transitions. To know more about CSDM, see Common Service Data Model.

To set up CSDM environment for HAM, see Set up the CSDM environment.

**Note:**
It is optional to adopt CSDM. You can either adopt CSDM or continue using the existing model.

## ITSM Software Asset Management

The software asset management features of the ITSM suite can be activated using one of the plugins in the feature table.

**Note:**
These features support IT service management processes related to software assets.

For the Software Asset Management product (requires a separate subscription), see Software Asset Management.

**Note:**
The Software Asset Management product is a standalone application supporting advanced use cases for software asset management.

**ITSM Software Asset Management feature plugins**

| Release | Plugin | Description |
|---|---|---|
| • Activation: Kingston<br>• Introduced: Kingston | Software Asset Management Foundation plugin | Manage your software assets using manual normalization and reconciliation to determine software compliance. |
| • Activation: Jakarta and earlier<br>• Introduced: Berlin | Legacy Software Asset Management plugin | Manage your software licenses. |

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**ITSM Software Asset Management feature plugins (continued)**

| Release | Plugin | Description |
|---|---|---|
| **Note:** Customers who have the Software Asset Management plugin enabled on a release prior to Kingston can continue to use the Software Asset Management plugin. | | |

## Legacy Software Asset Management plugin

The legacy Software Asset Management (com.snc.software_asset_management) plugin activates the legacy ITSM Software Asset Management feature that is provided with the Asset Management application.

**Important:**
The legacy Software Asset Management (com.snc.software_asset_management) plugin is supported only in the Jakarta and earlier releases. Although this legacy plugin can no longer be activated upon request, you can continue to use it if it has already been activated on a ServiceNow instance running the Jakarta or earlier releases.

If your ServiceNow instance is running the Kingston or later releases, you must request and activate the Software Asset Management Foundation plugin instead.

A strong software asset management (SAM) program can help an organization reduce software costs, improve compliance, and simplify or develop processes for employee software requests. SAM programs can also help control inventory through accurate databases, which in turn helps identify organizational software needs, identify unused software that can be deleted, as well as reduce or consolidate the number of software vendors used.

### Legacy Software Asset Management plugin Overview module

The Overview module for the legacy Software Asset Management (com.snc.software_asset_management) plugin is a homepage that displays various software asset management reports.

### Use the legacy Software Asset Management plugin Overview module

The Overview module is a homepage that displays charts and graphs to help you manage software assets in the organization.

To use the Overview module for the legacy Software Asset Management (com.snc.software_asset_management) plugin, navigate to **Software Asset Management** > **Overview**. Click an element within a report to see more information or add and move widgets as needed.

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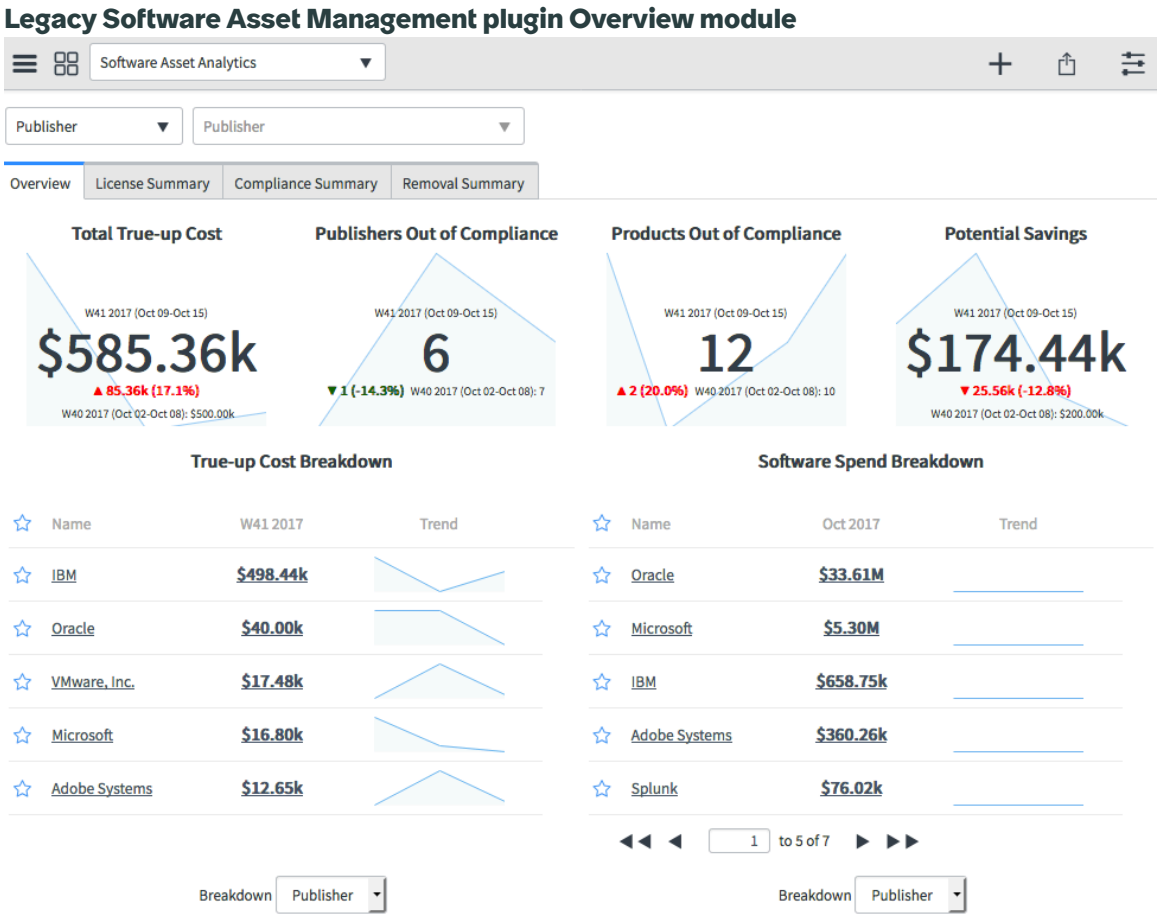


The overview shows the following compliance types:

- Immediate Compliance: number of licenses that should be purchased in order to be compliant immediately. Compliance is based on grouping. When tracking software licenses at a high level without any grouping, you are more likely to be compliant. With grouping, you are more likely to be out of compliance. For example, if grouping regionally by location, your organization can be globally compliant, but regionally non-compliant.
- Planned Compliance: based on the number of licenses you plan to allocate and the number installed.

The graphs show important statistics about the software being tracked, including software that has been entitled but is not being used and the total number of unallocated licenses.

## Legacy Software Asset Management plugin roles

The legacy Software Asset Management (com.snc.software_asset_management) plugin adds the following user role.

### Roles

| Role Title | Contains Role Names | Description |
|---|---|---|
| sam | inventory_user<br>category_manager<br>contract_manager | Can create, edit, change, and manage software licenses. |

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### Roles (continued)

| Role Title | Contains Role Names | Description |
|---|---|---|
| | financial_mgmt_user | |

Users with the sam or admin role can view the overview page and refresh, add, delete, and rearrange reports and other widgets.

### Installed with the legacy Software Asset Management plugin

A number of tables, properties, user roles, script includes, client scripts, UI policies, and business rules are installed with the legacy Software Asset Management (com.snc.software_asset_management) plugin.

**Note:**
Demo data is available with the legacy Software Asset Management (com.snc.software_asset_management) plugin.

## Tables

The legacy Software Asset Management (com.snc.software_asset_management) plugin adds the following tables.

### Legacy Software Asset Management plugin tables

| Table | Description |
|---|---|
| Processor Definition [cmdb_processor_definition] | Describes a computer in terms of the attributes IBM uses for its PVU licensing model. If they are all identical in terms of the attributes used for PVU licensing, a row can be associated with one or more discovered computers. |
| Processor Mapping [sam_processor_mapping] | Encodes the information specified by the IBM Table of Processor Value Units per core and is used in matching a computer's processor definition to a PVU cost for that computer. Each row in this table is a mapping between a set of processors and the associated PVU cost (per core). |
| Software Counter [sam_sw_counter] | Configures license counting options for software models. |
| Software Counter Compliance Violations [sam_sw_counter_violation] | Stores records of software counter compliance issues that are due to violations other than installs exceeding rights, such as:<br>• Maximum CPU/user count exceeded, based on model limits.<br>• Maximum or minimum rights rules not followed, based on model limits.<br>• Options installed on a server with a license that does not support options (Oracle). |
| Software Counter Detail [sam_sw_counter_detail] | Reconciles a software installation or usage with its corresponding software license and entitlement. The software counting logic automatically generates and maintains these records. |

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**Legacy Software Asset Management plugin tables (continued)**

| Table | Description |
|---|---|
| Software Counter History [sam_sw_counter_history] | Stores read-only copies of software counter records, which the system generates automatically each time a software counter finishes counting licenses. |
| Software Counter Result [sam_sw_counter_result] | Records all software counter results. Organizes the results based on the Grouping field (such as Company, Department, or Location) on the Software Counter record. |
| Software Counter Summary [sam_sw_counter_summary] | Aggregates all the software counter details for a given allocation state, a given group, and a given software counter. The software counting logic automatically generates and maintains these records. |
| Software Discovery Model [cmdb_sam_sw_discovery_model] | Stores a unique and definitive list of all software found by a discovery tool. |
| Software Installation [cmdb_sam_sw_install] | Associates software discovery models and the hardware on which they are installed. |
| Software Usage [cmdb_sam_sw_usage] | Associates software discovery models and the hardware that uses the models. ServiceNow Discovery does not populate the Software Usage [cmdb_sam_sw_usage] table. Use a third-party tool to add information about software assets to the Software Usage table. |

## Properties

The legacy Software Asset Management (com.snc.software_asset_management) plugin adds the following system properties.

**Legacy Software Asset Management plugin properties**

| Name | Description |
|---|---|
| sam.install_deletion_deadline | Defines the number of days after which a software install is deleted if not discovered with the configuration item. Use a value that is greater than the number of days between consecutive discovery runs.<br>• Type: integer<br>• Default value: 7<br>• Location: System Properties [sys_properties] table |

## User roles

The legacy Software Asset Management (com.snc.software_asset_management) plugin adds the following user roles.

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### Legacy Software Asset Management plugin user roles

| Role | Contains roles | Description |
|---|---|---|
| sam | inventory_user<br>contract_manager<br>category_manager<br>financial_mgmt_user | Can create, edit, change, and manage software licenses. Can edit the Software model field on a Discovery model. Can approve a model. Has full control of the Legacy Software Asset Management plugin. Controls the legacy IBM PVU Process Pack, if activated. |

## Script includes

The legacy Software Asset Management (com.snc.software_asset_management) plugin adds the following script includes.

### Legacy Software Asset Management plugin script includes

| Name | Description |
|---|---|
| DiscoveryModelMatcher | Matches a discovery model with a software product model. |
| ProcessorDefinitionsUtils | Contains utilities for managing the Processor Definition [cmdb_processor_definition] table. |
| ProcessorValueUnitsUtils | Contains logic that determines the IBM PVU pricing associated with a given processor. Also generates an event when a processor mapping is not found. |
| SAMMigration | Deprecated. Used by the fix job that migrates software license management data to the legacy Software Asset Management (com.snc.software_asset_management) plugin. |
| SAMSuiteEngine | Contains functions for handling suite inference on software installations. |
| SAMUtil | Generates models and counters for the legacy Software Asset Management (com.snc.software_asset_management) plugin. |

## Client scripts

The legacy Software Asset Management (com.snc.software_asset_management) plugin adds the following client scripts.

### Legacy Software Asset Management plugin client scripts

| Name | Table | Description |
|---|---|---|
| Clean up Counter | Software Counter [sam_sw_counter] | Ensures integrity between the various counting options of a software counter. |
| Deactivate automatched checkbox | Software Discovery Model [cmdb_sam_sw_discovery_model] | Deactivates the automatically matched check box when a user edits the software model. |
| Notify if counter in progress | Software Counter [sam_sw_counter] | Displays a message if the counter is currently running. |

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## UI policies

The legacy Software Asset Management (com.snc.software_asset_management) plugin adds the following UI policies.

### Legacy Software Asset Management plugin UI policies

| Name | Table | Description |
|---|---|---|
| Enforce Installs per license | Software Counter [sam_sw_counter] | Makes the Installs per license field mandatory when the software counter License type is By number of users. |
| Handle custom counts | License Calculation [sam_sw_license_calculation] | Displays the fields for entitlement type and valuation script when Count by is set to custom. |
| Hide condition fields | Software Counter [sam_sw_counter] | Hides the Software usage condition field if the license calculation query table is set to Software install and hides the Software install condition field if the license calculation query table is set to Software usage. |
| Hide query table | Software Counter [sam_sw_counter] | Hides the Query table field on the Software Counter form. |

## Business rules

The legacy Software Asset Management (com.snc.software_asset_management) plugin adds the following business rules.

### Legacy Software Asset Management plugin business rules

| Name | Table | Description |
|---|---|---|
| assign processor | Computer [cmdb_ci_computer] | Attempts to match a processor with a processor definition. |
| Build Primary Key | Software Installation [cmdb_sam_sw_install] | Sets the primary key for the record to the serial number on the [cmdb_sam_sw_install] table. If the serial number is empty, the rule creates one based on the publisher, display name, product ID, version, and revision. |
| Build Primary Key | Software Usage [cmdb_sam_sw_usage] | Creates the primary key for the record from the publisher, name, product ID, and version number on the [cmdb_sam_sw_usage] table. |
| Check for software suite | Software Installation [cmdb_sam_sw_install] | Checks if the current software install is part of a software suite. |
| Check for suite omission | Software Installation [cmdb_sam_sw_install] | Checks if the current software install should be omitted from any suites. |

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### Legacy Software Asset Management plugin business rules (continued)

| Name | Table | Description |
|---|---|---|
| Clean up Cache | Software License [alm_license] | Removes the cache for the counter of the software license record when a software license is deleted. |
| Clean up software normalization | Software Installation [cmdb_sam_sw_install] | Deletes the discovery model if the discovery model is changed and it is not used by other software installs. This rule is not enabled by default. |
| Clear install and usage records | Software Counter Summary [sam_sw_counter_summary] | Uncaches all related install and usage records when a software counter summary is deleted. |
| Clear normalized flag | Software Usage [cmdb_sam_sw_usage] | Clears normalized flag on certain field changes. |
| Clear normalized flag | Software Installation [cmdb_sam_sw_install] | Clears the is_normalized check box when a field value is changed from a normalized value. |
| CPU/Core count change | Computer [cmdb_ci_computer] | Clears the Cached check box on related software installs when the CPU count or CPU core count changes. |
| Create a Software Normalization | Software Installation [cmdb_sam_sw_install] | Links the record to the discovery model with that primary key on the [cmdb_sam_sw_install] table if the primary key changes. The business rule creates a discovery model if none exist for that primary key. |
| Create a Software Normalization | Software Usage [cmdb_sam_sw_usage] | Links the record to the discovery model with that primary key on the [cmdb_sam_sw_usage] table if the primary key changes. The business rule creates a discovery model if none exist for that primary key. |
| Delete cached count results | Software License [alm_license] | Marks the software counter results to be recounted when one or more fields on a license have changed.<br><br>This script runs after a change to a field that a counter can be grouped on, such as location, department, company, cost_center, entitlement_condition, or assigned_condition. If one or more of these fields changes, then the script sets the Recount field to true on any cached counter results matching the previous value. When the counter runs, the results with Recount set to true are treated as non-cached results and are recounted. For example, if Location on a license was Americas and changes to EMEA, cached results for |

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### Legacy Software Asset Management plugin business rules (continued)

| Name | Table | Description |
|---|---|---|
| | | Americas will have Recount set to true for the next count. |
| Delete Cached row entry | License Entitlement [alm_entitlement] | When an entitlement is deleted:<br>• Deletes all related software counter details.<br>• Clears the Cached check box on the related software install. |
| Drop counter Cache | Software Counter [sam_sw_counter] | Clears the Cached check box for the software counter if the grouping, license type, contract, or installs per license change in a software counter. Added enforce field changes to the conditions |
| Flag counter to reprocess | Software Upgrade and Downgrades [cmdb_m2m_downgrade_model] | Clears the Cached check box for all related software counters if the upgrade parent or downgrade child values are changed or deleted. |
| Flag counter to reprocess | Software Suite [cmdb_m2m_suite_model] | Clears the Cached check box for all related software counters if the suite parent or suite child values are changed or deleted. |
| invalidate sw install cache | Computer [cmdb_ci_computer] | Uncaches all install and usage records referencing a computer when the computer's processor field is changed. |
| Limit license metric | License [alm_license] | Limits software licenses to a single license metric value. |
| Limit license metric combinations | Hardware [cmdb_ci_hardware] | Rejects license metric combinations of the same type, such as CAL (user) and CAL (devices). |
| Link to Model | Software Discovery Model [cmdb_sam_sw_discovery_model] | Finds and sets the model field to the model that best corresponds to the record when a software discovery model is created. |
| Mark install for suite omission | License Entitlement [alm_entitlement] | Searches for any matching installs and marks them for suite omission. |
| One and only one default mapping | Processor Mapping [sam_processor_mapping] | Ensures only one default mapping by resetting the last resort flag for modified records and setting it to false for new records. |
| Process cache reset | Software Installation [cmdb_sam_sw_install] | Resets the install of any counter information when it becomes uncached. |
| Process suite component deletion | Software Installation [cmdb_sam_sw_install] | Updates all other members of an install's suite if the install is deleted. |

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### Legacy Software Asset Management plugin business rules (continued)

| Name | Table | Description |
|---|---|---|
| rebind processor definitions | Processor Mapping [sam_processor_mapping] | Refreshes processor definitions when a processor mapping changes. |
| Rebuild Cache | Software Discovery Model [cmdb_sam_sw_discovery_model] | Clears the Cached field on the software counter if the associated software model is modified on the software discovery model record. |
| Rebuild inferred suite and cached | Software Discovery Model [cmdb_sam_sw_discovery_model] | Clears the cached flag and inferred suite field on records referencing this discovery model, when the matched model changes. |
| Remove cached flag | Software Installation [cmdb_sam_sw_install] | Clears the corresponding cached software counter details if a software installation is deleted or if the configuration item on which it is installed changes. |
| Remove cached flag | Software Usage [cmdb_sam_sw_usage] | Clears the corresponding cached software counter details if a software usage record is deleted or if the configuration item from which the software is accessed changes. |
| Remove caches from detail | Software Counter Detail [sam_sw_counter_detail] | Clears the Cached check box on the related entitlement, installation, and usage records if they exist. |
| Reset counter info on suite change | Software Installation [cmdb_sam_sw_install] | Uncaches and resets counter information on the install if its inferred suite changes. |
| Reset Installs per License | Software Counter [sam_sw_counter] | Clears the Installations per license fields if the counter license type is not per user. |
| Retrieve PVU Mapping | Processor Definition [cmdb_processor_definition] | Finds a matching processor mapping based on the information of the processor definition. |
| SAM: Core Process | Global [global] | Not used for any processing. |
| Set Display name | Software Counter Result [sam_sw_counter_result] | Sets the display name of the counter result to the counter name with the grouping type. |
| Set normalized fields | Software Usage [cmdb_sam_sw_usage] | Sets normalized fields on insert to be copies of discovered fields. |
| Set normalized fields | Software Installation [cmdb_sam_sw_install] | Copies the given values as their normalized values when a software install is inserted. |
| Sync Software Package | Software Discovery Model [cmdb_sam_sw_discovery_model] | Creates a row in the package table to reflect the row in the discovery model table. |

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**Legacy Software Asset Management plugin business rules (continued)**

| Name | Table | Description |
|---|---|---|
| Update Cache | Software Installation [cmdb_sam_sw_install] | Updates all corresponding cached software counter details if usage metrics for this installation change. |
| Update Cache | Software Usage [cmdb_sam_sw_usage] | Updates all corresponding cached software counter details if usage metrics for this software usage change. |

## References

The legacy Software Asset Management (com.snc.software_asset_management) plugin adds the following references.

**Legacy Software Asset Management plugin references**

| Name | Description |
|---|---|
| Processor Definition | If you activated the legacy IBM PVU Process Pack after activating the legacy Software Asset Management (com.snc.software_asset_management) plugin, a reference to the processor definition is added to the Hardware [cmdb_ci_hardware] table. |

### Legacy Software Asset Management plugin setup process

To get started with the legacy Software Asset Management (com.snc.software_asset_management) plugin, you need to identify and discover software owned, create software models, create license records, and configure software counters.

To get started with the legacy Software Asset Management (com.snc.software_asset_management) plugin, perform the following:

- Identify the software that your organization owns using one of the following methods:
  - Use Discovery to identify currently owned software and begin working with the legacy Software Asset Management (com.snc.software_asset_management) plugin.
  - Identify and add the software manually or with a third-party tool.
- Make the Configuration Management Database (CMDB) accurate.

  Clean up information in CMDB. At first, focus on your top 10-20 software vendors.
- Create software models.

  Create software models for all of the software that your organization wants to monitor. Software models can also be imported from another source, such as a Discovery application, an existing data set of software licenses, or a third-party source.
- Create software license records.

  Create software license records for all of the software that your organization owns. This information can also be based on information from a purchasing source or imported as a spreadsheet.

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- Configure software counters.

  Configure software counters to view your organization's software compliance levels for all of your software.

### Determine where software is installed using the legacy Software Asset Management plugin

When using the legacy Software Asset Management (com.snc.software_asset_management) plugin to determine where your software is installed, you must keep the following points in mind.

- The software instance no longer contains discovered information. The information previously went to the Software Instance [cmdb_software_instance] table, but now goes to the Software Installation [cmdb_sam_sw_install] table. Because the table has changed, you must change your transform maps to point to the new table.
- Models identified by a discovery tool are linked to software models.
- Use grouping to obtain more specific information from a software counter.
- Software installations link a computer with a software model (via a discovery model).

A discovery tool places the data it obtains into the Software Installation [cmdb_sam_sw_install] table. All of the information can be seen in the Software Installations list and the individual Software Installation forms. When a record is created, the system analyzes the Discovery Model table and identifies five key points.

- Publisher
- Display name
- Prod ID
- Version
- Revision

### Find software on the network using the legacy Software Asset Management plugin

After using a discovery tool, you can find a definitive list of all the software found on the network using the legacy Software Asset Management (com.snc.software_asset_management) plugin.

#### Before you begin

Role required: sam

#### About this task

**Note:**
A user with the Asset role can delete software installations, but it is not recommended. As an alternative, archive software installation information.

#### Procedure

1. Navigate to **All** > **Software Asset** > **Discovery** > **Discovery Models**.
   A software administrator can, for example, look at the list and see that Adobe Acrobat 9.0, 9.2, 9.3, and 9.5 were found. Then, the administrator can edit software discovery models so all the dot versions are considered version 9.0 when doing reconciliation.
2. Click a **Display Name** in a row.
   All installations that map to an individual software discovery model are displayed.

   All fields on the form are read-only.

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### Software installation fields

| Field | Description |
|---|---|
| Display name | Name of the software installation as it appears in record lists. |
| Publisher | Publisher of the software. |
| Version | Version of the software. |
| Discovery model | Software discovery model that represents the installed software. |
| Prod id | Number created by the publisher to identify the software. |
| Install location | Path under which the software is installed. |
| Install date | Date on which the software was installed. |
| Revision | Revision of the software. |
| Instance key | Encrypted credentials for the software installation. |
| Installed on | Hardware on which the software is installed. |
| Uninstall string | Identifier used to uninstall the software. |
| ISO serial number | ISO number of the software. |
| Foreground | Duration of foreground usage of the software. |
| Background | Duration of background usage of the software. |
| Last scanned | Date and time on which the software was last discovered on this hardware. |
| Last used | Date and time on which the software was last used on this hardware. |
| Counted by | The counter summary name that the installation is counted on. |
| Entitlement | Entitlement that is associated with the software installation. |
| Inferred suite | Software suite inferred by the inference parameters. |
| Valuation | Indicates the number of rights the install has. |
| Cached | If checked, the license installation has already been counted. |
| Omit from suites | If checked, the license is ignored for any suite calculations. This box is automatically checked if the install finds a possible entitlement of the exact software model for this configuration item. |

**Note:**
Third-party discovery tools can use software normalization to more effectively manage the software installation database. Software normalization allows you to standardize your software installation data, such as the display name, publisher, revision, and version. You can personalize the software installation form to include these normalization fields. For more information, see Personalize a form.

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### Scan software installations with the system scheduler

The legacy Software Asset Management (com.snc.software_asset_management) plugin adds a scheduled job for scanning software installations named **SAM License Counters** in **System Scheduler** > **Scheduled Jobs**.

The **SAM License Counters** job occurs at 2:00am (local time) every morning. The job queries the Software Installation [cmdb_sam_sw_install] table and captures any installations that have not been scanned in the past 7 days.

### Software licenses in the legacy Software Asset Management plugin

Software licenses are based on models that are defined through the legacy Software Asset Management (com.snc.software_asset_management) plugin.

You can create the models to organize software licenses in any way that makes sense for your organization. Common methods of defining models and licenses include by department or by region.

Licenses can be associated with a contract. For more information, see the Contract Management application.

## Licensing types

The following license types are available in the legacy Software Asset Management (com.snc.software_asset_management) plugin:

- By CPU
  - By CPU cores
  - By number of CPUs
- By number of points: Per installation - IBM PVU
- By user
  - Number of installs per user
  - Per named user
- By utilization
  - Usage (CPU)
  - Usage (User)
- By workstation: Per workstation

### Supported license models

| Model | Description |
|---|---|
| Individual | Given to individuals. |
| Bulk allocated | Allocated to users via entitlements. |
| Bulk not allocated | Given to users with details, such as who has a license or where the license is located, not tracked. |

### License management with the legacy Software Asset Management plugin

The legacy Software Asset Management (com.snc.software_asset_management) plugin allows asset managers to track and organize the number of licenses available to the organization.

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Software licenses are based on models that you create to organize software licenses in meaningful ways. Different license calculation types determine how software is counted.

Software licenses can also be associated with a contract which enables a company to cover software licenses for multiple assets or users. You can manage and track software contracts using the Contract Management application.

### Add a software license using the legacy Software Asset Management plugin

You can add a new software license using the legacy Software Asset Management (com.snc.software_asset_management) plugin.

#### Before you begin

Role required: sam

#### Procedure

1. Navigate to **All** > **Software Asset** > **Software Licenses**.
2. Click **New**.
3. Complete the form.

| Field | Description |
|---|---|
| Display name | Read-only. Name of the software license. Created automatically. |
| Model category | Model category for the software license. **Software License** is selected by default. |
| Model | Software model of the license you are matching to. For example, Microsoft Excel. |
| Rights | Number of entitlements to be granted by this license. If an enterprise contract is attached to the license, the Rights field does not display. |
| General | |
| Asset tag | Number from the asset tag. The tag contains the serial number and bar code for tracking the software license. |
| State | Current status of the software license, such as **On order** or **In use**. |
| Assigned to | User currently assigned to this software license. |
| Managed by | User or department that maintains the software license. Can be different than the owner. For example, a specified user can own a software license, but the IT department manages it. |
| Owned by | User or department with financial ownership of the software license. Can be different than the manager. |
| Parent | Parent asset of the software license, if any. For example, the parent asset of Microsoft Word software is often the Microsoft Office suite. |
| Class | [Read-only] Automatically created as Software License. |
| License metric | [Optional] A single metric which the software license is counted against. |
| Serial number | Unique number assigned for identification. |

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| Field | Description |
|---|---|
| Substate | More details about the software license stage. The available substate settings depend on the **State** selected. For example, if you select the **Retired** state, the substate options available are **Disposed**, **Sold**, **Donated**, and **Vendor credit**. |
| Location | Where the license will be used. For example, a specific site, country, or region. |
| Department | Department of the person **Assigned to** this software license. |
| Company | Company that created the software. |
| Assigned | Date on which the software license was assigned. |
| Installed | Date on which the software license was installed. |
| Comments | Information about the software license that would be helpful for others to know. |

For information about the fields in the **Financial** and **Contracts** sections of the form, see Create assets.

4. Click **Submit**.

### Create and manage an enterprise license using the legacy Software Asset Management plugin

Enterprise licenses are typically for large customers and provide some flexibility, an agreed upon discount price, and a mechanism for easy administration.

#### Before you begin
Role required: contract_manager

#### About this task
Use the Contract Management application to set a software license as enterprise or subscription for the legacy Software Asset Management (com.snc.software_asset_management) plugin.

#### Procedure
1. Navigate to **All** > **Contract** > **Software Licenses**.
2. Click **New**.
3. Select a **License type** of **Enterprise**.
4. Fill in as many of the remaining fields on the Contract form as you can, and click **Submit**.
5. Reopen the contract.
6. In the Assets Covered related list, click **New**.
7. In **Asset**, select the software covered by the contract.
8. In **Date added**, select the date the software license was added to the contract.
   The date can be in the past, the present, or the future.
9. **Optional:** In **Date removed**, select the date asset was, or will be, removed from the contract.
10. Click **Submit**.
11. Navigate to **Software Asset** > **Reconciliation** > **Software Counters**.
12. Click the software you specified.
13. Click **Count Licenses**.

    The licenses are listed under **Software Counter Results**. The licenses display as 0, but you are not out of compliance because you have an enterprise license with an enterprise contract.

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Once an enterprise contract is associated with software, all users are entitled when the licenses are counted.

**Note:**
In the Software Licenses list, enterprise licenses display **0** in the **Rights** column. The concept of rights is not used with enterprise licenses.

### Create and manage a subscription license using the legacy Software Asset Management plugin

Use the legacy Software Asset Management (com.snc.software_asset_management) plugin to create subscription licenses and manage the information as it changes.

#### Before you begin
Role required: contract_manager

#### Procedure

1. Navigate to **All** > **Contract** > **Contracts** > **Software Licenses** and click **New**.
2. Select **Subscription** from the **Agreement type** list.
3. Complete the **Contract** form, right-click the header, and select **Save**.
4. In the **Assets Covered** related list, click **New**.
5. In **Asset**, select the software covered by the contract.
6. In **Date added**, select the date the software license was added to the contract.
   The date can be in the past, the present, or the future.
7. **Optional:** In **Date removed**, select the date asset was, or will be, removed from the contract.
8. Click **Submit**.
9. Navigate to **All** > **Software Asset** > **Reconciliation** > **Software Counters**.
10. Click the software specified in step 5.
11. Click **Count Licenses**.
    The licenses are listed under **Software Counter Results**.

### Software license entitlements for the legacy Software Asset Management plugin

Software entitlements enable you to define the people or machines to which a specific, purchased software license is assigned.

#### Before you begin
Role required: asset

#### About this task
Asset managers allocate a license to entitle a user or machine to use the license. For example, a company purchases a software license for 100 rights. The software entitlement specifies the 100 employees or machines that are rightfully assigned a license. If the ServiceNow Discovery tool is used and it finds the software installed on 200 machines, the asset manager can identify the employees or computers that have the software installed without a license. The asset manager can ask users to remove the software from their computers.

Built-in rules prevent entitling more licenses than have been purchased. License entitlements use specific software license asset tags. In addition to the mandatory asset tag, an individual person and a specific configuration item can be assigned.

The benefits of using software entitlements include the following.

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- If the overall license entitlement is exceeded, the asset manager can rapidly address the problem and return to compliant status by either removing unauthorized software or ordering more licenses.
- If the license entitlement is not being used completely, the asset manager can respond by lowering the number of licenses purchased in the future.

### Procedure

1. Navigate to **All** > **Asset** > **Software** > **Asset License Entitlements** and create a new record (see table for field descriptions).

| Field | Description |
|---|---|
| Display name | Name used in record lists. |
| Allocated to | The configuration item consuming the license token. |
| Licensed by | License granting this token. |
| Cached | Internal flag set and used by software counters logic. |

2. Click **Submit**.

## Create an entitlement for the legacy Software Asset Management plugin

You create software entitlements for both CIs and users from the same License Entitlement form.

### Before you begin
Role required: asset

### About this task
You can create these entitlements from the Asset Management application. Navigate to one of these locations and click **New**:

- **Asset** > **Software** > **Asset License Entitlements**
- **Asset** > **Software** > **User License Entitlements**

### Procedure

1. Navigate to **Software Asset** > **Software Licenses**.
2. Click an **Asset tag**.
3. Click **Add Entitlement** and complete the License Entitlement form using the fields in the table.
4. Click **Submit**.

   The view returns to the Software License form.

5. **Optional:** Set a condition in the **Allocated conditions** section.

   (Optional) The configuration items given this license must meet the specified conditions. For example, you might set a condition that allocates this software license to CIs in a certain department only.

6. Click **Update**.

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### License entitlement

| Field | Description |
|---|---|
| Display name | Name used in record lists. |
| Assigned to | User of the entitlement token. |
| Allocated to | The configuration item consuming the license token. |
| Licensed by | License granting this token. |
| Cached | Internal flag set and used by software counters. |

## Create a software user license entitlement for the legacy Software Asset Management plugin

You can entitle a user to use one of your software licenses.

### Before you begin

Role required: asset

### Procedure

1. Navigate to **All** > **Asset** > **Software** > **User License Entitlements** and create a new record (see table for field descriptions).

| Field | Description |
|---|---|
| Display name | Read-only. Name used in record lists. |
| Assigned to | User of the entitlement token. |
| Licensed by | License granting this token. |
| Cached | Read-only. Internal flag set and used by software counters logic. |

2. Click **Submit**.

## Entitle a license to a configuration item using the legacy Software Asset Management plugin

Use the legacy Software Asset Management (com.snc.software_asset_management) plugin to entitle a license to a configuration item, such as a computer or server, or a location, such as a city of building.

### Before you begin

Role required: sam

### Procedure

1. Navigate to **All** > **Software Asset** > **Software Licenses**.
2. Click an **Asset tag**, or click **New** to create a new software license.
3. In the **Asset Entitlements** related list, perform one of the following actions.
   - Double-click in **Allocated to** to entitle the license to a specific configuration item, such as a computer or server.
   - Double-click in **Location** to entitle the license to a specific location, such as a city or building.

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4. **Optional:** Set the **Allocated conditions** condition to the configuration items given this license must meet the specified conditions

   **Example**
   For example, only configuration items in a certain department can be allocated this software license.

5. Click **Update**.

### Entitle a license to a user or location using the legacy Software Asset Management plugin

Use the legacy Software Asset Management (com.snc.software_asset_management) plugin to entitle a license to an individual user.

#### Before you begin
Role required: sam

#### Procedure

1. Navigate to **All** > **Software Asset** > **Software Licenses**.
2. Click an **Asset tag**, or click **New** to create a new software license.
3. In the **User Entitlements** related list, perform one of the following actions.
   - Double-click in **Assigned to** to entitle the license to a specific user.
   - Double-click in **Location** to entitle the license to a specific location, such as a city or building.
4. **Optional:** Set the **Assigned to condition** to require that every user given this license meets the specified conditions.

   **Example**
   Only people in a certain region can be assigned this software license

5. Click **Update**.

### License upgrade and downgrade with the legacy Software Asset Management plugin

The concept of upgrading and downgrading licenses is built in to the legacy Software Asset Management (com.snc.software_asset_management) plugin.

This is helpful when reconciling licenses. Downgrading a license is the process of purchasing a license, but using an earlier version. Upgrading a license occurs when a newer version of a license is not purchased, but you are allowed to use the newer version. Downgrading is more common than upgrading.

Any version defined as a downgrade child that does not have entitlements and a license can be counted as an installation of the upgrade parent. Use this method to avoid having to uninstall unlicensed versions of software running in your environment. When you define an unlicensed version as a downgrade child of a licensed version, the system creates a software model record for the unlicensed version with an upgrade path to the licensed version. If you delete the downgrade child from the licensed version's record, it is automatically deleted from the Software Model record for the unlicensed version.

**Note:**
If the downgrade child has either a license or an entitlement, it must also have a counter, which counts all installations of the downgrade child against its own license.

For example, you have licenses for the software model Microsoft Word 2010, but no licenses or entitlements for Word 2007. Discovery finds installations of Word 2007 being used in your

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organization. Rather than force users to uninstall all instances of this unlicensed version, you decide to count installations of Word 2007 against your Word 2010 license. To do this, you configure Word 2007 as a downgrade child in the Word 2010 Software Model record. A Software Model record is automatically created for Word 2007 which specifies Word 2010 as the upgrade parent.

If a software version has a downgrade child or an upgrade version that can be counted against the parent, the number of installs counted is restricted to the number of available rights of the parent. For example, Microsoft Word 2010 has a downgrade to Word 2007. Both versions have an active counter. Microsoft Word 2010 finds all entitled copies of Word 2007, and also takes out of compliance any installs from that downgrade counter until the available downgrade rights are used. However, if Microsoft Word 2010 only has 100 rights, then the maximum number of rights to be taken from the downgrade counter is 100.

You can set the start and end dates for a software upgrade parent and downgrade child to be valid. The software counter counts the upgrade and downgrade licenses within the selected dates. If the software counter runs outside of the date range, the upgrade and downgrade licenses are not counted.

**Note:**
If an upgrade parent or downgrade child is set on the software model, it applies to all licenses of that model. If set on the software license, it applies specifically to that license.

### Upgrade a license using the legacy Software Asset Management plugin

Use the legacy Software Asset Management (com.snc.software_asset_management) plugin to upgrade a software license through one of two methods: through a software license record or through a software model record.

#### Before you begin
Role required: sam

#### Procedure

1. Complete the following steps to identify an upgrade parent from a software license record.

   a. Navigate to **Software Asset** > **Software Licenses** and select a software license.

   b. Click the **Software Upgrade and Downgrade** tab and click **New**.

   c. Complete the form.

   **Software Upgrade and Downgrades form**

| Field | Description |
|---|---|
| License | Name and asset number of the software license. |
| Downgrade Child | Lower version of the software license. |
| Upgrade parent | Higher version of the software license. |
| Start date | Start date of the upgrade. |
| End date | End date of the upgrade. |

   d. Click **Submit**.
   The software upgrade displays in the Software Upgrade and Downgrades section.

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e. Select the software upgrade check box and click **Update**.
The software license is updated in the Software License list.

2. Complete the following steps to identify an upgrade parent from a software model record.

a. Navigate to **Software Asset** > **Software Models**.

b. Select a model.

c. In the **Upgrade** section, double-click under the **Upgrade parent** column heading.

d. Select a software model from the list.

e. Click the green check mark and click **Update**.
The Software Model form is updated.

### Downgrade a license using the legacy Software Asset Management plugin

Use the legacy Software Asset Management (com.snc.software_asset_management) plugin to downgrade a software license through one of two methods: through a software model record or through a software license record.

#### Before you begin
Role required: sam

#### About this task
**Note:**
Downgrade children set on the software license applies specifically to that license. If a downgrade child is set on the software model, it applies to all licenses of that model.

#### Procedure
1. Complete the following steps to downgrade a license from a software model record.
   a. Navigate to **Software Asset** > **Software Models**.
   b. Select a model.
   c. In the **Downgrade** section, double-click under the **Downgrade child** column heading.
   d. Select a software model from the list.
   e. Click the green check mark.
2. Complete the following steps to downgrade a license from a software license record.
   a. Navigate to **Software Asset** > **Software Licenses**.
   b. Select a license.
   c. Click **New** in the Software Upgrade and Downgrades related list.
   d. Select a software model from the list.
   e. Select the **Start** and **End** dates.
   f. Click **Submit**.

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### Identify a downgrade child from a software license record using the legacy Software Asset Management plugin

Use the legacy Software Asset Management (com.snc.software_asset_management) plugin to identify a downgrade child from a software license record.

#### Before you begin
Role required: sam

#### Procedure

1. Navigate to **All** > **Software Asset** > **Software Licenses**.
2. Select a license.
3. Click **New** in the **Software Upgrade and Downgrades** related list.
4. Select a software model from the list.
5. Select the Start and End dates.
6. Click **Submit**.

> **Note:**
> Downgrade children set on the software license applies specifically to that license. If a downgrade child is set on the software model, it applies to all licenses of that model.

### View a list of unallocated software licenses for the legacy Software Asset Management plugin

Managing software licenses includes knowing what licenses are owned by your organization, but are not allocated.

#### Before you begin
Role required: sam

#### About this task
You can allocate the licenses to users or devices. If no one needs the unallocated licenses, this can be noted so that fewer licenses are purchased in the future.

#### Procedure

1. Navigate to **All** > **Asset** > **Software** > **Unallocated Licenses**.
2. View the **Software Counter Details** list (**Unallocated License** view).
   The **Valuation** column lists the number of unallocated licenses for the given software model.
3. Click a name in the **Model** column for detailed information about a specific license.
   View the **Software Model** list in the **Unallocated License** view.

### Merge software licenses using the legacy Software Asset Management plugin

If you have multiple software licenses that are linked to the same model, you can merge the individual licenses into a consolidated license using the legacy Software Asset Management (com.snc.software_asset_management) plugin.

#### Before you begin
Role required: sam

#### About this task
To be merged, the individual licenses must meet the following requirements:

- The licenses cannot already be merged into another consolidated license.
- The information in the following fields must match for each license:

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- Model
- Allocated condition
- Assigned condition
- Company
- Location
- Department
- Cost center
- State

- The licenses must have the same set of software upgrades and downgrades and the same set of assets covered. To verify this information, go to **Software Asset** > **Software Licenses** and select a license.
  - For upgrades and downgrades, go to the **Software Upgrade and Downgrades** related list.
  - For assets covered, go to the **Assets Covered** embedded list in the Contracts related list.

If a license can be merged, **Merge with similar licenses** appears under **Related Links** on the Software License form.

To merge a license:

### Procedure

1. Open a license.
2. Click the **Merge with similar licenses** link.

   Displays a dialog box with a message stating that the merge process is irreversible and that license keys are not merged.
3. Click **OK**.

   All qualifying licenses, including the current license, are merged into a new consolidated license. An informational message appears until the user is redirected to the newly merged license.

   All qualifying licenses are merged into a new consolidated license unless they can be matched to an existing consolidated license. If they are merged into a new consolidated license, the **Asset tag** field is cleared. After merging, the merged license is marked as **Is merged license** (field = true) and the **Merged into** field is set to this license for the consolidated licenses.

   **Note:**
   Licenses that are marked as merged are not counted.

   For the consolidated licenses:
   - The number of rights are summed up into a new count.
   - The asset and user entitlements are transferred to the new license.
   - The expense lines and assets on contract rate cards are transferred to the new license.
   - The set of software upgrades and downgrades, as well as the set of assets covered, are copied to the new license.
   - The cost of each individual license is summed up into the new license using the system base currency.
   - A history of the consolidated licenses and where they went is maintained.

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### Related topics

License management with the legacy Software Asset Management plugin

## Manage software models using the legacy Software Asset Management plugin

The legacy Software Asset Management (com.snc.software_asset_management) plugin uses software models to manage licenses, specifically in software counters and license restrictions, and to track upgrade and downgrade licenses.

### Before you begin

Role required: sam or model_manager

### About this task

Create software models for all of the software your organization wants to monitor. Software models can also be imported from another source such as the Discovery application.

**Note:**
Software does not create configuration items. If the discovery tool you use supports and finds ISO information, details such as ISO ID and ISO serial number are added to the Software Model form for compliance purposes.

### Procedure

1. Navigate to **All** > **Software Asset** > **Software Models**.
   Users with the model_manager role can navigate to **Product Catalog** > **Product Model** > **Software Models**, but cannot administer all aspects of software models.
2. Click **New**.
3. Complete the form.

#### Software model fields

| Field | Description |
|---|---|
| Display name | [Read-only] Name of the model. A system property called *glide.cmdb_model.display_name.shorten* controls how software model display names are generated. Administrators can configure the property. |
| Manufacturer | The company that built the model. |
| Name | The manufacturer-assigned name of the model or an abstract name specified by the model manager, such as Field Agent Laptop. |
| Edition | The edition of the software model, such as Professional. |
| General | |
| Short description | A brief description of the model. |
| Model categories | [Read-only] The category the model is assigned to. The system automatically sets the value to **Software License**. This field is a glide list. |
| Asset tracking strategy | The process the model should be tracked by. Choose from the following: |

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| Field | Description |
|---|---|
| | ○ **Leave to Category**: model is transparent and the asset class is defined solely by the category.<br>○ **Create Consumable Asset**: model forces the asset class to be consumable, regardless of what the category defines as the asset class.<br>○ **Don't create assets**: model blocks asset instantiation, regardless of what the category defines as the asset class. |
| Acquisition method | The method for purchasing the model. Options are **Both**, **Buy**, and **Lease**. |
| Cost | The cost a single unit of the model. |
| Depreciation | The depreciation scheme for the model. |
| Model number | The specific model number assigned to the item by the manufacturer. |
| Barcode | The barcode number assigned to the model. Barcodes are usually assigned by the manufacturer. |
| Owner | The person responsible for the model. |
| Status | The current status of the model. Options are **In Production**, **Retired**, and **Sold**. |
| Certified | The option that determines whether the model is approved for use. |
| Comments | Information about the model that would be helpful for others to know. |
| License | |
| Version | The exact version of the software. For example, Version 2. |
| Major | The ISO major version number of the software. |
| Minor | The ISO minor version number of the software. |
| Build | The build number of the software. |
| Software category | A category name for grouping software with similar characteristics. |
| Single or multi license | Defines whether this model uses a single license or multiple licenses. |
| Maximum socket count | Maximum number of CPU sockets that a computer must have for the software to be installed. |
| License type | The tracking type for the license. For example, by number of users, per workstation, per installation with IBM PVU or per Oracle processors. If you select the **By number of users** option, you can create a software counter and specify the number of installations per license. |
| Activation status | The activation state of the software model. Options are **None** and **Activated**. |
| ISO id | The unique ISO identification number of the software product. |
| ISO serial number | The serial number issued by ISO for the software. |
| Application model | Application associated with this software. |
| Rights | Number of licenses granted to this software. |

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| Field | Description |
|---|---|
| Minimum users | Minimum number of user licenses required for this software. |
| Maximum users | Maximum number of user licenses required for this software. |
| Suite Components | |
| Inference percent | The percentage of suite components that need to be present on a system to count as a suite. Used for suite management. For example, Suite A consists of 5 products. If the inference percent is set to 60% and a discovery tool finds three of the products on the system, the software is flagged for possible purchase as a suite. |
| Components | The child product or products of the suite. For example, Microsoft Word and Microsoft Excel are child products of Microsoft Office. |
| Suite Parents | |
| Parents | The parent suites to which the software is assigned. For example, the parent suite for several common Microsoft products is a version of Microsoft Office. |
| Upgrade | |
| Upgrades | An alternative version license to which you have rights. For example, if you purchase version 4 of a software product shortly before version 5 is released, your version 4 license may include a free upgrade to version 5 when it is released. |
| Downgrade | |
| Downgrades | An alternative version license to which you have rights. For example, if you purchase version 4 of a software product, your version 4 license may include downgrade rights to version 3. |
| Licenses | |
| Software Licenses | The software licenses that should be created automatically from this model.<br>**Note:**<br>This embedded list shows all assets created from this model, whether or not they are software licenses, in versions prior to this release. |
| Catalog Item | |
| Product Catalog | The information about the model as it appears in the product catalog and service catalog. Information only appears if the model has been published to the product catalog. |
| Description | Description of the software model as it appears in the product catalog. |
| Picture | An image of the software logo. |

Any software licenses you create and assign to the new model are displayed in the **Licenses** embedded list on the Software Model form.

### Create and manage software suites using the legacy Software Asset Management plugin

Software uses the concept of suites instead of bundles.

A software suite is a group of related software offered as one unit. An example is the Microsoft Office Professional suite of office productivity software tools that includes Powerpoint, Word, Excel, Outlook, and Access. You can use the legacy Software Asset Management

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(com.snc.software_asset_management) plugin to create suites and add components to the suite so that the licenses your organization own are counted accurately.

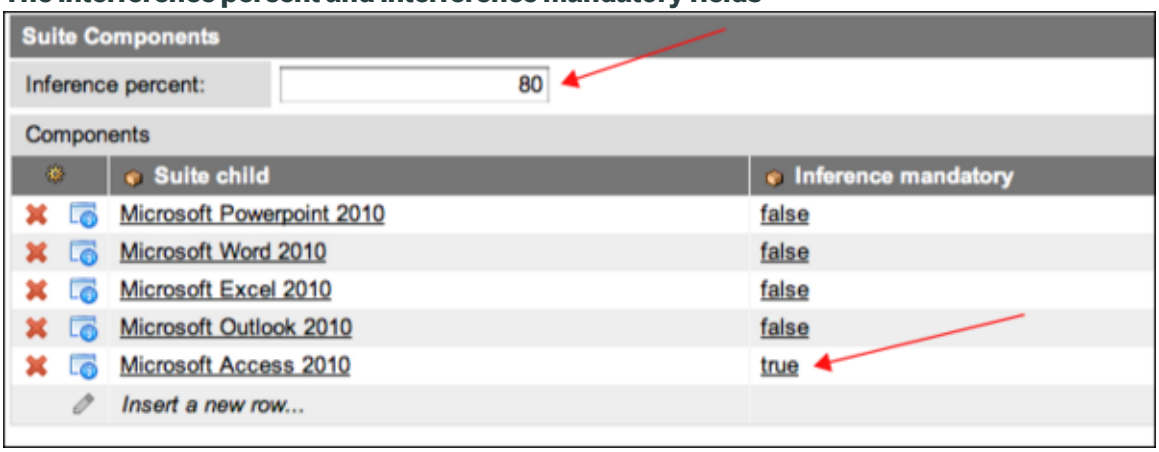
For any software model, you have the option to specify whether the model is a suite (parent) or a component (child). A software model can be a component in multiple suites. For example, Microsoft Word is a component in Microsoft Office Standard and Microsoft Office Professional. Although you can set a single software model as both a suite and a component, software is not typically sold as nested suites.

Use the **Inference percent** and **Inference mandatory** options for even greater control of suites.

- **Inference percent**: specifies what percentage of the components in the suite must be installed for the software to be identified as a suite.
- **Inference mandatory**: enforces that a specific component in a suite must be installed to infer that the suite is installed.

For example, specify the **Inference percent** as 80% and set the **Inference mandatory** option to **true** on Microsoft Access. These settings specify that Microsoft Access must be installed, along with 3 out of 4 other products (Microsoft Word, Microsoft Excel, Microsoft PowerPoint, and Microsoft Outlook) to infer that Microsoft Office Professional is installed.

**The interference percent and interference mandatory fields**




To make the new software model record a parent record in a suite:

1. Open a software model record.
2. In the Suite Components section, double-click an empty row under **Suite child**.

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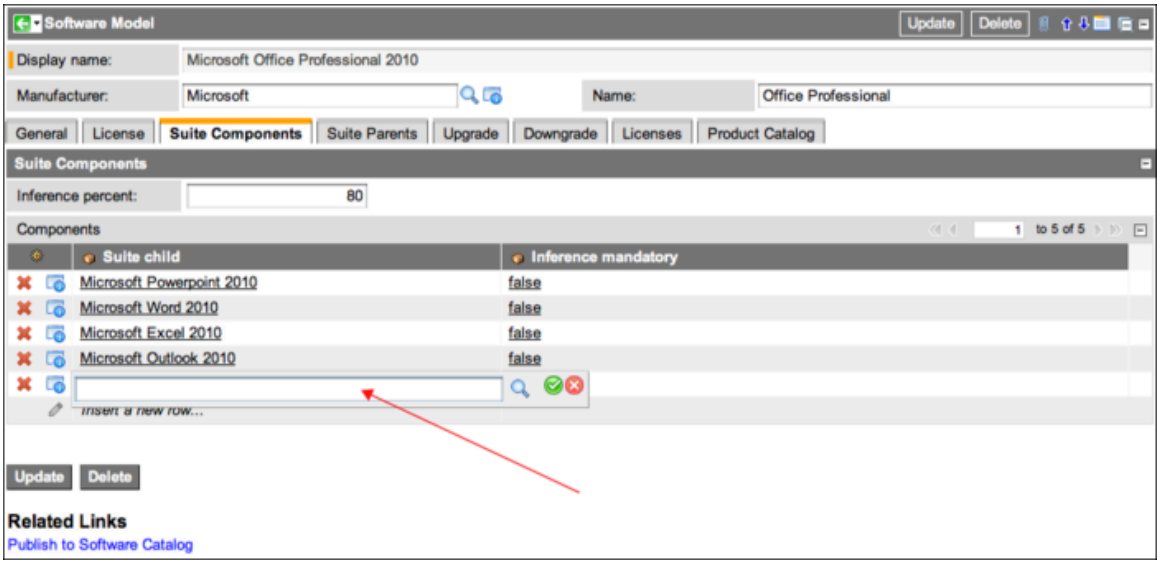
**Suite child**

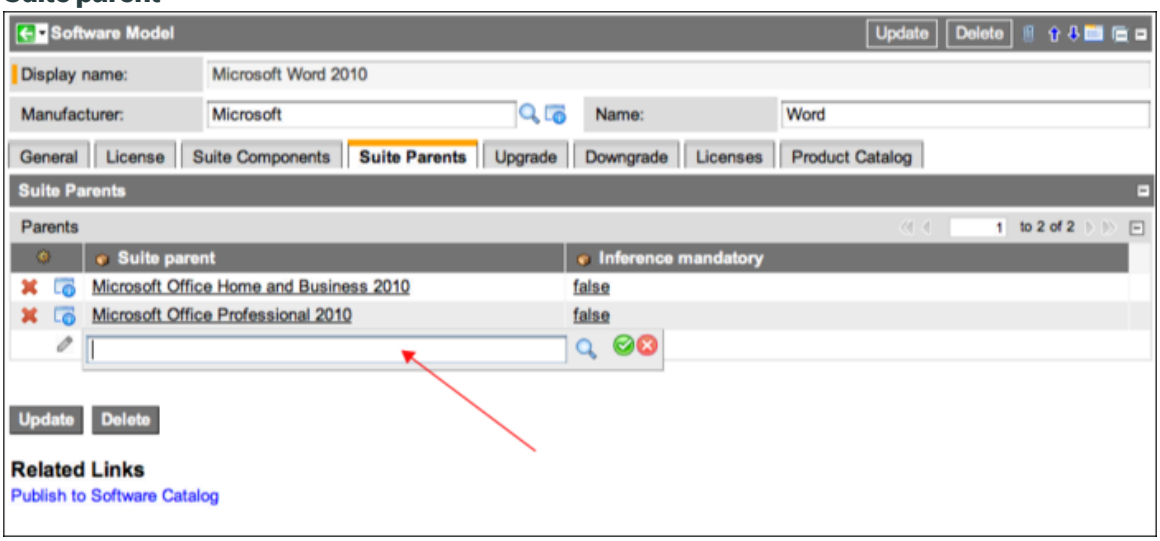



3. Add the software to include in the suite.
4. [Optional] Set the **Inference mandatory** option to **true** if the software must be installed to count the model as a suite.
5. Repeat as necessary.

To make the new software record a child item:

1. Open a software model record.
2. In the Suite Parents section, double-click an empty row under **Suite parent**.

**Suite parent**




3. Add the suite to which this software model should belong.

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4. Repeat as necessary.

> **Note:**
> When a change is made to a suite, a scheduled job called *`Calculate suites [Software Suite Model]`* is created. The job runs instantly, calculates any suites, and then deletes itself. The calculations are stored in the cmdb_sam_sw_install table under inferred suite.

### License calculations with the legacy Software Asset Management plugin

Software license calculations with the legacy Software Asset Management (com.snc.software_asset_management) plugin count the number of licenses that exist in your network environment.

Users with the sam role can choose to count software licenses using a variety of license calculation types, such as counting by the number of users, the number of workstations, the number of CPUs, and others. For example, you can count the number of Adobe Acrobat 9.0 licenses based on the number of users that have the software installed in the organization.

### Calculate software licenses using the legacy Software Asset Management plugin

Software calculations use license calculation types to determine how software licenses are counted in your organization.

You can use the default license types provided by the legacy Software Asset Management (com.snc.software_asset_management) plugin or create new ones. To view the default types, navigate to **Software Asset** > **Reconciliation** > **License Calculations** and select a type. All fields in the default records are read-only.

#### License calculation details

| Field | Description |
|---|---|
| Name | The name of the license type. |
| Query table | The table that is being used for data. Possible values are Software install and Software usage. |
| Count by | The calculation type by which the license calculation type counts software licenses. |

### License calculation types supported by the legacy Software Asset Management plugin

Default license calculation types are available with the legacy Software Asset Management (com.snc.software_asset_management) plugin.

These license types cannot be deleted.

#### License calculation types

| Category | License type |
|---|---|
| By CPU | • **By CPU cores**: The counter adds up the total license rights for all software license records of this model. The **CPU Core Count** field on the hardware configuration item determines the number of rights consumed by any software installation located on the configuration item. For that installation, the counter checks for a valid entitlement record on any of the software license records. Applies to software installation data and hardware configuration items. |

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**License calculation types (continued)**

| Category | License type |
|---|---|
| | • **By number of CPUs**: The counter adds up the total license rights for all software license records of this model. The **CPU Count field** on the hardware configuration item determines the number of rights consumed by any software installation located on the configuration item. For that installation, the counter checks for a valid entitlement record on any of the software license records. Applies to software installation data and hardware configuration items. |
| By number of points | **Per installation - IBM PVU**: The counter adds up the total license rights for all software license records of this model. The installation count for every hardware configuration item that has IBM PVU software is a point calculation. The CPU type determines the PVU per-core multiplier based on the IBM PVU mapping table. The total number of cores on the configuration item is multiplied with this per-core multiplier to determine how many rights are used by an installation on this configuration item. For that installation, the counter checks for a valid entitlement record on any of the software license records. Applies to software installation data and hardware configuration items.<br><br>This license type is present but does not work until the Software Asset Management plugin IBM PVU Process Pack is active. |
| By Client Access License (CAL) | • **CAL (Device)**: The counter adds up the total license rights for all software license records of this model. Usage is counted as one installation for every unique configuration item (device). For each installation, the counter checks for a valid entitlement record on any of the software license records. The Software Usage [ast_usage] table is used for counting.<br>• **CAL (User)**: The counter adds up the total license rights for all software license records of this model. Usage is counted as one installation for every unique user. For that installation, the counter checks for a valid entitlement record on any of the software license records. The Software Usage [ast_usage] table is used for counting. |
| By user | • **Number of installs per user**: The counter adds up the total license rights for all software license records of this model. It counts an installation when one software installation matches the discovery models that are mapped to this software model for any hardware used by a user. It counts up to the specified amount. For that installation, the counter checks for a valid entitlement record on any of the software license records. Applies to software installation data and hardware configuration items.<br>• **Per named user**: The counter adds up the total license rights for all software license records of this model. It counts an installation when there is at least one software installation that matches the discovery models that are mapped to this software model for any hardware used by a unique user. For that installation, the counter checks for a valid entitlement record on any of the software license records. Applies to software installation data and hardware configuration items.<br>• **No license needed (User)**: The counter adds up the total number of users of this model. It counts an installation when there is at least one software installation that matches the discovery models that are mapped to this software |

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**License calculation types (continued)**

| Category | License type |
|---|---|
| | model for any hardware used by a unique user. It applies to software installation data and hardware configuration items. This license type is used for software installations where no license is required, such as open source applications.<br><br>To compare **Number of installs per user** and **Per named user**:<br>• **Number of installs per user** counts the number of installs the user has and assigns license cost based on installs per license. For example, UserA has three installs. One license is used by each install, for a total of three licenses.<br>• For **Per named user**, there is no install limit for a particular user. For example, UserB, who has three installs, needs only one license for the three installs. |
| By utilization | • **Usage (CPU)**: The counter adds up the total license rights for all software license records of this model. The counter looks at all of the software usage data mapped to any of the discovery model records of the counter's software model. It counts one installation for every unique configuration item. For that installation, the counter checks for a valid entitlement record on any of the software license records. Applies to software usage data.<br>• **Usage (User)**: The counter adds up the total license rights for all software license records of this model. The counter looks at all of the software usage data mapped to any of the discovery model records of the counter's software model. It counts one installation for every unique user Accessed From hardware configuration item. For that installation, the counter checks for a valid entitlement record on any of the software license records. Applies to software usage data. |
| By workstation | • **Per workstation**: The counter adds up the total number of license rights for all software license records of this model. It counts an installation when there is at least one software installation on a hardware configuration item that matches the discovery models that are mapped to this software model. For each installation, the counter checks for a valid entitlement record on any of the software license records. Applies to software installation data and hardware configuration items.<br>• **No license needed (Workstation)**This license type is used for software installations where no license is required, such as open source applications. |
| By Oracle install | • **Oracle Named User**: Oracle licensing scheme that counts by the number of unique users.<br>• **Oracle Named User Plus**: Oracle licensing scheme that counts by the number of unique users and accounts.<br>• **Oracle Processor**: Oracle licensing scheme that counts by the number of processors on a server.<br><br>This category and its license types are available when the Oracle Process Pack is activated. |

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### Create a custom license type for the legacy Software Asset Management plugin

Custom license types in the legacy Software Asset Management (com.snc.software_asset_management) plugin allow you to create a license type with special conditions.

## Before you begin

Role required: sam

## About this task

A custom script can provide detailed information about the number of rights a software install or usage consumes.

## Procedure

1. Navigate to **All** > **Software Asset** > **Reconciliation** > **License Calculations**.
2. Click **New**.
3. Complete the form.

#### New license calculations

| Field | Description |
|---|---|
| Name | Name of the software license type. |
| Query table | The value that is used for queries. This can be either **Software install** to count the number of installations or **Software usage** to count the number of times the software is used. |
| Count by | The calculation type by which the license type counts software licenses. Make sure this value is set to **Custom** to create a new calculation type. |
| Entitlement type | The entitlement type of the license, either **Workstation** or **User**. This field is available only when the **Count by** field is set to **Custom**. |
| Script | The script used for custom license types. This field is available only when the **Count by** field is set to **Custom**. |

4. Click **Submit**.

### Create a custom script for a legacy Software Asset Management plugin license type

By default, the **Script** field in the legacy Software Asset Management (com.snc.software_asset_management) plugin Software License Calculation form contains information about available variables and an example script.

You can use the example as the basis of the custom script or replace the example entirely.

You can use the following variables in the custom script.

#### Custom script variables

| Variable | Description |
|---|---|
| `found` | Contains a GlideRecord of the software install or software usage record currently being evaluated. |
| `workstation` | Contains a GlideRecord of the workstation referenced by the found record. |

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### Custom script variables (continued)

| Variable | Description |
|---|---|
| *user* | Contains a GlideRecord of the user referenced by the found record. Can be null if no user is assigned. |
| *counter_id* | Contains the sys_id of the counter running the script. |
| *query_table* | Identifies the table currently being queried, either Software Installation or Software Usage. |
| *valuation* | Identifies the value in rights that is given to this software install or software usage record. |

The following functions are available as part of the *SAMUtil* script include and can be used in custom scripts.

**Note:**
All of these functions utilize and depend on the variables mentioned above.

### Custom script functions

| Functions | Description |
|---|---|
| *getWorkstationInstallsOrUsages* | Returns a list of other installs on the given workstation. |
| *getUserInstallsOrUsages* | Returns a list of all other installs belonging to the user. |
| *createCounterViolation* | Returns insert a counter violation for the current counter with the given cause. |

Example:

The following script uses the number of rights equal to the number of CPU sockets on the machine the script is installed on. The *workstation* variable is used to identify any workstation that is in the development environment. If such a workstation is found, the script then assigns a *valuation* equal to the number of CPU sockets on the machine. Otherwise, if the workstation is not in the development environment, then no rights are assigned.

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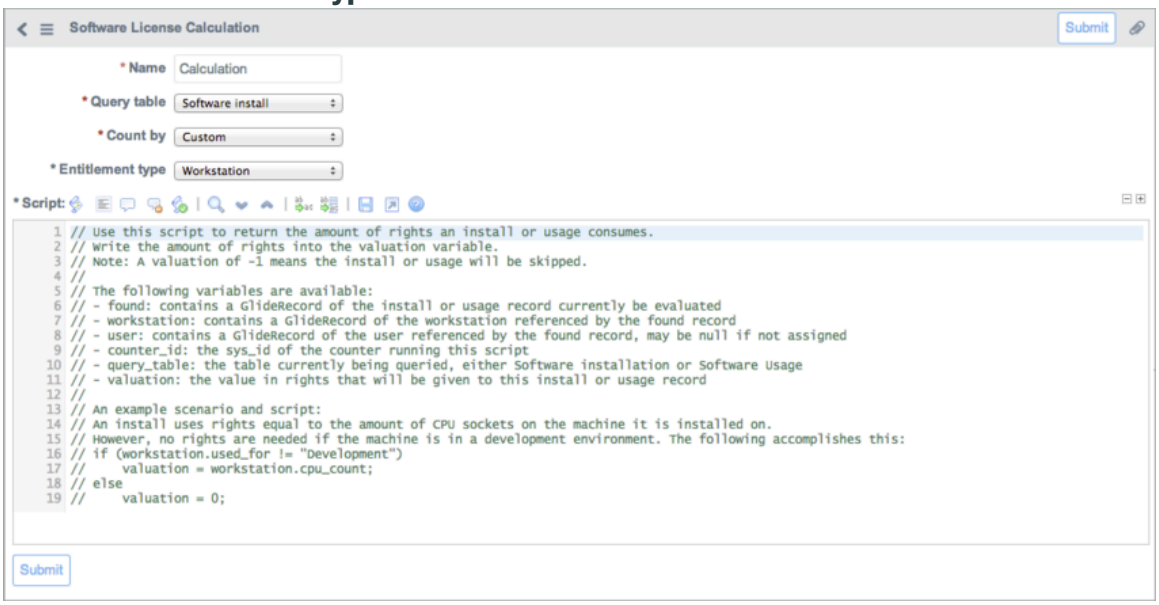
### SAM custom calculation type




### Software discovery models in the legacy Software Asset Management plugin

Software discovery models in the legacy Software Asset Management (com.snc.software_asset_management) plugin can be used to help normalize the software you own by analyzing and classifying models to reduce duplication.

Software discovery models are stored in the Software Discovery Model [cmdb_sam_sw_discovery_model] table. There is a distinct difference between software models and software discovery models.

- A software model is a specific version or configuration of software.
- A software discovery model is a model created when Discovery runs and identifies software.

Software discovery models cannot be created manually. The ServiceNow platform uses any of the following field combinations to match the new software discovery model to an existing software model.

- **Display Name**, **Publisher**, and **Version**
- **Display Name** and **Version** if the **Publisher** field is empty
- **Display Name** only if the **Publisher** and **Version** fields are empty

When analyzing version numbers, the ServiceNow platform always searches for an exact match first, but rounds down to a major version number if an exact match is not found. For example, if no match is found for version number 8.0.4, but version 8.0 is found, then version 8.0 is used in the **Software model** field.

### Edit a software discovery model using the legacy Software Asset Management plugin

You can edit only the **Software model** field and **Approved** check box on the legacy Software Asset Management (com.snc.software_asset_management) plugin Software Discovery Models form.

#### Before you begin

Role required: sam

#### About this task

If the information automatically added to the **Software model** field is incorrect, you can change to an existing model or create a new one.

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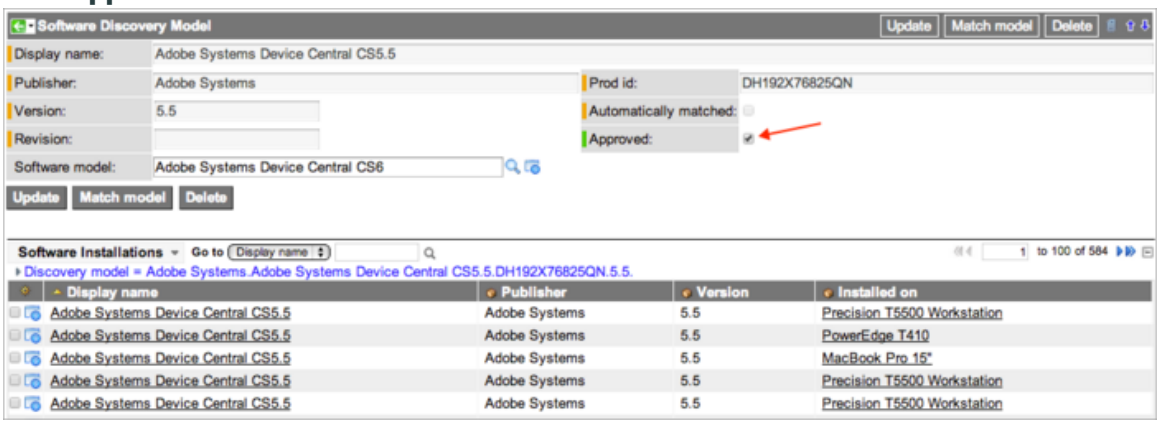
None of the software discovery model records are approved when they are created. You must approve them manually after you have reviewed them for accuracy or normalized them. If the automatically generated software model is correct, approve the model.

### Procedure

1. Navigate to **All** > **Software Asset** > **Reconciliation** > **Discovery models**.
2. Click an entry in the **Publisher** column.
3. Select **Approved**.

**SAM approval**




## Automatically match to an existing model using the legacy Software Asset Management plugin

The automatic matching feature in the legacy Software Asset Management (com.snc.software_asset_management) plugin allows you to match a software discovery model to an existing software model.

### Before you begin

Role required: sam

### Procedure

1. Navigate to **All** > **Software Asset** > **Reconciliation** > **Discovery models** and open a model.
2. Clear the **Software model** field.
3. Click an entry in the **Publisher** column.
4. Click **Match model**.
   The system searches for the best match from existing models. If a match is found, the system automatically adds the name to the **Software model** field and selects the **Automatically matched** check box. If a match is not found, a **No match found** message is displayed, and two related links appear, allowing you to create a new model. No change occurs if the system has already made a match.
5. If no match is found, create a new model.
   If a model is already matched, then the automatic matching feature does not run.

   The automatic matching feature can also be used when you insert a new discovery model record or if you modify and update an existing discovery model. If automatic matching is run, all software installations and usages that reference the discovery model will have their **Inferred suite** and **Cached** fields cleared.

   For more information on software installation and usage records, see Determine where software is installed.

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### Create new models using the legacy Software Asset Management plugin

If the automatically generated software model is not correct or if the system cannot find a match from existing models, you can create a new model using the legacy Software Asset Management (com.snc.software_asset_management) plugin.

## Before you begin

Role required: sam

## Procedure

1. Navigate to **All** > **Software Asset** > **Reconciliation** > **Discovery models** and open a model.
2. Clear the **Software model** field.
3. Save the record.
   Two related links appear for creating software models.
4. Select one of these related links to create a new model, which are available only if no **Software model** is specified.
   - **Create Software Model**: Creates a new software model for this record if a suitable one does not already exist. You can create a new software model for multiple records in the Discovery Models list view. Select one or more records and then click the link in the **Actions** choice list.
   - **Create Software Model and Counter**: Creates a new software model and a new software counter for this record. The system creates the software model automatically using the value in the **Display name** field, and then opens a new Software Counter form. In the Discovery Model list view, you can select multiple records and choose this option from the **Actions** choice list.
5. Complete the form.

### Model fields

| Field | Description |
|---|---|
| Display name | [Read-only] Name of the discovery model as it appears in record lists. |
| Publisher | [Read-only] Publisher of the software. |
| Version | [Read-only] Specific version of the software. |
| Revision | [Read-only] Revision number of the software. |
| Software model | Software product model to which the discovery model maps. Click the reference lookup icon and use the lookup list to find the software model to associate with this software discovery model. |
| Prod id | [Read-only] Product ID code for the software, as reported through the discovery process. |
| Automatically matched | [Read-only] Check box that indicates whether the discovery tool used the **Display Name**, **Publisher**, and **Version** fields to determine the **Software model**. |
| Approved | Check box that indicates whether the mapping to software model has been reviewed and approved. |
| Low confidence | [Read-only] Check box that indicates whether the automatically matched software model is not a close match. If selected, and if after reviewing the item it is determined that it's the correct software model, click **Confirm Mapping** to match the discovery model to the software model. |

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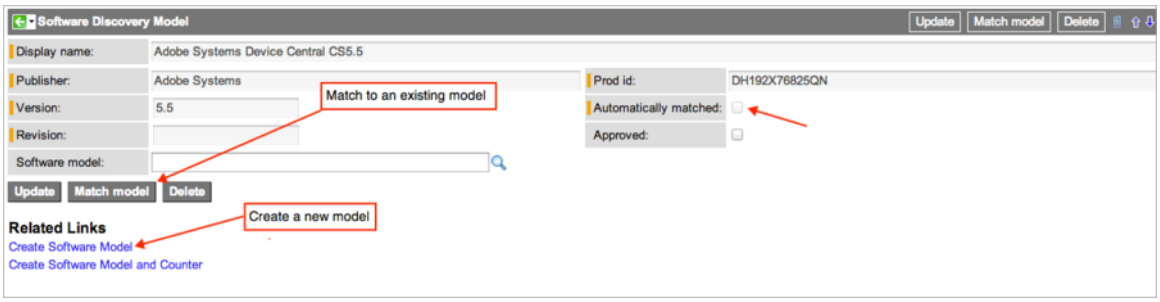
6. Select **Approved**.

**SAM match model**




7. Click **Submit**.

## Legacy Software License Compliance Checker

The Software License Compliance Checker that is included in the legacy Software Asset Management (com.snc.software_asset_management) plugin is a fast way to see if the software licenses used in your organization are compliant based on number of rights purchased and number of installations.

For example, if there are 100 licenses for a software program, the legacy Software License Compliance Checker can show if the software has been installed more than 100 times. The legacy Software Compliance Checker uses information found by a discovery tool such as Discovery or third-party technologies, to analyze the software installed on your network.

## Check your software license compliance using the legacy Software License Compliance Checker

You can check your software license compliance using the Software License Compliance Checker that is included in the legacy Software Asset Management (com.snc.software_asset_management) plugin.

### Before you begin

Role required: sam

### Procedure

1. Navigate to **All** > **Software Asset** > **System** > **Check License Compliance**.
2. Click **Proceed**.
   Your organization's network is analyzed for name, software model, rights, installs, license type, and active status.
3. View the results.
   The Software Counters list is color coded.

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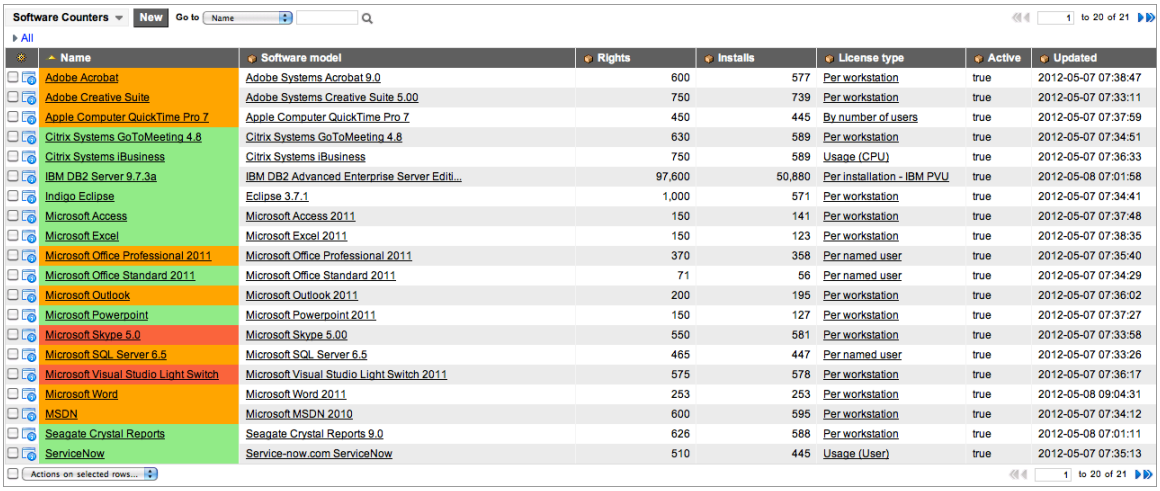
- Green - in compliance
- Orange - within 5% of being out of compliance
- Red - not compliant

**Software Counters list**



Software Counters | New | Go to Name | 1 to 20 of 21

All

| Name | Software model | Rights | Installs | License type | Active | Updated |
|---|---|---|---|---|---|---|
| Adobe Acrobat | Adobe Systems Acrobat 9.0 | 600 | 577 | Per workstation | true | 2012-05-07 07:38:47 |
| Adobe Creative Suite | Adobe Systems Creative Suite 5.00 | 750 | 739 | Per workstation | true | 2012-05-07 07:33:11 |
| Apple Computer QuickTime Pro 7 | Apple Computer QuickTime Pro 7 | 450 | 445 | By number of users | true | 2012-05-07 07:37:59 |
| Citrix Systems GoToMeeting 4.8 | Citrix Systems GoToMeeting 4.8 | 630 | 589 | Per workstation | true | 2012-05-07 07:34:51 |
| Citrix Systems iBusiness | Citrix Systems iBusiness | 750 | 589 | Usage (CPU) | true | 2012-05-07 07:36:33 |
| IBM DB2 Server 9.7.3a | IBM DB2 Advanced Enterprise Server Editi... | 97,600 | 50,880 | Per installation - IBM PVU | true | 2012-05-08 07:01:58 |
| Indigo Eclipse | Eclipse 3.7.1 | 1,000 | 571 | Per workstation | true | 2012-05-07 07:34:41 |
| Microsoft Access | Microsoft Access 2011 | 150 | 141 | Per workstation | true | 2012-05-07 07:37:48 |
| Microsoft Excel | Microsoft Excel 2011 | 150 | 123 | Per workstation | true | 2012-05-07 07:38:35 |
| Microsoft Office Professional 2011 | Microsoft Office Professional 2011 | 370 | 358 | Per named user | true | 2012-05-07 07:35:40 |
| Microsoft Office Standard 2011 | Microsoft Office Standard 2011 | 71 | 56 | Per named user | true | 2012-05-07 07:34:29 |
| Microsoft Outlook | Microsoft Outlook 2011 | 200 | 195 | Per workstation | true | 2012-05-07 07:36:02 |
| Microsoft Powerpoint | Microsoft Powerpoint 2011 | 150 | 127 | Per workstation | true | 2012-05-07 07:37:27 |
| Microsoft Skype 5.0 | Microsoft Skype 5.00 | 550 | 581 | Per workstation | true | 2012-05-07 07:33:58 |
| Microsoft SQL Server 6.5 | Microsoft SQL Server 6.5 | 465 | 447 | Per named user | true | 2012-05-07 07:33:26 |
| Microsoft Visual Studio Light Switch | Microsoft Visual Studio Light Switch 2011 | 575 | 578 | Per workstation | true | 2012-05-07 07:36:17 |
| Microsoft Word | Microsoft Word 2011 | 253 | 253 | Per workstation | true | 2012-05-08 09:04:31 |
| MSDN | Microsoft MSDN 2010 | 600 | 595 | Per workstation | true | 2012-05-07 07:34:12 |
| Seagate Crystal Reports | Seagate Crystal Reports 9.0 | 626 | 588 | Per workstation | true | 2012-05-08 07:01:11 |
| ServiceNow | Service-now.com ServiceNow | 510 | 445 | Usage (User) | true | 2012-05-07 07:35:13 |

Actions on selected rows... | 1 to 20 of 21

### Software license reconciliation counters for the legacy Software Asset Management plugin

Software counters for the legacy Software Asset Management (com.snc.software_asset_management) plugin reconcile software rights with software installations to verify compliance.

For asset managers, software counters answer the question: Is my number of installations equal to or lower than the number of rights purchased? Counters are useful for software that must be tracked; some software may not need to be tracked closely. Grouping—such as location, company, department, cost center, entitlement workstation and entitlement user—or no grouping can be used with software counters.

In addition to software counters, the legacy Software Asset Management (com.snc.software_asset_management) plugin offers usage counters that track a license based on use by a workstation or user.

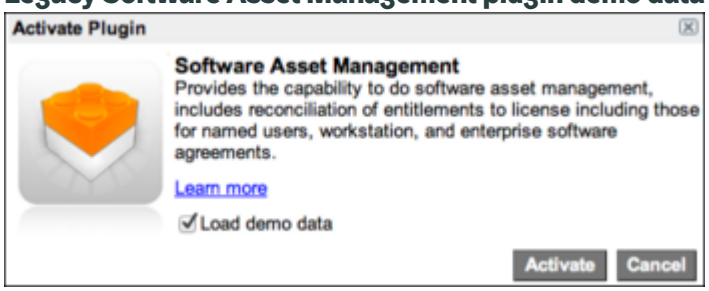
The software counter cache is used to increase the speed of counting software licenses. If there is a large number of software license records, the first time software is counted takes several minutes. After the first count, only changes are processed so the procedure is faster.

### Get started with software counters for the legacy Software Asset Management plugin

A good way to see how software counters work is to use the demo data provided with the legacy Software Asset Management (com.snc.software_asset_management) plugin.

Load the demo data on a non-production instance.

**Legacy Software Asset Management plugin demo data**

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Using the demo data, try some of the procedures on this page, such as Use the Software Counter and View a Usage Counter Result.

To use software counters with your own information, follow the steps in the Legacy Software Asset Management plugin setup process. ServiceNow Discovery does not populate the Software Usage (*cmdb_sam_sw_usage*) table. Use a third party tool such as Microsoft's System Center Configuration Manager to add information about software assets to the Software Usage table.

### Schedule a software count for the legacy Software Asset Management plugin

How to schedule a software count for the legacy Software Asset Management (com.snc.software_asset_management) plugin.

## Before you begin

Role required: sam

## About this task

The SAM License Counters scheduled job scans your instance for software installations. The SAM License Counters job occurs at 2:00am local time every morning. The job queries the Software Installation [cmdb_sam_sw_install] table and captures any installations that have not been scanned in the past 7 days. The job runs a join query on hardware that has been scanned within the last day and software installations that have not been scanned in the last 7 days.

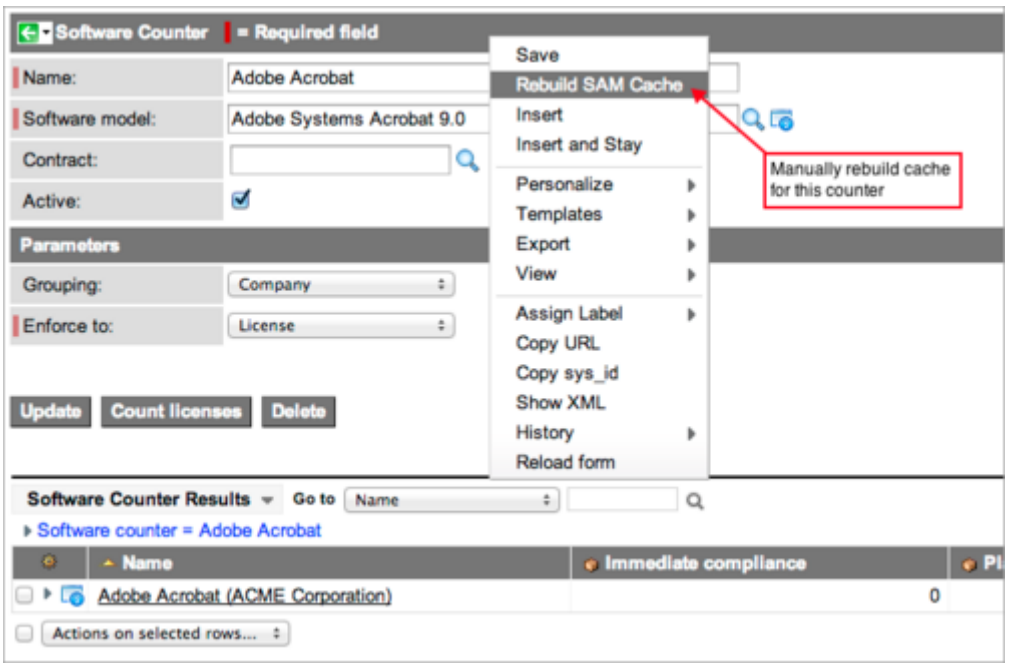
The SAM License Counters scheduled job runs all software counters at once.

To refresh the cache manually for a specific counter:

## Procedure

1. Navigate to **All** > **Software Asset** > **Reconciliation** > **Software Counters**.
2. Select a counter whose cache you want to refresh.
3. Right-click in the header bar of the Software Counter record and select **Rebuild SAM Cache** from the context menu.

**SAM rebuild cache**

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## Use a software counter for the legacy Software Asset Management plugin

Use a software counter for the legacy Software Asset Management (com.snc.software_asset_management) plugin to count the licenses for a specific version of software and receive summary or detailed results.

When a software counter runs for the first time, it can take several minutes to process records. The license counts are cached so that on subsequent runs, the counter processes only changed records, both those from Discovery or altered entitlements, making it faster. The Software Counter form contains check boxes to enable faster counting through the use of quick counters. For more information on using quick counters, see Setting Up Quick Counters.

Use a software counter to count the licenses for a specific version of software and receive summary or detailed results. For example, an asset manager can look at summary information to discover which departments are not in compliance. Then, department managers can look at detailed information to determine the people or individual computers that are not in compliance.

Software counters return results by *Licensing Type*:

- *Entitled in use*: Number of people who have been allocated a license and installed the software.
- *Entitled not in use*: Number of people who have been allocated a license but did not install the software.
- *Not entitled*: Number of people using an unauthorized copy of the software.
- *Not allocated*: Number of licenses not assigned.

**Note:**
For information about the scheduled job that runs all counters each day or the steps to run all counters manually, see Scheduling Software Counts.

The Software Counters list is color coded:

- Green - in compliance
- Orange - within 5% of being out of compliance
- Red - not compliant

### SAM software license compliance check

Software Counters | New | Go to Name | 1 to 20 of 21

All

| Name | Software model | Rights | Installs | License type | Active | Updated |
|---|---|---|---|---|---|---|
| Adobe Acrobat | Adobe Systems Acrobat 9.0 | 600 | 577 | Per workstation | true | 2012-05-07 07:38:47 |
| Adobe Creative Suite | Adobe Systems Creative Suite 5.00 | 750 | 739 | Per workstation | true | 2012-05-07 07:33:11 |
| Apple Computer QuickTime Pro 7 | Apple Computer QuickTime Pro 7 | 450 | 445 | By number of users | true | 2012-05-07 07:37:59 |
| Citrix Systems GoToMeeting 4.8 | Citrix Systems GoToMeeting 4.8 | 630 | 589 | Per workstation | true | 2012-05-07 07:34:51 |
| Citrix Systems iBusiness | Citrix Systems iBusiness | 750 | 589 | Usage (CPU) | true | 2012-05-07 07:36:33 |
| IBM DB2 Server 9.7.3a | IBM DB2 Advanced Enterprise Server Editi... | 97,600 | 50,880 | Per installation - IBM PVU | true | 2012-05-08 07:01:58 |
| Indigo Eclipse | Eclipse 3.7.1 | 1,000 | 571 | Per workstation | true | 2012-05-07 07:34:41 |
| Microsoft Access | Microsoft Access 2011 | 150 | 141 | Per workstation | true | 2012-05-07 07:37:48 |
| Microsoft Excel | Microsoft Excel 2011 | 150 | 123 | Per workstation | true | 2012-05-07 07:38:35 |
| Microsoft Office Professional 2011 | Microsoft Office Professional 2011 | 370 | 358 | Per named user | true | 2012-05-07 07:35:40 |
| Microsoft Office Standard 2011 | Microsoft Office Standard 2011 | 71 | 56 | Per named user | true | 2012-05-07 07:34:29 |
| Microsoft Outlook | Microsoft Outlook 2011 | 200 | 195 | Per workstation | true | 2012-05-07 07:36:02 |
| Microsoft Powerpoint | Microsoft Powerpoint 2011 | 150 | 127 | Per workstation | true | 2012-05-07 07:37:27 |
| Microsoft Skype 5.0 | Microsoft Skype 5.00 | 550 | 581 | Per workstation | true | 2012-05-07 07:33:58 |
| Microsoft SQL Server 6.5 | Microsoft SQL Server 6.5 | 465 | 447 | Per named user | true | 2012-05-07 07:33:26 |
| Microsoft Visual Studio Light Switch | Microsoft Visual Studio Light Switch 2011 | 575 | 578 | Per workstation | true | 2012-05-07 07:36:17 |
| Microsoft Word | Microsoft Word 2011 | 253 | 253 | Per workstation | true | 2012-05-08 09:04:31 |
| MSDN | Microsoft MSDN 2010 | 600 | 595 | Per workstation | true | 2012-05-07 07:34:12 |
| Seagate Crystal Reports | Seagate Crystal Reports 9.0 | 626 | 588 | Per workstation | true | 2012-05-08 07:01:11 |
| ServiceNow | Service-now.com ServiceNow | 510 | 445 | Usage (User) | true | 2012-05-07 07:35:13 |

Actions on selected rows... | 1 to 20 of 21

## Create a software counter for the legacy Software Asset Management plugin

How to create a software counter for the legacy Software Asset Management (com.snc.software_asset_management) plugin.

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### Before you begin
Role required: sam

### About this task
Depending on the license type you select for a counter, multiple installations can count as a single license, such as when using the per user license type. This licensing concept is used on occasion by companies like Microsoft and Adobe. It grants users the right to install software on multiple machines if those users already have rights to install the software.

**Note:**
You can create new counters from Discovery model records or from the list view.

To manage multiple versions of software from a single licensing perspective for the parent software model:

- The downgrade child software models that are licensed under the parent software model should all be related to a the single parent software model.
- The downgrade child software models should not have any software counters associated with them.
- The software counter should be associated only with the licensed parent software model, otherwise misleading results for the counter will be reported

To create a software counter:

### Procedure
1. Navigate to **All** > **Software Asset** > **Reconciliation** > **Software Counters**.
2. Click **New**.
3. Fill in the fields on the Software Counter form (see table).
4. Click **Submit**.
5. Reopen the new counter and click **Count Licenses**.
6. Reload the form to view the counter results.

**Software counter form**

| Field | Description |
|---|---|
| Name | [Required] Enter the name of the software counter as it appears in record lists. |
| Software model | [Required] Click the reference lookup icon and select the software model for which the counter will check compliance. |
| Contract | Select the contract that you want to use to limit the license. Used for enterprise and subscription-based licenses. Also restricts how counters retrieve licenses for the given counter. If left empty, all licenses for the model are counted. |
| Active | Select the check box to have the scheduler run the counter. |
| Rights Owned | [Read-Only] Displays a summation if a contract is specified. The total sum is the license rights provided by all the licenses for the software model (of the counter) under the specified contract. If no contract is specified, this field is a count of all licenses of this model. |
| Rights Used | [Read-Only] Displays the number of rights used by all installs, whether a contract is specified or not. |

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| Field | Description |
|---|---|
| Immediate compliance | [Read-Only] Displays the number of additional rights needed to achieve compliance based on installations. |
| Parameters | |
| Grouping | Select the field for grouping data:<br>○ Location: group by the geographic location set in the license record.<br>○ Company: group by the company set in the license record.<br>○ Department: group by the department set in the license record.<br>○ Cost Center: group by the cost center set in the license record.<br>○ Entitlement (CPU): group by the condition defined in the Allocated condition field of the license record.<br>○ Entitlement (User): group by the condition defined in the Assigned condition field of the license record.<br>The software counter results also displays counts for licenses that do not match the grouping parameter. |
| Enforce to | [Required] Select the level of adherence to the license:<br>○ License: counts all existing entitlements for the installations or usage you are analyzing regardless of the grouping parameter selected.<br>○ Strict: counts the license and entitlement as valid only if the license also matches the grouping category. For example, a license is assigned to a specific location, such as Americas. With strict enforcement enabled, the user and the machine on which the license is installed must be in the Americas group. If the person and their license assigned to the Americas group moves to the United Kingdom, the license is still valid, but strict enforcement flags the user as unauthorized to use that license. The license will be counted as valid, but will also show up as not entitled in the summary. |
| Verify entitlements | Select the check box to view the software entitlement details for the software counter. Results include the number of installations of all types: not entitled, entitled in use, entitled not in use, and not allocated. For more information, see Setting Up Quick Counters. |
| Generate details | Select the check box to generate the details of the entitlement records. For more information, see Setting Up Quick Counters. |
| License type | [Required] Select the method for counting licenses. For example, Per named user or Per workstation.<br>For more information, see License Calculation Types. |
| Installs per license | Enter the number of installations allowed (one or more) per license for each user if the License type is set to By number of users. You can allow more than two installations per license.<br>For all other license types this field is set to 1 install per license. |

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| Field | Description |
|---|---|
| Cached | [Read-Only] Shows whether this option is selected. If selected, only changed information is counted, reducing the amount of time it takes to count the licenses. |
| License condition | Specify the condition a license should satisfy in order to be counted. |
| Software install condition | Specify the condition an install record should satisfy in order to be counted. This field appears depending on the value of the License type field. |
| Software usage condition | Specify the condition a usage record should satisfy in order to be counted. This field appears depending on the value of the License type field. |
| Related Lists | |
| Software Counter Results | Displays all results for this software counter. |
| Software Counter Compliance Violations | Displays all records of compliance violations for this software counter. |
| Software Counter Histories | Displays all software counter history records for this software counter. Each time a count is completed, the system automatically generates a software counter history record, which is a read-only copy of the software counter record. |

**Note:**
A message is displayed at top of the software counter form indicating if a license count is in progress. Reload the form to view the counter results.

### Set up quick counters for the legacy Software Asset Management plugin

Quick counter settings can help speed up the software counting process that is used by the legacy Software Asset Management (com.snc.software_asset_management) plugin.

The following check boxes are available in the Parameters section of the Software Counter form:

- *Verify entitlements*: When this check box is selected, the software counter will generate entitlement details in the software counter summaries, displaying the number of entitlements in use and entitlements not in use. If the check box is cleared, the software counter will display *Entitlement not known* with a count of total installs. The counter will not check for entitlements.
- *Generate details*: When this check box is selected, the software counter will generate software counter detailsfor each software counter result type. If the check box is cleared, no details will be available.

Clearing these check boxes in addition to setting the *Grouping* parameter to *None* will enable software counters to run more quickly.

### View software counter results for the legacy Software Asset Management plugin

Software counter results provide detailed information about each grouping that is formed through the legacy Software Asset Management (com.snc.software_asset_management) plugin.

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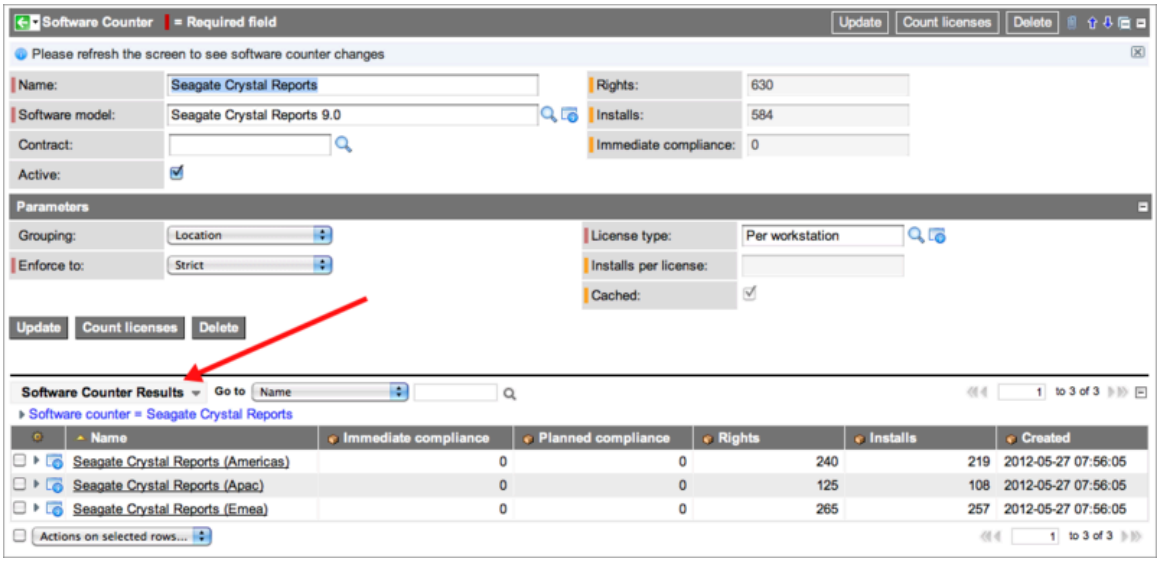
## Before you begin

Role required: sam

## Procedure

1. On the Software Counter form, click a name in the **Software Counter Results** related list.

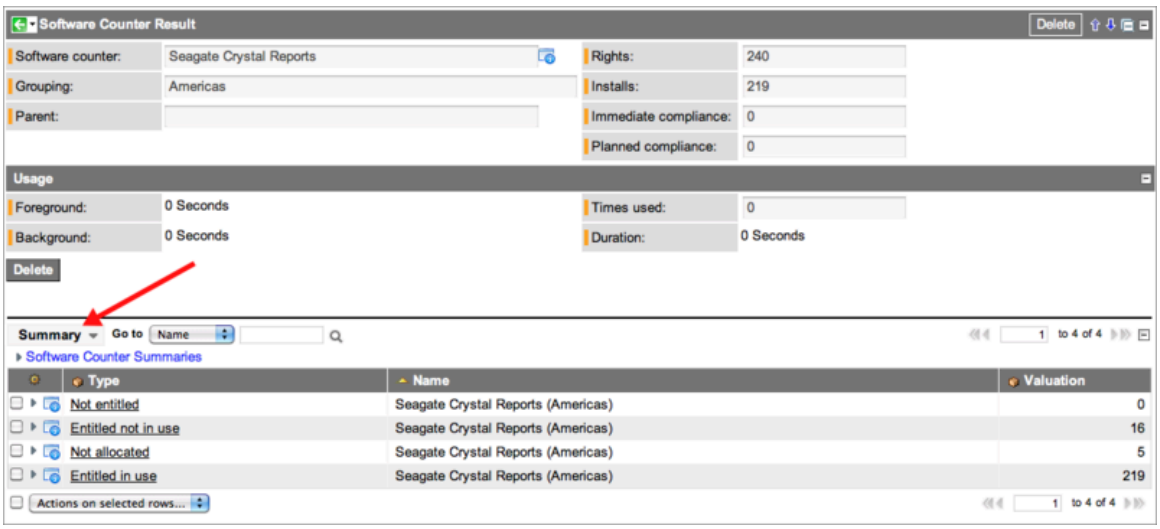
**SAM software counter results 2**




2. View the Software Counter Result form (see table).

   All fields on the form are read-only.

**SAM software counter results 3**




### Software counter result form

| Field | Description |
|---|---|
| Software counter | Name of the software counter whose results are displayed. |
| Grouping | Grouping this software belongs to. |
| Parent | Name of the parent software, if one exists, assigned to this software. |

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| Field | Description |
|---|---|
| Rights | Number of rights available in the group. |
| Installs | Number of rights used by installations of the software in the group. |
| Immediate compliance | Number of additional rights needed for the group to achieve compliance based on installations. |
| Planned compliance | Number of additional rights needed for the group to achieve compliance based on installations and number of unused entitlements available. |
| Usage Section | |
| Foreground | Total duration of foreground usage of the software, based on all the installations for the group. |
| Background | Total duration of background usage of the software, based on all the installations for the group. |
| Times used | Total number of times the software was used, based on software usage records for the group. |
| Duration | Total duration of software usage, based on software usage records for the group. (Not the sum of Foreground and Background.) |
| Related List | |
| Summary | Breakdown of software counter results bytype. Click a type to view a detailed summary. |

### View software counter summaries for the legacy Software Asset Management plugin

Software counter summaries provide information about each software counter type that is supported by the legacy Software Asset Management (com.snc.software_asset_management) plugin.

### Before you begin

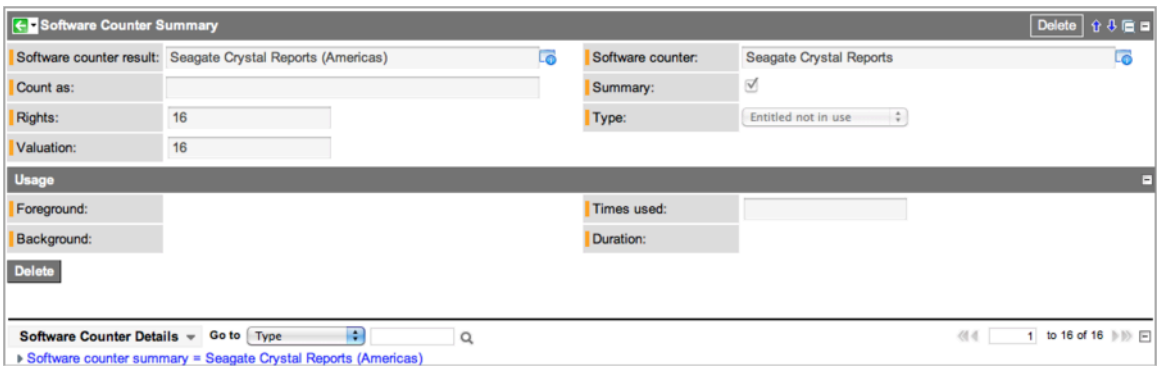
Role required: sam

### Procedure

1. On the Software Counter Result form, click a type in the **Summary** related list.
2. View the Software Counter Summary form (see table).

   All fields on the form are read-only.

#### SAM software counter results

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### Software counter summary

| Field | Description |
|---|---|
| Software counter result | Name of the software counter result for which the summary is displayed. |
| Count as | The software model being counted. |
| Rights | Number of rights that have been used. |
| Valuation | How software is counted during the reconciliation process. |
| Software counter | Name of the software counter. |
| Summary | Check box that indicates whether the form displays summary information (selected) or detailed information (cleared). |
| Type | Type of license counted. |
| Usage Section | |
| Foreground | Total duration of foreground usage of the software, based on all the installations for the grouping. |
| Background | Total duration of background usage of the software, based on all the installations for the grouping. |
| Times used | Total number of times the software was used, based on software usage records for the grouping. |
| Duration | Total duration of software usage, based on software usage records for the group. (Not the sum of Foreground and Background.) |
| Related List | |
| Software Counter Details | Shows every entitlement, software install, and software usage for the software. The related list also shows the Workstation and User, if applicable, for each software counter detail. A software asset manager can, for example, identify people who are using the license but are not entitled. The software can then be uninstalled from machines that are not in compliance or people can be entitled a license to meet compliance rules.<br><br>Click a type to view the software counter detail. |

### View software counter details for the legacy Software Asset Management plugin

Software counter details provide information about a specific software counter summary for the legacy Software Asset Management (com.snc.software_asset_management) plugin.

## Before you begin

Role required: sam

## Procedure

1. On the Software Counter Summary form, click a type in the **Software Counter Details** related list.
2. View the Software Counter Detail form (see table).

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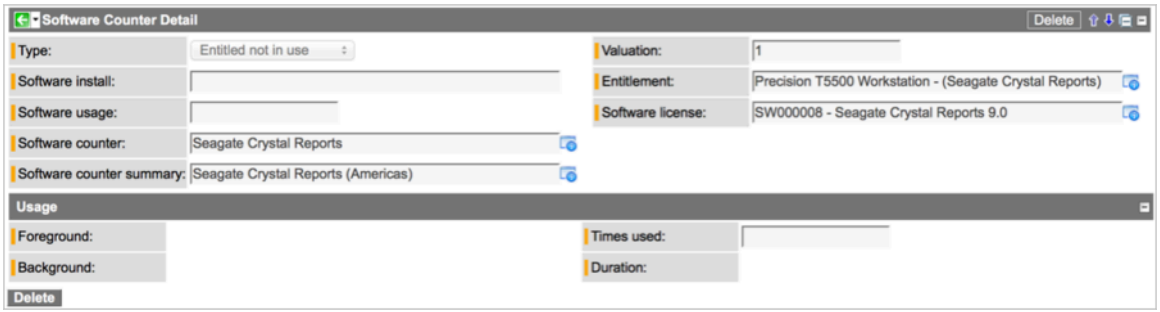
All fields on the form are read-only.

### Software counter detail form




### Software counter detail

| Field | Description |
|---|---|
| Type | Type of the counter detail. |
| Software install | Name of the related software install record, if applicable. This field is blank if the type is Entitled not in use or Not allocated. |
| Software usage | Name of the related software usage record, if applicable. |
| Software counter | Name of the related software counter. |
| Software counter summary | Name of the related software counter summary. |
| Valuation | A valuation of 1 indicates that the license right is being used. A valuation of 0 indicates that the license right is part of a software suite, or that the license allows more than one installation per right. The 0 indicates that this installation does not count against the license. |
| Entitlement | Name of the related software license entitlement, if applicable. This field is blank if the type is Not entitled or Not allocated. |
| Software license | Name of the related software license, if applicable. This field is blank if the type is Not entitled. |
| Usage Section | |
| Foreground | Total duration of foreground usage of the software, based on the related software install record. |
| Background | Total duration of background usage of the software, based on the related software install record. |
| Times used | Total number of times the software was used, based on the related software usage record. |
| Duration | Total duration of foreground and background software usage, based the related software usage record. |

## View usage counter results for the legacy Software Asset Management plugin

Usage counters for the legacy Software Asset Management (com.snc.software_asset_management) plugin track licenses based on how often those licenses are actually used either by a workstation or a user.

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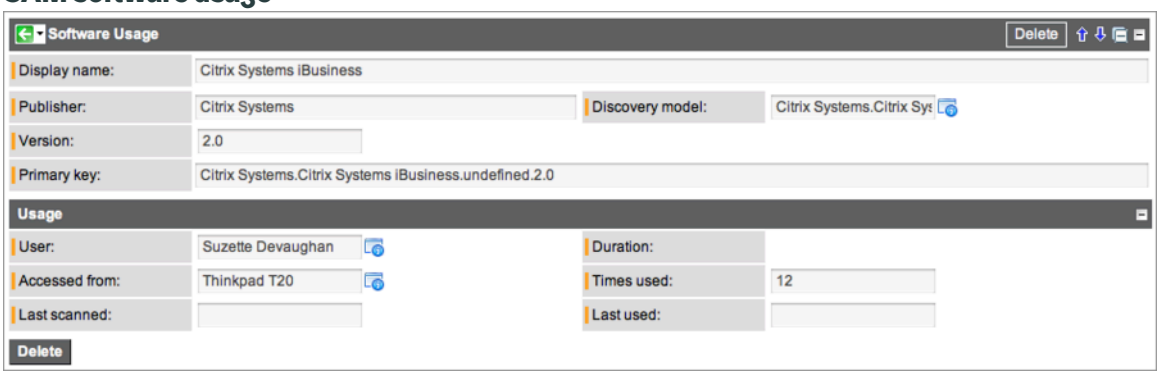
### Before you begin
Role required: sam

### About this task
A usage counter tracks a license based on how often the license is actually used either by a workstation or a user. For example, an asset manager can use a usage counter to determine who is actually using the software they have been entitled. If an individual is not using the software at all or very infrequently, the software can be uninstalled and given to an individual who will use it more often. If you have a way of capturing information, for example a proxy server or gateway, you can capture the IP address and the name of the user accessing the license. The captured data can be added directly into the Software Usages list.

### Procedure
1. Navigate to **All** > **Software Asset** > **Discovery** > **Software Usages**.
2. Click the **Display Name** in the row containing the software and user to check.
3. View the **Software Usage** form (see table).

All fields on the form are read-only.

**SAM software usage**




**Software usage form**

| Field | Description |
|---|---|
| Display name | Name of the software usage record. |
| Publisher | Publisher of the software. |
| Version | Version of the software. |
| Discovery model | Software discovery model associated with the installed software. |
| Primary key | Unique identifier for table row. |
| Usage | |
| User | User who accessed the software. |
| Accessed from | Hardware configuration item from which the software was accessed. |
| Last scanned | Date and time when the software was last discovered on this hardware. |

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| Field | Description |
|---|---|
| Duration | Duration of all usage. |
| Times used | Number of times the software was accessed from this hardware. |
| Last used | Date and time when the software was last used on this hardware. |
| Software counter | |
| Counted by | The software counter summary record in the Software Counter Summary [sam_sw_counter_summary] table on which this usage is counted. |
| Entitlement | The entitlement rights of the software. |
| Valuation | Number of license rights used by this software usage. |
| Cached | If selected, indicates that a software count has already been cached. |

### Legacy IBM PVU Process Pack

Processor Value Unit (PVU) is a unit of measurement defined by IBM to determine software licensing costs based on processor or server model.

A processor is defined as each core on a socket. Each software package has a price defined as number of points or PVUs per core. For a complete explanation of IBM PVU licensing for distributed software, see Processor Value Unit [PVU] licensing for Distributed Software on the IBM website.

In the ServiceNow AI Platform, the concept of PVU is used by the legacy IBM PVU Process Pack, which is an add-on to the legacy Software Asset Management (com.snc.software_asset_management) plugin. This legacy process pack provides the ability to manage software licensed under the IBM Processor Value Units licensing model.

**Important:**
The legacy IBM PVU Process Pack is not required for tracking and managing IBM PVU licenses through the Software Asset Management publisher pack for IBM, which is available as part of the Software Asset Management Professional (com.snc.samp) plugin. The IBM publisher pack includes all capabilities that are required for tracking and managing both full capacity and sub-capacity PVU and RVU licenses for your IBM products. See Software Asset Management publisher pack for IBM for more information on the IBM publisher pack.

The legacy Software Asset Management (com.snc.software_asset_management) plugin Processor Definition Extension is automatically activated when the legacy IBM PVU Process Pack is activated. It provides data model support for processor definitions and is required by all legacy Software Asset Management (com.snc.software_asset_management) plugin process packs.

**Note:**
Oracle and Microsoft also use the concept of PVU, but have slightly different definitions.

### Activate the legacy IBM PVU Process Pack

The legacy Software Asset Management - IBM PVU Process Pack (com.snc.sam.ibmpvu.pp) plugin can no longer be activated upon request. If the legacy plugin has already been activated on your ServiceNow instance, you can continue to use the legacy IBM PVU Process Pack.

**Before you begin**
Role required: admin

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### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. On the All Applications page, click **Request Plugin** to open the Request form on HI.
3. On Now Support, click the **Take me to the Hi Service Portal Active a Plugin Service Catalog** link to access the Now Support Service Portal Service Catalog.
4. On the form, fill in the fields.

**Activate Plugin Request form**

| Field | Description |
|---|---|
| Target Instance | Instance on which to activate the plugin. |
| Plugin Name | Name of the plugin to activate. |
| Specify the date and time you would like this plugin to be enabled | The date and time must be at least two business days from the current time.<br>**Note:** Plugins are activated in two batches, once in the morning and once in the evening, on every business day in the US Pacific time zone. If the plugin must be activated at a specific time, enter the request in the **Reason/Comments** field. |
| Reason/Comments | Information that would be helpful for the ServiceNow personnel who are activating the plugin. For example, if you need the plugin activated at a specific time instead of during one of the default activation windows, specify that in the comments. |

5. Click **Submit**.

## Validate legacy IBM PVU Process Pack requirements for associating software installations with PVU mappings

Meet the recommended requirements to ensure that you receive the highest quality results with PVU mapping.

### Before you begin

Role required: admin

### Procedure

1. Use a discovery tool, such as ServiceNow Discovery, to identify hardware and populate the configuration management database (CMDB) with the configuration items you want to manage with IBM PVU licensing.
2. Use a discovery tool, such as ServiceNow Discovery, to identify software installations. Check that the added CPU information is correct.
3. Activate the Software Asset Management plugin - IBM PVU Process Pack plugin. This also activates the Software Asset Management plugin if it is not already active.
4. Refresh processor definitions.

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5. Ensure that the software models you want to manage with IBM PVU licensing have the correct license type: **Per installation - IBM PVU**.
6. Create software counters to calculate IBM PVU licenses.
7. Count licenses to determine compliance with IBM PVU guidelines.

### IBM PVU mapping preparation for the legacy IBM PVU Process Pack

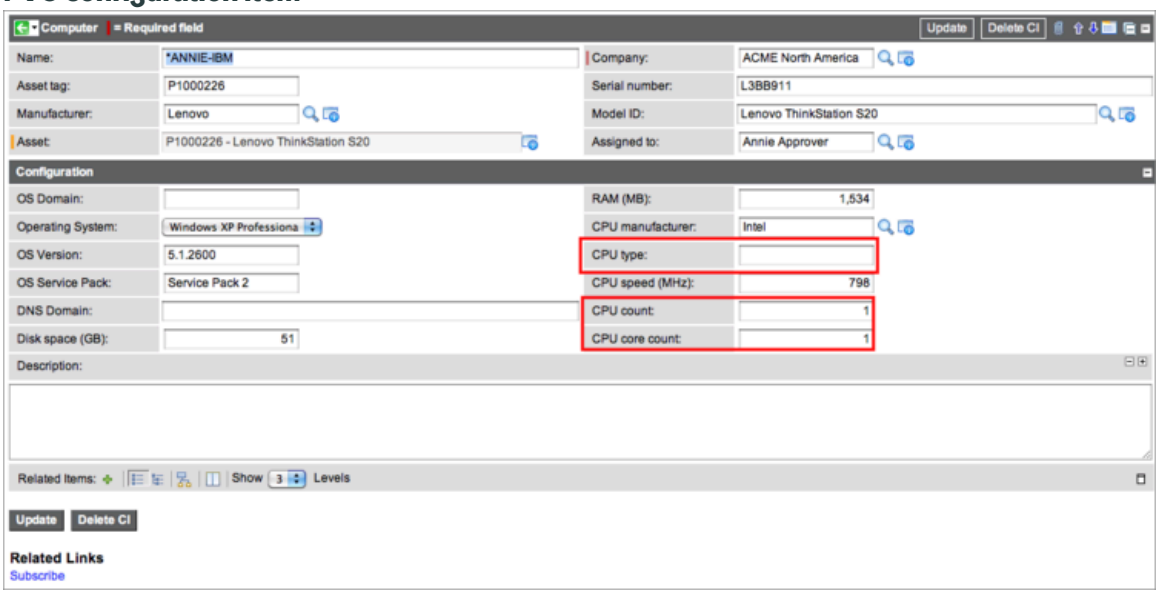
Most IBM PVU mapping and license checking for the legacy IBM PVU Process Pack is managed automatically.

For the automatic calculations to be as accurate as possible, it is important that configuration item and software model information be accurate.

The important fields describing the processor on the configuration item form are:

- CPU type
- CPU count
- CPU core count

#### PVU configuration item




This CPU data is often added accurately when the CMDB is populated with information. If the fields contain incorrect information, manually edit the fields on the configuration item form.

The mapping between the configuration item form fields and processor definition fields is as follows.

#### Preparing for IBM PVU mapping

| Configuration Item Form Field | Processor Definition Form Field | Definition |
|---|---|---|
| CPU type | Processor name, Server model number, | Combination of processor name, server model number, and processor model number. The *CPU type* field is created as part of the general process described in Populating the CMDB. Some discovery tools fill in the *CPU name* instead of *CPU type*. If the *CPU type* field is empty, the CPU name field is used for mapping instead. (You can |

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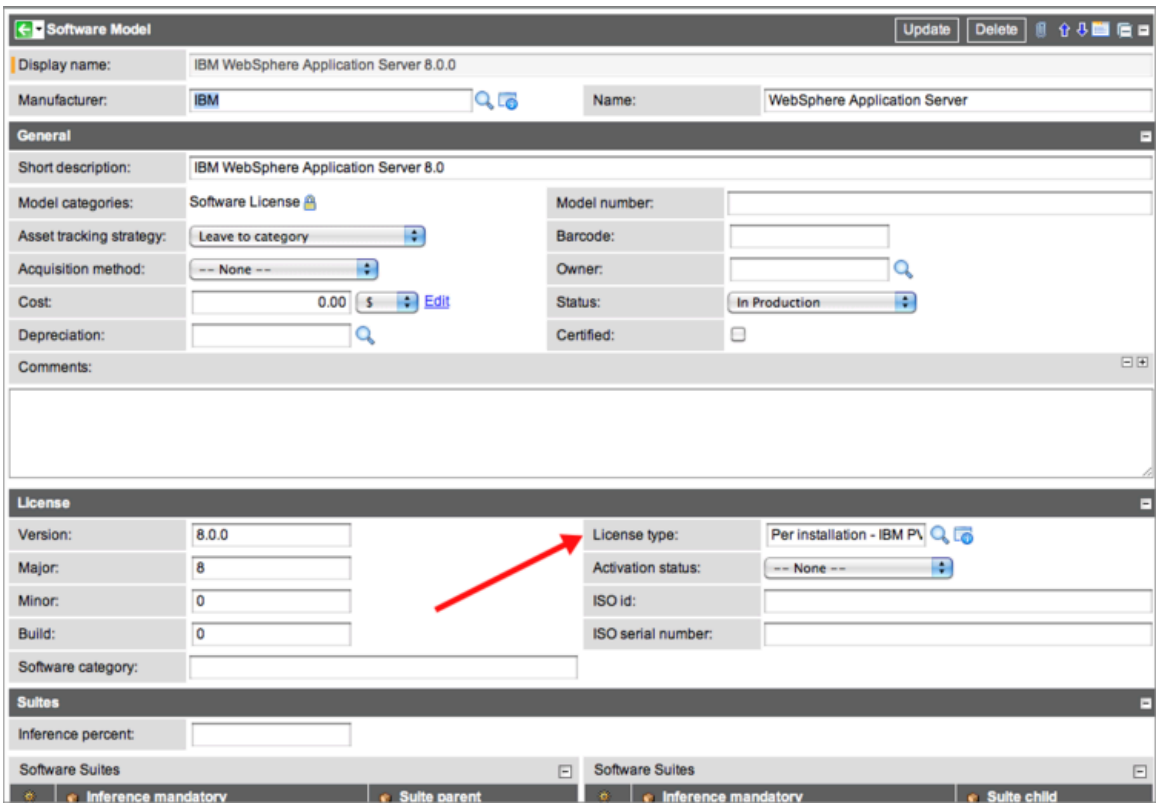
### Preparing for IBM PVU mapping (continued)

| Configuration Item Form Field | Processor Definition Form Field | Definition |
|---|---|---|
| | and Processor model number | configure the form to display the *CPU name*, if needed.) If the CPU type field and the CPU name field are both empty, no mapping is done. |
| CPU count | Number of sockets | Number of sockets. |
| CPU core count | Cores per socket | Cores per socket |

The key field on the Software Model form is **License type**. For any software licenses you want to track with IBM PVU, open the corresponding software model form and select the **Per installation - IBM PVU** license type.

**PVU software model**




### Refresh your legacy Software Asset Management plugin processor definitions

After activating the legacy IBM PVU Process Pack, use the Refresh Processor Definitions module in the legacy Software Asset Management (com.snc.software_asset_management) plugin to create process definitions for existing computers in the Computer [cmdb_ci_computer] table.

### Before you begin

Role required: sam

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### About this task

After this step, business rules in SAM update the Processor Definition [CMDB_processor_definition] table automatically when changes are made to computers or when new computers are added. You should not need to use the Refresh Processor Definitions module a second time, but it is always available if you make significant changes to the Computer [cmdb_ci_computer] table.

### Procedure

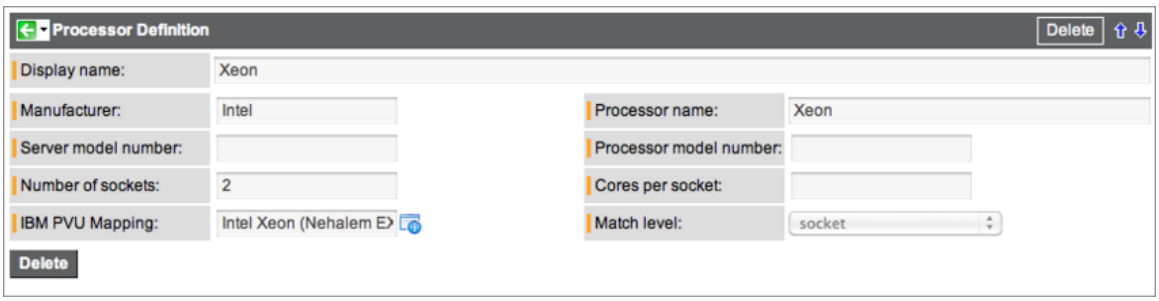
1. Navigate to **All** > **Software Asset** > **System** > **Refresh Processor Definitions**.
2. Click **Proceed**.

#### Legacy Software Asset Management plugin processor definitions

Processor definitions for the legacy Software Asset Management (com.snc.software_asset_management) plugin are automatically derived from the information in the configuration item form for an item such as a computer or server.

To view a processor definition, navigate to **Software Asset** > **Reconciliation** > **Processor Definitions** and click an item.

**Processor definition**




The following read-only fields are listed.

**Processor definitions**

| Field | Description |
|---|---|
| Display name | Name of the processor as it should appear in the processor list. |
| Manufacturer | Company that built the processor. |
| Server model number | Number assigned to the model by the server manufacturer. |
| Number of sockets | Number of dies on the computer motherboard. The number of CPUs per die is specified by **Cores per socket**. |
| IBM PVU Mapping | The IBM PVU mapping to which this processor is associated. The information in this field is automatically calculated from the server model number, number of sockets, processor name, and processor model number, based on the rules defined in the IBM PVU Table. |
| Processor name | Name assigned to the processor by the manufacturer. |
| Processor model number | Number assigned to the model by the processor manufacturer. |

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### Processor definitions (continued)

| Field | Description |
|---|---|
| Cores per socket | Number of cores (functional unit needed to execute programs) on each physical connection (socket) on the motherboard. |
| Match level | Accuracy level of the association between processor and PVU mapping. Automatically set when association is inferred. |

## View IBM PVU mappings for the legacy IBM PVU Process Pack

Every rule listed in the IBM PVU Table is represented by one PVU mapping record in the legacy Software Asset Management (com.snc.software_asset_management) plugin.

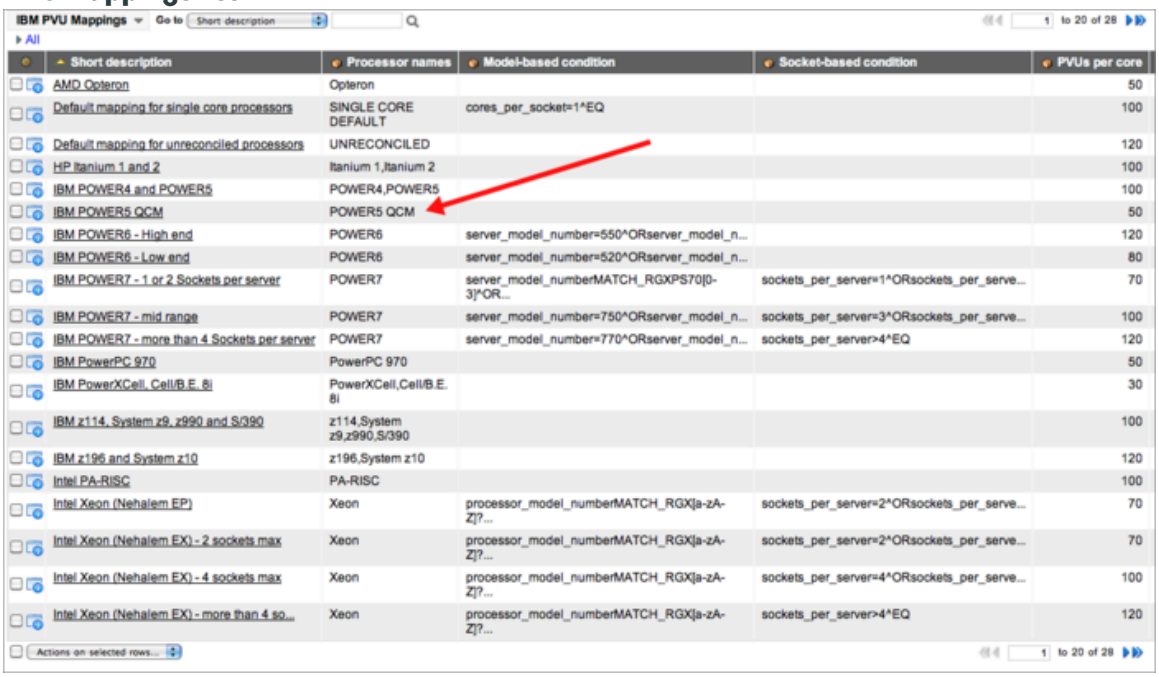
### Before you begin

Role required: sam

### About this task

For example, in the IBM PVU Table there is one line with processor name POWER5 QCM and in IBM PVU mappings there is a line representing POWER5 QCM.

#### PVU mappings list




### Procedure

1. Navigate to **All** > **Software Asset** > **Reconciliation** > **IBM PVU Mappings**.
2. Click a **Short Description** for detailed information about the mapping.

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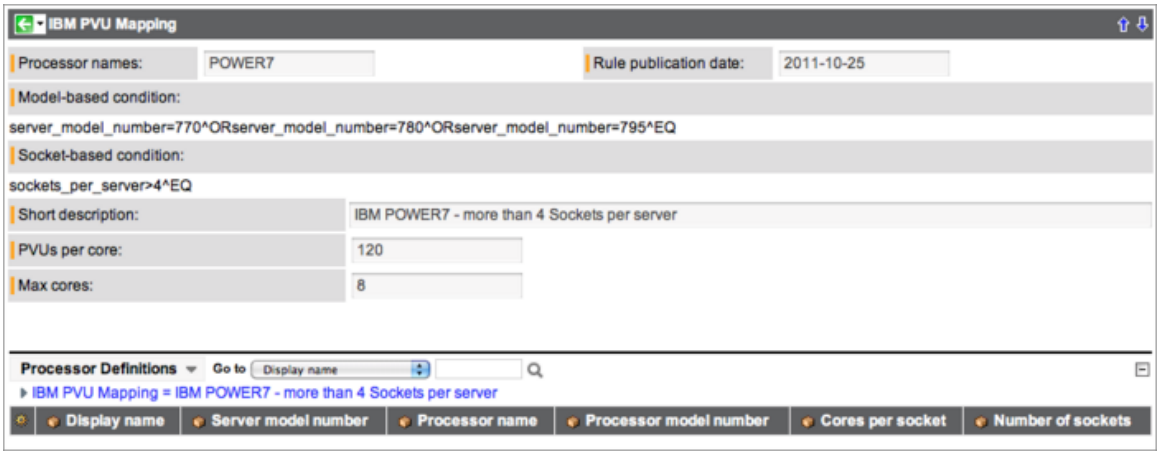


The fields are for information only and cannot be edited.

### IBM PVU mappings

| Field | Description |
|---|---|
| Processor names | Names of running processors. Processor names are separated by commas. |
| Model-based condition | Regular expression used to determine whether the server model number of a computer's processor definition matches that of the PVU entry. |
| Socket-based condition | Regular expression used to determine whether the number of sockets of a computer's processor definition matches that of the PVU entry. |
| Short description | A short description of this PVU mapping. |
| PVUs per core | Number of processor value units consumed (according to the IBM PVU chart) by each core. |
| Max cores | Maximum number of cores on the processor family, as shown in the IBM PVU Table (rightmost column under cores per socket). |
| Rule publication date | Date published by IBM on the PVU Rules table. |

## Use software counters with the legacy IBM PVU Process Pack

To calculate IBM PVU licenses through the legacy IBM PVU Process Pack, you can create a software counter with the IBM PVU license type. For a given PVU software package, you only need to create the counter once and then it can be reused.

### Before you begin

Role required: sam

### About this task

Processor definitions are searched as licenses are counted. If a processor definition is found, but no PVU mapping link exists for the processor, the system automatically does the following to obtain a PVU mapping link.

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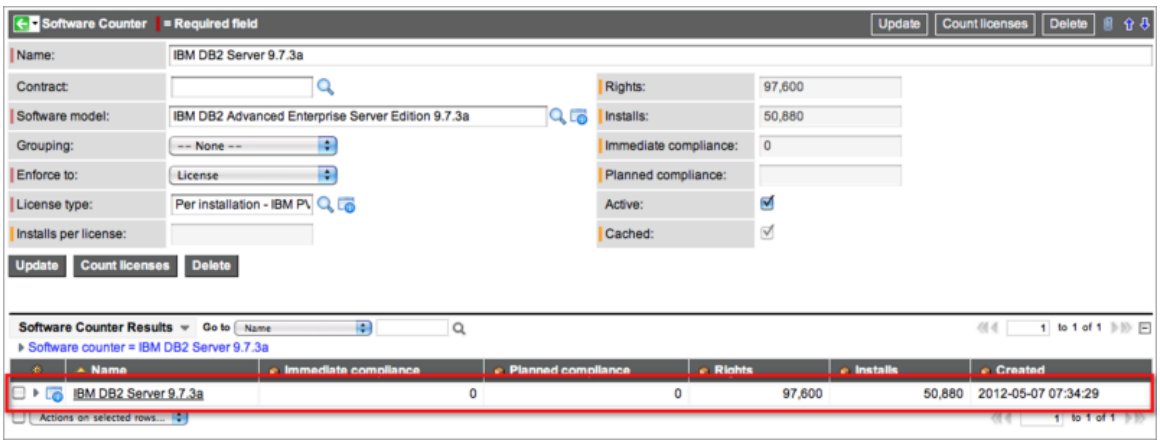
- Pre-filtering based on processor name.
- Advanced filtering based on PVU mapping records' condition field.
- If no exact match is found, the most expensive mapping is used to increase the chance of being compliant.

### Procedure

1. Navigate to **All** > **Software Asset** > **Reconciliation** > **Software Counters**.
2. Click **New**.
3. Enter a **Name**.
4. Select a **Software Model**.
5. Select a level of adherence to the license in the **Enforce to** field.
6. For **License type**, select **Per Installation - IBM PVU**.




7. Add information to other fields as necessary.
8. Right-click the header bar and select **Save**.
9. Click **Count licenses**.

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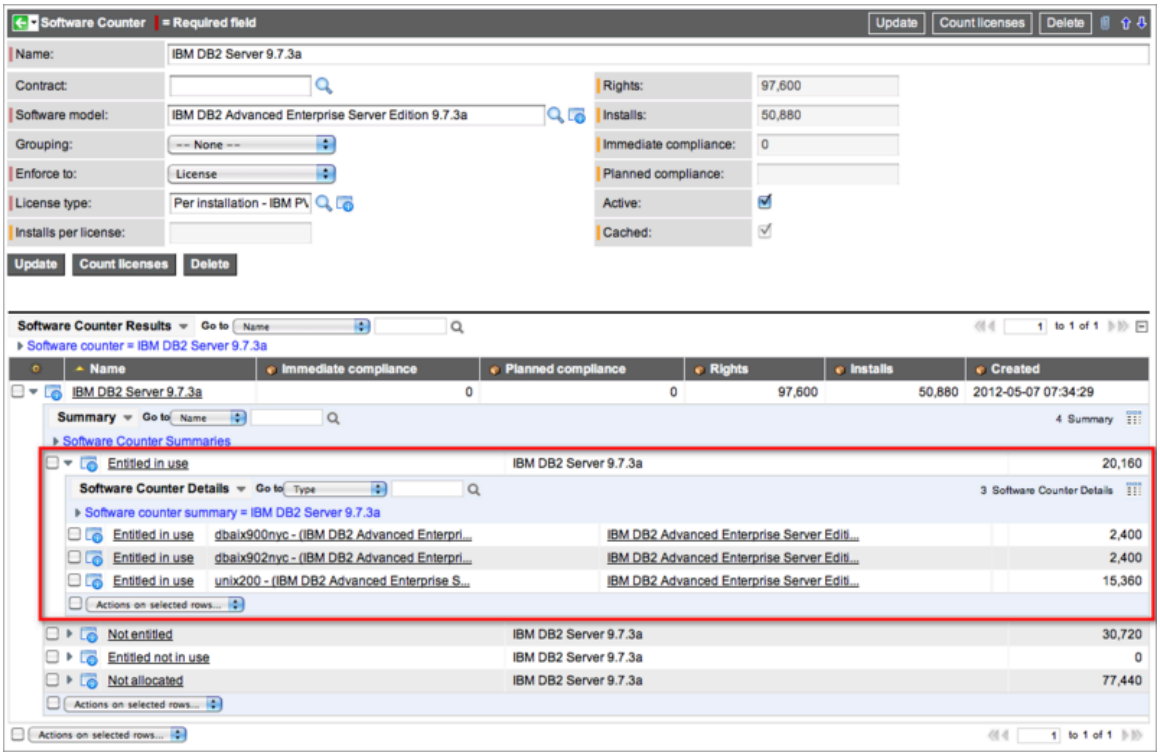
**10.** In the **Software Counter Results** list, drill down to obtain summary and detailed information.




### Installed with the legacy IBM PVU Process Pack

The following tables, fields, script includes, and business rules are installed with the legacy IBM PVU process pack.

## Tables

| Table | Description |
|---|---|
| Processor Definition [cmdb_processor_definition] | Each row in this table describes a computer in terms of the attributes IBM uses for its PVU licensing model. A row can be associated with one or more (if they are all identical in terms of the attributes used for PVU licensing) discovered computers. |

## Fields

| Field | Table | Description |
|---|---|---|
| ibm_pvu_mapping | Hardware [cmdb_ci_hardware] | PVU rule that applies to the software installation. Used for IBM PVU-based license counting. |
| ibm_pvu_mapping | Software Installation [cmdb_sam_sw_install] | PVU rule that applies to the software installation. Used for IBM PVU-based license counting. |

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## Script includes

| Name | Description |
|---|---|
| ProcessorDefinitionsUtils | Contains utilities for managing the Processor Definition [cmdb_processor_definition] table. |
| ProcessorValueUnitsUtils | Contains logic that determines the IBM PVU pricing associated with a given processor. |

## Business rules

| Name | Description |
|---|---|
| One and only one default mapping<br><br>`[sam_ibm_pvu_mapping]` | Ensures only one default mapping by resetting the last resort flag for modified records and setting it to false for new records. |

### Software contracts for the legacy Software Asset Management plugin

A software contract is a binding agreement between the owner of a software product and a buyer. The contract enables the buyer to use the software legally.

You can use the Contract Management application to create contracts for software that is tracked and managed through the legacy Software Asset Management (com.snc.software_asset_management) plugin. When you create a new software contract, you can specify that the contract is an enterprise or subscription license.

### Create software contracts for the legacy Software Asset Management plugin

You can create binding agreements that enable buyers to legally use software that is tracked and managed through the legacy Software Asset Management (com.snc.software_asset_management) plugin.

#### Before you begin

Role required: contract_manager

#### Procedure

1. Navigate to **All** > **Contract** > **Software License**.
2. Click **New**.
3. Complete the form.
4. Add the software license to the contract.
   Be sure to use the **Software License** option. The **License Bundle** and **Software License Contracts** options are deprecated.

#### Related topics

Contract Management

### Legacy Oracle process pack

The legacy Oracle process pack is an add-on to the legacy Software Asset Management (com.snc.software_asset_management) plugin that provides the ability to manage software licensed under the Oracle licensing model.

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**Important:**
The legacy Oracle Process Pack is not required for tracking and managing Oracle licenses through the Software Asset Management publisher pack for Oracle, which is available as part of the Software Asset Management Professional (com.snc.samp) plugin. The Oracle publisher pack includes all capabilities that are required for tracking and managing Oracle licenses. See Software Asset Management publisher pack for Oracle for more information on the Oracle publisher pack.

Administrators can use this feature to perform the following functions.

- Identify the software packs installed on Oracle database servers.
- See the software packs that are currently in use.
- List which options are installed and in use.

### Using software counters with the legacy Oracle Process Pack

There are two distinct ways to count Oracle software through the legacy Oracle Process Pack. Be sure that your Oracle models are set up accurately.

**Note:**
Oracle license calculation types are available in the Software Counter form after you activate the legacy Oracle process pack.

Oracle software that uses the **Oracle Processor** license calculation type counts by the number of processors on a server. This license calculation type must exist in the Software Installation [cmdb_sam_sw_install] table. A software installation record must be inserted with a discovery model that matches the correct Oracle software. For an install to be counted by an Oracle processor counter, the **Installed on** field on the Software Installation form should reference a configuration item with a **Metric type** of **Oracle Processor**.

Oracle software that uses the **Oracle Named User** or **Oracle Named User Plus** license calculation types count by number of unique users or number of unique users plus devices. This license calculation type must exist in the Software Usage [cmdb_sam_sw_usage] table. A software installation record must be inserted with a discovery model that matches the correct Oracle software. For a usage to be counted by an Oracle New User or Oracle New User Plus counter, the **Target host** field on the Software Usage [cmdb_sam_sw_usage] table should reference a configuration item with a **Metric type** of **Oracle NU** or **Oracle NUP**.

### Software models for the legacy Oracle Process Pack

In order to count Oracle software licenses, you must create software models for your Oracle software.

For more information, see Manage software models.

### Request the legacy Oracle Process Pack

The legacy Software Asset Management - Oracle Process Pack (com.snc.sam.oracle.pp) plugin can no longer be activated upon request. If the legacy plugin has already been activated on your ServiceNow instance, you can continue to use the legacy Oracle Process Pack.

## Before you begin
Role required: admin

## About this task
The legacy Software Asset Management (com.snc.software_asset_management) plugin activates all related plugins.

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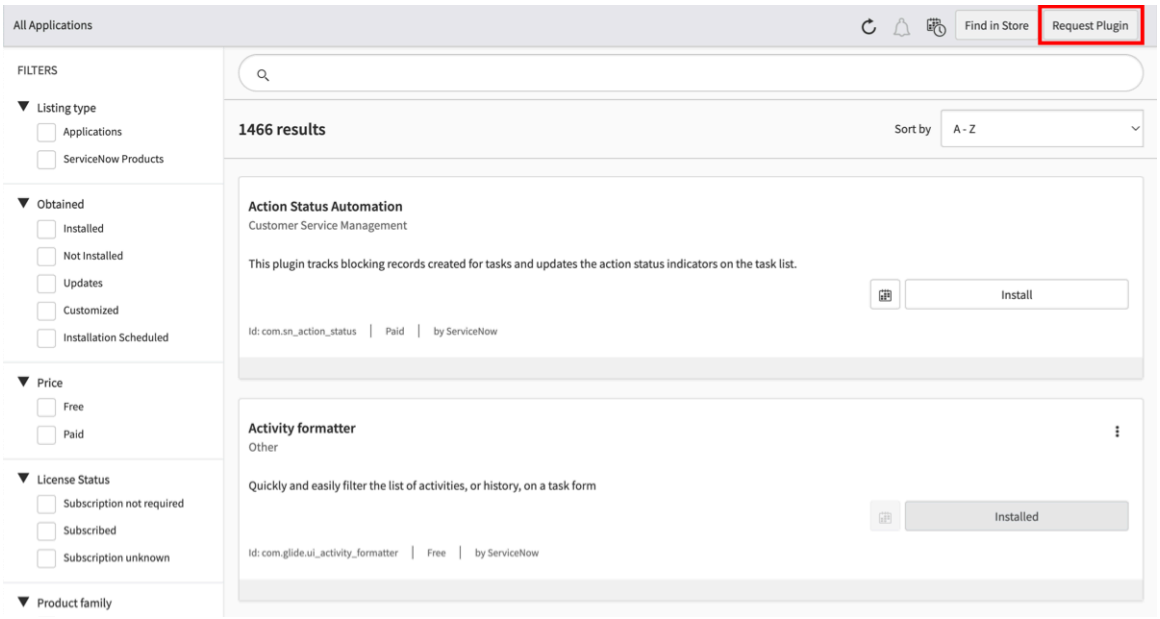
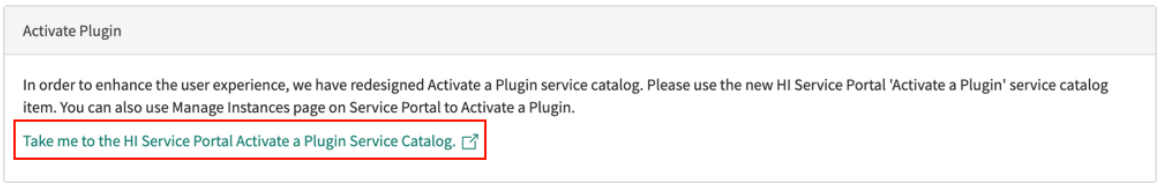
## Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. On the All Applications page, select **Request Plugin** to open the **Activate Plugin** form on Now Support.




3. On Now Support, select the link to access the Now Support Service Portal Service Catalog.




4. Select your instance.
5. Select **Actions > Activate Plugin**.
6. On the **Activate Plugin** form, provide the following information.

### Activate Plugin form

| Field | Description |
|---|---|
| What is your target instance | Instance on which to activate the plugin. |
| Which plugin would you like to activate | Name of the plugin to activate.<br><br>**Note:**<br>If the system does not list the plugin you want or if you are activating the plugin on an OEM or on-premise instance, select the **Plugin I'm looking for is not listed** check box and then enter the name of the plugin. |

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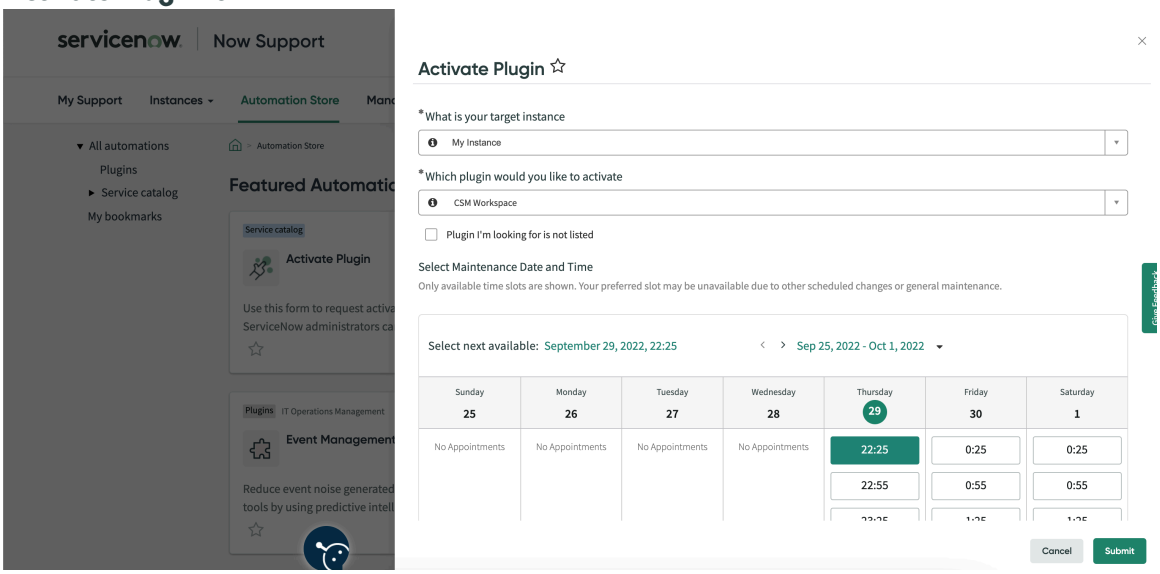
| Field | Description |
| --- | --- |
| Select Maintenance Date and Time | The date and time to activate the plugin.<br><br>**Note:**<br>Plugins are activated in two batches, once in the morning and once in the evening, on every business day in the US Pacific time zone. If the plugin must be activated at a specific time, enter the request in the **Reason/Comments** field. |

### Example

For example, see the following form to activate the CSM Workspace plugin on an instance named My Instance.

**Activate Plugin form**




7. Select **Submit**.
   For additional details about requesting a plugin, see Requesting a Plugin from the Service Catalog [KB0751715] article in the Now Support Knowledge Base.

### Related topics

List of plugins (Washington DC)

## Installed with the legacy Oracle Process Pack

The following tables, fields, and license calculation types are installed with the legacy Oracle process pack.

The information from this table appears in the Software Counter Compliance Violations section of the Software Model form.

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### Software counter compliance violations table

| Table | Description |
|---|---|
| Software Counter Compliance Violations [sam_sw_counter_violation] | Used to store counter violations that are due to violations other than installs exceeding rights, such as:<br>• Maximum CPU/user count exceeded (based on model limits)<br>• Maximum or minimum rights rules not followed (based on model limits)<br>• Option installed on a server with a non-option-supporting license (Oracle) |

### Fields

| Field | Table | Description |
|---|---|---|
| Software counter [counter] | Software Counter Compliance Violations [sam_sw_counter_violation] | References the software counter that this violation belongs to. (Reference field to Software Counter table [sam_sw_counter].) |
| Cause [name] | Software Counter Compliance Violations [sam_sw_counter_violation] | An explanation of the violation. |
| Is an option (is_option) | Software Model [cmdb_software_product_model] | Indicates if the software model is an option or pack for some other software, such as Active Data Guard or Data Mining options for Oracle Enterprise Edition. This field only appears if the manufacturer is Oracle. |
| License metric (metric_type) | Software License [alm_license] | A glide list reference to the License Calculation [cmdb_sw_license_calculation] table. This list contains all of the license calculations that apply to this license and identifies the preferred metric types to use when running software counters. |
| License metric (metric_type) | Hardware [cmdb_ci_hardware] | A glide list reference to the License Calculation [cmdb_sw_license_calculation] table. This list contains all of the license calculations that apply to this license. and identifies the preferred metric types to use when running software counters. This field does not appear on the form by default. |

The Oracle Process Pack adds the following license calculation types.

### Oracle license calculation types

| Name | Description |
|---|---|
| Oracle Named User | Oracle licensing scheme that counts by the number of unique users. |
| Oracle Named User Plus | Oracle licensing scheme that counts by the number of unique users and devices. |

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**Oracle license calculation types (continued)**

| Name | Description |
|---|---|
| Oracle Processor | Oracle licensing scheme that counts by the number of processors on a server. |

### Create an Oracle software license for the legacy Oracle Process Pack

To use the legacy Oracle process pack, you must create an Oracle software license.

#### Before you begin

Role required: sam

#### Procedure

1. Navigate to **All** > **Software Asset** > **Software Licenses**.
2. Click **New**.
3. Select **Software License** in the **Model category** field.
4. Select an Oracle model in the **Model** field.

   The Oracle models in this list are created by the user. For more information, see Manage software models.
5. Ensure that the **License metric** field specifies the correct license calculation type.
6. Fill in the remaining fields, as appropriate.
7. Click **Submit**.

### Validate legacy Oracle Process Pack requirements for associating software installations with Oracle mappings

Meet the recommended requirements to ensure that you receive the highest quality results with Oracle mapping.

#### Before you begin

Role required: admin

#### Procedure

1. Use a discovery tool (such as ServiceNow Discovery) to identify software installations.
   Check that the added CPU information is correct.
2. Activate the legacy Software Asset Management - Oracle Process Pack (com.snc.sam.oracle.pp) plugin.
   This also activates the legacy Software Asset Management (com.snc.software_asset_management) plugin if it is not already active.
3. Refresh processor definitions by navigating to **Software Asset** > **System** and clicking **Refresh Processor Definitions**.
4. Ensure that the software models that you want to manage with Oracle licensing are set up accurately.
   See Creating a software model.
5. Create a software license for your Oracle software.
   Ensure that the license is given the correct license metric.

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The **License metric** (metric_type) field on the Software License table is a reference field to the License Calculation table.

6. Create a software counter to calculate Oracle licenses with the matching license type.
7. Count licenses to determine compliance with Oracle guidelines.

### Run the Oracle software counter for the legacy Oracle Process Pack

Running the Oracle software counter is a requirement to associate a software installation with an Oracle mapping.

#### Before you begin

Role required: sam

#### Procedure

1. Navigate to **All** > **Software Asset** > **Reconciliation** > **Software Counters**.
2. Click the name of the counter.
3. Click **Count Licenses**.
   You can view different types of software counter results.

## Software Asset Management Foundation plugin

The Software Asset Management Foundation plugin activates the ITSM Software Asset Management feature provided with the Asset Management application.

For documentation on the full fledged Software Asset Management product (also known as Software Asset Management professional), see Software Asset Management.

Software Asset Management Foundation plugin systematically tracks, evaluates, and manages software licenses and compliance. Functionality consists of these main features.

| Feature area | Description |
|---|---|
| Dashboard | The Software Asset Management Foundation dashboard shows software installation results for your environment in the form of statistics and charts. |
| Licensing | Software models created for all installed software products are used to tie software installations (software being used) with entitlements (software owned). Entitlements define license details and are assigned to software models. |
| Discovery and normalization | A discovery process, such as ServiceNow Discovery or Microsoft SCCM, can be used to discover the software installed in your environment.<br><br>An Out Of the Box (OOB) Normalization library contains publisher and product content. Custom products can be created if a software product does not exist in the Software Library. Discovered software can be manually normalized for reconciliation. |
| Reconciliation | The reconciliation process calculates the compliance status of software products with respect to discovery and |

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| Feature area | Description |
| --- | --- |
| | entitlements. Remediation options are created to resolve compliance issues. |

### Exploring Software Asset Management Foundation plugin

Starting with the Washington DC release, we have enhanced the Software Asset Management Foundation plugin application's user interface to make it more user-friendly and intuitive, allowing you to better manage your software installations.

You can use the new Software Asset Management Foundation plugin user interface, referred to as Software Asset Workspace or continue using the classic Software Asset Management Foundation plugin framework.

The Software Asset Management Foundation plugin application's core functionality remains the same in both the user interfaces.

## Using the Software Asset Workspace

Once you request and activate the Software Asset Management Foundation plugin (com.snc.sams) plugin, you need to activate the Software Asset Workspace (com.sn_sam_workspace) plugin too.

**Note:**
Once you activate the workspace plugin, you cannot revert to the classic Software Asset Management Foundation plugin application.

For detailed information on configuring and using the Software Asset workspace, refer to Configuring Software Asset Management Foundation plugin workspace and Using Software Asset Management Foundation plugin workspace.

## Using the classic Software Asset Management Foundation plugin application

To continue using the classic Software Asset Management Foundation plugin application, just activate the Software Asset Management Foundation plugin (com.snc.sams) plugin.

If you later decide to use the Software Asset Workspace, you need to activate the Software Asset Workspace (com.sn_sam_workspace) plugin.

For detailed information on configuring and using the classic Software Asset Management Foundation plugin application, refer to Configuring Software Asset Management Foundation plugin classic and Using Software Asset Management classic.

### Software Asset Management Foundation plugin roles

Software Asset Management Foundation plugin adds the following roles.

**Roles**

| Role | Description |
| --- | --- |
| sam_admin | Inherits the sam_user role and has permission to run reconciliation and manage reclamation rules. |
| sam_user | Able to access all features except administrative. |

Users with the sam_user or sam_admin role can view and refresh the overview page.

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### Software Asset Management Foundation plugin software discovery and normalization

ServiceNow Discovery is used to automatically populate the Software Installations table so the software can be manually normalized and reconciled.

The discovery process consists of automatically discovering software used at your organization, which can be done either using ServiceNow Discovery, or using SCCM integration.

For more information, see Collect software data with either SCCM or Discovery and Discovery with Software Asset Management.

**Note:**
To use Discovery, the Request Discovery must be activated.

Discovery uses patterns in the discovery process that can be created or customized. The base system contains a wide range of patterns that cover most industry standard network devices and applications. Software Asset Management Foundation plugin automatically leverages SQL Server, Exchange Server, and Oracle Database Server specifically, but other patterns can be customized for use by Software Asset Management Foundation plugin, if needed.

Discovered software is stored in the Software Installations [cmdb_sam_sw_install] table.

**Note:**
If you are already running Discovery but have not used a version of ITSM Software Asset Management previously, run the Migrate Software Asset Management Foundation plugin software installations script to copy records from the [cmdb_ci_spkg] table to the [cmdb_sam_sw_install] table, so that any previously discovered software installs are utilized by Software Asset Management Foundation plugin.

When software install records are written to the Software Installations table, a business rule verifies whether the unique combination of the discovered publisher, discovered product, and discovered version already exist in the Discovery Model table.

- If so, the reference to the discovery model is set in the Software Installations table.
- If not, a new record is created in the Discovery Model table, and that discovery model reference is set in the Software Installations table.

After discovery, you can manually normalize the software discovery model for reconciliation. Normalization status can have two different results:

#### Normalization status

| Status | Description |
|---|---|
| Manually Normalized | A discovery model is manually normalized when key fields in the discovery model are filled in manually. |
| New | The software discovery model has not yet been manually normalized. |

### Software Asset Management Foundation plugin discovery models and software installations

Software discovery models are automatically created during discovery so you can manually normalize the software installed in your environment.

Software discovery models are stored in the Software Discovery Model [cmdb_sam_sw_discovery_model] table.

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There is a difference between software models and software discovery models.

- A software model is a specific version or configuration of software that is purchased and/or available to users.
- A software discovery model is a model created when a version of software is discovered in a network environment.

Multiple software discovery models can be associated to one software model. For example, a software model can be defined as follows:

- Publisher = X
- Product = Y
- Version = Starts with 10

If there are two separate installs of this product (version 10.1 and version 10.2), two discovery models are created. One of the discovery models has the discovered version set to 10.1, and the other discovery model has the discovered version set to 10.2. The reconciliation process associates both of these discovery models to the same software model since they both meet the version criterion of `Starts with 10`.

## Discovery Models

Software discovery models cannot be created manually. The following field combination, called the primary key, is used to match new software installations to a new or existing software discovery model.

Primary key: **Publisher**, **Display Name**, and **Version**

**Note:**
When analyzing version numbers, an exact match is always searched for first, but rounds down to a major version number when an exact match is not found.

For example, if no match is found for version number 8.0.4, but version 8.0 is found, then version 8.0 is used in the **Software model** field.

### Discovery Models form

| Field | Description |
|---|---|
| Display name | Name of the discovery model as it appears in record lists. This value is generated automatically using the discovered publisher, discovered product, and discovered version. |
| Normalization status | Status of the normalization process:<br>• Manually Normalized<br>• New |
| Publisher | Publisher of the software. |
| Product | Product name of the software. |
| Version | Version of the software product. |
| Discovered publisher | Discovered publisher of the software. |

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**Discovery Models form (continued)**

| Field | Description |
|---|---|
| Discovered product | Discovered name of the software. |
| Discovered version | Discovered version of the software. |
| Additional Information | |
| Product type | • Child: A subcomponent of main software (not licensable).<br>• Driver: A software product that controls a device.<br>• Licensable: A software product that is licensable.<br>• Not Licensable: A software product that is not licensable.<br>• Patch: A software product designed to update, fix, or improve an existing computer program.<br>• Unknown: Not discovered.<br>For unknown product types, the product type can be changed to another value.<br>When the product type is changed, the normalization status of the discovery model is updated to Manually Normalized.<br>The reconciliation process only considers software discovery models that are licensable. |
| Platform | Platforms include:<br>• Windows<br>• Mac<br>• Unix |
| Language | • Dutch<br>• English<br>• French<br>• German<br>• Italian<br>• Spanish<br>Additional languages are generated if discovered. |
| Edition | Edition of the software. |
| Full version | Full version of the software. |

**Note:**
If a normalized discovery model has a missing version, edition, language, or platform value, those field values can be set by the user. Once a new value is set, the normalization status changes form New to Manually Normalized.

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## Software Installations

The Software Installations list contains the software installed in your organization and is automatically populated by discovery.

Installed software is placed in the Software Installation [cmdb_sam_sw_install] table by Discovery, and a primary key is built (using **Publisher**, **Display Name**, and **Version** fields).

Discovery automatically matches the discovered software installation with a new or existing software discovery model using the primary key.

### Software Installations form

| Field | Description |
|---|---|
| Display name. | Name of the software installation as it appears in the record lists. Can be a combination of the discovered product name and edition. |
| Discovery model | Software discovery model that represents the installed software. |
| Publisher | Publisher of the software. |
| Version | Version of the software. |
| Edition Override | Override of the software edition setting.<br><br>If the edition for the software was not discovered, you can edit this field to set the edition, if known, so reconciliation can be performed successfully.<br><br>For more information, see Manually override SAM Foundation edition value in classic. |
| Installation | |
| Prod id | Unique ID for the product assigned by the manufacturer. Found through discovery. |
| Install location | Path under which the software is installed. |
| Install date | Date that the software was installed. |
| Revision | Revision of the software. |
| Instance key | Unique ID for the instantiation of the software. Automatically generated when the software is installed. |
| Installed on | Hardware on which the software is installed. |
| Uninstall string | Identifier used to uninstall the software. |
| ISO serial number | ISO number of the software. |
| Reconciliation | |
| Entitlement | The entitlement found to use with this installation. |
| Inferred suite | The inferred suite model this installation belongs to. |

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**Software Installations form (continued)**

| Field | Description |
|---|---|
| Omit from suites | Check box for not counting the software install as a component of a suite during reconciliation. |

### Software Asset Management Foundation plugin software reconciliation for compliance

Automated license reconciliation keeps license positions accurate and up to date without manual calculations. Reconciliation runs weekly or on demand.

Reconciliation is a scheduled job that is run at a specified frequency (default is weekly). It can also be run on demand for specific or all publishers. For details on running software reconciliation in workspace, see Run Software Asset Management Foundation plugin software reconciliation in workspace. For details on running software reconciliation in the classic Software Asset Management Foundation plugin framework, see Run Software Asset Management Foundation plugin software reconciliation in classic.

When reconciliation is run, a list of reconciliation results is created that shows the compliance status of software products with respect to discovery and entitlements. Users with the sam_user role can view reconciliation results.

Remediation options include rights not in use, rights not allocated, rights needed, reclaimable rights, and unlicensed rights.

### Setting up Software Asset Management Foundation plugin

Set up Software Asset Management Foundation plugin before configuration.

#### Before you begin

Role required: sam_admin

#### About this task

Once you have requested Software Asset Management Foundation plugin and it has been activated from ServiceNow personnel, complete these steps to set up Software Asset Management Foundation plugin before you begin to use it.

#### Procedure

1. Determine whether you are currently running the ITSM Software Asset Management feature of Asset Management using the Legacy Software Asset Management plugin.
   Check the list of plugins to see if the Software Asset Management (com.snc.software_asset_management) plugin is active.
   - If so, complete the Software Asset Management Foundation plugin migration procedure.

     This step automatically converts and adds new tables, forms and lists, fields and values, and disables deprecated functionality. It also contains manual procedures for you to complete for successful migration.

   - If not, proceed to the next step.
2. Determine whether Discovery is activated (see Request Discovery).
   Check the list of plugins to see if the Discovery plugin is active.

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- If so, run the Migrate Software Asset Management Foundation plugin software installations script.

  This step copies records from the [cmdb_ci_spkg] table to the [cmdb_sam_sw_install] table, so that any previously discovered software installs are utilized by the Software Asset Management Foundation plugin.

- If not, activate and configure Discovery.

  For more information, see Discovery.

3. Proceed to Get started with Software Asset Management Foundation plugin to begin using the Software Asset Management Foundation plugin in your environment.

### Request Software Asset Management Foundation plugin

The Software Asset Management Foundation (com.snc.sams) plugin must be activated by ServiceNow personnel. This plugin includes demo data.

## Before you begin

Role required: admin

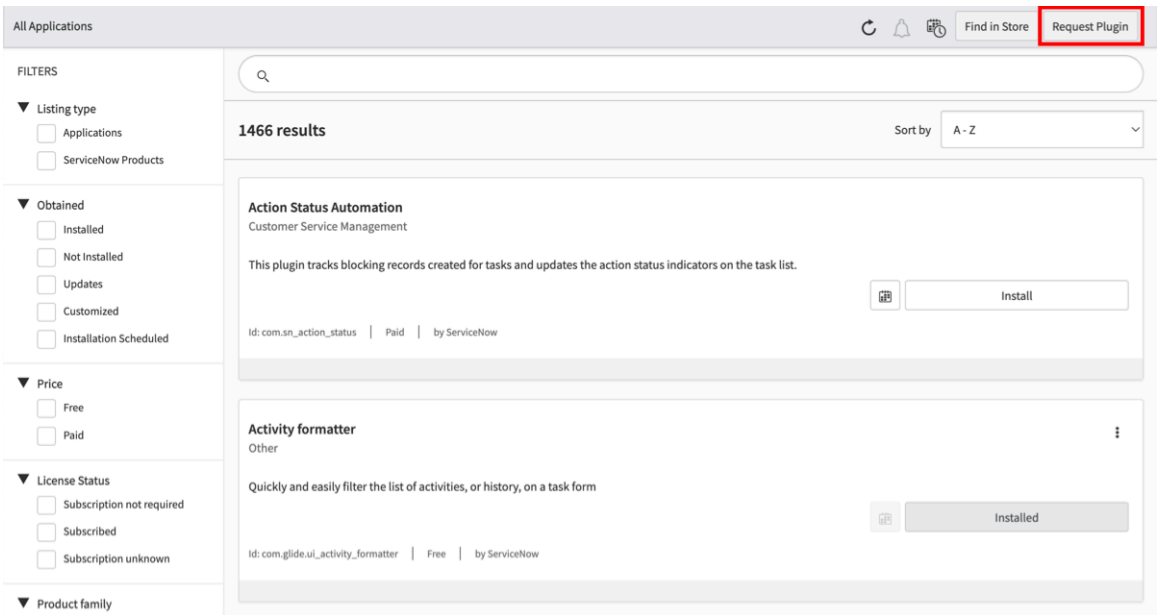
## About this task

There are two ways to request a plugin:

- Access the Now Support Service Catalog directly by selecting **All** > **Service Catalog** > **Activate Plugin** on Now Support.
- Access the Now Support Service Catalog through the All Applications page on your instance by following these steps.

## Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. On the All Applications page, select **Request Plugin** to open the **Activate Plugin** form on Now Support.




3. On Now Support, select the link to access the Now Support Service Portal Service Catalog.

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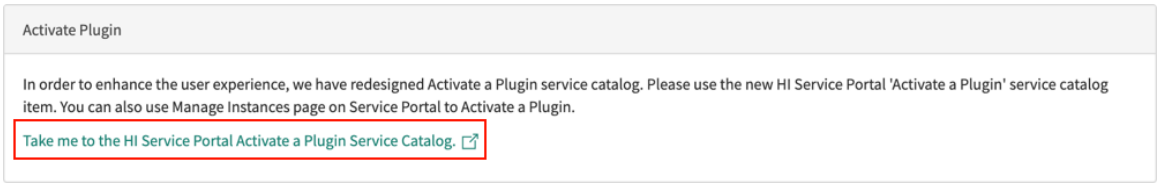


4. Select your instance.
5. Select **Actions > Activate Plugin**.
6. On the **Activate Plugin** form, provide the following information.

**Activate Plugin form**

| Field | Description |
|---|---|
| What is your target instance | Instance on which to activate the plugin. |
| Which plugin would you like to activate | Name of the plugin to activate.<br>**Note:** If the system does not list the plugin you want or if you are activating the plugin on an OEM or on-premise instance, select the **Plugin I'm looking for is not listed** check box and then enter the name of the plugin. |
| Select Maintenance Date and Time | The date and time to activate the plugin.<br>**Note:** Plugins are activated in two batches, once in the morning and once in the evening, on every business day in the US Pacific time zone. If the plugin must be activated at a specific time, enter the request in the **Reason/Comments** field. |

**Example**

For example, see the following form to activate the CSM Workspace plugin on an instance named My Instance.

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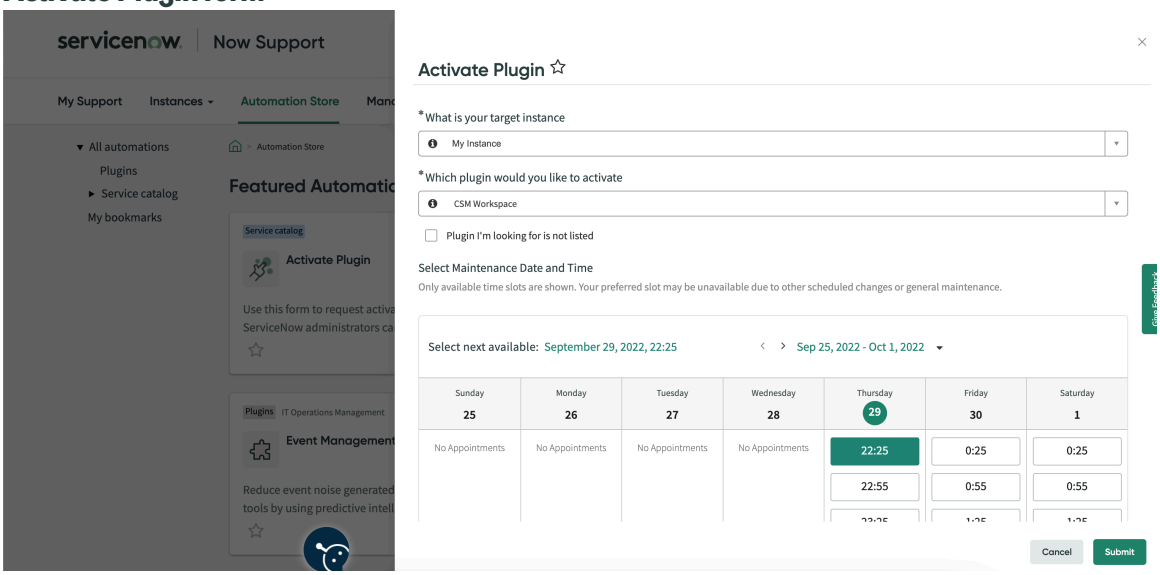
**Activate Plugin form**




7. Select **Submit**.
   For additional details about requesting a plugin, see Requesting a Plugin from the Service Catalog [KB0751715] article in the Now Support Knowledge Base.

## Manage a SAM Foundation software suite

Create a suite and add the corresponding components to the suite so the rights that your organization owns are counted accurately during reconciliation.

A software suite is a group of related software offered as one unit. An example is the Microsoft Office Professional suite of office productivity software tools that includes PowerPoint, Word, Excel, Outlook, and Access.

For any software model, you have the option to specify whether the model is a suite (parent) or a component (child). A software model can be a component in multiple suites. For example, Microsoft Word is a component in Microsoft Office Standard and Microsoft Office Professional. Although you can set a single software model as both a suite and a component, software is not typically sold as nested suites.

Use the **Inference percent** and **Mandatory** fields when the suite parent is not defined in the install table.

- **Inference percent**: Specifies what percentage of the components in the suite must be installed for the software to be identified as a suite.
- **Mandatory**: Enforces whether a specific component in a suite must be installed to infer that the suite is installed. Choices are: Optional, Always Mandatory, Mandatory Group.

For example, say you specify the **Inference percent** as 80% and set the **Mandatory** field to **Always Mandatory** on Microsoft Access. These settings specify that Microsoft Access must be installed, along with three out of four other products (Microsoft Word, Microsoft Excel, Microsoft PowerPoint, and Microsoft Outlook) to infer that Microsoft Office Professional is installed on a device.

When a suite parent is detected during reconciliation, the suite components do not count for the individual license.

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**Note:**
Users with the model_manager role can navigate to **Product Catalog** > **Product Model** > **Software Models**, but cannot administer all aspects of software models.

### Customize a Discovery pattern for Software Asset Management Foundation plugin

Software Asset Management Foundation plugin automatically leverages SQL Server, Exchange, and Oracle Database Discovery patterns, but you can perform steps for Software Asset Management Foundation plugin to utilize additional Discovery patterns, if needed.

#### Before you begin
Role required: sam_admin

#### About this task
Discovery uses a series of scripts and operations (probes, sensors, and patterns) with the base system to collect data, process it, and update the CMDB. Although Software Asset Management Foundation plugin is already set up to utilize three common patterns (MSSQL server discovery, Exchange MailBox discovery, and Oracle database discovery), you can perform a configuration procedure to include additional patterns.

This customization automatically copies the records from the discovered pattern to the Software Installation [cmdb_sam_sw_install] table so Software Asset Management Foundation plugin can utilize this data for reconciliation.

For more information on pattern customization, see Discovery patterns used by ITOM Visibility.

#### Procedure
1. Configure a post processing step in the discovery pattern.
   a. Navigate to **Pattern Designer** > **Discovery Patterns**.
   b. Open the pattern record from which you would like to collect data for Software Asset Management (for example, the discovery pattern for MySQL).
   c. Select and copy the **Class Name** field value.
   You will need to paste this class name value into a record field in the Software Installation Name Mapping [cmdb_sam_sw_name_mapping] table as part of this configuration procedure.
   d. Click the **Pre/Post Processing** related link.
   e. In the Sync Installed Software section, select the desired software from the list to add it (for example, MySQL).
   Data discovered relating to the software you select is automatically copied into the Software Installation [cmdb_sam_sw_install] table as part of the discovery process.
   f. Click **Update**.
2. Add the pattern data to a new record in the Software Installation Name Mapping [cmdb_sam_sw_name_mapping] table.

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a. Create a new record (see table for field descriptions).

| Field | Description |
|---|---|
| Class name | Class name of the discovery pattern.<br><br>Paste the value that you copied from the class field in discovery pattern. |
| Publisher | Publisher of the product (for example, Oracle). |
| Product | Product name (for example, MySQL). |

b. Click **Submit**.

When discovery is run, the records for the software product relating to the customized discovery pattern are utilized by Software Asset Management.

No further configuration is needed unless you know the software product consists of an edition that is not being discovered automatically.

### What to do next

If the software product has an edition that is not being discovered, Manually override SAM Foundation edition value in classic so the software can be successfully reconciled.

## Get started with Software Asset Management Foundation plugin

Get started with Software Asset Management Foundation plugin to optimize management of software installations in your environment.

### Before you begin

Role required: sam_admin

### About this task

After you have Setting up Software Asset Management Foundation plugin, get started by completing these steps for basic configuration.

### Procedure

1. Create a software model for common software, such as Microsoft Office 2013.
2. Create a basic per-user or per-device entitlement for the software.
3. After discovery of software installed, run reconciliation to reconcile software rights owned against software installed, with respect to discovery and software entitlements.
4. View reconciliation results that show the compliance status of your software products.

### What to do next

Depending on the compliance status of your software installations, you can choose to optimize your environment further.

## Configuring Software Asset Management Foundation plugin workspace

Once you have finished setting up the Software Asset Management Foundation plugin application, you need to configure the Software Asset Workspace.

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If you have multiple entitlements, you can import them at one go using a Microsoft Excel spreadsheet template.

If software models haven't automatically been created, you need to manually create software models. For information on creating software models, see Create a Software Asset Management Foundation software model in workspace

### Create a Software Asset Management Foundation entitlement in workspace

Create entitlements in the Software Asset Workspace to enter your license details and allocate purchased software rights to users or devices.

#### About this task

These instructions are for using the standard form for creating software entitlements one at a time. If you already have software entitlement details entered in a spreadsheet, you can also Import them using the bulk import functionality.

When you start creating the entitlement it is in the build status. Once you publish the entitlement, the status changes to in use and makes the entitlement eligible to be included in the reconciliation process.

#### Before you begin

Role required: sam_admin or sam_user

#### Procedure

1. Navigate to **All** > **Software asset** > **Software Asset Workspace**.
2. Click **New** to open the Create new entitlement dialog box.
3. Select **Fill out the details in a standard form** and then click **Next**.
4. In the Create New Software Entitlement page, fill in the fields.
   For a detailed description of the fields, see Create a Software Asset Management Foundation plugin entitlement in classic.

### Create a Software Asset Management Foundation software model in workspace

Create a software model in the Software Asset Workspace to add product details that are used to connect software rights you purchased with software installations discovered on your system.

#### Before you begin

Role required: sam_user, sam_admin, or model_manager

#### Procedure

1. Navigate to **All** > **Software asset** > **Software Asset Workspace**.
2. Click **License operations** view on the left bar.
3. Under **Licensing**, click **software models**.
4. Click **New**.
5. On the form, fill in the fields.

**Software Model form**

| Field | Description |
|---|---|
| Display name | [Read-only] Name of the model. The system property *glide.cmdb_model.display_name.shorten* |

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| Field | Description |
| --- | --- |
| | controls how software model display names are generated. System administrators can configure this property.<br><br>Default format is publisher + product + version + edition. |
| Publisher | Publisher of the software. You can use the lookup list provided.<br><br>**Note:**<br>Publisher is a reference to the company [core_company]. Only companies you are using internally are shown.<br><br>If the publisher and product do not exist, you can Add a Software Asset Management Foundation plugin custom license metric. |
| Product | Software product name. The same lookup list provided on the Software Discovery Models form.<br><br>**Note:**<br>If the relationship between the software publisher [samp_sw_publisher] and company [core_company] is not correct, products for that publisher may not be shown. |
| Product classification | The official UNSPSC classification of the product. |
| Product type | ○ Child: A subcomponent of main software (not licensable).<br>○ Driver: A software product that controls a device.<br>○ Licensable: A software product that is licensable.<br>○ Not Licensable: A software product that is not licensable.<br>○ Patch: A software product designed to update, fix, or improve an existing computer program.<br>○ Unknown: Not discovered. |
| General | |
| Short description | A brief description of the model. |
| Cost | The cost of a single unit of the software. |

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| Field | Description |
| --- | --- |
| Next version | Reference to another software model of the same manufacturer which represents the next version of the product. |
| Owner | The person responsible for the model. |
| Status | The current status of the model. Options are **In Production**, **Retired**, and **Sold**. |
| Certified | Check box for indicating the software model has been approved for use. |
| Discovery Mapping | |
| Version condition | Condition qualifier for the **Version** field.<br>○ starts with<br>○ is<br>○ is anything<br>Default is **is anything**. |
| Version | Version of the software product.<br>Required if version condition value is **starts with** or **is**. |
| Edition condition | Condition qualifier for the **Edition** field.<br>○ starts with<br>○ is<br>○ is anything<br>Default is **is anything**. |
| Edition | Edition of the software product to use when searching for the normalized discovery model.<br>Required if edition condition value is **starts with** or **is**. |
| Platform | Platform of the software product to use when searching for the normalized discovery model.<br>Default is **--Anything--** for Windows, Mac, Unix. |
| Language | Language of the software product to use when searching for the normalized discovery model, which is populated once it has been normalized or added manually.<br>Default is **--Anything--**. |

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| Field | Description |
|---|---|
| Software installation condition | Only software installations that meet this software discovery map condition are counted during reconciliation.<br><br>If needed, specify a subset of software installations that should be counted during reconciliation. |
| Product Catalog | |
| Catalog Item | The information about the model as it appears in the product catalog and service catalog.<br><br>Information only appears if the model has been published to the product catalog. |
| Description | Description of the software model as it appears in the product catalog. |
| Picture | An image of the software logo can be added. This logo appears in the Service Catalog if the software model is published. |

The Suite Components and Suite Parents related lists consist of parent and child configuration.

**Note:**
If you've added a discovery map to your product details, predefined suites are used and suite components are created automatically for known suite parent.

6. To publish the software model to the product catalog, under **Related Links**, click **Publish to Software Catalog** and select a category for the software model.
The values set in the Product Catalog related list are published.
7. To show the list of discovery models that match the software publisher and product fields of the software model, under **Related Links**, click **Show Matching Discovery Models**.
The Discovery Models list is opened in a new browser tab for your reference.
8. To perform additional configuration, select the new software model record in the Software Models list.

   a. In the Software Model Lifecycles related list, create a new record (see table for field descriptions).

**Software Model Lifecycle form**

| Field | Description |
|---|---|
| Software model | [Read-only] Name of software model. |
| Lifecycle type | ▪ Internal<br>▪ Publisher |
| Lifecycle phase | ▪ Pre Release<br>▪ General Availability |

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| Field | Description |
| --- | --- |
| | Date the software became generally available to the market.<br>▪ Upgrade<br>Only shown when the **Lifecycle type** field is Internal.<br>▪ End of Life<br>Date the software was no longer supported by the publisher.<br>▪ End of Support<br>▪ End of Extended Support |
| Source | [Read-only] Internal (for new records created manually), or ServiceNow (when created automatically). |
| Description | Description of the software model lifecycle. |
| Phase start date | Date the lifecycle phase starts. |
| Phase end date | Date the lifecycle phase ends. |
| Risk | ▪ Very High<br>▪ High<br>▪ Moderate<br>▪ Low<br>▪ None |

**b.** Create a Software Asset Management Foundation plugin entitlement in classic.

**c.** View Software Asset Management Foundation plugin software model results in classic.
The latest software model results are shown in the Software Model Results related list.

**d.** In the Metric Attributes related list, click a metric attribute to set the attribute value field (see table for field descriptions).
The Metric Attributes related list contains metric values set in Create a Software Asset Management Foundation plugin entitlement in classic and is used for reconciliation (metric group, license metric, and software model combination).

**Metric Attributes form**

| Field | Description |
| --- | --- |
| Software model | Software model associated with the metric attributes. |
| Metric group | Grouping for the software metric (Common). |
| License metric | The license metric that the software license is counted against when reconciliation is run (per user, per device, for example). |

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| Field | Description |
|---|---|
| Description | Attribute type description that is based on license metric value. |
| Attribute | Attribute type for reconciling entitlements license metric.<br>▪ Maximum active OSEs per server<br>▪ Maximum installs per OSE<br>▪ Maximum installs per right: For Per User, Per Device, Per Named User, and Per Named Device.<br>▪ Maximum processors per right<br>▪ Minimum users per processor<br>▪ Minimum cores per processor<br>▪ Minimum cores per server |
| Attribute value | Value of the attribute (integer). |
| Attribute value is unlimited | Check box for setting the attribute as unlimited. |

e. Create a vendor catalog item.

### Configuring Software Asset Management Foundation plugin classic

Configure Software Asset Management Foundation plugin if you prefer to continue using the classic version.

### Create a Software Asset Management Foundation plugin entitlement in classic

Software entitlements enable you to define license details that are matched to software models.

#### Before you begin
Role required: sam_user

#### About this task
Software entitlements are stored in the Software Entitlement [alm_license] table.

**Note:**
Entitlements are assigned to Create a Software Asset Management Foundation plugin software model in classic, which are different than software discovery models.

#### Procedure

1. Navigate to **All** > **Software Asset** > **Licensing** > **Software Entitlements** and create a new record (see table for field descriptions).

**Software Entitlement form**

| Field | Description |
|---|---|
| Display name | Automatically generated name based on asset tag and model. |
| Asset tag | Specify the serial number and the bar code for tracking the asset. |

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| Field | Description |
| --- | --- |
| Software model | Select the software model to match the entitlement. |
| License type | Specify the license type. Whether the rights grant full access to the software or if they are being upgraded from a previous version of the software.<br>○ Full: The rights grant full access to the software.<br>○ Upgrade: The rights are being upgraded from a previous version of the software.<br>When upgrade is selected, the Upgraded Entitlements related list is shown, which is used to specify the entitlements you are upgrading from.<br>This field becomes read-only after the form has been submitted. |
| License duration | Length of time the license is valid. Default value is Perpetual.<br>○ Perpetual: Duration is continuous.<br>○ Subscription: Duration is for a specified length of time.<br>Duration dates:<br>▪ Start date: Required.<br>▪ End date: If empty, subscription does not expire.<br>State is automatically set to In Use when current date is between start and end dates.<br>State is automatically set to Retired when current date is past the end date and active rights is 0.<br>State is automatically set to On Order when the start date is in the future and active rights is 0. |
| Metric group | Select the metric group for the software. Each metric group has a set of license metrics that are specific to the publisher.<br>○ Common<br>○ Add a custom license metric |
| License metric | Select the license metric for the license group that the software license is counted against when reconciliation is run. |

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| Field | Description |
| --- | --- |
| | Point to the reference field icon to view the license calculation.<br>○ Common:<br>▪ Per Device: Licenses a device for a number of installations of software.<br>▪ Per Named Device: Licenses a specific device for a number of installations of software.<br>▪ Per Named User: Licenses a specific user for a number of installations of software.<br>▪ Per User: Licenses a user for a number of installations of software.<br>○ Custom:<br>Custom license metrics configured, if any. |
| Agreement type | Select the agreement type.<br>○ Generic<br>○ Enterprise Level Agreement (ELA) |
| Purchased rights | Specify the number of rights that you are purchasing.<br>The number of purchased rights for the new entitlement gets set in the **Active rights** field. |
| Active rights | [Read-only] Specifies the number of entitlements to be granted for this license.<br>**Note:** If an enterprise contract is attached to the license, the **Active rights** field is not shown. |
| Allocations available | [Read-only] Specifies the number of user or device allocations that have not been created for an entitlement.<br>Allocations available = (number of active rights) - (sum of all allocation quantities) |
| General | |
| Serial number | Unique number assigned for identification of the asset. |
| Owned by | User or department with financial ownership of the asset. Can be different than the manager. |
| State | Current state of the asset. Values include On order, In stock, In transit, In use, Consumed, In maintenance, Retired, and Missing. |

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| Field | Description |
|---|---|
| | If the state is Retired, the **Active rights** field is set to 0. |
| Substate | More details about the software license stage. The available substate settings depend on the **State** selected.<br><br>For example, if you select the **Retired** state, the substate options available are **Disposed**, **Sold**, **Donated**, and **Vendor credit**. |
| Company | Company to which this asset belongs. |
| Location | Where the license is used. For example, a specific site, country, or region. |
| Department | Department of the person **Assigned to** this software license. |
| Financial | |
| Cost | Cost of the software.<br><br>**Note:**<br>Required for total cost and savings calculations on the Software Asset Management Foundation dashboard. |
| Upgraded Entitlements | |
| From Entitlement | The entitlement from which rights are upgrading. Multiple upgrade entitlements are supported.<br><br>You can upgrade previously owned rights for a particular version of software to a newer version (for example, Office Professional Plus 2013 to Office Professional Plus 2016).<br><br>**Note:**<br>This field is shown only when the License type is Upgrade.<br><br>The rights from entitlements that you are upgrading from get deactivated when you upgrade because they are moved to the new entitlement. |
| Number of rights | Number of rights to upgrade. |

The Contracts related list contains contract details.

The User or Device Allocations related list contains entitlement allocations.

**Note:**
This related list is only shown when the **License Metric** field is Per User or Per Device.

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The Activities related list contains work notes for the asset.

2. To perform additional configuration, select the new software entitlement record in the Software Entitlements list.

   a. To set upgrade and downgrade entitlements, in the Downgrades/Upgrades related list, create a new record to specify which software models to which you have upgrade or downgrade rights (see table for field descriptions).
   This allows you to set entitlement to previous or future versions of software (for example, the purchase of Office Professional Plus 2016 rights entitles you to Office Professional Plus 2013 as well).

   **Downgrades/Upgrades form**

| Field | Description |
|---|---|
| Software entitlement | Software entitlement with which the upgrade/downgrade is associated. |
| Software model | Software model of the entitlement. |
| Order | Order of the upgrade/downgrade. |
| Start date | Start date of the upgrade/downgrade. |
| End date | End date of the upgrade/downgrade. |

   b. To set up cost-tracking details, configure Expense Lines.

   c. To manage license keys, in the License Keys related list, create a new record to specify the licenses keys allocated to entitlements (see table for field descriptions).

   **License Key form**

| Field | Description |
|---|---|
| Is allocated | Check box indicating that the license key has been allocated. |
| License key | License key value. Must be unique per entitlement. |
| Software entitlement | Software entitlement associated with the license key. |

## Create a Software Asset Management Foundation plugin entitlement allocation in classic

A user or device allocation can be added to a software entitlement to specify a user or device to which rights have been allocated.

### Before you begin

Role required: sam_user

### About this task

User allocations are stored in the User Allocations [alm_entitlement_user] table. Device allocations are stored in the Device Allocations [alm_entitlement_asset] table.

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**Note:**
The total of all allocation quantities cannot exceed the total number of rights for the entitlement.

### Procedure

1. Navigate to **All** > **Software Asset** > **Licensing** > **Software Entitlements** and open the software entitlement record to add allocations to.
2. Click the applicable allocations related list (**User Allocations** or **Device Allocations**) to configure (see table for field descriptions).

**Note:**
The allocations related list that is shown pertains to the license metric that you chose. Only one related list for allocations is shown.

#### Allocations

| Field | Description |
|---|---|
| User Allocations | |
| Assigned to | The user to which the license is allocated. |
| Software Model | Automatically set based on entitlements software model. |
| Quantity | Quantity of rights allocated to this user. Default is 1.<br><br>Multiple rights come into play in the case where many rights are needed to fully license a device or user, such as with per core. |
| License Key | License key of the software. |
| Device Allocations | |
| Assigned to | The device to which the license is allocated. |
| Software Model | Automatically set based on entitlements software model. |
| Quantity | Quantity of licenses allocated to this user. Default is 1.<br><br>Multiple licenses come into play in the case where licenses are allocated per core and multiple core rights are needed. |
| License Key | License key of the software. |

## Create a Software Asset Management Foundation plugin software model in classic

Software models are used to connect purchased software rights with discovered software installations. Additionally, software models can be used to manage suites of software as well as to publish requestable software to the Service Catalog.

### Before you begin

Role required: sam_user or model_manager

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### About this task

Manage software available and tie software installations (software being used) with entitlements (software owned) using software models. Create software models for all software to be monitored.

**Note:**
Users with the model_manager role can navigate to **Product Catalog** > **Product Model** > **Software Models**, but cannot administer all aspects of software models.

Predefined suites are used so suite components are automatically created for known suite parent software models. Discovery maps indicate whether a suite is defined for the product.

You can also track a software model lifecycle phase for use with the Technology Portfolio Management.

### Procedure

1. Navigate to **Software Asset** > **Licensing** > **Software Models** and create a new record (see table for field descriptions).

**Software Model form**

| Field | Description |
|---|---|
| Display name | [Read-only] Name of the model. The system property *glide.cmdb_model.display_name.shorten* controls how software model display names are generated. System administrators can configure this property.<br><br>Default format is publisher + product + version + edition. |
| Publisher | Publisher of the software. You can use the lookup list provided.<br><br>**Note:**<br>Publisher is a reference to the company [core_company]. Only companies you are using internally are shown.<br><br>If the publisher and product do not exist, you can Add a Software Asset Management Foundation plugin custom license metric. |
| Product | Software product name. The same lookup list provided on the Software Discovery Models form.<br><br>**Note:**<br>If the relationship between the software publisher [samp_sw_publisher] and company [core_company] is not correct, products for that publisher may not be shown. |
| Product classification | The official UNSPSC classification of the product. |
| Product type | ○ Child: A subcomponent of main software (not licensable).<br>○ Driver: A software product that controls a device.<br>○ Licensable: A software product that is licensable.<br>○ Not Licensable: A software product that is not licensable. |

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| Field | Description |
|---|---|
| | ○ Patch: A software product designed to update, fix, or improve an existing computer program.<br>○ Unknown: Not discovered. |
| General | |
| Short description | A brief description of the model. |
| Cost | The cost of a single unit of the software. |
| Next version | Reference to another software model of the same manufacturer which represents the next version of the product. |
| Owner | The person responsible for the model. |
| Status | The current status of the model. Options are **In Production**, **Retired**, and **Sold**. |
| Certified | Check box for indicating the software model has been approved for use. |
| Discovery Mapping | |
| Version condition | Condition qualifier for the **Version** field.<br>○ starts with<br>○ is<br>○ is anything<br>Default is **is anything**. |
| Version | Version of the software product.<br>Required if version condition value is **starts with** or **is**. |
| Edition condition | Condition qualifier for the **Edition** field.<br>○ starts with<br>○ is<br>○ is anything<br>Default is **is anything**. |
| Edition | Edition of the software product to use when searching for the normalized discovery model.<br>Required if edition condition value is **starts with** or **is**. |
| Platform | Platform of the software product to use when searching for the normalized discovery model.<br>Default is **--Anything--** for Windows, Mac, Unix. |
| Language | Language of the software product to use when searching for the normalized discovery model, which is populated once it has been normalized or added manually.<br>Default is **--Anything--**. |

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| Field | Description |
|---|---|
| Software installation condition | Only software installations that meet this software discovery map condition are counted during reconciliation.<br><br>If needed, specify a subset of software installations that should be counted during reconciliation. |
| Product Catalog | |
| Catalog Item | The information about the model as it appears in the product catalog and service catalog.<br><br>Information only appears if the model has been published to the product catalog. |
| Description | Description of the software model as it appears in the product catalog. |
| Picture | An image of the software logo can be added. This logo appears in the Service Catalog if the software model is published. |

The Suite Components and Suite Parents related lists consist of parent and child configuration.

2. To publish the software model to the product catalog, under **Related Links**, click **Publish to Software Catalog** and select a category for the software model.
   The values set in the Product Catalog related list are published.
3. To show the list of discovery models that match the software publisher and product fields of the software model, under **Related Links**, click **Show Matching Discovery Models**.
   The Discovery Models list is opened in a new browser tab for your reference.
4. To perform additional configuration, select the new software model record in the Software Models list.

   a. In the Software Model Lifecycles related list, create a new record (see table for field descriptions).

**Software Model Lifecycle form**

| Field | Description |
|---|---|
| Software model | [Read-only] Name of software model. |
| Lifecycle type | ▪ Internal<br>▪ Publisher |
| Lifecycle phase | ▪ Pre Release<br>▪ General Availability<br><br>Date the software became generally available to the market.<br><br>▪ Upgrade<br><br>Only shown when the **Lifecycle type** field is Internal.<br><br>▪ End of Life |

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| Field | Description |
|---|---|
| | Date the software was no longer supported by the publisher.<br>▪ End of Support<br>▪ End of Extended Support |
| Source | [Read-only] Internal (for new records created manually), or ServiceNow (when created automatically). |
| Description | Description of the software model lifecycle. |
| Phase start date | Date the lifecycle phase starts. |
| Phase end date | Date the lifecycle phase ends. |
| Risk | ▪ Very High<br>▪ High<br>▪ Moderate<br>▪ Low<br>▪ None |

**b.** Create a Software Asset Management Foundation plugin entitlement in classic.

**c.** View Software Asset Management Foundation plugin software model results in classic.
The latest software model results are shown in the Software Model Results related list.

**d.** In the Metric Attributes related list, click a metric attribute to set the attribute value field (see table for field descriptions).
The Metric Attributes related list contains metric values set in software entitlements and is used for reconciliation (metric group, license metric, and software model combination).

**Metric Attributes form**

| Field | Description |
|---|---|
| Software model | Software model associated with the metric attributes. |
| Metric group | Grouping for the software metric (Common). |
| License metric | The license metric that the software license is counted against when reconciliation is run (per user, per device, for example). |
| Description | Attribute type description that is based on license metric value. |
| Attribute | Attribute type for reconciling entitlements license metric.<br>▪ Maximum active OSEs per server<br>▪ Maximum installs per OSE |

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| Field | Description |
|---|---|
| | ▪ Maximum installs per right: For Per User, Per Device, Per Named User, and Per Named Device.<br>▪ Maximum processors per right<br>▪ Minimum users per processor<br>▪ Minimum cores per processor<br>▪ Minimum cores per server |
| Attribute value | Value of the attribute (integer). |
| Attribute value is unlimited | Check box for setting the attribute as unlimited. |

**e.** Create a vendor catalog item.

### Manually normalize a SAM Foundation software discovery model in classic

You can edit a software discovery model to manually normalize discovered software on the Software Discovery Models form so that it can be reconciled.

#### Before you begin
Role required: sam_user

#### About this task
If the information automatically added to the software discovery model is incomplete, you can add the missing fields to manually normalize the software discovery model.

#### Procedure
1. Navigate to **All** > **Software Asset** > **Discovery** > **Discovery models** and open a discovery model record.
2. Fill in the **Publisher**, **Product**, and **Version** fields, as appropriate.
3. Click **Normalize**.
   The normalization status is set to Manually Normalized.

### Manually override SAM Foundation edition value in classic

When the edition of a software install is not automatically discovered, you can specify the edition on the Software Installation form with the correct value (if known) so the software can be successfully reconciled.

#### Before you begin
Role required: sam_admin

#### About this task
For reconciliation to run successfully, the publisher, product, version, and edition fields of the software must be set. When the edition is not discovered automatically (edition value is not included as part of the **Display name** field) but you know the edition, you can manually set it to the correct value (`Enterprise`, for example).

Once the edition value is set, the discovery model for the software install is automatically reset. If the appropriate discovery model does not exist, a new one is created.

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**Note:**
Not all software products consist of an edition. Of the software products consisting of an edition, not all edition values are automatically discoverable.

### Procedure

1. Navigate to **All** > **Software Asset** > **Discovery** > **Software Installations** and open the software installation record for which to set the edition value.
2. Fill in the **Edition override** field, as appropriate.

   **Note:**
   The **Edition override** field is a free-form field (no lookup list) therefore, since this field is used as a key, the value entered must be exact.

3. Click **Update**.
   The software installation is associated to different discovery model containing the edition value as part of the primary key. If the appropriate discovery model does not exist, a new one is created.

## Using Software Asset Management Foundation plugin workspace

Use the Software Asset Workspace, the intuitive and streamlined user interface of the Software Asset Management Foundation plugin application.

The Software Asset Management Foundation plugin views let you create entitlements, software models, run and review reconciliation results, give visibility into your software assets, and provides access to analytics via dashboards.

The Software Asset workspace contains the following views:

- Software asset overview: the landing page of the Software Asset Workspace. You can create entitlements, run reconciliation, view key metrics and get time sensitive alerts and notifications regarding your software assets.
- License usage: You can view the compliance status of all your publishers, review reconciliation results, and view and run reports.
- License operations: lists all the entitlements, software models, import entitlement errors, discovery models.

## Software asset overview for Software Asset Management Foundation plugin dashboard

Enhance your Software Asset Management Foundation plugin experience by using the modernized and user-friendly software asset overview dashboard. The software asset overview is a simplified and intuitive environment that helps you use the application more effectively by reducing complexity.

Use the software asset overview view to:

- Gain insights into key metrics such as compliance trends and true-up costs.
- Execute routine tasks such as running reconciliation or creating entitlements.

Click any widget to view detailed information. All the widgets are updated whenever a new reconciliation result is available.

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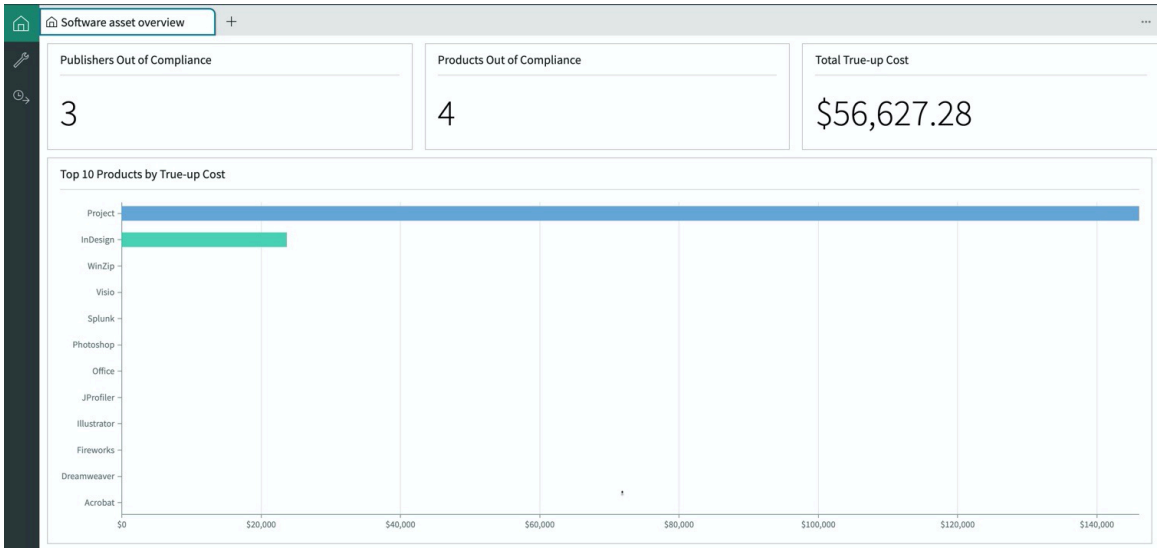
### Software asset overview dashboard




| Report | Source | Description |
|---|---|---|
| Publishers out of compliance | Product Results<br><br>[samp_product_result] | Number of publishers that have at least one software model out of compliance.<br><br>Click the report to view the results in the License usage view. |
| Products out of compliance | Product Results<br><br>[samp_product_result] | Number of products that have at least one software model out of compliance.<br><br>Click the report to view the results in the License usage view. |
| Total true-up Cost | Product Results<br><br>[samp_product_result] | Cost to be compliant based on the average prices in entitlements for the rights by publisher. |

### License usage view for Software Asset Management Foundation plugin

Use the license usage view as a single plane to understand the license position of all software products, remediate non compliance, and view reconciliation results.

The License usage view lets your organizations license usage trends and helps forecast the needs of your organization by trending the number of licenses required against the number of licenses purchased. Stay in compliance by purchasing additional rights before software consumption surpasses the number of rights owned.

You can access the License usage view by navigating to **Software asset** > **Software Asset Workspace** > **License usage**.

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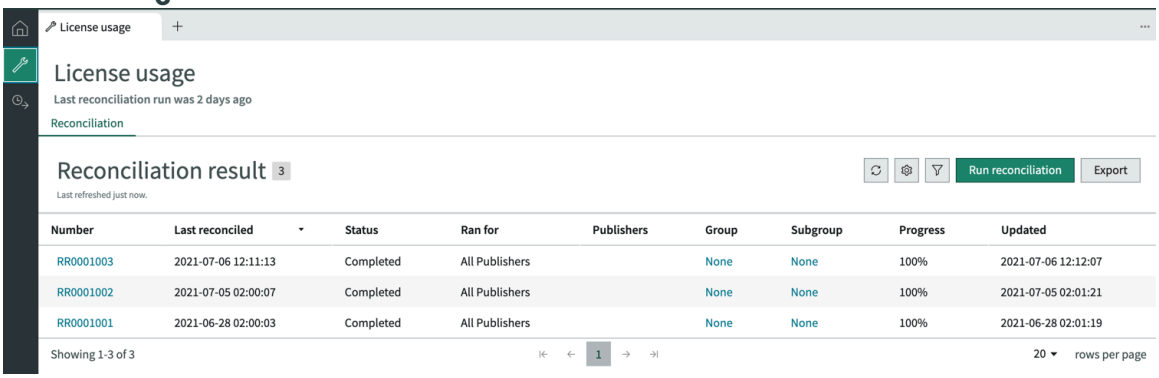
**License usage**




Use the License usage view to:

- filter by domain and compliance status.
- sort by True-up cost, over-licensed amount, and potential savings.
- run reconciliation and view its results.
- be informed about the last reconciliation run.
- view and export reports.

## Run Software Asset Management Foundation plugin software reconciliation in workspace

Reconciliation is run as a scheduled job (default is weekly), but you can also run reconciliation manually to reconcile software products in the Software Asset Workspace environment on-demand.

### Before you begin

Reconciliation is run for products that have software entitlements or software installs. Grouping and subgrouping are supported so you can narrow the compliance results.

When running reconciliation manually, allow enough time for the process to complete. For faster results, narrow the scope by selecting specific publishers.

Role required: sam_user or sam_admin

### Procedure

1. Navigate to the Run Reconciliation dialog box from either of the two ways:
   - **Software asset** > **Software asset workspace** > **Run Reconciliation**
   - **Software asset** > **Software Asset Workspace** > **License workbench** > **Run Reconciliation**
2. Select a particular publisher for which compliance should be calculated.
   You can also select all publishers.
3. To narrow results further, select a group or subgroup.
   Available group and subgroup values include None, Country, Department, Company, Region, and Cost Center.
4. Click **Run Reconciliation**.
   The reconciliation process may take some amount of time to complete. Once reconciliation is complete, the reconciliation results are shown in the **Reconciliation** tab.

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### Reconciliation results

| Field | Description |
|---|---|
| Number | Unique identifying number that is generated during the reconciliation process. |
| Last reconciled | Date of last reconciliation run. |
| Status | Status of the reconciliation.<br>○ Completed<br>○ In Progress<br>○ Failed |
| Ran for | All publishers, or specific publishers. |
| Publishers | Only shown if publishers were specified on which to run reconciliation. |
| Group | Group specified on which to run reconciliation. Values include **None**, **Country**, **Department**, **Company**, **Region**, and **Cost Center**. |
| Subgroup | Subgroup specified on which to run reconciliation. Values include **None**, **Country**, **Department**, **Company**, **Region**, and **Cost Center**. |
| Progress | Percent complete and progress bar for the reconciliation run. |
| Progress summary | Specific step within the reconciliation process.<br>**Note:** This list column is not shown by default. You can personalize your list column settings to add it, if desired. |
| Updated | The date and time when the particular reconciliation process was completed. |

## License Operation view for Software Asset Management Foundation plugin

Use the License operations view in the Software Asset Workspace to view all your licenses and discovery models that are managed by the Software Asset Management Foundation plugin application.

View all details related to entitlements and software models in the License operations view. You can also create, edit, and delete entitlements and software models.

You can access the License operations view by navigating to **Software asset** > **Software Asset Workspace** > **License operations**.

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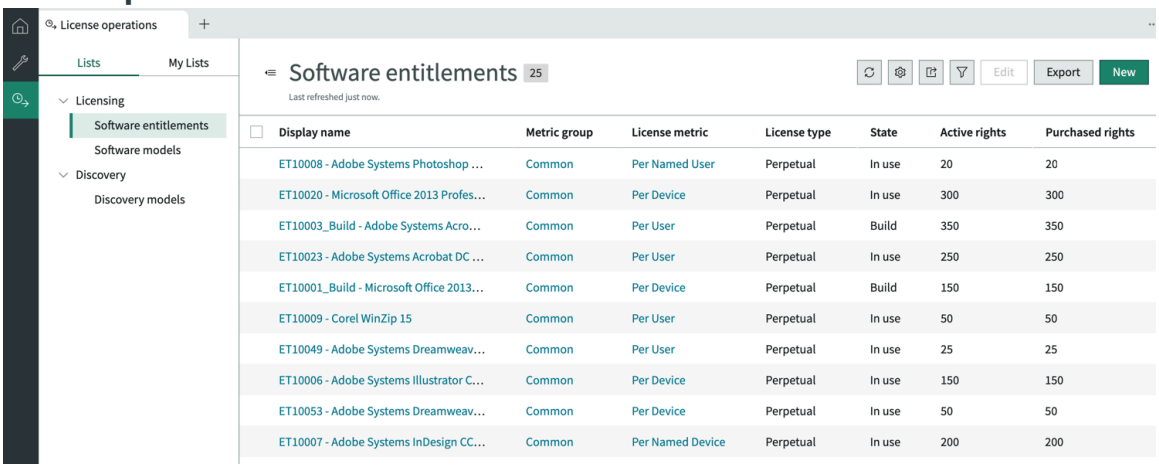
### License operations




The License operations view also lets you view:

- all the discovered software for your engineering applications.
- engineering license servers.
- discovery models.
- license consumption.

### View discovery models in workspace

View a list of all the discovered software for your engineering applications in the Software Asset Workspace.

#### Before you begin

Role required: sam_admin or sam_user

#### Procedure

1. Navigate to **All** > **Software Asset** > **Software Asset Workspace** > **License Operations**
2. Click **Discovered engineering license** from the Discovery list view.
3. You can click a record to view additional details.
   Clicking a record takes you to the Company page in the classic view.

### Using Software Asset Management Foundation plugin classic

Using Software Asset Management Foundation plugin classic.

### Software Asset Management Foundation dashboard

View compliance and true-up cost trend charts on the Software Asset Management Foundation dashboard.

The Software Asset Management Foundation dashboard is accessed by navigating to **Software Asset** > **Overview**. Click an element within a report to see more information, or add and move widgets as needed.

Results are updated daily, or whenever a new reconciliation result is available, and can be refreshed by clicking the **Refresh** icon for each result. You can also save charts in PNG or JPG formats.

The source for overview data is the Product Result [samp_product_result] table.

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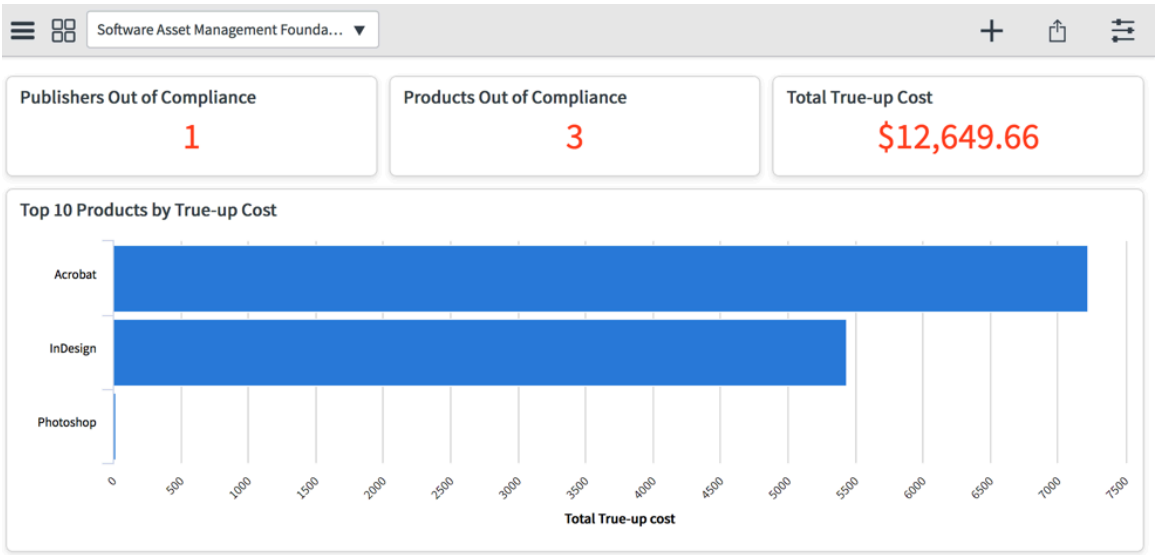


| Report | Description |
|---|---|
| Publishers out of Compliance | Number of publishers that have at least one software model out of compliance. |
| Products out of Compliance | Number of products that have at least one software model out of compliance. |
| Total True-up Cost | Cost to be compliant based on the average prices in entitlements for the rights. |
| Top 10 Products by True-up Cost | Top 10 products graphed in order of true-up cost. |

### Run Software Asset Management Foundation plugin software reconciliation in classic

Reconciliation is run as a scheduled job (default is weekly), but you can also run reconciliation manually to reconcile software products in your environment on demand.

#### Before you begin

Role required: sam_admin

#### About this task

Reconciliation is run for products that have entitlements.

When running reconciliation manually, allow enough time for the process to complete. For faster results, narrow the scope by selecting specific publishers.

#### Procedure

1. Navigate to **All** > **Software Asset** > **Reconciliation** > **Run Reconciliation** and select a publisher for which compliance should be calculated, or select all publishers.
2. Click **Continue**.
   The reconciliation process may take an extended amount of time to complete.
   The Reconciliation Results list is shown.

### View Software Asset Management Foundation plugin software model results in classic

View compliance information for software model results from the Product Results list after reconciliation is run.

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### Before you begin
Role required: sam_user

### About this task
You can view License Metric Results, Remediation Options, and Unlicensed Installs related lists for a software model result from a Product Result record.

For example, if the status of a product result shows that it is not compliant, you can drill down on the product result to view software model details, such as the number of unlicensed installs and the true-up cost to become compliant. Further, you can drill down on the software model result to view the license metric result, which is based on the entitlements for the product.

License metric result information includes rights owned and rights used as well as the license allocation breakdown so you can determine your options to become compliant. The Remediation Options related list shows the number of rights needed and calculates the cost of those rights for you, based on the license metric.

### Procedure
1. Navigate to **All** > **Software Asset** > **Reconciliation** > **Product Results** and open a record to view product results details.
2. In the Software Model Results related list, open a record to view the details (see table for field descriptions).

**Software Model Results form**

| Field | Description |
|---|---|
| Software model | Software model associated with the product. Drill down on the software model to see the software model result. |
| Product result | Unique product result number generated during the reconciliation process. |
| Latest | Indicates whether this software model result is from the most recent reconciliation run. |
| Status | Status of the software model.<br>○ Compliant<br>○ Not Compliant |
| Agreement type | Common: Generic, Enterprise License Agreement (ELA)<br>**Note:** If the agreement type is Enterprise Level Agreement, the **Status** is Compliant even if there are unlicensed installations. |
| Unlicensed installs | Number of unlicensed software installations that are not covered by any entitlements. |
| True-up cost | Estimated cost of remediating non-compliance based on the least number of rights needed (rights needed * average price |

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| Field | Description |
|---|---|
| | per right from entitlements). The lowest cost from Purchase Rights remediation options. |
| Over-licensed amount | Estimated cost of rights not being used. The sum of the Over Licensed amount from the True-up value costs. |
| License Metric Results | |
| License metric | License metric that the software license is counted against when reconciliation is run. |
| Software model result | Software model with which the result is associated. |
| Rights owned | Sum of all active rights from entitlements that share a license metric. |
| Rights used | Sum of rights used during reconciliation (allocated + not allocated and installed). |
| Unused rights | Sum of rights not used during reconciliation (rights owned - rights used). |
| Over-licensed amount | Estimated cost of unused rights. |
| Right Allocations | |
| Allocated in use | Rights that are allocated and are used to license installations. |
| Not allocated in use | Number of rights that are used to license installations, but not allocated.<br><br>When this value is greater than 0, two remediation options (Create Allocations and Remove Unallocated Installs) are automatically created for each unique license metric in the software model that meets this requirement, except User CAL and Device CAL. |
| Allocated not in use | Rights that are allocated but are not being used to license any installations.<br><br>**Note:**<br>**Allocated not in use** reflects rights that are wasted because the user or device for which these rights have been allocated do not have the software installed.<br><br>When this value is greater than 0, a Remove Allocations remediation option is automatically created for each unique license metric in the software model that meets this requirement. |

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| Field | Description |
|---|---|
| Not allocated | Number of rights that have not been allocated (rights owned - allocated regardless of whether installed or not). |
| Allocations needed | Number of allocations needed for compliance. Only used for Per Named User and Per Named Device license metrics. |
| Remediation Options | |
| Remediation action | Action to take to for compliance of Purchase Rights. |
| Affects compliance | Specifies whether compliance is affected by the remediation option. |
| License metric | Specific license metric of the software model result. |
| Software model result | Specific software model result pertaining to the remediation option. |
| Status | Status of the remediation option.<br>○ New (blue)<br>○ Complete (green)<br>○ Void (red)<br>○ In Progress (yellow)<br>In Progress state indicates that removal candidates were created for the installs. |
| Rights needed | **Purchase Rights** shows Rights needed. |
| Actionable rights | Total rights affected by the action. |
| True-up cost | Estimated cost of remediating non-compliance based on the least number of rights needed. |

The Unlicensed Installs related list contains the software installations that are unlicensed.

### Software Asset Management Foundation plugin Administration

Software Asset Management Foundation plugin administration tasks include adding custom product records, creating custom license metrics, and setting properties. You can also refresh processor definitions, and migrate software installations.

The sam_admin role is required to configure administrative tasks. However, the sam_user role can view and read configurations.

### Add a Software Asset Management Foundation plugin custom software product

You can add a custom product if a software product does not exist in the Software Library. Custom products enable you to normalize and account for homegrown software, or software that is not yet part of the Software Library.

#### Before you begin

Role required: sam_admin

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### About this task
The product and publisher combination is used during discovery model normalization. If the custom product already exists, a message is shown.

### Procedure

Navigate to **All** > **Software Asset** > **Administration** > **Custom Software Products** and create a new record (see table for field descriptions).

**Custom Software Product form**

| Field | Description |
|---|---|
| Publisher | Publisher of the custom software product. If it does not exist, a new one can be created on the Publisher field Companies lookup list. |
| Product | Name of the custom software product. |
| Product type | Product type of the custom software product.<br>• Child: A subcomponent of main software (not licensable).<br>• Driver: A software product that controls a device.<br>• Licensable: A software product that is licensable.<br>• Not Licensable: A software product that is not licensable.<br>• Patch: A software product designed to update, fix, or improve an existing computer program.<br>• Unknown: A software product that is unknown. |
| Product classification | Official UNSPSC classification. |
| Active | Check box for activating the rule. |

## Add a Software Asset Management Foundation plugin custom license metric

You can add a custom license metric to modify the default reconciliation process.

### About this task
Custom license metrics can be created to define specific software calculations not included in the predefined license metrics list. Custom license metrics are useful so reconciliation can calculate rights per user or device for certain software products and bundles of lesser-known software publishers.

For example, you can create a custom metric to avoid over counting installs for products that are part of an unrecognized bundle.

Custom metrics can be disabled using the custom license metric property. This feature is enabled by default.

### Before you begin
Role required: sam_admin

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### Procedure

Navigate to **All** > **Software Asset** > **Administration** > **Custom License Metrics** and create a new record (see table for field descriptions).

**Custom License Metric form**

| Field | Description |
|---|---|
| License metric | Name of the custom license metric. This name is shown in the **License Metric** field of software entitlements, and in the license metric results for the software model. |
| Metric group | [Read-only] Custom license metric. |
| Allocation type | Allocation type of the metric license, per device or per user.<br>• Device<br>• User |
| Description | Description of the custom license metric. |
| Reconciliation order - allocated | Reconciliation metric rank priority for allocated licenses. Lower rank value takes precedence. |
| Reconciliation order - unallocated | Reconciliation metric rank priority for unallocated licenses. Lower rank value takes precedence. |
| Calculation | |
| Calculation Script | The calculation method for the license metric is script. Specify the reconciliation script. |

## Migrate Software Asset Management Foundation plugin software installations

If you are using Discovery, run this script after installing Software Asset Management Foundation plugin to copy previously discovered software installation records from the [cmdb_software_instance] table to the [cmdb_sam_sw_install] table, which is used by Software Asset Management Foundation plugin to store software installation records.

### Before you begin
Role required: sam_admin

### About this task
If you are running Discovery and have used a version of ITSM Software Asset Management previously, there is no need to run this script. Additionally, if the [cmdb_sam_sw_install] table is already populated with software installation records, this script is disabled. You can run Discovery again to repopulate the table.

When running the Migrate Software Installs script, allow enough time for the process to complete.

### Procedure

Navigate to **All** > **Software Asset** > **Administration** > **Migrate Software Installs** and click **Procced**.

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The Software Installations list is shown. If the data has already been migrated, a message is shown.

### Software Asset Management Foundation plugin properties

You can set default reconciliation properties such as reconciliation run with custom license metrics, and reconciliation debugging settings.

These properties are available for Software Asset Management Foundation plugin.

To access these properties, navigate to **Software Asset** > **Administration** > **Properties**.

#### Properties for Software Asset Management Foundation plugin

| Property | Description |
|---|---|
| Run reconciliation with all available custom license metrics<br><br>com.snc.samp.recon.enablecustommetrics | Enable custom license metrics when running reconciliation.<br><br>If you have a custom license metric configured, it is not applied when this property is set to **No**.<br><br>• **Type**: Reconciliation<br>• **Default value**: Yes |
| Enable debugging of reconciliation results<br><br>com.snc.samp.debug | Enable debugging of reconciliation results to troubleshoot a result.<br><br>**Note:**<br>Enabling debugging may have an impact on performance.<br><br>• **Type**: Reconciliation<br>• **Default value**: No |

### Software Asset Management Foundation plugin migration

Migrate from the Software Asset Management plugin to the Software Asset Management Foundation plugin to take advantage of more powerful features. Manual actions by the customer are required after plugin activation.

After automatic changes are performed during plugin activation, successful migration from the Software Asset Management (com.snc.software_asset_management) plugin to the Software Asset Management Foundation (com.snc.sams) plugin requires a Overwrite customizations for Software Asset Management migration to be performed by the customer.

Customizations to forms and lists may need to be manually overwritten by the customer after plugin activation. In addition, certain fields in software models, software entitlements, user/device allocations forms require manual configuration by the customer after plugin activation.

## Automatic changes

The Software Asset Management Foundation (com.snc.sams) plugin performs these automatic changes:

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- Tables
  - Table labels renamed

| Table | Original Label | New Label |
|---|---|---|
| [alm_license] | Software License | Software Entitlement |
| [alm_entitlement_user] | User Entitlement | User Allocations |
| [alm_entitlement_asset] | Device Entitlement | Device Allocations |

  - Adds new tables and script includes.
  - Adds any string value in the Software Entitlements **License key** field to the License Key [samp_sw_license_key] table
- Field names and values
  - **Inference mandatory** field

    For software models that have suite components (to bundle software models), the **Inference mandatory** field value in the Software Suite [cmdb_m2m_suite_model] table is transferred to a new **Mandatory** field

  - **Rights** field

    The Software Entitlements (formerly Software Licenses) **Rights** field value in the License Entitlements [alm_entitlement] table is transferred to a new **Purchased rights** field, and name changed from **Rights** to **Active rights**

  - The **Software model** field for a software entitlement allocation (Software Entitlement [alm_license] table) is automatically set to the software model on the entitlement (License Entitlements [alm_entitlement] table)
  - The quantity for a software entitlement allocation (License Entitlements [alm_entitlement] table) is set to 1 unless there are multiple allocations

    If there are multiple software entitlement allocations for the same user or device, the allocations are aggregated into one record, the quantity is set to the count of aggregated records, and duplicate allocations are not allowed.
- Forms and lists

  Software Models, Entitlements (formerly Software License), Discovery Models, and Software Installations form and list layouts are modified to fit the new application

  **Note:**
  Any customizations to these forms and lists must be manually overwritten after plugin activation.

- Functionality

  **Functionality disabled**

| Functionality | Description |
|---|---|
| License and software counters | The scheduled job trigger for SAM License Counters is changed to None so that it is |

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| Functionality | Description |
| --- | --- |
| | deactivated, and software counters are disabled. |
| Auto-match functionality | The auto-match functionality, which attempts to match a discovery model to a corresponding software model, is deactivated. |
| Navigation menu | The navigation menu for the Software Asset Management plugin is deactivated and renamed. |
| Business rules | Legacy business rules applied to discovery models are disabled. |

### Overwrite customizations for Software Asset Management Foundation plugin migration

When migrating from the Software Asset Management plugin to the Software Asset Management Foundation plugin, further actions are required by the customer after plugin activation to ensure successful migration of customized forms and lists.

#### Before you begin

Role required: admin

#### About this task

If these lists and forms have been customized before the migration, they may have been skipped during plugin activation and, in that case, require further action.

- Software Entitlements (formerly Software Licenses)
- Software Allocations (formerly Software Entitlements)
- Software Models
- Discovery Models
- Software Installations

You can review plugin activation changes in the Upgrade History module to determine what changes have automatically been skipped so you can resolve the skipped update, if needed.

Certain fields added by the migration also must be configured to take advantage of the new features offered.

#### Procedure

1. Navigate to **All** > **System Diagnostics** > **Upgrade History**.
2. Identify the records that correspond to the upgrade history for the activation of the Software Asset Management Foundation plugin.
   The records in System Upgrades list that represent plugin activation contain the value **n/a** in the **From** field, and plugin name in the **To** field (such as com.snc.samp, com.snc.samp.core, com.snc.sam.core, com.glide.data_services_canonicalization.client, com.snc.asset_management, com.snc.model, com.snc.procurement).

   You can determine the list of related plugins based on the time stamp of when the Software Asset Management plugin was activated by sorting on the **Upgrade started** column.
3. Open a Software Asset Management Foundation plugin upgrade record that has changes skipped.

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4. In the **Upgrade Details** related list, open an Upgraded Details record, and then click **Resolve Conflicts** to view a side-by-side comparison of the base system file with the customized file.
5. Click **Revert to Base System** to overwrite the skipped change if it applies to form or list customization, and note down the changes.
6. Repeat these steps for all upgrade entries with skipped changes relating to customizations.
7. In Software Asset Management Foundation plugin configuration, manually reconfigure your original form and list customizations.
8. In Software Asset Management Foundation plugin configuration, set new field values (added as part of the automatic changes performed by plugin activation) to take advantage of the new features offered.

   a. Navigate to **Software Asset** > **Licensing** > **Software Models**.
      - Select the software product in the **Product** reference field.
      - Select a discovery map, or clear the **Discovery Map** field and set the discovery conditions to find all discovery models that correspond to the software model.

   b. Navigate to **Software Asset** > **Licensing** > **Software Entitlements** (formerly Software Licenses).
      - Navigate to **Software Asset** > **Licensing** > **Software Entitlements** (formerly Software Licenses).
      - Select the **License Metric** that the software license is counted against when reconciliation is run.
      - Define the upgrade and downgrade scenarios covered by certain rights.

   c. In the **User Allocations** and **Device Allocations** related lists (formerly User/Device Entitlements), verify that the number of allocated rights are not more than rights owned. If so, delete allocations so that the number of allocations does not exceed the number of rights owned.

9. If you have entitlements that require management of license keys, you can create multiple license keys associated to the same entitlement, as well as allocate these license keys to a user or device.

## Organization Management

The Organization Management application provides an easy way to perform such asset management tasks as updating users and adding vendors.

It includes managing your vendors and manufacturers, as well as managing locations.

### Create a new vendor or manufacturer

You can create a new vendor, which is a company that sells assets or services that your organization purchases. You can also create a new manufacturer, which is a company that builds assets that your organization purchases.

**Before you begin**
Role required: user_admin and asset

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### Procedure

1. Navigate to one of the following:
   - **Organization** > **Vendors**
   - **Organization** > **Manufacturers**
   - **Organization** > **Companies**
2. Click **New** and create a new record.
3. Complete the form and select either **Manufacturer** or **Vendor**.

> **Note:**
> A company can be considered both a vendor and a manufacturer.

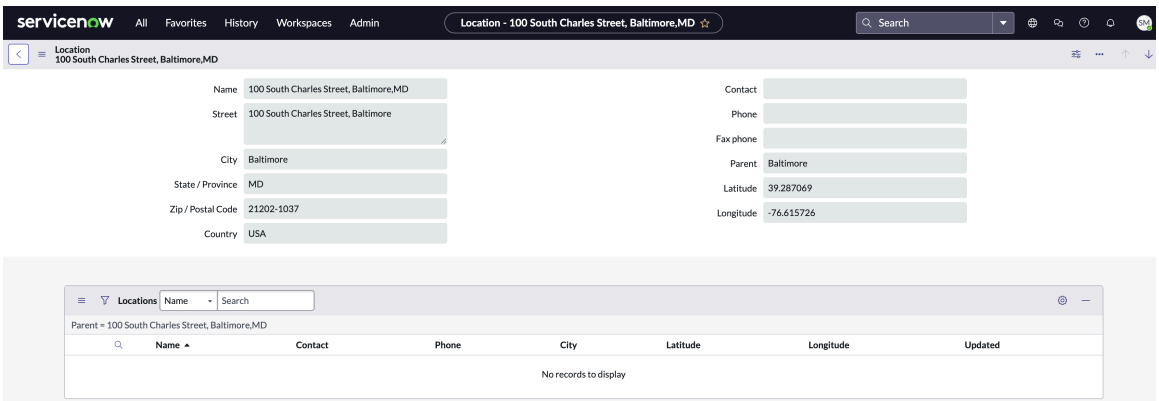
4. Click **Submit**.

## Locations module

The Locations module is the Asset view of the Location table [cmn_location].

In addition to the physical specifics for the location, the Asset view includes the **Stock room** designation and a list of configuration items (CI) in stock at that location.

**Asset location**




# Installed with Model Management

Several types of components are installed with Model Management.

Demo data is available with Model Management.

## Business rules installed with Model Management

Model Management uses a number of business rules.

| Name | Table | Description |
|---|---|---|
| Abort action if no license type | [cmdb_software_product_model] | Ensures that a license type (not a license type group that cannot be handled by counters) has been selected. |
| Calculate display_name | Product Model [cmdb_model] | Sets the **Display name** field when any of the following field values change: **Manufacturer**, **Name**, **Version**, **Edition**. The display name differs depending on whether the |

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| Name | Table | Description |
|---|---|---|
| | | *glide.cmdb_model.display_name.shorten* property is set to **true** or **false**. |
| Date validation | [cmdb_m2m_downgrade_model] | Ensures that the Start date is before the End date. |
| Enforce CI Rules | [cmdb_model_category] | Ensures that categories that track assets as consumables or software licenses do not have a CI class. |
| Flag parent as bundle on creation | [cmdb_m2m_model_component] | Flags a model that has components as a bundle. |
| License Type - Fullname | [cmdb_sw_license_calculation] | Computes the full name of the license type. |
| License validation | Software Upgrade and Downgrades [cmdb_m2m_downgrade_model] | Prevents software upgrades and downgrades from being duplicated and prevents having duplicate upgrades and downgrades for the same license where duplication also involves having the same dates. Also ensures that both the **Upgrade parent** and **Downgrade child** fields are mandatory and that if the **License** field is not empty, either **Upgrade parent** or **Downgrade child** must be equal to the license.model. |
| Protect cmdb_ci_class | [cmdb_model_category] | Prevents CI class from being changed after creation. |
| Protect cmdb_ci_class on insert | [cmdb_model_category] | Prevents creation of a category if another category already exists for the chosen CI class. |
| Protect Contract | [cmdb_model_category] | Prevents changes to the Contract model category record. |
| Set parent's main component link | [cmdb_m2m_model_component] | Populates a read-only reference from the bundle to the component when a bundle component is selected as the main component. |
| Unflag parent on last delete | [cmdb_m2m_model_component] | Removes the bundle flag from a model when the last component is deleted from the bundle. |
| Update model category | [cmdb_ci] | Updates the model categories for the associated model if the model is not already associated with the CI's model category. |
| Validate record before creation | [cmdb_m2m_model_component] | Ensures that a component is not already in a bundle when an attempt is made to add the component to a bundle. |

## Client scripts installed with Model Management

Model Management includes a number of client scripts.

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| Name | Table | Description |
|---|---|---|
| Clear models not matching license | [cmdb_m2m_downgrade_model] | Clears the **Upgrade parent** and **Downgrade child** fields when the **License** field is changed to a license and neither the upgrade or downgrade fields match the license model. |
| Constraints based on asset class | [cmdb_model_category] | Enables or disables bundling options based on the asset class of the category. |
| Hide sections when needed | [cmdb_model] | Shows and hides sections according to what is relevant for a given model. |
| model_category change | [cmdb_model] | Ensures compatibility of classes between the several categories referenced by the same model (client part). |
| Populate downgrade from license | [cmdb_m2m_downgrade_model] | Sets the downgrade child to the software model on the referenced license when an upgrade is selected. Only sets the downgrade to the license if the license is not empty. |
| Populate upgrade from license | [cmdb_m2m_downgrade_model] | Sets the upgrade parent to the software model on the referenced license when a downgrade is selected. Only sets the upgrade to the license if the license is not empty. |

## Properties installed with Model Management

Model Management includes the property *`glide.cmdb_model.display_name.shorten`*.

| Name | Description |
|---|---|
| *`glide.cmdb_model.display_name.shorten`* | When set to **true**, generates shorter display names for models by eliminating duplication of the manufacturer name. Consider the following model, for which **Manufacturer** is set to **Spotify** and **Name** is set to **Spotify Premium**.<br><br>The **Display name** field is set as follows, based on the property setting.<br>• false: Display name is Spotify Spotify Premium<br>• true: Display name is Spotify Premium<br><br>For software models, the edition and version are also included in the name, if they are specified. |

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| Name | Description |
| --- | --- |
| | • Type: true \| false<br>• Default value: false<br>• Location: System Properties [sys_properties] table |

## Script includes installed with Model Management

Model Management includes script includes.

| Name | Description |
| --- | --- |
| ModelAndCategoryFilters | Refines reference qualifiers for models and model categories based on class. |
| ModelCategoryCheck | Ensures compatibility of classes between the several categories referenced by the same model. |

## Tables installed with Model Management

Model Management includes numerous tables.

| Table | Description |
| --- | --- |
| Application Model [cmdb_application_product_model] | Stores models used to describe software application products. |
| Consumable Model [cmdb_consumable_product_model] | Describes consumable product models. |
| Contract Model [cmdb_contract_product_model] | Stores all contract models. |
| Depreciation [cmdb_depreciation] | Stores asset depreciation patterns. |
| Hardware Model [cmdb_hardware_product_model] | Describes hardware product models. |
| Model Category [cmdb_model_category] | Defines groups of assets, consumables, product bundles, and configuration items. |
| Model Compatibility [cmdb_m2m_model_compatibility] | Stores many-to-many relationship between two models signifying their compatibility with one another. |
| Model Component [cmdb_m2m_model_component] | Stores many-to-many relationship between two models signifying that they form a bundle. |
| Product model [cmdb_model] | Describes all kinds of product models. |
| Software License Calculation [cmdb_sw_license_calculation] | Defines commonly used software licensing patterns. |
| Software Model [cmdb_software_product_model] | Describes software product models. |
| Software Suite [cmdb_m2m_suite_model | Stores many-to-many relationship between two models that defines elements of a software suite. |

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| Table | Description |
|---|---|
| Software Upgrade and Downgrades [cmdb_m2m_downgrade_model] | Stores many-to-many relationship between two models signifying that being licensed for one model grants rights to the other as well. |

### UI policies installed with Model Management

Model Management includes UI policies.

| Name | Table | Description |
|---|---|---|
| Hide unverified | Model Category [cmdb_model_category] | Shows the **Enforce CI verification** field if the **Asset class** and **CI class** fields are not empty. |
| Lock fields for Contract and Work<br><br>Lock fields for Contract | Model Category [cmdb_model_category] | Sets all fields on the Model Category form to read-only if the **Name** is **Contract** or, **Work Order** or **Work Task**. |
| Protect model category | Product Model [cmdb_model] | Makes the **Model categories** field mandatory and read-only if it contains any of the following values: **Software License**, **Contract**, **Work Order**, **Work Task**. |
| Show is an option if Oracle | Software Model [cmdb_software_product_model] | Shows the **Is an option** field if the selected **Manufacturer** name starts with **Oracle**. |

### User roles installed with Model Management

Model Management includes user roles.

| Role | Contains Roles | Description |
|---|---|---|
| category_manager | model manager | Can create, edit, and delete model categories. |
| model_manager | none | Can create new CMDB models. The model manager role can control the base models and any model extensions that are not hardware, software, or consumables. Hardware and consumable models are controlled by the asset manager (asset) role. Software models are controlled by the software asset manager (sam) role. |

## Installed with Asset Management

Several tables, user roles, UI policies, script includes, client scripts, and business rules are installed with Asset Management.

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Demo data is available with asset management. The demo data provides information such as users, assets, and individual stockrooms.

## Tables

Asset Management includes the following tables.

### Asset Management tables

| Table | Description |
|---|---|
| Asset [alm_asset] | Stores general, financial, and contractual information about assets. |
| Asset Entitlement [alm_entitlement_asset] | Enables ServiceNow to categorize the Asset Entitlement table and enforce how entitlements behave. |
| Consumable [alm_consumable] | Stores data about consumable assets (previously known as parts). |
| Default Stockroom [alm_user_stockroom] | Stores the relationship between a user and their default stockroom. |
| Fixed Assets [alm_fixed_assets] | Stores fixed assets, which are containers that can hold multiple assets. |
| Fixed asset to asset [m2m_fixed_asset_to_asset] | Stores associations between fixed assets and assets. |
| Hardware [alm_hardware] | Stores general, financial, and contractual information about hardware assets. |
| License Entitlement [alm_entitlement] | Stores entitlements that permit users or machines to use a software license. |
| Software License [alm_license] | Stores general, financial, and contractual information about software license assets. |
| Stock Rule [alm_stock_rule] | Transfers stock or sends an email message to the asset manager when a specified asset drops below a set threshold. |
| Stockroom [alm_stockroom] | Stores information about stockrooms. |
| Stockroom Model [alm_m2m_stockroom_model] | Tracks all models that have ever been stocked in a stockroom. This table is automatically populated. |
| Stockroom Type [alm_stockroom_type] | Stores general information about stockroom types. |
| Transfer Order [alm_transfer_order] | Contains data about transfer orders, including the state and stockrooms.<br><br>**Note:** The inventory_user, asset, or procurement_user role can only access the reports. You must activate the Procurement (com.snc.procurement) plugin for the inventory_user, asset, and procurement_user roles. |
| Transfer Order Line [alm_transfer_order_line] | Contains data about individual assets being shipped with a transfer order. |

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**Asset Management tables (continued)**

| Table | Description |
|---|---|
| User Entitlement [alm_entitlement_user] | Enables ServiceNow to categorize the User Entitlement table and enforce how entitlements behave. |

## User roles

Asset Management includes the following user roles.

**Asset Management user roles**

| Role | Contains roles | Tasks |
|---|---|---|
| asset (Asset Manager) | • category manager<br>• contract manager<br>• financial mgmt user<br>• inventory user<br>• procurement user | • Manage hardware and consumable assets ([alm_hardware] and [alm_consumable]).<br>• Asset manager can't edit asset records that are created and updated automatically, but can read and delete the asset records when needed.<br>• Create requests.<br>• Create and delete stock information.<br>• Access to requests, purchase orders, and base system catalog tasks. |
| inventory_admin | inventory user | • Create and delete stock information.<br>• Edit stock rules, stockrooms, and stockroom types. |
| inventory_user | none | • Access stock information.<br>• Create and manage transfer orders. |
| sam | • contract manager<br>• model manager<br>• financial mgmt user | • Create, edit, change, and manage software licenses.<br>• Edit the Software model field on a Discovery models and software installations.<br>• Approve a model. Has full control of the Software Asset Management application.<br>• Controls the Software Asset Management IBM PVU Process Pack, if activated. |

## UI policies

Asset Management includes the following UI policies.

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### Asset Management UI policies

| Name | Table | Description |
|---|---|---|
| Hide asset tag and serial num | [alm_asset] | Hides the asset tag when the asset is pre-allocated and the quantity is greater than 1. |
| Hide/show parent stockroom on Stockroom Replenish | [alm_stock_rule] | Shows the Parent stockroom field only when the Restocking option field is set to Stockroom. |
| Make allocated to and assigned to required. | License Entitlement [alm_entitlement] | Makes the Allocated to and Assigned to fields required. |
| Make substatus read-only when not required | [alm_asset] | Sets the Substatus to read-only if the State is On order, In use, Consumed, or In maintenance. |
| Model bundle field hidden but present for UI Policy conditions purposes | [alm_asset] | Hides the Model Bundle field. Exists on page only for use by UI policies and client scripts. |
| Pre-allocated constraints | [alm_asset] | Hides unneeded fields and related lists when the asset is pre-allocated. |
| Quantity readonly until model and category qualify the asset and are not bundle | [alm_asset] | Sets the Quantity field to read-only for assets that aren't consumable, software, or pre-allocated. Quantity is also read-only if the model or model category fields are empty. |
| Show 'Assigned to' | [alm_asset] | Shows the Assigned to field if the State field is notOn order, In stock, or In transit. |
| Show 'Reserved for' | [alm_asset] | Shows the Reserved for field if the State field is On order, In stock, or In transit. |
| Show 'Stockroom' | [alm_asset] | Shows the Stockroom field if either of the following conditions is true:<br>• The State field is In stock and Substate isn't Pre-allocated.<br>• The Substate is Pre-allocated and Parent is empty. |

## Script includes

Asset Management includes the following script includes.

### Asset Management script includes

| Name | Description |
|---|---|
| AssetandCI | Code for creating and managing the relationship between asset and CI records. |
| AssetAndCISynchronizer | Synchronization code between asset and CI records. |
| AssetUtils | Utility functions for asset management. Also checks if a license can be merged and then merges licenses if requirements are met. |

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### Asset Management script includes (continued)

| Name | Description |
|---|---|
| AssetUtilsAJAX | AJAX-based utility functions for asset management. Call the AssetUtils script include from a client-side UI action. |
| Consumables | Code to change (for example, consume, split, and merge) consumables. |
| FixedAssetUtils | Methods for rolling up fixed asset costs. |
| PortalFilters | Filters used in the My Assets portal. |
| PreAllocatedAssets | Code to change pre-allocated assets. |
| StockRuleFilters | Reference qualifier code for filtering options on reference fields on stock rules. |
| StockRuleTransfer | Transfer order creation code for when stock rules are triggered. |
| TransferOrderDateTimeAjax | Date comparison utility for transfer orders. |
| TransferOrderFilters | Reference qualifier code for reference field filtering options on transfer orders. |
| TransferOrderFinder | Finds an appropriate transfer order to put a transfer order line into. |
| TransferOrderHelper | Function that checks if a transfer order has multiple transfer order lines. |
| TransferOrderLineFilters | Reference qualifier code for reference field filtering options on transfer order lines. |
| TransferOrderReceiver | Code for receiving a transfer order line. |
| TransferOrderReturn | Code for returning a transfer order line. |
| TransferOrderStageHandler | Code for changing transfer order stages and transfer order line stages. |
| TransferOrderStageHelper | Helper method to get numeric stages for transfer orders and transfer order lines. |

## Client scripts

Asset Management includes the following client scripts.

### Asset Management client scripts

| Name | Table | Description |
|---|---|---|
| Correct substatus | [alm_asset] | Updates the Substatus field when the Status field is modified. |
| Ensure no negative quantity | [alm_asset] | Clears the Quantity field when set to less than 1. |
| Error on pre-allocated substatus | [alm_consumable] | Prevents Substatus field from being set to be Pre-allocated for consumable assets. Also displays an error message. |

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### Asset Management client scripts (continued)

| Name | Table | Description |
|---|---|---|
| Error on pre-allocated substatus | [alm_license] | Prevents Substatus field from being set to be Pre-allocated for license assets. Also displays an error message. |
| Null out allocated_to | [alm_entitlement] | Does the following when the Assigned to field is set:<br>• Clears the Allocated to field and makes it not required.<br>• Makes the Assigned to field required. |
| Null out assigned_to | [alm_entitlement] | Does the following when the Allocated to field is set:<br>• Clears the Assigned to field and makes it not required.<br>• Makes the Allocated to field required. |
| Salvage must be less than cost | [alm_asset] | Displays a warning if a salvage value greater than the cost of an asset is entered. |
| Set Cost of the Asset | [alm_asset] | Populates the Cost field when the Model field is set. |
| Set Loc/ CC/Dep/Com from assigned to | [alm_asset] | Populates the Location, Cost center, Department, and Company fields when the Assigned to field is set. |
| Set Location from stockroom | [alm_asset] | Populates the Location field when the Stockroom field is set. |
| Update From Location from Stockroom | [alm_transfer_order] | Populates the From location field when the From stockroom field is set. |
| Update Model and Quantity based on Asset | [alm_transfer_order_line] | Populates the Model field when the Asset field is set. If the asset is a pre-allocated asset, this client script also populates the Quantity field. |
| Update To Location from Stockroom | [alm_transfer_order] | Populates the To location field when the To stockroom field is set. |
| Update UI on load and model change | [alm_transfer_order_line] | Runs checks, and updates the user interface, when the transfer order line form is loaded and when a model is selected. |
| Validate Delivery by Date | [alm_transfer_order] | Validates that the delivery date is in the future. |
| Verify Stock Available | [alm_transfer_order_line] | Verifies that stock exists to fulfill the quantity requested. |

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### Asset Management client scripts (continued)

| Name | Table | Description |
|---|---|---|
| Verify Stock Available (Stockroom) | [alm_transfer_order_line] | Verifies that stock exists to fulfill the quantity requested when the From stockroom value changes. |

## Business rules

Asset Management includes the following business rules.

### Asset Management business rules

| Name | Table | Description |
|---|---|---|
| Allocated more licenses than rights | Software License [alm_license] | Prevents creation or update of a license if the number of licenses allocated is larger than the total rights. |
| Asset Retirement | Asset [alm_asset] | Clears the Assigned to, Stockroom, and Reserved for fields and sets the retirement date to the current time when the asset is retired. |
| Automatically Change TOL State | Transfer Order Line [alm_transfer_order_line] | If a transfer order has the same From stockroom and To stockroom and it's a personal stockroom, this business rule:<br>• Sets the transfer order line Stage to Delivered.<br>• Sets the asset Substate to Reserved.<br><br>If a transfer order has the same From stockroom and To stockroom and it isn't a personal stockroom, this business rule:<br>• Sets the transfer order Stage to Received.<br>• Sets the asset Substate to Pending transfer. |
| Build bundle components on Insert | Asset [alm_asset] | Creates assets for the components related to a bundle if the model of the created asset is a bundle. |
| Clear Assigned To on update | Asset [alm_asset] | Clears the Assigned to field if the State field changes to On order, In stock, or In transit. |
| Clear fields irrelevant for preallocated | Asset [alm_asset] | Clears the value of fields that are irrelevant for pre-allocated assets. |
| Create Asset on insert | Configuration Items [cmdb_ci] | Creates a corresponding asset when a new configuration item with no asset is created. |
| Create asset on model change | Configuration Items [cmdb_ci] | Creates a new associated asset when the Model ID field changes. |
| Create CI on insert | Asset [alm_asset] | Creates a corresponding configuration item when a new asset with no configuration item is created. |

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### Asset Management business rules (continued)

| Name | Table | Description |
|---|---|---|
| Create Stockroom Model Relation | Asset [alm_asset] | Creates a record (if none exists) in the Stockroom Model table indicating the stockroom that holds the model when an asset is created or updated. |
| Delete all Transfer Order Lines | Transfer Order [alm_transfer_order] | Deletes all related transfer order lines when a transfer order is deleted. |
| Ensure Entitlements do not exceed rights | License Entitlement [alm_entitlement] | Checks that the total number of entitlements for the related license doesn't exceed the number of rights given by the license when an entitlement is created. |
| GenerateAssets | Model Categories [cmdb_model_category] | Executes a scheduled script job to create assets for configuration items. |
| Inherit information from parent | Asset [alm_asset] | Assigns some parent values to the asset when assigning a new parent to an asset. |
| Managed Stockroom for Vendor | Stock Rule [alm_stock_rule] | Validates that a vendor replenishing stock rule has a stockroom selected and the stockroom has an related manager with a valid email address. |
| Mandate allocated to or assigned to | License Entitlement [alm_entitlement] | Makes a value in either the Allocated to field or the Assigned to field required. |
| Merge Records | Consumable [alm_consumable] | Merges consumables that have matching fields and aren't In Transit into one record containing the total count. |
| Null out asset on insert and stay | Configuration Items [cmdb_ci] | Clears the Asset field on insert when the field includes an asset that has a CI. |
| Null out Ci on insert and stay | Asset [alm_asset] | Nulls out the asset field so a new asset is created for the CI when an insert is performed on an existing CI. |
| Populate reserved for field | Transfer Order Line [alm_transfer_order_line] | If the transfer order line has an related request line, this business rule populates the related asset's Reserved for field with the appropriate information from the request line. |
| Push Status to Asset/ Consumable | Transfer Order Line [alm_transfer_order_line] | Changes the corresponding asset to reflect the current state of transit when a transfer order line moves to another state. |
| Release Asset on TOL cancel/ delete | Transfer Order Line [alm_transfer_order_line] | Places the corresponding asset back into stock and unsources the part requirement when a transfer order line in the draft state is canceled or deleted. |
| Rollup TOL cancellation to TO | Transfer Order Line [alm_transfer_order_line] | Signals to the corresponding transfer order that the transfer order line has been canceled. |

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### Asset Management business rules (continued)

| Name | Table | Description |
|---|---|---|
| Salvage value must be less than cost | Asset [alm_asset] | Prevents saving an asset record if the salvage value is greater than the cost. |
| Sanity check on pre-allocated | Asset [alm_asset] | Prevents creation or update of pre-allocated assets if they don't satisfy the conditions to be pre-allocated. |
| Set Class | License Entitlement [alm_entitlement] | Sets the class for this entitlement depending on the entitlement is assigned or allocated. |
| Set Transfer Order Type | Transfer Order [alm_transfer_order] | Sets the type of the transfer order depending on whether there's a related service order or work order task. |
| Sync model category | Product Models [cmdb_model] | When the model category changes, this business rule creates assets if they didn't previously exist for configuration items associated with the model. |
| Transfer Order Stockroom Rules | Transfer Order [alm_transfer_order] | Prevents the From stockroom field from being changed if the transfer order has multiple transfer order lines. |
| Transition reserved to assigned | Asset [alm_asset] | Populates the Assigned to field with the value from the Reserved for field when the asset is in the appropriate state. |
| Trickle information down to components | Asset [alm_asset] | Updates components of an asset to reflect any changes that have been made to the asset record. |
| Update Asset fields on change | Configuration Items [cmdb_ci] | Synchronizes fields so changes made on the Configuration Item form trigger the same update on the corresponding Asset form, ensuring consistent reporting. You must update statuses on the Asset form. |
| Update CI fields on change | Asset [alm_asset] | Synchronizes fields so changes made on the Asset form trigger the same update on the corresponding Configuration Item form, ensuring consistent reporting. |
| Update location as needed | Asset [alm_asset] | Updates the location of the asset, if the asset is set to a new stockroom or assigned to a new user. |
| Validate Field Agent Type | Stockroom [alm_stockroom] | Ensures that you don't create a stockroom of the type Field Agent without Work Management or Field Service Management activated. Allows for only one personal stockroom per user. |
| Validate TOL and check availability | Transfer Order Line [alm_transfer_order_line] | Validates changes made to the transfer order line and checks the availability of the assets to be transferred in the specified stockroom. |
| Validate transfer order | Transfer Order [alm_transfer_order] | Validates that the Delivery by date isn't earlier than the current date. |

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**Asset Management business rules (continued)**

| Name | Table | Description |
|---|---|---|
| Validate Unique Users | Default Stockroom [alm_user_stockroom] | Prevents the creation of multiple records with the same user. |
| Verify Entitlement (Allocated) | License Entitlement [alm_entitlement] | Ensures that the allocation of the entitlement follows the allocation condition on the license when a condition exists. |
| Verify Entitlement (Assigned) | License Entitlement [alm_entitlement] | Ensures that the assignee of the entitlement follows the assignment condition on the license when a condition exists. |
| Verify Entitlements (Allocated) | Software License [alm_license] | Ensures that the allocations of all the license's entitlements follow the allocation condition on the license when a condition exists. |
| Verify Entitlements (Assigned) | Software License [alm_license] | Ensures that the assignees of all the license's entitlements follow the assignment condition on the license when a condition exists. |
| Verify Not Field Agent | Default Stockroom [alm_user_stockroom] | Verifies that the selected default stockroom isn't of the Field Agent type. |

## Domain separation and Asset Management

Domain separation is supported in Asset Management. Domain separation enables you to separate data, processes, and administrative tasks into logical groupings called domains. You can control several aspects of this separation, including which users can see and access data.

### Support level: Basic

- Business logic: Ensure that data goes into the proper domain for the application's service provider use cases.
- The application supports domain separation at run time. The domain separation includes separation from the user interface, cache keys, reporting, rollups, and aggregations.
- The owner of the instance must set up the application to function across multiple tenants.

Sample use case: When a service provider (SP) uses chat to respond to a tenant-customer's message, the customer must be able to see the SP's response.

For more information on support levels, see Application support for domain separation.

**Related topics**

Domain separation for service providers

### Domain separation and lifecycle reports

There are certain domain separation aspects to consider when running software lifecycle reports.

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## Software Asset Management overview

In a domain-separated environment, the software lifecycle report is generated at the level at which the Service Provider (SP) is managing compliance for their customers' environment. Typically, the level at which reconciliation is run indicates such compliance, and the software lifecycle report is generated at the same level.

The following table shows how the reconciliation should behave. In this example:

- The SP is managing Cisco's software asset management (SAM) program at the Cisco corporate level. That means the lifecycle report must run at the Cisco corporate level.
- The SP is managing Walmart's SAM program for each Walmart division (US and Mexico). That means the lifecycle report must run at the Walmart division level.

Here is the SP hierarchy:

- Cisco Corporate
  - Cisco USA
  - Cisco Mexico
- Walmart Corporate
  - Walmart USA
  - Walmart Mexico

| Domain settings (reconciliation/ normalization) | Compliance reporting | Lifecycle report level |
|---|---|---|
| TOP/Cisco | True | Yes |
| TOP/Cisco/US | False | |
| TOP/Cisco/Mexico | False | |
| TOP/Cisco/Germany | False | |
| TOP/Walmart | False | |
| TOP/Walmart/US | True | Yes |
| TOP/Walmart/Mexico | True | Yes |

If the SP sets up software models for Cisco corporate as well as Cisco Mexico, even though their intent is to manage compliance for Cisco at the Cisco Corporate level, the lifecycle report may show duplicate lifecycle records with the same install count.

### Lifecycle report

| Model domain | | Date | | Software Model | Domain |
|---|---|---|---|---|---|
| Cisco | SQL Server 2012 | 2014 | 10 | SQL Server 2012 | Cisco |
| Cisco Mexico | SQL Server 2012 | 2014 | 10 | SQL Server 2012 | Cisco |
| Walmart USA | SQL Server 2012 | 2014 | 5 | | |

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**Lifecycle report (continued)**

| Model domain | | Date | | Software Model | Domain |
|---|---|---|---|---|---|
| Walmart Mexico | SQL Server 2012 | 2014 | 20 | | |

To learn more about software lifecycles, see Create software models in Software Asset Management classic. To learn about domain separation path setup, see Domain separation setup and administration.

## Quick start test for Asset Management

Validate that Asset Management still works after you make any configuration change such as apply an upgrade or develop an application. Copy and customize these quick start tests to pass when using your instance-specific data.

### Asset Management

Asset Management quick start tests requires the Asset Management plugin (com.snc.asset_management).

**Asset Management test**

| Name | Description | Release version |
|---|---|---|
| Asset Sourcing - Consume local asset stock | Validates the consume local asset stock flow. | Washington DC |

**Related topics**

Quick start tests

## Contract Management

Manage and track contracts with the ServiceNow® Contract Management application.

A contract is a binding agreement between two parties. In the ServiceNow platform, contracts contain detailed information such as the following:

- Contract number
- Contract start and end dates
- Active status
- Terms and conditions statements
- Documents
- Renewal information
- Financial terms

Contract Management is active by default. If the Cost Management plugin is activated, the Contract Management application integrates with the Cost Management plugin to associate contracts with costs and determine the total cost of ownership. You can track recurring expenses with expense lines. An administrator can activate the Cost Management plugin.

If you are using the Software Asset Management plugin, use the Software Licenses option.

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### Related topics

- Create a new expense line
- Terms and conditions
- Software Asset Management

## Use the Asset Contract Overview module

You can view information about your contract status in the Contract Management Overview module.

### Before you begin

Role required: asset, contract_manager

### About this task

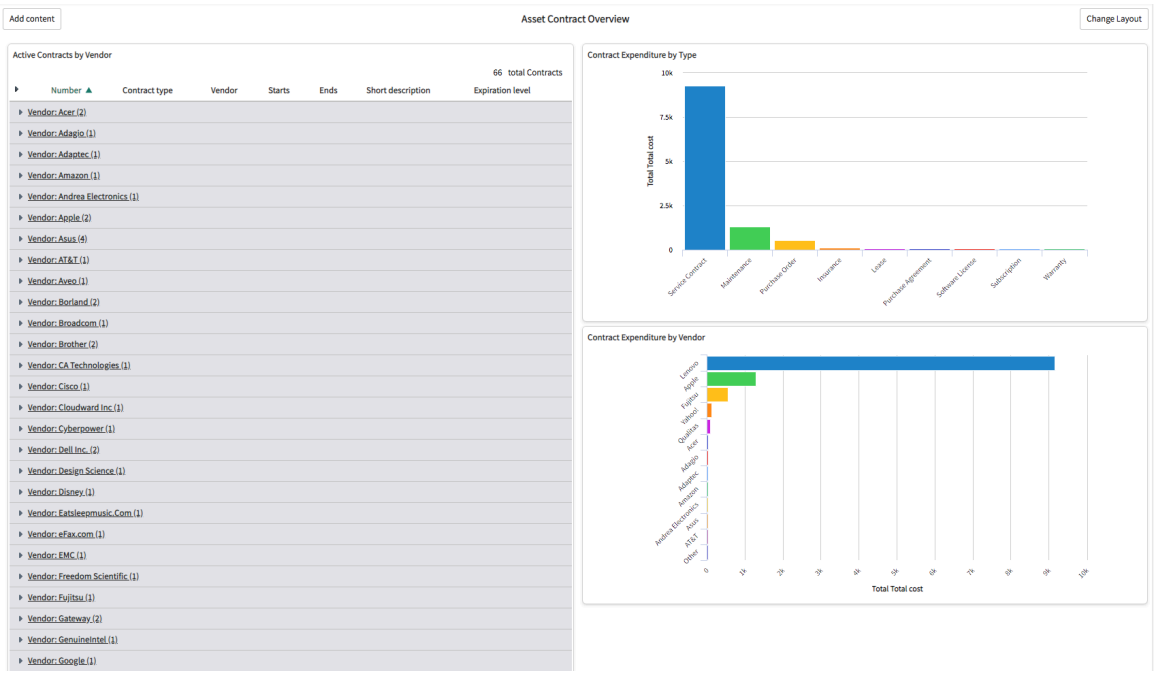
Because the Contract Management Overview module is a type of homepage, you can add, delete, and rearrange reports on the page.

### Procedure

1. Navigate to **All** > **Contract** > **Overview**.
2. Click elements within the reports to obtain more information.

#### Example

For example, click any of the colored bars in the **Contract Expenditure by Type** bar chart to see detailed information.




## Components installed with Contract Management

Several types of components are installed with Contract Management.

Demo data is available.

### Tables installed with Contract Management

Tables are added with Contract Management.

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| Table | Description |
|---|---|
| Asset Covered [clm_m2m_contract_asset] | Lists the assets covered by a contract. An asset can be covered by multiple contracts and a contract can have multiple assets.<br><br>**Note:**<br>The contract_manager, itil, inventory_admin, or procurement_user role can only access the reports. You must activate the Procurement (com.snc.procurement) plugin for the procurement_user role and the Hardware Asset Management Professional (com.sn_hamp) plugin for the itil and inventory_admin roles. |
| Asset Covered [clm_m2m_rate_card_asset] | Lists the rate cards that apply to an asset. |
| Condition [clm_condition_checker] | Lists the conditions and values for each condition checker. |
| Condition Checks [clm_condition_check] | Stores conditions and values that modify specified condition fields. |
| Contract [ast_contract] | Stores contract information. |
| Contract History [clm_contract_history] | Stores a copy of the contract when the start date, end date, or terms and conditions change. |
| Terms and Conditions [clm_terms_and_conditions] | Lists the terms and conditions used by contracts. |
| Terms and Conditions [clm_m2m_contract_and_terms] | Lists all terms and conditions available for use with contracts. |
| Users Covered [clm_m2m_contract_user] | Lists the users covered by contracts. |

### User roles installed with Contract Management

A user role is added with Contract Management.

| Role | Contains Role | Description |
|---|---|---|
| contract_manager | financial_mgmt_user | Manages the contract life cycle. Can create, edit, and delete contracts. |

### Script includes installed with Contract Management

Script includes are added with Contract Management.

| Name | Description |
|---|---|
| ConditionChecks | Checks for matching conditions, such as for contract expirations and license compliance, defined in the Condition Checks [clm_condition_check] table. |
| ContractManagementUtils | Utilities that manage contract management actions, such as state transitions. |

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### Client scripts installed with Contract Management

Client scripts are added with Contract Management.

| Name | Table | Description |
|---|---|---|
| Calculate Tax Cost - Base cost | Contract [ast_contract] | Calculates the **Tax cost** field and the **Total cost** field on the Contract form when the **Payment amount** field changes. |
| Calculate Tax Cost - Sales tax | Contract [ast_contract] | Calculates the **Tax cost** field and the **Total cost** field on the Contract form when the **Sales tax** field changes. |
| Calculate Tax Cost - Tax rate | Contract [ast_contract] | Calculates the **Tax cost** field and the **Total cost** field on the Contract form when the **Tax rate** field changes. |
| Ensure discount is valid percent | Contract [ast_contract] | Ensures that the **Discount** field does not contain a value less than zero or greater than 99. |
| Renew Cost Adjustment | Contract [ast_contract] | Sets the **Percentage** field on the Contract form to zero if the user sets a dollar amount for the cost adjustment. |
| Renew Cost Percentage | Contract [ast_contract] | Sets the **Amount** field on the Contract form to zero if the user enters a percentage for the cost adjustment. |
| Tax exempt/ rate | Contract [ast_contract] | Changes all tax-related fields on the Contract form to read-only if the **Tax Exempt** check box is selected. |
| Tax rate/exempt | Contract [ast_contract] | Changes all tax-related fields on the Contract form to writeable if the **Sales Tax** check box is selected. |

### Business rules installed with Contract Management

Business rules are added with Contract Management.

| Name | Table | Description |
|---|---|---|
| Calculate projected costs (Reports) | Contract [ast_contract] | Calculates the projected monthly and annual costs for a contract when costs or payment schedule changes. |
| Calculate totals with tax | Contract [ast_contract] | Calculates the **Tax cost** and **Total cost** fields for a contract when the contract is created or updated. |
| Contract history | Contract [ast_contract] | Stores history when the start, end, or terms and conditions of a contract change. |
| Create approval record | Contract [ast_contract] | Updates contract **Terms and Conditions** and starts the contract approval workflow when a contract is sent for review. |
| Flag terms and conditions | Terms and Conditions [clm_m2m_contract_and_terms] | Sets the **Use** flag on a Terms and Conditions record to **true** after the record is associated with a contract or to **false** after the record is disassociated from a contract. |
| Activate count for manual licenses | Software License Instance [ast_license_software_instance] | Calculates and updates the number of computers a particular license is installed on when a software license instance is created or deleted. |

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| Name | Table | Description |
|---|---|---|
| Manage contract lifecycle | Contract [ast_contract] | This business rule:<br>• Updates the end date of a contract when a contract extension has been approved.<br>• Renews the contract, updating its start date, end date, and base cost (if cost adjustments must be applied) when a contract renewal has been approved and the renewal has reached its start date.<br>• Runs the condition checks to evaluate if dates need to be changed when a contract is approved, or an extension or renewal is approved, or the start or end dates have changed. |
| Post outage to news | Service [cmdb_ci_service] | Posts a news article on the knowledge table when there is an outage. |
| Update contract cost per asset | Asset Covered [clm_m2m_contract_asset] | Updates the cost per unit value based on the total cost and number of assets associated to the contract. |
| Update contract lifetime cost | Contract Rate Card [fm_contract_rate_card | Calculates the lifetime cost of the contract by calculating the sum of the contract expense lines. |
| Updates after contract dates change | Contract [ast_contract] | Updates the **Date added** and **Date removed** fields for all assets and users associated with a contract if the contract end date changes. |
| Updates after rate card dates change | Contract Rate Card [fm_contract_rate_card] | Updates the related contract assets and users linked to the rate card when the end date is changed. |
| Verify contract's start and end dates | Contract [ast_contract] | Validates contract start and end dates and contract renewal start and end dates. |
| Verify purchase agreement discount price | Contract [ast_contract] | For contracts with the contract model **Purchase Agreement**, the business rule validates that the **Discount** field does not contain a value less than zero or greater than 99. |

## Contract renewal workflow

Use the contract renewal workflow to renew contracts that are nearing their expiry date or are already expired. This workflow enables you to renew contracts through a streamlined and managed process.

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Renew your contracts by creating, validating, approving, and activating a contract record that references the original contract. This workflow enables you to manage related entities like hardware assets, software entitlements, terms and conditions, and rate cards.

**Note:**
The contract renewal workflow supports Software license, Subscription contract, Maintenance, and Warranty contract models.

Complete the following tasks in the contract renewal workflow to renew your contracts:

1. Contract renewal request: Create a contract renewal request for contracts that are nearing their expiry date or are already expired.
2. Contract selection: Renew multiple child contracts under the parent contract.
3. Build renewal: Supply the contract renewal information.
4. Asset selection: Add or remove hardware or enterprise assets from the contract renewal process, and view the assets carried over to the new contract.
5. Software assets selection: Add or remove software entitlements that you want to include in the contract renewal process, and view the entitlements carried over to the new contract.
6. Terms and conditions: Update the terms and conditions in your new contract, and view the terms and conditions carried over to the new contract.
7. Rate cards: Add rate card details to the new contract to track contract expenses.
8. Renewal confirmation: Review the renewal details after completing all the details of a contract.
9. Renewal approval: Approve or reject a contract renewal request for all Contract Renewal Request Lines.
10. Renewal purchase order: Receive the purchase order for assets covered in the contract.

**Note:**

- You can't edit a task after you close it.
- You can cancel a contract renewal process for a Contract, Contract Renewal Request, Contract Renewal Request Lines, and Contract Renewal tasks. For more information, see Results of canceling a contract renewal process.

## Prerequisites

Before using the contract renewal workflow, you must complete the following prerequisites:

- Activate the Software Asset Management Professional (com.snc.samp) plugin on your ServiceNow instance.

  If you want to manage hardware or enterprise asset contracts, request and install the Hardware Asset Management or Enterprise Asset Management application from the ServiceNow Store instead.

- Enable the *sn_contract_enable_renewal_flow* system property.

  **Note:**
  If you're already using Software Asset Management, Hardware Asset Management, or both, this system property is set to false. If you're a new user, this system property is set to true.

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## Domain separation

Domain separation with data separation is supported for the contract renewal workflow with the following requirements:

- The request is created in the domain of the contract that initiated the renewal process.
- Request lines are in the domain of the contract of the request line.
- Tasks are created in the domain of the contract being renewed.

The *sn_contract_enable_renewal_flow* system property also supports domain separation.

### Create a contract renewal request

Create a contract renewal request for contracts that are nearing their expiry date or are already expired.

#### Before you begin

Role required: asset, contract_manager (core UI and Hardware Asset Workspace only), sn_eam.enterprise_admin (Enterprise Asset Workspace only), or sn_eam.enterprise_asset_manager (Enterprise Asset Workspace only)

#### About this task

You can create a renewal request only for Maintenance, Warranties, Subscriptions, and Software Licenses. If you have installed only the Software Asset Management application, you can renew Subscriptions, Maintenance, and Software Licenses contracts. If you have installed only the Hardware Asset Management application, you can renew Maintenance and Warranties contracts. If you have installed only the Enterprise Asset Management application, you can renew Maintenance and Warranties contracts.

#### Procedure

1. Open the list of contracts that you want to renew.
   - If you are using the core UI, navigate to **All** > **Contracts** > **Contract Renewal**.
   - If you are using the Hardware Asset Workspace, open the Contract management view and then select the **Overview** tab. In the Contract overview section, locate the Expiring contract widget.

     Alternatively, open the Contract management view and then select a tab for a contract type, such as **All** or **Maintenance**.
   - If you are using the Enterprise Asset Workspace, open the Contract and lease management view and then select the **Overview** tab. In the Contract overview section, locate the Expiring contract widget.

     Alternatively, open the Contract and lease management view and then select a tab for a contract type, such as **All** or **Maintenance**.
2. Select the contract that you want to renew with a type of either Maintenance, Warranties, Subscriptions, Software Licenses, or Service.
3. Click **Renew** for the selected contract.
4. Submit the contract renewal request.

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- If you are using the core UI or Hardware Asset Workspace, click **OK**.

  The contract renewal request includes the following information:

  - An auto-generated unique number
  - The Stage indicating the type of task in the contract renewal process
  - Reference to the contract for which you have requested the renewal
  - Date and time when the request was created

- If you are using the Enterprise Asset Workspace, the Renew the Contract dialog box appears. In the dialog box, fill in the fields and then click **Submit for review**.

**Renew the Contract dialog box**

| Field | Description |
|---|---|
| Approver | User who approves or rejects the contract renewal request. |
| Options | Duration of the contract renewal. |
| Renewal start date | Date on which the contract renewal begins. |
| Renewal end date | Date on which the contract renewal ends. |
| Cost adjustment type | Type of cost adjustment that is applied to the contract. The options are **Fixed**, **Manual**, and **CPI** (consumer price index). |
| Cost adjustment percentage | Percentage increase or decrease in the contract price. To indicate a decrease in price, enter a negative percentage.<br>**Note:** You can specify either a cost adjustment percentage or cost adjustment amount on a contract renewal request. You cannot specify both. |
| Cost adjustment amount | Numerical increase or decrease in the contract price. To indicate a decrease in price, enter a negative number.<br>**Note:** You can specify either a cost adjustment percentage or cost adjustment amount on a contract renewal request. You cannot specify both. |

5. **Optional:** Select the **Contract Renewal Request Lines** tab to view the parent Contract Renewal Request Line or existing and valid child contracts under the parent contract. A contract renewal request line is created for each contract that is being renewed.
6. **Optional:** View all open contract renewal flow tasks and the details of each contract renewal task by selecting the **Open Tasks** tab.
7. **Optional:** View all contract renewal flow tasks and the details of each contract renewal task by selecting the **All Tasks** tab.

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### Result
The substate of the contract that is being renewed is set to **Renewal in process**.

### What to do next
If the parent contract doesn't have child contracts, select the Build renewal task.

If the parent contract has child contracts, select the Contract selection task.

#### Renew multiple child contracts

Renew multiple child contracts under the parent contract by using the Contract selection task.

### Before you begin
Role required: asset, contract_manager

### About this task
This task is created only when the contract that you want to renew has valid child contracts supported by the contract renewal workflow that are not already renewed or in draft state.

### Procedure
1. On the Contract form, select the **Contract Renewal Requests** tab in the Related Links section to view the list of contract renewal requests.
2. Select a renewal request.
3. View all the child contracts linked to the selected contract by selecting the **Renewal contracts** tab on the Contract Renewal Task form.
4. Indicate the child contracts you want to renew.
   a. Open the record by selecting the preview icon ⓘ besides a child contract.
   b. Choose whether to include child contracts for renewal by entering Yes or No in the **Renewal Decision** field.
   You must provide a value for the **Renewal decision** field for each child contract.
5. Select **Update**.
   The Renewal decision column in the **Renewal contracts** tab displays your decision.
6. Select **Close Task**.

### Result
The contract renewal request lines for parent and child contracts are listed in the Contract Renewal Request Lines tab. Each contract request line has its own flow of tasks.

### What to do next
Supply contract renewal information

#### Supply contract renewal information

Supply the contract renewal information by completing the Build renewal task.

### Before you begin
Role required: asset, contract_manager

### About this task
Each contract renewal request line has its own flow of tasks.

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### Procedure

1. On the Contract Renewal Request Line form, select the Build renewal task number.
2. On the Contract Renewal Task form, select the **Renewal contract details** tab.
3. Provide the contract renewal information.

   You must fill in all the required fields before you close the task. If you are renewing the child contract, you must provide the end date and start date within the range of the start date and end date of the parent contract.

   **Note:**
   The Contract approver field is displayed only for the parent contract. The same Contract approver value is filled in automatically for any child contracts.

4. Select **Close Task**.

### Result
New draft contracts are created.

### What to do next
Add or remove assets for a contract renewal

#### Add or remove assets for a contract renewal

Add or remove hardware or enterprise assets from the contract renewal process. You can also view the hardware or enterprise assets carried over to the new contract.

### Before you begin
To add or remove hardware assets from the contract renewal process, request the Hardware Asset Management application from the ServiceNow Store. To add or remove enterprise assets from the contract renewal process, request the Enterprise Asset Management application from the ServiceNow Store.

Role required: asset, contract_manager (core UI and Hardware Asset Workspace only), sn_eam.enterprise_admin (Enterprise Asset Workspace only), or sn_eam.enterprise_asset_manager (Enterprise Asset Workspace only)

### About this task
The active and valid assets from the contract that are being renewed are carried over to the new contract, and are listed in the Assets Covered tab. Valid hardware and enterprise assets are the assets that are not removed from the contract before the end date, and are in the following states or substates:

- State
  - In stock
  - In transit
  - In maintenance
  - In use
- Substate
  - Available
  - Reserved
  - Pending transfer
  - None

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- Pending repair
- Pending install

Invalid assets are not carried over to the draft contract and you must add them manually.

### Procedure

1. Open the assets selection task or contract for which you want to add assets.
   - If you are using the core UI or Hardware Asset Workspace, select the assets selection task number on the Contract Renewal Request Line form.
   - If you are using the Enterprise Asset Workspace, open the Contract and lease management view. Select the **All contracts** tab and then open the contract that you want to add assets to.
2. Select the **Assets Covered** tab.
3. If you are using the core UI or Hardware Asset Workspace, click **Edit**.
4. Update the hardware or enterprise assets in the contract.
5. Select **Save**.
6. Edit the renewal cost of the assets.

   **Note:**
   This step is applicable only if you are using the core UI or Hardware Asset Workspace.

   a. Select the asset that you want to update the renewal cost for.
   b. In the **Renewal cost** field, update the renewal cost of the asset.
   c. Click **Update**.
7. Click **Save**.
8. If you are adding assets through the asset selection task on the Contract Renewal Request Line form, click **Close Task**.

### Result
The Payment amount field in the Financial tab of the draft contract shows the total renewal cost of the hardware or enterprise assets you selected.

### What to do next
Add or remove entitlements for a contract renewal

#### Add or remove entitlements for a contract renewal

Add or remove software entitlements that you want to include in the contract renewal process by using the Software assets selection task. You can also view the entitlements carried over to the new contract.

### Before you begin
The Software Asset Management Professional (com.snc.samp) plugin must be activated.

Role required: sam_user, contract_manager

### About this task
The entitlements with the following license types are carried over to the new contract:

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- Perpetual and maintenance
- Perpetual and software assurance
- Only perpetual

### Procedure

1. On the Contract Renewal Request Line form, select the Software assets selection task number.
2. Create an entitlement if you don't have any entitlements carried over to the draft contract.

   a. On the Contract Renewal Task form, select **Create Entitlement** in the **Planned Entitlements** tab.

   b. On the Software Entitlement form, fill in the required fields.

      For more information, see Software entitlement fields.

   c. Select **Save**.

      You can publish this entitlement after you complete the renewal request because this entitlement is associated with an existing renewal process.

   The entitlement is now listed in the Planned Entitlements list.
3. **Optional:** Update the existing entitlements for the draft contract.
4. Select **Save**.
5. Select **Close Task**.

### What to do next

Update terms and conditions

## Update terms and conditions

Update the terms and conditions in your new contract. You can also view the terms and conditions carried over to the new contract.

### Before you begin

Role required: asset, contract_manager (core UI and Hardware Asset Workspace only), sn_eam.enterprise_admin (Enterprise Asset Workspace only), or sn_eam.enterprise_asset_manager (Enterprise Asset Workspace only)

### Procedure

1. Open the task or contract for which you want to add terms and conditions.
   - If you are using the core UI or Hardware Asset Workspace, select the Terms and conditions task number on the Contract Renewal Request Line form. Select the **Renewal contracts terms** tab and then click **Edit**.
   - If you are using the Enterprise Asset Workspace, navigate to the Contract and lease management view and then select the **All contracts** tab. Open the enterprise asset contract that you want to add terms and conditions to and then select the **Terms and Conditions** tab.
2. Update the terms and conditions in the contract.

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3. Select **Save**.
4. If you are adding terms and conditions through the Terms and conditions task on the Contract Renewal Request Line form, click **Close Task**.

### Result
Multiple terms and conditions are displayed in the **Terms and Conditions** tab of the contract.

### What to do next
Add rate cards to the new contract

#### Add rate cards to the new contract

Add rate card details to the new contract by using the Rate cards task to track contract expenses.

### Before you begin
The Cost Management (com.snc.cost_management) plugin must be active.

Role required: asset, contract_manager

### About this task
The rate card details aren't carried over to the new contract.

Adding rate card details to a contract isn't a required procedure. You can close this task if you do not need to add a rate card to the draft contract.

### Procedure
1. On the Contract Renewal Request Line form, select the Rate cards task number.
2. On the Contract Renewal Task form, select the **Renewal rate cards** tab.
3. Select **New**.
4. On the Contract Rate Card form, fill in the financial details.
   For a description of the field values, see Contract Rate Card form.
5. Select **Submit**.
6. Select **Close Task**.

### Result
The rate card is attached to the draft contract.

### What to do next
Review contract renewal details

#### Review contract renewal details

Review the renewal details after completing all the details of a contract by using the Renewal confirmation task. You can then either approve them or mark the details for further review.

### Before you begin
Role required: asset, contract_manager

### About this task
This task must be completed before the contract renewal request is eligible for approval.

### Procedure
1. On the Contract Renewal Request Line form, select the Renewal confirmation task number.
2. On the Contract Renewal Task form, verify the renewal details.

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3. **Optional:** Review the list of entitlements in the draft contract by accessing the **Planned Entitlements** tab.
4. Determine whether to close this task.
5. Select **Close Task**.

### Result

When you have closed the task, the Contract Renewal Request Line processing is complete because all the contract renewal tasks are closed. The stage of the Contract Renewal Request Line is set to Awaiting approval. After all the Contract Renewal Request Lines are processed for a contract renewal request, the Approval task is created under Contract Renewal Requests.

### What to do next

Approve or reject a contract renewal request

#### Approve or reject a contract renewal request

Approve or reject a contract renewal request for all Contract Renewal Request Lines.

### Before you begin

The Renewal approver field must contain a value. If you need to change the approver, navigate to the parent contract and adjust the value there.

Role required: asset_manager (core UI and Hardware Asset Workspace only), contract_manager (core UI or Hardware Asset Workspace only), sn_eam.enterprise_admin (Enterprise Asset Workspace only), or sn_eam.enterprise_asset_manager (Enterprise Asset Workspace only)

### Procedure

1. Verify your contract renewal details.
   - If you are using the core UI or Hardware Asset Workspace, select the **Open Tasks** tab on the Contract Renewal Request form. Select the contract renewal request number to view the contract renewal details and then click **Close Task**.
   - If you are using the Enterprise Asset Workspace, open the Contract and lease management view. Select the **All contracts** tab and then open the enterprise asset contract that you want to renew. View the contract renewal details in the Renewal section of the **Details** tab.

   An approval request is triggered and the substate of the draft contract changes to Under review.
2. Open the list of contract and contract renewal requests.
   - If you are using the core UI or Hardware Asset Workspace, navigate to **All** > **Contract** > **My Approvals**.
   - If you are using the Enterprise Asset Workspace, open the Contract and lease management view and then select the **My contract approvals** tab.
3. Select the contract renewal request waiting for approval.
4. Evaluate any contract renewal request lines and contract renewal tasks.
5. Either approve or reject the contract renewal request.
6. **Optional:** Go to the **Approval History** tab to view the approval or rejection history of the contract and child contracts.

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### What to do next
Receive a purchase order for contract assets

#### Receive a purchase order for contract assets

Receive the purchase order for assets covered in the contract by using the Renewal purchase order task. This task is available if you have added at least one hardware asset, created an entitlement, or selected an existing entitlement that is in the Build state.

### Before you begin
This task is not created if you haven't selected or added any hardware assets or entitlements or the Procurement plugin (com.snc.procurement) is not active. You must instead manually track the financial expenses.

Role required: procurement_user

### Procedure

1. On the Contract Renewal Request form, select the **Open Tasks** tab.
2. Select the contract renewal request number.
3. Select the **Purchase orders** tab.
4. Select the purchase order number to capture the financial transactions of the contract.

   For every asset record covered under a contract, a purchase order line item is created. The cost of each purchase order is the renewal cost of each asset covered.

   The purchase order line items are created for the entitlements that are in the Build state. Each entitlement added in the Planned Entitlements tab corresponds to a unique purchase order line.

5. Select **Order**.
6. Select **Receive** to receive the purchase order for assets covered by the contract.
   Receiving the purchase order only updates the assets and does not create an entitlement.

### Result
The draft entitlement is published and the status is set to In use.

The purchase order receipt is listed in the **Receiving Slips** tab.

The status of the purchase order and purchase order line items shows as Received. The state of the Renewal purchase order task automatically changes to Closed Complete. The contract renewal request flow is complete.

The substate of the old contract is set to Renewed. A contract history record is created that displays the start and end dates of the old contract and the renewed contract, and the renewal date. You can view the entire history of the contract by selecting the Contract History tab in the Related Links section.

After you receive the purchase order, the state of the renewal contract is no longer Draft and the contract becomes active. If the start date of the renewed contract has been reached but the purchase order has not been received, the status of the contract renewal request remains set to Draft. After the new contract becomes active, the old contract becomes expired and the covered assets have an end date.

#### Results of canceling a contract renewal process

Cancelling a contract renewal process results in a change in the state of Contract, Contract Renewal Request, Contract Renewal Request Lines, and Contract Renewal tasks.

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### Contract cancellation results

| Canceled item | Result |
| --- | --- |
| Contract Renewal Request | • The entire renewal request is canceled.<br>• The substate of the contract that is being renewed is cleared.<br>• All the draft contracts are canceled. |
| Contract Renewal Request Line | • The Contract Renewal Request Line is canceled.<br>• When all Contract Renewal Request Lines are canceled, the Contract Renewal Request is canceled.<br>• The renewal of immediate child draft contracts is canceled. |
| Contract Renewal Task | • The Contract Renewal Task and the Contract Renewal Request Line are canceled.<br>  ○ If the Contract Renewal Request has only one Contract Renewal Request Line, the stage of the Contract Renewal Request changes to Canceled.<br>  ○ If the Contract Renewal Request has multiple Contract Renewal Request Lines, the stage of the Contract Renewal Request doesn't change.<br>• The renewal of immediate child draft contracts is canceled.<br>• The state of the draft contract changes to Canceled.<br>• The state of the tasks that are already closed does not change.<br>• The state of the open tasks changes to Closed Incomplete.<br>• Rate cards are attached to the draft contract become inactive.<br>• The state of the contract that was being renewed moves to the original state and the substate is cleared.<br>• The associated entitlements with the Contract Renewal Task are removed. |

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**Contract cancellation results (continued)**

| Canceled item | Result |
| --- | --- |
| Contract | • The renewal of immediate child contracts is canceled when child contracts are included in the Contract Renewal Request.<br>• The Contract Renewal Request Line is canceled.<br>• Any initiated Contract Renewal Request by this contract is canceled.<br>• The purchase order of the contract and immediate child contracts is canceled. |

## Contract Management use

Users with the contract_manager role can use the Contract Management application to create various types of contracts, such as leases, warranties, maintenance, and service.

You can add the following information to contracts.

- Assets covered by the contract
- Users covered by the contract
- Terms and conditions associated with the contract
- Other documents related to the contract

Track the various stages of a contract from draft to closure by viewing contract history and running reports. Adjust, extend, and renew active contracts.

### Contract life cycle

From creation until closure, contracts follow a life cycle that determines which fields can be edited.

When a contract is in **Draft** state, almost all fields on the contract record can be edited. After a contract moves past the **Draft** state, certain date, renewal, extension, and financial fields become read-only. The **State** field and **Substate** field are read-only.

The **Contract Compliance Checks** schedule job runs on the Contract [ast_contract] table automatically each night. For more information about the scheduled job, see Use Condition Check Definitions. The scheduled job performs the following actions:

- Changes the contract state to **Active** if the contract is approved and reaches the specified start date.
- Renews the contract if the contract is approved for renewal and reaches the specified start date.
- Changes the contract state to **Expired** if the contract state is **Active** and reaches the end date.

The system property *contract_compliance_check_job.enable_override* enables the Contract Compliance Checks job to override checks in a hierarchy. By default, this system property is set to **True**. When checks are defined on the same field of the parent and child tables, the Contract Compliance Checks job performs the following:

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- For the records on the parent table, the condition check on the table sets the field with the value specified in the condition.
- For the records on the child table, the condition check on the child table overrides the parent table condition and sets the field value on the child table accordingly.

For example, when a check is defined on the Description field of the Contract (parent) and Lease (child) tables, the field on the Lease table is set to the value specified in the child table condition. To disable the contract compliance check override functionality, set the system property contract_compliance_check_job.enable_override to **False**.

Expense lines are only generated from contracts that are active or expired.

### Contract states

| State | Description |
|---|---|
| Draft | User adds information about the contract and specifies an approver. |
| Active | Contract was approved and has reached the specified start date. |
| Expired | Contract reached the specified end date. Expired contracts with an active renewal workflow that are waiting for approval have a substate of **Awaiting Review**. Expired contracts with an active renewal workflow where the renewal was approved, but the renewal date hasn't yet passed, have a substate of **Renewal Approved**. Expired contracts with no active renewal or extension pending workflow have an empty substate. |
| Canceled | Contract was discontinued and is no longer active. |

In addition to a state, a contract can also have a substate.

### Contract substates

| Substate | Description |
|---|---|
| Awaiting Review | Contract is being prepared for review. |
| Under Review | Contract sent to the approver and the approver is reviewing the contract. |
| Approved | Contract reviewed and accepted by the approver. |
| Rejected | Contract reviewed and declined by the approver. |
| Renewal Approved | Contract renewal approved by the approver. |
| Renewal Rejected | Contract renewal rejected by the approver. |
| Renewal in process | Contract renewal is in progress through the contract renewal workflow. |
| Renewed | Contract renewal is complete through the contract renewal workflow. |
| Extension Approved | Contract extension approved by the approver. |
| Extension Rejected | Contract extension rejected by the approver. |
| None | No substate is specified. |

## Contracts

A contract is a binding agreement between two parties.

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In the ServiceNow AI Platform, contracts contain detailed information such as contract number, start and end dates, active status, terms and conditions statements, documents, renewal information, and financial terms.

Working with contracts includes the following tasks and processes.

### Create a contract

Create a contract with various contract models, which would act as a binding agreement between the two parties.

## Before you begin

Role required:

- For Core UI and Hardware Asset Workspace: admin, contract_manager
- For Enterprise Asset Workspace: sn_eam.enterprise_admin, sn_eam.enterprise_asset_manager
- For Software Asset Workspace: sam_admin, sam_user

## About this task

If a contract has one or more associated rate cards, the fields on the Contract form can't be edited.

## Procedure

1. Open the list of contracts that are used across your deployment.
   - If you're using the Core UI, navigate to **All** > **Contract** and select a contract type, such as **Insurance**, **Maintenance**, or **Service**, or select **All**.
   - If you're using Hardware Asset Workspace, navigate to the **Contract management** view and then select the **All contracts** tab.
   - If you're using Enterprise Asset Workspace, open the **Contract and lease management** view and then select the **All contracts** tab.
   - If you're using Software Asset Workspace, navigate to **License operations** > **Contracts** > **Software contracts** and select **New**.
2. Select **New**.
3. On the form, fill in the fields.
   Not all fields appear on all contract type forms.

### Contract or Create New Contract form

| Field | Description |
|---|---|
| Contract model | Model the contract is assigned to.<br><br>For example **Lease**, **Maintenance**, **Warranty**, **Service Contract Software License**, or **Subscription**. |
| Vendor | Vendor responsible for the contract.<br><br>This field is required when **Purchase Agreement** or **NDA** is selected from **Contract model**. |
| Contract number | Number assigned to the contract by the vendor (required). |
| Name | Name of the contract. |

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| Field | Description |
| --- | --- |
| Parent contract | Parent contract of the new contract, if applicable. You can select a parent contract from the contract lookup list. |
| Start date | Date on which the contract takes effect.<br>This field is required when **Purchase Agreement** or **NDA** is selected from **Contract model**. |
| End date | Date on which the contract expires. Leave the end date empty to create an open-ended contract.<br>This field is required when **Purchase Agreement** or **NDA** is selected from **Contract model**. |
| State | Current state of the contract.<br>○ Draft<br>○ Active<br>○ Expired<br>○ Canceled |
| Substate | Current substate of the contract.<br>○ Awaiting Review<br>○ Under Review<br>○ Approved<br>○ Rejected |
| Contract administrator | Person responsible for managing the contract and interacting with the vendor. |
| Approver | User who approves or rejects the contract.<br>This list is filtered to only show users with the itil role. |
| Business owner | User who manages the contract from a business perspective. |
| Agreement type | Agreement type of license:<br>○ Enterprise<br>○ SaaS<br>○ Subscription<br>This field appears only when **Maintenance** and **Software License** is selected from **Contract model**. |
| Commitment | Amount committed to spend with this vendor during this time period, from the start to the end of the contract.<br>This field appears only when **Purchase Agreement** is selected from **Contract model**. |
| Discount | Discount the vendor has agreed to provide. |

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| Field | Description |
|---|---|
| | This field appears only when **Purchase Agreement** is selected from **Contract model**. |
| Process non-contractual SLAs | Option to process both contractual and non-contractual Service Level Agreements (SLAs).<br><br>This field appears only when **Service Contract** is selected from **Contract model**. |
| Description | Detailed description of the contract. |
| Financial section | |
| Invoice payment terms | Terms that explain how to pay the contract. For example, **Net Monthly Account** or **Net 30**. |
| Payment schedule | Schedule that defines when to make payments. For example, **Monthly** or **Annually**. |
| Payment amount | Amount that has been paid on the contract to date. |
| Applicable taxes | Indicates if the contract is exempt from taxes or subject to sales tax. |
| Effective tax rate | Effective tax rate to apply to the total cost, if applicable. Effective tax rate is usually the average tax rate charged.<br><br>This field appears only when **Sales** is selected from **Applicable taxes**. |
| Tax cost | Total cost of the tax.<br><br>This field appears only when **Sales** is selected from **Applicable taxes**. |
| Total cost | Final cost of the contract after adjustments have been applied. If a contract has one or more rate cards, this field shows the combined value of all rate cards.<br><br>This field appears only when **Sales** is selected from **Applicable taxes**. |
| Vendor account | Vendor account associated with the contract. |
| PO Number | Purchase order number assigned to the contract. |
| Cost center | Cost center that is financially responsible for the asset. |
| Has rate card | Check box to indicate whether the contract has an associated rate card. |
| Renewal section | |
| Automatically renew | Indicates if the contract can be renewed or extended at the end of its term. |
| Options | Duration of the contract renewal or extension. For example, 1 year. |

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| Field | Description |
|---|---|
| Renewal start date | Date on which the contract renewal or extension takes effect. |
| Renewal end date | Date on which the contract renewal or extension ends. |
| Cost adjustment type | Type of cost adjustment applied to the contract.<br>○ Fixed<br>○ Manual<br>○ CPI (Consumer Price Index) |
| Cost adjustment amount | Numerical increase or decrease in price of contract. To indicate a decrease in price, enter a negative number. Either a **Cost adjustment** or **Cost adjustment percentage** can be specified, but not both. |
| Cost adjustment percentage | Percentage increase or decrease in price of contract. To indicate a decrease in price, enter a negative percentage. Either a **Cost adjustment** or **Cost adjustment percentage** can be specified, but not both. |
| Terms and Conditions section | |
| Terms and conditions | Specific legal information in the contract. |

4. Save the form.
   - If you're using Core UI, right-click the form header and select **Save**.
   - If you're using Hardware Asset Workspace, Software Asset Workspace, or Enterprise Asset Workspace, select **Save**.
5. Continue entering information in the related lists or tabs that appear.

### Contract form related lists or tabs

| Related list or tab | Description |
|---|---|
| Assets Covered | Lists all assets covered by this contract. |
| Users Covered | Lists all users covered by this contract. |
| Contract used by | Lists all configuration items (CI) used in this contract. |
| Terms and Conditions | Lists all terms and conditions of this contract. |
| Expense Lines | Lists all expense lines in this contract. |
| Contract History | Displays the changes to the start and end dates of this contract and changes to the terms and conditions. |
| Approval History | Lists all approvals for this contract. |
| Service Offerings | Lists all service offerings from this vendor.<br>Activate Service Portfolio Management to see this related list. |
| Service Commitments for Contracts | Lists all service commitments for this vendor's offerings.<br>Activate Service Portfolio Management to see this related list. |

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6. Perform one of the following actions.
   - Select **Update** to save and exit the contract.
   - Select **Submit for Review** to send a notification to the approver.

### Related topics

Models

Service Portfolio Management

Add a commitment to a service offering

Contract renewal workflow

Contracts

### Create a software maintenance contract example

One common use case for the Contract Management application is creating a contract to track maintenance payments for enterprise software. You can use this example to learn how to create a software maintenance contract.

## Before you begin

Role required: contract_manager or admin

## About this task

The goal of this example is to create a contract that shows the total amount of maintenance that must be paid for the software application, independent of different license purchases made over time. The Software Asset Management plugin must be activated to use this example.

## Procedure

1. Create an application model, adding a **Name** and specifying **Software License** in **Model categories**.
2. Create a software model, adding a **Name** and **Model Number**, and selecting the application model created in step 1.
3. Create a new software entitlement by selecting the software model created in step 2.
4. Navigate to **Contract** > **Contracts** > **Maintenance**.
5. Click **New** and enter the following information.

| Option | Description |
|---|---|
| **Agreement Type** | Select **Enterprise**. |
| **Application Model** | Select the application model created in step 1. |

6. Right-click the form header and click **Save**.
   A number of related lists and sections appear.
7. In the **Asset Covered** related list, click **New** and enter the following information.

| Option | Description |
|---|---|
| **Asset** | Select the software license created in step 3. |
| **Date added** | Enter the value. |

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8. Click **Submit**.
9. Continue completing the form with the following information.

| Option | Description |
| --- | --- |
| **Payment schedule** | Select **Annually**. |
| **Payment amount** | Enter the value. |

10. Complete the other fields as appropriate.
11. Click **Update**.
12. Submit the contract for review.

**Related topics**

Software Asset Management

### Add an asset to a contract

You can associate contracts with specific assets, including software licenses.

#### Before you begin

Role required: admin, contract_manager (core UI and Hardware Asset Workspace only), sn_eam.enterprise_admin (Enterprise Asset Workspace only), or sn_eam.enterprise_asset_manager (Enterprise Asset Workspace only)

#### About this task

Linking a contract with assets clarifies what the contract legally covers.

#### Procedure

1. Open the list of contracts that are used across your deployment.
   - If you are using the core UI, navigate to **Contract Management** > **Contract** > **All**.
   - If you are using the Hardware Asset Workspace, open the Contract management view and then select the **All contracts** tab.
   - If you are using the Enterprise Asset Workspace, open the Contract and lease management view and then select the **All contracts** tab.
2. Select a contract.
3. Add assets to the contract.
   - If you are using the core UI, use the following steps:
     a. In the **Assets Covered** related list, click **New**.
     b. In the **Asset** field, select a specific asset that is covered by the contract.
     c. In the **Date added** field, select the date the asset was added to the contract.

        The date can be in the past, the present, or the future.
     d. (Optional) In the **Date removed** field, select the date the asset was, or will be, removed from the contract.

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Specifying the **Date added** and **Date removed** fields is useful for reporting.

**e.** Click **Submit**.

- If you are using the Hardware Asset Workspace or Enterprise Asset Workspace, use the following steps:

  **a.** In the **Assets Covered** tab, click **New**.

  **b.** In the dialog box, select the check box for each asset that you want to add to the contract.

  **c.** Click **Add**.

### Add a user to a contract

A contract can cover specific users. For example, you may use a contract to hire a group of temporary workers.

#### Before you begin

Role required: contract_manager or admin

#### Procedure

1. Navigate to **Contract Management** > **Contract** > **All**.
2. Select a contract.
3. In the **Users Covered** related list, click **New**.
4. In the **User** field, select a specific user covered by the contract.
5. In the **Date added** field, select the date the user was added to the contract.
   The date can be in the past, the present, or the future.
6. **Optional:** In the **Date removed** field, select the date the user was, or will be, removed from the contract.
   Specifying the **Date added** and **Date removed** fields can be useful for reporting.
7. Click **Submit**.

### Add a configuration item to a contract

Contracts can be associated with configuration items. You can link a contract with configuration items to clarify what the contract legally covers.

#### Before you begin

Role required: admin or contract_manager

#### Procedure

1. Navigate to **Contracts** > **All**.
2. Select a contract.
3. **Optional:** In the **CIs Covered** related list, select **New** to create a configuration item.
4. In the **CIs Covered** related list, select **Edit**.
5. In the **Collection** configuration items list on the left, double-click a configuration item name.
   The item is added to the **CIs Covered List** on the right.
6. Select **Save**.

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### Add a document to a contract

Contracts can be associated with documents. Linking a contract to related documents helps keep all relevant information about a contract together and easily accessible.

#### Before you begin

Role required: admin, contract_manager (core UI and Hardware Asset Workspace only), sn_eam.enterprise_admin (Enterprise Asset Workspace only), or sn_eam.enterprise_asset_manager (Enterprise Asset Workspace only)

#### Procedure

1. Open the list of contracts that are used across your deployment.
   - If you are using the core UI, navigate to **All** > **Contract** > **Contracts** > **All**.
   - If you are using the Hardware Asset Workspace, open the Contract management view and then select the **All contracts** tab.
   - If you are using the Enterprise Asset Workspace, open the Contract and lease management view and then select the **All contracts** tab.
2. Select a contract.
3. Add a document to the contract.
   - If you are using the core UI, use the following steps:
     a. Click the Manage Attachments ( ) icon on the form header.
     b. In the Attachments dialog box, click **Choose file** to search for and select the document that you want to add to the contract.
   - If you are using the Hardware Asset Workspace or Enterprise Asset Workspace, use the following steps:
     a. Click the Attachment ( ) icon on the sidebar of the contract record.
     b. In the Attachments window, click **Select** to search for and select the document that you want to add to the contract.

### Adjust a contract

After creating a contract, you can change the start date, end date, or payment amount for a contract.

#### Before you begin

Role required: admin, contract_manager (core UI and Hardware Asset Workspace only), sn_eam.enterprise_admin (Enterprise Asset Workspace only), or sn_eam.enterprise_asset_manager (Enterprise Asset Workspace only)

#### About this task

To adjust a contract, the **State** should be **Active**. If the end date of a contract changes, the end date of any associated assets changes to match the new end date.

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### Procedure

1. Open the list of contracts that are used across your deployment.
   - If you are using the core UI, navigate to **Contract** > **Contracts** > **All**.
   - If you are using the Hardware Asset Workspace, open the Contract management view and then select the **All contracts** tab.
   - If you are using the Enterprise Asset Workspace, open the Contract and lease management view and then select the **All contracts** tab.
2. Select a contract in the **Active** state.
3. Click **Adjust**.
4. In the Adjust the Contract dialog box, fill in the fields.

**Adjust the contract fields**

| Field | Description |
|---|---|
| Contract Start Date | Date on which the contract takes effect. |
| Contract End Date | Date on which the contract expires. |
| Contract Payment Amount | Total amount paid for the contract. If the contract has one or more rate cards, this field shows the total of all rate card base costs. |

5. Click **Submit Adjustments**.

## Renew a contract

After you have created a contract or the contract has expired, you can renew the contract.

### Before you begin

Role required: admin, contract_manager (core UI or Hardware Asset Workspace only), sn_eam.enterprise_admin (Enterprise Asset Workspace only), or sn_eam.enterprise_asset_manager (Enterprise Asset Workspace only)

### About this task

- When a contract is renewed, a new contract isn't created. Instead, the same contract is updated with renewal information.
- The changes to the start date and end date of a contract is captured in the Contract History tab.
- Contract information and history is retained when a contract is renewed. If the end date of the contract changes, the end date of any associated assets changes to match. You can renew a contract that meets the following conditions.
  - **State** is **Active** or **Expired**
  - **Substate** is **None** or **Rejected**
- If the system property *sn_contract_enable_renewal_flow* is enabled, the contract renewal workflow is available for maintenance & warranty contracts. For more information, see Contract renewal workflow.

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## Procedure

1. Open the list of contracts that are used across your deployment.
   - If you are using the core UI, navigate to **Contract** > **Contracts** > **All**.
   - If you are using the Hardware Asset Workspace, open the Contract management view and then select the **All contracts** tab.

     Alternatively, select the **Overview** tab of the Contract management view. In the Contract overview section, locate the Expiring contract widget to view the list of contracts that are expiring.
   - If you are using the Enterprise Asset Workspace, open the Contract and lease management view and then select the **All contracts** tab.

     Alternatively, select the **Overview** tab of the Contract and lease management view. In the Contract overview section, locate the Expiring contract widget to view the list of contracts that are expiring.
2. Select a contract in the **Active** or **Expired** state.
3. Click **Renew**.
4. On the Renew the Contract form (core UI) or dialog box (Hardware Asset Workspace and Enterprise Asset Workspace), fill in the fields.

**Renew the Contract fields**

| Field | Descriptions |
|---|---|
| Approver | User who approves or rejects the contract. |
| Options | Length of time for the renewal, in years. |
| Renewal start date | Date on which the renewed contract takes effect. |
| Renewal end date | Date on which the renewed contract expires. |
| Cost adjustment type | Type of cost adjustment applied to the renewed contract: **None**, **Fixed**, **Manual**, or **CPI**. |
| Cost adjustment percentage | Percentage increase or decrease in price of the renewed contract. To indicate a decrease in price, enter a negative percentage. A **Cost adjustment amount** or **Cost adjustment percentage** can be specified, but not both. |
| Cost adjustment amount | Numerical increase or decrease in price of the renewed contract. To indicate a decrease in price, enter a negative number. A **Cost adjustment amount** or **Cost adjustment percentage** can be specified, but not both. |

5. Perform one of the following steps.
   - To save all entered data and change the substate to **Under Review**, click **Submit for Review**. The contract is sent to the specified **Approver**.
   - To save all entered data and change the substate to **Awaiting Review**, click **Save**. The **Renew** button is available to submit the renewed contract for review later.

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6. Change any information on the **Contract** form, as necessary.
7. Click **Update**.

### What to do next

If you selected the **Save** option, ensure that you click **Renew** when you are ready to submit the contract renewal for approval.

## Cancel a contract

You can cancel a contract when the **State** is **Active**.

### Before you begin

Role required: admin, contract_manager (core UI and Hardware Asset Workspace only), sn_eam.enterprise_admin (Enterprise Asset Workspace only), or sn_eam.enterprise_asset_manager (Enterprise Asset Workspace only)

### About this task

After a contract is canceled, the following process occurs.

- The contract **State** changes to **Canceled**.
- Condition checkers are changed to inactive.
- **Renew** and **Extend** buttons become inactive.
- Contract rate cards become inactive.

### Procedure

1. Open the list of contracts that are used across your deployment.
   - If you are using the core UI, navigate to **Contract** > **Contracts** > **All**.
   - If you are using the Hardware Asset Workspace, open the Contract management view and then select the **All contracts** tab.
   - If you are using the Enterprise Asset Workspace, open the Contract and lease management view and then select the **All contracts** tab.
2. Select a contract.
3. Click **Cancel Contract**.
4. Click **Yes** to confirm the contract cancellation.

## Verify contract administrator assignment for notification

An event runs automatically each night to send reminders to contract administrators about contract expiration dates so they can renew or renegotiate the contract. You can verify that the right contract administrator is assigned to the contract.

### Before you begin

Role required: admin, contract_manager (core UI and Hardware Asset Workspace only), sn_eam.enterprise_admin (Enterprise Asset Workspace only), or sn_eam.enterprise_asset_manager (Enterprise Asset Workspace only)

### About this task

When the contract.expiration event runs on the Contract [ast.contract] table each night, an email message is sent to the person identified as the contract administrator. This email is sent at the following times.

- 90 days ahead of the contract expiration date
- 60 days ahead of the contract expiration date

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- 30 days ahead of the contract expiration date
- On the contract expiration date

A user with the admin role can edit the contract.expiration condition check that processes contract notifications.

### Procedure

1. Open the list of contracts that are used across your deployment.
   - If you are using the core UI, navigate to **Contract** > **Contracts** > **All**.
   - If you are using the Hardware Asset Workspace, open the Contract management view and then select the **All contracts** tab.
   - If you are using the Enterprise Asset Workspace, open the Contract and lease management view and then select the **All contracts** tab.
2. Select a contract.
3. Check that the **Contract administrator** field contains the correct name.
   A single name can be specified.

#### Related topics

Condition check definitions

Email and SMS notifications

## Send the contract for approval

You can send a contract that is in **Draft** state for approval.

### Before you begin

Role required: admin, contract_manager (core UI and Hardware Asset Workspace only), sn_eam.enterprise_admin (Enterprise Asset Workspace only), or sn_eam.enterprise_asset_manager (Enterprise Asset Workspace only)

### Procedure

1. Open the list of contracts that are used across your deployment.
   - If you are using the core UI, navigate to **Contract** > **Contracts** > **All**.
   - If you are using the Hardware Asset Workspace, open the Contract management view and then select the **All contracts** tab.
   - If you are using the Enterprise Asset Workspace, open the Contract and lease management view and then select the **All contracts** tab.
2. Select a contract in the **Draft** state and **Awaiting Review** substate.
3. Select an **Approver** for the contract.
4. Click **Submit For Review**.
   An email message is sent to the selected approver and the contract **Substate** changes to **Under Review**.

## Approve or reject a contract

If you are the contract manager, you can approve or reject a contract.

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### Before you begin

Role required: admin, contract_manager (core UI and Hardware Asset Workspace only), sn_eam.enterprise_admin (Enterprise Asset Workspace only), or sn_eam.enterprise_asset_manager (Enterprise Asset Workspace only)

### Procedure

1. Open the list of contract and contract renewal requests.
   - If you are using the core UI, navigate to **All** > **Contract** > **My Approvals**.
   - If you are using the Hardware Asset Workspace, open the Contract management view and then select the **My approvals** tab.
   - If you are using the Enterprise Asset Workspace, open the Contract and lease management view and then select the **My contract approvals** tab.
2. Select a contract in the **Requested** state.
3. Approve or reject the contract.
   - Approve the contract.
     - To approve the contract in the core UI, click **Approve**. The contract **Substate** changes to **Approved**.
     - To approve the contract in the Hardware Asset Workspace or Enterprise Asset Workspace, set the **State** field to **Approved**.
   - Reject the contract.
     - To reject the contract in the core UI, click **Reject** and enter a rejection reason in the **Comments** field. The contract **Substate** changes to **Rejected**.
     - To reject the contract in the Hardware Asset Workspace or Enterprise Asset Workspace, set the **State** field to **Rejected**.
4. Click **Update** (core UI) or **Save** (Hardware Asset Workspace and Enterprise Asset Workspace).
   - A contract with the state set to **Draft** and a start date set in the future is kept in **Draft** until the start date is reached. If the contract has a **Substate** of **Approved**, the system changes the **State** to **Active** and removes the **Substate** value.
   - When a contract with a **State** of **Draft** and a **Start Date** set to a date in the past is approved, the contract **State** is automatically set to **Active** and **Substate** is left blank.

## View approval history on contracts

You can view the approval history for a contract in the Approval History related list on the Contract form.

### Before you begin

Role required: workflow_admin, admin, or sn_eam.enterprise_admin (Enterprise Asset Workspace only)

### About this task

After a contract is sent to an approver for review, the approver name cannot be changed. If the approver rejects a contract, the same approver or a different approver can be specified before the contract is sent for approval again. Once the contract has been reviewed and approved, approval history records are automatically listed in the Approval History related list on the Contract form.

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## Procedure

1. Open the list of contracts that are used across your deployment.
   - If you are using the core UI, navigate to **Contract** > **Contracts** > **All**.
   - If you are using the Hardware Asset Workspace, open the Contract management view and then select the **All contracts** tab.
   - If you are using the Enterprise Asset Workspace, open the Contract and lease management view and then select the **All contracts** tab.
2. Select a contract.
3. Select the **Approval History** tab.
4. Click a record to view the approval details.

### Terms and conditions

You can add terms and conditions to a contract to keep all documentation that is relevant to a contract in one location.

The terms and conditions can be searched and used in reports. If multiple terms and conditions records are added to a single contract, set an order for the records so they appear in a specific sequence. The terms and conditions fields become read-only after a contract is sent for approval.

Users with the contract_manager role can read contract history and add terms and conditions.

There are three procedures involved in adding terms and conditions to a contract:

### Create a terms and conditions record

You can create a terms and conditions record to add to a contract.

## Before you begin

Role required: admin, contract_manager (core UI and Hardware Asset Workspace only), sn_eam.enterprise_admin (Enterprise Asset Workspace only), or sn_eam.enterprise_asset_manager (Enterprise Asset Workspace only)

## Procedure

1. Open the list of terms and conditions for your contracts.
   - If you are using the core UI, navigate to **All** > **Contract** > **Contracts** > **Terms & Conditions**.
   - If you are using the Hardware Asset Workspace, open the Contract management view and then select the **Terms and conditions** tab.
   - If you are using the Enterprise Asset Workspace, open the Contract and lease management view and then select the **Terms and conditions** tab.
2. Click **New**.
3. On the Terms and Conditions form (core UI) or Create New Terms and Conditions form (Hardware Asset Workspace and Enterprise Asset Workspace), fill in the fields.

#### Terms and Conditions or Create New Terms and Conditions form

| Field | Description |
|---|---|
| Number | Unique ID used for the terms and conditions. This field is automatically generated. |

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| Field | Description |
|---|---|
| Name | Name for the terms and conditions. |
| Contract | Link to the contract. |
| Used | Check box to indicate if the terms and conditions are associated with contract. |
| Description | Details of the terms and conditions. |

4. Click **Submit** (core UI) or **Save** (Hardware Asset Workspace and Enterprise Asset Workspace).

### Add terms and conditions to a contract

After you create a terms and conditions record, add the record to a contract that is in the Awaiting Review, Rejected, Renewal Rejected, or Extension Rejected substate.

## Before you begin

Role required: admin, contract_manager (core UI and Hardware Asset Workspace only), sn_eam.enterprise_admin (Enterprise Asset Workspace only), or sn_eam.enterprise_asset_manager (Enterprise Asset Workspace only)

## About this task

Terms and Conditions can only be added to a contract when it is being created. After the contract is approved, the terms and conditions cannot be changed.

## Procedure

1. Open the list of contracts that are used across your deployment.
   - If you are using the core UI, navigate to **Contract** > **Contracts** > **All**.
   - If you are using the Hardware Asset Workspace, open the Contract management view and then select the **All contracts** tab.
   - If you are using the Enterprise Asset Workspace, open the Contract and lease management view and then select the **All contracts** tab.
2. Select a contract.
3. Add terms and conditions to the contract.
   - If you are using the core UI, use the following steps:
     a. In the **Terms and Conditions** related list, double-click **Insert a new row**.
     b. Click the reference lookup icon and select a terms and conditions record from the list.
     c. (Optional) Enter a number in **Order** to specify the sequence in which the record should appear in the terms and condition document.

     **Note:**
     If you attempt to enter a duplicate terms and conditions record for a contract and save the record, an error message appears and the new duplicate record is not added.

   - If you are using the Hardware Asset Workspace, use the following steps:
     a. On the **Terms and Conditions** tab, click **Add**.
     b. When prompted, provide the required information.
   - If you are using the Enterprise Asset Workspace, use the following steps:

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a. On the **Terms and Conditions** tab, click **Add**.

b. In the dialog box, select the check box for each term and condition that you want to add.

c. Click **Add**.

### Build a terms and conditions document within a contract

After adding one or more terms and conditions records to a contract, you can build a terms and conditions document within the contract.

#### Before you begin

Role required: admin, contract_manager (core UI and Hardware Asset Workspace only), sn_eam.enterprise_admin (Enterprise Asset Workspace only), or sn_eam.enterprise_asset_manager (Enterprise Asset Workspace only)

#### About this task

The terms and conditions records are added in the sequence specified in the **Order** field.

#### Procedure

1. Open the list of contracts that are used across your deployment.
   - If you are using the core UI, navigate to **Contract Management** > **Contract** > **All**.
   - If you are using the Hardware Asset Workspace, open the Contract management view and then select the **All contracts** tab.
   - If you are using the Enterprise Asset Workspace, open the Contract and lease management view and then select the **All contracts** tab.
2. Select a contract.
3. Verify that one or more terms and conditions records have been added to the **Terms and Conditions** tab.
4. On the **Terms and Conditions** tab, build the terms and conditions for the contract.
   - If you are using the core UI, click the **Build Terms and Conditions** related link.
   - If you are using the Hardware Asset Workspace or Enterprise Asset Workspace, click **Build Terms and Conditions**.

   All records from the Terms and Conditions list are added to the Terms and Conditions for the contract.
5. Click **Update**.

### Create a contract rate card

You can create rate cards to track contract expenses. Rate cards help to record and allocate costs.

#### Before you begin

You must activate the Cost Management plugin to use rate cards.
Role required: financial_mgmt_user, asset, or contract_manager

#### About this task

A contract rate card provides detailed price information for a contract and enables you to generate expense lines for recurring expenses automatically. There can be multiple rate cards for the same contract.

Consider the following case: an organization has a contract with a third-party company, which oversees technical operations in the organization's data centers. The contract costs to use a

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specific server model in the New York data center are different from using the same server model in the Madrid data center. There are two rate cards to detail these costs separately.

### Procedure

1. Navigate to **Contract Management** > **Contract** > **All**.
2. Select a contract.
3. In the **Contract Rate Cards** related list, click **New**.
4. On the Contract Rate Card form, fill in the fields.
   For a description of the field values, see Contract Rate Card form.
5. Click **Submit**.

### Related topics

Allocating expenses

Use business services with expenses

### Contract Rate Card form

The Contract rate card form enables you to generate expense lines for recurring expenses automatically by providing detailed price information for a contract. There can be multiple rate cards for the same contract.

| Field | Description |
|---|---|
| Number | Contract rate card number. |
| Contract | Internal contract number. |
| Summary type | Contract rate card type. Categorizing rate cards can be useful for reporting. Select **Grow Business**, **Run Business**, or **Transform Business**. |
| Name | Descriptive name for the contract rate card. |
| Active | Option that indicates whether the rate card is available for use. |
| Short description | Brief description of the contract rate card. |
| Start date | Date on which the contract rate card becomes active. Expense lines are generated for the costs incurred beginning on the date specified. For financial calculations to work, the date cannot be before the start date of the contract. |
| End date | Date on which the contract rate card becomes inactive. For financial calculations to work, the date cannot be after the end date of the contract. If no value is entered, the date is automatically set to the end date of the contract if the contract has an end date. No expense lines are generated for costs incurred after the end date. |
| Interval | The amount of time between rate card charges. For example, **Monthly**, **Quarterly**, or **Annually**. |
| Cost center | The cost center financially responsible for the rate card. |
| Last processed | The most recent date on which the rate card was charged. |
| Next process | The next date on which the rate card will be charged. |

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| Field | Description |
|---|---|
| Description | Detailed information about the rate card. |
| Sales tax | Option that indicates whether to apply sales tax to the total cost. |
| Tax rate | The effective tax rate to apply to the total cost. This tax rate is usually the average tax rate charged. |
| Distribute cost | The method for distributing the amount listed in the **Base cost** field and generating expense lines. |
| Value | Type of value to use when **Allocate and distribute cost based on value** is selected in the **Distribute cost** field. |
| Base cost | The amount that must be paid before taxes. |
| Tax cost | Total cost of the tax. |
| Total cost | Final cost of the rate card after adjustments such as taxes have been applied. |

### Create a new expense line

Typically, expense lines are automatically generated based on assets or users, but you can create a new expense line manually if needed.

## Before you begin

Role required: asset, contract_manager (core UI and Hardware Asset Workspace only), sn_eam.enterprise_admin (Enterprise Asset Workspace only), or sn_eam.enterprise_asset_manager (Enterprise Asset Workspace only)

## Procedure

1. Open the list of contracts that are used across your deployment.
   - If you are using the core UI, navigate to **Contract Management** > **Contract** > **All**.
   - If you are using the Hardware Asset Workspace, open the Contract management view and then select the **All contracts** tab.
   - If you are using the Enterprise Asset Workspace, open the Contract and lease management view and then select the **All contracts** tab.
2. Select a contract.
3. In the **Expense Lines** related list (core UI) or tab (Hardware Asset Workspace and Enterprise Asset Workspace), click **New**.
4. Complete the form.

### Expense line table

| Field | Description |
|---|---|
| Number | The unique number identifying the expense line. |
| Date | The date on which the expense line was created. |
| Rate Card | The identification number of the rate card to which the expense line is associated. |
| Rate type | The rate type that is considered during the expense line generation. This field is read-only. |

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| Field | Description |
|---|---|
| Source ID | The identification number of the item associated with the expense line. If this field is filled in, corresponding information is automatically added to the **Source** fields on this form. |
| Amount | The monetary value of the item specified in the **Source ID** field. Enter a negative value to indicate a credit. |
| Process date | The date the expense line is processed. |
| Inherited | Check box that indicates whether the expense line is on another expense line. |
| State | The current state of the expense line, either **Pending** or **Processed**. |
| Summary type | The expense line category: **Grow Business**, **Run Business**, or **Transform Business**. Categorizing expense lines can be useful for reporting. |
| Short description | A brief description of the expense line. |
| Asset | The identification number of the asset associated with the expense line, if any. |
| Fixed asset | Fixed asset that contains the asset in this expense line. A fixed asset is a container that holds one or more individual assets, including hardware or software assets. The system auto-populates this field with the appropriate fixed asset if the named **Asset** is contained within that fixed asset. |
| Contract | The identification number (not the contract number) of the contract associated with the **Asset**, if any. |
| User | The name of the user associated with the **Asset**, if any. |
| Configuration Item | The name of the configuration item associated with the expense line, if any. |
| Task | The identification number of the task associated with the expense line, if any. |
| Cost center | The cost center financially responsible for the item identified in **Source ID**, if any. |

5. Click **Submit** (core UI) or **Save** (Hardware Asset Workspace and Enterprise Asset Workspace).

### Generating expense lines based on assets or users

An expense line is an expense amount at a given point in time and the record that incurred or generated the expense. You can generate expense lines based on assets or users assigned to the contract.

#### Before you begin
Role required: financial_mgmt_user, asset, or contract_manager

#### About this task
Generating expense lines is a three-step procedure.

#### Procedure

### Add a user or asset to a contract

You can add a user or asset to a contract to generate expense lines.

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### Before you begin

Role required: asset, financial_mgmt_user (core UI and Hardware Asset Workspace only), contract_manager (core UI and Hardware Asset Workspace only), sn_eam.enterprise_admin (Enterprise Asset Workspace only), or sn_eam.enterprise_asset_manager (Enterprise Asset Workspace only)

### Procedure

1. Open the list of contracts that are used across your deployment.
   - If you are using the core UI, navigate to **Contract Management** > **Contract** > **All**.
   - If you are using the Hardware Asset Workspace, open the Contract management view and then select the **All contracts** tab.
   - If you are using the Enterprise Asset Workspace, open the Contract and lease management view and then select the **All contracts** tab.
2. Select a contract.
3. Add assets or users to the contract.
   - If you are using the core UI, use the following steps:
     a. In the **Assets Covered** or **Users Covered** related list, click **New**.
     b. Specify an **Asset** or **User**.
     c. Specify a **Date Added**.
     d. Click **Submit**.
     e. (Optional) Repeat the previous steps to add more assets or users to the contract.
   - If you are using the Hardware Asset Workspace or Enterprise Asset Workspace, use the following steps:

     **Note:**
     You cannot add users to a contract in the Enterprise Asset Workspace.

     a. In the **Assets Covered** or **Users Covered** tab, click **New**.
     b. In the dialog box, select the check box for each asset or user that you want to add to the contract.
     c. Click **Add**.

## Create a rate card and assign a user or asset

You can assign a user or asset when you create a rate card. You can only assign the user or asset that is assigned to the contract.

### Before you begin

Role required: financial_mgmt_user, asset, or contract_manager

### Procedure

1. Navigate to **Contract Management** > **Contract** > **All**.
2. Select a contract with an assigned user or asset.
3. In the **Contract Rate Cards** related list, click **New**.
4. Specify a **Start date**.
   For financial calculations to work, the date cannot be before the start date of the contract.
5. Right-click the header bar and select **Save**.

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6. In the **Asset Covered** or **Rate Card Users** related list, click **New**.
7. Select the **Asset** or **User** who is assigned to the contract.
   Only assets and users associated with the parent contract are listed.
8. Specify a **Date Added**.
9. Click **Submit**.

### Configure rate card expense generation

After assets or users are added to the rate card, you can use the **Distribute cost** field in the Financial section of the contract to generate rate card expenses.

#### Before you begin

Role required: financial_mgmt_user, asset, or contract_manager

#### Procedure

1. Navigate to **Contract** > **Contracts** > **All**.
2. Select the contract to generate expenses.
3. In the **Contract Rate Card** related list, select a rate card.
4. In **Distribute cost**, select one of the following options to distribute the amount listed in **Base cost**.

| Option | Description |
|---|---|
| **Split expense lines evenly across assets** | Select **Allocate and distribute cost per asset**.<br><br>For example, with a $100 **Base cost** and two assets, two expense lines for $50 are creat ed. |
| **Split expense lines across assets based on asset value** | Select **Allocate and distribute cost based on value:**.<br><br>The **Value** field displays with **Cost** and **Resid ual Cost** options. The cost is derived from the **Cost** or **Residual Cost** field on an asset record. If there are multiple assets on the rate card, the cost or residual cost is distributed based on the value of the assets.<br><br>For example, if you select the **Cost** option with a $100.00 **Base cost**, one asset worth $70, and one asset worth $30, two expense lines are created, one for $70 and one for $30. |
| **Split expense lines evenly across users** | Select **Allocate and distribute cost per user**.<br><br>For example, with a $100 **Base cost** and two users on the contract, two expense lines for $50 are created. |
| **Allocate the cost to the contract instead of the individual assets** | Select **Allocate cost to contract**. |

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5. Select **Update**.
   Expense lines are automatically generated by a scheduled job for costs incurred between the rate card **Start date** and **End date**. The scheduled job, *Process FM Costs*, runs on the Contract [ast_contract] table once per day. This scheduled job runs forward and generates additional records from the Next Process [next_process] time. Expense lines are only generated from contracts with the **Active** or **Expired** state. You may want to generate expense lines for expired contracts to track previous expenses.

**Related topics**

Contract life cycle

### View contract expense lines

Use the **Expense Lines** related list or tab to view and audit all the expenses recorded for a given contract.

#### Before you begin

Role required: asset, financial_mgmt_user (core UI and Hardware Asset Workspace only), contract_manager (core UI and Hardware Asset Workspace only), sn_eam.enterprise_admin (Enterprise Asset Workspace only), or sn_eam.enterprise_asset_manager (Enterprise Asset Workspace only)

#### Procedure

1. Open the list of contracts that are used across your deployment.
   - If you are using the core UI, navigate to **Contract** > **Contracts** > **All**.
   - If you are using the Hardware Asset Workspace, open the Contract management view and then select the **All contracts** tab.
   - If you are using the Enterprise Asset Workspace, open the Contract and lease management view and then select the **All contracts** tab.
2. Select a contract.
3. Select the **Expense Lines** related list (core UI ) or tab (Hardware Asset Workspace and Enterprise Asset Workspace).
4. Select an expense line record to view.
   Information such as expense line details, total cost of the contract, and the contract current value is listed.

### Monitor a contract

You can monitor contracts by viewing contract history and creating contract reports.

#### Before you begin

Role required: asset, contract_manager (core UI and Hardware Asset Workspace only), sn_eam.enterprise_admin (Enterprise Asset Workspace only), or sn_eam.enterprise_asset_manager (Enterprise Asset Workspace only)

#### About this task

If changes are made to a contract start date, end date, or terms and conditions, a copy of the contract is automatically saved and placed in contract history. This is useful for tracking changes to a contract and keeping an audit trail. Configure the **Contract History** related list or tab to include columns for creation and update so you can easily see who edited the contract.

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### Procedure

1. Open the list of contracts that are used across your deployment.
   - If you are using the core UI, navigate to **Contract** > **Contracts** > **All**.
   - If you are using the Hardware Asset Workspace, open the Contract management view and then select the **All contracts** tab.
   - If you are using the Enterprise Asset Workspace, open the Contract and lease management view and then select the **All contracts** tab.
2. Select a contract.
3. View the **Contract History** related list (core UI) or tab (Hardware Asset Workspace and Enterprise Asset Workspace) and perform one of the following actions.
   - If earlier versions of the contract exist, click a date in the **Contract Starts** column to view a version.
   - If an earlier version of the contract does not exist, change the contract's **Start date** or **End date**. Right-click in the header bar and select **Save**. In the **Contract History** related list, click a date in the **Contract Starts** column to view the earlier version.

## Run a contract report

A variety of contract reports are available to help track and manage contracts.

### Before you begin

Role required: contract_manager or admin

### Procedure

1. Navigate to **All** > **Reports** > **View / Run**.
2. Select one of the following reports to run.

#### Contract reports

| Report | Description |
|---|---|
| Active Contracts by Cost Per Unit | All active contracts grouped in ascending order by average cost per unit. |
| Active Contracts by Lifetime Cost | All active contracts with an associated rate card grouped in ascending order by total cost. Total cost is measured from the beginning of the contract to the report run date. |
| Active Contracts by Monthly Cost | All active contracts grouped in ascending order by cost per month. |
| Active Contracts by Vendor | All active contracts alphabetically by vendor. |
| Active Contracts by Yearly Cost | All active contracts grouped in ascending order by cost per year. |
| All Contracts by State | Contracts grouped by state, such as **Draft**, **Active**, or **Expired**, in bar chart format |

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| Report | Description |
|---|---|
| Asset Contracts by Type | All active contracts for assets grouped by type, in pie chart format. |
| Asset Contracts List | All active contracts for assets by contract number. |
| Contract Expenditure by Type | Total contract expenses by type, such as lease, maintenance, or warranty, in bar chart format. |
| Contract Expenditure by Vendor | Total costs of all contracts associated with a specific vendor, in bar chart format. |
| Contract Pipeline Report | All contracts with a state of **Draft**, **Active**, or **Expired** and a substate of **Awaiting Review** or **Under Review**, in bar chart format. |
| Expiring Contracts | All contracts expiring in the next 90 days. |

## Condition check definitions

Condition check definitions enable you to define logical conditions that indicate when to change a field value in a record.

A scheduled job, called *`Contract Compliance Checks`* in **System Scheduler** > **Scheduled Jobs**, evaluates these condition check definitions daily by running the condition checker. When this job is run, the ConditionChecks Script Include is triggered that runs the Condition Check Definitions. Use this condition checker to check start dates and end dates and to set expiration levels for contracts.

For example, a contract has a start date of March 1. When the condition checker runs on March 1, it verifies that the contract **Substate** is **Approved** and sets the contract **State** to **Active** based on the **Start Date** field.

The daily condition checker sets the appropriate expiration level for active contracts based on the contract **End Date**. The expiration level can be viewed in the Contracts list. Knowing the expiration level can help contract managers renew or extend a contract before it expires.

### Define a condition check

You can define a condition check to change values in a contract when the *`Contract Compliance Checks`* scheduled job runs each night.

#### Before you begin

Role required: contract_manager or admin

#### Procedure

1. Navigate to **All** > **Contract** > **Administration** > **Condition Check Definitions**.
2. Click **New**.
3. Complete the form.

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### Condition check definition fields

| Field | Description |
|---|---|
| Table | The table to which the condition applies. For a contract check definition, select **Contract [ast.contract]**. |
| Category | The category for the condition check. Select **Contract** or **None**. The category is used for organizing information and reporting. |
| Condition field | The field to be updated, typically **Expiration level** or **State**. |
| Event name | The name for the event to be fired when this condition changes the value of the field. Create a name using this syntax: <table_name>.<condition_field>, for example, `contract.validation`. |
| Order | The order in which the conditions are evaluated. |

4. Right-click the header bar and click **Save**.
   The **Conditions** related list appears.
5. In the **Conditions** related list, click **New**.
6. Complete the form.

### Conditions fields

| Field | Description |
|---|---|
| Name | The value the field is set to, if the expiration conditions are met. |
| Condition check | The associated condition check. |
| Table | The table associated with the condition check. |
| Event name | The name of the event this condition triggers. |
| Expiration Condition | The condition that must be true for the **Condition check** field to be set to this value (the **Name**).<br><br>Add as many conditions as are needed. |
| Compliant state | System field. Do not use. |
| Order | The order in which the conditions are evaluated. The first condition that is found to match, where the Expiration Condition is true, is used, and no others are checked. |

7. Click **Submit.**
   The Condition Checks form reopens with the new condition listed in the related list.
8. **Optional:** Continue adding conditions as needed, following the steps above.

## Domain separation and Contract Management

Domain separation is unsupported in Contract Management. Domain separation enables you to separate data, processes, and administrative tasks into logical groupings called domains. You can control several aspects of this separation, including which users can see and access data.

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### Support level: No support

- The domain field may exist on data tables but there is no business logic to manage the data.
- This level is not considered domain-separated.

For more information on support levels, see Application support for domain separation.

**Related topics**

Domain separation for service providers

## Procurement

Procurement managers can use the ServiceNow® Procurement application to create purchase orders and to obtain items for fulfilling service catalog requests.

Procurement offers the ability to perform the following functions.

- Track service catalog requests
- Create and manage purchase orders
- Create and manage transfer orders
- Receive assets

### Procurement roles

The Procurement application uses the following roles.

| Role | Contains roles | Description |
|---|---|---|
| procurement_admin | procurement_user | Can create purchase orders without a request. Can view requests and requested items. Can view transfer orders. Can create a purchase order or transfer order when sourcing items for a request. Can view the vendor catalog.<br><br>Can refresh, add, delete, and rearrange gauges in the Procurement Overview module. |
| procurement_user | financial_mgmt_user, model_manager | Can create purchase orders without a request. Can view requests and requested items. Can view transfer orders. Can create a purchase order or transfer order when sourcing items for a request. Can view the vendor catalog. Can view and refresh gauges in the Procurement Overview module. |

### Procurement workflows

Procurement uses the following workflows.

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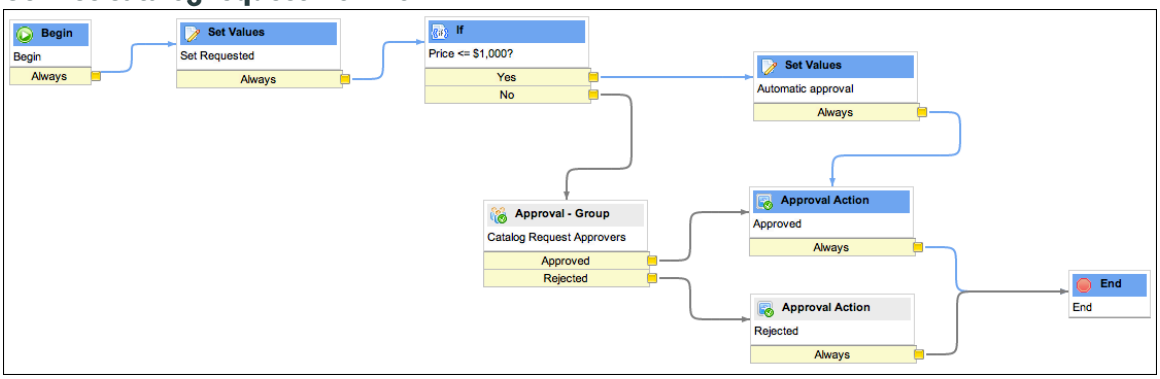
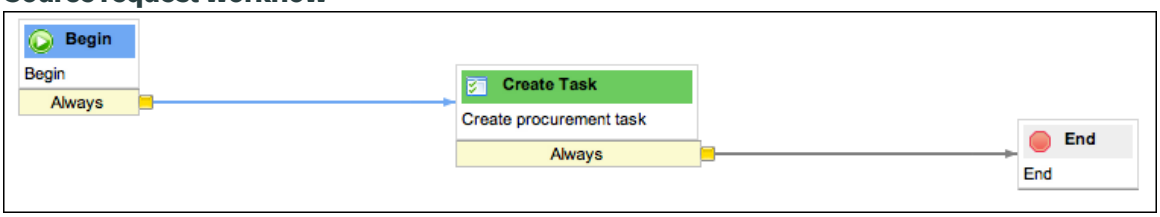
- In the Service Catalog Request workflow, items ordered from the service catalog that cost over one thousand dollars require approval.

**Service catalog request workflow**




- In the Source Request workflow, catalog tasks are created so that a procurement manager can source the item by creating a transfer order or purchase order.

**Source request workflow**




These workflows are provided in the base system. You can edit these workflows in the graphical Workflow Editor or create a workflow to better fit your organization's procurement needs.

### Related topics

Workflows

## Use the Procurement Overview module

Use the gauges on the Procurement Overview homepage to help you track and manage requests, purchase orders, and other important aspects of the procurement process.

### Before you begin

Role required: procurement_admin or procurement_user

### Procedure

1. Navigate to **All** > **Procurement** > **Overview**.
2. Click elements within the gauges to obtain more information.

**Example**

For example, click a request number to view the request record.

## Activate Procurement

You can activate the Procurement plugin that provides core procurement capabilities.

### Before you begin

Role required: procurement_admin, procurement_user

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### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the Procurement plugin (com.snc.procurement) using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.
3. Select **Install** to start the installation process.

   **Note:**
   When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

   You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

#### Components installed with Procurement

Several types of components are installed with Procurement.

Demo data is available with Procurement. The demo data provides sample requests, purchase orders, purchase order line items, and receiving slips.

#### Business rules installed with Procurement

Procurement plugin adds the following business rules.

| Business rule | Table | Description |
|---|---|---|
| Adjust remaining quantity | Purchase order line items [proc_po_item] | Calculates the remaining quantity of items ordered on a purchase order line items by subtracting the amount received from the amount ordered. |
| Can request be sourced | Request [sc_request] | Checks if a request can be sourced. |
| Cancel Procurement Orders | Request [sc_request] | Cancels all unreceived purchase orders and unshipped transfer order lines associated with the request's items if the request state changes to **Closed Cancelled**. |
| Check if req item is sourced | Requested Item [sc_req_item] | Sets the **Sourced** field on the parent request to **true** if all requested items have been sourced. |
| Check if request is sourceable | Requested Item [sc_req_item] | Checks if the request associated with a requested item can be sourced (obtained from a transfer order or by creating a purchase order to a vendor). |
| Create Assets | Receiving Slip Line [proc_rec_slip_item] | If the purchase order line item is available, creates the assets for a receiving slip line when the slip line assets are received. |

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| Business rule | Table | Description |
|---|---|---|
| Handle roll up states and assets removal | Purchase order line items<br><br>[proc_po_item] | Manages purchase order line items if they are canceled or received. If a purchase order line is canceled, this business rule deletes any pre-created assets.<br><br>This business rule also checks the status of other purchase order lines that share the same purchase order and, if necessary, updates the status of the purchase order. For example, when the last purchase order line is received, the status of the purchase order changes to **Received**. |
| Redirect TOL to existing TO-Procurement | Transfer Order Line<br><br>[alm_transfer_order_line] | Attaches a transfer order line to an existing transfer order if the transfer order is in the **Draft** stage and has the same **From stockroom** and **To stockroom** values as the transfer order line. |
| Shipping Cost Changes | Purchase Order<br><br>[proc_po] | Recalculates the total cost of the purchase order if the shipping rate changes. |
| State Change | Transfer Order Line<br><br>[alm_transfer_order_line] | Marks the requested item as **Received** if the state of the associated transfer order line changes to **Received**. |
| State Change | Purchase order line items<br><br>[proc_po_item] | Sets the time at which the purchase order line item is ordered and updates the original requested item when the purchase order line item is received. |
| State Change PO | Purchase Order<br><br>[proc_po] | Changes the purchase order line item status when the status of the associated purchase order changes. |
| Total Cost | Purchase order line items<br><br>[proc_po_item] | Calculates the total order cost based on the cost of individual items and the quantity ordered. When you receive a purchase order line item, this business rule also takes the following steps.<br>• Populates the **List price** field with the value from the **Cost** field unless you enter a different value.<br>• Calculates the **Total list price** field value by multiplying the **List price** and **Ordered quantity** values. |
| Update expected delivery date for PO | Purchase order line items<br><br>[proc_po_item] | Sets the **Expected delivery date** for purchase orders to the latest purchase order line **Expected delivery date**. |
| Update expected delivery date for POLs | Purchase Order<br><br>[proc_po] | Sets the **Expected delivery date** of associated purchase order lines to the purchase order's **Expected delivery date** if at least one of the following conditions is true. |

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| Business rule | Table | Description |
|---|---|---|
| | | • The purchase order line has no expected delivery date.<br>• The purchase order line's expected delivery date is later than the purchase order's expected delivery date.<br>• The purchase order line's expected delivery date is the same as the purchase order's previous delivery date. |
| Update Ordered Date | Purchase Order<br>[proc_po] | Sets the **Ordered date** field to the date and time at which the status of the purchase order is set to **Ordered**. |
| Update PO | Purchase order line items<br>[proc_po_item] | Updates the purchase order if the cost of any purchase order line item changes. |
| Update Purchase Order Line | Receiving Slip Line<br>[proc_rec_slip_item] | Updates the **Quantity received** field on the associated purchase order line item when a receiving slip item is received. |
| Update Request Item CI | Hardware<br>[alm_hardware] | Sets the **Configuration item** field on the catalog task and requested item to the related hardware CI created during the procurement process. |

**Related topics**

Business rules

### Client scripts installed with Procurement

Procurement plugin adds the following client scripts.

| Client script | Table | Description |
|---|---|---|
| Hide request item if request is not empty | Catalog Task<br>[sc_task] | Displays the task's **Request item** and the request item's **Requested for** value if the task is associated with a requested item and not directly with a request. Otherwise, if the task is associated with a request, the client script displays the **Request** and the request's **Requested for** value. |
| Purchase Order Line Mandatory | Receiving Slip Line<br>[proc_rec_slip_item] | Changes the **Purchase Order Line** field on the Receiving Slip Line form to mandatory if the associated receiving slip has a listed purchase order. |

**Related topics**

Client scripts

### Script includes installed with Procurement

Procurement plugin adds the following script include.

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| Script include | Description |
|---|---|
| ProcurementUtils | Provides utilities for Procurement. |

### Tables installed with Procurement

Procurement plugin adds the following tables.

| Table | Description |
|---|---|
| Purchase Order<br><br>[proc_po] | Stores information about items ordered, cost of items ordered, and users that require the items for orders placed with a vendor.<br><br>**Note:**<br>The asset, procurement_user, inventory_admin, or contract_manager role can only access the reports. You must activate the Hardware Asset Management Professional (com.sn_hamp) plugin for the contract_manager and inventory_admin role. |
| Purchase order line items<br><br>[proc_po_item] | Stores information about items and quantity ordered on purchases orders.<br><br>**Note:**<br>The asset, procurement_user, inventory_admin, or contract_manager role can only access the reports. You must activate the Hardware Asset Management Professional (com.sn_hamp) plugin for the contract_manager and inventory_admin roles. |
| Receiving Slip<br><br>[proc_rec_slip] | Stores receiving information for items ordered with a purchase order. Can reference multiple receiving slip lines. |
| Receiving Slip Line<br><br>[proc_rec_slip_item] | Stores receiving information for items ordered on a specific purchase order line, such as the items ordered, quantity ordered, and who ordered them. |

### User roles installed with Procurement

Procurement plugin adds the following user roles.

| Role | Contains roles | Description |
|---|---|---|
| procurement_admin | procurement_user | Can create purchase orders without a request. Can view requests and requested items. Can view transfer orders. Can create a purchase order or transfer order when sourcing items for a request. Can view the vendor catalog.<br><br>Can refresh, add, delete, and rearrange gauges in the Procurement Overview module. |
| procurement_user | financial_mgmt_user, model_manager | Can create purchase orders without a request. Can view requests and requested items. Can |

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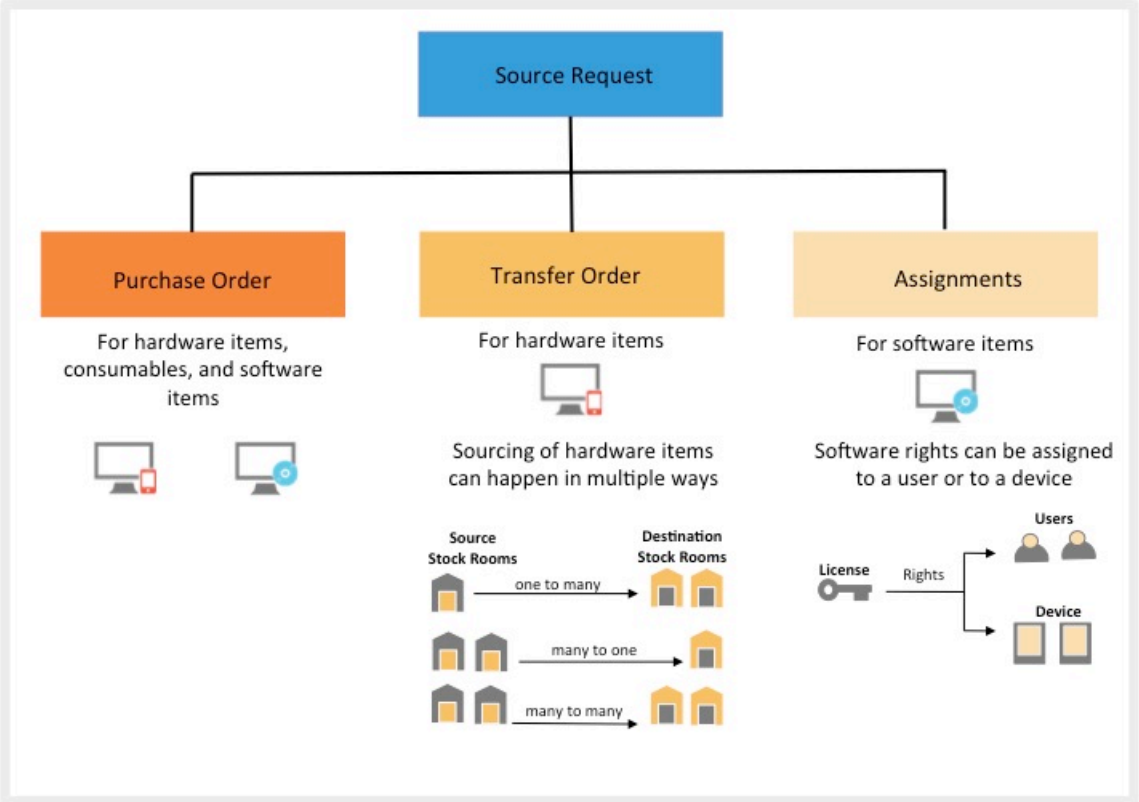
| Role | Contains roles | Description |
|---|---|---|
| | | view transfer orders. Can create a purchase order or transfer order when sourcing items for a request. Can view the vendor catalog. Can view and refresh gauges in the Procurement Overview module. |

## Sourcing items in a service catalog request

A service catalog request can contain multiple items that must be sourced.

### Methods of sourcing requested items




**Note:**
Only items with an assigned model can be sourced. You can't source bundles.

## Sourcing requested items from local stockrooms

You can use the assets available in the requester's local stockroom to fulfill a service catalog request. The assets that are in stock are reserved and a fulfillment task is created to source and fulfill the request.

## Sourcing requested items from other stockrooms

When the requested items aren't in stock, you can create a purchase order to deliver the items from other source stockrooms to your local stockroom. You can request multiple items in a purchase order.

After creating a purchase order, you can create hardware assets and reserve it for the requester either before or after you receive the requested items. You can't create or assign software licenses to the requester before you receive the software licenses.

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## Sourcing requested hardware items

You can source requested hardware items by creating a transfer order. You can transfer hardware assets from a source stockroom to multiple destination stockrooms.

When a source stockroom doesn't have enough items in stock, you can specify multiple source stockrooms in the transfer order so that the hardware items can be transferred to the destination stockrooms.

**Important:**
If the Field Service Management application is also activated on your ServiceNow instance, then a workflow in this application processes the transfer orders. For more information, see Move an asset through the transfer process.

## Sourcing requested software licenses

To source a requested software license, you must assign the rights of the software license to a user or a device so that they're authorized to use the software.

### Related topics

- Manage transfer orders
- Track a request from the service catalog
- Models
- Bundled models
- Source requests from local stockrooms

### Create a purchase order from a request

You can create a purchase order directly from a request. This enables procurement managers to obtain items and fulfill requests from the Service Catalog. You can create multiple purchase orders from a request.

#### Before you begin

Role required: procurement_admin or procurement_user

#### Procedure

1. Navigate to **All** > **Procurement** > **Requests** > **Requests**.
2. Select the **Number** of a request that has been approved but not sourced.
   Look in the **Request State** and **Sourced** columns.
3. In the **Catalog Tasks** related list, select a Source Request Items number.
4. Select **Source Request**.
   The Source Request screen is displayed with a list of all the requested items.
5. Select **Purchase** in the requested item section.
6. In the **Vendor** list, select the vendor from which the requested item or items should be delivered.
7. Verify if the **Out of Stock** field is set to **false**.
   If the vendor doesn't have stock, the field value will be **true**.
8. In the **Quantity** field, specify the quantity you want to order.
9. In the **Destination Stockroom** list, select the destination to which the requested item or items should be delivered.

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10. **Optional:** Select the **Consolidate PO** check box to combine the listed items with existing purchase orders.

    (Optional) When you check Consolidate Purchase Orders, all items sourced from the same vendor on the same request are placed on the same purchase order. When you select a vendor, the system automatically searches for purchase orders that have been created for the same request, have the same **Vendor** selected, and have the **Requested** status. If the system finds a match, all items are placed on the same purchase order and can be ordered together. If the system does not find a match, a new purchase order is created.

    For example, if you are purchasing 25 phones from Apple and an open purchase order already exists for Apple, the 25 phones are added to the open purchase order. If there are no open purchase orders for the selected vendors, new purchase orders are created. Items ordered from the same vendor are grouped together. Different items are shown on separate lines on the purchase order.

11. Select **Submit**.

### Result

- Purchase order is created.
- On the request, the **Sourced** check box is selected

#### Create a transfer order from a request

You can create a transfer order directly from a request to source hardware items and consumables from stockrooms.

### Before you begin

Role required: procurement_admin or procurement_user

**Important:**
If the Field Service Management application is also activated on your ServiceNow instance, then a workflow in this application processes the transfer orders. For more information, see Move an asset through the transfer process.

### Procedure

1. View procurement requests.

2. Select a request that has been approved but not sourced.
   Check the **Request State** and **Sourced** columns.
3. In the **Catalog Tasks** related list, select a sourcing task.
4. Select **Source Request**.
   The Source Request or Sourcing page appears with a list of all the requested items.
5. Create a transfer order.

6. **Optional:** On the Sourcing page of the Hardware Asset Workspace, select the **Source through distribution channel** check box to source the assets from the inbound distribution channels that support the destination stockrooms.

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**Note:**
The **Source through distribution channel** check box that enables you to source through a distribution channel for Transfer orders appears only in the Hardware Asset Workspace. Your preference of selecting or clearing this check box is saved and is shown when you open the Sourcing page again.

You can associate the location of the requester as a service location with multiple stockrooms for better location coverage. Also, these stockrooms can be associated with multiple inbound stockrooms or distribution channels for optimized transfer of assets between the stockrooms. Distribution channels enable you to source the assets from the stockrooms that you prefer for sourcing based on the rank that you provide to the stockrooms.

For more information, see Associate a stockroom with service locations and Link stockrooms into a distribution channel.

7. In the **Source stockroom** list, select a stockroom from which the hardware item should be sourced.

   **Note:**
   In the Hardware Asset Workspace, the Source stockroom list shows only the inbound distribution channels of the stockrooms that support the location of the requester under the following conditions:

   a. When you've selected the **Source through distribution channel** option.

   b. When the inbound distribution channels are added to the stockrooms that support the location of the requester.

8. In the **Transfer Quantity** field, specify the quantity you want to transfer.
   The **In stock** column, displays the total stock available with the selected source stockroom.
9. In the **Destination stockroom** list, select the destination to which the requested item or items should be delivered.

   **Note:**
   In the Hardware Asset Workspace, the Destination stockroom list shows only the stockroom that supports the location of the requester under the following conditions:

   a. When you've selected the **Source through distribution channel** option.

   b. When the location of the requester is added as a service location of one or more stockrooms.

10. Select **Submit**.
    A transfer order is created to move the item or items from the **Source stockroom** location to the **Destination stockroom** location. When you view the request, the **Sourced** check box is selected.

**Related topics**

Manage transfer orders

### Source requests from local stockrooms

Get visibility into local stockrooms at the time of sourcing requests.

**Before you begin**
You can source a request by using assets from the requester's local stockroom.

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- If stock is available in the local stockroom, the asset is reserved and follows the fulfillment task to source the request.
- If the requester's location is supported by another stockroom as part of service locations, the asset can also be sourced from this stockroom.
- If stock in the local stockroom is unavailable, you can get the assets transferred from other stockrooms or create a purchase order.

The Flow Designer application is used to create the Asset Local Stock subflow to take you through the process of using assets from your local stockroom to source your request. As the subflow takes you through the various stages, the asset details are automatically updated. You can open the Asset Local Stock subflow to view the status of the stages in the subflow.

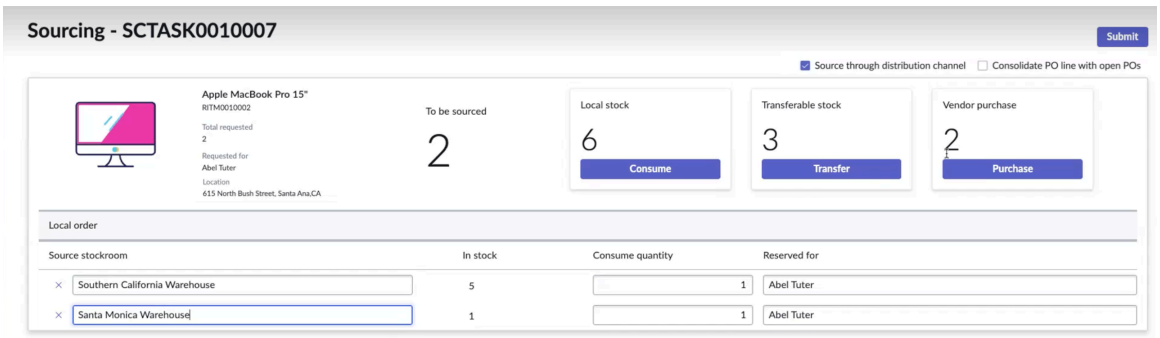
**Note:**
Use decision tables to customize the Asset Local Stock subflow. For more details, see Hardware Asset Management flow customization.

Role required:

- procurement_user or procurement_admin
- inventory_user or inventory_admin

### Procedure

1. Log in with credentials for the role of procurement_user or procurement_admin.
2. Navigate to **All** > **Service Catalog** and select **Hardware**.
3. Select the hardware item that you want to source and select **Order Now**
   Your request is submitted and the Order Status form layout appears.
4. Select the request number.
5. On the Request form layout, select the **Catalog Tasks** related list to view the sourcing task for the request.
6. Select the sourcing task and select **Source Request**.




The Sourcing form shows the following hardware sourcing request details:

- **Total requested**- Quantity of the hardware requested.
- **Requested for**- Name of the person for whom the hardware is requested.
- Location- Place where the hardware should be deployed.

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**Trouble?**
If the Source Request functionality or button isn't functioning as expected, confirm that the catalog task has both the **Parent** and **Request** fields populated. For more information, see View and edit a catalog task. The Request ID, which is required for the Source Request page to function correctly is derived from the Parent field of the catalog task. If the Parent field is missing and the catalog task was created using Flow Designer, refer to the relevant Set Parent field when creating Catalog Task from Flow Designer for further details.

7. Select **Consume** to source the available stock from the local stockroom and from the stockroom that supports your location.
   If stock isn't available in your local stockroom and the stockroom that supports your location, select **Transfer** or **Purchase** to source the request via a transfer order or a purchase order. If you create a transfer order and want the local stockroom to be included in the list of stockrooms to choose from, the admin must turn on the `glide.asset.procurement.sourcing.local_stock_transfer` property.
8. Select **Source Stockroom** to select the stockroom from where you want to source the assets. If your location is associated with a stockroom as a service location, you can source from this stockroom along with the local stockroom. Service location capabilities enable a single stockroom to support multiple locations and consume the local stock efficiently. For more information on Service locations, see Associate a stockroom with service locations.

   If the Asset pick task is enabled for the source stockroom, then this task is added to the Hardware Asset Refresh Request and Hardware Asset Request flows.
9. In the **Consume Quantity** field, specify the quantity of assets that you want to consume from the stockroom that you selected.
10. Select **Reserved for** to specify a user for whom you want to source the request.
11. To source from multiple stockrooms, repeat steps 7–9.
12. Select **Submit**.
    A consume asset task is created. Assets are selected from the stockrooms and are reserved for the user who you selected in the **Reserved for** list. The state of the selected asset moves to in stock and the substate to reserved.
13. Log in with credentials for the role of inventory_admin or inventory_user.
14. Select the **Requested Items** related list and then select the request item.
15. Select the **Asset Tasks** related list and then select a task to select and assign an asset to the sourcing task.
    The Consume Asset Task form layout appears in the Asset Tasks module. Based on the type of asset (hardware or consumable) that is being sourced, fields in the form layout differ. The Assets Tasks module lists all the asset task records.
16. Change that you need and then close the task when you're done.
    - For hardware assets: Assets are auto-assigned to sourcing tasks but you can change an asset by selecting the **Asset** list. After you're done, select **Close Task**.
    - For consumable assets: The model for the asset appears on the form layout instead of the asset. Select **Close Task** or **Consume and Close**. If you select **Consume and Close**, the reserved asset is automatically picked up and assigned to the user. If you select **Close Task**, you must go to the Consumable form layout and assign an asset to the user manually.

### Add an assignment from a request

You can add assignments directly from a request to source rights from software licenses.

## Before you begin

Role required: procurement_admin or procurement_user

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### Procedure

1. Navigate to **All** > **Procurement** > **Requests** > **Requests**.
2. Select the request that has been approved but not sourced.
   Check the **Request State** and **Sourced** columns.
3. In the **Catalog Tasks** related list, select a number.
4. Select **Source Request**.
5. Select **Add assignments** in the requested software item section.
6. In the **License Name** list, select a license from which the software rights should be sourced.
   The **Available Rights** column, displays the total rights available with the selected license.
7. In the **Rights** field, specify the rights you want to assign.
8. From the **Type** list, select whether to assign the rights to a user or device.
9. In the **Assigned\Allocated** list, select the user or device to whom the requested item should be assigned.
10. Select **Submit**.
    An assignment is created to assign rights from the **License Name** location to the **Assigned \Allocated** user or device. When you view the request, the **Sourced** check box is selected.
11. Run the conuter to make sure that you are in compliance.
    You are prompted to run the software counter if the Software Asset Management is active.
12. Select **OK**.
    For auditing, the **Assigned Licences** related list in the Request form will provide the details of all the assignments done as part of this request.

## Procurement purchase order management for assets

Accurate purchase order information is important for invoice tracking, receiving, and reporting in the ServiceNow platform.

The Procurement application enables users with an appropriate procurement role to manage purchase order information for assets. It also provides direct access to service catalog requests. You can create purchase orders and transfer orders directly from requests.

Before using the Procurement application, create assignment groups for catalog tasks. Assignment groups are sets of users, filtered by location, who can perform catalog tasks.

### Related topics

Manage transfer orders

Create a group

### Consumable assets

A consumable asset is one that is purchased in quantity and distributed. It is assigned to the consumable model category, and the asset record tracks the quantity that is available and total cost. When consumable assets are received, they are merged into an existing consumable record, if available.

For the records to merge, the consumable cannot be listed on an active transfer order and the **Model**, **Location**, **Model Category**, **Stockroom**, **Status**, and **Substatus** fields on the asset record must match.

If consumables are merged into an existing consumable record, the cost of the additional consumables received is added to that of the existing consumables in the record. For example, if 50 computer keyboards arrive and 20 keyboards of the same model exists in the receiving

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stockroom, the two records are merged showing 70 keyboards in the stockroom with a combined total cost.

If no matching consumable record exists in the receiving stockroom, a record is created. After the consumables are received, the quantity is updated, but individual consumables are no longer tracked within the Procurement application and are not displayed on receiving slip lines.

**Note:**
The related list of a purchase order doesn't display consumable asset details. This means that you can't track consumables through a purchase order.

For more details on creating consumable assets, see Create consumable assets.

### Track a request from the service catalog

The Procurement application lets you track a request that was ordered from the service catalog.

#### Before you begin
Role required: procurement_admin or procurement_user

#### About this task
When a user places an order from the service catalog, a request record is created to track the order. Each ordered item becomes a requested item that is listed on the request record. For example, a single request for one laptop, two monitors, and one keyboard creates the following records.

Request REQ0000001: 4 items

- Requested Item RITM0000001: 1 laptop
- Requested Item RITM0000002: 2 monitors
- Requested Item RITM0000003: 1 keyboard

#### Procedure

1. Navigate to **All** > **Procurement** > **Requests** > **Requests**.
2. Click a request **Number**.
   The **Requested Items** related list displays the items that were ordered. You can view the requested item, or view associated **Purchase Orders**, **Transfer Orders**, and **Assignments** on other related lists. A catalog task is automatically generated for each requested item to identify the source of the item, whether it must be purchased or transferred from a stockroom.

### Cancel a request from the service catalog

You can cancel a request from the service catalog if, for example, the item is no longer needed or the request was not approved.

#### Before you begin
Role required: catalog_admin, procurement_admin, or procurement_user

#### About this task
When a service catalog request is canceled, the following actions occur automatically.

- Associated purchase orders that have not been received are canceled.
- All procurement tasks are canceled.
- Associated transfer orders are canceled, if all transfer order lines related to the transfer order are also associated with the service catalog request and the transfer order lines have all been canceled. If the transfer order contains transfer order lines that are not related to the service catalog request and those lines have not been canceled, the transfer order is not canceled.

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Associated transfer order lines that are in the **In Transit** or **Delivered** stages are not canceled.

### Procedure

1. Navigate to **All** > **Procurement** > **Requests** > **Requests**.
2. Click a request **Number**.
3. Click **Cancel Request**.

## View and edit a catalog task

Catalog tasks are used to source items and fulfill requests. You can view and edit catalog tasks from a request.

### Before you begin

Role required: procurement_admin or procurement_user

### About this task

If a request requires approval, a catalog task is created automatically when the request is approved. If a request doesn't require approval, a catalog task is created automatically when the request is created.

**Note:**
If a request contains one requested item and the item has no model specified, a catalog task isn't created automatically. If a request includes multiple items and only some have a specified model, catalog tasks are automatically created, but only for those items with a model.

### Procedure

1. Navigate to **All** > **Procurement** > **Requests** > **Tasks**.
2. Open a catalog task.
3. Edit the fields as necessary.

#### Catalog task fields

| Field | Description |
|---|---|
| Number | The unique number identifying the catalog task. |
| Request | The number of the request to which the catalog task is associated. The information in this field is derived from the **Number** field on the Request form. |
| Request item | The number of the requested item to which the catalog task is associated. The information in this field is derived from the **Number** field on the Requested Item form. |
| Requested for | The name of the person for whom the associated item was requested. The information in this field is derived from the **Request** or **Request item** field. |
| Due date | The date by which the catalog task should be completed. |
| Configuration item | The configuration item associated with the **Request Item**. |
| Approval | The status of catalog task approval: **Not Yet Requested**, **Requested**, **Approved**, or **Rejected**. |
| State | The current state of the catalog task: **Pending**, **Open**, **Work in Progress**, **Closed Complete**, **Closed Incomplete**, or **Closed Skipped**. |

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| Field | Description |
|---|---|
| Assignment group | The group from which an individual is selected to complete the catalog task. |
| Assigned to | The individual assigned to complete the catalog task is selected from the **Assignment group**. |
| Work notes list | The list of users to receive email notifications when the work notes on the catalog task are updated. |
| Short description | A brief description of the catalog task. |
| Description | A detailed description of the catalog task. |
| Work notes | Information about how the catalog task is resolved. |
| Parent | The parent record associated with the task. |
| Additional comments | Additional information about the catalog task. |

4. Select **Update**.

### Related topics

Models

## Create a purchase order

You can create a purchase order. Purchase orders specify assets to order from a single vendor.

### Before you begin

Role required: procurement_admin or procurement_user

### About this task

For example, an organization can create a purchase order to buy 20 laptop computers or 10 servers. Information on a purchase order enables physical and financial tracking of the assets that were ordered.

You can also use a transfer order if an asset is already owned by an organization. A transfer order is used to internally transfer assets from one stockroom to another instead of purchasing the assets. For example, a company stockroom in New York has five laptops that are needed in Boston. You create a transfer order to move the laptops from the New York stockroom to the Boston stockroom.

After you create a purchase order, the **Receiving Slip** related list is available on the Purchase Order form. A receiving slip is created manually or automatically when the item is received. The **Receiving Slip** related list shows all receiving slips related to the purchase order. After a receiving slip is added to a purchase order, all fields on the purchase order record become read-only.

### Procedure

1. Navigate to **All** > **Procurement** > **Orders** > **Purchase Orders**.
2. Click **New**.
3. Complete the form.

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### Purchase order fields

| Field | Description |
|---|---|
| Number | The unique number identifying the purchase order. |
| Due by | The date by which the purchase order **Total cost** must be paid. |
| Vendor | The supplier to which the purchase order was issued. |
| Ship to | The stockroom to which the items on the purchase order should be shipped.<br>**Note:**<br>This field is required but doesn't affect creating requisitions for software on Coupa. |
| PO date | The date on which the purchase order was created. |
| Status | The status of the purchase order: **Canceled**, **Ordered**, **Received**, **Requested**, or **Suspended**. |
| Assigned to | The user to whom the purchase order is assigned. |
| Bill to | The location responsible for paying the purchase order **Total cost**. |
| Short description | A brief description of the purchase order. |
| General section | |
| Shipping | The delivery method to be used when shipping the items on the purchase order. |
| Terms | The purchase order payment terms: **Credit**, **Net 30 days**, or **Net 90 days**. |
| Ship rate | The amount that must be paid for the delivery method specified in the **Shipping** field. |
| Total cost | The sum of all item costs on the purchase order and the shipping costs. |
| Description | A full description of the purchase order contents. |
| Details section | |
| Initial request | The record number of the request that requires the items on the purchase order. |
| Requested by | The user requesting the items on the purchase order.<br>**Note:**<br>The email ID or email address of the user requesting the items on the purchase order must be the same on both Coupa and ServiceNow ServiceNow application. |
| Requested | The date the user in the **Requested by** field requested the items on the purchase order. |
| Ordered | The date and time of clicking the **Order** button on the Purchase Order form. |
| Expected delivery | The date the items associated with the purchase order are expected to arrive in the stockroom identified in the **Ship to** field. This field can’t be edited when the |

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| Field | Description |
|---|---|
| | purchase order has a **Status** of **Received** or **Canceled**. (For more information about this field, seePurchase order expected delivery date .) |
| Received | The date and time at which the purchase order status changed to **Received**. |
| Contract | The record number of the contract with the vendor from which the items on the purchase order are ordered. |
| Department | The department responsible for paying for the purchase order. |
| Budget number | The budget number related with the purchase order. |
| Vendor account | The vendor account related with the purchase order. |

4. Click **Submit**.

### What to do next
Add purchase order line items to specify what you are ordering from this vendor.

### Related topics
Manage transfer orders

## Create a purchase order line item

After you save a new purchase order, you create purchase order line item records to specify the individual items to order.

### Before you begin
Role required: procurement_admin or procurement_user

### Procedure
1. Navigate to **All** > **Procurement** > **Orders** > **Purchase Orders**.
2. Open a purchase order.
3. In the **Purchase order line items** related list, click **New**.
4. Complete the form.

#### Purchase order line item fields

| Field | Description |
|---|---|
| Number | The unique number identifying the purchase order line item. |
| Vendor | The supplier from which this product should be ordered. |
| Product Model | The model of the purchase order line item. |
| Product Catalog | The product catalog category to which the product model is assigned. For example, **Hardware**, **Software**, or **Supplies**. |
| Part number | The identification number assigned to the product model. |
| Metric group | Each metric group has a set of license metrics that are specific to the software publisher. |

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| Field | Description |
|---|---|
| | **Note:**<br>If you select only a software model in the Product model field, this field gets displayed on the form. |
| License metric | License metric for the license group that the software license is counted against when reconciliation is run. The options for license metric change based on the **Metric group** field.<br>**Note:**<br>○ If you select only a software model in the Product model field, this field gets displayed on the form.<br>○ If you choose a license metric that isn't available on Coupa, the license metric value is defaulted as **each**. |
| Request line | The identification number of the requested item record associated with this purchase order line item. |
| Ordered | The date and time at which this purchase order line item was ordered. |
| Expected delivery | The date the purchase order line item is expected to arrive in the stockroom identified in the **Ship to** field on the purchase order record. This field is automatically filled with the value in the **Expected delivery** field on the purchase order record. This field can be edited when the purchase order line item has a **Status** of **Requested**.<br>For more information about this field, see Purchase order expected delivery date. |
| Received | The date and time at which the purchase order line item status was changed to **Received**. |
| Purchase order | The purchase order record number associated with this purchase order line item. |
| Rights per license pack | Rights associated with each pack that is purchased for Microsoft Per Core or Microsoft Per Core with CAL licenses. |
| Number of packs | Number of packs for Microsoft Per Core or Microsoft Per Core with CAL licenses. |
| Status | The current status of the purchase order line item: **Canceled**, **Ordered**, **Pending Delivery**, **Received**, or **Requested**. |
| Ordered quantity | The number of product models that were ordered. |
| Received quantity | The number of product models that were shipped and received. The vendor may have sent multiple shipments.<br>The received quantity can be larger or smaller than the **Ordered** quantity. For example, you may have ordered five laptops but the vendor sent six. |
| Remaining quantity | The number of product models that still need to be received to fulfill the **Ordered** quantity. |

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| Field | Description |
|---|---|
| List price | The price at which the item retails, not including discounts. If the system creates the purchase order from the service catalog ordering process, the purchase order line item inherits the list price from the associated vendor catalog item. If the vendor catalog item does not have a list price value and you have not entered a value, this field is automatically populated with the value from the **Cost** field. |
| Cost | The cost of a single product model, including discounts. If the system creates the purchase order from the service catalog ordering process, the purchase order line item inherits the cost from the associated vendor catalog item **Vendor Price**. |
| Total cost | The cost of a single product model multiplied by the value specified in **Quantity**. |
| Non-catalog request | Select this check box to create a requisition for an item that is not present in the product catalog of the organization.<br>**Note:**<br>○ This field isn't visible on the form if you haven't published a procurement integration profile. For more information, see Integrating with external procurement applications.<br>○ If you select only a software model in the Product model field, this check box gets displayed on the form.<br>○ If you select an item in the Product Catalog field, the check box gets automatically unchecked.<br>○ If you haven't selected any item in the Product Catalog field, this check box is automatically checked, which indicates you are submitting a non-catalog request. |
| Stock Order | Read only and selected if the related request is using the bulk stock order workflow.<br>**Note:**<br>Appears for all purchase order line items when the Hardware Asset Management application is installed from ServiceNow Store. |
| Short description | A few words or short phrase describing the purchase order line item. |

5. Click **Submit**.
   The purchase order reopens with the line item listed. The purchase order and line item are in **Requested**s status.
6. **Optional:** Continue adding purchase order line items for this vendor, as needed.
7. After you initiate the order with the vendor and are ready to show that the order was placed, click **Order**.
   The status of the purchase order and line items change to **Ordered**.

### Related topics

Vendor catalog items

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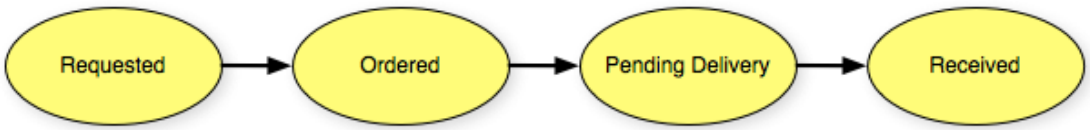
### Purchase order status

Purchase orders follow a specific life cycle. The **Status** field on the purchase order record is always read-only.

#### Purchase order status




#### Status life cycle

| Status | Description |
|---|---|
| Requested | The status is **Requested** when you create a purchase order. |
| Ordered | The status changes to **Ordered** when you add purchase order line items, and click **Order**. |
| Pending Delivery | When you create assets before receiving them as a purchase order line item, the status of purchase orders and purchase order line items changes to **Pending Delivery** status. |
| Received | When ordered assets arrive in the specified stockroom and you click **Receive**, the status of purchase orders and purchase order line items changes to **Received**. |
| Canceled | You can cancel a purchase order if its status is **Requested**, **Ordered**, or **Pending Delivery**. For more information, see Cancel a purchase order. |

### Purchase order expected delivery date

The purchase order record and the purchase order line item record both contain the **Expected delivery** date field.

The **Expected delivery** field can be edited on both records. Editing the field on one record can change the field on the other record.

- If you add an expected delivery date to the purchase order and the expected delivery date field on the purchase order line item is blank, the date on the purchase order is added automatically to the purchase order line item.
- If you add an expected delivery date on the purchase order line item and the expected delivery date field on the purchase order is blank, the date on the purchase order line item is added automatically to the purchase order.
- If the purchase order and the purchase order line item have the same expected delivery date and you change the date on the purchase order, the date is changed automatically on the purchase order line item.
- If you change the date on the purchase order line item to a date that is later than the one specified on the purchase order, the date on the purchase order is changed to the new date. The expected delivery date of a purchase order line item cannot be later than the expected delivery date on the associated purchase order.
- If you change the date on the purchase order line item to a date that is earlier than the date specified on the purchase order, the date on the purchase order remains the same.

### Cancel a purchase order

You can cancel purchase orders with a status of **Requested**, **Ordered**, or **Pending Delivery**.

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### Before you begin
Role required: procurement_admin or procurement_user

### About this task
Purchase order line items can also be canceled from a purchase order.

### Procedure
1. Navigate to **All** > **Procurement** > **Orders** > **Purchase Orders**.
2. Open a purchase order to cancel.
3. Click **Cancel**.
   All associated purchase order line items that have not been received are canceled. Any assets created for the purchase order are deleted.

## Cancel a purchase order line item

You can cancel a purchase order line items with a status of **Requested**, **Ordered**, or **Pending Delivery**.

### Before you begin
Role required: procurement_admin or procurement_user

### About this task
Keep the following in mind when you cancel a purchase order line item.

- When a purchase order line item is canceled, if all other line items are also canceled, the purchase order is canceled.
- After a purchase order line item is canceled, it can be reordered if the associated purchase order has not been canceled or received.
- If you cancel a purchase order line item for which assets were created, the assets are deleted from the system and removed from the purchase order.
- If you reorder the same purchase order line item, the assets are recreated for that line if the line has a status of **Pending Delivery**.

### Procedure
1. Navigate to **All** > **Procurement** > **Orders** > **Purchase Orders**.
2. Open a purchase order.
3. In the **Purchase order line items** related list, select a line item to cancel.
4. Click **Cancel**.

## Reorder a purchase order

You can reorder a purchase order that was canceled.

### Before you begin
Role required: procurement_admin or procurement_user

### Procedure
1. Navigate to **All** > **Procurement** > **Orders** > **Purchase Orders**.
2. Open a purchase order with a status of **Canceled**.

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3. Click **Order**.
   The status changes to **Ordered** for the purchase order and all associated purchase order line items.

### Reorder a purchase order line item

You can reorder a purchase order line item that was canceled.

#### Before you begin
Role required: procurement_admin or procurement_user

#### Procedure

1. Navigate to **All** > **Procurement** > **Orders** > **Purchase Orders**.
2. Open a purchase order.
3. In the **Purchase order line items** related list, select a line item with a status of **Canceled**.
4. Click **Order**.
   The purchase order line item **Status** field changes based on the **Status** field of the associated purchase order. For example, if the purchase order has a status of **Pending Delivery**, the purchase order line item status changes to **Pending Delivery** and the assets for the purchase order line item are created automatically.

### Create an asset and reserve it for the requester

Create the asset before they're delivered so that you can create the asset record with an asset tag and serial number early in the process and reserve the asset for the user who requested it. The receiver can only select the assets to be received as assets are pre-created.

#### Before you begin
Role required: procurement_admin or procurement_user

#### About this task
Some requests must be approved before items on the request can be sourced. In the base system, requests over $1,000 require approval. To change the $1,000 approval threshold and other workflow attributes, edit the Service Catalog Request workflow.

When the asset state is **In stock**, the **Reserved for** field is maintained as the asset is received and placed in a stockroom. When the asset state changes to **In use**, the **Reserved for** field is relabeled **Assigned to**. If there is a name in the **Reserved for** field, the name is retained when the field is relabeled. A user with the asset role can change the name in the **Assigned to** field. Changing the name is helpful, for example, if an IT technician orders 10 laptops and must assign them to individual users.

**Note:**
If assets are not created prior to delivery, they are automatically created from line items when purchase orders are received. Also you can enter the asset details and receive them when the purchase orders are received.

#### Procedure

1. Navigate to **All** > **Procurement** > **Requests** > **Tasks**.
2. Open a task with a **State** of **Open** and a **Short description** of **Source Request Items**.
3. Click **Source Request**.

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- If the request is already fulfilled or the items in the request are not sourceable, the **Source Request** button is hidden.
- If the requested item does not have an assigned model, the item is not listed on the Source the Request dialog box.
- Any items on the purchase order that have a remaining quantity of **0** are not listed on the Source the Request dialog box.

4. Select a **Destination Stockroom**.
5. Select the **Create PO** option for one or more listed items.
6. For each item requiring a purchase order, select a **Vendor**.
7. Click **OK**.
8. Navigate to **Procurement** > **Orders** > **Purchase Orders**.
9. Open the purchase order you just created.
   If you created a purchase order for more than one item, multiple purchase orders may have been created.
10. Select **Order**.
    After the items are ordered, no additional purchase order line items can be added to the purchase order.
    The status of all purchase order line items changes to **Ordered**.
11. Click the **Create hardware assets prior to delivery** related link to automatically create hardware assets for all purchase order line items.
    Hardware assets are listed in the **Assets** related list. Click an asset in the list to view the asset record. Except for consumables, the **Reserved for** field contains the name of the user who made the original request.

    You can also create assets for individual purchase order line items. On a purchase order, go to the **Purchase order line items** related list and click a specific purchase order line item number. Then, click the **Create hardware assets prior to delivery** related link. Only the hardware assets included on the purchase order line item are created.

### Related topics

Set asset states and substates

Models

## Receive assets

Assets can be received and added to the system when they are delivered to a stockroom.

Users with an appropriate procurement role can receive assets. If one purchase order contains multiple purchase order lines, the lines can be received at different times. This is useful if items arrive at the stockroom in different shipments. The purchase order status does not change to **Received** until all purchase order lines are received.

As an alternative to receiving assets when they arrive, you can create assets before they arrive and reserve them for the requester.

### Receive an asset

When assets are received and delivered to a stockroom, they're added to the system.

#### Before you begin

Role required: procurement_admin or procurement_user

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### About this task

When you receive assets:

- If you haven't pre-created hardware assets, you can enter asset details and reserve them for users.
- You can over receive an order wherein, the received quantity can be higher than the ordered quantity.
- If you have ordered multiple items with different receiving stockrooms, you can receive them at the same time.

### Procedure

1. View purchase orders.
2. Select a purchase order with a **Status** of **Ordered** or **Pending Delivery**.
3. Select **Receive**.
   The Receive Purchase Order screen appears with the list of the products ordered.
4. Select the **Received** check box for the line items that you're receiving.
5. To receive software assets:
   a. Edit the **Receiving Stockroom** if the items arrived at a different stockroom than the one specified on the purchase order.
   b. Edit the **Receiving Quantity** if the number of items delivered doesn't match the number ordered.
   c. Edit the **Unit Cost** if the price changed between the time the item was ordered and the time it arrived at the stockroom.
   Enter a number. The number can include decimals.
   d. Select **Capture Asset tags** to enter asset details.
   You can't enter details for assets more than the received rights.
   e. In the **Capture Asset Tag** dialog box, select **Insert a new row**.
   f. Enter the asset tag, serial number, rights, and License key.
6. To receive hardware and consumables assets:
   a. Edit the **Receiving Stockroom** if the items arrived at a different stockroom than the one specified on the purchase order.

      **Note:**
      The asset bundle when received creates the asset bundle with the status as **Bundle**. You must add the individual assets under the asset bundle.

   b. Edit the **Receiving Quantity** if the number of items delivered doesn't match the number ordered.
   c. Select the **Reserve** toggle button to reserve the item.

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When a reserved item is received, the **State** and **Substate** fields on the corresponding asset record are automatically set to **In stock** and **Reserved**, respectively. If the **Reserve** button isn't selected for an item, the **State** and **Substate** fields on the corresponding asset record are set to **In stock** and **Available**.

**Note:**
You can't reserve consumables.

**d.** From the **Reserved for** list, select a user you want reserve the asset for.

If a name was specified in the **Requested for** field on the Purchase order line item form, the name is added automatically but can be changed.

You can add multiple users in the **Capture Asset tags** dialog box.

**e.** Select **Capture Asset tags** to enter asset details.

You can't enter details for assets more than the received quantity. You can also reserve assets for a user.

**Note:**
If you've pre-created the assets, you must select the ones you want to receive.

**f.** On the **Capture Asset Tag** dialog box, select **Insert a new row**.

**g.** Enter the asset tag and serial number.

**h.** From the **Reserved for** list, select the user for whom the item was ordered.
If a name was specified in the **Requested for** field on the Purchase order line item form, the name is added automatically, but you can change it.

**i.** Edit the **Unit Cost** if the price changed between the time the item was ordered and the time it arrived at the stockroom.
Enter a number. The number can include decimals.

7. Select **Submit**.
A confirmation message displays with the details of assets received.
8. Select **OK**.

A receiving slip is automatically created and can be viewed in the **Receiving Slips** related list. If items on a purchase order are received at different times, a new receiving slip is created each time any item on the purchase order is received. For example, if 30 laptop computers were ordered and arrived in three separate shipments, three receiving slips are created.

Different assets are created for each hardware item. If it's a software asset, one single asset is created for each license if you don't split the rights. For consumables, if an asset exists, it's updated, or else, new assets are created.

### Create a receiving slip

Receiving slips are created automatically during the process of receiving assets. You can also create receiving slips manually.

#### Before you begin

Role required: procurement_admin or procurement_user

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### About this task
After a receiving slip has been created for a purchase order, all fields on the purchase order record are changed to read-only.

### Procedure
1. Navigate to **All** > **Procurement** > **Receiving** > **Receiving Slips**.
2. Click **New**.

   A **Number** is assigned automatically. The current date and time is added automatically to the **Received** field.
3. Select a **Purchase Order**.
   Only purchase orders with a status of **Ordered**, **Pending Delivery**, or **Requested** are listed in the selection window. The **Vendor** column lists the vendor specified on the purchase order. The **Ship to** column lists the destination stockroom specified on the purchase order.
4. Select a **Receiving Stockroom**.
5. Click **Submit**.

### What to do next
Add a receiving slip line to the receiving slip to identify the items from the purchase order that were received.

## Create a receiving slip line

When assets arrive at a stockroom and you receive them, a receiving slip is created on the purchase order. You create a receiving slip line to identify the specific assets and quantities that were received.

### Before you begin
Role required: procurement_admin or procurement_user

### About this task
If the asset already exists, the asset record is updated when you save the receiving slip line. If the asset does not already exist, a new hardware or software asset record is created. The **Model category** and **Configuration item** fields are automatically filled in on the new asset record based on information in the request, purchase order, or receiving slip. If **Asset Tag** and **Serial Number** information exists, it is not overwritten.

### Procedure
1. Navigate to **All** > **Procurement** > **Receiving** > **Receiving Slips** and open a receiving slip.
2. In the **Receiving Slip Lines** related list, select **New**.
   The following fields are completed automatically.

   - A **Number** is assigned.
   - In **Received**, the current date and time are added.
   - In **Received by**, the currently logged in user is added.
3. In **Purchase Order Line**, select the reference lookup icon and select a purchase order line.
   The **Purchase Order Line** field is required if the parent receiving slip has an associated purchase order. Only purchase order lines that are associated with the same purchase order linked to the parent receiving slip are available for selection.
4. In **Quantity**, enter the number of items received.
   For example, five items were ordered, but only two are being received.

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5. **Optional:** Edit the **Received by**, **Requested for**, and **Unit cost** fields, as needed.
6. Select **Submit**.

### Result
The **Receiving stockroom** field on the Receiving Slip record becomes read-only.

## Integrating with external procurement applications

Manage an end-to-end procurement process by integrating external procurement applications with Software Asset Management and create software requisitions directly on the external procurement applications. Software Asset Management tracks these requisitions and automatically generates entitlements or entitlement import errors after these requisitions are received on the external procurement application.

Integrating Software Asset Management with external procurement applications help you to:

- Gain end-to-end visibility of the entire purchase request to entitlement creation.
- Automate the complete process of creating software requisitions to entitlement creation.
- Reduce errors in entitlement creation.

## Before you begin

- Activate the Procurement plugin (com.snc.procurement). For more information, see Activate Procurement.
- Install the Asset Management - Procurement Integration (app-itam-procurement-integration) store application from ServiceNow Store. For more information, see Install Asset Management - Procurement Integration.

### Install Asset Management - Procurement Integration

You can install the Asset Management - Procurement Integration application (app-itam-procurement-integration) from the ServiceNow Store.

### Before you begin

- Ensure that the application and all of its associated ServiceNow Store applications have valid ServiceNow entitlements. For more information, see Get entitlement for a ServiceNow product or application.
- Review the Asset Management - Procurement Integration application listing in the ServiceNow Store for information on dependencies, licensing or subscription requirements, and release compatibility.

Role required: Now Support

After the Asset Management - Procurement Integration has been entitled, you can reach out to Now Support to install this application.

### About this task
Scheduled jobs and tables are installed with Asset Management - Procurement Integration:

For more information, see Components installed with Asset Management - Procurement Integration.

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### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the Asset Management - Procurement Integration application (app-itam-procurement-integration) using the filter criteria and search bar.

   You can search for the application by its name or ID. If you can't find the application, you might have to request it from the ServiceNow Store.

   In a list next to the **Install** button, you see the versions that are available to you.
3. Select a version from the list and select **Install**.

   In the Install dialog box that is displayed, any dependencies that are installed along with your application are listed.
4. If you're prompted, follow the links to the ServiceNow Store to get any additional entitlements for dependencies.
5. Select **Install**.

#### Components installed with Asset Management - Procurement Integration

Several types of components are installed with activation of the Asset Management - Procurement Integration application, such as tables and scheduled jobs.

## Scheduled jobs installed

| Scheduled job | Description |
|---|---|
| ITAM - Sync <procurement_integration_profile_name> purchase orders | Fetches the status of the already created requisitions daily.<br>This scheduled job is automatically created when you publish the integration profile. |

## Tables installed

| Table | Description |
|---|---|
| Procurement Integration Profile<br>[itam_procurement_integration_profile] | Includes the details of the third-party procurement integrations that are connected to the Procurement application in ServiceNow. |
| Procurement Integration Jobs<br>[itam_procurement_integration_job] | Includes the mapping information of a procurement integration profile with its associated scheduled jobs. |
| Integration Scheduled Job Results<br>[itam_procurement_integration_job_log] | Includes the details of the failure of the scheduled job execution. |

#### Domain separation and Asset Management - Procurement Integration

Domain separation is supported for Asset Management - Procurement Integration. Domain separation enables you to separate data, processes, and administrative tasks into logical

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groupings called domains. You can control several aspects of this separation, including which users can see and access data.

### Support level: Enhanced

- Includes **Basic** and **Standard** levels.
- Data-driven process enables service provider customers to modify business logic that is based on defined use cases. These configurations are UI-based and fail-safe so that configurations by one customer can't affect another.
- Tenants of the instance must be able to configure minimum viable product (MVP) business logic and data parameters for themselves. This logic and parameters would be expected for the application's normal function.

Sample use case: Tenant-customers of a shared environment must be able to change the impact, urgency, or priority matrix to set priority within their domain.

For more information on support levels, see Application support for domain separation.

### Asset Management Procurement integration overview

Domain separation is present in all aspects of the Asset Management - Procurement Integration application.

### How domain separation works in Asset Management - Procurement Integration

- You can create multiple procurement integration profiles in each domain. You must have only one published and active profile in each domain, including the parent domain.
- For the Purchase Order to create a requisition in your external purchasing application, a published procurement integration profile must exist in the domain of the purchase order.
- All Purchase Orders, Purchase Order Lines, Receiving Slips, Receiving Slip Lines, entitlements, entitlement import errors, and expense line records that you created are stamped with the respective domain of the purchase order.

The Procurement Integration Job [itam_procurement_integration_job] table isn't domain separated.

However, each procurement integration job is associated with a procurement integration profile. The job execution only synchronizes the updates from the external purchasing application to the purchase orders that are stamped with the corresponding procurement integration profile.

### Domain separated tables

- Procurement Integration Profile [itam_procurement_integration_profile]
- Procurement Integration Job Log [itam_procurement_integration_job_log]

### Required plugins

- Domain separation extension (com.glide.domain.msp_extensions.installer)
- SAMP (com.sn_samp_master)
- Procurement (com.snc.procurement)

#### Other supported plugins

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Service Catalog – Domain Separation (com.glideapp.servicecatalog.domain_separation)

### Integrating with Coupa

Integrating Coupa with Software Asset Management helps you create software requisitions directly on Coupa. Software Asset Management tracks these requisitions and automatically generates entitlements or entitlement import errors after these requisitions are received on Coupa.

**Note:**
This integration doesn't pull requisitions created on Coupa to Software Asset Management.

## Before you begin

- Install the Asset Management - Procurement Integration (app-itam-procurement-integration) store application from ServiceNow Store. For more information, see Install Asset Management - Procurement Integration.
- You must have the Software Asset Management Enterprise license.
- Activate the Coupa spoke. For more information, see Coupa Spoke.
- Activate the Procurement plugin (com.snc.procurement). For more information, see Activate Procurement.

## Synchronize reference data

Both ServiceNow Procurement and Coupa have theirs own set of tables and reference data types. For a smooth and successful integration, you must synchronize the data you would refer. For more information, see Reference data synchronization.

**Warning:**
If you don't synchronize data, you might encounter a few issues while creating a requisition on Coupa.

### Create a Coupa integration profile

Create a Coupa integration profile to verify the status of the procurement-scheduled jobs, entitlements, and entitlement import errors created through this profile.

**Before you begin**
Role required: sam_admin

Create an OAuth 2.0 connection with Coupa to get the Client ID and Client Secret. For more information, see OAuth 2.0 Getting Started with Coupa API. Save the Client ID and Client Secret in a secure location for later use.

You must set the following scopes while creating an OAuth 2.0 connection with Coupa.

- core.approval.configuration.read
- core.approval.read
- core.approval.write
- core.catalog.read
- core.common.read
- core.contract.read
- core.contract.write
- core.inventory.adjustment.read

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- core.inventory.adjustment.write
- core.inventory.asn.read
- core.inventory.common.write
- core.inventory.consumption.read
- core.inventory.consumption.write
- core.inventory.receiving.read
- core.inventory.receiving.write
- core.inventory.return_to_supplier.read
- core.inventory.transfer.read
- core.inventory.transfer.write
- core.invoice.delete
- core.invoice.read
- core.invoice.write
- core.item.read
- core.item.write
- core.legal_entity.read
- core.purchase_order.read
- core.purchase_order.write
- core.requisition.read
- core.requisition.write
- core.sourcing.pending_supplier.read
- core.sourcing.pending_supplier.write
- core.sourcing.read
- core.sourcing.response.award.write
- core.sourcing.response.read
- core.sourcing.response.write
- core.sourcing.write
- core.supplier.read
- core.supplier.write
- core.user.read
- core.user.write

**Note:**
If these scopes aren't associated with the Client ID and Client Secret, the OAuth token flow fails on ServiceNow.

### Procedure

1. Navigate to **Software Asset Workspace** > **License operations** > **Purchasing** > **Procurement integrations**.
2. Select **New**.

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3. On the form, fill in the fields.

**Create New Procurement Integration Profile**

| Field | Description |
|---|---|
| Display name | Name of the procurement integration profile. For example, `Coupa integration`. |
| Connection & Credentials | Connection and credential alias for Coupa. This field gets automatically populated to **sn_coupa_spoke.Coupa_OAuth**. |
| Profile type | Type of integration profile.<br>Select **Coupa integration**. |
| Status | Status of the integration profile.<br>○ If you haven't published the integration profile, this field is automatically set to Draft.<br>○ If you've already published the integration profile, this field is automatically set to Published. |
| Active | This field is visible and set to true only when the integration profile is published.<br>If you set this field to false, the associated requisitions with this integration profile aren't created and tracked. |

4. Select **Save**.
5. Select the Preview icon ⓘ next to the Connection & Credentials field.
   You get redirected to the Connection & Credential Aliases form.
6. Select **Create New Connection & Credential** in the Related Links section to create connection credential.
7. In the dialog box, fill in the fields.

**Create Connection and Credential**

| Field | Description |
|---|---|
| Name (Connection) | Name to identify the connection uniquely. For example, `Coupa OAuth connnection`. |
| Connection URL | URL to make a connection to Coupa. Use the `https://<coupa-instance-url>` format.<br>○ For customer instances, use the `https://{organization_name}.coupahost.com` format. |

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| Field | Description |
| --- | --- |
| | ○ For partner and demo instances, use the `https://{organization_name}.coupacloud.com` format. |
| Name (Credential) | Name to identify the credential uniquely. For example, `Coupa OAuth credential`. |
| Token URL | URL used to generate OAuth token. Use the `https://<coupa-instance-url>/oauth2/token` format. |
| OAuth Client ID | Identifier (Client ID) generated in Coupa. |
| OAuth Client Secret | Secret (Client Secret) generated in Coupa. |

8. Select **Create and Get OAuth Token**.
   Your ServiceNow instance creates an OAuth for Coupa and then automatically returns you to the Integration Profile form.
9. **Optional:** Create a child alias that can uniquely identify the connection and credentials for this integration profile.
   The first Coupa integration profile that you create uses the default (parent) connection and credential alias for Coupa. Each additional Coupa integration profile that you create needs a unique child alias that helps differentiate the connection and credentials between each integration profile.
   a. On the Connection & Credential Aliases form, select the link under **Child Aliases > Parentalias=*** ** to add child aliases.
   b. Select **New**.
   c. Enter a name for the child alias in the Name field.
   d. Right-click the form header and then select **Save**.
   e. After the form reloads, select the **Create New Connection & Credential** related link.
   f. Repeat steps 7 and 8.
   g. In the Connection & Credential field of the Integration Profile form, select the lookup icon to locate and select the child alias that you created.
   Selecting the child alias associates the alias with the integration profile. Your ServiceNow instance uses this alias to identify the connection and credentials for this integration profile.
10. Select **Publish**.

### Result

After you publish the integration profile, the scheduled job *`ITAM - Sync Coupa purchase orders`* runs daily and fetches the status of the already created requisitions.

**Note:**
If you haven't created any requisition, the scheduled job doesn't run.

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You can view this information by clicking the **Procurement Integration Jobs** tab.

### What to do next

Verify if the scheduled job *ITAM - Sync Coupa purchase orders* has run successfully by selecting the **Integration Scheduled Job Results** tab. If the job has failed, you can view the list of errors by following these steps:

1. On the Procurement integration profile form, select the **Procurement Integration Job Log** related list.
2. Open the job log record where the displayed status shows as failed.
3. Select the related list **Asset Job Log Details** to find out the reason for the job failure.

Create software requisitions directly on Coupa through the ServiceNow Procurement application to purchase software.

If you want to delete the Coupa integration profile, see Deleting an external procurement application integration profile.

## Create a requisition on Coupa through Procurement application

Create software requisitions directly on Coupa through the ServiceNow Procurement application to purchase software.

### Before you begin

To create a requisition on Coupa through ServiceNow Procurement application, you must perform the following tasks.

- Create and publish a Coupa integration profile. For more information see, Create a Coupa integration profile.
- Ensure that the Purchase Order you create has at least one Purchase Order Line, and all Purchase Order Lines must be for software products.
- Synchronize reference data types on both ServiceNow Procurement and Coupa applications. For more information, see Reference data synchronization.

If all these conditions are met, you can create a requisition in Coupa.

If the conditions aren't met, requisitions aren't created on Coupa, and the legacy procurement flow continues on the Procurement application.

Role required: sam_admin and procurement_integrator

**Note:**
The procurement_integrator role is added to the sam_admin role. The procurement_integrator role enables the SAM admin to view the connections and aliases.

### About this task

You can create a requisition on Coupa through the following ways:

- When a user requests software through Service Catalog. For more information, see Request a catalog item from Service Portal.
- If a procurement_user or sam_admin directly creates a Purchase Order on the Procurement application. For more information, see Create a Purchase Order.
- When a sam_user creates a Purchase Order directly from the Remediation Options form. For more information, see View software model results.

Requisitions are of the following types:

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- **Catalog request**: A requisition created for an item that is already present in the external purchasing application.
- **Non catalog request**: A requisition created for an item that isn't present in the product catalog of the organization.

For more information about creating a Purchase Order, see Create a purchase order.

### Procedure

1. Navigate to **All** > **Procurement** > **Orders** > **Purchase Orders**.
2. Select **New**.
3. On the form, fill in the fields.

#### Purchase order fields

| Field | Description |
|---|---|
| Number | The unique number identifying the purchase order. |
| Due by | The date by which the purchase order **Total cost** must be paid. |
| Vendor | The supplier to which the purchase order was issued. |
| Ship to | The stockroom to which the items on the purchase order should be shipped.<br>**Note:**<br>This field is required but doesn't affect creating requisitions for software on Coupa. |
| PO date | The date on which the purchase order was created. |
| Status | The status of the purchase order: **Canceled**, **Ordered**, **Received**, **Requested**, or **Suspended**. |
| Assigned to | The user to whom the purchase order is assigned. |
| Bill to | The location responsible for paying the purchase order **Total cost**. |
| Short description | A brief description of the purchase order. |
| General section | |
| Shipping | The delivery method to be used when shipping the items on the purchase order. |
| Terms | The purchase order payment terms: **Credit**, **Net 30 days**, or **Net 90 days**. |
| Ship rate | The amount that must be paid for the delivery method specified in the **Shipping** field. |
| Total cost | The sum of all item costs on the purchase order and the shipping costs. |
| Description | A full description of the purchase order contents. |
| Details section | |
| Initial request | The record number of the request that requires the items on the purchase order. |
| Requested by | The user requesting the items on the purchase order. |

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| Field | Description |
|---|---|
| | **Note:**<br>The email ID or email address of the user requesting the items on the purchase order must be the same on both Coupa and ServiceNow ServiceNow application. |
| Requested | The date the user in the **Requested by** field requested the items on the purchase order. |
| Ordered | The date and time of clicking the **Order** button on the Purchase Order form. |
| Expected delivery | The date the items associated with the purchase order are expected to arrive in the stockroom identified in the **Ship to** field. This field can't be edited when the purchase order has a **Status** of **Received** or **Canceled**. (For more information about this field, seePurchase order expected delivery date .) |
| Received | The date and time at which the purchase order status changed to **Received**. |
| Contract | The record number of the contract with the vendor from which the items on the purchase order are ordered. |
| Department | The department responsible for paying for the purchase order. |
| Budget number | The budget number related with the purchase order. |
| Vendor account | The vendor account related with the purchase order. |

4. Right-click on the form and select **Save**.
   You can add purchase order line items to specify what you are ordering from this vendor. For more information about creating a purchase order line item, see Create a purchase order line item. A requisition line is created with a unique ID in Coupa.
5. After you've added at least one purchase order line item, select **Order**.
   A requisition ID is displayed on your Purchase Order and the corresponding requisition line IDs are displayed on your Purchase Order Lines.

   **Note:**
   Wait for some time and then reload the Purchase Order form to view the generated IDs or errors.

**Result**

After the status of the Purchase Order is **Received** on Coupa, the following activities occur:

- **Assets** and **Receiving Slips** get created and you can find the **Purchase Order Number** on the Purchase Order form.
- The Asset Management - Procurement Integration application automatically generates entitlements.
- On receipt of the assets, the scheduled job *ITAM - Sync Coupa purchase orders* creates a Receiving Slip and Receiving Slip Lines on the ServiceNow Procurement application. This job also pulls the Coupa fields such as Manufacturer part number, Status, and Receiving quantity. The values returned from Coupa through the receiving transactions are used to populate the created entitlements. However, if these values are not available from the

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receiving slips, then the Asset Management - Procurement Integration application uses the values populated in the Purchase Order of the Procurement application.

- If any discrepancy exists on the Purchase Order, Asset Management - Procurement Integration creates entitlement import errors. You can view the errors by selecting the **Entitlement Import Errors** tab under a Purchase Order, Purchase Order Line item, and Receiving Slip line.

### Reference data synchronization

For a successful integration of Coupa with Software Asset Management, you must synchronize the following reference data types on both the ServiceNow Procurement application and Coupa.

#### Requisition or Purchase Order form

| Coupa Requisition field | ServiceNow Procurement Purchase Order field | Description |
|---|---|---|
| Requested by | Requested by | The email address that is associated with the Requested by record is used to find the corresponding reference record in Coupa. |

#### Requisition Line or Purchase Order Line Item fields

| Coupa Requisition Line fields | ServiceNow Procurement Purchase Order Line Item fields | Description |
|---|---|---|
| Supplier | Vendor | The supplier or vendor from which the software product should be ordered. |
| unit-price | Cost | The cost or price of a single product model, including discounts. |
| Currency | Cost | Currency is a reference field on Coupa. For a successful integration, verify that the currency codes on Coupa and ServiceNow match. |
| Item | Catalog Item | The Coupa items and ServiceNow Procurement catalog items must share the same display name.<br>**Note:** This field is only used for catalog requests. |
| Description | Product Model | The model of the purchase order line item.<br>**Note:** This field is only used for non-catalog requests. |

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### Deleting an external procurement application integration profile

If you want to stop using an external procurement application for creating software requisitions through Software Asset Management, you can delete the integration profile.

A sam_admin can delete an integration profile by selecting **Delete** on the integration profile record.

When you delete a direct integration profile, all scheduled jobs and the job results associated with the profile gets deleted. The integration profile references are also removed from the Purchase Order records on ServiceNow.

After you delete the integration profile, Software Asset Management doesn't consider any in progress requests. Ensure that all the requests in progress are completed before you delete the integration profile.

## Domain separation and Procurement

Domain separation is supported in Procurement processing. Domain separation enables you to separate data, processes, and administrative tasks into logical groupings called domains. You can control several aspects of this separation, including which users can see and access data.

## Support level: Standard*

The support level is Standard but has some exceptions or special conditions.

- Includes all aspects of **Basic** level support.
- Business logic: The service provider (SP) creates or modifies processes per customer. The use cases reflect proper use of the application by multiple SP customers in a single instance.
- The instance owner must be able to configure minimum viable product (MVP) business logic and data parameters. This configuration is done per tenant, as expected for the specific application.

Sample use case: An admin must be able to make comments required when a record closes for one tenant, but not for another.

For more information on support levels, see Application support for domain separation.

## How domain separation works in Procurement

To create or edit Purchase Orders (POs) or PO line items that distinguish the domain, customers must be working in the proper domain. When adjusting any configuration, you should be in the domain where you're doing the work. Use the domain picker to choose the correct domain to work in.

**Related topics**

Domain separation for service providers

# Product Catalog

The product catalog is a set of information about individual models. Models are specific versions or various configurations of an asset. Asset managers use the product catalog as a centralized repository for model information.

A detailed and well-maintained product catalog can coordinate with service catalog, asset, procurement, request, contract, and vendor information.

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Models published to the product catalog are automatically published to the Service Catalog. The service catalog includes information about goods (models) and services. If the model is available from multiple vendors, a model can be listed more than once. Models are included with the Asset Management application.

Keep the following in mind when working with the product catalog.

- A product catalog item can be linked to multiple vendor catalog items or to a single model.
- A model can only have one product catalog item.
- A vendor catalog item can only have a single product catalog item.

**Related topics**

Asset and CI management

## Components installed with Product Catalog

The following components are installed with the Product Catalog plugin.

Demo data is available with the product catalog. The demo data provides various models, model categories, product catalog items, vendor catalog items, and vendors.

### Tables installed with Product Catalog

Product Catalog plugin adds the following tables.

| Table | Description |
|---|---|
| Hardware Catalog [pc_hardware_cat_item] | Stores all hardware catalog items that have been published from the Product Model [cmdb_model] base table. Extends the Product Catalog Item [pc_product_cat_item] table. |
| Product Catalog Item [pc_product_cat_item] | Stores all information for the product catalog. This table extends the Catalog Item [sc_cat_item] table. |
| Software Catalog [pc_software_cat_item] | Stores all software catalog items that have been published from the Product Model [cmdb_model] base table. Extends the Product Catalog Item [pc_product_cat_item] table. |
| Vendor Catalog Item [pc_vendor_cat_item] | Stores all vendor catalog item information. |

### Roles installed with Product Catalog

Product Catalog plugin adds the following roles.

| Role | Description | Contains roles |
|---|---|---|
| model_manager | Can create CMDB models. | none |
| category_manager | Can do everything that model managers can do and can administer model categories. | model_manager |

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### Script includes installed with Product Catalog

Product Catalog plugin adds the following script include.

| Table | Description |
|---|---|
| ProductCatalogUtils | Utilities for creating and maintaining product catalog items derived from vendor catalog items and models. |

### Client scripts installed with Product Catalog

Product Catalog plugin adds the following client script.

| Client script | Table | Script contents |
|---|---|---|
| Set Model Fields | [pc_vendor_cat_item] | Adds the description and price, if they do not exist, when a vendor catalog item is added to the product catalog. |

**Related topics**

Client scripts

### Business rules installed with Product Catalog

Product Catalog plugin adds the following business rules.

| Business rule | Table | Description |
|---|---|---|
| Clear model | [pc_product_cat_item] | Clears the link on a model when the link is cleared from the product catalog. |
| Create child product catalog entries | [cmdb_hardware_product_model] | Creates entries in the product catalog for all items in a bundled model when the bundled model is created. |
| Sync to Product catalog item | [pc_vendor_cat_item] | Updates the corresponding field in the product catalog when a field is updated. |
| Sync to Product catalog item | [cmdb_model] | Updates the corresponding field in the product catalog when a field is updated. |

**Related topics**

Business rules

## Models

Models are specific versions or various configurations of an asset. Models are used for managing and tracking assets through various ServiceNow platform asset applications, including Product Catalog, Asset Management, and Procurement.

Model definitions can be based on vendor-provided criteria, for example, the manufacturer name Apple MacBook Pro, or on a custom abstraction, for example, Graphic Designer Workstation. All model information is located in the Product Catalog application.

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A model can be in one or more model categories. For example, a laptop can be a computer and a server. Model definitions specify whether the model creates an asset, a configuration item, or both. On a hardware model record, compatible hardware models can be added.

Unless otherwise noted, working with product models requires the model_manager role. This role is contained by other roles, such as sam, category_manager, and asset.

## Creating models

Models are created in the **Product Catalog** > **Product Model** > **All Models** module.

See Model form fields for a list of the fields that appear on all models, regardless of the type of model.

### Related topics

Asset Management

Procurement

### Model form fields

There are fields on the Model form that apply to all types of models.

| Field | Description |
|---|---|
| Display name | Name of the model. A system property called *glide.cmdb_model.display_name.shorten* controls how software model display names are generated. |
| Manufacturer | The company that built the model. |
| Name | Field that Discovery uses to create a model with the value discovered. Model managers can specify a name of their choice when creating a model and can also edit the name of an existing model. |
| Edition | The edition of the software model, such as **Professional**. |
| Short description | A brief description of the model. |
| Model categories | The categories to which the model is assigned. This field is a glide list and cannot be used to create reports. |
| Asset tracking strategy | The process by which the model can be tracked. Choose from the following:<br>• **Leave to Category:** model is transparent and the category defines the asset class.<br>• **Create Consumable Asset:** model forces the asset class to be consumable, regardless of what the category defines as the asset class.<br>• **Don't create assets:** model blocks asset instantiation, regardless of what the category defines as the asset class. |
| Acquisition method | The method for purchasing the model. Options are **Both**, **Buy**, or **Lease**. |
| Cost | The cost of a single unit of the model. |
| Depreciation | The depreciation scheme for the model. |

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| Field | Description |
|---|---|
| Salvage value | The estimated value that an asset realizes upon its sale at the end of its useful life. This value must be less than or equal to the cost of the asset. |
| Model number | The specific model number assigned to the item by the manufacturer. Setting the system property *glide.cmdb.makeandmodel.use_model_number_lookup* to true enables you to lookup the model number of hardware models through the MakeAndModelJS script. |
| Barcode | The barcode number assigned to the model. Barcodes are assigned by the manufacturer. |
| Owner | The person responsible for the model. |
| Status | The status of the model. Options are **In Production**, **Retired**, and **Sold**. |
| Expenditure type | The type of expenditure. Choose from the following:<br>• **Capex**: Capital expenditure is a one-time expenditure, where the value is realized over the years. For example, a photocopier.<br>• **Opex**: Operational expenditure is an on-going expenditure. For example, toners for the photocopier. |
| Certified | The option that determines whether the model is approved for use. |
| Comments | Information about the model that would be helpful for others to know. |
| Assets | The assets created from this model. This creation can have any combination of assets and configuration items. For example, with a single hardware model you can have assets and no configuration items, configuration items and no assets, or have both. |
| Configuration Items | The configuration items created from this model. Can have any combination of assets and configuration items. |
| Product Catalog | The information about the model as it appears in the product catalog and service catalog. Information only appears if the model has been published to the product catalog. |

### Create hardware models

Use hardware models to track equipment assets such as servers and racks. You can create a new hardware model.

## Before you begin

Role required: model_manager

## Procedure

1. Navigate to **All** > **Product Catalog** > **Product Model** > **Hardware Models**.
2. Click **New**.
3. Complete the form.
   For general field descriptions, see Model form fields. The hardware model fields listed are found in the Information section of the form.

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**Model form fields for hardware models**

| Field | Description |
|---|---|
| Height (U) | The total height of the hardware item, in inches. |
| Flow Rate (cfm) | The flow rate of the hardware model, expressed in cubic feet per minute. |
| Sound Power (bels) | The noise measurement, in bels (1 bel=10 decibels). |

4. Click **Update**.

### Add compatible models to a hardware model

On a hardware model record, you can add compatible hardware models, giving you a good method for tracking hardware assets that can work together.

#### Before you begin

Role required: model_manager

#### About this task

**Note:**
Hardware models included in bundled models cannot be added as compatibles.

#### Procedure

1. Navigate to **All** > **Product Catalog** > **Product Model** > **Hardware Models**.
2. Click a hardware model **Name**.
3. Click **Add Compatible**.
4. Select a compatible model.
5. Click **Submit**.
   The selected model is listed in the **Compatibles** related list.

#### Related topics

Models

Bundled models

### Add substitute models to a hardware model

On a hardware model record, you can add substitutes to track what hardware models can be substituted for another hardware model.

#### Before you begin

Role required: model_manager

#### About this task

For example, a 19" monitor can be a valid substitute for a 17" monitor. Note that substitutions are directional so, in this case, a 17" monitor is not a substitution for a 19" monitor. Information about valid substitute models is useful when you select models while creating transfer orders.

When you select substitute models, note the following conditions.

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- Substitute models can be used with work management transfer orders. Substitute models are not used in procurement part sourcing.
- Hardware models included in bundled models cannot be added as substitutes.

### Procedure

1. Navigate to **All** > **Product Catalog** > **Product Model** > **Hardware Models**.
2. Click a hardware model **Name**.
3. Click **Add Substitution**.
4. In the **Collection** list on the left, double-click a hardware model.
   The hardware model is added to the **List** on the right.
5. Click **Save**.
   The model is listed in the **Substitutes** related list.

### Related topics

Models

Bundled models

Manage transfer orders

Procurement

## Create consumable models

Consumables are items that are tracked as a group, not individually. An example of consumable items is computer keyboards.

### Before you begin

Role required: model_manager

### Procedure

1. Navigate to **All** > **Product Catalog** > **Product Model** > **Consumable Models**.
2. Click **New**.
3. Complete the form.
   For general field descriptions, see Model form fields. There are no fields specific to consumable models.
   Any consumable assets you create and assign to the new model are displayed in the **Consumables** related list on the model record.
4. Click **Submit**.

## Bundled models

A bundled model is a single model comprised of individual models. For example, a laptop, printer, keyboard, and mouse can be combined into a single bundled model. If you assign any one asset from the bundled model to an individual, that person receives all the components in the bundle.

Bundled model is a template to define the kind of assets that would be a part of asset bundles. To maintain the integrity between asset bundles and bundled models, select the **Bundle assets** check box in the Product Model form layout. Once you select the check box, the status of the bundled model defaults to **Build**. While the status is in build, you can add make changes to the bundled model. Once you change the status to **In Production**, no changes can be made to the bundled model. Now that the bundled model is read-only, you can create asset bundles out of

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this bundled model. You can change the status of the bundled model back to **Build** only if there are no asset bundles associated with the bundled model.

**Note:**
The **Bundle assets** check box functionality is available only with the Hardware Asset Management licensable application. Hardware Asset Management is available in the ServiceNow Store. To view more information on the asset bundle functionality, see asset bundles.

Bundled models can be abstract or concrete.

**Abstract**

Permits use of one model in multiple bundles. The abstract bundle is created as a container. One asset in the bundle is specified as the main component. Model categories define which assets can be included in a bundle. Model categories also define what can be the main component of a bundle.

Add a main component to make it easier to track the bundle components. For example, create an abstract bundle adding a computer as the main component and a mouse and keyboard as additional components. When the bundle is assigned to a user, the asset record for the computer shows the computer, mouse, and keyboard all assigned to the user. Abstract bundles are used more often than concrete bundles.

**Concrete**

Is a fixed bundle where the main component is an asset. Specify the main component and the other components to create an exact bundle. Concrete bundles do not allow for a many-to-many relationship with models.

Keep the following tips in mind when creating and using bundled models.

- Bundles can be nested inside bundles.
- Any type of model can be used in a bundle.
- When a parent link is defined, the fields related to assignment and state of the child assets are read-only. They are populated based on the parent's assignment and state fields.
- If you make a change to the parent bundle, the children in the bundle are affected. For example, if you assign a bundle to an individual, all child asset records show that same individual as the person assigned.
- You cannot pre-allocate bundles.
- In a bundle, consumables are consumed and assets are set to the same state as the main component.
- Only the bundle, not individual components, can be part of a transfer order.
- You control what can go into a bundle through the model category. For example, the model category **Servers** could be set to never allow servers in bundles.
- To create a collection of software, you must create a suite instead of a bundled model.
- A software license cannot be the main component of a bundle.

To create an abstract model, set the model category to **Bundle** and add the components. To create a concrete model, create a model in the **Product Catalog** > **Product Model** > **Bundled Models** module and add components.

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**Related topics**

- Create pre-allocated assets
- Consume consumable assets
- Model categories

### Add model components to a bundle

Add model components to a model as needed, for example, when you upgrade a bundle to include additional assets.

## Before you begin

Role required: model_manager and asset

## Procedure

1. Navigate to **All** > **Product Catalog** > **Product Model** > **Bundled Models**.
2. Open a bundle record.
3. In the **Model Components** related list, click **New**.
4. Select the **Model category** of the component, such as **Computer**.
5. Select the **Component**, such as **Apple Computer MacBook Pro 17"**.
6. Select the **Is main component** check box if this component is the one that other components are attached to.
7. Click **Submit**.
8. Repeat steps 3–7 to add more components to the bundle.

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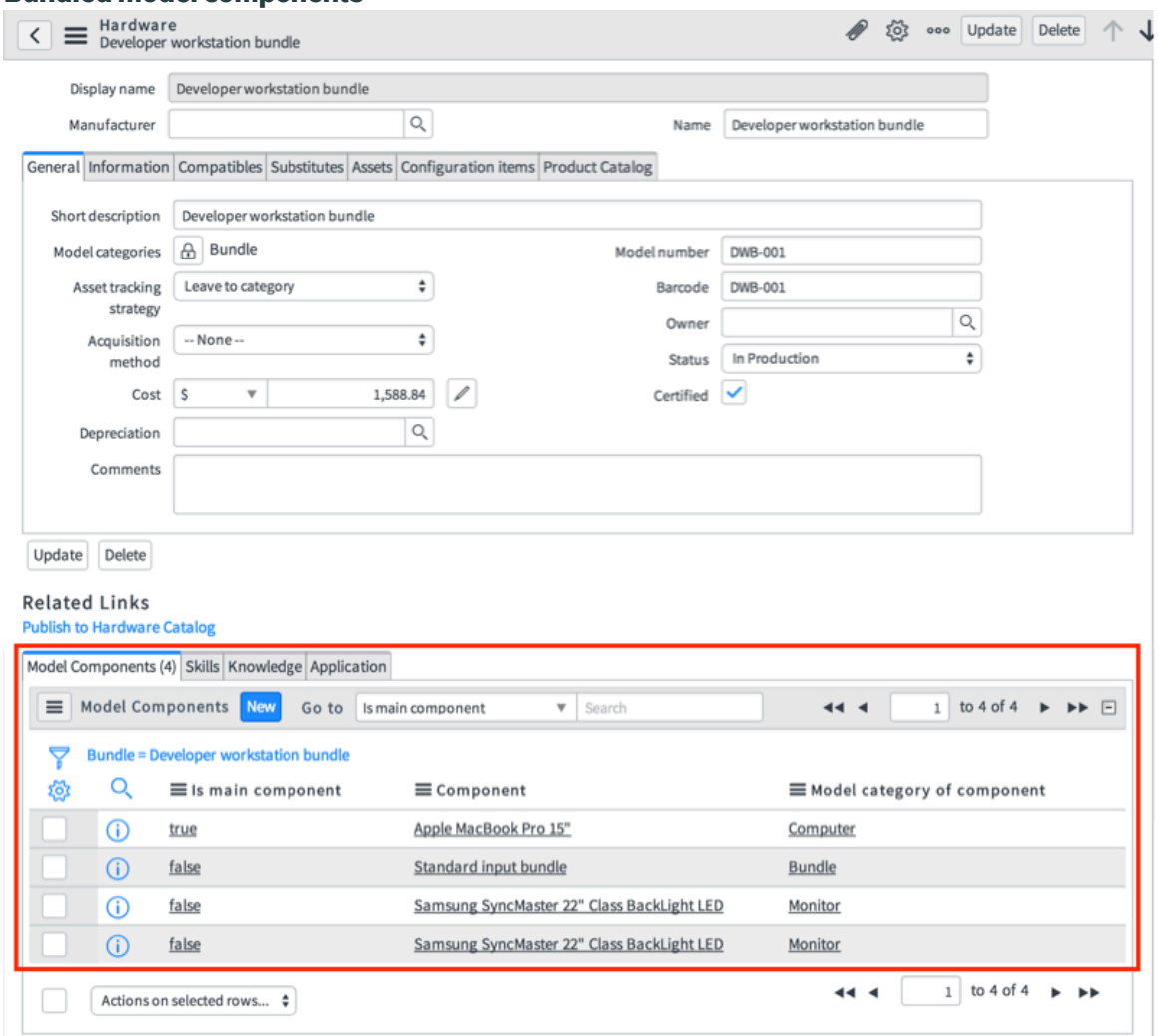
Any components you add to the bundled model are displayed in the **Model Components** related list.

**Bundled model components**




## Related topics

Models

### Remove model components from a bundle

Remove a component from a bundled model, for example, when you want to replace it with a different component.

## Before you begin

Role required: model_manager

## About this task

No component history is retained. If you remove a component from a bundled model, no record is saved showing that the component was ever part of a bundle.

## Procedure

1. Navigate to **All** > **Product Catalog** > **Product Model** > **Bundled Models**.
2. Open a bundle record.
3. In the **Model Components** related list, select the component you want to remove.

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4. In the **Actions** choice list below the list, select **Delete**.
5. Click **OK**.

### Publish bundled models to product catalog

You can publish bundled models to the product catalog to make the bundled models available in the service catalog.

#### Before you begin

Role required: catalog_admin or catalog_manager

#### About this task

You can publish a bundled model only under the following conditions:

- The model should be created in the cmdb_model table.
- The model shouldn't have an existing catalog item.

#### Procedure

1. Navigate to **All** > **Product Catalog** > **Product Models** > **Bundled Models**.
2. Open a product model.
3. In **Related Links**, select **Publish to product catalog**.
4. Select a category.
5. Select **OK**.

### Software models

Software models are created as part of the asset management process. You can create product models for software from the product catalog, but you cannot administer all aspects of the software models.

Software models are used in software counters. For more information about creating software model, see Create software models.

### Create application models

You can create application models that can be managed and tracked within a Scrum development process.

#### Before you begin

Role required: model_manager

#### Procedure

1. Navigate to **All** > **Product Catalog** > **Product Model** > **Application Models**.
2. Click **New**.
3. Complete the form.
   For general field descriptions, see Model form fields. There are no fields specific to application models.
4. Click **Submit**.

#### Related topics

Agile Development

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### Work order models

When work management is activated, the ServiceNow platform adds the Work Order Models and Work Task Models modules to the product catalog.

Users with the wm_admin role can define new model records, which can be used as templates to create work orders for common procedures.

### Models created for VMware support and Amazon EC2

When you activate Orchestration for VMware and Amazon EC2, the system creates models automatically.

The system creates the following models:

- A vmware instance for VMware
- An ec2 instance for Amazon

When the virtual machine is terminated, the asset state changes to **Retired**.

### Add skills to a model

You can associate skills with any model. Creating associations between skills and models is helpful if you are using work management and want to assign tasks to agents based on their skills with specific models.

#### Before you begin

Role required: skill_admin or model_manager

#### Procedure

1. Navigate to **All** > **Product Catalog** > **Product Model** > **All Models**.
2. Open a product model.
3. In the **Skills** related list, click **Edit**.
4. Add items from the **Collection** list to the **Skills List**.
5. Click **Save**.

### Publish models to the hardware or software catalog

You can publish models to the hardware or software catalog to make the models available in the service catalog.

#### Before you begin

Role required: catalog_admin

#### Procedure

1. Navigate to **All** > **Product Catalog** > **Product Model** > **All Models**.
2. Open a product model.
   When you publish a catalog item from a model, the property *glide.model.catalog_item_currency* decides the currency on the catalog item. This property is set to false by default and the value is set to user session currency. If you set this property to true, the value is set to model currency.
3. In **Related Links**, click **Publish to Hardware** or **Publish to Software Catalog**.
4. Select a category.
5. Click **OK**.

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### Delete models

If a model is no longer needed, you can delete it as long as no assets or configuration items use the model.

#### Before you begin

Role required: model_manager

#### Procedure

1. Navigate to **All** > **Product Catalog** > **Product Model** > **All Models**.
2. Select the check box beside the product model.
3. From the **Actions** choice list below the list, select **Delete**.
4. Click **OK**.

## Vendor catalog items

The vendor catalog is a list of goods available from different vendors.

An accurate and complete vendor catalog can make it easier to keep items in stock at the best possible price.

You can link multiple vendor catalog items to a single product catalog item, which allows you to track information about a single item at different vendors.

For example, for an iPhone 5 product catalog item, you can create separate vendor catalog items from Apple and from Amazon. Select the vendor with the best price when you source an item. Users need the model_manager role to work with vendor catalog items.

### Synchronize information

Certain information is synchronized between models, product catalog items, and vendor catalog items.

When working with models, product catalog items, and vendor catalog items, keep the following in mind:

- Changes to model record update vendor catalog items automatically only if the vendor catalog items are published, not linked.
- If a model is linked to a vendor catalog item, any changes to the model do not update the vendor catalog item.
- After publishing a vendor catalog item or model to the hardware or software catalog, some fields become read-only on the vendor catalog item or product catalog item record. Information can only be updated on the model record.

List of synchronized fields:

- Description
- Short description
- Name
- Product ID
- Price
- Vendor
- Specs
- Features

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- Model
- UPC
- Model number
- Cost
- Manufacturer

### Create a vendor catalog item

Create a vendor catalog item to associate product models with a vendor.

## Before you begin

Role required: model_manager

## Procedure

1. Navigate to **All** > **Product Catalog** > **Catalog Definition** > **Vendor Items**.
2. Click **New**.
3. Complete the form.

### Vendor Catalog Item fields

| Field | Description |
|---|---|
| Name | The name of the item is built from information in the **Product Model**, **Vendor**, and **Product ID** fields. |
| Vendor | The supplier that provides the item. |
| Product model | The specific version or configuration of the item. |
| Out of stock | The option that indicates whether the item is unavailable for order. This field is important if you are sourcing request items. Clear this check box if the item is available to order. |
| Product ID | The item identification number assigned by your organization. |
| List price | The price at which the item retails, excluding vendor discounts. |
| Vendor price | The price at which the item is available in the vendor catalog. If the vendor offers a discount, the vendor price reflects the discounted price. |
| Rank tier | Displays the overall ranking for this vendor's products and services, such as Valued Partner or Tactical Supplier. Rank tier expresses your organization's opinion of this vendor's performance. It can be used to decide if the vendor's products should be promoted or discontinued. Users with the vendor_manager role can edit this field. |
| Short description | A brief description of the item. |
| General section | |
| Product catalog item | Name of the product catalog item, if the item has been added to the product catalog. Leave this field empty if you are going to link a vendor catalog item to the hardware catalog. |
| UPC | The barcode number used to uniquely identify and track items for sale. |

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| Field | Description |
|---|---|
| Active | Select the check box to list the item in the vendor catalog. Clear this check box to hide the item in the vendor catalog. |
| Description | A detailed description of the item. |
| Information section | |
| Specifications | Facts about the item such as size, weight, version, or speed. |
| Features | Distinct properties or distinguishing characteristics of the item. |

4. Click **Submit**.

### Link an item to the hardware catalog

After you create a vendor catalog item, link the item to the hardware catalog for viewing.

#### Before you begin
Role required: model_manager

#### About this task
To see the **Link to Hardware Catalog Item** related link on the Vendor Catalog Item form, add a hardware model or a consumable model to the **Product Model** field, and leave the **Product Catalog Item** field blank.

#### Procedure
1. Navigate to **All** > **Product Catalog** > **Catalog Definition** > **Vendor Items**.
2. Open a vendor catalog item.
3. In **Related Links**, click **Link to Hardware Catalog Item**.
4. Select a **Catalog Item**.
5. Click **OK**.
   The page refreshes to the selected hardware catalog item. The vendor catalog item is listed in the **Vendor Catalog Items** related list.

### Link an item to the software catalog

After you create a vendor catalog item, link the item to the software catalog for viewing.

#### Before you begin
Role required: model_manager

#### About this task
To see the **Link to Software Catalog Item** related link on the Vendor Catalog Item form, add a software model or a consumable model to the **Product Model** field, and leave the **Product Catalog Item** field blank.

#### Procedure
1. Navigate to **All** > **Product Catalog** > **Catalog Definition** > **Vendor Items**.
2. Open a vendor catalog item.
3. In **Related Links**, click **Link to Software Catalog Item**.
4. Select a **Catalog Item**.

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5. Click **OK**.
   The page refreshes to the selected software catalog item. The vendor catalog item is listed in the **Vendor Catalog Items** related list.

### Publish an item to the hardware catalog

After you create a hardware item for the vendor catalog, publish it to the hardware catalog for viewing. The hardware catalog is a section within the service catalog.

#### Before you begin
Role required: catalog_admin

#### About this task
To see the **Publish to Hardware Catalog Item** related link on the Vendor Catalog Item form, add a hardware model or a consumable model to the **Product Model** field, and leave the **Product Catalog Item** field blank.

After you publish a vendor catalog item to the hardware catalog, the **Publish to Hardware Catalog** related link is no longer available. Any changes made on the vendor catalog item record are synchronized with the information in the hardware catalog.

#### Procedure

1. Navigate to **All** > **Product Catalog** > **Catalog Definition** > **Vendor Items**.
2. Open a vendor catalog item.
3. In **Related Links**, click **Publish to Hardware Catalog**.
4. Select a **Category**.
5. Select **OK**.
   The published item is listed in the **Vendor catalog Items** related list of the Hardware Catalog form.

### Publish an item to the software catalog

After you create a software item for the vendor catalog, publish it to the software catalog for viewing. The software catalog is a section within the service catalog.

#### Before you begin
Role required: catalog_admin

#### About this task
To see the **Publish to Software Catalog Item** related link on the Vendor Catalog Item form, add a software model or a consumable model to the **Product Model** field, and leave the **Product Catalog Item** field blank.

After you publish a vendor catalog item to the software catalog, the **Publish to Software Catalog** related link is no longer available. Any changes made on the vendor catalog item record are synchronized with the information in the software catalog.

#### Procedure

1. Navigate to **All** > **Product Catalog** > **Catalog Definition** > **Vendor Items**.
2. Open a vendor catalog item.
3. In **Related Links**, select **Publish to Software Catalog**.
4. Select a **Category**.

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5. Select **OK**.
   The published item is listed in the **Vendor catalog Items** related list of the Software Catalog form.

### View a vendor list

You can view a list of vendors from the product catalog.

#### Before you begin
Role required: model_manager

#### About this task
The list includes every company that has the **Vendor** option selected on its record.

#### Procedure
1. Navigate to **All** > **Product Catalog** > **Catalog Definition** > **Vendors**.
2. Click any vendor **Name** for more information.

## Product catalog items

Product catalog items are hardware and software that you can track and offer in the service catalog.

The product catalog is an extension of the Service Catalog that contains a list of available Models. Users with the catalog_admin role can create, activate, and deactivate product catalog items.

### Create a product catalog item

Create hardware and software product catalog items to include in the product catalog and the service catalog.

#### Before you begin
Role required: catalog_admin

#### About this task
You must activate the items separately before they appear in the product catalog or service catalog.

#### Procedure
1. Navigate to **All** > **Product Catalog** > **Catalog Definition** > **Hardware & Software Items**.
2. Select **New**.
3. Complete the form.
   Some of the fields listed do not appear until you save the product catalog item.

**Product catalog item fields**

| Field | Description |
|---|---|
| Name | Name of the item as you want it displayed in the product catalog. |
| Catalogs | Catalog this item is listed in. |
| Vendor | Vendor that supplies the item. If the item is purchased from multiple vendors, use the vendor catalog and leave this field empty. |

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| Field | Description |
|---|---|
| Rank tier | Overall ranking for the selected vendor's products and services. This field is shown in a Product Catalog Item record when the CI class is **Hardware Catalog** or **Software Catalog**. |
| Model | Specific version or configuration of the item. |
| Product ID | Item identification number assigned by your organization. |
| Price | Price at which the item is available in the product catalog. Enter a numerical value and select the appropriate currency. |
| Recurring price | Item's recurring price. For example, a subscription to a mobile phone contract could cost $500.00, with an $30.00 monthly recurring price. |
| Recurring price frequency | Interval at which the recurring price is accrued. |
| List Price | Price at which the item retails. This field is shown only when the **Class** is **Hardware Catalog** or **Software Catalog**. |
| Cost | Price at which the item was purchased from the vendor. The cost could be less than the **List Price** if your organization received a discount from the vendor. This field is shown in a product catalog item record only when the CI class is **Hardware Catalog** or **Software Catalog**. |
| Omit price in cart | When selected, hides the price when the item is displayed in the service catalog. Clear the check box to show the price in the service catalog. This field is only visible in a product catalog item record when the CI class is **Hardware Catalog**. |
| Workflow | Workflow associated with this item.<br><br>You can view the activities, the conditions, and the stages associated with the workflow by selecting **Show Workflow**. |
| Execution plan | Execution plan associated with this item. |
| Short description | Brief description of the item. |
| Ordered item link | List of links containing more information about items. The links can be reused across multiple items. |
| Class | Catalog item class this item belongs to. Select **Hardware Catalog** or **Software Catalog**. This field is visible by default. When you save the record as a hardware or software catalog item, the form is retitled Hardware Catalog or Software, respectively. |
| General section | |
| Category | Named group of items to which the item belongs. |
| Delivery time | Amount of time it takes to deliver the item, starting from when it is ordered from the product catalog. |
| UPC | Barcode number used to identify and track items. |
| Description | Detailed description of the item. The description is displayed in the product catalog listing. |
| Product Information section | |

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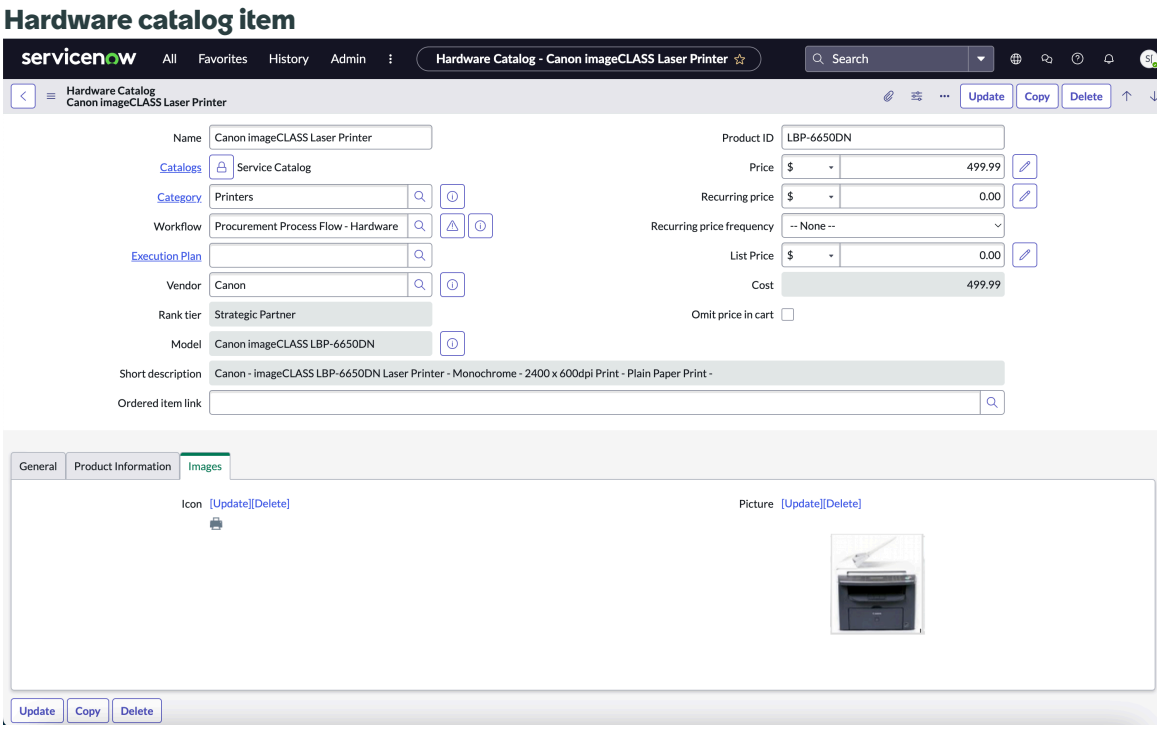
| Field | Description |
|---|---|
| Cost | Price at which the item was purchased from the vendor. This field is only visible when the **Class** is **Software Catalog**. |
| Specifications | Facts about the item, such as size, weight, version, or speed. |
| Features | Distinct properties or distinguishing characteristics of the item. |
| Images section | |
| Icon | Small image that appears next to the name when the item is displayed in the service catalog. Supported file types are `jpg`, `png`, `bmp`, `gif`, and `jpeg`. |
| Picture | An image showing the item. Supported file types are `jpg`, `png`, `bmp`, `gif`, and `jpeg`. |
| Related lists | |
| Includes | More catalog items provided with this item. This related list is for informational purposes only. |
| Variables | Service catalog variables associated with this item. A service catalog variable captures and passes on information about choices a customer makes when ordering an item from the service catalog. |
| Vendor Catalog Items | Vendor catalog items associated with this item. Vendor catalog items allow you to track information about this item by its specifications for each vendor. |

**Example**
Hardware catalog item record with an icon and picture of the item.




4. **Optional:** Select **Try It** to preview the item as it appears in the service catalog.
5. Select **Submit** or **Update**.

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**Related topics**

Create a vendor catalog item

Create an execution plan

Service catalog variables

### Activate a product catalog item

Activate a product catalog item to make it available in the product catalog and the service catalog.

#### Before you begin
Role required: catalog_admin

#### About this task
You can activate the item from either the list view or the record.

#### Procedure

1. Navigate to **All** > **Product Catalog** > **Catalog Definition** > **Hardware & Software Items**.
2. Complete one of the following actions.

| Option | Description |
|---|---|
| **Activate one or more items from the list view** | Select the check box next to one or more items in the record list and select **Activate** be low the list. |
| **Activate from the record** | Select **Activate** under **Related Links**. |

### Deactivate a product catalog item

Deactivate a product catalog item to remove it from the product catalog and the service catalog.

#### Before you begin
Role required: catalog_admin

#### About this task
You can deactivate the item from either the list view or the record.

#### Procedure

1. Navigate to **All** > **Product Catalog** > **Catalog Definition** > **Hardware & Software Items**.
2. Complete one of the following steps.

| Option | Description |
|---|---|
| **Deactivate from the list view** | Select the check box next to one or more items in the record list and click **Deactivate** below the list. |
| **Deactivate from the record** | Select **Deactivate** under **Related Links**. |

## Model categories

Model categories associate CI classes with asset classes. Model categories are part of the Product Catalog application.

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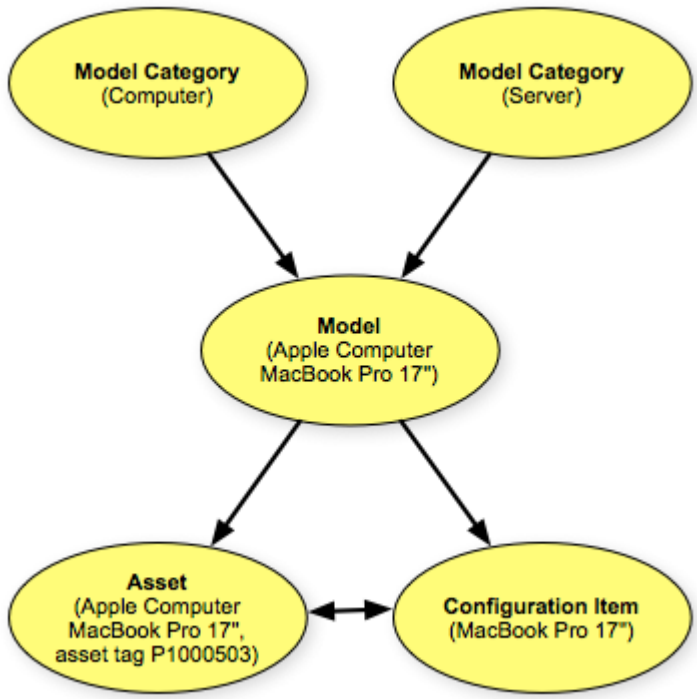
The model category configuration determines if the ServiceNow platform creates an asset from a CI, and, if so, what class of asset. Asset classes in the base system are **Hardware**, **Software License**, and **Consumable**. You can associate a model category to many models and a model to many model categories. For example, a specific model of a computer can be a **Computer** and a **Server**.

**Models diagram**




Any item that is provided as a service or sold to your customer is tracked as an Install Base Item (IBI). The Model category table associates Asset class, CI class, and Install Base Item (IBI) class.

**Note:**
The Install Base Item class field is available on the Model category form only when the Customer Service Install Base Management [com.snc.install_base] plugin is installed. Currently, only the Medical device install base item [sn_hcls_medical_device_install_base_item] is supported when the Healthcare and Life Sciences Service Management Core application is installed. For more details, see Medical device install base item table. When an IBI class is created, it associates with an asset when the asset exists, otherwise an asset is created.

The fields in the Asset class and the IBI class are synchronized as follows:

1. When an IBI class is updated, the Account, Consumer, Location, and Install date field changes are synchronized with the corresponding fields of the Asset class.
2. When an Asset class is updated, the Location and Install date field changes are synchronized with the corresponding fields of the IBI class.

**Related topics**

CMDB classifications and class dependency

Create an asset class

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### View model categories

Default model categories are included with product catalog. You can view a list of default categories and the categories that you created.

#### Before you begin
Role required: model_manager

#### Procedure

1. Navigate to **All** > **Product Catalog** > **Product Model** > **Model Categories**.
2. Open a model category to view its details.

### Create model categories

You can add custom model categories for your instance.

#### Before you begin
Role required: model_manager

#### About this task
When you create model categories, keep the following in mind:

- The base system provides a model category for each CI class in the CMDB. As you create *cmdb_ci* classes, create a corresponding row in the model category table for the model table to be used.
- If you select an **Asset class** on any existing model category, the system automatically creates assets for all configuration items associated with the model category, if configured to do so. If an asset is not created automatically, you can create the asset manually. After an asset class is selected for a model category, the asset class cannot be changed.
- The **Allow pre-allocated**, **Allow in bundle**, and **Allow as main** options are only available if an asset class is specified for the model category.
- If you select **Consumable** or **Software License** for the asset class, the **Allow in bundle** option is available, but not **Allow pre-allocation** or **Allow as main**.
- When a CI is created from a model category that requires asset tracking, the system automatically creates an asset record for the asset class specified in the model category. It then links that asset record to the CI. If a model is specified, the model category of the CI is determined by a combination of the CI class and the list of categories supported by the model. Asset tracking is specified on the model record.
- When an asset is created from a model category that requires CI tracking, the system automatically creates a CI record of the class specified by the category and links it to the asset.
- The Model Categories list (**Product Catalog** > **Product Model** > **Model Categories**) shows all the CI classes and what asset class is generated on the asset side.

#### Procedure

1. Navigate to **Product Catalog** > **Product Model** > **Model Categories** and select **New**.
2. On the form, fill in the fields.

#### Model Category fields

| Field | Description |
|---|---|
| Name | A descriptive name for this category. |

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| Field | Description |
|---|---|
| CI class | If a CI class is needed, it must be specified when you create the model category. You can't add the CI class the model category later. |
| Asset class | Default options and any new asset classes you've created. Setting the asset class triggers the creation of assets depending on the model category selected. You can add an asset class to the model category later, but can't be changed after it's added. If you select **Consumable** or **Software License**, the **CI class** field becomes read-only because consumables and software licenses don't create CIs. If you specify a CI class and then select **Consumable** or **Software License**, the**CI class** field is changed to **None** automatically.<br>○ Asset: An item that can be tracked individually.<br>○ Consumable: An asset not tracked individually, such as keyboards.<br>○ Hardware: A physical piece of computer equipment, such as a laptop or server.<br>○ Software License: A legal statement defining the uses of software, such as the number of installations allowed or the terms of distribution. |
| Install base item class | Class to track the asset as an Install base item.<br>**Note:**<br>This field is available only when the Customer Service Install Base Management [com.snc.install_base] plugin is installed. Also, currently, only the Medical device install base item [sn_hcls_medical_device_install_base_item] is available when the Healthcare and Life Sciences Service Management Core application is installed. |
| Product model class | Class table where the models are stored. The default values are:<br>○ Application<br>○ Consumable<br>○ Contract<br>○ Facility<br>○ Hardware<br>○ Service<br>○ Software<br>After you select a value, the table content, form views, and overall functionality of the models created in the model category gets impacted. |
| Is product instance | Identifies whether the model category is associated with Product Instance, which is a logical grouping of asset, CI, and IBI class.<br>**Note:**<br>This check box is read-only and is supported only for Medical device model category. After you select this option, Product Instance Identifier (PID), a unique identifier for asset, CI, and IBI class is generated whenever you create an asset of that model category. However, for the existing assets, the PID is generated only when any of the asset fields such as Serial number, Model component ID, or Parent is updated. |

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| Field | Description |
|---|---|
| Allow pre-allocation | Add and track items in this category as pre-allocated assets. |
| Allow in bundle | Use items in this category in bundles. |
| Allow as main | Use items in this category as the main component in a bundle. |
| Enforce CI verification | Prevents the system from automatically creating assets in a specific model category when CIs are added manually or found with Discovery. This option enables an administrator to review and verify new CIs before adding them as assets. |

3. Select **Submit**.

**Related topics**

Discovery

### Create assets manually

The ServiceNow AI Platform does not create an asset automatically under certain conditions. You can create an asset manually as needed.

## Before you begin

Role required: model_manager

## About this task

The conditions under which an asset is not automatically created include the following.

- Forced CI verification: If you select the **Enforce CI verification** check box in the **Model Category** form, the system does not create an asset automatically when a CI is created or discovered. When **Enforce CI verification** is enabled, newly created CIs do not trigger an automatic creation of an asset. Instead, these newly created CIs have their **Requires verification** field automatically set to true, which displays the following UI actions for the CI:
  - *`Create Asset`*: Creates an asset and sets *`Requires verification`* to false.
  - *`Merge CI`*: Merges duplicates of a CI. This action is useful if an asset for the CI was created in a separate process, which created an associated CI. Then a second CI was created either manually or via the discovery source - and the duplicate CIs did not properly coalesce.
- Configuration errors: In rare cases, the system can fail to create the asset automatically. This failure can occur if you assign the model and model category to the CI in the wrong sequence.

Follow these steps to create an asset manually.

## Procedure

1. Navigate to **All** > **Product Catalog** > **Product Model** > **Model Categories**.
2. Open a model category that has no assigned CI class.
3. Click **Create Assets**.
   This action creates assets from all CIs deferred for verification in this model category. This option is only available for users with the admin role.

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### Edit model categories

All default model categories can be edited, except for the Contract model category. You can edit any custom model categories that you created at any time.

#### Before you begin
Role required: model_manager

#### Procedure

1. Navigate to **All** > **Product Catalog** > **Product Model** > **Model Categories**.
2. Open a model category record.
3. Edit the fields as needed.

   **Note:**
   If a CI class is needed, you must specify it when you create the model category. You can't add the CI class to the model category later.

4. Click **Update**.

### Delete model categories

If a model category is no longer needed, you can delete it.

#### Before you begin
Role required: model_manager

#### About this task
Only model categories that are not referenced by any models can be deleted.

#### Procedure

1. Navigate to **All** > **Product Catalog** > **Product Model** > **Model Categories**.
2. Select the check box beside the model category **Name**.
3. From the **Actions on Selected Rows** menu below the list, click **Delete**.
4. Click **Delete**.

## Domain separation and Product Catalog

Domain separation is supported in the Product Catalog. Domain separation enables you to separate data, processes, and administrative tasks into logical groupings called domains. You can control several aspects of this separation, including which users can see and access data.

## Support level: Standard

- Includes all aspects of **Basic** level support.
- Application properties are domain-aware as needed.
- Business logic: The service provider (SP) creates or modifies processes per customer. The use cases reflect proper use of the application by multiple SP customers in a single instance.
- The instance owner must configure the minimum viable product (MVP) business logic and data parameters per tenant as expected for the specific application.

Sample use case: An admin must be able to make comments required when a record closes for one tenant, but not for another.

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For more information on support levels, see Application support for domain separation.

### How domain separation works in Product Catalog

The domain owner's employees and tenants can use the same processes if the work is done in the correct domain. When adjusting any configuration, you should be in the domain where you're doing the work. Use the domain picker to select the correct domain to work in.

**Related topics**

- Domain separation for service providers

# Benchmarks

The ServiceNow® Benchmarks application gives you instant visibility into your key performance indicators (KPIs) and trends, as well as comparative insight relative to industry averages of your peers and to the industry top performers. You can contrast the performance of your organization with recognized industry standards, view a side-by-side comparison of performance with global benchmarks, and implement recommendations for improved performance.

This video provides you with an overview of Benchmarks.

https://player.vimeo.com/video/958567073?h=c37ce22de1&badge=0&autopause=0&player_id=0&app_id=58479

**Explore**

- Benchmarks overview
- Benchmark KPIs
- Domain separation and Benchmarks

**Set up**

- Enable Benchmarks
- Configure KPI participation

**Administer**

- Link or customize a benchmark KPI
- Drill down within benchmark KPI data (deprecated)

**Use**

- Deprecated Benchmarks dashboard
- View benchmark KPI data (deprecated)
- Benchmarks KPI performance trend and recommendations (deprecated)
- ITSM dashboards

**Troubleshoot and get help**

- Troubleshooting Benchmarks errors
- Ask or answer questions in the Benchmarks forum
- Search the Known Error Portal for known error articles
- Contact Customer Service and Support

## Benchmarks overview

The ServiceNow Benchmarks application securely collects daily data on your instance and then aggregates the data into monthly global benchmark reports.

This video provides an overview of how you can get started with Benchmarks.

Getting started with Benchmarks

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Performance Analytics collects daily data on customer instances. The data from the previous month is uploaded at the beginning of the following month via a scheduled job. If there are any errors, there are multiple retries.

During the month the data is uploaded, the data is aggregated and monthly results (your instance results, global results, and your ranking) are downloaded to the customer instance mid month. Monthly recommendation candidates are provided that you can implement to help improve your KPI performance. An email notification is sent when the global data is available.

ServiceNow has over 2850 customers that have opted into the Benchmarks program. All ServiceNow customers are allowed to participate in the Benchmarks program by opting in from their ServiceNow production instance, except:

- Express customers
- Federal customers
- Customers with on-premise instances

**Note:**
You must have a production instance to opt into the Benchmarks program.

Managed Service Providers (MSPs) and MSP-managed instances are supported and have exclusive access to global MSP aggregate score data. All instances will support the following benchmarks that can be downloaded for comparison in the Benchmarks dashboard:

- Global, which applies to all customers
- Industry category
- User size, based on active user count
- Companies in your industry category and those that are of similar size to your company
- Geographical regions

**Note:**

- These benchmarks aren't calculated using MSP data.
- Along with the above Benchmarks, you will also receive the top performers in each of these categories.

Changing KPI configuration within the month requires one to two months of data collection before your monthly values reflect that change.

**Note:**
The Benchmark Scheduler (bm.scheduler) user is added with Benchmarks. It's required for Benchmarks data collection.

## Key features

- Available KPIs from other ServiceNow applications such as ITSM, ITOM, Security Operations. For more information, see Benchmark KPIs.
- Ability to change KPI definitions to match customizations.
- Benchmarks dashboard in Service Portal (mobile friendly).
- Ability to download KPI reports.
- Ability to filter data based on the following parameters:
  - Industry, number of users, or geographical region.
  - Companies in your industry category and of similar user size.

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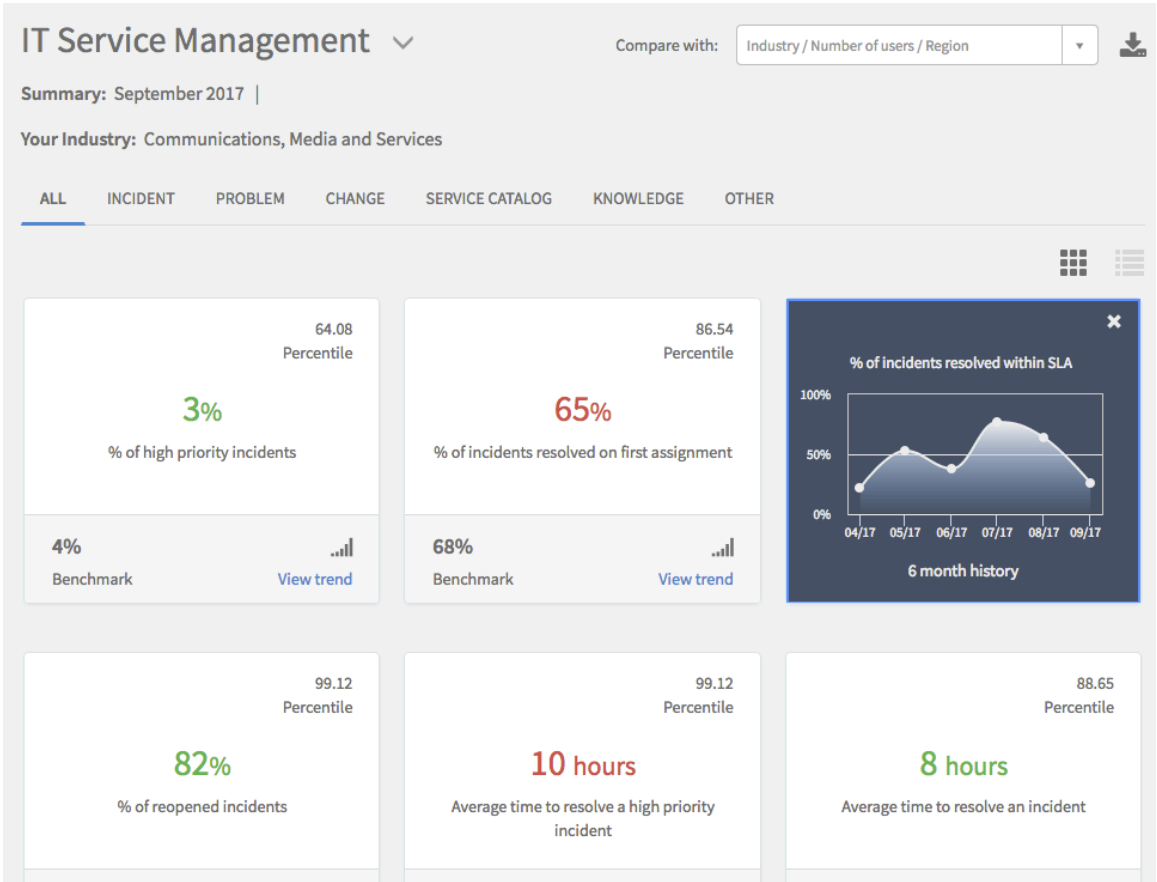
- Email notification when new aggregate monthly data is available.
- Percentile ranking to indicate the performance of the key indicator within your participating peer group.
- Recommendation candidates with guided setup to help improve KPI performance.
- Product category-based roles to limit data access.
- Integration with Performance Analytics for daily data collection and drill-down on KPI data.

### Benchmarks dashboard




### Benefits

| Benefit | Description |
|---|---|
| Global anonymity | Viewers in your organization have access benchmarks for your organization, however the global benchmarks are anonymous, and don't include any company information. |
| Industry comparison | Using the **Compare with** drop-down in the Benchmarks dashboard, you can filter the benchmarks results by industry, ServiceNow user size, or geographical region to make the results more relevant to your organization.<br>• Industry is determined based on the standard industry code in the account record for the company.<br>• Number of users is determined by the number of ServiceNow active users within the company, so |

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**Benefits (continued)**

| Benefit | Description |
| --- | --- |
| | you can compare your company to similar-sized ServiceNow implementations to gain insight about your company.<br>• Region is determined based on the **Region** field in the company table.<br><br>If a filter category includes fewer than 20 participants, the corresponding data is shown in the **Other** category. |
| Trends | You can see the results of all published KPIs as well as the previous six months of history.<br><br>You can then use the trend data to measure and report on service delivery progress over a period of time to determine what is working well and what needs improvement. |
| Recommendations | Data is analyzed and recommendation candidates are provided to help improve the performance of your KPIs.<br><br>All recommendations are dynamic and are updated monthly, based on data from the previous month. |
| Reports | Benchmarks reports get refreshed monthly, which can be downloaded in PDF format. An email notification is sent to the customer when new data is available. |

## Email notification

Users with the Benchmarks admin (sn_bm_client.benchmark_admin) and Benchmarks data viewer (sn_bm_client.benchmark_data_viewer) roles automatically receive email notification regarding availability of monthly scores, historical data recalculation, and new KPIs. You must have system admin (admin) role to modify the email recipient list.

- An email containing notification information is sent when the monthly global data is available. Monthly results (your instance results, and global results) are downloaded to the customer instance mid month.
  - Subject: New Monthly Benchmarks report is available now
  - Body: ServiceNow Benchmarks has been updated with <month> data. You can see the updated Benchmarks by viewing the Benchmarks Dashboard <Benchmarks Dashboard Portal link>.
- An email containing notification information is sent when historical data for the past six months is recalculated.
  - Subject: Historical Global Benchmarks scores have been refreshed
  - Body: The global Benchmarks scores of last six months have been recalculated with improved data quality. You can see the updated Benchmarks by visiting Benchmarks Dashboard <Benchmark Dashboard Portal Link>.

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- An email containing notification information is sent when an updated KPI version is introduced (with some fixes, for example).

  - Subject: One or more Benchmarks KPI versions have changed
  - Body: The latest Benchmarks scores have a new version of following KPIs with improved data quality.

    < KPI name>.

    You can see the updated Benchmarks by visiting Benchmarks Dashboard <Benchmark Dashboard Portal Link>.

Benchmarks notification emails are accessed using the **System Settings** > **Notifications** navigation menu.

### Benchmarks data transfer

Your Benchmarks score data is automatically uploaded to ServiceNow on the third day of the month. Global scores are automatically downloaded to your instance on the 11th day of the month.

You can manually upload or download scores beyond those days of the month (on demand) by executing the Benchmarks scores scheduled jobs through the **System Definition** > **Scheduled Jobs** navigation item.

- Upload the benchmark scores (automatically runs on the first day of the month)
- Download the benchmark scores (automatically runs on the ninth day of the month)

These on-demand scheduled jobs are useful if, for any reason, there was a failure in the automatic upload or download scores process and it is after the cutoff dates. You can also run a scheduled job to generate six months of historical data.

### Benchmarks KPI categories

Benchmarks supports KPIs from other ServiceNow applications such as ITSM, ITOM, Security Operations, Conversational Interfaces, Success Dashboard, and Strategic Portfolio Management. For more information, see Benchmark KPIs.

**Note:**
The categories do not display on the Benchmarks dashboard unless, any KPI is opted in for tracking the metrics in Benchmarks.

## Benchmarks roles

These roles are introduced with Benchmarks.

An overview of the Benchmarks feature in ServiceNow, including opting in, setting up Benchmarks, reading the KPI dashboard, reading KPI cards, recommendations and implementing them.

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**Roles**

| Role | Capabilities | Roles inherited |
|---|---|---|
| sn_bm_client.benchmark_admin | • Set up Benchmarks from an instance<br>• Opt in or out of the Benchmarks program<br>• Enable, disable, or modify indicators (including changing Performance Analytics indicator source, script, and conditions for those KPIs not requiring application-specific roles)<br>• Receive email notification when new aggregate monthly data is available<br>• All functions of the Benchmarks viewer and Benchmarks recommendations roles | |
| sn_bm_client.benchmark_data_viewer | • View full benchmark reports in Service Portal<br>• View data visualizations and drill-downs for analyzing trends (not PA scorecards)<br>• Download visualizations<br>• View industry category or size comparisons<br>• Receive email notification when new aggregate monthly data is available | |
| sn_bm_client.benchmark_recommendation_viewer | View benchmark KPI recommendation candidates. | sn_process_optimization_viewer |

## Enable Benchmarks

Configure the Benchmarks application for your company to enable your company to compare performance with industry peers. You can opt out of Benchmarks at any time.

### Before you begin

To keep the Benchmarks comparison data clean, you can opt in to Benchmarks only from your production instance.

Role required: sn_bm_client.benchmark_admin

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### About this task

Benchmarks is installed on your instance by default. It is also installed with the ITSM Success Dashboard application. Enable Benchmarks by opting in to the application.

Six months of global data is available after opting in. If available, the corresponding data for your instance is also included.

**Note:**
Past data for your instance is only available for Benchmarks users upgrading from a previous release.

### Procedure

1. Opt in to Benchmarks by using the guided setup or by using the Success Dashboard.
2. In the Opt-in to Benchmarks section on the Benchmarks configuration page, select the **Opt-in Agreement** link.
3. Read the Opt-in agreement and then select **Okay**.
4. Acknowledge the Opt-in agreement by selecting the **Yes, I agree/accept the Opt-In Agreement** check box.
5. Select **Opt-in**.
   The Benchmarks configuration page appears and Benchmarks is enabled on your instance.

### What to do next

1. Assign roles for Benchmarks users
2. Configure KPI participation

   For information about the Benchmarks KPIs available for each category, see Benchmark KPIs.

## Getting started with the ITSM Success Dashboard admin console

With the new ITSM Success Dashboard admin console, you can access the Benchmarks application.

The admin console displays the required updates or plugins for Benchmarks that help in optimizing the performance of the selected KPIs. It also helps you configure Benchmarks and customize the KPIs and trends according to your organizational requirements.For more information on Admin Console, see ITSM Success Dashboard Admin console.

- User Roles: You can assign different roles based on specific access requirements.
- KPI participation: You can review and configure the KPIs opted in for the ITSM, ITOM, and Success dashboard categories.
- Opt out: You can opt out of Benchmarks at any time. If you opt out, your company usage data is no longer included in the Benchmarks data set, and you no longer see aggregate metrics.

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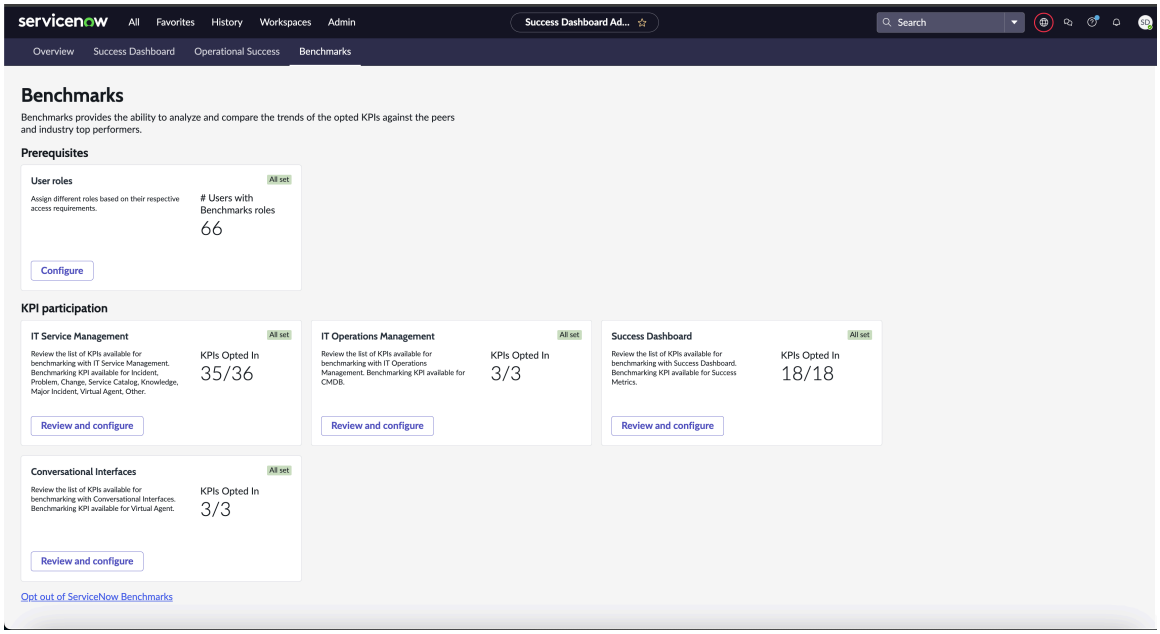


## Assign roles for Benchmarks users

Assign roles for Benchmarks users based on their access requirements.

### Before you begin

Role required: sn_bm_client.benchmark_admin

### Procedure

1. Opt in for the Benchmarks application.
   For more information, see Enable Benchmarks.
2. On the Benchmarks configuration page, locate the User roles section and select **Configure**.
3. On the User roles page, select a role from the **Select role** drop-down list.
   A list of users currently assigned the selected role and a graph showing the distribution of users in different roles are displayed.

   For information about Benchmarks roles, see Benchmarks roles.
4. Add users to a role list.
   a. Select **Add User**.
   b. Start typing the user name and select from the drop-down list.
   c. Select **Save**.
5. Remove users from a role list.
   a. Select the check box next to the user name you want to remove.
   b. Select **Remove user**.

## Opt out of Benchmarks

You can opt out of Benchmarks at any time. If you opt out, your company usage data is no longer included in the Benchmarks data set, and you no longer see aggregate metrics.

### Before you begin

Role required: sn_bm_client.benchmark_admin

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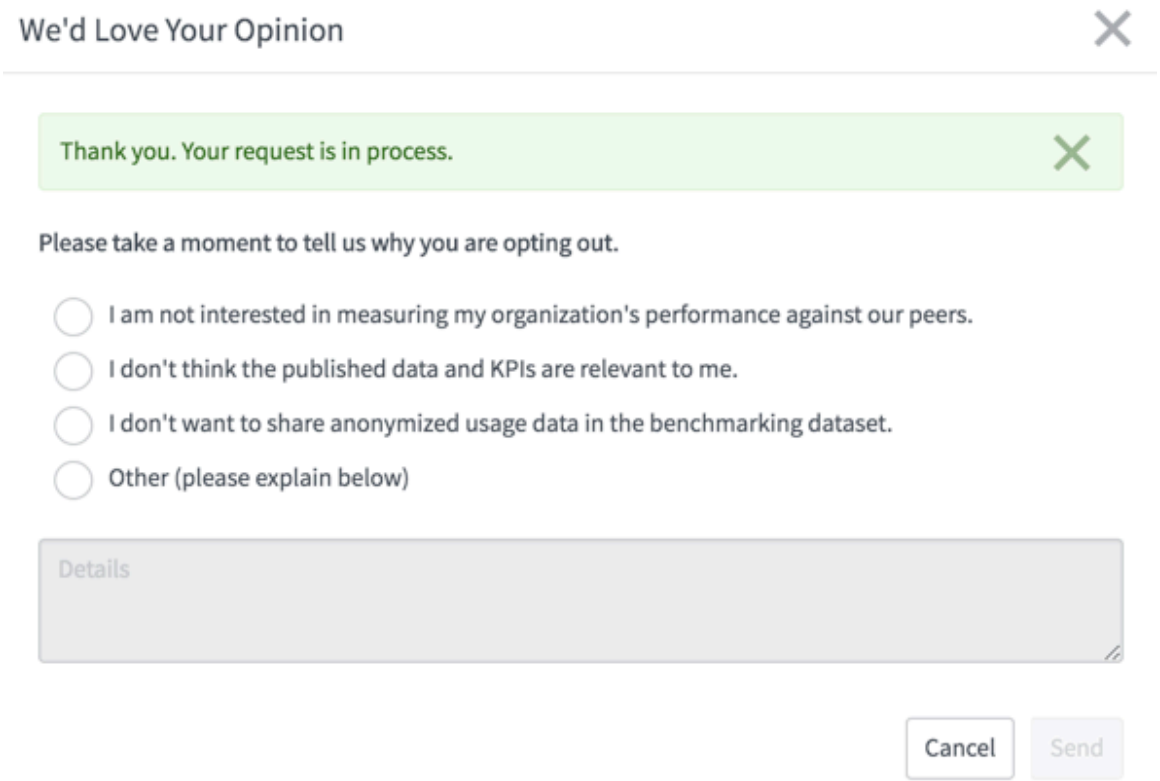
### About this task

When you opt out of the Benchmarks forum, it means that you no longer have access to benchmarking information for your organization. Your usage data is also removed from the Benchmarks data set going forward. However, your company can rejoin the Benchmarks program at any time.

**Note:**
It may take up to two monthly refresh cycles for the request to be processed.

### Procedure

1. Navigate to **All** > **Benchmarks** > **Setup**.
2. Click **Opt-out of ServiceNow Benchmarks**.
3. Click **Opt-Out**.
4. **Optional:** To send your feedback, provide the relevant information and click **Send**. Otherwise, click **Cancel** to skip the survey.




The opt-out confirmation is shown. You can opt back in at any time.

## Benchmark KPIs

You can enable or disable a benchmark KPI, and customize KPI conditions. Integration with Performance Analytics provides daily data collection and drill down capabilities on KPI data.

Benchmarks offers ITSM, ITOM, Virtual Agent, Security Operations KPIs, Success Dashboard, and Strategic Portfolio Management.

**Note:**
Upgrading Benchmarks does not change KPI status or configuration from the previous release. New KPIs are enabled by default.

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Benchmarks uses anonymous, aggregated usage data from customers who have opted in to calculate global and industry benchmarks. The KPIs in the Benchmarks application are performance analytics indicators that only collect the usage count data, for example, the total number of incidents in a month, based on the monthly aggregates. During data collection, the Benchmarks application does not consider any other details such as description of incidents, or information about requests, changes, or applications.

The participating customer count for each cohort bucket in Industry Category, User Size, and Three geo regions aggregates are large enough to calculate monthly benchmarks values and to maintain full anonymity. To further ensure data anonymity, the Benchmarks user interface allows you to use only one filter at a time.

## ITSM KPIs

### Incident

| KPI | Description |
| --- | --- |
| **Note:** In some environments, KPIs involving resolved incidents may require further configuration to retrieve resolved incident data. | |
| % of high priority incidents resolved | [Number of priority 0 (P0) and priority 1 (P1) incidents resolved during the month] / [Total number of incidents resolved during the same month]<br><br>Incident count is generated from the Incident table.<br><br>**Note:** The definition of P0 and P1 incidents is likely to vary per participant. Your P0 and P1 incidents may or may not be similar to the incidents of others. For comparison, the metrics provided in this report represent the average of all participants. |
| % of incidents resolved on first assignment | [Number of incidents resolved on first assignment during the month] / [Total number of incidents resolved during the same month]<br><br>First assignment is when the **Reassignment Count** field is 0 for the incident. |
| % of incidents resolved within SLA | [Number of incidents with met SLAs resolved during the month] / [Total number of incidents resolved during the same month]<br><br>Met SLAs are calculated from the task_sla table for incidents resolved during the month. |

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### Incident (continued)

| KPI | Description |
|---|---|
| % of reopened incidents | [Number of incidents resolved during the month that were reopened] / [Total number of incidents resolved during the same month].<br><br>Reopened is when the **Reopen Count** field is greater than 0 for the incident. |
| Average time to resolve a high priority incident | [Sum of the duration of all high priority incidents resolved during the month] / [Total number of high priority incidents resolved during the same month]<br><br>• Duration is the length of time from creation to resolution.<br>• High priority incidents include priority 0 (P0) and priority 1 (P1). |
| Average time to resolve an incident | [Sum of the duration of all incidents resolved during the month] / [Total number of incidents resolved during the same month]<br><br>Duration is the length of time from creation to resolution. |
| Number of incidents created per user | Number of incidents per user created during the month. Global value is the average of all participating customers per user. |

### Problem

| KPI | Description |
|---|---|
| % of high priority problems | [Number of high priority problems closed during the month] / [Total number of problems closed during the same month]<br><br>High priority problems include priority 0 (P0) and priority 1 (P1). |
| % of incidents resolved by problem | [Number of incidents resolved during the month that are associated with a problem] / [Total number of incidents resolved during the same month] |
| Average time to close a problem | [Sum of the duration of all problems closed during the month] / [Total number of problems closed during the same month] |

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### Problem (continued)

| KPI | Description |
| --- | --- |
| | Duration is the length of time from creating to closure. |

### Change

| KPI | Description |
| --- | --- |
| % of emergency changes | [Number of emergency changes closed during the month] / [Total number of all changes closed during the same month]<br><br>All changes include standard, normal, and emergency. |
| % of failed changes | [Number of unsuccessful changes during the month] / [Total number of all changes closed during the same month] |
| Average time to close a change | [Sum of the duration of all changes closed during the month] / [Total number of all changes closed during the same month]<br><br>• Duration shows the length of time from creating to closure.<br>• All changes include standard, normal, and emergency. |

### Service Catalog

| KPI | Description |
| --- | --- |
| % of closed requests with breached SLAs | [Number of closed requests with breached SLAs during the month] / [Total number of closed requests during the same month]<br><br>Breached SLAs are calculated from the task_sla table for requests closed during the month. |
| Average time to fulfill a request | [Sum of the duration for Service Catalog requests fulfilled during the month] / [Total number of Service Catalog requests fulfilled in the same month] |

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### Service Catalog (continued)

| KPI | Description |
|---|---|
| | • **Duration** is the length of time from creation to closure.<br>• **Number of Service Catalog requests fulfilled** is the count of the number of records in the sc_req_item table, which were closed within a month. |
| Number of requests created per user | Number of requests per user created during the month. |

### Knowledge

| KPI | Description |
|---|---|
| % of incidents resolved using KB articles | [Number of incidents with KB articles resolved during the month] /<br>[Total number of incidents resolved during the same month] |
| Number of knowledge articles views per user | Number of knowledge article views per user during the month.<br>• **Knowledge base views** are generated from the sys_view_count table.<br>• **Global** value is the average of all participating customers per user. |

### ITSM Virtual Agent

| KPI | Description |
|---|---|
| % call deflection | [The number of incidents and requests created using Virtual Agent ] / [Total numbers of incidents and requests created]<br>The number of times, in percentage, the incident, or request was submitted using Virtual Agent. This is determined by the deflection pattern added in the Virtual Agent topic. |
| % of incidents auto-resolved | [The number of incidents auto-resolved by Virtual Agent ] / [Total number of incidents resolved] |

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### ITSM Virtual Agent (continued)

| KPI | Description |
|---|---|
| | The number of times, in percentage, incidents were automatically resolved using automated workflows or by Issue Auto Resolution. |

### Other

| KPI | Description |
|---|---|
| Average customer satisfaction | [Sum of normalized metric values of all survey instances taken during the month] /<br>[Total number of survey instances taken during the same month]<br>• Table: metric_results.<br>• Survey: Customer Satisfaction Survey.<br>• Metric value is normalized as per category weights.<br>**Note:** This KPI uses the base system Customer Satisfaction Survey.<br>If you're using a different survey to collect user feedback, you can customize the KPI definition. |
| Number of requests per fulfiller | [Number of active requester (non-ITIL) users during the month] /<br>[Total number of active ITIL users during the same month] |

## ITOM KPIs

### CMDB

| KPI | Description |
|---|---|
| % of duplicate CIs | [Number of duplicate CIs during the month] / [Total number of CIs during the same month]<br>Duplicate CIs are calculated using the cmdb_health_scorecard table. |

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### CMDB (continued)

| KPI | Description |
| --- | --- |
| | **Note:** The definition of duplicate CIs is likely to vary per participant. Your duplicate CIs definition may or may not be similar to the definitions of others. For comparison, the metrics provided in this report represent the average of all participants. |
| % of non-compliant CIs | [Number of CI audit failures during the month] / [Total number of CIs audited during the same month]<br><br>Non-compliant CIs are calculated using the cmdb_health_scorecard table.<br><br>**Note:** The definition of CI compliance audits is likely to vary per participant. Your CI compliance audit definition may or may not be similar to the definitions of others. For comparison, the metrics provided in this report represent the average of all participants. |
| % of stale CIs | [Number of stale CIs during the month] / [Total number of CIs during the same month]<br><br>Stale CIs are calculated using the cmdb_health_scorecard table.<br><br>**Note:** The definition of stale CIs is likely to vary per participant. Your stale CIs definition may or may not be similar to the definitions of others. For comparison, the metrics provided in this report represent the average of all participants. |

## Conversational Interfaces KPIs

### Virtual Agent

| KPI | Description |
| --- | --- |
| % of users using Virtual Agent | [Total number of users using Virtual Agent ] / [Total number of active users]<br><br>Percentage of unique users who are using Virtual Agent to handle everyday tasks and requests. |

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### Virtual Agent (continued)

| KPI | Description |
|---|---|
| % conversation handed over to a live agent | [Number of conversations assigned to a live agent] / [Total number of conversations]<br><br>The percentage of virtual agent conversations that were redirected to handle everyday tasks and requests. |
| Virtual Agent CSAT score | Uses the daily average score of the surveys conducted to analyze the quality of user interactions with Virtual Agent conversations. |

## Security Operations KPIs

### Security Incident Response

| KPI | Description |
|---|---|
| % of critical and high priority security incidents | [Number of critical and high priority security incidents created during the month] / [Total number of all security incidents created during the same month] |

### Vulnerability Response

| KPI | Description |
|---|---|
| Average critical vulnerability age | [Summed age of critical vulnerable items] / [Number of critical vulnerable items] |
| Average vulnerability age | [Summed age of vulnerable items] / [Number of vulnerable items] |
| Average vulnerability per asset | [Sum of active vulnerable items] / [Total number of scanned configuration items] |
| VI mean time to remediate (MTTR) | [Sum of duration of closed vulnerable items] / [Total number of closed vulnerable items displayed as a 30-day running average] |
| % of remediation efficiency | [Number of vulnerable Items items closed during a month] / [Number of new or reopened vulnerable items in the same month] |

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## Success Dashboard KPIs

| KPI | Formula | Description |
|---|---|---|
| Self-solved % | [Self-solved (VA) + Self-solved (KB) + Automated resolutions] / [Total Tickets Resolution + Self-solved (VA) + Self-solved (KB)] *100 | Self-solved percentage is calculated based on the daily average number of times your users achieved resolution without agent intervention. It includes numbers from the following items:<br>• Self-solved using Virtual Agent.<br>• Self-solved using Knowledge articles.<br>• Automated resolutions. This could be, for example, incidents that were auto-resolved using Virtual Agent. |
| Call deflection % | [Catalog ticket submissions + VA ticket submissions + Self-solved (VA) + Self-solved (KB)] / [Total tickets submitted + Self-solved (VA) + Self-solved (KB)] * 100 | Call deflection is calculated per day based on the number of times requestors performed the following actions without Tier 1 agent intervention:<br>• Ticket submissions using Service Catalog<br>• Ticket submissions using Virtual Agent<br>• Self-solved using Virtual Agent<br>• Self-solved using Knowledge articles |
| Structured tickets % | [Structured tickets completed]/[Total Ticket resolutions]*100 | Total number of tickets successfully completed and closed for the report range that has a pre-defined or guided intake and fulfillment process. This could be, for example, a requested item fulfillment or an HR Case where payroll ambiguity was resolved. |
| Customer satisfaction survey scores | [ITSM Customer Satisfaction Score] + [Virtual agent Customer Satisfaction score] | Average of customer satisfaction scores based on the surveys conducted after the issue was resolved. |

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| KPI | Formula | Description |
|---|---|---|
| | | **Note:** Both ITSM Customer Satisfaction score and VA Customer Satisfaction score are normalized with the base as 10. |
| MTTR – Average mean time to resolution | [Time to resolve]/[Issues resolved]/24 | Average time, in days, between the day, a ticket was created and the day it was closed. |
| Breached SLA % | [Issues resolved with breached SLAs]/[Issues resolved]*100 | Percentage of issues resolved after the SLA was breached. |
| First assignment resolution | [Tickets resolved without reassignment]/[Issues resolved]*100 | Tickets resolved without having to reassign to an agent. |
| % Automated resolutions | ([[Automated resolutions]]/[[Self solved - percentage (denominator)]])*100 | Total number of tickets successfully completed and closed using the automated workflows, or by Issue Auto Resolution, or by Password Reset web/windows application. |
| % KB - Self-solved (count) | ([[KB - Self-solved (count)]]/[[Self solved - percentage (denominator)]])*100 | Total number of tickets successfully completed and closed by reading the knowledge articles. This is determined when users read knowledge article(s) and do not create a ticket in a 24-hour window. |
| % VA - Self-solved (count) | ([[VA - Self-solved (count)]]/[[Self solved - percentage (denominator)]])*100 | Total number of automated conversations that resolved the issue. This is determined by the deflection node instrumented in the Virtual Agent topic. |
| % Call deflection when self-solved (count) | ([[Call deflection when self-solved (count)]]/[[Call deflection - percentage (denominator)]])*100 | Total number of issues or requests solved using the Virtual Agent and Knowledge Base articles that resulted in call deflection. |
| % VA ticket submissions (count) | ([[VA ticket submissions (count)]]/[[Call deflection - percentage (denominator)]])*100 | Total number of times the ticket was submitted using the Virtual Agent. This is determined by the deflection node instrumented in the Virtual Agent topic. |

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| KPI | Formula | Description |
|---|---|---|
| % Catalog ticket submissions (count) | ([[Catalog ticket submissions (count)]]/[[Call deflection - percentage (denominator)]])*100 | Total number of tickets (cases, incidents, requested items and so on) submitted using the Service Catalog in Service Portal or NOW mobile. |
| Productivity moments | [[Productivity in search (count)]] + [[Productivity in routing (count)]] + [[Productivity in fulfilment (count)]] / [[Average number of active users]] | Productivity moment related KPIs are benchmarked after being normalized on the basis of active users Productivity moments per user.<br>• Productivity in search per user<br>• Productivity in routing per user<br>• Productivity in fulfilment per user |

For more information on Success Dashboard KPI definitions and formulas, see ITSM Success Dashboard indicators KPI definitions and formulas

## Strategic Portfolio Management KPIs

Benchmarks supports Strategic Portfolio Management KPIs. For more information, see SPM Benchmarking KPIs.

## Configure KPI participation

Review and configure Benchmarks KPI participation by opting in or out of categorized KPIs.

### Before you begin

Role required: sn_bm_client.benchmark_admin

### Procedure

1. Opt in for Benchmarks.
   For more information, see Enable Benchmarks.
2. On the Benchmarks configuration page, view the KPI categories in the KPI participation section.
3. Select a category for which you want to view KPI details and select **Review and configure**.
   On the respective category page, a summary of KPIs, current participation status, descriptions, formulas for KPI calculation, and conditions for contributing indicators are displayed.
4. Opt in for KPI participation.
   a. Select the vertical ellipsis next to the KPI that you want to opt in to.
   b. Select **Opt in**.
5. Opt out of KPI participation.
   a. Select the vertical ellipsis next to the KPI that you want to opt out of.
   b. Select **Opt out**.
6. Modify KPI details.

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a. Select the vertical ellipsis next to the KPI that you want to modify.

b. Select **Modify**.

c. Modify KPI details such as the description, formula for KPI calculation, and conditions for contributing indicators.

7. Create or schedule a Benchmarks historical data collection job for a newly enabled KPI.
   For information about how to create or schedule a data collection job, see Create or schedule a data collection job. The recommended time interval to collect data for a new KPI is 60 days.
8. Execute the Benchmarks historical data collection job to collect data for the new KPI.

   a. Navigate to **Platform Analytics** > **Data Collector** > **Jobs**.

   b. Find and open the historical data collection job that you created.

   c. Select **Execute**.
   The collected data scores are stored in the Platform Analytics Score (pa_scores) table.

9. Upload the collected data to the centralized Benchmarks instance.

   a. In the Benchmarks historical data collection job, navigate to the **Job Logs** related list.

   b. Make sure that the state for the historical data collection job is **Collected**.
   This state indicates that the job is complete and all data for the set period is collected.

   c. Navigate to **System Definition** > **Scheduled Jobs**.

   d. Find and open the **Copy historical scores from PA to Benchmarks table** job.

   e. Select **Execute Now**.

10. **Optional:** Download the Benchmarks scores manually to your instance to view the scores before they are automatically downloaded.
    a. Navigate to **System Definition** > **Scheduled Jobs**.
    b. Find and open the **Download the benchmark scores** job.
    c. Select **Execute Now**.

### Configure resolved incident Benchmarks KPIs

The source for the KPIs containing resolved incident data is the **resolved_at** field in the Incident [incident] table, which may not exist in some environments. In this case, additional configuration is required to use these KPIs.

#### Before you begin

**Note:**
If you have never tracked resolved incidents in your environment before, install the Incident Resolution Fields (com.snc.incident_resolution_fields) plugin, which automatically adds the **resolved_at** field to the Incident table. No further steps are required.

Role required: sn_bm_client.benchmark_admin

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### About this task

If you are receiving errors in the Benchmarks Data Collection job log for resolved incident KPIs because you are using a custom (user-created) field to track resolved incidents, the following procedure is required for successful data retrieval using these Benchmarks KPIs.

- % of high priority incidents resolved
- % of incidents resolved on first assignment
- % of incidents resolved within SLA
- % of reopened incidents
- Average time to resolve a high priority incident
- Average time to resolve an incident
- Number of incidents created per user

Configure the KPI conditions and script to use your custom field (instead of the default **resolved_at** field) for resolved incident Benchmarks KPIs.

### Procedure

1. Configure the Benchmark.Incidents.Resolved indicator source condition with your custom field.
   a. Navigate to **Performance Analytics** > **Sources** > **Indicator Sources**.
   b. Select the **Benchmark.Incidents.Resolved** indicator source and enter edit mode.
   c. In the Conditions section, select your custom field from the list (custom field names are typically preceded by `u_`).
   d. Click **Update**.
2. Configure the Benchmark.Incident.ResolvedTime.Hours script with your custom field name.
   a. Navigate to **Performance Analytics** > **Automation** > **Scripts**.
   b. Select the **Benchmark.Incident.ResolveTime.Hours** script and enter edit mode.
   c. Replace the `resolved_at` field name occurrence within the script with the name of your custom field (custom field names are typically preceded by `u_`).
   d. Click **Update**.
3. Verify that you are no longer receiving errors in the Benchmarks Data Collection job log.

## Link or customize a benchmark KPI

You can customize KPI conditions to fit the needs of your organization better.

### Before you begin

The Benchmarks admin role does not provide application-specific roles. Therefore, although a Benchmarks admin can access a KPI through the Benchmarks application, changes to KPI conditions require the role specific to the KPI application.

For example, a Benchmarks admin cannot modify conditions for the knowledge base KPI (Knowledge Use [kb_use] table), SLA KPI (Task SLA [task_sla] table), ITOM KPIs (CMDB Health Scorecard [cmdb_health_scorecard] table), Security Operations KPIs (Vulnerable Item [sn_vul_vulnerable_item], or Security Incident [sn_si_incident] tables) from within Benchmarks without specific access granted to those tables (knowledge_admin, sla_admin, asset, or sn_si.special_access roles).

Role required: sn_bm_client.benchmark_admin

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### About this task

Customizing KPI conditions is useful to adjust the criteria to more accurately represent the data that your company is interested in.

For example, if your implementation does not use priority 1 incidents, you can change the criteria for high priority KPIs from 1 to 0, which returns more accurate data for your organization.

**Note:**
It takes one to two months for aggregate monthly data to accurately reflect changes made to KPI conditions. For example, changes made within the month include a combination of data:

- Data for the previous condition (up until the date the condition was changed)
- Data for the new condition from that date forward

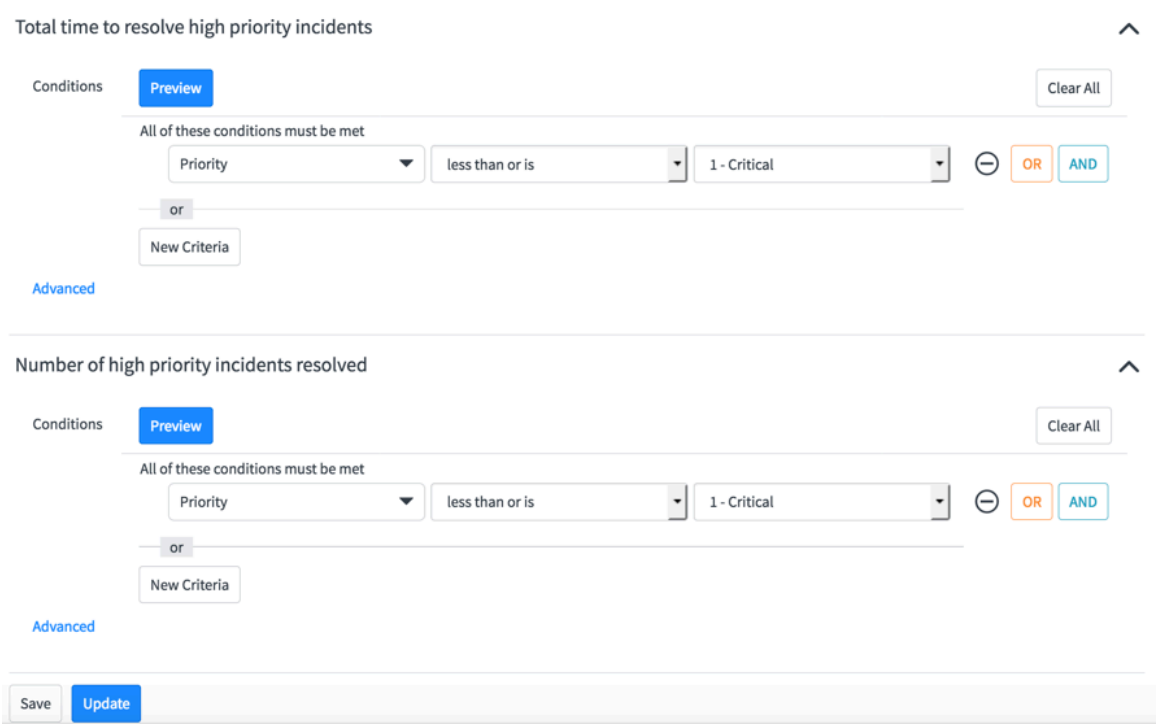
For further analysis, you can link a Performance Analytics indicator that you are already using to the corresponding Benchmarks indicator to see breakdowns, in addition to individual scores, when drilling down on KPI data.

For example, link **Number of resolved incidents by first assigned group** to **Benchmark: Number of incidents resolved on first assignment** to view breakdown values by priority, assignment group, and category.

**Note:**
Individual scores are shown by default but you must have Performance Analytics to use linking to show breakdowns.

### Procedure

1. Navigate to **All** > **Success Dashboard** > **Getting Started** > **Benchmarks** > **KPI participation**.




2. Change the conditions, as appropriate.
3. To link a Performance Analytics indicator to a Benchmarks indicator, follow the procedure in Link an automated indicator to a benchmark.

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### Performance Analytics KPI to Benchmarks KPI link

| Benchmarks KPI | Formula | Performance Analytics KPI |
|---|---|---|
| Number of active users | -- | Benchmark: Number of active users |
| Total time to close changes | -- | Benchmark: Total time to close changes |
| % of failed changes | [Number of unsuccessful changes during the month] /<br>[Total number of all changes closed during the same month] | Benchmark: % of failed changes |
| Number of unsuccessful changes | -- | Benchmark: Number of unsuccessful changes |
| Number of changes closed | -- | Benchmark: Number of changes closed |
| % of emergency changes | [Number of emergency changes closed during the month] /<br>[Total number of all changes closed during the same month] | Benchmark: % of emergency changes |
| Number of emergency changes closed | -- | Benchmark: Number of emergency changes closed |
| Average time to close a change | [Benchmark: Total time to close changes] /<br>[[Benchmark: Number of changes closed]] | Benchmark: Average time to close a change |
| % of stale CIs | Monthly average. | Benchmark: % of stale cis |
| % of duplicate CIs | Monthly average. | Benchmark: % of duplicate cis |
| % of non-compliant CIs | Monthly average. | Benchmark: % of non-compliant cis |
| Average time to resolve a high priority incident | [[Benchmark: Total time to resolve high priority incidents]]/<br>[[Benchmark: Number of high priority incidents resolved]] | Benchmark: Average time to resolve a high priority incident |
| % of incidents resolved within SLA | ([[Benchmark: Number of resolved incidents with | Benchmark: % of incidents resolved within SLA |

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| Benchmarks KPI | Formula | Performance Analytics KPI |
|---|---|---|
| | SLAs]] - [[Benchmark: Number of resolved incidents with breached SLAs]]) /<br><br>[[Benchmark: Number of resolved incidents with SLAs]] * 100 | |
| Total number of incidents resolved by problem | -- | Benchmark: Total number of incidents resolved by problem |
| Number of incidents closed that were re-opened | -- | Benchmark: Number of incidents closed that were re-opened |
| Number of high priority incidents | -- | Benchmark: Number of high priority incidents resolved |
| Average time to resolve an incident | [[Benchmark: Total time to resolve an incident]] /<br><br>[[Benchmark: Number of incidents resolved]] | Benchmark: Average time to resolve an incident |
| Number of resolved incidents with SLAs | -- | Benchmark: Number of resolved incidents with SLAs |
| Number of incidents created per user | [[Benchmark: Number of incidents created / By month SUM]]/<br><br>[[Benchmark: Number of active users / By month AVG]] | Benchmark: Number of incidents created per user |
| Total time to resolve high priority incidents | -- | Benchmark: Total time to resolve high priority incidents |
| % of high priority incidents | [[Benchmark: Number of high priority incidents resolved]] /<br><br>[[Benchmark: Number of incidents resolved]] * 100 | Benchmark: % of high priority incidents |
| Number of incidents created | -- | Benchmark: Number of incidents created |
| Number of incidents resolved with attached KB articles | -- | Benchmark: Number of incidents resolved with attached KB articles |
| Number of resolved incidents with breached SLAs | -- | Benchmark: Number of resolved incidents with breached SLAs |
| Total number of incidents | -- | Benchmark: Number of incidents resolved |

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| Benchmarks KPI | Formula | Performance Analytics KPI |
|---|---|---|
| Number of incidents resolved on first assignment | -- | Benchmark: Number of incidents resolved on first assignment |
| % of incidents resolved on first assignment | [[Benchmark: Total time to resolve an incident]] /<br><br>[[Benchmark: Number of incidents resolved]] | Benchmark: % of incidents resolved on first assignment |
| Total time to resolve incidents | -- | Benchmark: Total time to resolve an incident |
| % of reopened incidents | [[Benchmark: Number of incidents closed that were re-opened]] /<br><br>[[Benchmark: Number of incidents closed ]] * 100 | Benchmark: % of reopened incidents |
| Number of incidents closed | -- | Benchmark: Number of incidents closed |
| Number of knowledge article views | -- | Benchmark: Number of knowledge article views |
| Number of knowledge base views per user | [[Benchmark: Number of knowledge article views / By month SUM]]/<br><br>[[Benchmark: Number of active users / By month AVG]] | Benchmark: Number of knowledge base views per user |
| % of incidents resolved using KB articles | [[Benchmark: Number of incidents resolved with attached KB articles]] /<br><br>[[Benchmark: Number of incidents resolved]] * 100 | Benchmark: % of incidents resolved using KB articles |
| Number of survey instances | -- | Benchmark: Number of survey instances |
| Number of active ITIL users | -- | Benchmark: Number of active ITIL users |
| Normalized customer satisfaction | -- | Benchmark: Normalized customer satisfaction |
| Average customer satisfaction | [[Benchmark: Normalized customer satisfaction]] /<br><br>[[Benchmark: Number of survey instances]] | Benchmark: Average customer satisfaction |

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| Benchmarks KPI | Formula | Performance Analytics KPI |
|---|---|---|
| Number of requesters per fulfiller | ([[Benchmark: Number of active users]] - [[Benchmark: Number of active ITIL users]]) /<br><br>[[Benchmark: Number of active ITIL users]] | Benchmark: Number of requesters per fulfiller |
| % of high priority problems | [[Benchmark: Number of high priority problems closed]] /<br><br>[[Benchmark: Number of problems closed]] * 100 | Benchmark: % of high priority problems |
| Total time to close problems | -- | Benchmark: Total time to close problems |
| % of incidents resolved by problem | [[Benchmark: Total number of incidents resolved by problem]] /<br><br>[[Benchmark: Number of incidents resolved]] * 100 | Benchmark: % of incidents resolved by problem |
| Number of high priority problems closed | -- | Benchmark: Number of high priority problems closed |
| Number of problems closed | -- | Benchmark: Number of problems closed |
| Average time to close a problem | [[Benchmark: Total time to close problems]] /<br><br>[[Benchmark: Number of problems closed]] | Benchmark: Average time to close a problem |
| % of critical and high priority security incidents | [[Benchmark: Number of Critical and High Priority Security Incidents]] /<br><br>[[Benchmark: Number of Security Incidents]] * 100 | Benchmark: % of critical and high priority security incidents |
| Number of critical and high priority security incidents | -- | Benchmark: Number of Critical and High Priority Security Incidents |
| Number of security incidents | -- | Benchmark: Number of Security Incidents |
| Number of requests created | -- | Benchmark: Number of requests created |

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| Benchmarks KPI | Formula | Performance Analytics KPI |
|---|---|---|
| Number of requests closed | -- | Benchmark: Number of requests closed |
| Average time to fulfil a request | [[Benchmark: Total time to fulfil requests]]/<br>[[Benchmark: Number of requests closed]] | Benchmark: Average time to fulfil a request |
| Number of closed requests with SLAs | -- | Benchmark: Number of closed requests with SLAs |
| Number of requests created per user | [[Benchmark: Number of requests created / By month SUM]]/<br>[[Benchmark: Number of active users / By month AVG]] | Benchmark: Number of requests created per user |
| Number of closed requests with breached SLAs | -- | Benchmark: Number of closed requests with breached SLAs |
| Total time to fulfil requests | -- | Benchmark: Total time to fulfil requests |
| % of closed requests with breached SLAs | [[Benchmark: Number of closed requests with breached SLAs]] /<br>[[Benchmark: Number of closed requests with SLAs]] * 100 | Benchmark: % of closed requests with breached SLAs |
| Number of critical vulnerability items | -- | Benchmark: Number of critical vulnerability items |
| Number of vulnerability items | -- | Benchmark: Number of vulnerability items |
| Average vulnerability age | [[Benchmark: Summed age of vulnerable items]] /<br>[[Benchmark: Number of vulnerability items]] | Benchmark: Average age of vulnerable items |
| Average critical vulnerability age | [[Benchmark: Summed age of critical vulnerable items]] /<br>[[Benchmark: Number of critical vulnerability items]] | Benchmark: Average age of critical vulnerable items |
| Summed age of critical vulnerable items | -- | Benchmark: Summed age of critical vulnerable items |

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| Benchmarks KPI | Formula | Performance Analytics KPI |
|---|---|---|
| Summed age of vulnerable items | -- | Benchmark: Summed age of vulnerable items |

### Performance Analytics KPI to Benchmarks VA KPI link

| Benchmarks KPI | Formula | Performance Analytics KPI | Description |
|---|---|---|---|
| Call Deflection (VA Triaged and Created) | -- | Benchmark: Call Deflection (VA Triaged and Created) | Incidents created using Virtual Agent and tracked using the *ITSM VA-Triage and Created* deflection pattern. |
| Call Deflection (VA Catalog Analytics) | -- | Benchmark: Call Deflection through VA (Catalog Analytics) | Requests created using Virtual Agent and tracked every time Virtual Agent referred a catalog for submission. |
| % Call Deflection | ([[Benchmark: Call Deflection (VA Triaged and Created)]] + [[Benchmark: Call Deflection through VA (Catalog Analytics)]]) / ([[Benchmark: Number of requests created]] + [[Benchmark: Number of incidents created]]) * 100 | Benchmark: % VA Deflection | The number of times the Virtual Agent automatically resolved incidents or completed requests. |
| IAR (Intercept & Resolved) | -- | Benchmark: VA IAR (Intercept & Resolved) | Incidents that were resolved using *ITSM VA-Intercept & Resolved* deflection pattern. |
| VA Self Resolved | -- | Benchmark: VA Self Resolved | Every time the user was able to self-solve incident resolution or complete requests using *ITSM VA-Self Resolving* deflection pattern. |
| Number of incidents resolved | -- | Benchmark: Number of incidents resolved | The total number of incidents resolved. |
| % of incident that were auto-resolved using VA | ([[Benchmark: VA IAR (Intercept & Resolved)]] + [[Benchmark: VA | Benchmark: % of incident that were | Percentage of incidents that were auto-resolved using Virtual Agent. |

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| Benchmarks KPI | Formula | Performance Analytics KPI | Description |
|---|---|---|---|
| | Self Resolved]]) / ([[Benchmark: Number of incidents resolved]] + [[Benchmark: VA Self Resolved]]) * 100 | auto-resolved using VA. | |
| Number of monthly users of VA | -- | Benchmark: Number of monthly users of VA | Number of monthly users who are using Virtual Agent. |
| % of users using Virtual Agent | [[Benchmark: Number of monthly users of VA]] / [[Benchmark: Number of active users]] * 100 | Benchmark: % of users using Virtual Agent | Percentage of users in the organization using Virtual Agent as an engagement channel. |
| Number of VA conversations handed over to an agent | -- | Benchmark: Number of VA conversation handed over to an agent | Conversations that were not resolved by the Virtual Agent and had to be handed off to a live agent. |
| Total conversations in VA | -- | Benchmark: Total conversations in VA | All conversations that occurred in the Virtual Agent. |
| % ofVA conversations handed over to live agent | [[Benchmark: Number of VA conversation handed over to an agent]] / [[Benchmark: Total conversations in VA]] * 100 | Benchmark: % of VA conversations handed over to live agent | Number of times, in percentage, that the conversation was handed off to an agent. |
| VA normalized Satisfaction score | -- | Benchmark: VA normalized Satisfaction score | Overall, total normalized score of all the surveys conducted for Virtual Agent conversations. |
| VA survey instances | -- | Benchmark: VA survey instances | Total number of surveys that an agent responded to for assessing the satisfaction score. |
| Virtual Agent CSAT score | [[Benchmark: VA normalized Satisfaction score]]/ [[Benchmark: VA survey instances]] | Benchmark: VA CSAT score | Average Virtual Agent satisfaction score. |

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## Use Benchmarks data for value management analysis

Manually collect historical Benchmarks data to analyze the benefits of year-over-year growth when you use the ServiceNow Benchmarks application.

### Before you begin

Role required: sn_bm_client.benchmark_admin, pa_data_collector, or admin

### About this task

If you want to analyze year-over-year performance, you must collect at least 24 months of Benchmarks data. Use the **sn_bm_client.months_copy_historical_pa_bm** system property to set the number of months from the current month for which you want to collect Benchmarks historical data.

### Procedure

1. Set up Benchmarks historical data collection.
   a. Navigate to **Performance Analytics** > **Data Collection** > **Jobs**.
   b. Select the *Benchmarks Historical Data Collection* job.
   c. In the **Relative start** field, enter the period of time for which you want to collect the data.
   d. In the **Relative start interval** field, select the length of the time period to collect the data. Recommended interval is 24 months.
   e. Click **Execute**.
   For detailed information on scheduling a data collection job, refer to Create or schedule a data collection job.
2. Upload the collected data to the centralized Benchmarks instance.
   a. In the *Benchmarks Historical Data Collection* job, navigate to the **Job Logs** related list.
   b. Make sure that the state for the historical data collection job is **Collected**.
   This state indicates that all data for the job has successfully run and all data has been gathered for the set time period.
   c. Navigate to **System Definition** > **Scheduled Jobs**.
   d. Select the *Copy historical scores from PA to Benchmarks table*.
   e. Click **Execute Now**.

   The data is automatically sent for value management analysis. Connect with your account representative to receive the report and discuss the benefits for your organization's value management.

# Deprecated Benchmarks dashboard

The Benchmarks dashboard shows KPI data, performance trends, and indicator scorecards.

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The Benchmarks KPI dashboard view displays all the KPIs and can be accessed through Service Portal.

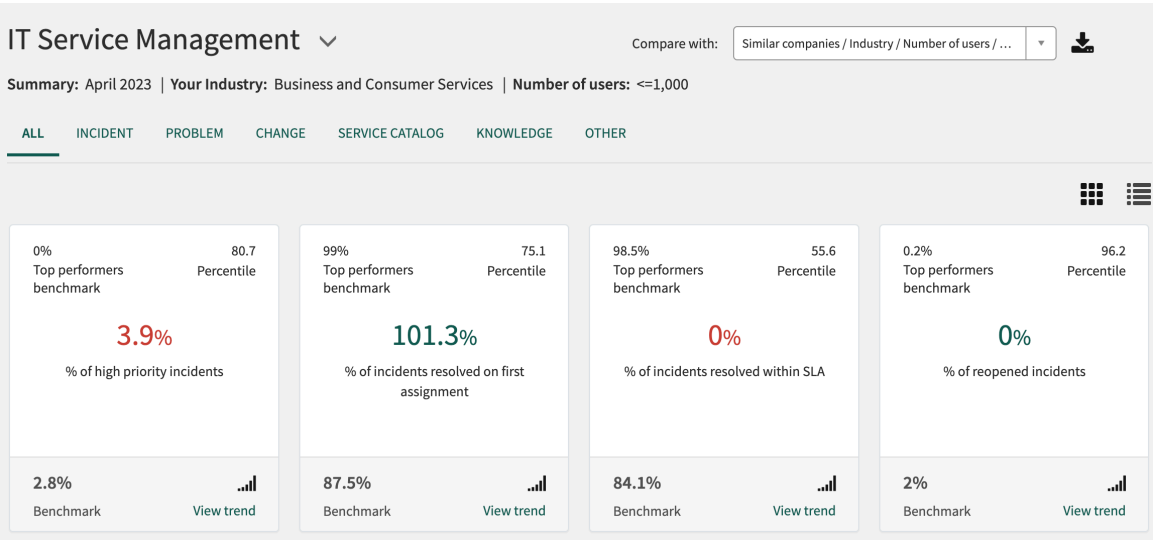
Features include:

- Ability to show KPIs in either list or card view.
- Downloadable reports of KPI list and all charts in PDF format.
- Ability to filter data by type of industry, number of users, MSPs, or geographic region (the filter is retained when switching between KPI view and trend view).

**Note:**
Only Managed Service Providers (MSP) can view the global MSP aggregate score data.

- Color-coded KPI data (the favorable comparison results for your instance are in green, while red favors global data).
- Monthly change percentage calculation of your instance from the previous month.
- Ability to view six months of historical KPI data.
- Ability to display time values in hours or days (using the *sn_bm_client.dashboard_display_unit* system property).

**Note:**
Service Portal must be installed to view the Benchmarks dashboard.




## Percentile rank

The exact standing of the KPI for your company within your participating peer group is indicated by percentile rank. A KPI percentile rank of 90% indicates that your instance standing for that KPI is greater than 90% of the instances participating in that group.

**Note:**
A high percentile rank does not always indicate a desirable result.

For certain KPIs a higher ranking is preferred (% of incidents resolved using KB articles), but for others it is not (% of emergency changes). The meaning of your percentile ranking should be interpreted based on the direction of the KPI being analyzed.

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| KPI | Direction (Percentile rank goal) | |
|---|---|---|
| | Minimize | Maximize |
| Incident | | |
| % of high priority incidents resolved | ✓ | ✗ |
| % of incidents resolved on first assignment | ✗ | ✓ |
| % of incidents resolved within SLA | ✗ | ✓ |
| % of reopened incidents | ✓ | ✗ |
| Average time to resolve a high priority incident | ✓ | ✗ |
| Average time to resolve an incident | ✓ | ✗ |
| Number of incidents created per user | ✓ | ✗ |
| Problem | | |
| % of high priority problems | ✓ | ✗ |
| % of incidents resolved by problem | ✗ | ✓ |
| Average time to close a problem | ✓ | ✗ |
| Change | | |
| % of emergency changes | ✓ | ✗ |
| % of failed changes | ✓ | ✗ |
| Average time to close a change | ✓ | ✗ |
| Service Catalog | | |
| % of closed requests with breached SLAs | ✓ | ✗ |
| Average time to fulfill a request | ✓ | ✗ |
| Number of requests created per user | ✓ | ✗ |
| Knowledge | | |
| % of incidents resolved using KB articles | ✗ | ✓ |

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| KPI | Direction (Percentile rank goal) | |
|---|---|---|
| | Minimize | Maximize |
| Number of knowledge article views per user | ✗ | ✓ |
| ITSM Virtual Agent | | |
| % call deflection | ✗ | ✓ |
| % of incidents auto-resolved | ✗ | ✓ |
| Other | | |
| Average customer satisfaction | ✗ | ✓ |
| Number of requesters per fulfiller | ✗ | ✓ |
| CMDB | | |
| % of duplicate CIs | ✓ | ✗ |
| % of non-compliant CIs | ✓ | ✗ |
| % of stale CIs | ✓ | ✗ |
| Security Incident Response | | |
| % of critical and high priority security incidents | ✓ | ✗ |
| Vulnerability Response | | |
| Average critical vulnerability age | ✓ | ✗ |
| Average vulnerability age | ✓ | ✗ |
| Virtual Agent | | |
| % of users using Virtual Agent | ✓ | ✗ |
| % conversation handed over to a live agent | ✗ | ✓ |
| Virtual Agent CSAT score | ✓ | ✗ |
| Success Dashboard | | |
| Self-solved % | ✓ | ✗ |
| Call deflection % | ✓ | ✗ |
| Structured tickets % | ✓ | ✗ |
| Customer satisfaction survey scores | ✓ | ✗ |

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| KPI | Direction (Percentile rank goal) | |
|---|---|---|
| | Minimize | Maximize |
| MTTR – Average mean time to resolution | ✗ | ✓ |
| Breached SLA % | ✗ | ✓ |
| First assignment resolution | ✓ | ✗ |
| % Automated resolutions | ✓ | ✗ |
| % KB - Self-solved (count) | ✓ | ✗ |
| % VA - Self-solved (count) | ✓ | ✗ |
| % Call deflection when self-solved (count) | ✓ | ✗ |
| % VA ticket submissions (count) | ✓ | ✗ |
| % Catalog ticket submissions (count) | ✓ | ✗ |

## Top Performers

You can compare the customer's Benchmark score to analyze your performance against the top-ten percentile in a cohort.

## ITSM dashboards

ITSM dashboards are a central place for ITSM users to monitor ongoing ITSM operations. These dashboards contain data visualizations to help you improve your business processes and practices.

Access the dashboards under **Self-Service** > **Dashboards**. To view detailed information, hover over any report graphic.

**Note:**
The Performance Analytics ITSM Dashboards The ITSM Platform Analytics Solutions are required to view these dashboards. The Performance Analytics - Content Pack - ITSM Dashboards (com.snc.pa.itsm_dashboards) plugin must be activated.

For more information, see Platform Analytics Solutions.

| Dashboard | Description | Role |
|---|---|---|
| IT Manager | Overview reports and IT service analysis reports | • Incident Manager<br>• SLA Manager<br>• pa_admin |

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| Dashboard | Description | Role |
|---|---|---|
| IT Agent | Agent work and agent group work reports, and prioritized workload | • itil<br>• itil_admin<br>• pa_admin |
| IT Executive | Customer service, performance, and risk map reports | • itil<br>• itil_admin<br>• pa_admin |

## View benchmark KPI data (deprecated)

Benchmarks KPI data is shown in Service Portal. Data includes values for your company instance, and for global data.

### Before you begin

Role required: sn_bm_client.benchmark_data_viewer

### Procedure

1. Navigate to **All** > **Benchmarks** > **Dashboard**.
2. Select one of the **KPI categories** from the KPI list.
3. To view the corresponding group of KPIs, click a tab.

   **Note:**
   If the data seems incomplete or incorrect, you can investigate the KPI definition and conditions in **Performance Analytics** > **Sources** > **Indicator Sources**.

4. To filter results, select either an industry, number of users, or region in the **Compare with:** list. The data is automatically updated when you select a filter.

   **Note:**
   If a filter category contains fewer than 20 participants, the corresponding data is shown in the **Other** category.

5. For choice of view, click either the list icon or the card-view icon.
   In card view, clicking a KPI displays the six-month KPI performance trend chart.
6. To download a report to a PDF file, click the arrow icon ( ).

### What to do next

Click a KPI to view Benchmarks KPI performance trend and recommendations (deprecated).

## Benchmarks KPI performance trend and recommendations (deprecated)

The Benchmarks KPI performance chart trend view shows your KPI performance comparison with global data, and provides recommendations to implement for improved performance of your KPI.

The KPI Performance Trends chart section is shown only for users with the Benchmarks viewer role (sn_bm_client.benchmark_data_viewer).

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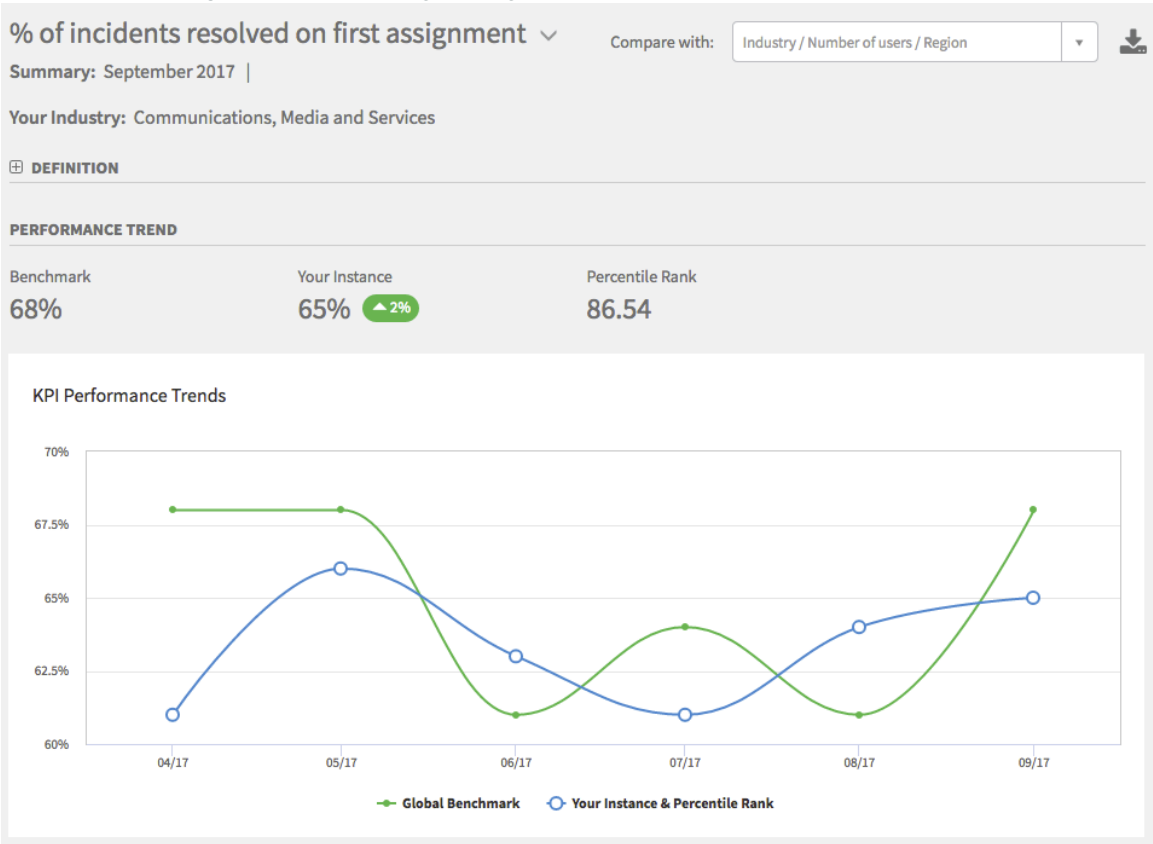
## KPI Performance Trends chart

### 6-month monthly data mapped against global data




Your 6-month monthly data is mapped against global data, and your percentile rank indicating your standing within the participating peer group is shown.

Functionality of the performance trend chart view includes:

- Switching between KPIs in the same category using the KPI list.
- Viewing your instance and global data for a certain month by hovering over a point on the graph.
- Accessing the Performance Analytics scorecard for a data point in your instance.
- Downloading KPI chart reports.
- Filtering data by type of industry, number of users, or geographic region.

## Recommendations

The Recommendations section is shown only for users with the Benchmarks recommendation role (sn_bm_client.benchmark_recommendation_viewer).

Recommendation candidates are provided in the performance trend view to help improve the performance of your KPIs. All recommendations are dynamic and are updated monthly, based on data analyzed from the previous month. Recommendation candidates are listed by rank.

**Note:**
Some KPI recommendations that use guided setup require system admin permission. Work with your system administrator to implement these recommendations.

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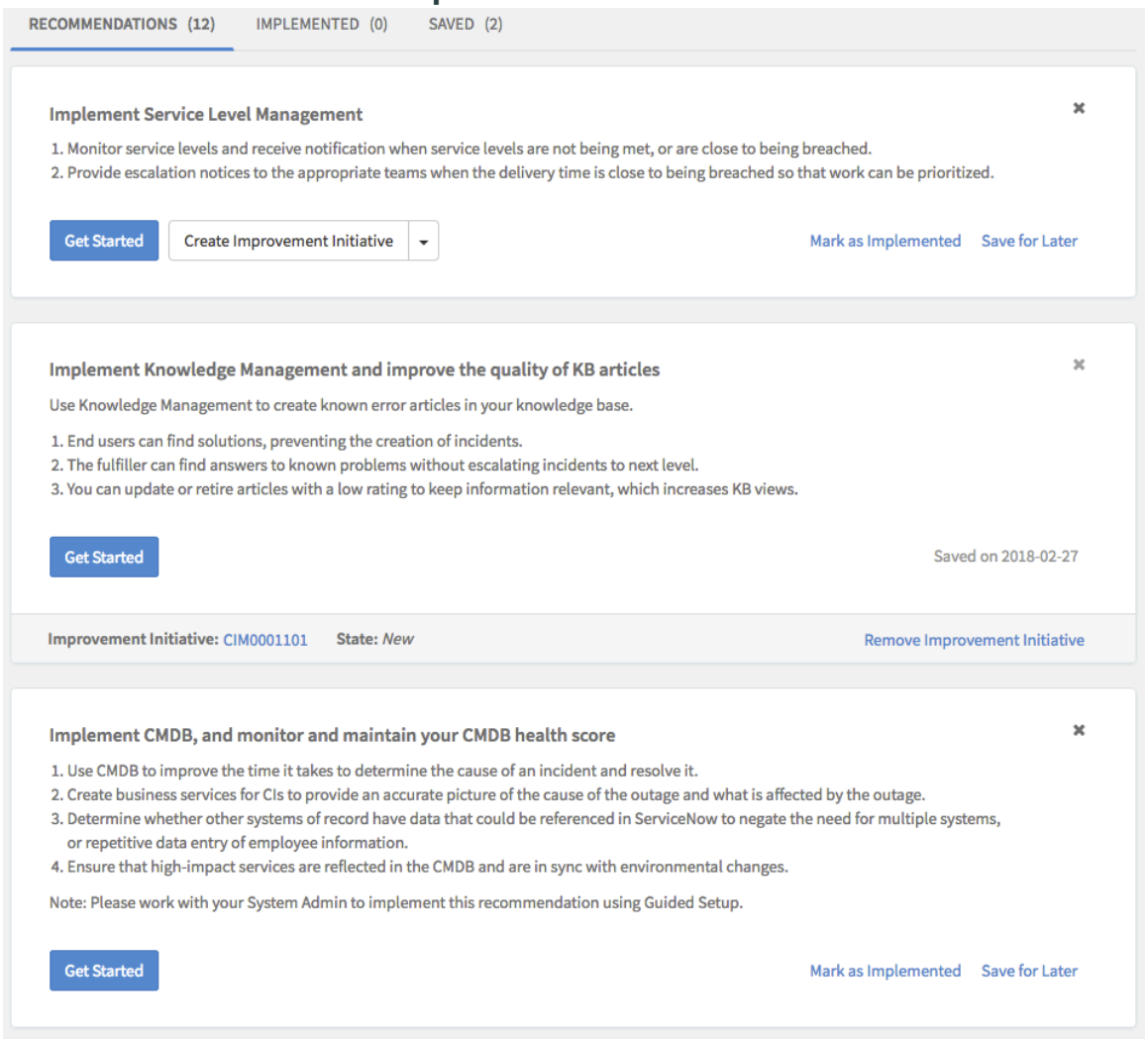
**Recommendations filtered into Implemented or Saved tabs**




Actions are available for each recommendation candidate. Based on the action, recommendations get filtered into the appropriate group tab (Implemented or Saved). Closing out the recommendation removes the recommendation candidate from the list.

- **Get Started**: Executes Guided Setup, if available, otherwise opens documentation containing information regarding the improvement.
- **Mark as Implemented**: Moves the recommendation candidate to the Implemented tab. This action is no longer available when a CIM improvement initiative is associated with the recommendation candidate.
- **Save for Later**: Moves the recommendation candidate to the Saved tab to be implemented at a later time.
- **Improvement Initiative** section:
  - **Create Improvement Initiative**: Creates a CIM improvement initiative, which contains phases and tasks to improve the KPI. Once the CIM improvement initiative is created, the recommendation candidate is moved to Saved tab.

    CIM fields automatically populated:

    - Short description: Recommendation candidate name.
    - Description: Recommendation candidate content and action URL.

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- **Select Improvement Initiative**: Associates an existing CIM improvement initiative. The state of the recommendation candidate is set to the state of the associated CIM improvement initiative.

  **Note:**
  CIM **Short description** and **Description** fields are populated automatically from the recommendation candidate content only when the CIM improvement initiative is initially created from a recommendation candidate, not when associating afterward.

- **Improvement Initiative** related link: Links to the associated CIM improvement initiative. Click the related link to view the CIM improvement initiative in Continual Improvement Management.
- **Remove Improvement Initiative**: Removes the associated CIM improvement initiative from the item in the Recommendations list.

  When the CIM improvement initiative is closed, the recommendation candidate is moved to the Implemented tab. If the CIM improvement initiative is canceled, the recommendation candidate remains in the Saved tab. The associated CIM improvement initiative can always be removed, and another can be selected.

Tabs for recommendation candidates:

**Recommendations**

Lists all recommendation candidates based on the analysis of the monthly data. This list gets refreshed monthly.

**Implemented**

Lists all recommendation candidates that you have implemented. Recommendation candidates that were implemented the previous month include tracking information on the trend chart so you can determine the impact of the change. Hovering over the implementation point shows the recommendation implemented.

**Note:**
Recommendation candidates implemented in the current month do not have tracking data points on the chart until the following month.

**Saved**

Lists all recommendation candidates that have been saved to implement later.

## Drill down within benchmark KPI data (deprecated)

You can drill down within benchmark KPI data for further analysis within Performance Analytics.

### Before you begin

**Note:**
When drilling down on a benchmark value, Benchmarks viewers must have the pa_viewer role to view Performance Analytics scorecards.

Role required: sn_bm_client.benchmark_admin or sn_bm_client.benchmark_data_viewer with pa_viewer role

### About this task

You can drill down on a benchmark value from the KPI performance trends chart to view individual data that makes up that value. For example, you may want to drill down and investigate data that is presented as a value in red (lower performance) on the chart.

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**Note:**
You can only drill down within KPI data from the KPI performance trends chart. You can only drill down on scores generated using Performance Analytics.

### Procedure

1. Navigate to **All** > **Benchmarks** > **Dashboard**.
2. To view the KPI definition and performance trend, click a KPI.
3. To drill down further into the Performance Analytics scorecard, click a value in your benchmark data on the performance trends chart.

**Note:**
For additional analysis on **Chart**, **Scores**, **Comments**, or **More info**, see Performance Analytics.

## New Benchmarks Dashboard

The Benchmarks dashboard displays KPI data, performance trends, and indicator scorecards.

The Benchmarks KPI dashboard view displays all the KPIs and can be accessed through Service Portal.

The dashboard features include the following:

- KPIs are shown in either the list or card view.
- Downloadable reports of the KPI list are available in PDF format.
- Data is filtered by type of industry, number of users, Managed Service Providers (MSPs), or geographic region (the filter is retained when switching between the KPI view and trend view).

**Note:**
Only MSPs can view the global MSP aggregate score data.

- The performance against the global data is shown with a thumbs up or thumbs down representation.
- Depending on the subscription, six months to two years of historical KPI data can be viewed.
- Time values can be displayed in hours or days using the *sn_bm_client.dashboard_display_unit* system property.

**Note:**
The new Benchmarks dashboard is available from the ServiceNow store.

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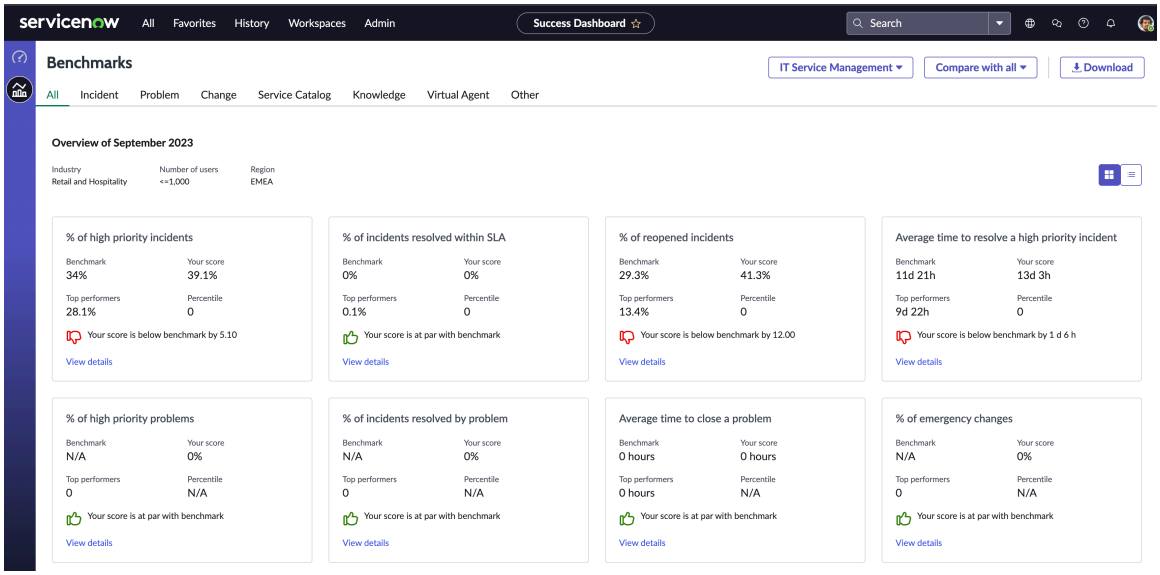


## Percentile rank

The exact standing of the KPI for your company within your participating peer group is indicated by percentile rank. A KPI percentile rank of 90% indicates that your instance standing for that KPI is greater than 90% of the instances participating in that group.

| KPI | Direction (Percentile rank goal) | |
|---|---|---|
| | Minimize | Maximize |
| Incident | | |
| % of high priority incidents resolved | ✓ | ✗ |
| % of incidents resolved on first assignment | ✗ | ✓ |
| % of incidents resolved within SLA | ✗ | ✓ |
| % of reopened incidents | ✓ | ✗ |
| Average time to resolve a high priority incident | ✓ | ✗ |
| Average time to resolve an incident | ✓ | ✗ |
| Number of incidents created per user | ✓ | ✗ |
| Problem | | |
| % of high priority problems | ✓ | ✗ |
| % of incidents resolved by problem | ✗ | ✓ |

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| KPI | Direction (Percentile rank goal) | |
|---|---|---|
| | Minimize | Maximize |
| Average time to close a problem | ✓ | ✗ |
| Change | | |
| % of emergency changes | ✓ | ✗ |
| % of failed changes | ✓ | ✗ |
| Average time to close a change | ✓ | ✗ |
| Service Catalog | | |
| % of closed requests with breached SLAs | ✓ | ✗ |
| Average time to fulfill a request | ✓ | ✗ |
| Number of requests created per user | ✓ | ✗ |
| Knowledge | | |
| % of incidents resolved using KB articles | ✗ | ✓ |
| Number of knowledge article views per user | ✗ | ✓ |
| ITSM Virtual Agent | | |
| % call deflection | ✗ | ✓ |
| % of incidents auto-resolved | ✗ | ✓ |
| Other | | |
| Average customer satisfaction | ✗ | ✓ |
| Number of requesters per fulfiller | ✗ | ✓ |
| CMDB | | |
| % of duplicate CIs | ✓ | ✗ |
| % of non-compliant CIs | ✓ | ✗ |
| % of stale CIs | ✓ | ✗ |
| Security Incident Response | | |
| % of critical and high priority security incidents | ✓ | ✗ |
| Vulnerability Response | | |

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| KPI | Direction (Percentile rank goal) | |
|---|---|---|
| | Minimize | Maximize |
| Average critical vulnerability age | ✓ | ✗ |
| Average vulnerability age | ✓ | ✗ |
| Virtual Agent | | |
| % of users using Virtual Agent | ✓ | ✗ |
| % conversation handed over to a live agent | ✗ | ✓ |
| Virtual Agent CSAT score | ✓ | ✗ |
| Success Dashboard | | |
| Self-solved % | ✓ | ✗ |
| Call deflection % | ✓ | ✗ |
| Structured tickets % | ✓ | ✗ |
| Customer satisfaction survey scores | ✓ | ✗ |
| MTTR – Average mean time to resolution | ✗ | ✓ |
| Breached SLA % | ✗ | ✓ |
| First assignment resolution | ✓ | ✗ |
| % Automated resolutions | ✓ | ✗ |
| % KB - Self-solved (count) | ✓ | ✗ |
| % VA - Self-solved (count) | ✓ | ✗ |
| % Call deflection when self-solved (count) | ✓ | ✗ |
| % VA ticket submissions (count) | ✓ | ✗ |
| % Catalog ticket submissions (count) | ✓ | ✗ |

## View benchmark KPI data

Benchmarks KPI data is shown in Benchmarks dashboard built in Next Experience UI. Data includes values for your company instance, and for global data.

### Before you begin

Role required: sn_bm_client.benchmark_data_viewer

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### Procedure

1. Navigate to **All** > **Benchmarks** > **Dashboard**.
2. Select one of the **KPI categories** from the KPI list.
3. To view the corresponding group of KPIs, click a tab.

   **Note:**
   If the data seems incomplete or incorrect, you can investigate the KPI definition and conditions in **Performance Analytics** > **Sources** > **Indicator Sources**.

4. To filter results, select either an industry, number of users, or region in the **Compare with:** list. The data is automatically updated when you select a filter.

   **Note:**
   If a filter category contains fewer than 20 participants, the corresponding data is shown in the **Other** category.

5. For choice of view, click either the list icon or the card-view icon.
   In card view, clicking a KPI displays the six-month KPI performance trend chart.
6. To download a report to a PDF file, click the **Download** button.

### What to do next

Click a KPI to view Benchmarks KPI performance trend.

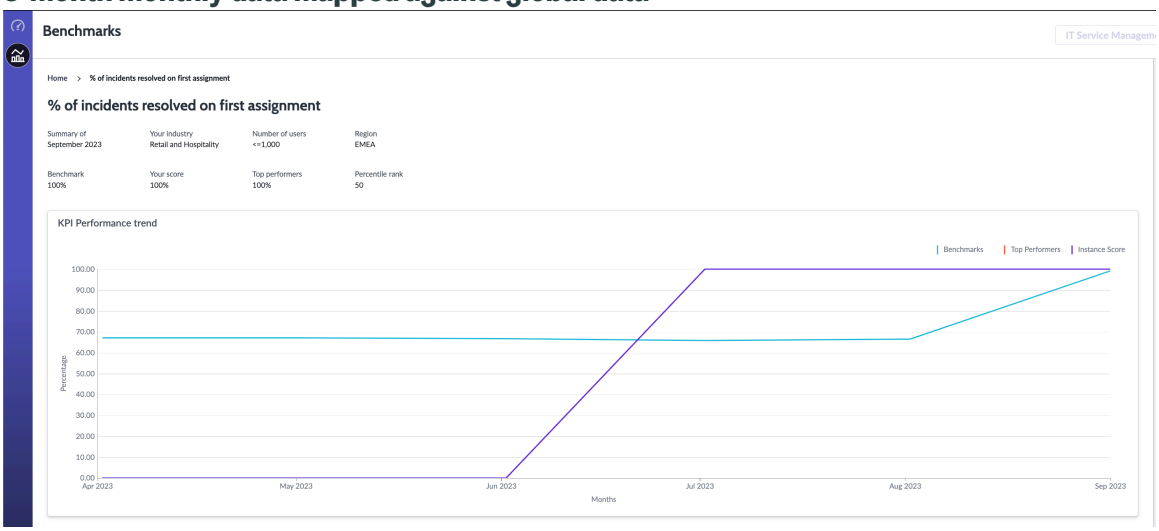
## Benchmarks KPI performance trend

The Benchmarks KPI performance chart trend view shows your KPI performance comparison with global data, and provides details about the KPI on the contextual side panel.

The KPI Performance Trends chart section is shown only for users with the Benchmarks viewer role (sn_bm_client.benchmark_data_viewer).

## KPI Performance Trends chart

### 6-month monthly data mapped against global data




Your 6-month monthly data is mapped against global data, and your percentile rank indicating your standing within the participating peer group is shown.

Functionality of the performance trend chart view includes:

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- Viewing your instance and global data for a certain month by hovering over a point on the graph.
- Accessing the Performance Analytics scorecard for a data point in your instance.
- Filtering data by type of industry, number of users, or geographic region.

## Troubleshooting Benchmarks errors

Troubleshoot and resolve common errors when setting up or running Benchmarks.

### Data Error Scenarios

| Scenario | Reason | Action |
|---|---|---|
| No data in dashboard after opting in. | The download REST API for six months failed or there is a connection failure. | Verify in the sysevent table that the sn_bm_client.download.scores.6months event is processed. |
| No instance data is shown in the dashboard for the last month. | PA data collection or scorecards API failure. | • Make sure the condition in the indicator source, script field in the indicator, and additional conditions in the indicator are correct.<br>• Verify that historical data of the last month for the KPI is collected.<br>1. Navigate to **Platform Analytics** > **Data Collector** > **Jobs**.<br>2. Find and open the historical data collection job for the KPI.<br>3. Navigate to the **Job Logs** related list.<br>4. Make sure that the state for the historical data collection job is **Collected**. |
| No global or cohort benchmark scores in dashboard for the last month. | • The download REST API failed or there is a connection failure.<br>• The minimum data required to generate global or cohort scores for a KPI isn't available due to insufficient customer participation in a cohort or peer group segment. | • Verify in the sysevent table that the sn_bm_client.download.scores event is processed.<br>• Make sure that each cohort has a minimum of 10 participating customers. |

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**Data Error Scenarios (continued)**

| Scenario | Reason | Action |
|---|---|---|
| Opt-in process fails. | Authentication failed or the instance type is not supported. | Contact Customer Service and Support team. |
| Incorrect or no KPI data in the Benchmarks dashboard. | • KPI condition configuration<br>• The minimum historical data scores for KPIs are not available. | • Verify the KPI definition and conditions in **Performance Analytics** > **Sources** > **Indicator Sources**.<br>• Make sure that a minimum of one to two months of aggregate monthly historical data for a KPI is available. The recommended time interval is 60 days. |
| No data in Percentile Rank list view. | Percentile Rank shows N/A due to the following reasons.<br>• You are viewing an industry that you are not a part of.<br>• The minimum data required to generate global or cohort scores for a KPI isn't available due to insufficient customer participation in a cohort or peer group segment. | • View the industry in which your scores are included.<br>• Make sure that each cohort has a minimum of 10 participating customers. |
| No data in Top Performer score. | Top Performer score shows N/A if the minimum historical data scores for KPIs are not available. | Make sure that a minimum of one to two months of aggregate monthly historical data for a KPI is available. The recommended time interval is 60 days. |

## Domain separation and Benchmarks

Domain separation is unsupported in the Benchmarks application. Domain separation enables you to separate data, processes, and administrative tasks into logical groupings called domains. You can control several aspects of this separation, including which users can see and access data.

### Support level: No support

- The domain field may exist on data tables but there is no business logic to manage the data.
- This level is not considered domain-separated.

For more information on support levels, see Application support for domain separation.

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**Related topics**

Domain separation for service providers

[qa: BEGIN review]

# Benchmarks

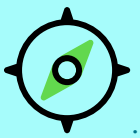
The ServiceNow® Benchmarks application gives you instant visibility into your key performance indicators (KPIs) and trends, as well as comparative insight relative to industry averages of your peers and to the industry top performers. You can contrast the performance of your organization with recognized industry standards, view a side-by-side comparison of performance with global benchmarks, and implement recommendations for improved performance.

## Benchmarks overview

This video provides you with an overview of Benchmarks. Benchmarks Overview

## Get started

The ServiceNow Benchmarks application securely collects daily data on your instance and then aggregates the data into monthly global benchmark reports.

| | |
|---|---|
| Explore<br>  <br>Learn about Benchmarks features and benefits | Configure<br>  <br>Configure and customize the Benchmarks KPI |
|  <br>Use<br>Learn how you can analyse the Benchmarks data | Reference<br>  <br>Get details about the Benchmarks components such as KPI, roles and trends |

## Troubleshoot and get help

Contact Customer Service and Support.

[End]
[qa: BEGIN review]

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## Exploring Benchmarks

Use Benchmarks for ITSM to get a comparative insight relative to industry averages of your peers and to the industry top performers. With Benchmarks get a quick visibility into your key performance indicators (KPIs) and trends.

The ServiceNow Benchmarks application securely collects daily data on your instance and then aggregates the data into monthly global benchmark reports.

Performance Analytics collects daily data on customer instances. The data from the previous month is uploaded at the beginning of the following month via a scheduled job. If there are any errors, there are multiple retries.

This video provides an overview of how you can get started with Benchmarks.

Getting started with Benchmarks

During the month the data is uploaded, the data is aggregated and monthly results (your instance results, global results, and your ranking) are downloaded to the customer instance mid month. Monthly recommendation candidates are provided that you can implement to help improve your KPI performance. An email notification is sent when the global data is available.

ServiceNow has over 2850 customers that have opted into the Benchmarks program. All ServiceNow customers are allowed to participate in the Benchmarks program by opting in from their ServiceNow production instance, except:

- Express customers
- Federal customers
- Customers with on-premise instances

**Note:**
You must have a production instance to opt into the Benchmarks program.

Managed Service Providers (MSPs) and MSP-managed instances are supported and have exclusive access to global MSP aggregate score data. All instances will support the following benchmarks that can be downloaded for comparison in the Benchmarks dashboard:

- Global, which applies to all customers
- Industry category
- User size, based on active user count
- Companies in your industry category and those that are of similar size to your company
- Geographical regions

**Note:**

- These benchmarks aren't calculated using MSP data.
- Along with the above Benchmarks, you will also receive the top performers in each of these categories.
- Changing KPI configuration within the month requires one to two months of data collection before your monthly values reflect that change.
- The Benchmark Scheduler (bm.scheduler) user is added with Benchmarks. It's required for Benchmarks data collection.

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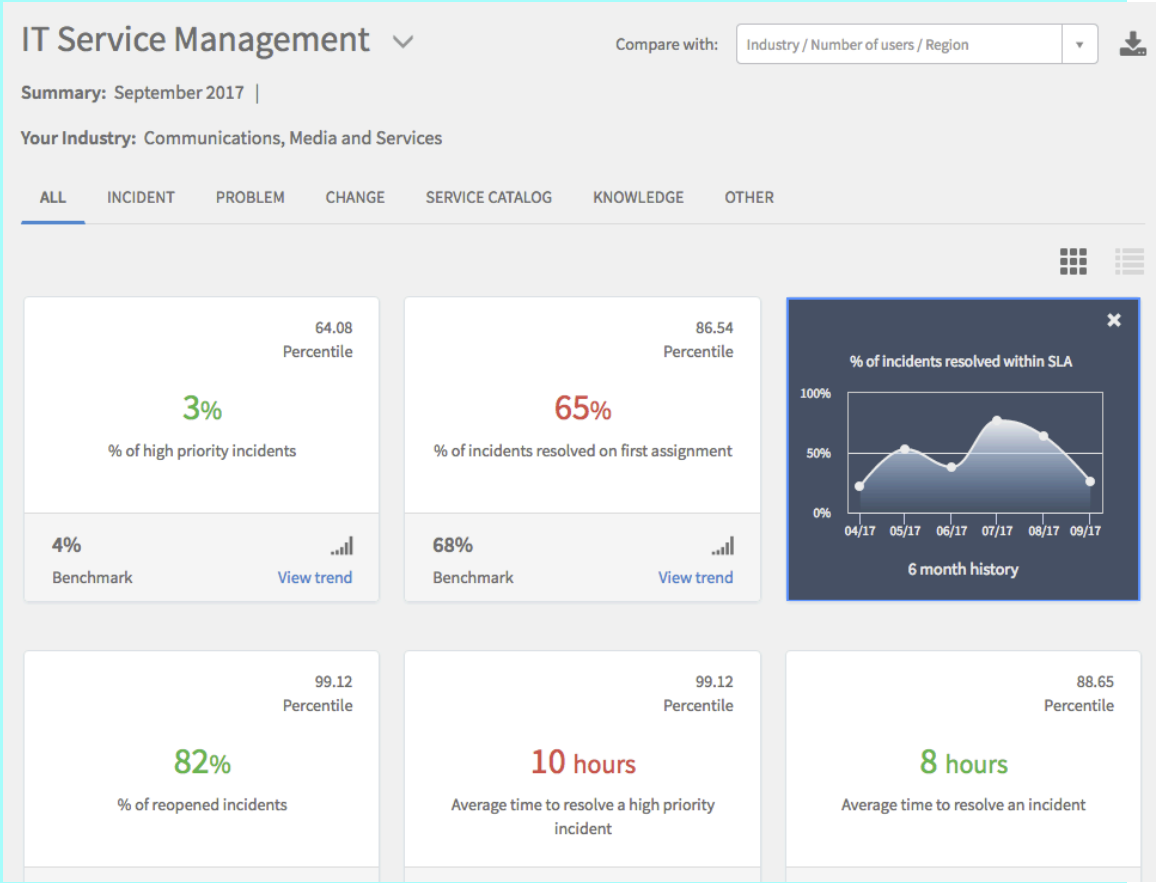
## Key features

- Available KPIs from other ServiceNow applications such as ITSM, ITOM, Security Operations. For more information, see Benchmark KPIs.
- Ability to change KPI definitions to match customizations.
- Benchmarks dashboard in Service Portal (mobile friendly).
- Ability to download KPI reports.
- Ability to filter data based on the following parameters:
  - Industry, number of users, or geographical region.
  - Companies in your industry category and of similar user size.
- Email notification when new aggregate monthly data is available.
- Percentile ranking to indicate your standing within your participating peer group.
- Recommendation candidates with guided setup to help improve KPI performance.
- Product category-based roles to limit data access.
- Integration with Performance Analytics for daily data collection and drill-down on KPI data.

### Benchmarks dashboard

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## Benchmarks benefits

### Benefits

| Benefit | Description |
| --- | --- |
| Global anonymity | Viewers in your organization have access benchmarks for your organization, however the global benchmarks are anonymous, and don't include any company information. |
| Industry comparison | Using the **Compare with** drop-down in the Benchmarks dashboard, you can filter the benchmarks results by industry, ServiceNow user size, or geographical region to make the results more relevant to your organization.<br>• Industry is determined based on the standard industry code in the account record for the company.<br>• Number of users is determined by the number of ServiceNow active users within the company, so you can compare your company to similar-sized ServiceNow implementations to gain insight about your company.<br>• Region is determined based on the **Region** field in the company table.<br>If a filter category includes fewer than 20 participants, the corresponding data is shown in the **Other** category. |
| Trends | You can see the results of all published KPIs as well as the previous six months of history.<br>You can then use the trend data to measure and report on service delivery progress over a period of time to determine what is working well and what needs improvement. |
| Recommendations | Data is analyzed and recommendation candidates are provided to help improve the performance of your KPIs.<br>All recommendations are dynamic and are updated monthly, based on data from the previous month. |
| Reports | Benchmarks reports get refreshed monthly, which can be downloaded in PDF format. An email notification is sent to the customer when new data is available. |

[End]
[qa: BEGIN review]

## Benchmarks roles

The Benchmarks admin and the viewer roles are introduced with Benchmarks.

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An overview of the Benchmarks feature in ServiceNow, including opting in, setting up Benchmarks, reading the KPI dashboard, reading KPI cards, recommendations and implementing them.

**Roles**

| Role | Capabilities | Roles inherited |
|---|---|---|
| sn_bm_client.benchmark_admin | • Set up Benchmarks from an instance<br>• Opt in or out of the Benchmarks program<br>• Enable, disable, or modify indicators (including changing Performance Analytics indicator source, script, and conditions for those KPIs not requiring application-specific roles)<br>• Receive email notification when new aggregate monthly data is available<br>• All functions of the Benchmarks viewer and Benchmarks recommendations roles | |
| sn_bm_client.benchmark_data_viewer | • View full benchmark reports in Service Portal<br>• View data visualizations and drill-downs for analyzing trends (not PA scorecards)<br>• Download visualizations<br>• View industry category or size comparisons<br>• Receive email notification when new aggregate monthly data is available | |
| sn_bm_client.benchmark_recommendation_viewer | View benchmark KPI recommendation candidates. | sn_process_optimization_viewer |

[End]

[qa: BEGIN review]

## Configuring Benchmarks

Enable Benchmarks for ITSM and configure the settings to track the Benchmarks KPI and the trends.

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You must opt in to Benchmarks to participate in Benchmarks data collection. However, you can opt out at any time.

[End]
[qa: BEGIN review]

## Enable Benchmarks

Enable Benchmarks by opting in to participate in Benchmarks data collection. With Benchmarks you can compare your organization's performance with that of the recognized industry standards.

### Before you begin

To keep the Benchmarks comparison data clean, you can opt in to Benchmarks only from your production instance.

Role required: sn_bm_client.benchmark_admin

### About this task

**Note:**
You must install the Success Dashboard and Install SPM Benchmarks applications to access the respective Benchmarks KPIs. For information on these KPIs, see Benchmark KPIs.

Once you have manually opted into Benchmarks, enable and configure benchmark KPIs. From the Benchmarks dashboard, you can view the Benchmarks KPI data, performance trends, and indicator scorecards.

**Note:**
Service Portal must be installed to view the Benchmarks dashboard.

Six months of global data is available after opting in. If available, the corresponding data for your instance is also included.

**Note:**
Past data for your instance is only available for Benchmarks users upgrading from a previous release.

### Procedure

1. Opt into Benchmarks using the guided setup or by navigating using the application navigator.
2. Click **Opt-In Agreement** and read the agreement.
3. After reading the agreement, click **Done**.
4. Select the **Yes, I have read and accept the Opt-In Agreement** check box, and then click **Opt-In**.
   The opt-in confirmation screen appears.

### What to do next

Enable and configure your KPIs.

[End]

[qa: BEGIN review]

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## Enable a benchmark KPI

Enable KPIs to use in your data reporting.

### Before you begin

Role required:
The sn_bm_client.benchmark_admin role can enable KPIs.

Admins can assign roles to a KPI category.

### About this task

KPIs are grouped within categories (for example, ITSM, ITOM, Security Operations). You can assign roles to certain categories so that the corresponding KPI data is limited to authorized groups.

### Procedure

1. Navigate to **All** > **Benchmarks** > **Administration** > **Setup**.
2. To enable or disable a KPI, click the KPI slider.
3. To view more information about a KPI, click the KPI.
   Additional information includes description, formula, conditions, and tables from which the data is collected.
4. Click **Save**.
   Allow one to two months for aggregate monthly data to accurately reflect changes made to KPI status.

   **Note:**
   In some environments, resolved incident KPIs may require further configuration to retrieve resolved incident data.

5. **Optional:** To limit access of benchmark data to specific categories, assign roles to a KPI category.

   a. Navigate to **Benchmarks** > **Administration** > **Category** and select a KPI category.

   b. To add a role, click **View Roles**.

   **Note:**
   You must have the admin role to assign roles to categories.

[End]

[qa: BEGIN review]

## Configure resolved incident Benchmarks KPIs

The source for the KPIs containing resolved incident data is the **resolved_at** field in the Incident [incident] table, which may not exist in some environments. In this case, additional configuration is required to use these KPIs.

### Before you begin

**Note:**
If you have never tracked resolved incidents in your environment before, install the Incident Resolution Fields (com.snc.incident_resolution_fields) plugin, which automatically adds the **resolved_at** field to the Incident table. No further steps are required.

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Role required: sn_bm_client.benchmark_admin

### About this task

If you are receiving errors in the Benchmarks Data Collection job log for resolved incident KPIs because you are using a custom (user-created) field to track resolved incidents, the following procedure is required for successful data retrieval using these Benchmarks KPIs.

- % of high priority incidents resolved
- % of incidents resolved on first assignment
- % of incidents resolved within SLA
- % of reopened incidents
- Average time to resolve a high priority incident
- Average time to resolve an incident
- Number of incidents created per user

Configure the KPI conditions and script to use your custom field (instead of the default **resolved_at** field) for resolved incident Benchmarks KPIs.

### Procedure

1. Configure the Benchmark.Incidents.Resolved indicator source condition with your custom field.
   a. Navigate to **Performance Analytics** > **Sources** > **Indicator Sources**.
   b. Select the **Benchmark.Incidents.Resolved** indicator source and enter edit mode.
   c. In the Conditions section, select your custom field from the list (custom field names are typically preceded by `u_`).
   d. Click **Update**.
2. Configure the Benchmark.Incident.ResolvedTime.Hours script with your custom field name.
   a. Navigate to **Performance Analytics** > **Automation** > **Scripts**.
   b. Select the **Benchmark.Incident.ResolveTime.Hours** script and enter edit mode.
   c. Replace the `resolved_at` field name occurrence within the script with the name of your custom field (custom field names are typically preceded by `u_`).
   d. Click **Update**.
3. Verify that you are no longer receiving errors in the Benchmarks Data Collection job log.

[End]

[qa: BEGIN review]

## Using Benchmarks

Use the ServiceNow Benchmarks application to collect historical data to analyze the benefits of year-over-year growth. View the Benchmarks KPI data and drill down to analyse the performance analytics.

[End]
[qa: BEGIN review]

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## Use Benchmarks data for value management analysis

Manually collect historical Benchmarks data to analyze the benefits of year-over-year growth when you use the ServiceNow Benchmarks application.

### Before you begin

Role required: sn_bm_client.benchmark_admin, pa_data_collector, or admin

### About this task

If you want to analyze year-over-year performance, you must collect at least 24 months of Benchmarks data. Use the **sn_bm_client.months_copy_historical_pa_bm** system property to set the number of months from the current month for which you want to collect Benchmarks historical data.

### Procedure

1. Set up Benchmarks historical data collection.
   a. Navigate to **Performance Analytics** > **Data Collection** > **Jobs**.
   b. Select the *Benchmarks Historical Data Collection* job.
   c. In the **Relative start** field, enter the period of time for which you want to collect the data.
   d. In the **Relative start interval** field, select the length of the time period to collect the data. Recommended interval is 24 months.
   e. Click **Execute**.
   For detailed information on scheduling a data collection job, refer to Create or schedule a data collection job.
2. Upload the collected data to the centralized Benchmarks instance.
   a. In the *Benchmarks Historical Data Collection* job, navigate to the **Job Logs** related list.
   b. Make sure that the state for the historical data collection job is **Collected**.
   This state indicates that all data for the job has successfully run and all data has been gathered for the set time period.
   c. Navigate to **System Definition** > **Scheduled Jobs**.
   d. Select the *Copy historical scores from PA to Benchmarks table*.
   e. Click **Execute Now**.

   The data is automatically sent for value management analysis. Connect with your account representative to receive the report and discuss the benefits for your organization's value management.

[End]

[qa: BEGIN review]

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## New Benchmarks Dashboard

The Benchmarks dashboard displays KPI data, performance trends, and indicator scorecards.

The Benchmarks KPI dashboard view, which shows all KPIs, is launched in Service Portal.

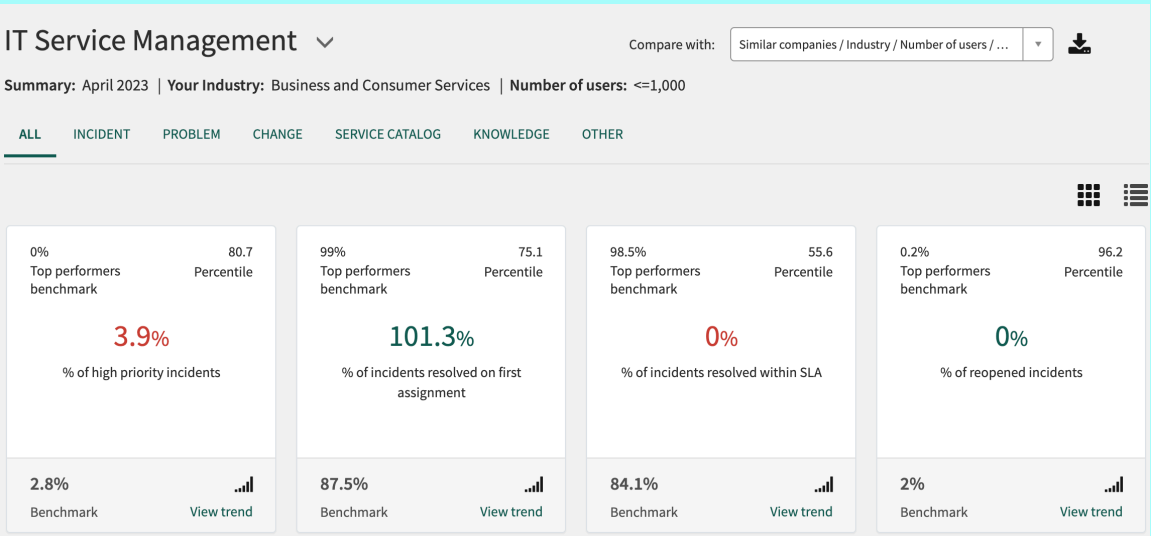
The dashboard features include the following:

- KPIs are shown in either the list or card view.
- Downloadable reports of the KPI list are available in PDF format.
- Data is filtered by type of industry, number of users, Managed Service Providers (MSPs), or geographic region (the filter is retained when switching between the KPI view and trend view).

**Note:**
Only MSPs can view the global MSP aggregate score data.

- The performance against the global data is shown with a thumbs up or thumbs down representation.
- 6 months of historical KPI data can be viewed.
- Time values can be displayed in hours or days using the *sn_bm_client.dashboard_display_unit* system property.

**Note:**
The new Benchmarks dashboard is available from the ServiceNow store.




## Percentile rank

The exact standing of the KPI for your company within your participating peer group is indicated by percentile rank. A KPI percentile rank of 90% indicates that your instance standing for that KPI is greater than 90% of the instances participating in that group.

| KPI | Direction (Percentile rank goal) | |
|---|---|---|
| | Minimize | Maximize |
| Incident | | |

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| KPI | Direction (Percentile rank goal) | |
|---|---|---|
| | Minimize | Maximize |
| % of high priority incidents resolved | ✓ | ✗ |
| % of incidents resolved on first assignment | ✗ | ✓ |
| % of incidents resolved within SLA | ✗ | ✓ |
| % of reopened incidents | ✓ | ✗ |
| Average time to resolve a high priority incident | ✓ | ✗ |
| Average time to resolve an incident | ✓ | ✗ |
| Number of incidents created per user | ✓ | ✗ |
| Problem | | |
| % of high priority problems | ✓ | ✗ |
| % of incidents resolved by problem | ✗ | ✓ |
| Average time to close a problem | ✓ | ✗ |
| Change | | |
| % of emergency changes | ✓ | ✗ |
| % of failed changes | ✓ | ✗ |
| Average time to close a change | ✓ | ✗ |
| Service Catalog | | |
| % of closed requests with breached SLAs | ✓ | ✗ |
| Average time to fulfill a request | ✓ | ✗ |
| Number of requests created per user | ✓ | ✗ |
| Knowledge | | |
| % of incidents resolved using KB articles | ✗ | ✓ |
| Number of knowledge article views per user | ✗ | ✓ |
| ITSM Virtual Agent | | |

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| KPI | Direction (Percentile rank goal) | |
|---|---|---|
| | Minimize | Maximize |
| % call deflection | ✗ | ✓ |
| % of incidents auto-resolved | ✗ | ✓ |
| Other | | |
| Average customer satisfaction | ✗ | ✓ |
| Number of requesters per fulfiller | ✗ | ✓ |
| CMDB | | |
| % of duplicate CIs | ✓ | ✗ |
| % of non-compliant CIs | ✓ | ✗ |
| % of stale CIs | ✓ | ✗ |
| Security Incident Response | | |
| % of critical and high priority security incidents | ✓ | ✗ |
| Vulnerability Response | | |
| Average critical vulnerability age | ✓ | ✗ |
| Average vulnerability age | ✓ | ✗ |
| Virtual Agent | | |
| % of users using Virtual Agent | ✓ | ✗ |
| % conversation handed over to a live agent | ✗ | ✓ |
| Virtual Agent CSAT score | ✓ | ✗ |
| Success Dashboard | | |
| Self-solved % | ✓ | ✗ |
| Call deflection % | ✓ | ✗ |
| Structured tickets % | ✓ | ✗ |
| Customer satisfaction survey scores | ✓ | ✗ |
| MTTR – Average mean time to resolution | ✗ | ✓ |
| Breached SLA % | ✗ | ✓ |

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| KPI | Direction (Percentile rank goal) | |
|---|---|---|
| | Minimize | Maximize |
| First assignment resolution | ✓ | ✗ |
| % Automated resolutions | ✓ | ✗ |
| % KB - Self-solved (count) | ✓ | ✗ |
| % VA - Self-solved (count) | ✓ | ✗ |
| % Call deflection when self-solved (count) | ✓ | ✗ |
| % VA ticket submissions (count) | ✓ | ✗ |
| % Catalog ticket submissions (count) | ✓ | ✗ |

[End]
[qa: BEGIN review]

### View benchmark KPI data

Benchmarks KPI data is shown in Benchmarks dashboard built in Next Experience UI. Data includes values for your company instance, and for global data.

## Before you begin

Role required: sn_bm_client.benchmark_data_viewer

## Procedure

1. Navigate to **All** > **Benchmarks** > **Dashboard**.
2. Select one of the **KPI categories** from the KPI list.
3. To view the corresponding group of KPIs, click a tab.

> **Note:**
> If the data seems incomplete or incorrect, you can investigate the KPI definition and conditions in **Performance Analytics** > **Sources** > **Indicator Sources**.

4. To filter results, select either an industry, number of users, or region in the **Compare with:** list. The data is automatically updated when you select a filter.

> **Note:**
> If a filter category contains fewer than 20 participants, the corresponding data is shown in the **Other** category.

5. For choice of view, click either the list icon or the card-view icon.
   In card view, clicking a KPI shows the six-month KPI performance trend chart on the card.
6. To download a report to a PDF file, click the **Download** button.

## What to do next

Click a KPI to view Benchmarks KPI performance trend.

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[End]

[qa: BEGIN review]

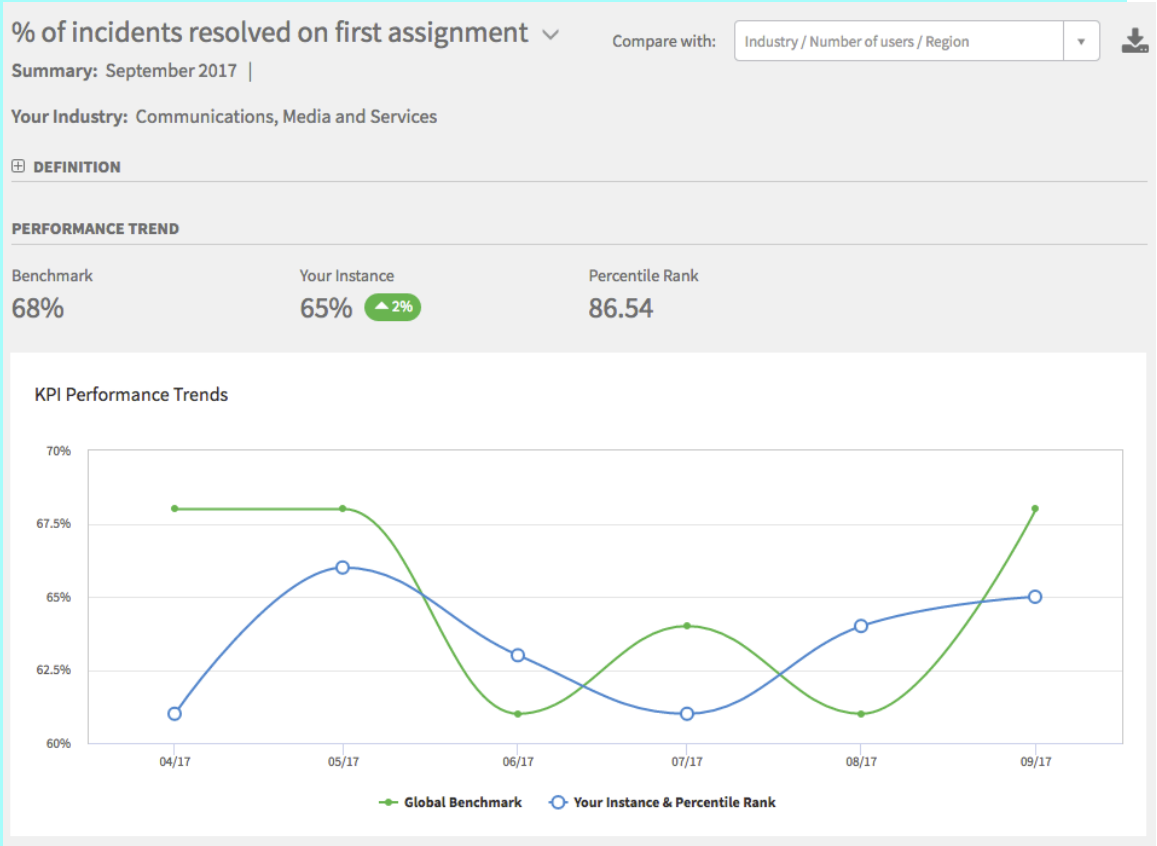
### Benchmarks KPI performance trend

The Benchmarks KPI performance chart trend view shows your KPI performance comparison with global data, and provides details about the KPI on the contextual side panel.

The KPI Performance Trends chart section is shown only for users with the Benchmarks viewer role (sn_bm_client.benchmark_data_viewer).

## KPI Performance Trends chart

### 6-month monthly data mapped against global data




Your 6-month monthly data is mapped against global data, and your percentile rank indicating your standing within the participating peer group is shown.

Functionality of the performance trend chart view includes:

- Viewing your instance and global data for a certain month by hovering over a point on the graph.
- Accessing the Performance Analytics scorecard for a data point in your instance.
- Filtering data by type of industry, number of users, or geographic region.

[End]

[qa: BEGIN review]

## Drill down within benchmark KPI data

You can drill down within benchmark KPI data for further analysis within Performance Analytics.

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### Before you begin

**Note:**
When drilling down on a benchmark value, Benchmarks viewers must have the pa_viewer role to view Performance Analytics scorecards.

Role required: sn_bm_client.benchmark_admin or sn_bm_client.benchmark_data_viewer with pa_viewer role

### About this task

You can drill down on a benchmark value from the KPI performance trends chart to view individual data that makes up that value. For example, you may want to drill down and investigate data that is presented as a value in red (lower performance) on the chart.

**Note:**
You can only drill down within KPI data from the KPI performance trends chart. You can only drill down on scores generated using Performance Analytics.

### Procedure

1. Navigate to **All** > **Benchmarks** > **Dashboard**.
2. To view the KPI definition and performance trend, click a KPI.
3. To drill down further into the Performance Analytics scorecard, click a value in your benchmark data on the performance trends chart.

   **Note:**
   For additional analysis on **Chart**, **Scores**, **Comments**, or **More info**, see Performance Analytics.

[End]

[qa: BEGIN review]

## Benchmarks reference

Refer to the different roles, dashboard, KPI categories and trends offered by ServiceNow Benchmarks.

[End]
[qa: BEGIN review]

### Benchmark KPIs

You can enable or disable a benchmark KPI, and customize KPI conditions. Integration with Performance Analytics provides daily data collection and drill down capabilities on KPI data.

Benchmarks offers ITSM, ITOM, Virtual Agent, Security Operations KPIs, Success Dashboard, and Strategic Portfolio Management.

**Note:**
Upgrading Benchmarks does not change KPI status or configuration from the previous release. New KPIs are enabled by default.

Benchmarks uses anonymous, aggregated usage data from customers who have opted in to calculate global and industry benchmarks. The KPIs in the Benchmarks application are performance analytics indicators that only collect the usage count data, for example, the total number of incidents in a month, based on the monthly aggregates. During data collection, the Benchmarks application does not consider any other details such as description of incidents, or information about requests, changes, or applications.

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The participating customer count for each cohort bucket in Industry Category, User Size, and Three geo regions aggregates are large enough to calculate monthly benchmarks values and to maintain full anonymity. To further ensure data anonymity, the Benchmarks user interface allows you to use only one filter at a time.

## Benchmarks KPI categories

Benchmarks supports KPIs from other ServiceNow applications such as ITSM, ITOM, Security Operations, Conversational Interfaces, Success Dashboard, and Strategic Portfolio Management. For more information, see Benchmark KPIs.

## ITSM KPIs

### Incident

| KPI | Description |
| --- | --- |
| **Note:** In some environments, KPIs involving resolved incidents may require further configuration to retrieve resolved incident data. | |
| % of high priority incidents resolved | [Number of priority 0 (P0) and priority 1 (P1) incidents resolved during the month] / [Total number of incidents resolved during the same month]<br><br>Incident count is generated from the Incident table.<br><br>**Note:** The definition of P0 and P1 incidents is likely to vary per participant. Your P0 and P1 incidents may or may not be similar to the incidents of others. For comparison, the metrics provided in this report represent the average of all participants. |
| % of incidents resolved on first assignment | [Number of incidents resolved on first assignment during the month] / [Total number of incidents resolved during the same month]<br><br>First assignment is when the **Reassignment Count** field is 0 for the incident. |
| % of incidents resolved within SLA | [Number of incidents with met SLAs resolved during the month] / [Total number of incidents resolved during the same month]<br><br>Met SLAs are calculated from the task_sla table for incidents resolved during the month. |

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**Incident (continued)**

| KPI | Description |
|---|---|
| % of reopened incidents | [Number of incidents resolved during the month that were reopened] / [Total number of incidents resolved during the same month].<br><br>Reopened is when the **Reopen Count** field is greater than 0 for the incident. |
| Average time to resolve a high priority incident | [Sum of the duration of all high priority incidents resolved during the month] / [Total number of high priority incidents resolved during the same month]<br><br>• Duration is the length of time from creation to resolution.<br>• High priority incidents include priority 0 (P0) and priority 1 (P1). |
| Average time to resolve an incident | [Sum of the duration of all incidents resolved during the month] / [Total number of incidents resolved during the same month]<br><br>Duration is the length of time from creation to resolution. |
| Number of incidents created per user | Number of incidents per user created during the month. Global value is the average of all participating customers per user. |

**Problem**

| KPI | Description |
|---|---|
| % of high priority problems | [Number of high priority problems closed during the month] / [Total number of problems closed during the same month]<br><br>High priority problems include priority 0 (P0) and priority 1 (P1). |
| % of incidents resolved by problem | [Number of incidents resolved during the month that are associated with a problem] / [Total number of incidents resolved during the same month] |
| Average time to close a problem | [Sum of the duration of all problems closed during the month] / [Total number of problems closed during the same month] |

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**Problem (continued)**

| KPI | Description |
| --- | --- |
| | Duration is the length of time from creating to closure. |

**Change**

| KPI | Description |
| --- | --- |
| % of emergency changes | [Number of emergency changes closed during the month] / [Total number of all changes closed during the same month]<br><br>All changes include standard, normal, and emergency. |
| % of failed changes | [Number of unsuccessful changes during the month] / [Total number of all changes closed during the same month] |
| Average time to close a change | [Sum of the duration of all changes closed during the month] / [Total number of all changes closed during the same month]<br><br>• Duration shows the length of time from creating to closure.<br>• All changes include standard, normal, and emergency. |

**Service Catalog**

| KPI | Description |
| --- | --- |
| % of closed requests with breached SLAs | [Number of closed requests with breached SLAs during the month] / [Total number of closed requests during the same month]<br><br>Breached SLAs are calculated from the task_sla table for requests closed during the month. |
| Average time to fulfill a request | [Sum of the duration for Service Catalog requests fulfilled during the month] / [Total number of Service Catalog requests fulfilled in the same month] |

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### Service Catalog (continued)

| KPI | Description |
|---|---|
| | • **Duration** is the length of time from creation to closure.<br>• **Number of Service Catalog requests fulfilled** is the count of the number of records in the sc_req_item table, which were closed within a month. |
| Number of requests created per user | Number of requests per user created during the month. |

### Knowledge

| KPI | Description |
|---|---|
| % of incidents resolved using KB articles | [Number of incidents with KB articles resolved during the month] /<br>[Total number of incidents resolved during the same month] |
| Number of knowledge articles views per user | Number of knowledge article views per user during the month.<br>• **Knowledge base views** are generated from the sys_view_count table.<br>• **Global** value is the average of all participating customers per user. |

### ITSM Virtual Agent

| KPI | Description |
|---|---|
| % call deflection | [The number of incidents and requests created using Virtual Agent ] / [Total numbers of incidents and requests created]<br>The number of times, in percentage, the incident, or request was submitted using Virtual Agent. This is determined by the deflection pattern added in the Virtual Agent topic. |
| % of incidents auto-resolved | [The number of incidents auto-resolved by Virtual Agent ] / [Total number of incidents resolved] |

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### ITSM Virtual Agent (continued)

| KPI | Description |
| --- | --- |
| | The number of times, in percentage, incidents were automatically resolved using automated workflows or by Issue Auto Resolution. |

### Other

| KPI | Description |
| --- | --- |
| Average customer satisfaction | [Sum of normalized metric values of all survey instances taken during the month] /<br>[Total number of survey instances taken during the same month]<br>• Table: metric_results.<br>• Survey: Customer Satisfaction Survey.<br>• Metric value is normalized as per category weights.<br>**Note:** This KPI uses the base system Customer Satisfaction Survey.<br>If you're using a different survey to collect user feedback, you can customize the KPI definition. |
| Number of requests per fulfiller | [Number of active requester (non-ITIL) users during the month] /<br>[Total number of active ITIL users during the same month] |

## ITOM KPIs

### CMDB

| KPI | Description |
| --- | --- |
| % of duplicate CIs | [Number of duplicate CIs during the month] /<br>[Total number of CIs during the same month]<br>Duplicate CIs are calculated using the cmdb_health_scorecard table. |

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### CMDB (continued)

| KPI | Description |
|---|---|
| | **Note:** The definition of duplicate CIs is likely to vary per participant. Your duplicate CIs definition may or may not be similar to the definitions of others. For comparison, the metrics provided in this report represent the average of all participants. |
| % of non-compliant CIs | [Number of CI audit failures during the month] / [Total number of CIs audited during the same month]<br><br>Non-compliant CIs are calculated using the cmdb_health_scorecard table.<br><br>**Note:** The definition of CI compliance audits is likely to vary per participant. Your CI compliance audit definition may or may not be similar to the definitions of others. For comparison, the metrics provided in this report represent the average of all participants. |
| % of stale CIs | [Number of stale CIs during the month] / [Total number of CIs during the same month]<br><br>Stale CIs are calculated using the cmdb_health_scorecard table.<br><br>**Note:** The definition of stale CIs is likely to vary per participant. Your stale CIs definition may or may not be similar to the definitions of others. For comparison, the metrics provided in this report represent the average of all participants. |

## Conversational Interfaces KPIs

### Virtual Agent

| KPI | Description |
|---|---|
| % of users using Virtual Agent | [Total number of users using Virtual Agent ] / [Total number of active users]<br><br>Percentage of unique users who are using Virtual Agent to handle everyday tasks and requests. |

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### Virtual Agent (continued)

| KPI | Description |
|---|---|
| % conversation handed over to a live agent | [Number of conversations assigned to a live agent] / [Total number of conversations]<br><br>The percentage of virtual agent conversations that were redirected to handle everyday tasks and requests. |
| Virtual Agent CSAT score | Uses the daily average score of the surveys conducted to analyze the quality of user interactions with Virtual Agent conversations. |

## Security Operations KPIs

### Security Incident Response

| KPI | Description |
|---|---|
| % of critical and high priority security incidents | [Number of critical and high priority security incidents created during the month] / [Total number of all security incidents created during the same month] |

### Vulnerability Response

| KPI | Description |
|---|---|
| Average critical vulnerability age | [Summed age of critical vulnerable items] / [Number of critical vulnerable items] |
| Average vulnerability age | [Summed age of vulnerable items] / [Number of vulnerable items] |
| Average vulnerability per asset | [Sum of active vulnerable items] / [Total number of scanned configuration items] |
| VI mean time to remediate (MTTR) | [Sum of duration of closed vulnerable items] / [Total number of closed vulnerable items displayed as a 30-day running average] |
| % of remediation efficiency | [Number of vulnerable Items items closed during a month] / [Number of new or reopened vulnerable items in the same month] |

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## Success Dashboard KPIs

| KPI | Formula | Description |
|---|---|---|
| Self-solved % | [Self-solved (VA) + Self-solved (KB) + Automated resolutions] / [Total Tickets Resolution + Self-solved (VA) + Self-solved (KB)] *100 | Self-solved percentage is calculated based on the daily average number of times your users achieved resolution without agent intervention. It includes numbers from the following items:<br>• Self-solved using Virtual Agent.<br>• Self-solved using Knowledge articles.<br>• Automated resolutions. This could be, for example, incidents that were auto-resolved using Virtual Agent. |
| Call deflection % | [Catalog ticket submissions + VA ticket submissions + Self-solved (VA) + Self-solved (KB)] / [Total tickets submitted + Self-solved (VA) + Self-solved (KB)] * 100 | Call deflection is calculated per day based on the number of times requestors performed the following actions without Tier 1 agent intervention:<br>• Ticket submissions using Service Catalog<br>• Ticket submissions using Virtual Agent<br>• Self-solved using Virtual Agent<br>• Self-solved using Knowledge articles |
| Structured tickets % | [Structured tickets completed]/[Total Ticket resolutions]*100 | Total number of tickets successfully completed and closed for the report range that has a pre-defined or guided intake and fulfillment process. This could be, for example, a requested item fulfillment or an HR Case where payroll ambiguity was resolved. |
| Customer satisfaction survey scores | [ITSM Customer Satisfaction Score] + [Virtual agent Customer Satisfaction score] | Average of customer satisfaction scores based on the surveys conducted after the issue was resolved. |

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| KPI | Formula | Description |
|---|---|---|
| | | **Note:** Both ITSM Customer Satisfaction score and VA Customer Satisfaction score are normalized with the base as 10. |
| MTTR – Average mean time to resolution | [Time to resolve]/[Issues resolved]/24 | Average time, in days, between the day, a ticket was created and the day it was closed. |
| Breached SLA % | [Issues resolved with breached SLAs]/[Issues resolved]*100 | Percentage of issues resolved after the SLA was breached. |
| First assignment resolution | [Tickets resolved without reassignment]/[Issues resolved]*100 | Tickets resolved without having to reassign to an agent. |
| % Automated resolutions | ([[Automated resolutions]]/[[Self solved - percentage (denominator)]])*100 | Total number of tickets successfully completed and closed using the automated workflows, or by Issue Auto Resolution, or by Password Reset web/windows application. |
| % KB - Self-solved (count) | ([[KB - Self-solved (count)]]/[[Self solved - percentage (denominator)]])*100 | Total number of tickets successfully completed and closed by reading the knowledge articles. This is determined when users read knowledge article(s) and do not create a ticket in a 24-hour window. |
| % VA - Self-solved (count) | ([[VA - Self-solved (count)]]/[[Self solved - percentage (denominator)]])*100 | Total number of automated conversations that resolved the issue. This is determined by the deflection node instrumented in the Virtual Agent topic. |
| % Call deflection when self-solved (count) | ([[Call deflection when self-solved (count)]]/[[Call deflection - percentage (denominator)]])*100 | Total number of issues or requests solved using the Virtual Agent and Knowledge Base articles that resulted in call deflection. |
| % VA ticket submissions (count) | ([[VA ticket submissions (count)]]/[[Call deflection - percentage (denominator)]])*100 | Total number of times the ticket was submitted using the Virtual Agent. This is determined by the deflection node instrumented in the Virtual Agent topic. |

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| KPI | Formula | Description |
|---|---|---|
| % Catalog ticket submissions (count) | ([[Catalog ticket submissions (count)]]/[[Call deflection - percentage (denominator)]])*100 | Total number of tickets (cases, incidents, requested items and so on) submitted using the Service Catalog in Service Portal or NOW mobile. |

For more information on Success Dashboard KPI definitions and formulas, see ITSM Success Dashboard indicators KPI definitions and formulas

## Strategic Portfolio Management KPIs

Benchmarks supports Strategic Portfolio Management KPIs. For more information, see SPM Benchmarking KPIs.

## Benchmarks data transfer

Your Benchmarks score data is automatically uploaded to ServiceNow on the third day of the month. Global scores are automatically downloaded to your instance on the 11th day of the month.

You can manually upload or download scores beyond those days of the month (on demand) by executing the Benchmarks scores scheduled jobs through the **System Definition** > **Scheduled Jobs** navigation item.

- Upload the benchmark scores (automatically runs on the first day of the month)
- Download the benchmark scores (automatically runs on the ninth day of the month)

These on-demand scheduled jobs are useful if, for any reason, there was a failure in the automatic upload or download scores process and it is after the cutoff dates. You can also run a scheduled job to generate six months of historical data.

## Email notification

Users with the Benchmarks admin (sn_bm_client.benchmark_admin) and Benchmarks data viewer (sn_bm_client.benchmark_data_viewer) roles automatically receive email notification regarding availability of monthly scores, historical data recalculation, and new KPIs. You must have system admin (admin) role to modify the email recipient list.

- An email containing notification information is sent when the monthly global data is available. Monthly results (your instance results, and global results) are downloaded to the customer instance mid month.
  - Subject: New Monthly Benchmarks report is available now
  - Body: ServiceNow Benchmarks has been updated with <month> data. You can see the updated Benchmarks by viewing the Benchmarks Dashboard <Benchmarks Dashboard Portal link>.
- An email containing notification information is sent when historical data for the past six months is recalculated.
  - Subject: Historical Global Benchmarks scores have been refreshed
  - Body: The global Benchmarks scores of last six months have been recalculated with improved data quality. You can see the updated Benchmarks by visiting Benchmarks Dashboard <Benchmark Dashboard Portal Link>.

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- An email containing notification information is sent when an updated KPI version is introduced (with some fixes, for example).
  - Subject: One or more Benchmarks KPI versions have changed
  - Body: The latest Benchmarks scores have a new version of following KPIs with improved data quality.

    < KPI name>.

    You can see the updated Benchmarks by visiting Benchmarks Dashboard <Benchmark Dashboard Portal Link>.

Benchmarks notification emails are accessed using the **System Settings** > **Notifications** navigation menu.

[End]

[qa: BEGIN review]

## Opt out of Benchmarks

You can opt out of Benchmarks at any time. If you opt out, your company usage data is no longer included in the Benchmarks data set, and you no longer see aggregate metrics.

### Before you begin

Role required: sn_bm_client.benchmark_admin

### About this task

When you opt out of the Benchmarks forum, it means that you no longer have access to benchmarking information for your organization. Your usage data is also removed from the Benchmarks data set going forward. However, your company can rejoin the Benchmarks program at any time.

**Note:**
It may take up to two monthly refresh cycles for the request to be processed.

### Procedure

1. Navigate to **All** > **Benchmarks** > **Setup**.
2. Click **Opt-out of ServiceNow Benchmarks**.
3. Click **Opt-Out**.
4. **Optional:** To send your feedback, provide the relevant information and click **Send**. Otherwise, click **Cancel** to skip the survey.

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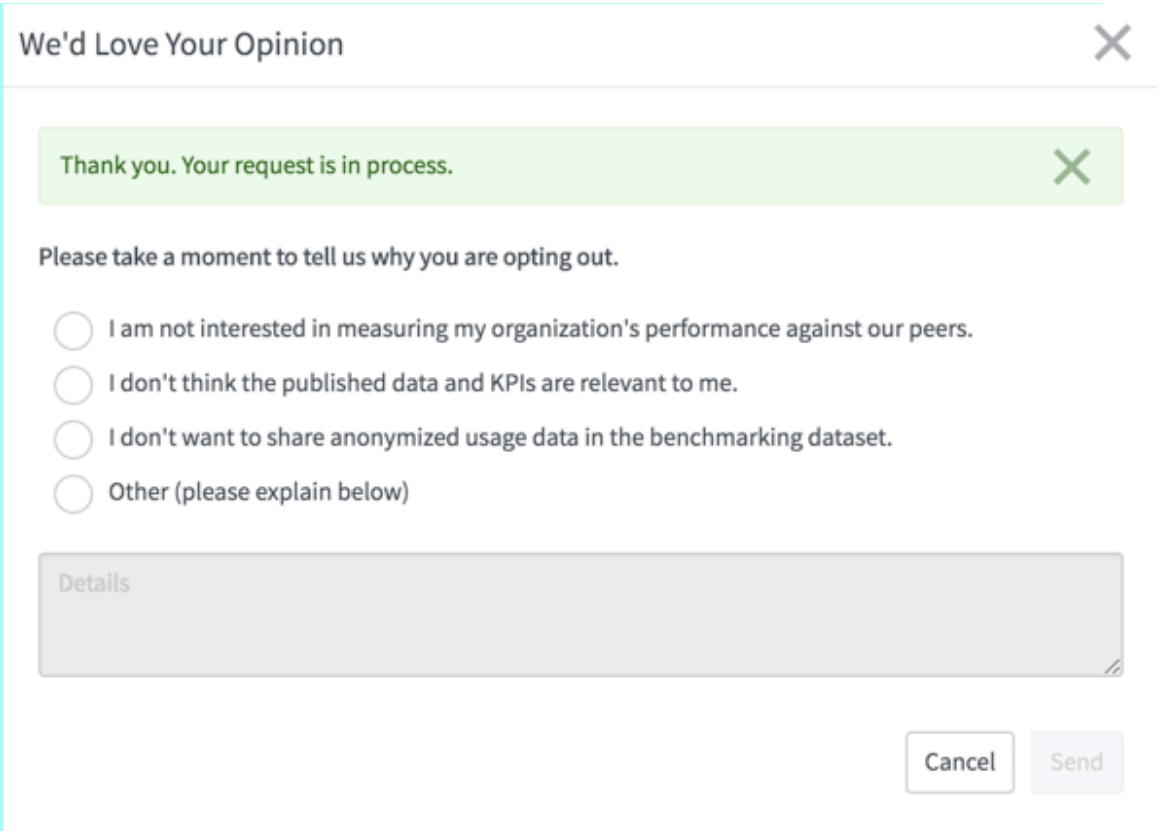


The opt-out confirmation is shown. You can opt back in at any time.

[End]

[qa: BEGIN review]

### Domain separation and Benchmarks

Domain separation is unsupported in the Benchmarks application. Domain separation enables you to separate data, processes, and administrative tasks into logical groupings called domains. You can control several aspects of this separation, including which users can see and access data.

### Support level: No support

- The domain field may exist on data tables but there is no business logic to manage the data.
- This level is not considered domain-separated.

For more information on support levels, see Application support for domain separation.

**Related topics**

Domain separation for service providers

[End]

[qa: BEGIN review]

## Link or customize a benchmark KPI

You can customize KPI conditions to fit the needs of your organization better.

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### Before you begin

The Benchmarks admin role does not provide application-specific roles. Therefore, although a Benchmarks admin can access a KPI through the Benchmarks application, changes to KPI conditions require the role specific to the KPI application.

For example, a Benchmarks admin cannot modify conditions for the knowledge base KPI (Knowledge Use [kb_use] table), SLA KPI (Task SLA [task_sla] table), ITOM KPIs (CMDB Health Scorecard [cmdb_health_scorecard] table), Security Operations KPIs (Vulnerable Item [sn_vul_vulnerable_item], or Security Incident [sn_si_incident] tables) from within Benchmarks without specific access granted to those tables (knowledge_admin, sla_admin, asset, or sn_si.special_access roles).

Role required: sn_bm_client.benchmark_admin

### About this task

Customizing KPI conditions is useful to adjust the criteria to more accurately represent the data that your company is interested in.

For example, if your implementation does not use priority 1 incidents, you can change the criteria for high priority KPIs from 1 to 0, which returns more accurate data for your organization.

**Note:**
It takes one to two months for aggregate monthly data to accurately reflect changes made to KPI conditions. For example, changes made within the month include a combination of data:

- Data for the previous condition (up until the date the condition was changed)
- Data for the new condition from that date forward

For further analysis, you can link a Performance Analytics indicator that you are already using to the corresponding Benchmarks indicator to see breakdowns, in addition to individual scores, when drilling down on KPI data.

For example, link **Number of resolved incidents by first assigned group** to **Benchmark: Number of incidents resolved on first assignment** to view breakdown values by priority, assignment group, and category.

**Note:**
Individual scores are shown by default but you must have Performance Analytics to use linking to show breakdowns.

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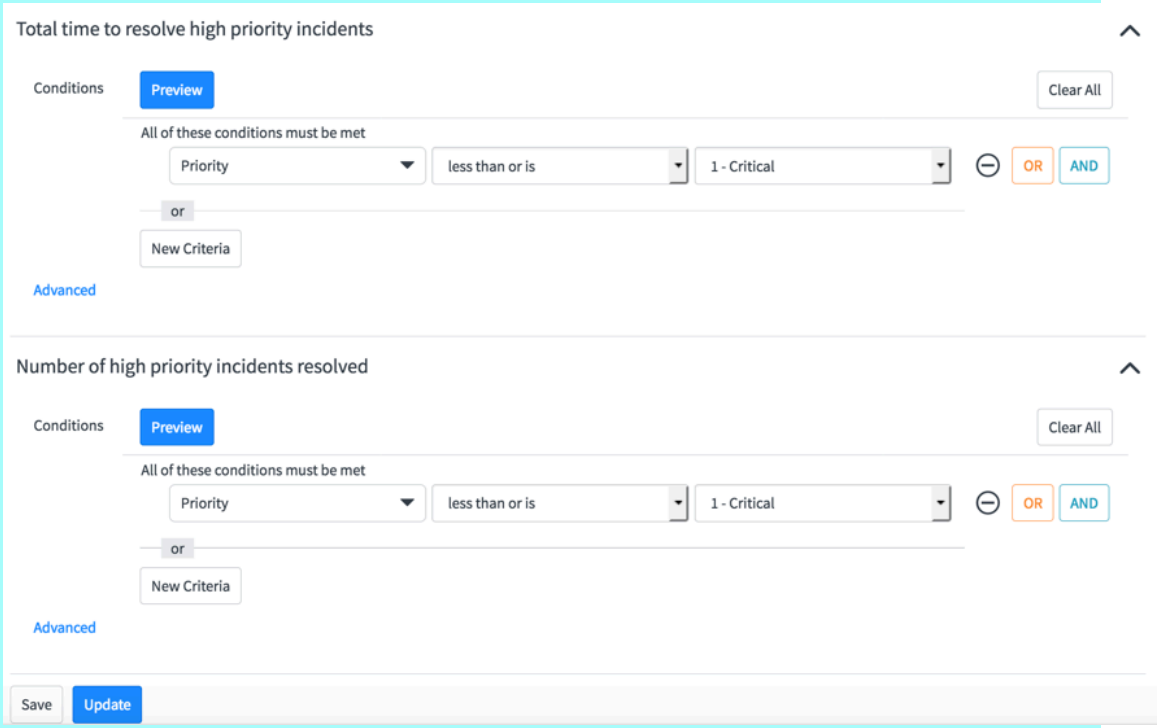
## Procedure

1. Navigate to **All** > **Benchmarks** > **Setup** and click a KPI to access the KPI conditions.




2. Change the conditions, as appropriate.
3. To link a Performance Analytics indicator to a Benchmarks indicator, follow the procedure in Link an automated indicator to a benchmark.

### Performance Analytics KPI to Benchmarks KPI link

| Benchmarks KPI | Formula | Performance Analytics KPI |
|---|---|---|
| Number of active users | -- | Benchmark: Number of active users |
| Total time to close changes | -- | Benchmark: Total time to close changes |
| % of failed changes | [Number of unsuccessful changes during the month] / [Total number of all changes closed during the same month] | Benchmark: % of failed changes |
| Number of unsuccessful changes | -- | Benchmark: Number of unsuccessful changes |
| Number of changes closed | -- | Benchmark: Number of changes closed |
| % of emergency changes | [Number of emergency changes closed during the month] / | Benchmark: % of emergency changes |

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| Benchmarks KPI | Formula | Performance Analytics KPI |
|---|---|---|
| | [Total number of all changes closed during the same month] | |
| Number of emergency changes closed | -- | Benchmark: Number of emergency changes closed |
| Average time to close a change | [[Benchmark: Total time to close changes]] /<br>[[Benchmark: Number of changes closed]] | Benchmark: Average time to close a change |
| % of stale CIs | Monthly average. | Benchmark: % of stale cis |
| % of duplicate CIs | Monthly average. | Benchmark: % of duplicate cis |
| % of non-compliant CIs | Monthly average. | Benchmark: % of non-compliant cis |
| Average time to resolve a high priority incident | [[Benchmark: Total time to resolve high priority incidents]]/<br>[[Benchmark: Number of high priority incidents resolved]] | Benchmark: Average time to resolve a high priority incident |
| % of incidents resolved within SLA | ([[Benchmark: Number of resolved incidents with SLAs]] - [[Benchmark: Number of resolved incidents with breached SLAs]]) /<br>[[Benchmark: Number of resolved incidents with SLAs]] * 100 | Benchmark: % of incidents resolved within SLA |
| Total number of incidents resolved by problem | -- | Benchmark: Total number of incidents resolved by problem |
| Number of incidents closed that were re-opened | -- | Benchmark: Number of incidents closed that were re-opened |
| Number of high priority incidents | -- | Benchmark: Number of high priority incidents resolved |
| Average time to resolve an incident | [[Benchmark: Total time to resolve an incident]] /<br>[[Benchmark: Number of incidents resolved]] | Benchmark: Average time to resolve an incident |

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| Benchmarks KPI | Formula | Performance Analytics KPI |
|---|---|---|
| Number of resolved incidents with SLAs | -- | Benchmark: Number of resolved incidents with SLAs |
| Number of incidents created per user | [[Benchmark: Number of incidents created / By month SUM]]/ [[Benchmark: Number of active users / By month AVG]] | Benchmark: Number of incidents created per user |
| Total time to resolve high priority incidents | -- | Benchmark: Total time to resolve high priority incidents |
| % of high priority incidents | [[Benchmark: Number of high priority incidents resolved]] / [[Benchmark: Number of incidents resolved]] * 100 | Benchmark: % of high priority incidents |
| Number of incidents created | -- | Benchmark: Number of incidents created |
| Number of incidents resolved with attached KB articles | -- | Benchmark: Number of incidents resolved with attached KB articles |
| Number of resolved incidents with breached SLAs | -- | Benchmark: Number of resolved incidents with breached SLAs |
| Total number of incidents | -- | Benchmark: Number of incidents resolved |
| Number of incidents resolved on first assignment | -- | Benchmark: Number of incidents resolved on first assignment |
| % of incidents resolved on first assignment | [[Benchmark: Total time to resolve an incident]] / [[Benchmark: Number of incidents resolved]] | Benchmark: % of incidents resolved on first assignment |
| Total time to resolve incidents | -- | Benchmark: Total time to resolve an incident |
| % of reopened incidents | [[Benchmark: Number of incidents closed that were re-opened]] / [[Benchmark: Number of incidents closed ]] * 100 | Benchmark: % of reopened incidents |
| Number of incidents closed | -- | Benchmark: Number of incidents closed |

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| Benchmarks KPI | Formula | Performance Analytics KPI |
|---|---|---|
| Number of knowledge article views | -- | Benchmark: Number of knowledge article views |
| Number of knowledge base views per user | [[Benchmark: Number of knowledge article views / By month SUM]]/<br>[[Benchmark: Number of active users / By month AVG]] | Benchmark: Number of knowledge base views per user |
| % of incidents resolved using KB articles | [[Benchmark: Number of incidents resolved with attached KB articles]] /<br>[[Benchmark: Number of incidents resolved]] * 100 | Benchmark: % of incidents resolved using KB articles |
| Number of survey instances | -- | Benchmark: Number of survey instances |
| Number of active ITIL users | -- | Benchmark: Number of active ITIL users |
| Normalized customer satisfaction | -- | Benchmark: Normalized customer satisfaction |
| Average customer satisfaction | [[Benchmark: Normalized customer satisfaction]] /<br>[[Benchmark: Number of survey instances]] | Benchmark: Average customer satisfaction |
| Number of requesters per fulfiller | ([[Benchmark: Number of active users]] - [[Benchmark: Number of active ITIL users]]) /<br>[[Benchmark: Number of active ITIL users]] | Benchmark: Number of requesters per fulfiller |
| % of high priority problems | [[Benchmark: Number of high priority problems closed]] /<br>[[Benchmark: Number of problems closed]] * 100 | Benchmark: % of high priority problems |
| Total time to close problems | -- | Benchmark: Total time to close problems |
| % of incidents resolved by problem | [[Benchmark: Total number of incidents resolved by problem]] / | Benchmark: % of incidents resolved by problem |

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| Benchmarks KPI | Formula | Performance Analytics KPI |
|---|---|---|
| | [[Benchmark: Number of incidents resolved]] * 100 | |
| Number of high priority problems closed | -- | Benchmark: Number of high priority problems closed |
| Number of problems closed | -- | Benchmark: Number of problems closed |
| Average time to close a problem | [[Benchmark: Total time to close problems]] /<br>[[Benchmark: Number of problems closed]] | Benchmark: Average time to close a problem |
| % of critical and high priority security incidents | [[Benchmark: Number of Critical and High Priority Security Incidents]] /<br>[[Benchmark: Number of Security Incidents]] * 100 | Benchmark: % of critical and high priority security incidents |
| Number of critical and high priority security incidents | -- | Benchmark: Number of Critical and High Priority Security Incidents |
| Number of security incidents | -- | Benchmark: Number of Security Incidents |
| Number of requests created | -- | Benchmark: Number of requests created |
| Number of requests closed | -- | Benchmark: Number of requests closed |
| Average time to fulfil a request | [[Benchmark: Total time to fulfil requests]]/<br>[[Benchmark: Number of requests closed]] | Benchmark: Average time to fulfil a request |
| Number of closed requests with SLAs | -- | Benchmark: Number of closed requests with SLAs |
| Number of requests created per user | [[Benchmark: Number of requests created / By month SUM]]/<br>[[Benchmark: Number of active users / By month AVG]] | Benchmark: Number of requests created per user |
| Number of closed requests with breached SLAs | -- | Benchmark: Number of closed requests with breached SLAs |

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| Benchmarks KPI | Formula | Performance Analytics KPI |
|---|---|---|
| Total time to fulfil requests | -- | Benchmark: Total time to fulfil requests |
| % of closed requests with breached SLAs | [[Benchmark: Number of closed requests with breached SLAs]] /<br>[[Benchmark: Number of closed requests with SLAs]] * 100 | Benchmark: % of closed requests with breached SLAs |
| Number of critical vulnerability items | -- | Benchmark: Number of critical vulnerability items |
| Number of vulnerability items | -- | Benchmark: Number of vulnerability items |
| Average vulnerability age | [[Benchmark: Summed age of vulnerable items]] /<br>[[Benchmark: Number of vulnerability items]] | Benchmark: Average age of vulnerable items |
| Average critical vulnerability age | [[Benchmark: Summed age of critical vulnerable items]] /<br>[[Benchmark: Number of critical vulnerability items]] | Benchmark: Average age of critical vulnerable items |
| Summed age of critical vulnerable items | -- | Benchmark: Summed age of critical vulnerable items |
| Summed age of vulnerable items | -- | Benchmark: Summed age of vulnerable items |

### Performance Analytics KPI to Benchmarks VA KPI link

| Benchmarks KPI | Formula | Performance Analytics KPI | Description |
|---|---|---|---|
| Call Deflection (VA Triaged and Created) | -- | Benchmark: Call Deflection (VA Triaged and Created) | Incidents created using Virtual Agent and tracked using the *ITSM VA-Triage and Created* deflection pattern. |
| Call Deflection (VA Catalog Analytics) | -- | Benchmark: Call Deflection through VA (Catalog Analytics) | Requests created using Virtual Agent and tracked every time Virtual Agent referred a catalog for submission. |
| % Call Deflection | ([[Benchmark: Call Deflection | Benchmark: % VA Deflection | The number of times the Virtual |

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| Benchmarks KPI | Formula | Performance Analytics KPI | Description |
|---|---|---|---|
| | (VA Triaged and Created)]] + [[Benchmark: Call Deflection through VA (Catalog Analytics)]]) / ([[Benchmark: Number of requests created]] + [[Benchmark: Number of incidents created]]) * 100 | | Agent automatically resolved incidents or completed requests. |
| IAR (Intercept & Resolved) | -- | Benchmark: VA IAR (Intercept & Resolved) | Incidents that were resolved using *ITSM VA-Intercept & Resolved* deflection pattern. |
| VA Self Resolved | -- | Benchmark: VA Self Resolved | Every time the user was able to self-solve incident resolution or complete requests using *ITSM VA-Self Resolving* deflection pattern. |
| Number of incidents resolved | -- | Benchmark: Number of incidents resolved | The total number of incidents resolved. |
| % of incident that were auto-resolved using VA | ([[Benchmark: VA IAR (Intercept & Resolved)]] + [[Benchmark: VA Self Resolved]]) / ([[Benchmark: Number of incidents resolved]] + [[Benchmark: VA Self Resolved]]) * 100 | Benchmark: % of incident that were auto-resolved using VA. | Percentage of incidents that were auto-resolved using Virtual Agent. |
| Number of monthly users of VA | -- | Benchmark: Number of monthly users of VA | Number of monthly users who are using Virtual Agent. |
| % of users using Virtual Agent | [[Benchmark: Number of monthly users of VA]] / [[Benchmark: Number of active users]] * 100 | Benchmark: % of users using Virtual Agent | Percentage of users in the organization using Virtual Agent as an engagement channel. |
| Number of VA conversations handed over to an agent | -- | Benchmark: Number of VA conversation handed over to an agent | Conversations that were not resolved by the Virtual Agent and had to be handed off to a live agent. |

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| Benchmarks KPI | Formula | Performance Analytics KPI | Description |
|---|---|---|---|
| Total conversations in VA | -- | Benchmark: Total conversations in VA | All conversations that occurred in the Virtual Agent. |
| % ofVA conversations handed over to live agent | [[Benchmark: Number of VA conversation handed over to an agent]] / [[Benchmark: Total conversations in VA]] * 100 | Benchmark: % of VA conversations handed over to live agent | Number of times, in percentage, that the conversation was handed off to an agent. |
| VA normalized Satisfaction score | -- | Benchmark: VA normalized Satisfaction score | Overall, total normalized score of all the surveys conducted for Virtual Agent conversations. |
| VA survey instances | -- | Benchmark: VA survey instances | Total number of surveys that an agent responded to for assessing the satisfaction score. |
| Virtual Agent CSAT score | [[Benchmark: VA normalized Satisfaction score]]/ [[Benchmark: VA survey instances]] | Benchmark: VA CSAT score | Average Virtual Agent satisfaction score. |

[End]

## Change Management

The ServiceNow® Change Management application provides a systematic approach to control the life cycle of all changes, facilitating beneficial changes to be made with minimum disruption to IT services.

ServiceNow Change Management integrates with the Vulnerability response plugin to introduce extra functionality within Change Management.

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## Get started

| | |
|---|---|
| Explore<br>  <br>Learn about Change Management concepts and features. | Configure<br>  <br>Configure environment, tools, and user access. |
| Use<br>  <br>Learn how you can use Change Management. | Reference<br>  <br>Get details about Change Management components such as roles and dependent applications. |

# Exploring Change Management

The Change Management processes for a change request are controlled by workflows defined for a specific change request type.

## Change types

Change Management supports the three types of service changes ITIL describes — standard, emergency, and normal. The change type determines which state model is invoked and the change process that must be followed.

Watch this eight-minute video for an overview of Change Management in ITSM. Introduction to change management; types of change; creating and working change requests; improving efficiency through standard changes.

**Standard change**

A standard change is a pre-authorized change that is low risk, relatively common and follows a specified procedure or work instruction.

A standard change is one that is frequently implemented, has repeatable implementation steps, and has a proven history of success. As Standard changes are pre-approved, they follow a stream lined process in which group level or peer approval and CAB authorization steps are not required.

Approved standard change requests can be predefined in a catalog of templates to make accessing and requesting a standard change more efficient. This ability also enables the Change Management team to control the changes that are authorized as standard.

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**Emergency change**

A change that must be implemented as soon as possible, for example to resolve a major incident or implement a security patch. This change is of such a high priority that it bypasses group and peer review and approval and goes straight to the Authorization state for approval by the CAB approval group.

Emergency changes cover the following types of emergencies:

- Fix on fail or retroactive situations where the impact to service has already been experienced.
- Fail or fail situations where the impact to service is imminent if action is not taken.

These changes do not follow the complete life cycle of a normal change due to the speed with which they must be authorized. Therefore, they progress directly to the **Authorize** state for approval from the CAB Approval group.

During an emergency change, there are chances that an unplanned CI change activity occurs. During such a case, an unauthorized change request is created and sent for approvals. For more information, see Unauthorized change request.

**Normal change**

Any service change that is not a standard change or an emergency change.

Normal change requests follow a prescriptive process which requires two levels of approval before being implemented, reviewed, and closed. These changes require a full range of assessments and authorizations such as peer or technical approval, change management, and Change Advisory Board (CAB) authorization, to ensure completeness, accuracy, and the least possible disruption to service. These changes are most often scheduled outside of defined change blackout windows or during defined maintenance windows. The normal type is used to implement beneficial change for any change to a service that is not a standard or emergency change.

**Related topics**

Add a new change request type

## Change models

Change managers can use the Change models feature to conveniently tailor change activities and flows for specific use cases.

This feature is an extension to the existing IT Infrastructure Library (ITIL) OOB Change types and workflows. You can use the change types to transit to change models and ServiceNow® *Flow Designer* without compromising on existing capabilities.

Change models enable you to define:

- Fit-for-purpose state models
- State transitions
- State transition conditions

By default, the following models are provided as examples for ITIL mode 1 and mode 2 processes. These models are available with the activation of the Change Management - Change Model Foundation Data (com.snc.change_management.change_model.foundation) plugin.

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- ITIL mode 1 - This is a traditional and sequential approach to process the Change Requests. This mode goes through a sequential process defined to complete a change successfully.
- ITIL mode 2 - This is an adaptable approach to expedite the change request. This mode supports the right process for a given change to ensure a Change isn't a blocker to another change.

### Change models

| Change model | Description |
|---|---|
| Normal | Change model used for ITIL mode 1 Normal changes. |
| Emergency | Change model used for ITIL mode 1 Emergency changes. |
| Standard | Change model used for ITIL mode 1 Standard changes. |
| Change Registration | Change model used to capture change requests in an external system. There are no approvals associated with this model. |
| Cloud Infrastructure | Change model used for change requests that commission and decommission Cloud infrastructure services. |
| Site Reliability Ops | Change model used for site reliability operations. |
| Unauthorized Change | Change model used for change requests that are created from the unauthorized change events. |

### Change Models properties

Configure the Change Models properties to access the Change models capabilities when creating a Change request.

The following properties enable you to access the Change Models features. For upgrade users, these properties are set to **true**.

Enter `sys_properties.list` in the navigation filter and enter `*change_model` in the Search panel to view and edit the properties.

### Change Models Properties

| Property | Description |
|---|---|
| com.snc.change_management.change_model.type_backward_compatibility | Enables Change Type Compatibility for Change models if the *com.snc.change_management.state_model* plugin is installed. When true allows changes to be created with both the type based workflow and Change models. |
| com.snc.change_management.change_model.manage_workflow | Enables workflow management support for ChangeRequest API if the *com.snc.change_management.state_model* plugin is installed. This will call the |

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### Change Models Properties (continued)

| Property | Description |
|---|---|
| | 'deleteDefaultWorkflowContext' method to be called on specific state and type changes. |
| com.snc.change_management.change_model.hide | Hides the Change models feature when the `com.snc.change_management.change_model.type` property is enabled. When creating a new change, you do not have the option to choose a model, and the **Model** field is not available on the Change request form. |

## Create a user criteria record for Change Management

Create a user criteria record to control user access to widgets.

### Before you begin

Role required: admin

### Procedure

1. Navigate to **All** > **Change** > **Administration** > **Change Models**.
2. Select a change model.
3. Select **Advanced Security**.
4. In the related list at the bottom of the record, select **Available For** to manage access to the widgets.
5. On the form, fill the fields.

### User Criteria record

| Field | Description |
|---|---|
| Name | Unique name for the user criteria record. |
| Active | Option to make the condition active. |
| Users | Users to be granted access. |
| Groups | Groups to be granted access. |
| Roles | Roles to be granted access. |
| Companies | Companies to be granted access. |
| Locations | Locations to be granted access. |
| Departments | Departments to be granted access. |
| Match All | Determines whether all elements from each populated criteria field must match. If selected, only users who match all criteria are given access. If cleared, the user must meet one or more of the set criteria to be given access.<br><br>By default, this check box is cleared so that any condition met provides a match. |

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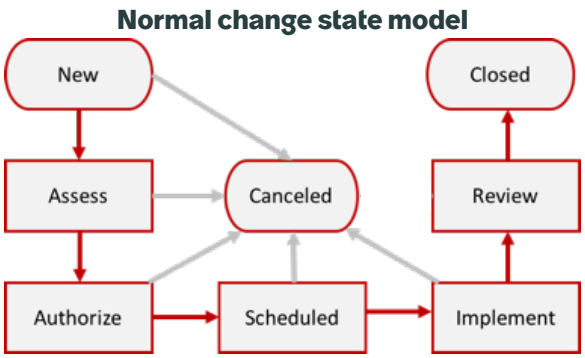
| Field | Description |
|---|---|
| Advanced | Displays or hides the **Script** field. |
| Script | Defines any additional criteria, and returns true or false. This field is available only if **Advanced** is selected. |

6. Select **Submit**.

## State progression for normal, standard, and emergency changes

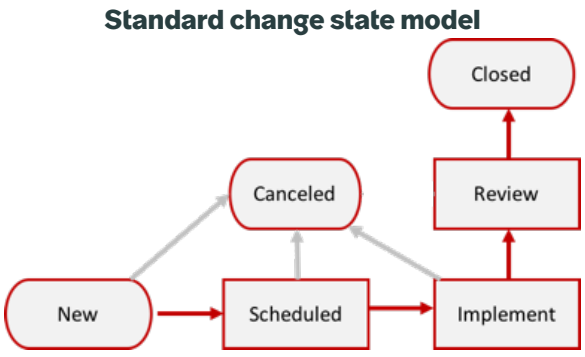
Each change request model progresses through a number of state values in a specific order.

### Normal change state progression

| | State | Can be canceled? | Diagram |
|---|---|---|---|
| 1. | **New** | Yes |  |
| 2. | **Assess** | Yes | |
| 3. | **Authorize** | Yes | |
| 4. | **Scheduled** | Yes | |
| 5. | **Implement** | Yes | |
| 6. | **Review** | No | |
| 7. | **Closed** | No | |



### Standard change state progression

| | State | Can be canceled? | Diagram |
|---|---|---|---|
| 1. | **New** | Yes |  |
| 2. | **Scheduled** | Yes | |
| 3. | **Implement** | Yes | |
| 4. | **Review** | No | |
| 5. | **Closed** | No | |



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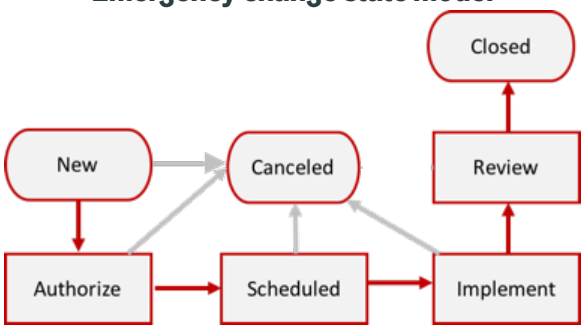
**Emergency change state progression**

| | State | Can be canceled? | Diagram |
|---|---|---|---|
| 1. | **New** | Yes | Emergency change state model  |
| 2. | **Authorize** | Yes | |
| 3. | **Scheduled** | Yes | |
| 4. | **Implement** | Yes | |
| 5. | **Review** | No | |
| 6. | **Closed** | No | |



## Modify the email notification for change request state changes

There is a change request email notification, which, if active, sends a notification to the user when the state progresses to **Scheduled**, **Implement**, **Review**, or **Canceled**. You can modify the change request notification to specify when to send it, who receives it, and what it contains.

### Before you begin

Role required: admin

### About this task

By default, the notification is sent to the user who originally requested the change. Notifications are not sent to the user who updated the state on the change request.

### Procedure

1. Navigate to **All** > **System Notification** > **Email** > **Notifications**.
2. Locate and open **Change request state change notification**.
3. On the form, modify information in the following form sections: **When to send**, **Who will receive**, **What it will contain**.
   For more information about email notifications and the fields in the form, see Create an email notification.
4. Click **Update**.

## Change approval policies

In Change approval policies, approval definitions are used to generate approvals according to your business requirements.

A change approval policy is a course of action that can be applied to a change request. It uses a set of variable inputs to evaluate the decisions that are associated with it. For each matching decision, the associated approval definition is applied.

An approval policy can contain multiple decisions allowing a single policy to handle every approval required for a change type. When a decision condition matches, the related approval definition is evaluated. If one or more decisions match, all the related approval definitions are evaluated.

Use the **Change Approval Policy** workflow activity instead of the **User** and **Group Approval** workflow activities to manage the approvals at a particular stage of the workflow. For more information, see Change Approval Policy workflow activity

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**Note:**
To use the change approval policies after you upgrade:

1. Configure the approval policies as needed.
2. Replace the **User** and **Group Approval** activities with the **Change Approval Policy** activity in the workflow.

A change approval policy consists of three components:

- **Policy inputs**: The variable sources evaluated within the condition defined on a decision.
- **Decisions**: Based on the conditions, determines whether the associated Change approval definition applies.
- **Approval definitions**: Defines the type of approval that can applied.

## Change Advisory Board (CAB) workbench

The Change Advisory Board (CAB) workbench enables a CAB manager to schedule, plan, and manage CAB meetings.

CAB meetings are typically intended to review and authorize change requests and review recently implemented changes. A standard agenda with the relevant change request details enables the CAB members to conduct risk and impact analysis prior to the CAB meeting.

Overview of the CAB Workbench. This video covers: What is the CAB Workbench, CAB Manager, Benefits of the CAB Workbench, Key Structures of the CAB Workbench.

The CAB workbench assists you in managing CAB meetings in the following ways:

**Define a schedule for CAB meetings**

Schedule a recurring series of CAB meetings for CAB members to assess the impact and risk of change requests prior to the meetings.

**Define CAB meeting attendees**

Define members who attend this CAB meeting series for each occurrence. For example, define the CAB board members or any delegates who can substitute if the CAB manager cannot attend.

**Define CAB meeting agenda**

Define filter criteria that determines which change requests are included in any occurrence of a CAB meeting. If a change request is included in an agenda, the change requester is notified of the CAB meeting in which the change request is discussed. The change requester can attend and present the reasons for the proposed change, and explain the intended outcomes and potential risks of the change.

**View change calendar**

Schedule changes by displaying existing planned changes in a change calendar in daily, weekly, and monthly view. The calendar view also lists maintenance windows and blackout schedules, if any.

**Approve or reject a change request**

Approve or reject a change request based on the decision taken in the CAB meeting.

**View and record meeting notes**

Record meeting notes from a specific CAB meeting and share these notes with other meeting attendees.

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The CAB Definition (cab_definition) table inherits the domain properties from the Schedule (cmn_schedule) table which has the Domain and Domain path columns. As the CAB Definition table makes use of the same Child Schedule and Schedule Entry tables as the Schedule table, domain support is identical, where the domain_master attribute is used to derive Domain from a parent record. For more information, refer Domain support for schedules .

### Upgrade Change Management

Follow these instructions to upgrade your Change Management system.

**Before you begin**
Prior to Geneva, Change Request installed the Conflict Detection, Best Practice Change Risk Calculator, Change Risk Assessment, and Bulk CI Changes plugins by default.

For new instances from Geneva onwards, the Standard change catalog, State Model, and Mass updates CI plugins are also installed by default.

Role required: admin

**Procedure**

Choose one of the following options.

- If you are upgrading from a release prior to Geneva, you can choose to activate Change Management core, State Model, Standard change catalog, and Mass updates CI plugins. The State Model, and Standard change catalog plugins are dependent on the Change Management core plugin. Hence, activating either the State model or the Standard change catalog plugins results in the activation of the Change Management core plugin.

  Also consider the following consequences of activating Change Management core and the subsequent changes you might need to make to best suit your organization's requirements:

  - The previous change types are updated from routine, comprehensive, and emergency to standard, normal, and emergency respectively. Analyze customizations that you may have performed that reference old change type values since they are affected and require updating.
  - When Change management core is activated, the change types are updated.

- Perform the following tasks after you activate Change management core to ensure that change types and customizations are updated if you already upgraded from a release prior to Geneva.

  - If you had created newer change types in addition to the default change types, then you must customize them based on the new change types being introduced.
  - Modify the customizations that are affected to use the new change type values.
  - A new ACL, *change_request.type*, prevents users from updating the change type. If you allow any roles to update the type of a change request, for example, from **Normal** to **Emergency**, modify the ACL. Remove **nobody** from the **Requires role** list and add the roles allowed to update the change type.
  - If you had the Bulk CI plugin installed, then install the Mass updates CI plugin for enhanced user experience and alignment with the new plugins.

## Configuring Change Management

You can configure various aspects of Change Management based on the specific requirements of your organization.

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The ITSM guided setup provides a sequence of tasks that help you configure Change Management on your ServiceNow instance. To open ITSM guided setup, navigate to **Guided Setup** > **ITSM Guided Setup**. For more information about using the guided setup interface, see Using guided setup.

## Change Management plugins

You can activate one or more of the Change Management plugins if they are not already active. Some plugins include demo data.

Many of the following Change Management plugins are activated in the base system. Others can be activated when you are ready to use them. The Change Management plugins that are inactive in the base system include the following.

- Change Management mass update CI (com.snc.change_management.mass_update_ci)
- Change Management risk assessment (com.snc.change_management.risk_assessment)
- Best practice - bulk CI changes (com.snc.bestpractice.bulkchange)

You can activate one or more of the following Change Management plugins.

### Request ITSM Roles- Change Management

Request the ITSM Roles plugin (com.snc.itsm.roles) to activate the ITSM Roles — Change Management plugin (com.snc.itsm.roles.change_management) to gain more control over the access that different change agents, technicians, and managers have within your Change Management process.

#### Before you begin

Role required: admin

#### About this task

The ITSM Roles plugin activates several related plugins such as Business Stakeholder (com.snc_business_stakeholder), ITSM Roles — Incident Management (com.snc.itsm.roles.incident_management), ITSM Roles — Problem Management (com.snc.itsm.roles.problem_management), ITSM Roles — Change Management (com.snc.itsm.roles.change_management), and ITSM Roles — Request Management (com.snc.service_management.roles.request_management). The related plugins updates the security model and introduces roles for respective products.

With the introduction of the new roles, ITSM provides more control over the access that users have within the process.

#### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. On the All Applications page, select **Request Plugin** to open the **Activate Plugin** form on Now Support.

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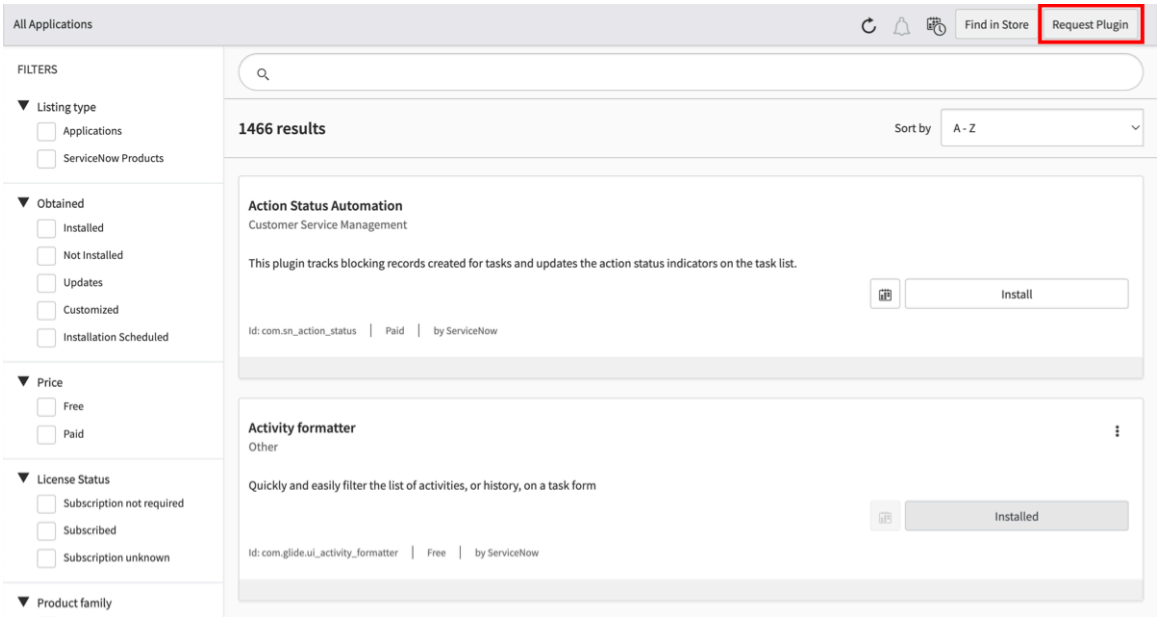
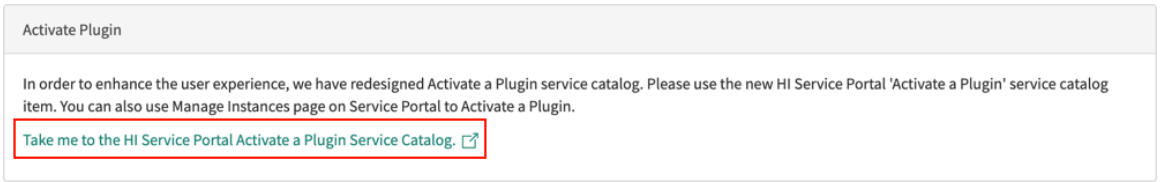



3. On Now Support, select the link to access the Now Support Service Portal Service Catalog.




4. Select your instance.
5. Select **Actions > Activate Plugin**.
6. On the **Activate Plugin** form, provide the following information.

### Activate Plugin form

| Field | Description |
|---|---|
| What is your target instance | Instance on which to activate the plugin. |
| Which plugin would you like to activate | Name of the plugin to activate.<br><br>**Note:**<br>If the system does not list the plugin you want or if you are activating the plugin on an OEM or on-premise instance, select the **Plugin I'm looking for is not listed** check box and then enter the name of the plugin. |
| Select Maintenance Date and Time | The date and time to activate the plugin. |

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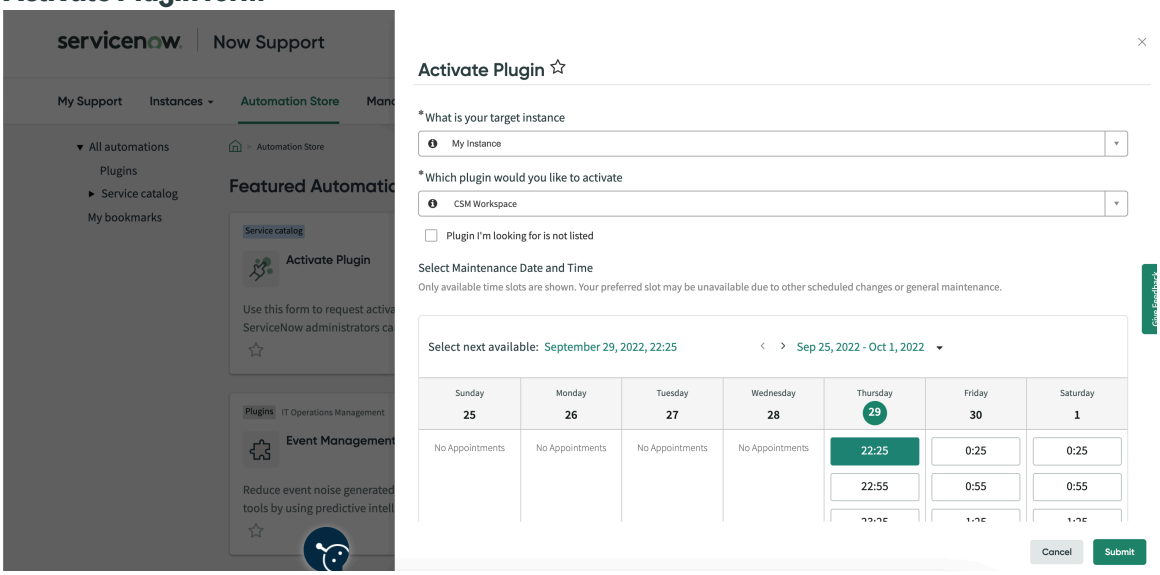
| Field | Description |
| --- | --- |
| | **Note:** Plugins are activated in two batches, once in the morning and once in the evening, on every business day in the US Pacific time zone. If the plugin must be activated at a specific time, enter the request in the **Reason/Comments** field. |

### Example

For example, see the following form to activate the CSM Workspace plugin on an instance named My Instance.

**Activate Plugin form**




7. Select **Submit**.
   For additional details about requesting a plugin, see Requesting a Plugin from the Service Catalog [KB0751715] article in the Now Support Knowledge Base.

### Components installed with ITSM Roles - Change Management

Several user roles are installed with the activation of the ITSM Roles — Change Management plugin (com.snc.itsm.roles.change_management). Security ACLs to support the security model for Change Management and related functionality are also installed.

When you install the ITSM Roles — Change Management plugin (com.snc.itsm.roles.change_management), the plugin updates the Security Access Control Lists (ACLs), integrating revised scripts, and other files to overhaul the security model for these applications.

**Note:**
The Application Files table lists the components that are installed with this application. For instructions on how to access this table, see Find components installed with an application.

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### Roles installed

| Role title [name] | Description | Contains roles |
|---|---|---|
| Change read<br><br>[sn_change_read] | Read access to the Change Management application and related records.<br><br>**Note:**<br>A user with the sn_change_read role can view all change requests as well as the CAB workbench. | • sn_cmdb_user<br>• dependency_views<br>• view_changer<br>• cmdb_read<br>• app_service_user<br>• cmdb_query_builder_read |
| Change write<br><br>[sn_change_write] | Write access to the Change Management application and related records. | • sn_change_read<br>• template_editor<br>• cmdb_query_builder |

### Activate Business Stakeholder

Activate the Business Stakeholder plugin (com.snc.business_stakeholder) if you have an admin role. This plugin installs the Business Stakeholder role. Users with this role can view and approve records at all ITSM product levels.

#### Before you begin

Role required: admin

**Note:**
Ensure that ITSM Roles plugin (com.snc.itsm.roles) is activated before you activate the Business Stakeholder plugin. For more information to activate ITSM Roles plugin, refer Request ITSM Roles- Change Management.

#### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.
3. Select **Install** to start the installation process.

   **Note:**
   When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

   You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

#### Related topics

List of plugins (Washington DC)

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### Installed with Business Stakeholder

The Business Stakeholder plugin (com.snc.business_stakeholder) installs the Business Stakeholder role when activated.

**Note:**
The Application Files table lists the components that are installed with this application. For instructions on how to access this table, see Find components installed with an application.

## Roles installed

| Role title [name] | Description | Contains roles |
|---|---|---|
| Business Stakeholder<br><br>[business_stakeholde | Users with this role can view and approve records within all products of ITSM.<br><br>**Note:**<br>The business_stakeholder role contains the following ITSM roles sn_incident_read, sn_problem_read, sn_change_read, sn_request_read, and approver_user roles. | • pa_viewer.business_stakeholder<br>• approver_user.business_stakeholder<br>• cmdb_read.business_stakeholder |

### Activate Change Management - State Model

You can activate the Change Management - State Model plugin (com.snc.change_management.state_model) if you have the admin role. This plugin includes demo data and activates related plugins if they are not already active.

### Before you begin

Role required: admin

### About this task

State Model activates the following related plugin if it is not already active.

| Plugin | Description |
|---|---|
| Change Management - Core<br><br>[com.snc.change_management] | Change management is used to create and manage change requests. Once this is activated, the values for the **Type** field on the change request are updated. |

**Note:**
If you install the Change Management - Core plugin (com.snc.change_management), the Change Management - State Model plugin (com.snc.change_management.state_model) doesn't function as expected. You must not install Change Management - State Model plugin (com.snc.change_management.state_model) plugin if you install Change Management - Core plugin (com.snc.change_management).

### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

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You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.

3. Select **Install** to start the installation process.

**Note:**
When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

### What to do next
If you upgraded from a release prior to Geneva, you must update old state labels to new state labels.

### Related topics
List of plugins (Washington DC)

## Update change request states

If you upgraded from a release prior to Geneva, you must update old state labels to new state labels after you activate the Change Management state model.

### Before you begin
Role required: admin

### About this task
State values for current change records are not modified when you activate the Change Management state model. However, your current change records display the new state labels in the state field.

| State value | New state label | Old state label |
|---|---|---|
| -5 | New | Pending |
| -4 | Assess | (Not used) |
| -3 | Authorize | (Not used) |
| -2 | Scheduled | (Not used) |
| -1 | Implement | (Not used) |
| 0 | Review | (Not used) |
| 1 | (Not used) | Open |
| 2 | (Not used) | Work in Progress |
| 3 | Closed | Closed Complete |
| 4 | Canceled | Closed Incomplete |
| 7 | (Not used) | Closed Skipped |

For example, records with a state value of -5 have the **Pending** state label before the Change Management state model is activated. After the state model is activated, these records retain the state value of -5 but have the **New** label. To use your organization's required change

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management process with the state model, you must update state values to the new labels in your existing change records as appropriate, either manually or by script.

You must also update any reports that run queries based on old state labels to reflect the new state labels.

### Procedure

1. To automatically update the state field values from old state labels to new state labels, customize and then run the following sample script:

```
updateStates();

function updateStates() {

  function hasApprovers(changeGr) {
    var approverGr = new GlideRecord("sysapproval_approver");
    approverGr.addQuery('sysapproval',
 changeGr.getUniqueValue());
    approverGr.query();
    return approverGr.getRowCount() > 0;
  }

  function hasRunningWorkflows(changeGr) {
    var workflow = new Workflow();
    var workflowGr = workflow.getRunningFlows(changeGr);
    var hasRunningFlows = workflowGr.getRowCount() > 0;
    return hasRunningFlows;
  }

  // Old State Model
  var PENDING = '-5';
  var OPEN = '1';
  var CLOSED_COMPLETE = '3';
  var CLOSED_INCOMPLETE = '4';
  var CLOSED_SKIPPED = '7';

  // New State Model
  var NEW = '-5';
  var ASSESS = '-4';
  var AUTHORIZE = '-3';
  var SCHEDULED = '-2';
  var IMPLEMENT = '-1';
  var REVIEW = '0';
  var CLOSED = '3';
  var CANCELLED = '4';

  // Find all change requests
  var record = new GlideRecord('change_request');
  record.query();

  // Update state from old value to new value
  while (record.next()) {
    switch(record.getValue('state')) {
      case OPEN:
        if (!hasRunningWorkflows(record)
 && !hasApprovers(record))
```

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```
          record.state = NEW;
        break;
      case CLOSED_COMPLETE:
        record.state = CLOSED;
        record.close_code = "successful";
        break;
      case CLOSED_SKIPPED:
        record.state = CANCELLED;
        record.close_code = "unsuccessful";
        break;
      case CLOSED_INCOMPLETE:
        record.state = CLOSED;
        record.close_code = "successful_issues";
        break;
    }
    record.autoSysFields(false);
    record.setWorkflow(false);
    record.update();
  }

}
```

2. Verify that the state labels have changed in existing change request records.

### Installed with Change Management - State Model

Several types of components are installed with the Change Management - State Model.

### Table modified with Change Management - State Model

Change Management - State Model modifies the list view of the following table.

| Table | Description |
|---|---|
| Change Request<br><br>[change_request] | Sets the column order in the list of change requests. |

### Activate Change Management - Collision Detector

You can activate the Change Management - Collision Detector plugin (com.snc.change.collision) if you have the admin role. This plugin includes demo data and activates related plugins if they are not already active.

#### Before you begin

Role required: admin

#### About this task

#### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.

3. Select **Install** to start the installation process.

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**Note:**
When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

**Related topics**

List of plugins (Washington DC)

### Installed with Change Management - Collision Detector

Several types of components are installed with Change Management - Collision Detector.

### Tables installed with Change Management - Collision Detector

Change Management - Collision Detector adds or modifies the following tables.

| Table | Description |
|---|---|
| Change request [change_request] | Specifies the background color of the **Conflict status** message based on whether there is a conflict. |
| Blackout Schedule [cmn_schedule_blackout] | Represents a blackout schedule |
| Condition Schedule [cmn_schedule_condition] | Represents a schedule condition |
| Conflict [conflict] | Represents conflicts found during the detection process. |
| Maintenance Schedule [cmn_schedule_maintenance] | Represents a maintenance schedule |

### Activate Best Practice - Change Risk Calculator

The Best Practice - Change Risk Calculator plugin (com.snc.bestpractice.change_risk) is active by default in the base system. This plugin includes demo data and activates related plugins if they are not already active.

## Before you begin

Role required: admin

## Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.
3. Select **Install** to start the installation process.

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**Note:**
When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

## What to do next
You can define risk and impact conditions for your change records.

### Related topics
List of plugins (Washington DC)

### Installed with Best Practice - Change Risk Calculator
Several types of components are installed with the Best Practice- Change Risk Calculator.

### Tables installed with Best Practice - Change Risk Calculator
Best Practice- Change Risk Calculator adds the following table.

| Table | Description |
|---|---|
| Risk Conditions [risk_conditions] | Represents the risk conditions, such as **Insufficient lead time** or **Critical service affected**. |

### Activate Change Management - Change Schedule
You can activate the Change Management - Change Schedule plugin (com.snc.change_management.soc) if you have the admin role. This plugin includes demo data and activates related plugins if they are not already active.

## Before you begin
Role required: admin

## About this task
The Change Management - Change Schedule plugin (com.snc.change_management.soc) activates these related plugins if they are not already active.

### Plugins for Change Management - Change Schedule

| Plugin | Description |
|---|---|
| Change Management - Change Schedule foundation [com.snc.change_management.soc.foundation] | This plugin contains six change schedules to help users. Enabling this plugin automatically enables Change Management – Change Schedules Version 1.0.0. |

## Procedure
1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

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You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.

3. Select **Install** to start the installation process.

**Note:**
When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

**Related topics**

List of plugins (Washington DC)

### Installed with Change Management - Change Schedule

Several types of components are installed with the Change Management - Change Schedule.

### Plugins installed with Change Management - Change Schedule

Plugins are added with activation of Change Management - Change Schedule.

| Plugin | ID | Description |
|---|---|---|
| Change Management - Change Schedule | com.snc.change_management.soc | This plugin is the core Change Schedules plugin which includes the supporting Change Schedules table structure, landing page, and Change Schedules user interface. |
| Change Management - Change Schedule foundation | com.snc.change_management.soc.foundation | This plugin contains six change schedules to help users. Enabling this plugin automatically enables Change Management – Change Schedules Version 1.0.0. |

### Roles installed with Change Management - Change Schedule

Roles are added with activation of Change Management - Change Schedule.

| Role title [name] | Description |
|---|---|
| [sn_chg_soc.change_soc_admin] | This role has full administrative rights to Change Schedule pages. |

### Tables installed with Change Management - Change Schedule

Tables are added with activation of Change Management - Change Schedule.

Change Management - Change Schedule adds the following tables.

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| Table | Description |
|---|---|
| Style Rule<br><br>[chg_soc_style_rule] | Define a default style rule that is applied to all Change Schedule definitions for each Change record displayed on the page |
| Style Rule<br><br>[chg_soc_definition_style_rule] | Define a style rule for each Change record displayed on the Change Schedule page |
| Style Rule<br><br>[chg_soc_def_child_style_rule] | Define a style rule for each related record displayed on the Change Schedule page |
| Change Schedule Definition<br><br>[chg_soc_definition] | Define a Change Schedule page |
| Change Schedule Definition Core<br><br>[chg_soc_definition_child] | Define related records for each Change record that is presented on the Change Schedule page |

### Properties installed with Change Management - Change Schedule

Properties are added with activation of Change Management - Change Schedule.

Change schedules are loaded on the timeline page on the client side in batches of 20. You can load a maximum of 1000 records. These numbers can be modified using the following properties from the System Properties [sys_properties] table. To open the System Property table, enter `sys_properties.list` in the navigation filter.

| Property | Usage |
|---|---|
| sn_chg_soc.change_soc_initial_limit | Define the number of change_request records to display on load of the Change Schedule.<br>• **Type**: Integer<br>• **Default value**: 40<br>• **Location**: System Property [sys_properties] table |
| sn_chg_soc.change_soc_scroll_load_limit | Define the number of change_request records to display as the Change Schedule is scrolled.<br>• **Type**: Integer<br>• **Default value**: 20<br>• **Location**: System Property [sys_properties] table |
| sn_chg_soc.change_soc_total_limit | Define the total number of change_request records that can be displayed on a Change Schedule. |

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| Property | Usage |
|---|---|
| | • **Type**: Integer<br>• **Default value**: 1000<br>• **Location**: System Property [sys_properties] table |
| sn_chg_soc.landing_page.pinned_notification | Show a message when pin or unpin a change schedule.<br>• **Type**: String<br>• **Default value**: true<br>• **Location**: System Property [sys_properties] table |
| sn_chg_soc.schedule_window_days | Define the number of days to be factored before and after the respective start/end of a change_request record when displaying blackout and maintenance window spans on the Change Schedule page.<br>• **Type**: Integer<br>• **Default value**: 30<br>• **Location**: System Property [sys_properties] table |

### Business rules installed with Change Management - Change Schedule

Business rules are added with activation of Change Management - Change Schedule.

| Business rule | Table | Description |
|---|---|---|
| Create default style rule | Related Definition [chg_soc_definition_child] | Defines a standard style rule with a high order for the related records. |
| Different start and end fields | Change Schedule Definition [chg_soc_definition] | Ensures that the start and end fields are different by aborting an insert or save when this is the case. |
| Flush share lists when ShareWith is none | Change Schedule Definition [chg_soc_definition] | Empties shared with lists when share with none is set. |
| Flush shareWith to match empty lists | Change Schedule Definition [chg_soc_definition] | Ensures shared with is updated to reflect the selected share options such as groups, roles, users. |
| Update style field | Style Rule Core | Updates the stylesheet defined in the style field when one of the conditions is met: |

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| Business rule | Table | Description |
|---|---|---|
| | [chg_soc_style_rule_core] | • Label color changes<br>• Label weight changes<br>• Event color changes<br><br>Providing Advanced is not true. |

### UI policies installed with Change Management - Change Schedule

UI policies are added with activation of Change Management - Change Schedule.

| UI Policy | Table | Description |
|---|---|---|
| Show maintenance color | Change Schedule Definition<br><br>[chg_soc_definition] | Only show the maintenance color field if Show maintenance has been enabled. |
| Switch between Basic and Advanced | Style Rule Core<br><br>[chg_soc_style_rule_core] | Only show label and event options if the style rule advanced option is false. When advanced is specified only the style field is presented. |
| Hide share users, groups and roles if share with everyone | Change Schedule Definition<br><br>[chg_soc_definition] | If sharing with everyone then the other share options are hidden. |
| Show blackout color | Change Schedule Definition<br><br>[chg_soc_definition] | Only show the Blackout color field if Show blackout has been enabled. |
| Hide table name | Style Rule Core<br><br>[chg_soc_style_rule_core] | Condition builder requires a table field to be present on the form, but it is not necessary to present this so it is hidden. |
| Hide table name | Change Schedule Definition<br><br>[chg_soc_definition] | Condition builder requires a table field to be present on the form, but it is not necessary to present this so it is hidden. |

### Script includes installed with Change Management - Change Schedule

Script includes are added with activation of Change Management - Change Schedule.

| Script include | Description |
|---|---|
| SoC | Base class that provides utilities and constants for Change Schedules |
| SoCChangeRequest | Extends SoCChangeRequestSNC and can be used to overwrite functionality defined therein |
| SoCChangeRequestSNC | Provides utilities for the change_request table |
| SoCDefinition | Extends SoCDefinitionSNC and can be used to overwrite functionality defined therein |

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| Script include | Description |
|---|---|
| SoCDefinitionSNC | Provides utilities for the chg_soc_definition table |
| SoCDefinitionChild | Extends SoCDefinitionChildSNC and can be used to overwrite functionality defined therein |
| SoCDefinitionChildSNC | Provides utilities for the chg_soc_child_def table |
| SoCDefinitionChildStyleRule | Extends SoCDefinitionChildStyleRuleSNC and can be used to overwrite functionality defined therein |
| SoCDefinitionChildStyleRuleSNC | Provides utilities for the chg_soc_def_child_style_rule table |
| SoCDefinitionStyleRule | Extends SoCDefinitionStyleRuleSNC and can be used to overwrite functionality defined therein |
| SoCDefinitionStyleRuleSNC | Provides utilities for the chg_soc_definition_style_rule table |
| SoCLandingModelBuilder | Extends SoCLandingModelBuilderSNC and can be used to overwrite functionality defined therein |
| SoCLandingModelBuilderSNC | Builds the change schedule definition model used by the Change Schedule landing page |
| SoCModelBuilder | Extends SoCModelBuilderSNC and can be used to overwrite functionality defined therein |
| SoCModelBuilderSNC | Builds the change schedule model used by the change schedule page |
| SoCRefFieldsList | Field choice list processor. Return the fields on the current table which reference the parent table |
| SoCRefTablesList | Field Choice List Processor. Return the tables referencing the provided table name. |
| SoCStyleRule | Extends SoCStyleRuleSNC and can be used to overwrite functionality defined therein |
| SoCStyleRuleSNC | Provides utilities for style rules |

### UI scripts installed with Change Management - Change Schedule

UI scripts are added with activation of Change Management - Change Schedule.

| UI Scripts | Description |
|---|---|
| sn_chg_soc.change_soc | Angular module for the change schedule, which includes all of the angular applications dependencies |
| sn_chg_soc.change_soc_filter | Angular module for text filtering on the change schedule page |
| sn_chg_soc.config | Angular module for the configuration panel on the change schedule page |
| sn_chg_soc.context_menu | Angular module for the context menu on the change schedule page |
| sn_chg_soc.data | Angular module for the data model on the change schedule page |
| sn_chg_soc.duration | Angular module for a duration calculation utility |

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| UI Scripts | Description |
|---|---|
| sn_chg_soc.filter_control | Angular module implementation of the filter widget |
| sn_chg_soc.filter_widget | Angular module that provides a filter control similar to a condition builder |
| sn_chg_soc.gantt | Angular module that maintains instances of gantt objects and handles the definition of the gantt scale |
| sn_chg_soc.keyboard | Angular module for the keyboard panel on the change schedule page |
| sn_chg_soc.landing.app | Angular module for the change schedule landing page, which includes all of the angular applications dependencies |
| sn_chg_soc.landing_accessibility | Angular module for acceissbility support on the change schedule landing page |
| sn_chg_soc.landing_card | Angular module defines a directive for a change schedule definition card |
| sn_chg_soc.landing_decoration | Angular module defines a directive that provides styling |
| sn_chg_soc.landing_notifications | Angular module for displaying notifications |
| sn_chg_soc.landing_page_header | Angular module provides header for change schedule landing page |
| sn_chg_soc.landing_sort | Angular module provides utility for sorting cards on the change schedule landing page |
| sn_chg_soc.landing_splash_screens | Angular module provides splash screen when no change schedule definitions are present in a tab on the change schedule landing page |
| sn_chg_soc.landing_tabs | Angular module provides tabs for the change schedule landing page |
| sn_chg_soc.landing_wizard | Angular module defines the creation of a new change schedule definition from the landing page |
| sn_chg_soc.loading | Angular module defines when the change schedule page is loading by listening to requests |
| sn_chg_soc.mousedown | Angular module that makes a button execute multiple times when holding mouse down |
| sn_chg_soc.notification | Angular module used to display messages on the change schedule page |
| sn_chg_soc.popover | Angular module used for accessibility support for the popover that is displayed on the change schedule page |
| sn_chg_soc.share | Angular module for the share panel on the change schedule page |
| sn_chg_soc.sn.app_itsm.now.iscroll | Angular module that supports scrolling to load more content on the change schedule landing page |

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| UI Scripts | Description |
|---|---|
| sn_chg_soc.snCreateNewInvite | Angular module for the share panel component that adds elements to the shared with field for the change schedule |
| sn_chg_soc.sn_soc_now.scheduleService | Angular module for the change schedule landing page that is used to retrieve change schedule definitions from the server |
| sn_chg_soc.style | Angular module for the style panel on the change schedule page |

### Activate Change Management - Risk Assessment

You can activate the Change Management - Risk Assessment plugin (com.snc.change_management.risk_assessment) if you have the admin role. This plugin includes demo data and activates related plugins if they are not already active.

## Before you begin

Role required: admin

## About this task

Change Management - Risk Assessment activates these related plugins if they are not already active.

### Plugins for Change Management - Risk Assessment

| Plugin | Description |
|---|---|
| Assessment Components<br><br>[com.snc.assessment] | Provides the core components required for legacy surveys. |
| Best Practice - Change Risk Calculator<br><br>[com.snc.bestpractice.change_risk] | Provides simple risk and impact calculations for change management. |
| Assessment Designer<br><br>[com.glide.assessment_designer] | Provides an interface to create and edit the Change Risk Assessment form that is required to collect user information on risk of the change request. |

## Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.
3. Select **Install** to start the installation process.

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**Note:**
When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

### What to do next
You can define risk assessment conditions for change requests.

#### Related topics
- Risk conditions and calculation
- Change Management properties
- List of Washington DC plugins

## Activate Change Management - Standard Change Catalog

You can activate the Change Management - Standard Change Catalog plugin (com.snc.change_management.standard_change_catalog) if you have the admin role. This plugin includes demo data and activates related plugins if they are not already active.

### Before you begin
Role required: admin

### About this task
Standard Change Catalog activates the following related plugin if it is not already active.

**Plugin for Standard Change Catalog**

| Plugin | Description |
|---|---|
| Change Management - Core [com.snc.change_management] | Change management is used to create and manage change requests. Once this is activated, it updates the values for the **Type** field on the change request. |

### Procedure
1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.
3. Select **Install** to start the installation process.

**Note:**
When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

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**Related topics**

- Standard change catalog
- Change Management properties
- List of Washington DC plugins

### Installed with Change Management - Standard Change Catalog

Several types of components are installed with Change Management - Standard Change Catalog.

### Tables installed with Change Management - Standard Change Catalog

Change Management - Standard Change Catalog adds or modifies the following tables.

| Table | Description |
|---|---|
| Change request<br>[change_request] | Adds the standard change template version to the table |
| Standard change producer version<br>[std_change_producer_version] | Contains the record producer and change proposal for the standard change with the current version of the template. It also includes the number and percentage of successful and unsuccessful change requests created from the proposal. |
| Standard change properties<br>[std_change_properties] | List of standard change catalog properties. |
| Standard change proposal<br>[std_change_proposal] | List of standard change proposals. |
| Standard change record producer<br>[std_change_record_producer] | List of standard change record producers. |
| Standard change template<br>[std_change_template] | List of standard change templates. |

### Activate Change Management - Change Success Score

You can activate the Change Management - Change Success Score (com.snc.change_management.change_success_score) plugin if you have the admin role. This plugin activates related plugins if they are not already active.

## Before you begin

Role required: admin

## About this task

The Change Management - Change Success Score (com.snc.change_management.change_success_score) plugin activates these related plugins if they are not already active.

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### Plugins for Change Management - Change Success Score

| Plugin | Description |
| --- | --- |
| Change Management - Change Success Score Foundation<br><br>[com.snc.change_management.change_success_score.foundation] | Adds the Change Success Score icon to the change form, loads default rating records, and installs the basic configurations that are needed to use the change success score feature. |

## Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.

3. Select **Install** to start the installation process.

   **Note:**
   When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

   You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

### Related topics

List of plugins (Washington DC)

### Components installed with Change Management - Change Success Score

Several types of components are installed with activation of the Change Management - Change Success Score (com.snc.change_management.change_success_score) plugin, including tables and scheduled jobs.

## Scheduled jobs installed

| Scheduled job | Description |
| --- | --- |
| Change success score metrics (Daily) | Collects individual metrics for changes completed and incidents raised the previous day. This job runs on a daily basis at 02.00 UTC. When this job is completed, the Daily change success score script action is executed. This action triggers the calculation of the adjustment formula indicators, and store the new score in the metric table. |
| Change success | Reads scores from metric table and calculates the daily averages for the past 30 days. |

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| Scheduled job | Description |
|---|---|
| score for today | |
| Change success score metrics (Historical data) | Gathers individual metrics daily for the past 30 days. This result overrides what is already stored in PA, that is not more than 30 days old. When this job is completed, the Historical change success scores script action is executed. The functionality of this script action is similar to that of the Daily change success score. Additionally, creating a new historic metric record for each day of the past 30 days. |
| Change success score (Historical data) | Reads scores from the metric table and calculates the daily average for the past 30 days≥ |

**Note:**

Historical calculations are useful you decide to change the overall formula or multipliers for individual metrics later on. You can run Change success score metrics (Historical data) to recalculate metrics and score for the past 30 days creating a new history record.

## Tables installed

| Table | Description |
|---|---|
| Change Success Score Rating<br><br>[chg_success_score_rating] | Defines the record that associates a rating choice and color with a Change Success Score range, such as, 0 to 499. |

### Activate Change Management - Mass Update CI

You can activate the Change Management - Mass Update CI plugin (com.snc.change_management.mass_update_ci) if you have the admin role. This plugin includes demo data and activates related plugins if they are not already active.

### Before you begin

Role required: admin

### About this task

#### Plugins for Change Management - Mass Update CI

| Plugin | Description |
|---|---|
| Change Management - State model<br><br>[com.snc.change_management.state_model] | State model is used to move and track change requests through several states. |
| Best Practice - Bulk CI Changes<br><br>[com.snc.bestpractice.bulkchange] | Best Practice - Bulk CI Changes enables you to record a single change proposal that are linked to all affected CIs. |

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### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.
3. Select **Install** to start the installation process.

   **Note:**
   When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

   You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

### Related topics

List of plugins (Washington DC)

#### Installed with Change Management - Mass Update CI

Several types of components are installed with the Change Management - Mass update CI.

#### Table modified with Change Management - Mass Update CI

Change Management - Mass Update CI updates the following table.

| Table | Description |
|---|---|
| Change Request [change_request] | Adds the **Mass Update CI Class** (is_bulk) field to the table to use when the change performs a mass update of configuration items. |

#### Activate Change Management -Approval policy

You can activate the Change Management -Approval policy plugin (com.sn_chg_pol_appr) if you have the admin role. This plugin includes demo data and activates related plugins if they are not already active.

### Before you begin

Role required: admin

### About this task

### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.
3. Select **Install** to start the installation process.

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**Note:**
When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

### Components installed with Change Management -Approval policy

Several types of components are installed with activation of the Change Management -Approval policy plugin, that includes tables.

## Tables installed

| Table | Description |
|---|---|
| Change Approval Policy<br><br>[chg_policy_approval] | Extends the Change Policy table. |

### Activate Change Management - CAB Workbench

You can activate the Change Management - CAB Workbench plugin (com.snc.change_management.cab) if you have the admin role. This plugin includes demo data and activates related plugins if they are not already active.

### Before you begin

Role required: admin

### About this task

#### Plugins for CAB workbench

| Plugin | Description |
|---|---|
| Service Portal<br><br>[com.glide.service-portal] | Service Portal provides an alternative user experience to the standard platform UI. It is easy to configure, customize, and extend, similar to what users are used to in other consumer products. |
| [com.snc.app_common.service_portal] | Common application components for Service Portal. |

### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.
3. Select **Install** to start the installation process.

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**Note:**
When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

**Related topics**

List of plugins (Washington DC)

### Installed with Change Management - CAB Workbench

Several types of components are installed with Change Management - CAB Workbench.

### Tables installed with Change Management - CAB Workbench

Change Management - CAB Workbench adds the following tables.

| Table | Description |
|---|---|
| Mtg Agenda Item [mtg_agenda_item] | Parent table for CAB Agenda Item table. |
| CAB Agenda Item [cab_agenda_item] | Contains list of CAB agenda items. |
| CAB Attendee [cab_attendee] | Contains list of CAB attendees. |
| Mtg Definition [mtg_definition] | Parent table for CAB Definitions table. |
| CAB Definition [cab_definition] | Contains list of CAB definitions. |
| Mtg Meeting [mtg_meeting] | Parent table for CAB Meeting table. |
| CAB Meeting [cab_meeting] | Contains list of CAB meetings without completion information. |
| Mtg Runtime State [mtg_runtime_state] | Parent table for CAB Runtime State |
| CAB Runtime State [cab_runtime_state] | Contains list of CAB meeting runtime states. |

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### Activate Change Management ATF Tests

You can activate the Change Management - ATF Tests plugin (com.snc.change_management.atf) if you have the admin role. This plugin includes demo data and activates related plugins if they are not already active.

#### Before you begin
Role required: admin

#### About this task
Change Management - ATF Tests (com.snc.change_management.atf) loads ATF tests when the Change Management - State Model plugin is active.

#### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.
3. Select **Install** to start the installation process.

   **Note:**
   When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

   You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

#### Related topics

List of plugins (Washington DC)

### Activate Change Management - Core

You can activate the Change Management - Core plugin (com.snc.change_management) if you have the admin role. This plugin includes demo data and activates related plugins if they are not already active.

#### Before you begin
Role required: admin

#### About this task
This plugin will update the Type field on the Change Request to have the values as Normal, Standard, or Emergency.

The Type value on existing the Change Requests will be updated as following:

**Change type**

| Before installing the plugin | After installing the plugin |
|---|---|
| Routine | Standard |
| Comprehensive | Normal |
| Emergency | Emergency |

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### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.

3. Select **Install** to start the installation process.

   **Note:**
   When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

   You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

### What to do next

You can activate one or more of the following plugins:

- State model (com.snc.change_management.state_model)
- Change Management - Collision Detector (com.snc.change.collision)
- Best practice - change risk calculator (com.snc.bestpractice.change_risk)
- Change risk assessment (com.snc.change_management.risk_assessment)
- Standard change catalog (com.snc.change_management.standard_change_catalog)
- Best practice - bulk CI changes (com.snc.bestpractice.bulkchange)
- Mass update CI (com.snc.change_management.mass_update_ci)
- CAB workbench (com.snc.change_management.cab)

You can now configure Change Management.

### Related topics

List of plugins (Washington DC)

#### Installed with Change Management - Core

Several types of components are installed with the Change Management - Core.

#### Tables installed with Change Management core

Change Management - Core modifies the following table.

| Table | Description |
|---|---|
| Task CI [task_ci] | Adds **Manual Proposed Change** (manual_proposed_change) field if the proposed change has been made manually rather than through the Mass Update CI feature |

#### Request Change Management - Risk Assessment

To activate Change Management capability to predict change risk using Predictive Intelligence, request the Change Management - Risk Intelligence plugin (com.snc.change_management.ml.risk) through the Now Support Customer Service system.

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## Before you begin

Role required: maint

## About this task

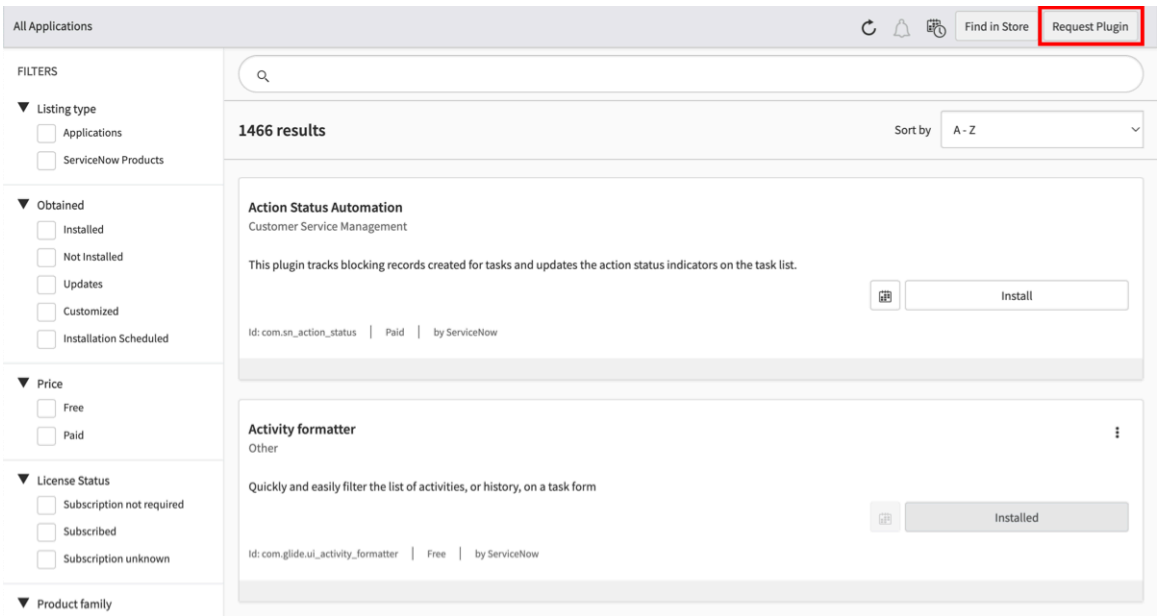
The Change Management - Risk Intelligence (com.snc.change_management.ml.risk) plugin activates these related plugins if they are not already active.

### Plugins for Change Management - Risk Intelligence plugin

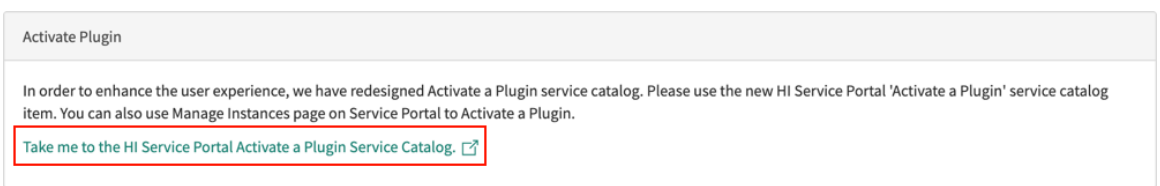
| Plugin | Description |
|---|---|
| Change Management - Predictive Intelligence Core<br><br>[com.snc.change_management.ml] | Enables you to use Predictive Intelligence in Change Management. |

## Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. On the All Applications page, select **Request Plugin** to open the **Activate Plugin** form on Now Support.




3. On Now Support, select the link to access the Now Support Service Portal Service Catalog.




4. Select your instance.
5. Select **Actions > Activate Plugin**.
6. On the **Activate Plugin** form, provide the following information.

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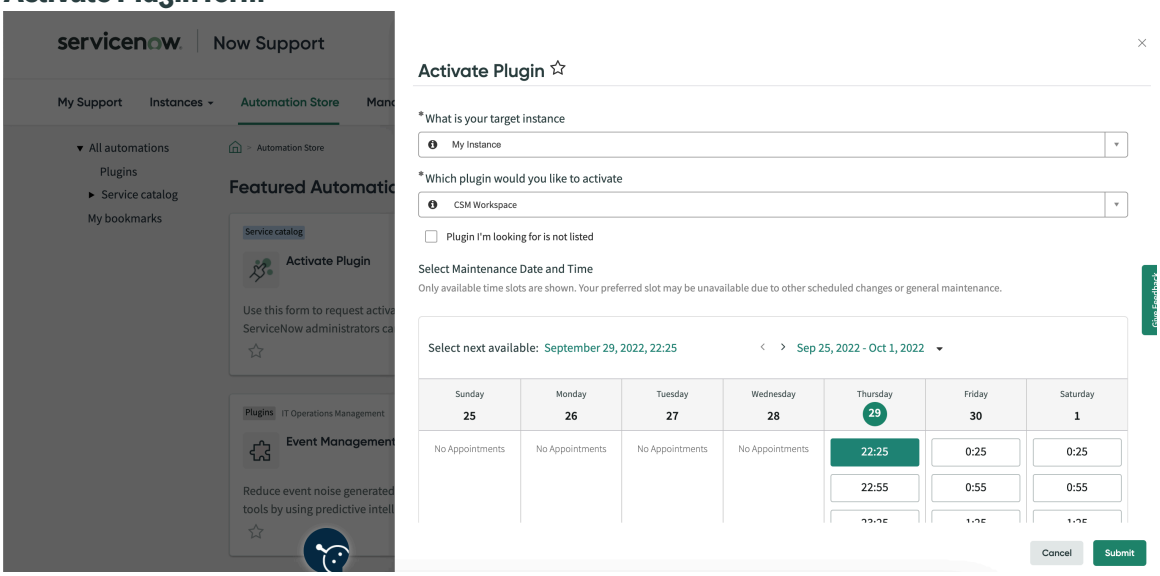
### Activate Plugin form

| Field | Description |
|---|---|
| What is your target instance | Instance on which to activate the plugin. |
| Which plugin would you like to activate | Name of the plugin to activate.<br><br>**Note:**<br>If the system does not list the plugin you want or if you are activating the plugin on an OEM or on-premise instance, select the **Plugin I'm looking for is not listed** check box and then enter the name of the plugin. |
| Select Maintenance Date and Time | The date and time to activate the plugin.<br><br>**Note:**<br>Plugins are activated in two batches, once in the morning and once in the evening, on every business day in the US Pacific time zone. If the plugin must be activated at a specific time, enter the request in the **Reason/Comments** field. |

#### Example

For example, see the following form to activate the CSM Workspace plugin on an instance named My Instance.

**Activate Plugin form**

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7. Select **Submit**.
   For additional details about requesting a plugin, see Requesting a Plugin from the Service Catalog [KB0751715] article in the Now Support Knowledge Base.

**Related topics**

List of plugins (Washington DC)

### Components installed with Change Management - Risk Intelligence

Several types of components are installed with activation of the Change Management - Risk Intelligence plugin, that includes tables.

**Note:**
The Application Files table lists the components that are installed with this application. For instructions on how to access this table, see Find components installed with an application.

## Tables installed

| Table | Description |
|---|---|
| Risk Categorization Solution<br>[chg_ml_prop_risk_solution_cat] | Categorization of the solution definitions configured for the Risk Intelligence feature. Used when the feature is configured to employ a Categorization type Solution Definition. |
| Risk Similarity Solution<br>[chg_ml_prop_risk_solution_sim] | Similarity solution definitions configured for the Risk Intelligence feature. Used when the feature is configured to employ a Similarity type Solution Definition. |
| Risk Intelligence Properties<br>[chg_ml_prop_risk] | Properties used to configure the Risk Intelligence feature. |

### Request Change Management - Standard Change Template Intelligence

To activate Change Management capability that uses Predictive Intelligence to identify change clusters and propose standard change templates, request the Change Management - Standard Change Template Intelligence plugin (com.snc.change_management.ml.sctp) through the Now Support Customer Service system.

## Before you begin

Role required: maint

## About this task

The Change Management - Standard Change Template Intelligence plugin (com.snc.change_management.ml.sctp) plugin activates these related plugins if they are not already active.

### Plugins for Change Management - Standard Change Template Intelligence plugin

| Plugin | Description |
|---|---|
| Change Management - Predictive Intelligence Core | Enables you to use Predictive Intelligence in Change Management. |

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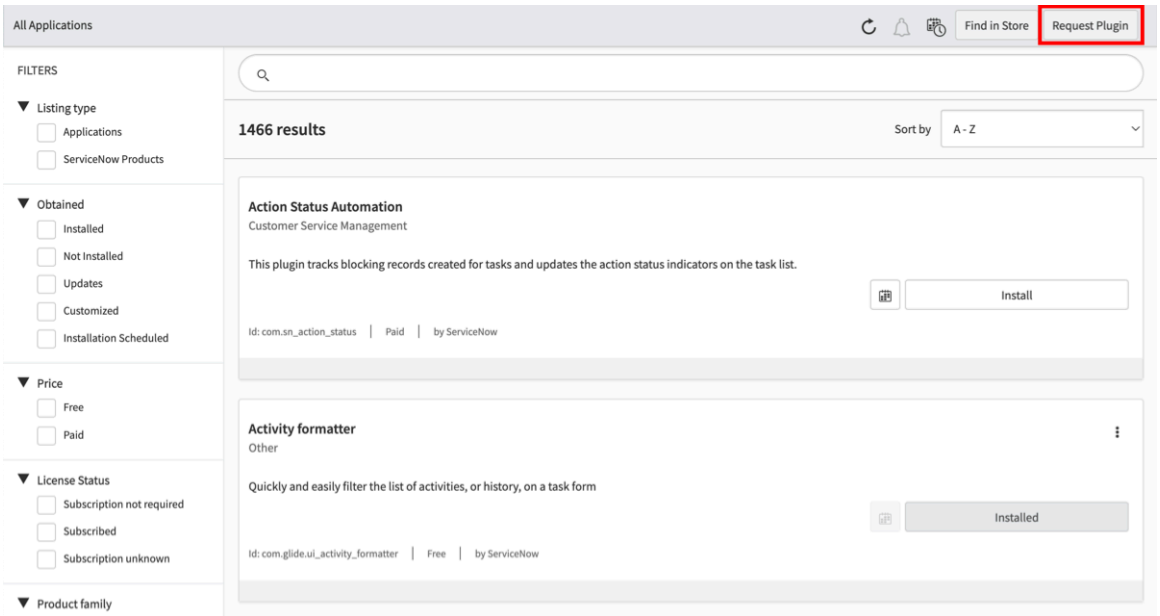
### Plugins for Change Management - Standard Change Template Intelligence plugin (continued)

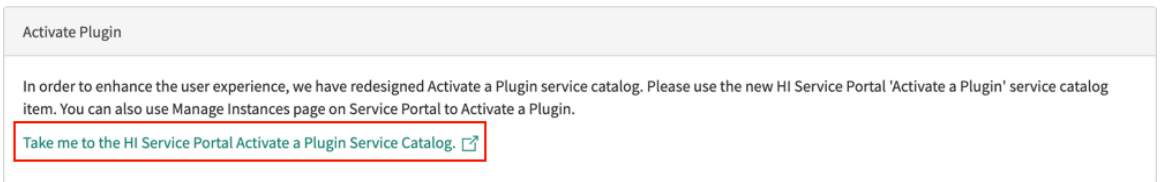
| Plugin | Description |
|---|---|
| [com.snc.change_management.ml] | |

## Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. On the All Applications page, select **Request Plugin** to open the **Activate Plugin** form on Now Support.




3. On Now Support, select the link to access the Now Support Service Portal Service Catalog.




4. Select your instance.
5. Select **Actions > Activate Plugin**.
6. On the **Activate Plugin** form, provide the following information.

### Activate Plugin form

| Field | Description |
|---|---|
| What is your target instance | Instance on which to activate the plugin. |
| Which plugin would you like to activate | Name of the plugin to activate. |

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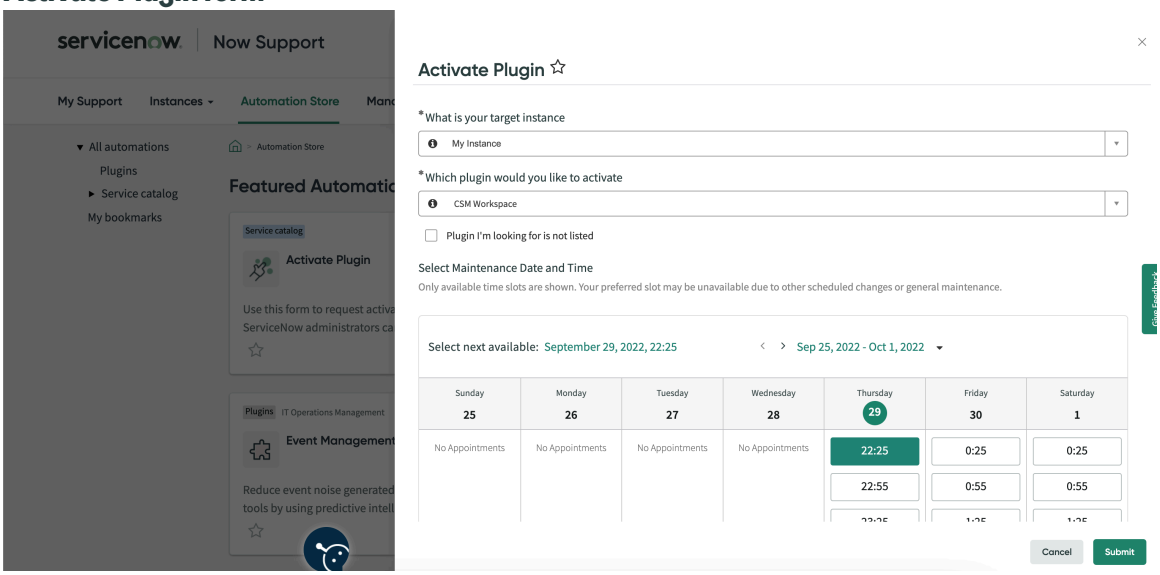
| Field | Description |
| --- | --- |
| | **Note:** If the system does not list the plugin you want or if you are activating the plugin on an OEM or on-premise instance, select the **Plugin I'm looking for is not listed** check box and then enter the name of the plugin. |
| Select Maintenance Date and Time | The date and time to activate the plugin.<br>**Note:** Plugins are activated in two batches, once in the morning and once in the evening, on every business day in the US Pacific time zone. If the plugin must be activated at a specific time, enter the request in the **Reason/Comments** field. |

### Example

For example, see the following form to activate the CSM Workspace plugin on an instance named My Instance.

**Activate Plugin form**




7. Select **Submit**.
   For additional details about requesting a plugin, see Requesting a Plugin from the Service Catalog [KB0751715] article in the Now Support Knowledge Base.

### Related topics

List of plugins (Washington DC)

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### Components installed with Change Management - Standard Change Template Intelligence

Several types of components are installed with activation of the Change Management - Standard Change Template Intelligence plugin that includes tables.

**Note:**
The Application Files table lists the components that are installed with this application. For instructions on how to access this table, see Find components installed with an application.

## Tables installed

| Table | Description |
|---|---|
| Standard Change Template Proposal Properties<br><br>[chg_ml_prop_sctp] | Properties used to configure the Standard Change Template Proposal feature. |
| Standard Change Template Candidate<br><br>[std_change_template_candidate] | Standard Change Template Candidates identified by the Predictive Intelligence feature. |
| Standard Change Template Proposal Solution<br><br>[chg_ml_prop_sctp_solution] | Solution Definitions configured for the Standard Change Template Proposal Solution feature. |

### Request Change Management - Case Intelligence

To activate Change Management capability that uses Predictive Intelligence to identify similar cases that may have been caused by change, request the Change Management - Case Intelligence plugin (com.snc.change_management.ml.ccbc) through the Now Support Customer Service system.

## Before you begin

Role required: maint

## About this task

The Change Management - Case Intelligence (com.snc.change_management.ml.ccbc) plugin activates these related plugins if they are not already active.

### Plugins for Change Management - Case Intelligence plugin

| Plugin | Description |
|---|---|
| Change Management - Predictive Intelligence Core<br><br>[com.snc.change_management.ml] | Enables you to use Predictive Intelligence in Change Management. |

## Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. On the All Applications page, select **Request Plugin** to open the **Activate Plugin** form on Now Support.

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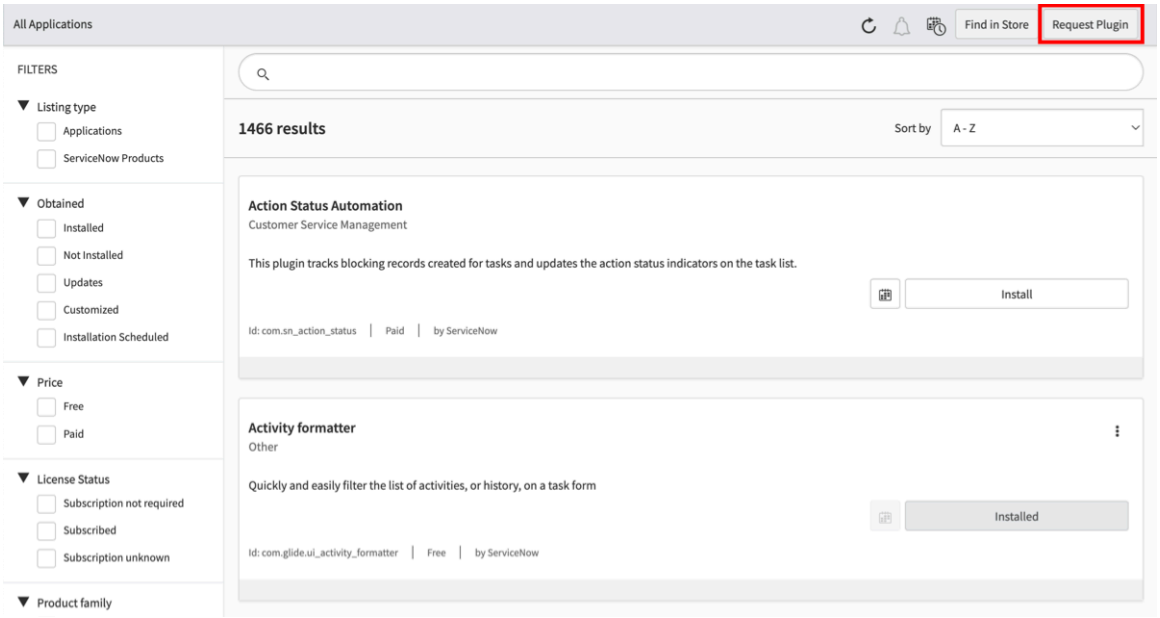
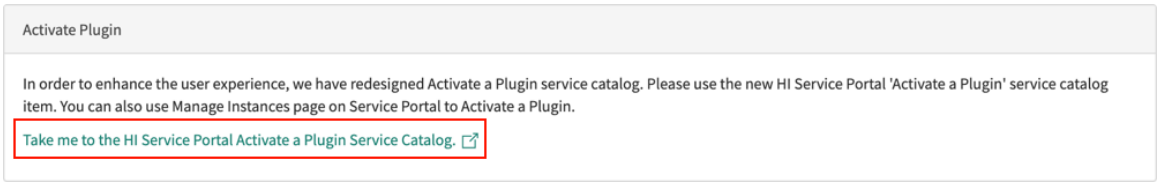



3. On Now Support, select the link to access the Now Support Service Portal Service Catalog.




4. Select your instance.
5. Select **Actions > Activate Plugin**.
6. On the **Activate Plugin** form, provide the following information.

### Activate Plugin form

| Field | Description |
|---|---|
| What is your target instance | Instance on which to activate the plugin. |
| Which plugin would you like to activate | Name of the plugin to activate.<br>**Note:** If the system does not list the plugin you want or if you are activating the plugin on an OEM or on-premise instance, select the **Plugin I'm looking for is not listed** check box and then enter the name of the plugin. |
| Select Maintenance Date and Time | The date and time to activate the plugin. |

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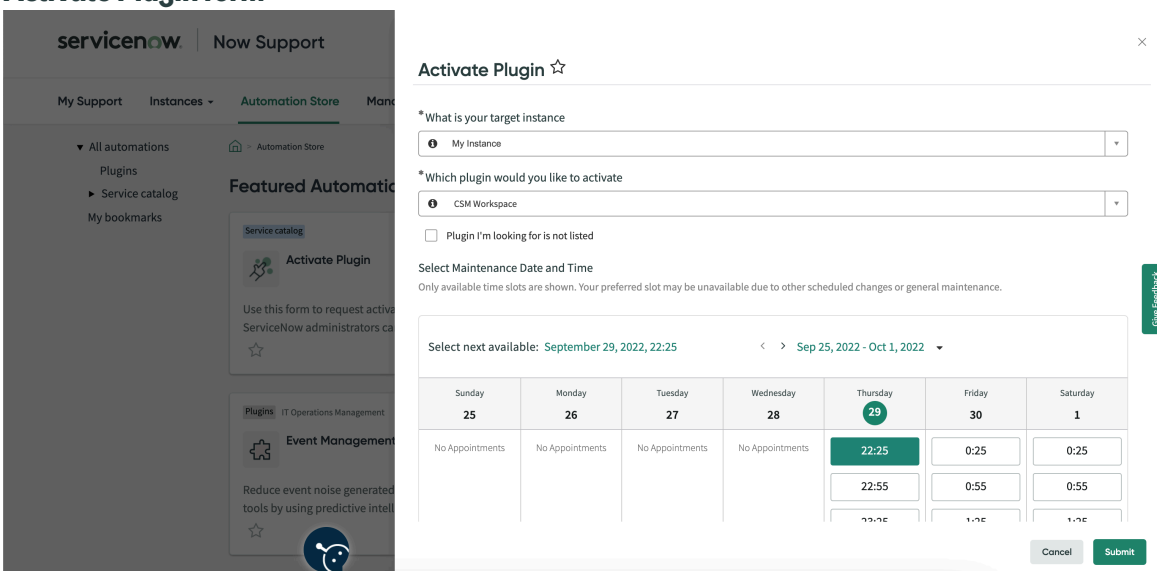
| Field | Description |
| --- | --- |
| | **Note:** Plugins are activated in two batches, once in the morning and once in the evening, on every business day in the US Pacific time zone. If the plugin must be activated at a specific time, enter the request in the **Reason/Comments** field. |

### Example

For example, see the following form to activate the CSM Workspace plugin on an instance named My Instance.

**Activate Plugin form**




7. Select **Submit**.
   For additional details about requesting a plugin, see Requesting a Plugin from the Service Catalog [KB0751715] article in the Now Support Knowledge Base.

### Related topics

List of plugins (Washington DC)

## Change Management - Predictive Intelligence Core

To activate Change Management predictive intelligent features, the Change Management - Predictive Intelligence Core plugin (com.snc.change_management.ml) is required and is automatically installed along with other through Change Management Predictive Intelligence plugins that are requested using the Now Support Customer Service system.

### Before you begin

Role required: maint

### About this task

The Change Management - Predictive Intelligence Core plugin (com.snc.change_management.ml) plugin activates these related plugins if they are not already active.

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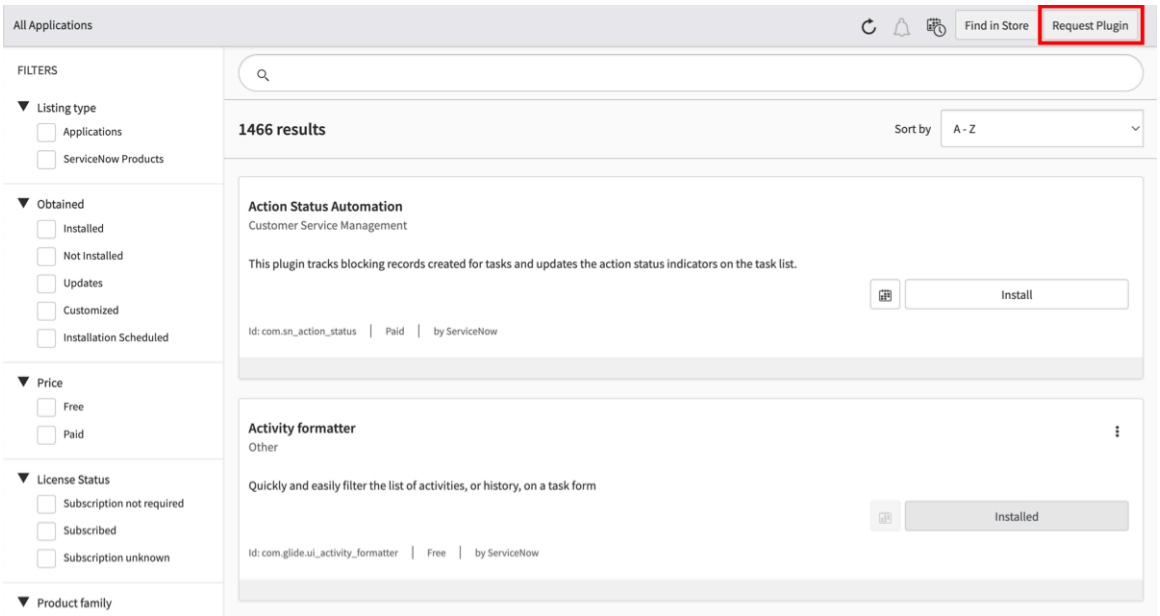
### Plugins for Change Management - Predictive Intelligence Core plugin

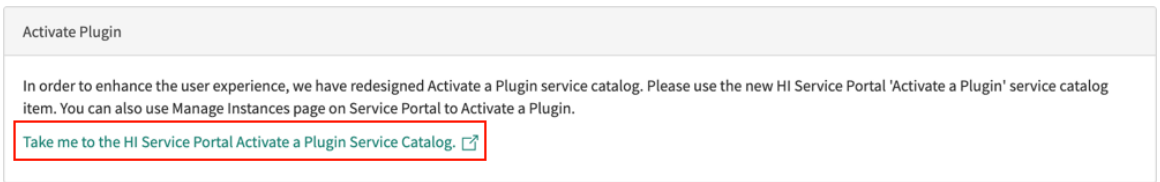
| Plugin | Description |
|---|---|
| Predictive Intelligence<br><br>[com.glide.platform_ml] | Using Predictive Intelligence you an create, train, and test solutions so that you can quickly understand the basic functionality of how a machine-learning solution works. |

## Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. On the All Applications page, select **Request Plugin** to open the **Activate Plugin** form on Now Support.




3. On Now Support, select the link to access the Now Support Service Portal Service Catalog.




4. Select your instance.
5. Select **Actions > Activate Plugin**.
6. On the **Activate Plugin** form, provide the following information.

### Activate Plugin form

| Field | Description |
|---|---|
| What is your target instance | Instance on which to activate the plugin. |
| Which plugin would you like to activate | Name of the plugin to activate. |

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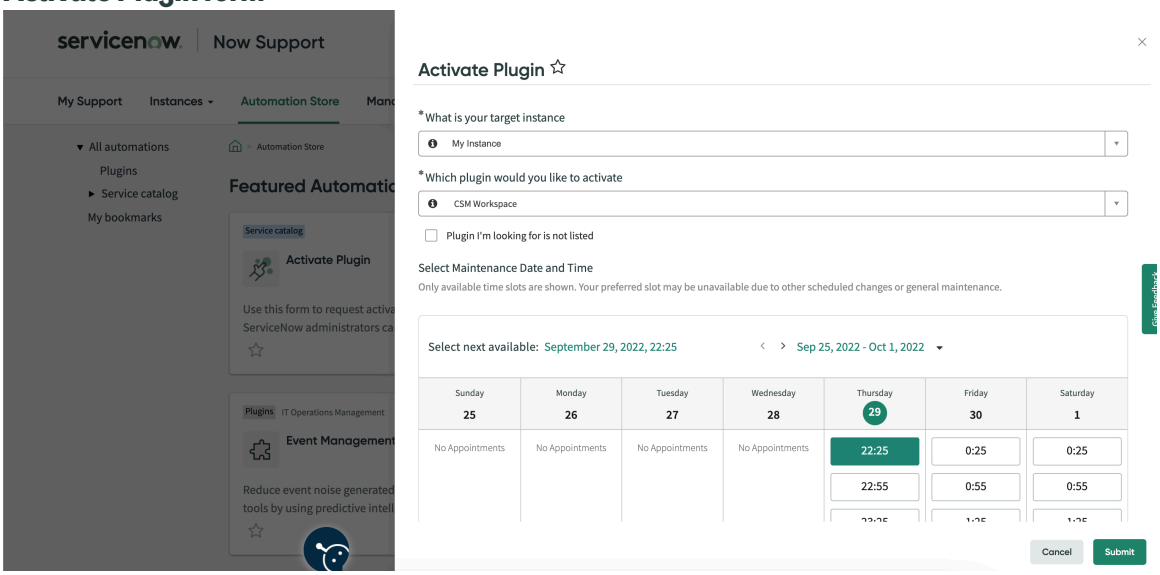
| Field | Description |
| --- | --- |
| | **Note:** If the system does not list the plugin you want or if you are activating the plugin on an OEM or on-premise instance, select the **Plugin I'm looking for is not listed** check box and then enter the name of the plugin. |
| Select Maintenance Date and Time | The date and time to activate the plugin.<br>**Note:** Plugins are activated in two batches, once in the morning and once in the evening, on every business day in the US Pacific time zone. If the plugin must be activated at a specific time, enter the request in the **Reason/Comments** field. |

### Example

For example, see the following form to activate the CSM Workspace plugin on an instance named My Instance.

**Activate Plugin form**




7. Select **Submit**.
   For additional details about requesting a plugin, see Requesting a Plugin from the Service Catalog [KB0751715] article in the Now Support Knowledge Base.

### Related topics

List of plugins (Washington DC)

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### Components installed with Change Management - Predictive Intelligence Core

Several types of components are installed with activation of the Change Management - Predictive Intelligence Core plugin that includes tables. These tables can be utilized only after the other Change Management Predictive Intelligence plugins are activated.

**Note:**
The Application Files table lists the components that are installed with this application. For instructions on how to access this table, see Find components installed with an application.

## Tables installed

| Table | Description |
|---|---|
| Change Predictive Intelligence Properties<br><br>[chg_ml_prop] | Base table for Change Management properties. |
| Change Predictive Intelligence Solution<br><br>[chg_ml_prop_solution] | Base table for Change Management Intelligent solutions. |
| Change Similarity Boosters<br><br>[chg_ml_similarity_boosters] | Provides boosting capabilities for similarity based solutions. |

### Activate Change Management - Change Flows

You can activate the Change Management - Change Model Foundation Data (com.snc.change_management.chnage_model.foundation) plugin if you have the admin role. This plugin includes demo data and activates related plugins if they are not already active.

### Before you begin

Role required: admin

### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.
3. Select **Install** to start the installation process.

   **Note:**
   When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

   You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

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### Activate Change Management - Change Velocity dashboard

You can activate the Performance Analytics - Content Pack - Change Management (com.snc.pa.change) and Process Optimization (com.sn_process_optimization) plugins if you have the admin role. These plugins include demo data and activates related plugins if they are not already active.

#### Before you begin

Role required: admin

#### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.
3. Select **Install** to start the installation process.

   **Note:**
   When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

   You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

### Activate Change Management - Change Models

You can activate the Change Management - Change Model Foundation Data plugin (com.snc.change_management.change_model.foundation) if you have the admin role. This plugin includes demo data and activates related plugins if they are not already active.

#### Before you begin

Role required: admin

#### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.
3. Select **Install** to start the installation process.

   **Note:**
   When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

   You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

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### Activate Change Management Success Probability

You can activate the Change Management - Success Probability plugin (com.snc.change_management.success_probability) if you have the admin role.

#### Before you begin
Role required: admin

#### About this task
Activate the Change Management Success Probability (com.snc.change_management.success_probability) plugin to calculate the probability of success of a change request.

#### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.

3. Select **Install** to start the installation process.

   **Note:**
   When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

   You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

### Activate Change Management - Data Archiving

You can activate the Change Management - Data Archiving plugin (com.glide.auxdb) if you have the admin role. This plugin includes demo data and activates related plugins if they are not already active.

#### Before you begin
Role required: admin

#### About this task
The Change Management - Data Archiving plugin (com.glide.auxdb) enables to move a subset of data from large tables into the data archive.

#### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.

3. Select **Install** to start the installation process.

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**Note:**
When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

## Standard change catalog

Standard changes are pre-approved, low risk changes with a proven history of success. The standard change catalog contains the changes that have been approved by the Change Management application as standard changes.

Users with the ITIL role can view the list of available standard changes and submit change requests.

This video demonstrates how the standard change catalog works and how it enables change managers to manage change requests effectively. Standard Change Catalog

A property controls whether the selection of a standard change request from the catalog inserts the change request record into the database. An administrator can select the **Two step** check box in Standard Change Properties. This property requires the requester to click **Submit** to insert the change request record.

Standard changes are logically grouped under specific categories. The Change Management application uses a proposal process to control which changes become available in the standard change catalog.

The standard change catalog enables you to perform the following activities:

- Request, review, and approve standard change templates.
- Request preapproved standard changes.
- Determine access to standard change templates at the user level.

You can propose, modify, and retire standard change templates based on the requirements of your organization.

## Pre-approved standard changes

Submitting a change request from a standard change template ensures that pre-approved information is automatically populated in the necessary fields. Standard changes are submitted more quickly and fulfillment can be expedited.

**Note:**
You cannot mass-update a set of Configuration Items (CIs) in standard changes. However, you can propose individual changes.

## Determine access to standard change templates at the user level

Standard change templates are logically grouped under specific categories. These categories are displayed to users based on user criteria such as user role, geographical location, and department.

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### Configure standard change catalog properties

Configure the standard change catalog through the standard change properties.

## Before you begin

The Change Management - Standard Change Catalog [com.snc.change_management.standard_change_catalog] plugin must be activated.

Role required: admin

## Procedure

1. Navigate to **All** > **Change** > **Administration** > **Standard Change Properties**.
2. On the form, fill in the fields.

#### Standard change properties form

| Field | Description |
|---|---|
| Catalog | Select the service catalog to add the generated standard change template to. |
| Category | Select the service catalog category to add the generated standard change template to. You can also choose the category or any child categories of the selected catalog.<br>**Note:** This value is not set automatically on the Proposal form, but must be specified before it is approved. |
| Two step | Check box to make the request of a standard change a two-step process. The process redirects the requester from a standard change template to a change request that can be reviewed before submitting.<br>This option is enabled by default on instances provisioned on Jakarta. Customers upgrading from prior releases must enable the **Two step** property. |
| Mandatory Change Request values | Specify a list of mandatory fields that require values when you propose a new standard change template or a modification to a standard change template.<br>This configuration ensures that when a standard change request is created from a standard change template, one or more fields on the Change Request form contain preset values. |
| Default Change Request values | Specify default values for common fields on the Change Request form. |
| Restricted Change Request values | Specify the list of fields that end users are not allowed to provide any value for when making a proposal.<br>**Note:** Ensure that internal columns, such as **Updates**, **Updated**, **Updated by**, **Domain**, **Created**, **Created by** are restricted. |

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| Field | Description |
|---|---|
| Read-only fields | Specify the fields that end users are not allowed to provide any value for in the created standard change request.<br>**Note:** This configuration ensures that for the specified fields, the values approved in the standard change template do not change when the standard change request is submitted. |
| Fields to copy | Specify the fields whose values are copied to the **Propose a New Standard Change Template** record producer from a non-standard change request.<br>**Note:** If any fields not specified in this list have default values specified, the default values are copied to the record producer. |
| **Change Task properties** | |
| Mandatory Change Task fields | Specify a list of mandatory fields. Enter values for these fields when proposing a new change task template or modifying a change task template. |
| Default Change Task values | Specify default values for fields on the Change Task form when creating a change task template. |
| Restricted Change Task fields | Specify the list of change request fields that end users are not allowed to provide any value for when creating a change task template. |
| Read-only Change Task fields | Specify the fields that end users are not allowed to alter any value for in the change task.<br>**Note:** This configuration ensures that for the specified fields, the values approved in the change task template do not change when the change task is created. |
| Change Task Fields to copy | Specify the fields whose values are copied to one or more change task templates when proposing a new standard change template from an existing change request. |

3. Select **Update**.

### What to do next

You can create a standard change catalog. By default, the basic Standard Change Proposal workflow sends approval records to members of the Change Management group and the members should verify and modify the records, as appropriate.

#### Create a standard change task template

You can create a change task template to add to a standard change proposal. If the standard change proposal is approved, the related change tasks are created when the standard change request is created.

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### Before you begin
Role required: itil, change_manager, or sn_change_write

### Procedure

1. Navigate to **All** > **Standard Change** > **Open Proposals**.

   **Note:**
   You can add standard change tasks to a standard change proposal only when the proposal is in the **New** state. Once you submit a standard change task for approval, you cannot add additional tasks.

2. Click the **Change Task Templates** tab, and then click **New**.
3. On the form, fill in the fields.

**Change task template form**

| Field | Description |
|---|---|
| Name | Unique name for the change task. |
| Std change proposal | Name of the standard change proposal for which you want to create the change task template. |
| Order | Order in which change tasks are created in the change request.<br><br>The **Order** field determines the order in which you add the change tasks to the change request when you select it from the standard change catalog. |
| Short description | Brief description of the change task template. |
| Change Task values | Field values that are populated on the change task created as part of the standard change. |

4. Click **Submit**.

   **Note:**
   Standard change catalog templates are not supported on Service Portal.

## Propose a standard change template

Propose a new standard change template when you identify a need while creating a change request.

### Before you begin
Role required: itil, admin

### About this task
As an IT technician, you can propose a new change template for a change request that you frequently create. This new template is later sent for approval to the change management team, which reviews the request and approves the template as part of the approval process.

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## Procedure

1. You can propose a standard change template by navigating to **Change** > **Standard Change** > **Standard Change Catalog** > **Template Management** > **Propose a new Standard Change Template** and filling in the fields on the form.

**Standard Change Proposal form**

| Field | Description |
|---|---|
| Short description | Short description of the standard change proposal template. |
| Category | Category under which the template is published. For example, Server Standard Changes. |
| Sample Change Requests | Change requests that are available as samples for the change that you propose. The Change Management team reviews the requests as a part of the approval process. |
| Change Request values | Text which appears as default text in the standard change proposal template. |

2. Click **Save**.
   The proposal is created with the status **New**.
3. Click **Request Approval**.
   The proposal is created with the status **In Progress**.
4. **Optional:** Create a standard change template from a change that exists by completing the following steps.
   a. Navigate to **Change** > **Open** and click the change whose information you want to use in the standard change template.
   b. Open the form context menu and click **Propose a Standard Change Template**.

**Note:**

- Any change tasks that are included with the change also get copied to the new standard change proposal. The fields copied from both the change and change tasks are defined in the Standard Change Properties.
- By default, approval records are created for members of the Change Management group.

Alternatively, as a change manager, create and submit a standard change proposal that can be utilized as a template to draft a standard change request that occurs frequently and is of low risk. By default, the basic standard change proposal workflow sends approval records to members of the change management group where the members verify and modify the records, as appropriate. Navigate to **Change** > **Standard Change** > **My Proposals**. Click **New**, fill the form, and then click **Submit**.

## Result

A new template record is created for use.

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### Attach files to a standard change template

Attach files, such as documents, spreadsheet, and images to a standard change proposal. Standard change templates copy any file attached to the template to a change request that the template creates.

#### Before you begin
Role required: itil, admin

#### Procedure

1. Navigate to **All** > **Change** > **Standard Change** > **My Proposals**.
2. Open the proposal to which you want to add the attachment to.
3. Click the  icon to browse and select the file.

   The attached file appears at the top of the proposal.

   **Note:**
   You can add more than one file as an attachment.

4. Click **Update** and request approval for the proposal.

#### Result
Any attachment associated with a standard change proposal gets copied to the standard change template that is created when the proposal is approved. When that template is used to create a standard change, any attachment associated to it is also copied to those standard change requests.

### Modify or retire a standard change template

You can modify and retire standard change templates based on your organization's requirements.

#### Before you begin
Role required: admin, change_manager, sn_change_writeor itil

#### Procedure

1. Navigate to **All** > **Change** > **Standard Change** > **All Templates**.
2. Select the template you want to modify or retire and perform one of the following steps.

| Option | Description |
|---|---|
| **Modify a standard change template** | **a.** Click **Modify Template** under **Related Links**.<br>**b.** Enter your modifications in the **Modify a Standard Change Template** form. |
| **Retire a standard change template** | **a.** Click **Retire Template** under **Related Links**.<br>**b.** Enter your business justification to retire the specific template in the **Retire a Standard Change Template** form. |

3. Perform one of the following actions:

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- Click **Save**. The modifications are saved but not sent for approval.
- Click **Request Approval**. The template is sent for approval to the change management team.

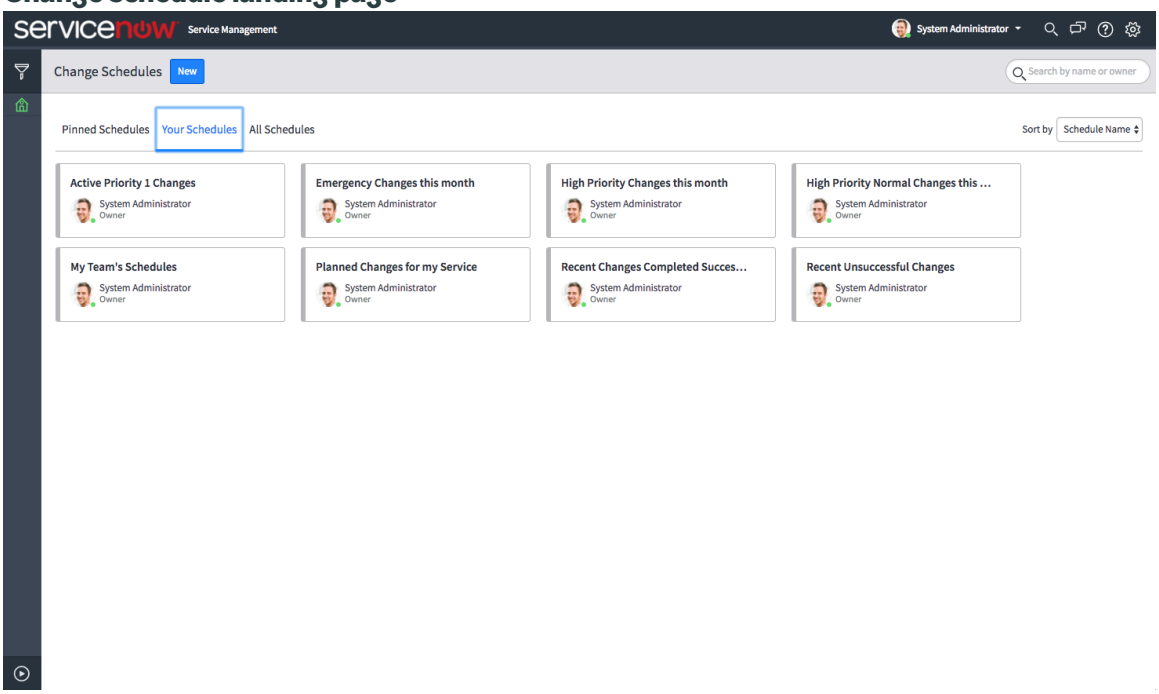
## Change schedules

The Change Schedules landing page provides a view of schedules that are categorized under **Pinned Schedules**, **Your Schedules**, and **All Schedules**. The grouping of schedules provides easy access to your most required schedules and saves your time from searching through all the schedules in the system.

To access Change Schedules, navigate to **Change** > **Schedule** > **Change Schedules**.

**Note:**
To view the Change Schedules page, you must activate Change Management - Change Schedule plugin (com.snc.change_management.soc).

### Change schedule landing page




You can find schedules arranged under three categories as follows:

- **Pinned Schedules**: Includes all change schedules you have previously chosen to pin for quick access.
- **Your Schedules**: Includes all change schedules you own or are a member of the group that owns the schedule.
- **All Schedules**: Includes all change schedules you have access to.

To pin a schedule, hover over the schedule tile and click the pin icon ( ). The schedule appears under **Pinned Schedules**. To unpin a tile, click the pin icon again.

**Note:**
The **Show an information message when a change schedule is pinned** property in Change Properties controls whether you see an informational message confirming the pinning or unpinning of the schedule.

Click a tab to view a Change Schedule. For more information, refer Change schedules view.

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### Change schedules view

The Change Schedules module provides a Gantt or timeline view of change requests based on criteria defined within a Change Schedule Definition.

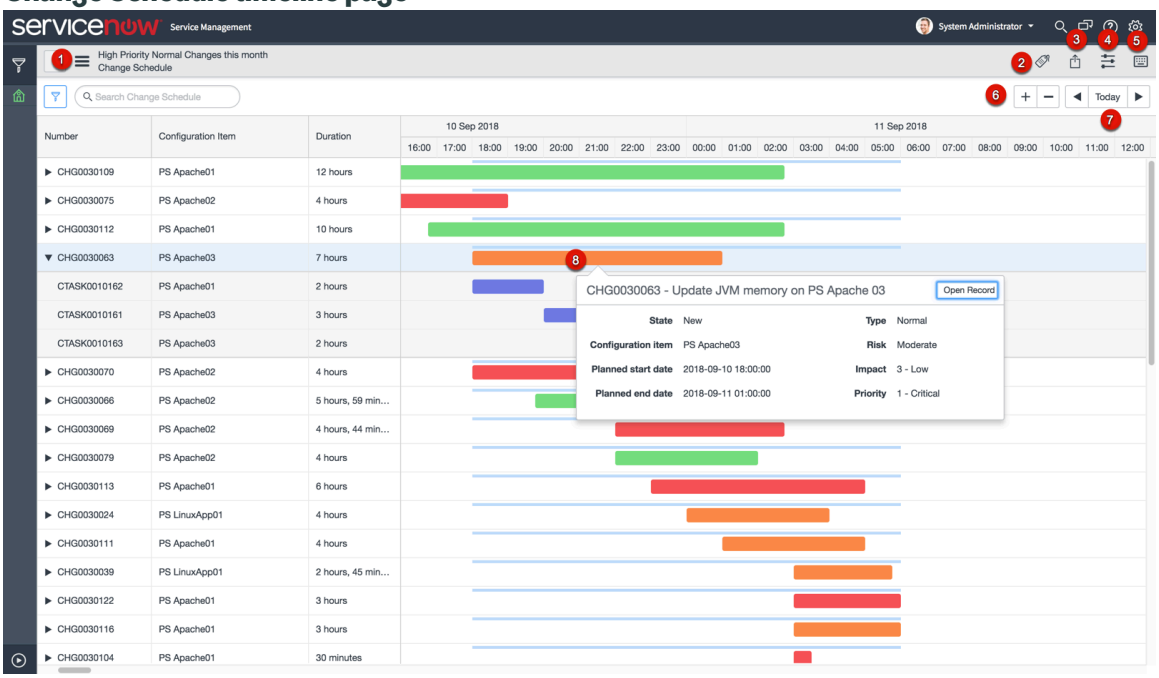
The change schedule provides detailed insight to change requests that are included based on the change schedule definition. The change requests can include change timing, duration, related change tasks, blackout periods, and maintenance windows for any given date, week or month.

To view the Change Schedules page, you must activate Change Management - Change Schedule plugin (com.snc.change_management.soc).

Change requests are represented by a span. The duration of the span is defined by the start and end date fields defined in the Change Schedule definition. The Change Schedules page allows conditions to be defined using the condition builder. The condition builder determines which change requests are displayed and sorted in a change schedule.

**Note:**
To show the blackout and maintenance windows of the change in the calendar view, the **Affected CI** field for the change must be configured.

#### Change Schedule timeline page




| SI # | UI Component | Description |
|---|---|---|
| 1 | Context Menu | Option to do the following:<br>• Create new schedule: You can create a new schedule from a simplified wizard.<br>• Edit a schedule: Allows the modification of change schedules you own and any changes made are saved to the related Change Schedule Definition record.<br>• Copy a schedule: If you are the owner of the change schedule that you want to copy, then a copy of the change schedule is created. If you want to copy a change schedule that is owned by any other user, then you |

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| Sl # | UI Component | Description |
|---|---|---|
| | | become the owner of the copied schedule and the new schedule is fully editable by you.<br>• View schedule definition: You can view the change schedule definition and the related fields associated with it.<br>• Delete: Allows users, who own a change schedule, to delete the schedule.<br>**Note:**<br>• A user who only possesses the ITIL role and is not the owner of a change schedule can only create a schedule, copy a schedule, or view an existing schedule definition.<br>• You become the owner of any schedule that you create. The new schedule that you create appears in the Change Schedule page in a tile form under the **Your Schedules** tab. |
| 2 | Span styles | Defined span color based on conditions you specify. You can add new span styles by clicking **Add Span Styles**. You can also edit an existing style rule, apply filters to a style rule, or remove a style rule.<br>**Note:**<br>By default, span styles are based on the Risk value of a change.<br>• Risk = High – Span style is Red<br>• Risk = Moderate – Span style is Orange<br>• Risk = Low – Span style is green |
| 3 | Share | Schedules to be shared to other users by user name, group, or role. The share pane also provides a check box to share a change schedule with everybody. If change schedules are not shared with anyone, then only the owner, owner group, and administrator can see them. If a change schedule is shared with other users, an option is available to send an email notification to inform them of their access. |
| 4 | Configuration | Components of the change schedule including the configuration item, duration, or any related tasks can be hidden or exposed. |
| 5 | Keyboard shortcuts | List of available keyboard shortcuts to help you navigate quickly and to provide accessibility to users. The list of navigation shortcuts appears when you click<br> |
| 6 | Zoom | Zoom levels to control change schedule zoom resolution. The range can vary from hours to a yearly view of change schedules. |

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| Sl # | UI Component | Description |
|---|---|---|
| 7 | Arrow keys | Option to navigate forward or back in time in the change schedule based on the current zoom level. Click **Today** to navigate back to the current day and time in a single click. |
| 8 | Change record | Summary of the change record when you click any span. Use **Open Record** in the header of the summary to open the change request in the form view. In the form, you can view the entire change request record.<br>**Note:**<br>You can specify the fields that are displayed in this window. On the Change Schedule Definition form, under the **Record Summary** tab, specify required fields on **Left column fields** and **Right column fields**. |

**Note:**
Change schedules are loaded on the timeline page on the client side in batches of 20. You can load a maximum of 1000 records. These numbers can be modified by system administrator. For more information, refer the properties at Installed with Change Management - Change Schedule.

### Create a change schedule from the Change Schedules page

You can create a change schedule to view all scheduled changes, change tasks, blackout periods, maintenance windows for any given date, week, month, or year.

### Before you begin

- You have activated Change Management - Change Schedule plugin (com.snc.change_management.soc).
- Role required: itil, sn_chg_soc.change_soc_admin, sn_change_role, sn_change_write roles, sn_change_write, or admin

**Note:**

- A user with an ITIL role can create a Change Schedule definition and view the schedule definition that they have created.
- An admin or a change schedule administrator can read or edit all Change Schedule definitions.

### Procedure

1. Navigate to **All** > **Change** > **Schedules** > **Change Schedules** and click **New**.
2. On the form, fill in the fields.

#### New Change Schedule form

| Field | Description |
|---|---|
| Name | Name of the change schedule. |
| Start date field | Field from the change request form that indicates the start date as an example planned start date. |
| End date field | Field from the change request form that indicates the end date as an example planned end date. |

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| Field | Description |
|---|---|
| Condition | Conditions that determine which change requests display in the Change Schedule interface and the order in which those change requests are sorted. |

3. Click **Submit**.
   The change schedule is displayed in the timeline view.

### Create a change schedule from the change schedule definition

You can define a change schedule from a change schedule definition record. Change schedule definitions help you to define the content that displays in the change summary popover, the users, groups or roles with whom a schedule is to be shared, and related span style colors.

## Before you begin

- You have activated Change Management - Change Schedule plugin (com.snc.change_management.soc).
- Role required: itil, sn_chg_soc.change_soc_admin, sn_change_role, sn_change_write roles, sn_change_write, or admin

## About this task

To create a new Change Schedule, specify the start and end date fields that you want to be represented in the user interface and also specify the conditions to determine which change requests to display.

## Procedure

1. Navigate to **All** > **Change** > **Schedules** > **Change Schedule Definitions** and click **New**.
2. On the form, fill in the fields.

### Change Schedule Definition form

| Field | Description |
|---|---|
| Name | Name of the change schedule. |
| Active | Check box to select if a schedule is active. |
| Changes | |
| Start date field | Field from the change request form that determines the start date of the span. |
| End date field | Field from the change request form that determines the end date of the span. |
| Condition | Conditions which determine which change requests display in the Change Schedule interface and the order those change requests are sorted. |
| Record Summary | |
| Left column fields | List of fields which appear on the left column of the record summary pop-up. The record summary pop-up appears when you click any span on the change schedule timeline. |

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| Field | Description |
|---|---|
| Right column fields | List of fields that appear on the right of the window when you click any span on the change schedule timeline. The record summary pop-up appears when you click any span on the change schedule timeline. |
| Blackout and Maintenance | |
| Show blackout window | Check box to select if blackout window associated to a change request appears in the change schedule timeline. |
| Blackout window color | Color to represent blackout window in the change schedule timeline. |
| Show maintenance window | Check box to select if maintenance window associated to a change request appears in the change schedule. |
| Maintenance window color | Color to represent maintenance window in the change schedule timeline. |
| Sharing | |
| Share with | Option to share the schedule with everyone associated with the change or with specific users and groups. |
| Owner | Owner of the change schedule. |
| Group Owner | Group that owns a change schedule and has administrative rights to the change schedule. |
| Related Link | |
| Show Schedule | Link to the change schedule that you have defined. |
| Related Lists | |
| Related Definitions | Details of related child schedules |
| Style Rules | Options to define style conditions to determine the color of a span using a condition builder. For example, if you want all changes of type Emergency to show as a red span, a span style can be defined for that condition. |

3. Click **Submit**.

### Add related tasks to a change schedule

Create related definitions to present related tasks for change requests in the change schedule. For example, to view the change tasks associated with a change request, you need to define a related definition. You can also add style rules specific to a related task.

## Before you begin

- You have activated Change Management - Change Schedule plugin (com.snc.change_management.soc).
- Parent change schedule is defined.
- Role required: itil, sn_chg_soc.change_soc_admin, sn_change_role, sn_change_write roles, sn_change_write, or admin

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### Procedure

1. Navigate to **All** > **Schedules** > **Change Schedule Definitions**.
2. Select a Change schedule definition.
3. Select **New** in **Related Definition** tab.
4. On the form, fill in the fields.

#### Related Definition form

| Field | Description |
|---|---|
| Name | Name of the related definition. |
| Change schedule definition | Reference for the parent change schedule. |
| Active | Check box to select whether the child schedule is active. |
| Related Records | |
| Table name | Choice list to select the table on which the Related Definition is based. |
| Reference field | Reference the Related Definition is based on, for example, change request. |
| Start date field | Start date field from the related record. |
| End date field | End date field from the related record. |
| Condition | Conditions included in the change schedule and the associated ordering of the conditions. |
| Record Summary<br>**Note:**<br>The record summary pop-up appears when you click any span on the change schedule timeline. | |
| Left column fields | List of fields that appear on the left column of the record summary pop-up. The record summary pop-up appears when you click any span on the change schedule timeline. |
| Right column fields | List of fields that appear on the right column of the record summary pop-up. The record summary pop-up appears when you click any span on the change schedule timeline. |

5. Click **Submit**.

#### Style rules definition

You can create a style span to specify the color for different events in a change schedule. Style spans in a schedule help to quickly identify characteristics of a change based on a field value from the Change Request.

Change Schedules includes several base styles to ensure every schedule has span styles to begin with. By default, Blackout Schedules are represented by a gray color, Maintenance

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schedules are represented by a light blue color and change requests are represented by either red (risk = High), orange (risk = moderate), or green (risk = low).

To define style rules, you must activate Change Management - Change Schedule plugin (com.snc.change_management.soc).

You can define styles in multiple ways, such as from the Default Style Rules, Change Schedule definitions, or from the Span Style window in the Change Schedule timeline.

**Note:**
All style rule tables extend the Style Rule Core table [chg_soc_style_rule_core].

### Define default style rules

You can define style rules from the Default Style Rules module when you want the style rules to be used by change schedules globally and not for any specific application.

#### Before you begin

Role required: itil, sn_chg_soc.change_soc_admin, sn_change_role, sn_change_write roles, sn_change_write, or admin

#### Procedure

1. Navigate to **All** > **Change** > **Schedule** > **Default Style Rules**.
2. On the Style Rule page, click **New**.
3. On the form, fill in the fields.

**Style Rule form**

| Field | Description |
|---|---|
| Name | Name of the style rule. |
| Conditions | Conditions which dictate the style rule. For example, risk = High = red. |
| Active | Check box to determine whether the style rule is active. |
| Styling | |
| Advanced | Check box to write script to set the value of label color, label weight, and event color.<br><br>If you do not select the check box, the **Label color**, **Label weight**, and the **Event color** fields appear. |
| Label color | Color of the text that is displayed for each record on the timeline that matches the style rule. |
| Label weight | Thickness of the label such as normal or bold. |
| Event color | Color of the schedule span displayed for each record on the timeline that matches the style rule. |

4. Click **Save**.

### Define style rules from Change Schedule Definitions

You can define style rules from change schedule definitions when you want the style rules to be applied to the change schedule related to the change schedule definition.

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### Before you begin
Role required: itil, sn_chg_soc.change_soc_admin, sn_change_role, sn_change_write roles, sn_change_write, or admin

### Procedure
1. Navigate to **All** > **Change** > **Schedules** > **Change Schedule Definitions**.
2. Open the definition for which you want to define or edit a style rule.
3. Click the Style Rules related list and click **New**.
4. On the form, fill in the fields.

#### Style Rule form

| Field | Description |
|---|---|
| Name | Name for the style rule. |
| Conditions | Conditions which dictate the style rule. For example, risk = High = red. |
| Active | Check box to determine whether the style rule is active. |
| Styling | |
| Advanced | Check box to write a script to set the value of label color, label weight and event color.<br><br>If you do not select the check box, the **Label color**, **Label weight**, and the **Event color** fields appear. |
| Label color | Color of the text that is displayed for each record on the timeline that matches the style rule. |
| Label weight | Thickness of the label such as normal or bold. |
| Event color | Color of the schedule span displayed for each record on the timeline that matches the style rule. |

5. Click **Save**.

**Note:**
Style rules that you create from a change schedule definition take precedence over the style rules that exist in the base style rule table [chg_soc_style_rule].

#### Define style rules from Change Schedules View

You can create style rules from the change schedules view when you want the style rules to be applied to the specific change schedule where it is defined.

### Before you begin
Role required: sn_chg_soc.change_soc_admin, sn_change_role, sn_change_write, or admin

### Procedure
1. Navigate to **All** > **Change** > **Schedule** > **Change Schedules**.
2. Click a tile to view the Change Schedule page.
3. Click the style icon ( ).

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4. Do any one of the following actions.

5. Click **Save**.

## Configure ability to copy a change request

You can configure the ability to copy a change request record and its details using system properties.

### Before you begin

Role required: admin

### About this task

You can configure the following functionality.

- Disable the ability to copy a change request.
- Disable the ability to copy attachments.
- Determine the components of the source change request that are copied.

### Procedure

1. Navigate to **All** > **Change** > **Administration** > **Change Properties**.
   Some properties are found by entering `sys_properties.list` in the application navigator, as noted.
2. Set the following properties as desired.

| Option | Description |
|---|---|
| **Disable the ability to copy a change request** | Set **Enable Copy Change feature** (*com.snc.change_request.enable_copy*) to `false`. |
| **Disable the ability to copy an attachment** | Set **Copy attachments from originating change** (*com.snc.change_request.attach.enable_copy*) to `false`. |
| **Disable the ability to copy the attachments from the change task** | This system property is located in the [sys_properties] table.<br><br>Set the **Enable copying of attachments from the originating change's related change tasks** (*com.snc.change_request.rl.change_task.atta* system property to `false`.<br><br>**Note:** If the ability to copy attachments is enabled, the attachment appears on the copy of the change request only after it is saved. |
| **Configure attributes to be copied** | Edit the list of values in **List of attributes (comma-separated) that will be copied from the originating change** |

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| Option | Description |
| --- | --- |
| | (*com.snc.change_request.copy.attributes*) to remove or add more attributes.<br><br>For example, to prevent the **Assigned to** attribute from being copied, remove the `assigned_to` value from the list of attributes in the property text box. |
| **Configure related lists to be copied** | This system property is located in the [sys_properties] table. The following related lists are copied by default:<br>○ **Affected CIs**<br>○ **Impacted Services/CIs**<br>○ **Change Tasks**<br><br>Edit the list of values in **Related lists (comma-separated) that will be copied from the originating change** (*com.snc.change_request.copy.related_lists*).<br><br>For example, if you do not want to copy the **Change Tasks** related list, remove the `change_task` value from the list of related lists in the property text box.<br><br>**Note:** You can configure this property to control the copy functionality of the **Affected CIs**, **Impacted Services/CIs**, and **Change Tasks** related lists. You cannot add any other related list to this property. |
| **Configure attributes of the default related lists to be copied** | These system properties are located in the [sys_properties] table. Navigate to the appropriate system property for one of the default related lists to configure the attributes to copy.<br><br>**System properties for related list attributes**<br><br>**Related list** / **System property**<br>Change Tasks / *com.snc.change_request.copy.rl.ch*<br>Affected CIs / *com.snc.change_request.copy.rl.ta* |

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| Option | Description |
| --- | --- |
| | Related list: Impacted Services/ CIs<br>System property: com.snc.change_request.copy.rl.ta |

3. Complete the following steps to further customize the ability to copy a change request by modifying a script include.

   a. Navigate to **System Definition** > **Script Includes**.

   b. Modify the *ChangeUtils* script include.

      **Example**
      For example, the ability to copy a change request is not available by default for standard changes. However, you can provide your own implementation of the *isCopyRulesValid* function in the *ChangeUtils* script include to override the default.

**Related topics**

Copy a change request

## Create a change request template

You can create a template that can be used to create change requests with pre-defined supporting tasks. Templates simplify the process of submitting new records by populating fields automatically.

### Before you begin

Role required: admin

The administrator must configure the form layout to add these fields: **Next Related Template**, **Next Related Child Template**, **Link element**

### About this task

There are two change request template configuration items.

- **Change_request**: This object does not have a link element, because it is at root level.
- **Change_task**: This task object is one level below root level, so it uses the parent table as a link element.

### Procedure

1. Navigate to **All** > **System Definition** > **Templates**.
2. Click **New**.
3. Complete the form as described in Create a template using the Template form.
4. Complete the remaining fields, as appropriate.

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| Field | Description |
|---|---|
| Next Related Template | A template at the same hierarchical level as the current template (sibling).<br><br>Use this field on a child template to specify an extra child template under the same parent template. For example, you can use child templates to create multiple change tasks for a change request template and specify sibling child templates.<br><br>This field is not supported on top-level templates. |
| Next Related Child Template | A template at the hierarchical level below the current template (child).<br><br>You can assign a child template to a child template. |
| Link element | Specifies a link to a record created from a child template to the record created from the parent template.<br><br>The template script chooses the first valid reference field that can link to the parent record when this field is left blank. |

5. Click **Submit**.

## Create a change request assignment rule

You can define assignment rules to automate the process of assigning change requests to the appropriate group or individual.

### Before you begin

Role required: admin

### About this task

You can define an assignment rule either for the change request or for the change tasks that are generated for change requests. In the following example, you create an assignment rule to assign change requests for configuration items in the database class to the **Database** group.

### Procedure

1. Navigate to **All** > **System Policy** > **Assignment**, and then click **New**.
2. Enter the name: `Database Change`.
3. In the Applies To form section, select the table **Change Request [change_request]** and add a condition **[Configuration Item.Class] [is] [Database]**.
4. In the Assign To section, select the group **Database**.
5. Click **Submit**.

### What to do next

To test the assignment rule, navigate to **Change** > **Create New** and enter a Normal change. Complete the form, selecting **bond_trade_ny**, or another CI in the database class, in the **Configuration Item** field.

Save the change and see that it was automatically assigned to the **Database** group.

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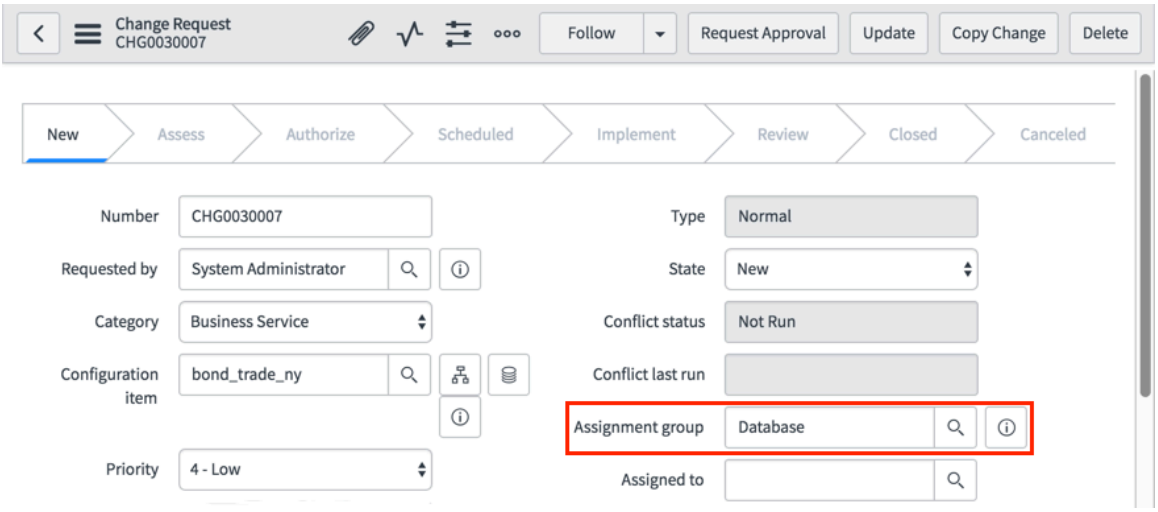


## Add a new change request type

You can add a new change type to your change process. There are several processes involved with adding a change type. These processes include managing script includes and workflows.

### Before you begin

Role required: admin

### About this task

In addition to the three types of change available by default, you can add new change types based on your organization requirements. For example, you can create a change type **Expedited** for changes that you require to be processed immediately.

### Procedure

1. Complete the following steps to add a new choice to the **Type** field.

   a. Open an existing change request.

   b. Right-click the **Type** field and select **Show Choice List**.

   c. Click **New** and fill in the following fields.

| Field Name | Description |
|---|---|
| Table | Select the **Change Request** table. |
| Label | Enter a value for the new change type. For example, `Expedited`. |
| Value | Enter a value for the new change type. For example, `expedited`. |
| Sequence | Enter a sequence for the change type. For example, `4`. |

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**d.** Submit the form.

| Table ▲ | Element | Language | Value | Label | Inactive | Sequence | Updated |
|---|---|---|---|---|---|---|---|
| change_request | type | en | standard | Standard | false | 1 | 2015-06-03 03:45:26 |
| change_request | type | en | normal | Normal | false | 2 | 2015-06-03 03:45:33 |
| change_request | type | en | emergency | Emergency | false | 3 | 2015-06-03 03:45:37 |
| change_request | type | en | expedited | Expedited | false | 4 | 2017-03-14 11:25:10 |

**2.** Complete the following steps to add the new change type to the change request interceptor.

**a.** Navigate to **System Definition** > **Interceptors**.

**b.** Open the **Change Request** interceptor.

**c.** Click **New** in the **Answers** related list.

**d.** Complete the form, as appropriate.

| Field | Description |
|---|---|
| Question | Change Request |
| Name | Enter a name for the new change type. For example, `Direct to Expedited Change`. |
| User Prompt | Enter a description that is displayed to the end user when they click **Create New** under **Change**. |
| Target URL | Set the appropriate target URL. For example, `change_request.do?sys_id=-1&sysparm_query=type=expedited`. |
| Order | Set the appropriate order level for the change type. For example, 400. |

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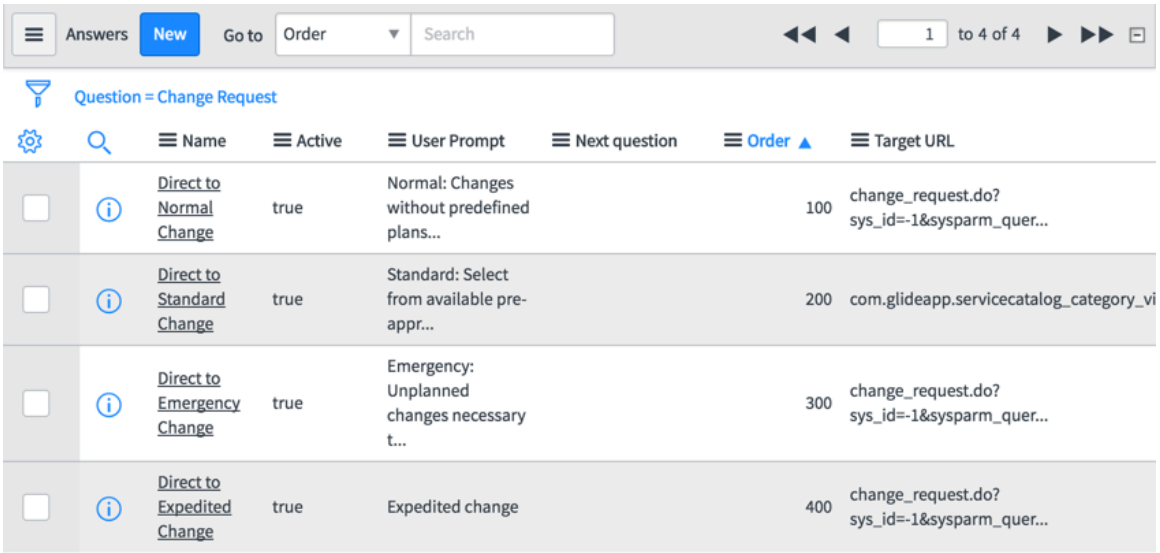
e. Submit the form.




3. Complete the following steps to create the script include for the new change type.

   a. Navigate to **System Definition** > **Script Includes**.

   b. Search for a change type script include on which to base the workflow for the new change type.
   For example, to base it on Emergency change type, search for `ChangeRequestStateModelSNC_emergency` and open the script include.

   c. Copy the script of the `ChangeRequestStateModelSNC_emergency` script include from the **Script** field.

   d. Navigate to **System Definition** > **Script Includes** and click **New**.

   e. Name the new script include to match the value of the new type.
   For example, `ChangeRequestStateModelCust_expedited`.

   f. Paste the copied script in the **Script** field of the new script include.

   g. Update any references in the pasted script include from `ChangeRequestStateModelSNC_emergency` to `ChangeRequestStateModelCust_expedited`.

   h. Click **Submit**.

   **Note:**
   An existing script include contains the implementation for all the `moving` and `canMove` functions. The `moving` function is used to pre-populate any fields that are required for the new state. The `canMove` function is used to check for any additional requirements and to validate whether a task can move to the next state.

4. Complete the following steps to create the script include to define state transitions and control the transitioning between states for the new change type.

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a. Navigate to **System Definition** > **Script Includes**.

b. Search for change type script include on which to base the transitioning controls for the new change type on.

   For example, to base it on Emergency change type, search for *ChangeRequestStateModel_emergency* and open the script include.

c. Update the name of the script include to match the value of the new type.

   For example, *ChangeRequestStateModel_expedited*.

d. Update the reference to the base script include for the new change type as created in step 3.

   Change the extended Object in line 2 to the base script include name. For example, *ChangeRequestStateModelCust_expedited*, so the reference is similar to the following string.

   ```
   ChangeRequestStateModel_expedited.prototype =
   Object.extendsObject(ChangeRequestStateModelCust_expedited,
   ```

   Ensure that the reference of the type is similar to the script include that is created. For example, `type:"ChangeRequestStateModel_expedited"});`. The type is present at the bottom of the script.

e. Click **Insert and Stay** create a copy of the script include *ChangeRequestStateModel_emergency* with the new name *ChangeRequestStateModel_expedited*.

5. Complete the following steps to modify the script include that controls the transition between states using one of the defined models for the new change type.

   a. Navigate to **System Definition** > **Script Includes**.

   b. Search for and open the *ChangeRequestStateHandler* script include, which controls the transitioning between states using one of the defined models.

   c. Create a property to reference the new change request type value.
   For example, *EXPEDITED:"expedited"*.

   d. Override the base method *_resetModel* to be able to include the new model.

      For example, if the change request type is *expedited*, then the new state model *ChangeRequestStateModel_expedited* is included. You must include the string *EXPEDITED:"expedited"* after *initialize: function(changeRequestGr){* as shown in the screen.

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```
ChangeRequestStateHandler.prototype = Object.extendsObject(ChangeRequestStateHandlerSNC, {
    initialize: function(changeRequestGr) {
        ChangeRequestStateHandlerSNC.prototype.initialize.call(this, changeRequestGr);
    },
    EXPEDITED:"expedited",
    type: "ChangeRequestStateHandler"
});
```

e. Save the script include.

6. Complete the following steps to create a workflow for the new change request type.

a. Navigate to **Workflow** > **Workflow Editor**.

b. Open an existing change request workflow.
For example, **Change Request – Emergency**.

c. Select **Copy** from the **Actions** menu to copy the workflow and name the new workflow.
For example, `Change Request - Expedited`.

d. Select **Properties** from the **Actions** menu to update the condition under which the new workflow executes.
For example, **[Type] [is] [Expedited]** in the condition.

e. Open the matching change tasks workflow that is called by the main workflow.
For example, **Change Request - Emergency change tasks**.

f. Select **Copy** from the **Actions** menu to copy the workflow and name the new workflow.
For example, `Change Request - Expedited change tasks`.

g. Select **Publish** from the **Actions** menu to publish the new change tasks workflow and make it available for use.

h. Go back to the first workflow you created and update the Workflow activity to reference the new change tasks workflow.
For example, **Change Request - Expedited change tasks**.

i. Select **Publish** from the **Actions** menu to publish the new workflow and make it available for use.

**Related topics**

Change types

Add a state to the state model

## Extend or disable multiple CI association

The ability to associate multiple CIs to a task can be extended to other types of tasks. You can also disable multiple CI association from the related lists on change request records.

### Before you begin

Role required: admin

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### Procedure

1. In the navigation filter, enter `sys_properties.list` to open the System Property [sys_properties] table.
2. Open the **List of all the task types where user wants to associate CIs using a List** (*com.snc.task.associate_ci*) system property.
   The value of this property is set to change_request, incident by default to enable association of multiple CIs to change requests.
3. To enable multiple CI association to other types of task, add the required table as a value.
   For example, to enable multiple CI association for problem records, add `problem` as a value, separated by a comma.
4. Click **Update** to save and update the property.
5. **Optional:** Complete the following steps to disable multiple CI association for the Change Request form.

   a. Remove the **change_request** value from the **List of all the task types where user wants to associate CIs using a List** (*com.snc.task.associate_ci*) system property.

   b. Navigate to **System UI** > **List control**.

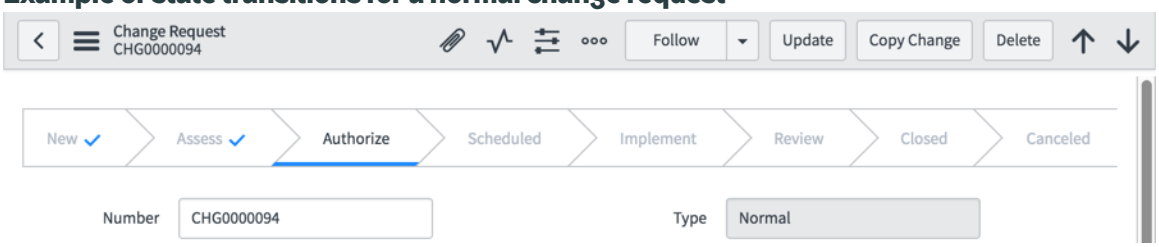
   c. Perform one or both of the following tasks to disable multiple CI association for the related lists.

| | |
|---|---|
| **Associated CIs** | Open the entry with the **task_ci.task** related list and clear the **Omit edit** check box. |
| **Impacted Services/CIs** | Open the entry with the **task_cmdb_ci_service.task** related list and clear the **Omit edit** check box. |

## State model and transitions

Change Management offers a state model to move and track change requests through several states.

**Example of state transitions for a normal change request**




The following table provides a list of all the states that a change request can progress through. Email notifications can be sent to the user who requested the change when it progresses to the following states: **Scheduled**, **Implement**, **Review**, and **Canceled**.

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### Change states

| State | Description | State value |
|---|---|---|
| New | Change request is not yet submitted for review and authorization. A change requester can save a change request as many times as necessary while building out the details of the change prior to submission. | -5 |
| Assess | Peer review and technical approval of the change details are performed during this state. | -4 |
| Authorize | Change Management and the CAB schedule the change and provide final authorization to proceed. | -3 |
| Scheduled | The change is fully scheduled and authorized, and is waiting for the planned start date. An email notification is sent to the user who requested the change. | -2 |
| Implement | The planned start date has approached and the actual work to implement the change is being conducted. An email notification is sent to the user, who requested the change. | -1 |
| Review | The work has been completed. The change requester determines whether the change was successful. A post-implementation review can be conducted during this state. An email notification is sent to the user who requested the change.<br>**Note:**<br>You cannot cancel the change request if it is in the Review state. | 0 |
| Closed | All review work is complete. The change is closed with no further action required. | 3 |
| Canceled | A change can be canceled at any point when it is no longer required. However, a change cannot be canceled from a **Closed** state. An email notification is sent to the user who requested the change. | 4 |

Normal, standard, and emergency changes progress through states in different ways.

### Change state progress

| | New | Assess | Authorize | Scheduled | Implement | Review | Closed | Canceled |
|---|---|---|---|---|---|---|---|---|
| Normal | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Standard | ✔ | ✗ | ✗ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Emergency | ✔ | ✗ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |

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## State progress for different changes

- Normal changes progress through all states.
- Standard changes are considered to be pre-authorized, so they bypass the **Assess** and **Authorize** states that trigger approval records. Approving these changes progress the change to the next appropriate state. Rejecting these changes send them back to **New** state.
- Emergency changes are similar to standard changes, except that they must be authorized.

## Revert a change request to a New change

Change Management allows the Emergency and Normal change types to be reverted to the new state which is the first approval state using the **Revert to New** action from the **Context** Menu. This action is performed if the approval was requested and the submitter recognizes that not all configuration item in the scope of the change is included before submitting for approval.

- To modify the Normal change request to the New state, modify the state of a change request from **Assess** state to **New** state by clicking **Revert to New** from the Context menu.
- To modify the Emergency change request to the New state, modify the state of a change request from **Authorized** state to **New** state by clicking **Revert to New** from the Context menu.

> **Note:**
> When you revert to **New** from the **Assess** state or the **Authorized** state, the workflow is restarted and all pending approvals are cancelled.

## Modify change request type

- A new ACL for change_request.type has been added that allows modification of the **Type** field in change request when the change request is in a **New** state and no approvals have been generated yet for it.
- In case of **Standard** change request, you can modify the type of the change request from Standard to **Normal** or **Emergency**, if the state of a change request is **New**.
- In case of **Normal** or **Emergency** change request, you can modify the type of the change request from **Normal** to **Emergency** or vice versa if the state of a change request is **New**.
- If a **Normal** or **Emergency** change request is rejected, the state of the change request is set to **New**. As the state of the change request is **New**, you can modify the type of the change request again. For example, if your **Emergency** change request is rejected on the grounds that the change request is **Normal**, you can modify the **Type** of the change request to **Normal** and resubmit the change request.

## Disabled Cancel change action

The Cancel option for a change request in the Review state is disabled. This restricts cancelling the request when the work is complete and is waiting for review.

### Add a state to the state model

You can add a new state to the existing state model for different change types based on the requirements of your organization.

#### Before you begin

Role required: script_include_admin, ui_policy_admin, ui_action_admin, or admin

#### About this task

The State model plugin is activated by default. For more information about base system states for change requests, see State model and transitions.

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### Procedure

1. Navigate to **All** > **Change** > **Create New** and complete the following steps to add a choice to the choice list.

   a. Right-click the **State** field and click **Configure dictionary**.

   b. In the **Choices** related list, run a filter for **[Table] [is] [change_request]**.

   c. Click **New** and add the new state with the following information.

   - **Table**: Change Request [change_request]
   - **Label**: name of your new state
   - **Value**: numerical value that is not already assigned to an existing state choice
   - **Sequence**: number corresponding to the location for it to appear in the list of states. If you assign it the same sequence number as another choice, it appears below the other choice.

   d. Click **Submit**.

2. Navigate to **System definition** > **Script includes**.
   Script include records that contain *SNC* in the name are read-only. As you complete the following steps, ensure that you are selecting the correct script include to modify. For example, modify *ChangeRequestStateHandler* not *ChangeRequestStateHandlerSNC*.

   **Note:**
   Extended script includes (without *SNC*) include all of the functionality of their SNC counterparts. If you modify a base script include (appended with *SNC*), it is no longer updated during system upgrades.

3. Open the *ChangeRequestStateHandler* script to perform the following edits.

   - Update the **statehandler constants** section at the start of this script include to include values for the newly added state. For example:

     ```
     ChangeRequestStateHandler.MY_NEW_STATE = "mynewstate";
     ```

   - Update the **STATE_NAMES** map at the end of the initialize function to include the numeric value for the newly added state. For example:

     ```
     this.STATE_NAMES["-6"] =
      ChangeRequestStateHandler.MY_NEW_STATE;
     ```

     **Note:**
     The **STATE_NAMES** map provides a mapping between the numeric values that are stored in the **State** field on a change request under a memorable name. This mapping enables the memorable name to be used in the state model script includes.

4. Edit the appropriate script include to incorporate the new states into the model for the relevant change request types.
   Each type of change request has a corresponding script include named *ChangeRequestStateModel_<type>* where *<type>* is the value of the change request type. For example, *ChangeRequestStateModel_normal* defines the state model for change requests with a type of normal.

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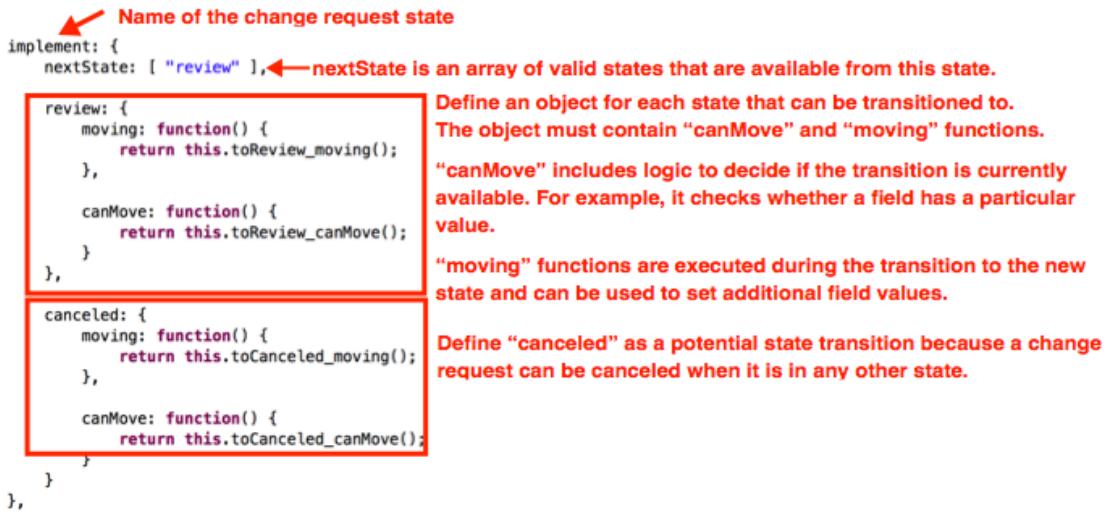
Each state model script include defines objects that specify the following information.

- Which states are available.
- The next state or states for each available state.
- Functions for each state transition to decide whether that transition is available (`canMove`) along with a function to be executed as part of moving to that state (`moving`).

The following example is from the *`ChangeRequestStateModel_normal`* script include.




5. Create a UI action to provide a button to progress the change request to the new state.

   a. Use **Insert and Stay** to make a copy of one of the default UI actions, such as **implement**.

   b. Update the following fields on the form.

| Field name | Update |
|---|---|
| Name | Update to match the name of the new state. |
| Action name | Replace the state at the end of the name with the new state. |
| Hint | Update the text to refer to the new state. |
| Onclick | Rename the function to match the new state. |
| Condition | Update the call to the `isNext` function with the new state. |
| Script | ▪ Update the function name to match the one specified in the **Onclick** field.<br>▪ Update the line that starts with `ga.addParam("sysparm_state_name",...` to enter the name of the new state as the second parameter of the `addParam` function.<br>▪ Update the line starts with `gsftSubmit` and modify the third parameter of this function call to match the value entered in the **Action name** field. |

The following example uses the **Implement** UI action to show the values to update.

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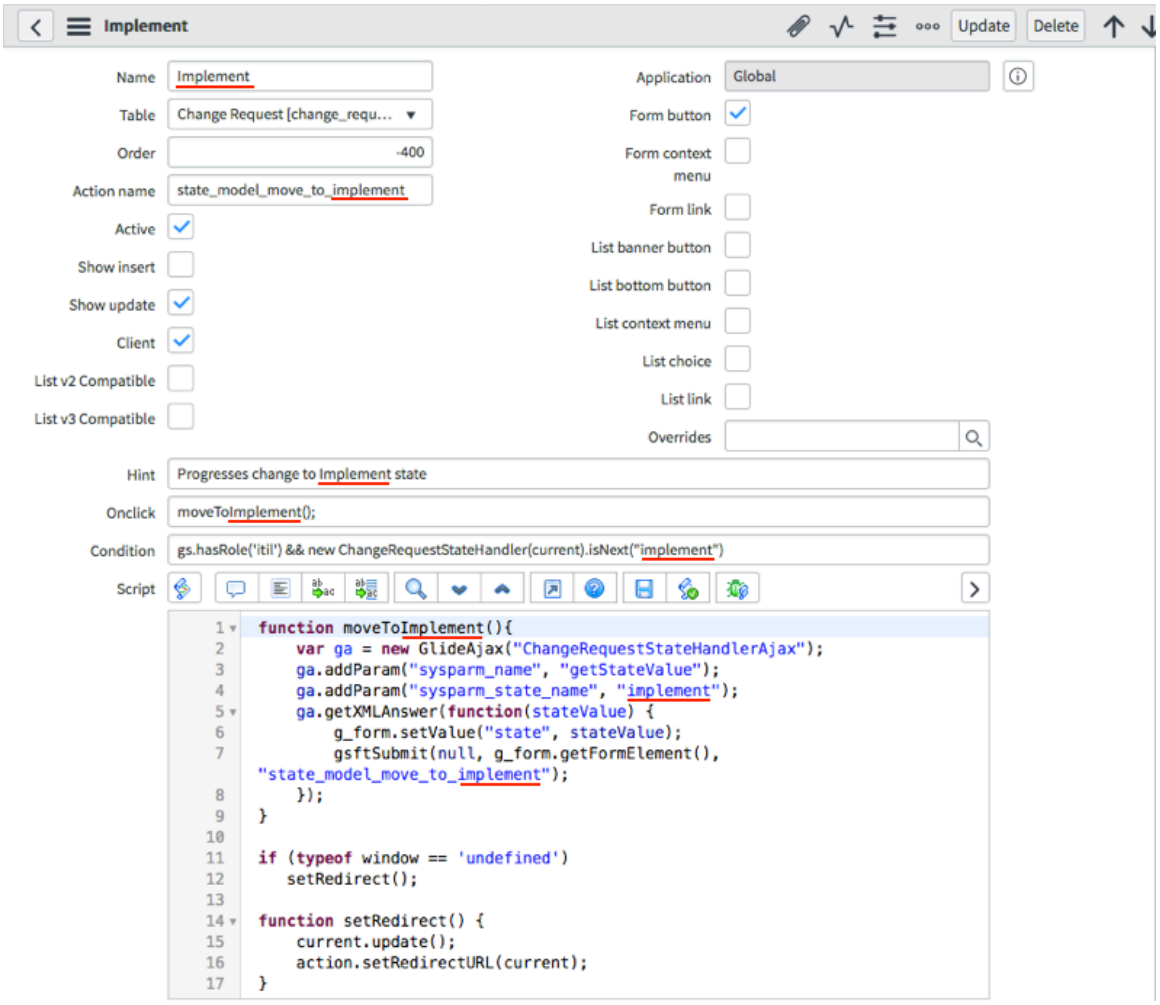


The *ChangeRequestStateHandler* script include contains two functions that are used to determine if a UI action is displayed based on the current state of the change request.

- `isNext(stateName)`: This function only checks if the *stateName* passed as a parameter is available as a next state for the current state of the change request.
- `canMoveTo(stateName)`: This function performs the same check as the *isNext* function. However, it also checks the result of calling the appropriate *canMoveTo* function for the transition from the current state to the *stateName* passed as a parameter. This function is used if there are additional checks in the *canMove* functions such as checking that a field contains a particular value.

6. Complete the following steps to update the process flow configuration to incorporate the new change state.
   The process flow is displayed at the top of the Change Request form and is configured in various process flow records.

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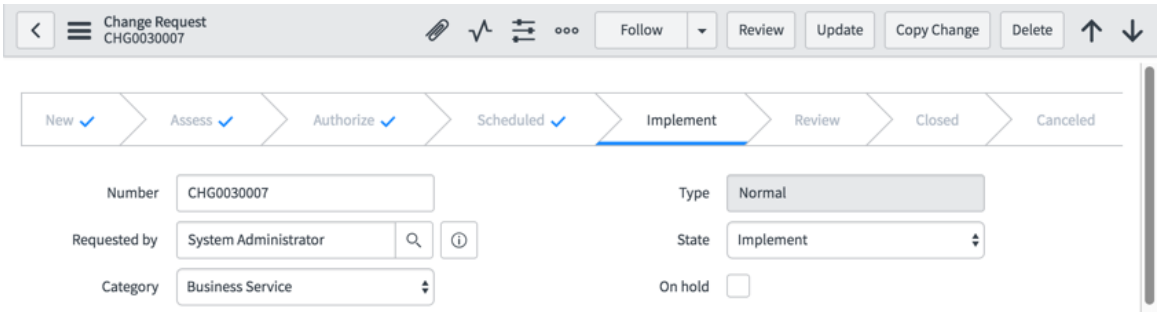


**a.** Navigate to **System UI** > **Process Flow** module and filter for **[Table] [is] [change_request]**.

**b.** Open a record and use **Insert and Stay** to make a copy.

**c.** Update the following fields on the form.

| Field name | Update |
|---|---|
| Name | Update to match the name of the new state. |
| Label | Update to match the name of the new state. This value is included in the process flow at the top of the Change Request form. |
| Order | Update this number so that the new state is in the correct sequence with the existing process flow records for other states. |
| Condition | Update the filter to match the new state. |

**d.** Click **Update**.

### What to do next

To ensure that the new state works as expected, review the default workflows. Add the new state to the workflow as necessary.

## Review default workflows

Any modification to the state model may impact the default workflows for change requests.

### Before you begin

Role required: admin

### About this task

Each change type has a default workflow. To ensure that any change to the state model has not adversely impacted workflows, you must review each of the default workflows.

### Procedure

Review the workflow for each `ChangeRequestStateModel_<type>` script include that has been modified.

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### Change request default workflows

| Change type | Script include name | Workflow |
|---|---|---|
| Normal | ChangeRequestStateModel_normal | Change Request - Normal |
| Standard | ChangeRequestStateModel_standard | Change Request - Standard |
| Emergency | ChangeRequestStateModel_emergency | Change Request - Emergency |

Modifications to the default workflow for each change type depend on where the new state is added in the sequences of states.

### Configure state model transitions

You can use script includes or UI policies to configure state models and the criteria for moving change requests from one state to another.

## Before you begin

Role required: script_include_admin, ui_policy_admin, or admin

## Procedure

1. Complete the following steps to add state change criteria in a script include that enables a state transition.

   a. Navigate to **System Definitions** > **Script Includes**.

   b. Open the script include for the state transition model that you want to edit.

| State transition model | Script include |
|---|---|
| Normal | ChangeRequestStateModel_normal |
| Standard | ChangeRequestStateModel_standard |
| Emergency | ChangeRequestStateModel_emergency |

   c. Modify the appropriate method *canMove* method in the script include.

   **Example**
   For example, to add a condition for a normal change to transition from the New state to the Authorized state, modify the *draft.authorized.canMove()* method in the *ChangeRequestStateModel_normal* script include. In the script, the GlideRecord you are acting on can be referenced using the *this._gr* variable.

   The *canMove* method is part of a structure that defines the transitions available to the change type. The *canMove* method is contained in the *currentState.nextState.canMove()* structure.

2. Complete the following steps to use a UI policy to add new criteria for state transitions.

   a. Navigate to **System UI** > **UI Policies**.

   b. Open a default UI policy to edit or click **New** to create a new policy.
   The following are the default UI policies.

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| UI Policy | Description |
|---|---|
| Show | CAB fields for normal and emergency changes from the **Authorize** state and onwards. |
| Mandatory | **Assignment Group** field. |
| Mandatory | **Close notes** and **Code** fields when in the **Closed** state. |

**Note:**
In both of the mandatory UI policies, the state of the change request determines the mandatory fields. For **Show - CAB** fields, the type of change is also taken into account because standard changes do not require approval.

**c.** Complete and save the UI policy.

## Create a Change model

Depending on your requirements, you can create a Change model and configure the states and transitions for a specific use case.

### Before you begin

Role required: change_manager

### Procedure

1. Navigate to **All** > **Change** > **Administration** > **Change Models**.
2. Click **New**.
3. On the form, fill in the fields.

#### Change Model form

| Field | Description |
|---|---|
| Name | Unique name for the Change model. |
| Default Change Model | Option for enabling the Change model as a default model on the Change request form. |
| Active | Option for enabling that this model is available for selection when creating a Change request. |
| Color | Color that appears on the left side of the Change model bar on the **Models** tab in the Change landing page. |
| Available in 'Create New' | Option for enabling that this model is available for selection on the **Models** tab on the Change landing page. Also, the model will be available to select in the **Model** field on the Change request form. |
| Description | Detailed description of the Change model. |
| Implementation states | Implementation state for the Change model. For more information on states, see State model and transitions. |

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| Field | Description |
|---|---|
| | If you are using Mass CI Update with Change Models ensure the Implementation states field in the model is set to the state in which you want the changes to take effect. |
| Record Preset | Preset values for all changes using this model.<br><br>You can set a pre-defined value for any field, which will be pre-populated when you create a change request. This field will then become read-only in the change request form. |
| Advanced Security | Option to enable role-based access controls and user criteria to tailor the Change creation landing page views. When you enable Advanced Security, **Available For**, **Not Available For**, and **Can write** tabs appear next to **Model States** tab. |
| Read Roles | Option to define the roles to view the Change model. |
| Write Roles | Option to define the roles to edit the Change model. |

4. Click the form context menu icon ( ) and select **Save**.
   The Model States context menu appears. You can select the states for your Change model.
5. Click **New**.
6. On the form, fill in the fields.

**Model State form**

| Field | Description |
|---|---|
| State | State that you want to include in your model. |
| Initial State | Option to enable this state as the initial state for your model. This field is automatically selected when you add the first state to your model. |

7. To save the state and return to the Change Model form, click **Submit**.
8. To add a transition between the states, click the display/hide hierarchical lists icon ( ) for the model state that you want to apply the transition to.
   The Model State Transitions context menu appears.
9. Click **New**.
10. On the form, fill in the fields.

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**Model State form**

| Field | Description |
|---|---|
| From | State that the Change request is moving from. |
| To | State that the Change request is moving to. |
| Automatic Transition | Option for enabling automatic transition to the Change request when the defined conditions are met. Selecting this option also prevents you from manually selecting the **State** field on the Change request form. |

11. Click the form context menu icon ( ) and click **Save**.
    The Model State Transition Condition context menu appears.
12. Click **New**.
13. On the form, fill in the fields.

**Model State Transition Condition form**

| Field | Description |
|---|---|
| Name | Unique name for the condition. |
| State Transition | State that you're applying the transition condition to. This field is automatically set with the state that you're applying the condition to. |
| Description | Detailed description of the condition. |
| Requires | Condition for your transition. You can select a pre-defined condition or select **Transition Condition** to define a condition. To create pre-defined conditions, see Create predefined conditions. |
| Condition (condition builder) | Condition on the Change request that must be fulfilled to enable the transition. |
| Condition (script) | Script that must be fulfilled to enable the transition. The script returns a value of **True** when passed. |
| Active | Option to make the condition active. |

14. Click **Submit**.
15. Select **Available For** tab.
16. Select **New** to add the list of users who can access the Change model
17. On the form, fill the fields.

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### User Criteria record

| Field | Description |
|---|---|
| Name | Unique name for the user criteria record. |
| Active | Option to make the condition active. |
| Users | Option to select the users who can access the Change model. |
| Groups | Option to select the groups who can access the Change model. |
| Roles | Option to select the role who can access the Change model. |
| Companies | Option to select the companies who can access the Change model. |
| Locations | Option to select the location of the company who can access the Change model. |
| Departments | Option to select the departments who can access the Change model. |
| Match All | Option to use the Change model if it meets all conditions in the user criteria. |
| Advanced | Option to create a script to meet the condition for user criteria. |

18. Select **Submit**.
19. Manage the users to access the change model by providing the user access in **Not Available For**, **Available For**, and **Can Write** tabs:
    - **Available For** – Provides the access for the change model
    - **Not Available For** – Doesn't provide the access for the change model
    - **Can Write** – Provides the editable access to the change model

    For more information on user access, refer Create a user criteria record for Change Management.
20. Select **Submit**.

### Create predefined transition condition types

Create predefined transition conditions to reuse the conditions for your Change models.

#### Before you begin

Role required: change_manager

#### Procedure

1. Navigate to **All** > **Application** > **Module** > **Change Model Condition Types**.
   A list of transition conditions for Change requests appears.
2. Click **New**.
3. On the form, fill in the fields.

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**Model State form**

| Field | Description |
|---|---|
| Name | Unique name for the condition type. This name is displayed in the **Requires** field on the Model State Transition Condition form. |
| Description | Detailed description of the condition type. |
| Condition Type | Type of condition that is either **condition** or **script**. |
| Table name | Table name that the condition is based on. |
| Condition (Condition builder) | Conditions that must be fulfilled for processing the transition. |
| Condition (Script) | Script that must be fulfilled for processing the transition. If passed, it returns a value of **true**. |

4. Click **Submit**.

### Attach a process for Change model states

You can attach a process with defined conditions to the Change model states to enable state transitions.

This process can be done by using one of the following methods:

- ServiceNow® Flow Designer :See Flow Designer .
- Business Rules: See Business rules .
- Workflow: See Workflow .

Change flows for default Change models are available in Flow Designer . For more information on default Change flows, see Change flows.

## Evaluating a Change model

When your flow is completed, you can evaluate the Change model to process any automated transitions. In Flow Designer , the **Evaluate Change Model** action is used to evaluate the Change model.

When using Business Rules or Workflow, you can use the script to evaluate the Change model. For example, see the *Change Registration: Auto State Change* business rule on the change_request table.

You can also evaluate a Change model for a specific Change request using this event:

**Event to evaluate Change model**

| Event name | Parameter | Description |
|---|---|---|
| change_model.evaluate | Change Request sys_id | Process that may affect the state of the Change request but doesn't change the Change request record. |

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## Conflict detection

Conflict detection identifies potential scheduling conflicts for a change request based on the configuration items (CIs), planned start date, and the planned end date in scope for the change. If a scheduling conflict exists, conflict detection also checks any related blackout or maintenance schedules and other active change requests to determine the scheduling conflict.

Conflict detection identifies conflicts for any of the following reasons:

- The CIs are already scheduled at the given date and time.
- A parent of the CI is already scheduled at the given date and time.
- A child of the CI is already scheduled at the given date and time.
- The CI is not in the maintenance window.
- A parent of the CI is not in the maintenance window.
- A child of the CI is not in the maintenance window.
- The CI is in a blackout window.
- A parent of the CI is in a blackout window.
- A child of the CI is in a blackout window.
- The assigned to person is already scheduled at the given date and time.

If conflicts are identified, the **Conflict status** field is updated to reflect a conflict and an error message directs you to the Conflict form section of the Change request record to review conflicts. When you create a change request and provide a CI, planned start date, and planned end date, or update any of these values, conflict detection is executed automatically.

You can choose to show or hide the conflict error message by using the **Enable/Disable Scheduling Conflict Message** menu item from the context menu. As an admin, you can configure the message display setting using the *change.conflict.show_conflict_message* property. For more information on the property, see Conflict analysis properties.

You can manually execute conflict detection. For more information, see Detect conflicts manually and review conflict details.

The Conflicts form section lists specific conflict details including the type of conflict, conflicting schedule, or conflicting change request. If a conflict must be resolved before requesting approval, modify the **Planned start date** and **Planned end date** fields in the Schedule form section.

## Conflict Calendar

You can also use the Conflict calendar to visually display any scheduling conflicts identified. To reschedule the change request, click the change request record or drag the change request to another time within the calender.

### Configure conflict analysis properties

Configure Change Management conflict analysis properties to detect change conflicts. Use the relevant information to calculate conflicts for change requests and review and modify the change to eliminate conflicts.

**Before you begin**
Role required: admin

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### About this task

By default, not all properties are selected in the Change Management Conflict Analysis Properties page. Modify or customize conflict detection capabilities to meet the needs of your organization.

### Procedure

1. Navigate to **All** > **Change** > **Administration** > **Conflict Properties**.
2. In the Change Management Conflict Analysis Properties page, enter the roles that have access to the conflict detection feature.
3. Configure the remaining customization properties as required.
4. Click **Save**.

### Related topics

Conflict analysis properties

### Conflict analysis properties

Conflict detection includes properties that determine how the conflict detection capability is executed. Identify conflicts based on the selected properties and the roles that have access to the feature.

These properties are available by navigating to **Change** > **Administration** > **Conflict Properties**.

#### Change Management conflict analysis properties

| Property | Property name | Description |
|---|---|---|
| A comma separated list of roles which have access to the conflict detection feature. Roles included here should have access to the underlying change_request record | *change.conflict.role* | The roles are entered exactly as they appear in **User Administration** > **Roles**. For example, enter `itil`. |
| When checking for change request conflicts, check against blackout windows | *change.conflict.blackout* | To check if the change request falls within the blackout wi25ndow, select **Yes**. |
| When checking change request conflicts, check whether the change falls within the child CIs' blackout window | *change.conflict.relatedchildblackout* | To check if the change request of any of the child configuration items (CIs) falls within the blackout window, select **Yes**. |
| When checking change request conflicts, check whether the change falls within the parent CIs' blackout window | *change.conflict.relatedparentblackout* | To check if the change request of the parent CI falls within the blackout window, select **Yes**. |
| When checking change request conflicts, check against changes already schedules for the same CI | *change.conflict.currentci* | To check if the change request is already scheduled against the given CI, select **Yes**. |

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**Change Management conflict analysis properties (continued)**

| Property | Property name | Description |
|---|---|---|
| When checking change request conflicts, check whether the change falls within the CIs' maintenance window | *change.conflict.currentwindow* | To check if the change request of the CI falls within the maintenance window, select **Yes**. |
| When checking change request conflicts, check whether the change falls within child CIs' maintenance window | *change.conflict.relatedchildwindow* | To check if the change request of any of the child CIs falls within the maintenance window, select **Yes**. |
| When checking change request conflicts, check whether the change falls within parent CIs' maintenance window | *change.conflict.relatedparentwindow* | To check if the change request of the parent CI falls within the maintenance window, select **Yes**. |
| When checking change request conflicts, check whether the change falls within the schedule defined in the maintenance schedule reference field on the CI | *change.conflict.ci_maint_sched* | To check if the change request falls within the scheduled maintenance defined for the CI in the maintenance schedule reference field, select **Yes**. |
| When checking change request conflicts, check whether the change falls within maintenance or blackout windows affecting related Application Services | *change.conflict.relatedservices* | To check if the change request that falls within the maintenance or blackout windows affects other related application services, such as the services created that include the CI scheduled for change or any other CI within that service, select **Yes**.<br><br>**Note:** This action requires any business services identified to be converted to an application service. For more information, see Convert business services to application services. For information about application services, see Application services Application services. |

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**Change Management conflict analysis properties (continued)**

| Property | Property name | Description |
|---|---|---|
| When checking change request conflicts, check whether other change requests are already scheduled for the same assigned to user | *change.conflict.assigned_to* | To check if any other change request is assigned to the same change request assigned to a user. For example, if you assign a change request to a user who is already scheduled to implement another change request at that date and time, a conflict error is displayed, select **Yes**. |
| CI conflict check mode. Basic mode only checks the change requests CI. Advanced mode checks the entire Affected CIs related list (the change's CI will be automatically added to the related list) | *change.conflict.mode* | To check the conflict mode for a CI, select the appropriate CI conflict mode.<br>• **Basic**: When selected, checks only change requests of the CI against the change request for the CI and all affected CIs.<br>• **Advanced**: When enabled, checks both the CI for the current change request and affected CIs against other change requests for the CI and affected CIs. |
| Run conflict detection automatically after changes to Configuration item, Planned start date, Planned end date or State when a change request is updated | *change.conflict.refresh.conflict* | To refresh and run conflict detection automatically when any of the following field values are changed, select **Yes**.<br>• **Configuration item**<br>• **Planned start date**<br>• **Planned end date** |
| Enable the scheduled change conflict checker | *change.conflict.refresh.scheduled* | To enable the schedule change conflict checker, select **Yes**. |
| Automatically include business or application services related to CIs with conflicts in the Impacted CI related list | *change.conflict.populateimpacted* | To automatically include and list all the business and application services with related CIs that have conflicts, select **Yes**. |

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**Change Management conflict analysis properties (continued)**

| Property | Property name | Description |
|---|---|---|
| Identify the most critical business or application service affected when a conflict is detected against a supporting configuration item | *change.conflict.identifymostcritical* | To identify the most affected business or application services that have a related conflicting CI, select **Yes**. |
| Define the number of days to be factored after the respective Planned start/ end date of a Change record when searching for the next available time. This window is used to find all potentially conflicting Changes, the larger the window, the more Changes that need to be factored per search. Default value is 90 days; the value must be a positive integer. | *change.conflict.next_available_schedule_window* | To calculate from the scheduled planned start date or end date of the change request to find the next available time, enter the number of days.<br>• Type: Integer<br>• The default value is **90** |
| Define the number of suggestions to be calculated for the next available time field on a Change. The greater the value, the more time taken to calculate the next available times to implement the change. Default value is 100 suggestions; the value must be a positive integer. | *change.conflict.next_available_suggestion_limit* | Enter the number of suggestions to calculate and display for the next available time.<br>• Type: Integer<br>• The default value is **100** |
| Logging level for ChangeCheckConflict (default: Notice) | *change.conflict.log* | Select any of the logging levels for the change conflict.<br>• **Emergency**<br>• **Alert**<br>• **Critical**<br>• **Error**<br>• **Warning**<br>• **Notice**<br>• **Info**<br>• **Debug**<br>The default level is **Notice**. |

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**Change Management conflict analysis properties (continued)**

| Property | Property name | Description |
|---|---|---|
| Handle contiguous change request that has overlapping schedules that results in conflicts. | *change.conflict.allow_contiguous_changes* | This property is enabled by default. |
| Show message when scheduling conflict is detected. | *change.conflict.show_conflict_message* | Shows a message when scheduling conflict is detected. Choose any of the given options to configure the display of the conflict message.<br>• **User Preference**: Displays a UI menu option where the user can toggle to show or hide the conflict message.<br>• **Always**: Always displays the conflict message.<br>• **Never**: The conflict message is not displayed unless the property is changed to either **User Preference** or **Always**.<br>By default, **User Preference** is selected. |
| Consolidate conflicts so a conflict is only registered for each unique combination of conflict type and schedule or conflicting-change. | change.conflict.consolidated_conflicts | Displays only the conflicts that results from a unique combination of the conflict type and schedule or conflict type and conflicting-change.<br>By default, the property is enabled. |

### Create blackout and maintenance schedules in Change Management

Use the Blackout and Maintenance windows to schedule a change. Blackout windows specify times during which normal change activity should not be scheduled. Maintenance windows specify times during which change requests should be scheduled. For example, create a blackout schedule for code freezes at the end of the year. blackout-maintenance-schedule

#### Before you begin

Role required: itil_admin or admin

Ensure that the Change Management - Collision Detector (com.snc.change.collision) plugin is activated.

#### About this task

Conflict detection uses blackout and maintenance schedules to find potential scheduling conflicts for the configuration items (CIs) associated with a change request. When conflict

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detection runs, either automatically or by manual request, conflict detection determines if either type of defined schedule applies to the change request. If a potential conflict is identified, a warning message appears and conflicts are listed within the Conflict form section. View conflicts in the Conflict calendar.

**Note:**
To use the business service as the source for a blackout or maintenance schedule, the business service must be converted to an application service. For instructions, see Convert business services to application services. For information about application services, see Application services.

### Procedure

1. Create a blackout or maintenance schedule.

| Option | Description |
|---|---|
| **Create a blackout schedule** | **a.** Navigate to **Change** > **Schedules** > **Black out Schedules**.<br>**b.** Click **New**. |
| **Create a maintenance schedule** | **a.** Navigate to **Change** > **Schedules** > **Mainte nance Schedules**.<br>**b.** Click **New**. |

2. On the form, fill in the fields.

**Blackout and Maintenance schedule form**

| Field | Description |
|---|---|
| Name | Unique name for the schedule. |
| Description | Short description about the schedule. |
| Time zone | Time zone for the schedule.<br><br>Select **Floating** to evaluate planned start and end dates on the Change Request form for the logged-in user. |
| Source | Source of the blackout or maintenance schedule. The available options are **Service**, **Change Request**, and **CI Class**.<br><br>**Note:**<br>When you select **Service** or **Change Request** from the Source list, the **Applies to** field does not appear. The **Applies to** field appears if you select **CI Class** as the Source, which in turn enables the selection of a **CI Class**. |
| Applies to | CI classification that the conflict detection is filtered on.<br><br>You can select a dynamic CI group so that all the configuration items in that dynamic CI group will be taken into account for blackout and maintenance when conflict detection is run. |

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| Field | Description |
|---|---|
| | The dynamic CI group is seen as the parent CI to all the CIs that are within that group. If there are scheduling conflicts related to any of the CIs in the dynamic group, the conflict will be shown in the conflicts table of the dynamic CI group. |
| Condition | Conditions to specify the CIs that the schedule applies to.<br><br>This field does not appear when the **Applies to** field is set to **None**.<br><br>**Note:**<br>Related fields used in conditions are not evaluated for blackout or maintenance schedules. |

3. Open the form context menu and click **Save**.
   A blackout or maintenance schedule is created and the Schedule Entries, Child Schedules, and Referenced By related lists appear in the change.

   **Note:**

   The Blackout Schedule [cmn_schedule_blackout] table extends the Condition Schedule [cmn_schedule_condition] table, which in turn extends the Schedule [cmn_schedule] table. The Blackout Schedule table inherits the domain properties from the Schedule table which has the Domain and Domain path columns.

   Because the Blackout schedule table uses the same Child Schedule and Schedule Entry tables as the Schedule table uses, the domain support is identical. The *domain_master* attribute is used to derive the domain from a parent record. For more information, see Domain support for schedules .

4. Create one or more schedule entries by completing the following steps:

   a. In the Schedule Entries related list of the new maintenance schedule, click **New**.

   b. Enter a unique name and define the time during which you want to schedule the maintenance.
      For more information about the schedule entries field, see Schedule entry fields .

### Result
A blackout or maintenance schedule is created.

### What to do next
Associate the configuration item with the maintenance schedule that is used in the change request.

### Related topics

Define a schedule

Schedule entry fields

Parent and child schedules

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### Assign a maintenance schedule to configuration items

You can review and determine the conflicts in a change schedule by assigning the maintenance schedules to configuration items (CI). After you assign a maintenance schedules to the CI, add the CI to the change request.

#### Before you begin
Role required: itil

#### About this task
When the configuration item with an assigned maintenance schedule is used in the change request, the conflict detection determines the schedule change outside the maintenance window and displays a conflict error message.

#### Procedure

1. Navigate to **All** > **Configuration** > **Application Servers**.
2. From the list of servers, select the server that you want to add the maintenance schedule to.

   **Note:**
   If you don't see the **Maintenance schedule** field on the record, click the personalize list icon ( ) and modify the Personalize List settings to add this field.

3. Double-click the **Maintenance schedule** field and use the search icon to select a schedule and assign it to the server.

#### Result
The selected maintenance schedule is assigned to the server.

### Configure a change request to monitor outside maintenance schedule conflicts

When a change request is configured to display the conflicts that are outside the maintenance schedule, conflict detection indicates whether the planned start and end dates occur outside the maintenance window or not. By reviewing the conflicts that are detected, you can modify the change schedule.

#### Before you begin
Role required: personalize_ui or admin

#### About this task
The Outside maintenance schedule check box is informational and the instance sets this value and disregards any changes that you make to this check box. The check box is selected by default if either of the following actions occur.

- The planned start and end dates in the change request with an associated configuration item (CI) are compared to the maintenance schedule and are determined to be outside the schedule.
- Affected CIs associated with the change request are checked against their assigned maintenance schedules, if any.

**Note:**
Only the maintenance window for the primary CI or affected CIs is checked; the upstream and downstream items are not checked.

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## Procedure

1. Navigate to **All** > **Change** > **Open** and select an existing change request.
2. If the **Outside maintenance schedule** field does not appear, add the field to the form.
   a. Click the context menu icon and then click **Additional actions** > **Configure** > **Form Layout**.
   b. Move **Outside maintenance schedule** to the Selected list.
   c. Click **Save**.

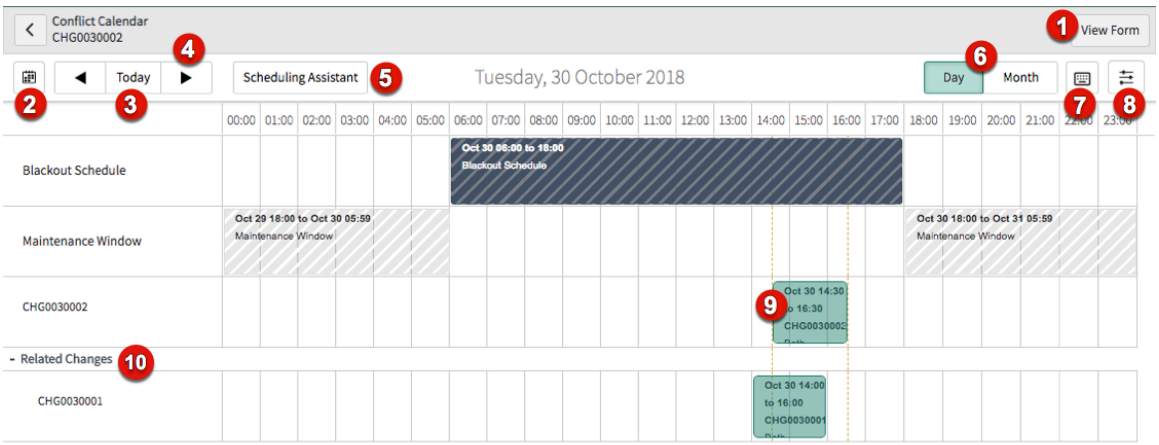
## Result

When you save a change request that is outside the maintenance schedule, a warning appears for each item (primary or affected). This warning also displays the planned dates that fall outside the maintenance window.

### Conflict calendar

The conflict calendar graphically represents the potential scheduling conflicts for a change request. Conflicts are identified as active change requests, blackout schedules, and changes scheduled outside maintenance schedules. Use the **Scheduling Assistant** to resolve any schedule conflicts.

**Conflict calendar**




| SI # | UI Component | Description |
|---|---|---|
| 1 | View Form | Returns you to the Change Request form. |
| 2 | Calendar | Enables you to choose a date. When you select a date, you can view the schedule details of that day. |
| 3 | Current day or month | Enables you to view the schedule of the current day or month when you click **Today**. |
| 4 | Navigating dates | Enables you to navigate to the previous day, the next day, or month, depending on the view type when you click the arrow buttons. |
| 5 | Scheduling Assistant | Enables you to choose from the list of available time slots to resolve conflicts. For more information on resolving conflicts, see Manage your change schedules and resolve conflicts Manage your change schedules and resolve conflicts |

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| Sl # | UI Component | Description |
|---|---|---|
| 6 | Day or Month view | Enables you to change the calendar view to a day view or month view. |
| 7 | Keyboard Shortcuts | Provides you with keyboard shortcuts for quick navigation. |
| 8 | Options | Enables you to control the view of the calender, customize settings, or set the configuration filters using the **Settings** tab and the **Configuration** tab. From the configuration filters you can select and display the **Assigned to**, **Assignment group**, **Configuration item**, or **Show all** options in the Related Changes section. This section has the same value of the option selected for the current change. |
| 9 | Change request block | Enables you to view the details of the change request. |
| 10 | Related Changes | Helps you to detect other scheduled changes that potentially conflict with the change based on a schedule or assignment. For example, if the same person is assigned to two or more changes at the same date and time, you can visually see the conflict and update one of the scheduled changes, as appropriate. |

### Manage your change schedules and resolve conflicts

Prevent schedule conflicts by using the conflict calendar to manage your change schedule details, customize views, and resolve conflicts.

#### Before you begin

Role required: admin

**Note:**
Users with the admin role must activate the Change Request Calendar (com.snc.change_request_calendar) plugin for the **Conflict Calendar** button to appear.

#### About this task

When there is a conflict, you can use **Scheduling Assistant** link in the change form to find the next available slot.

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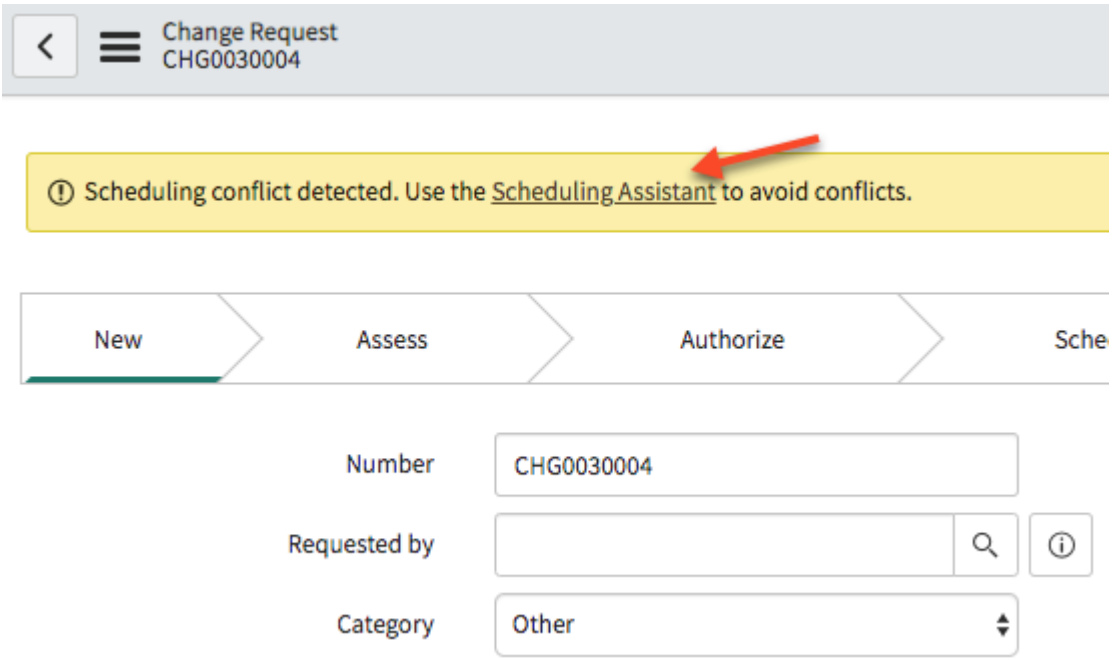
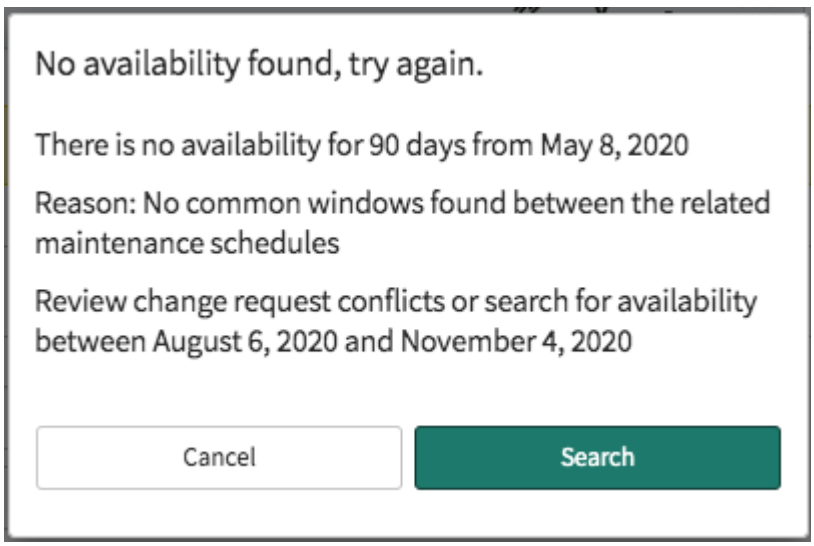



When there are no available slots for the next 90 days, then an actionable message is displayed with the reason why the assistant was not able to find a slot.




Alternatively, you can resolve conflicts by moving the change request to be within a maintenance window in the conflict calendar. The **Conflict Calendar** button appears in the header of the change form once the **Planned start date**, **Planned end date**, and the **Configuration items** fields are added and the record is saved.

### Procedure

1. Navigate to **All** > **Change** > **Open**.
2. Open your required change request.
3. Click **Conflict Calendar**.
4. Click **Scheduling Assistant**.
   The scheduling assistant dialog box displays the next available times to choose to resolve the conflict. The number of days factored after the planned start and end dates and the number of suggestions calculated for the next available time are configured under **Conflict properties**. For more information, see Configure conflict analysis properties form.

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5. Select the time from the available time slots.
6. Click **Select Available Time**.
   The planned start date and end date are updated with the new time, and the conflict is resolved.
7. To select another day from the calendar, click the calendar icon ( ) and select the date.

### Result
The conflicts are reviewed and resolved.

## Enable automatic change conflict detection

Automate conflict detection to run at specific intervals or when a change request is updated to immediately review the conflicts when the schedule dates are updated.

### Before you begin
Prior to running conflict detection, consider the following scenarios unique to your organization.

**CMDB list size and relationship complexities**

If you have a large organization with a large CMDB, conflict detection can take longer to complete.

**Inactive changes are not evaluated**

Conflict detection does not evaluate inactive changes when determining conflicting changes.

**Advanced mode conflict checking is disabled by default**

When you upgrade the application, advanced mode conflict checking is disabled by default and affected CIs are not considered during conflict detection. To evaluate all the CIs, set the mode to **Advanced**.

Role required: change_manager or admin

### Procedure
1. Navigate to **All** > **Change** > **Administration** > **Conflict Properties**.
2. Select one of the following options.

| Option | Description |
|---|---|
| **Run conflict detection automatically after changes to Configuration item, Planned start date, Planned end date, or State when a change request is updated** | When selected, runs conflict detection auto matically when a change to one or more of the following fields on the change request record is saved.<br>○ **Configuration item**<br>○ **Planned start date**<br>○ **Planned end date**<br>○ **State** |
| **Enable the scheduled change conflict check er** | When selected, runs the following conflict de tection scheduled jobs at these intervals:<br>*`Change Conflict Detection < 1 Week Away`* is scheduled every day.<br>*`Change Conflict Detection < 1 Month Away`* is scheduled every two days. |

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| Option | Description |
| --- | --- |
| | *Change Conflict Detection >=1 Month Away* is scheduled every seven days. |

3. Click **Save**.
   You can view the conflicts on the **Conflicts** tab on the change request record.

### Detect conflicts manually and review conflict details

Run conflict detection manually for a change request and cancel conflict detection before it completes. Review the conflicts detected either automatically or manually and resolve them by changing the schedules.

#### Before you begin

Before you can run conflict detection for a change request, the following fields must be completed in the change record.

- **Configuration item**, except in advanced mode. In advanced mode, the **Affected CIs** field is required instead.
- **Planned start date** of the change request.
- **Planned end date** of the change request.

For more information about running conflict detection automatically, see Enable automatic change conflict detection.

Prior to running conflict detection, consider the following scenarios unique to your organization.

**CMDB list size and relationship complexities**

If you have a large organization with a large CMDB, conflict detection can take longer to complete.

**Inactive changes are not evaluated**

Conflict detection does not evaluate inactive changes when determining conflicting changes.

**Advanced mode conflict checking is disabled by default**

When you upgrade the application, advanced mode conflict checking is disabled by default and affected CIs are not considered during conflict detection. To evaluate all the CIs, set the mode to **Advanced**.

Role required: itil or sn_change_write

#### Procedure

1. Navigate to **All** > **Change** > **Open**.
2. From the list of change requests, open the desired change request.
3. Click the **Conflicts** tab or scroll to the bottom the form to find the **Conflicts** tab.
4. Click **Check Conflicts**.
   To cancel without detecting conflicts, click **Close** on the Checking conflicts progress status pop-up window.
5. When the conflict detection is completed, click **Close** in the pop-up window.
   Conflicts appear in the Conflicts Detected list on the **Conflicts** tab. The **Conflict status** and **Conflict last run** fields on the change request record are also updated.

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6. In the Conflicts Detected list, review the list of conflicts that appear.

**Conflicts Detected List columns**

| Field | Description |
|---|---|
| Conflicting change | The change that is in conflict with the scheduled change, if any. |
| Affected CI | The affected CI associated with the change. |
| Last Checked | The last time the conflicts were checked. The **Last Checked** field is automatically updated. |
| Related CI | The parent CI or child CI of the current CI, if the CI has caused a conflict. |
| Schedule | The name of the maintenance window or blackout window that is causing the conflict, if any. |
| Type | The issue that caused the conflict.<br>○ **CI Already Scheduled**<br>○ **Parent CI Already Scheduled**<br>○ **Child CI Already Scheduled**<br>○ **Not in Maintenance Window**<br>○ **Parent Not In Maintenance Window**<br>○ **Child Not In Maintenance Window**<br>○ **Blackout** |

### Result

You can review the conflicts and the affected CIs in the Conflicts Detected list and reschedule the change to resolve the conflicts.

## Cancel conflict detection manually

Cancel any conflict detection jobs that are actively running for a change request if you want to make any modifications to the schedules. After modifying the schedules, you can rerun the check conflicts action again to identify potential conflicts.

### Before you begin

Role required: admin

### Procedure

1. Navigate to **All** > **Change** > **Open**.
2. Open the change request that you want to cancel conflict checking for.
3. Click the **Conflicts** tab.
4. Click **Check Conflicts**.
   The Checking conflicts progress status pop-up window appears.
5. To cancel conflict detection, click **Cancel**.

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The active conflict detection job is canceled and all conflicts displayed in the Conflicts section are cleared. The **Conflict Status** field displays a **Not Run** status.

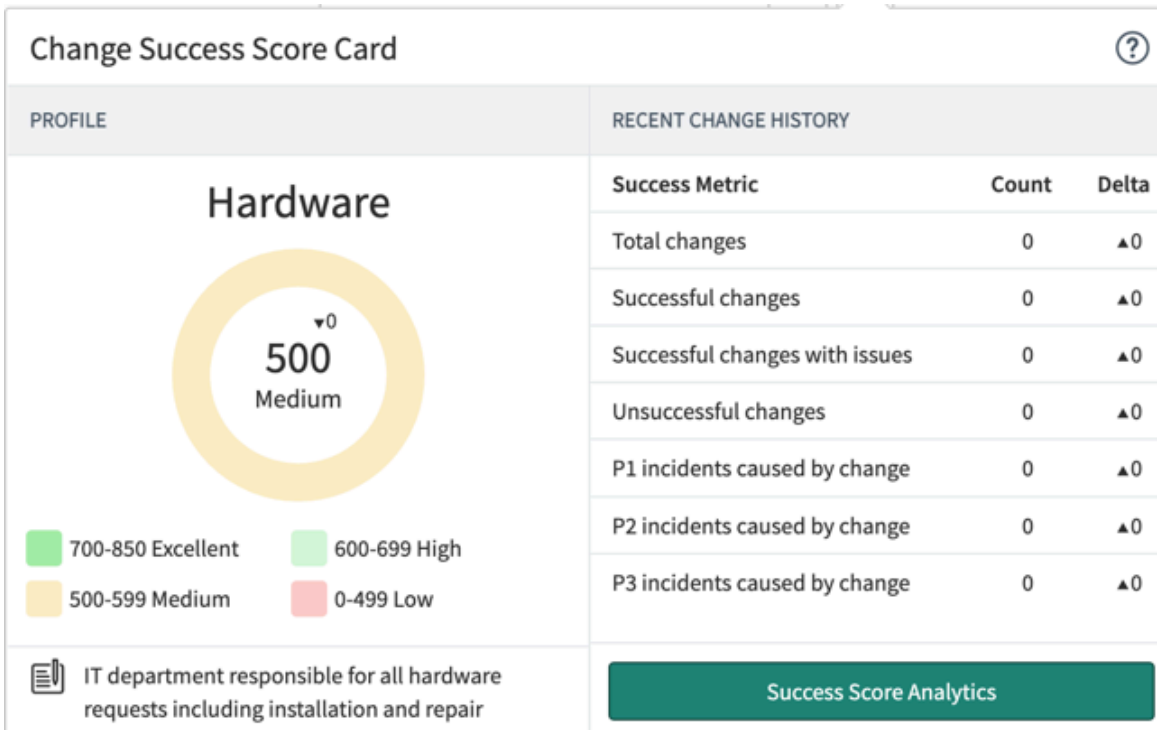
**Note:**
If you set conflict detection to run automatically or on a scheduled basis, the future executions of conflict detection against the same change request record are not canceled.

## Change success score

Use team historical data for insights into team performance. The score value helps you to determine how likely the team is to complete your change request without issues.

**Note:**
The change success score feature is installed after you activate the Change Management - change success score plugin available with the ITSM Professional subscription only. Contact your account manager for more information.

The change success score can help you evaluate a team's success in handling prior change requests.




When the Change Management - Change success score plugin is activated, a *`Change success score metrics (Daily)`* performance analytic (PA) job is added. The PA job is a daily job that collects the first set of change success scores until the next job run time that is 02.00 UTC. After the first job run, a **Change Success Score** card icon appears next to the **Assignment group** field on the change request form. On a click of this icon, you can view the score card details of the assignment group.

## Change Success Score dashboard

Use the data on this dashboard to see trends in the resolution efficiency of a team over time based on the same parameters used to calculate the overall score. To view the trends of all the assignment groups, clear the selected element.

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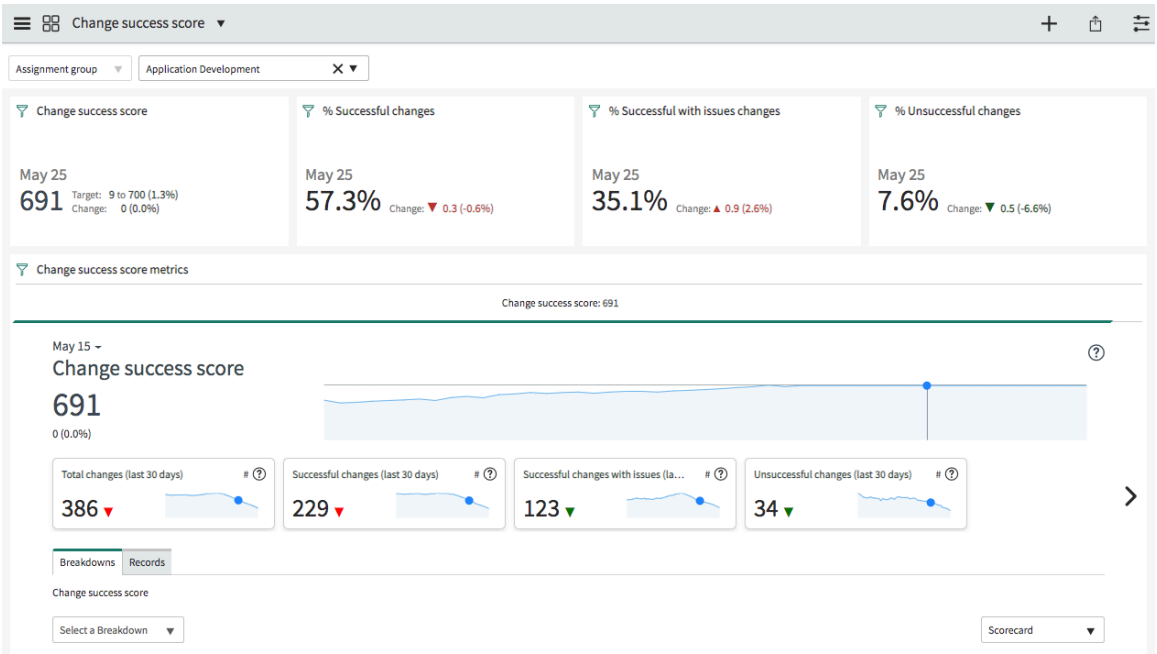
Navigate to **Change** > **Change Analytics** to access the **Change Success Score**, **Change Type Success**, and **Change Model Success** dashboards.




For more information on the indicators, see Success score indicators.

## Change Type Success dashboard

This dashboard displays trends in the resolution efficiency for change types. To view the trends of all the change types, clear the selected type.

## Change Model Success dashboard

This dashboard displays trends in the resolution efficiency for the change model over time based on the same parameters used to calculate the overall score. To view the trends of all the change model, clear the selected model.

### Success score indicators

Change Success score contains Performance Analytics indicators for data collection. Indicators define a performance measurement taken at regular intervals of a business service, an activity, or organizational behavior. These performance measurements result in a series of indicator scores over time.

The following are the Change Success Score indicators that are used to collect data daily for the changes completed on the previous day.

**Total Changes**

The total number of change requests addressed during the time.

**Successful changes**

The number of successfully resolved change requests.

**Unsuccessful changes**

The number of change requests that was not resolved.

**Successful changes with issues**

The number of change requests that was resolved, but had other defects that were not addressed.

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**P1 incidents caused by change**

The total number of P1 incidents that were reported as caused by one of the changes completed by the team.

**P2 incidents caused by change**

The total number of P2 incidents that were reported as caused by one of the changes completed by the team.

**P3 incidents caused by change**

The total number of P3 incidents that were reported as caused by one of the changes completed by the team.

For more information on the PA indicators, see Performance Analytics indicators

### Success score calculation

To calculate the success score, formula indicators are provided. These indicators apply the multiplication operation to the data collected by the automated indicators to arrive at the final score.

You can view the Change success score formula indicators in Performance Analytics under the indicator group *Change success score - multipliers*.

Review the following table to understand the default multipliers used in success score calculation.

#### Default multipliers

| Automated indicator | Multiplier applied by formula indicator |
|---|---|
| Successful changes | 3 |
| Successful changes with issues | -2 |
| Unsuccessful changes | -5 |
| P1 incident caused by change | -10 |
| P2 incident caused by change | -5 |
| P3 incident caused by change | -2 |

### Modify score calculation

Modify the multiplier values in the formula indicators to calculate the final success score.

## Before you begin

Role required: admin

## Procedure

1. Navigate to **All** > **Performance Analytics** > **Indicator Groups** > **Change success score - multipliers**.
2. Open the indicator that you want to modify.
3. In the formula, change the multiplier value.

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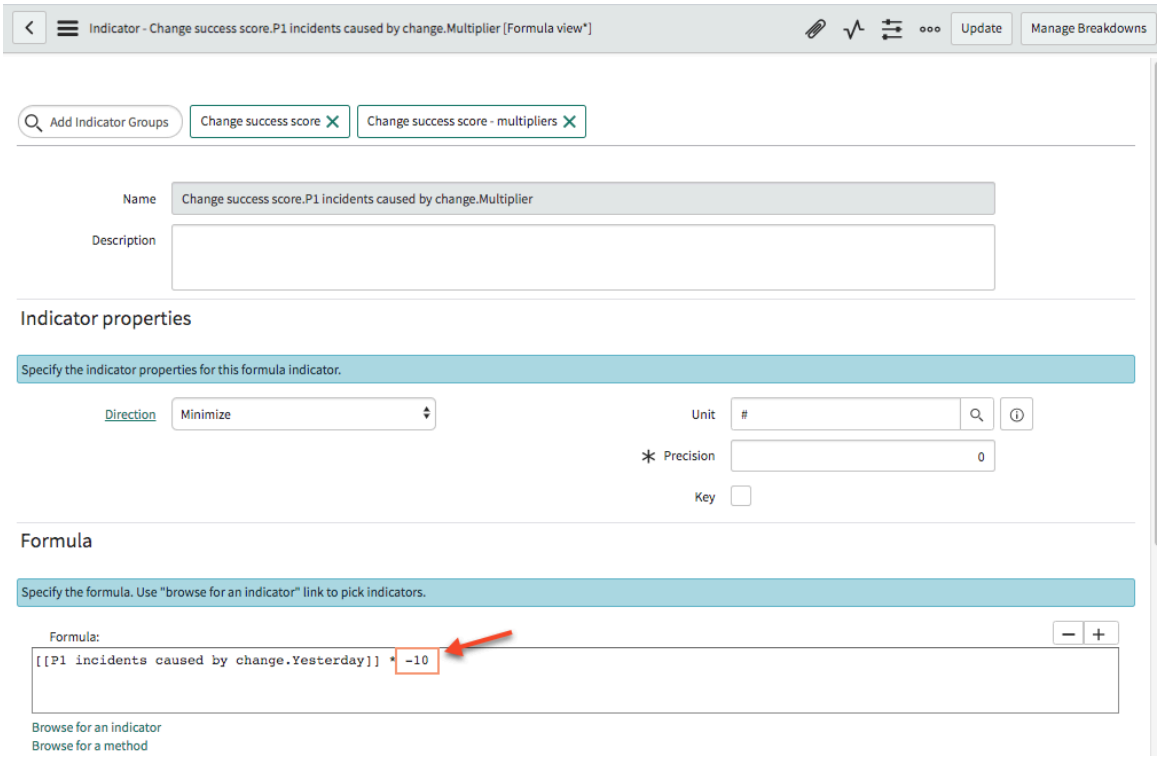


4. Click **Update**.

### Success score rating

Based on the change success score rating, a color and text is associated that is displayed as part of the Change Success Score card. By default, four success score ratings are available with a specific score range.

## Before you begin

Role required: admin

The following default ratings available.

- Low
- Medium
- High
- Excellent

Each rating is associated with a default range and color.

The Change Success Score Ratings table is used to hold the records of the text and a color associated with the success score range.

You can choose to modify the score range, color, introduce, or modify new rating values. The values defined here can be viewed in the **Change Success Score card** on the change Request form.

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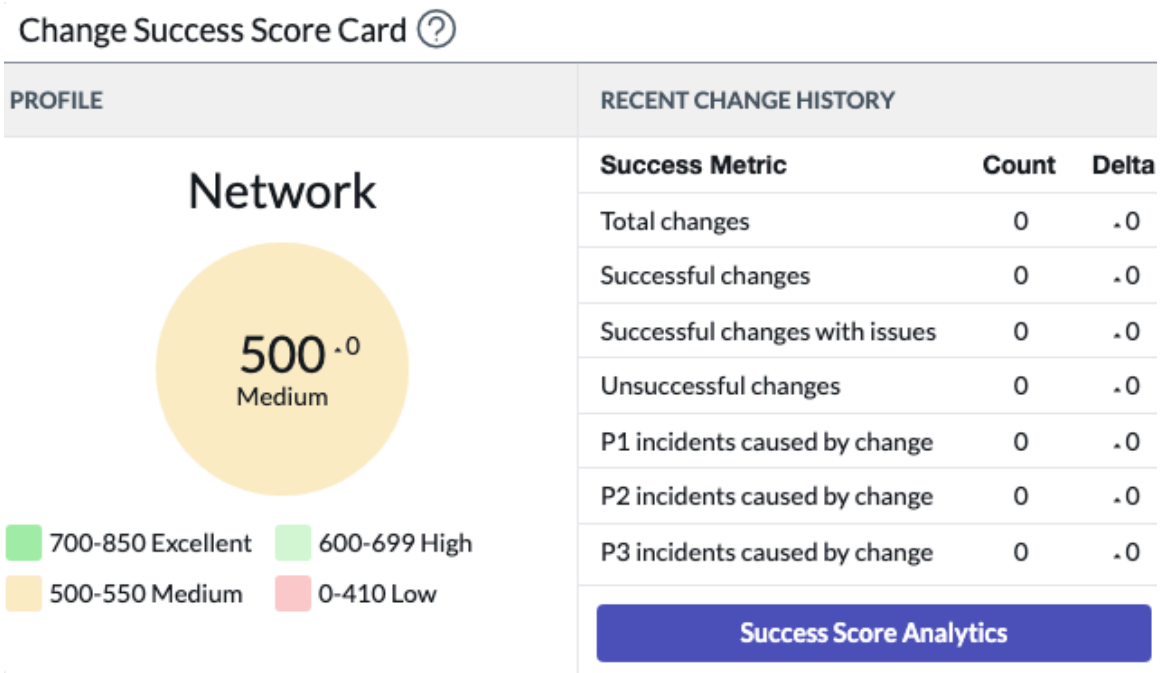


**Procedure**

1. Navigate to **All** > **Change** > **Administration** > **Change Success Score Ratings**.
2. Perform the given action based on your requirements.
3. Click **Update**.

## Predictive Intelligence for Change Management

The Predictive Intelligence for Change Management capability uses machine-learning algorithms to suggest standard templates, identify similar incidents, and enhance risk assessment for the change.

Predictive Intelligence for Change Management delivers the following benefits:

- Enhanced change risk calculation using machine-learning algorithms to assess change risk.
- Uses Predictive Intelligence clustering capability to identify and suggest Standard Change templates to create a change.

## Solution definitions for Predictive Intelligence for Change Management

The Solutions definitions for Predictive Intelligence for Change Management capability are available after you activate the following plugins:

- Change Management - Risk Intelligence plugin (com.snc.change_management.ml.risk)
- Change Management - Standard Change Template Intelligence plugin (com.snc.change_management.ml.sctp)

**Note:**
Predictive intelligent for Change Management plugins can be requested through the Now Support Customer Service system.

For more information, see Change Management plugins.

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**Solution definitions for Change Management**

| Solution definition | Solution type | Description |
|---|---|---|
| Risk for proposed change | Similarity and Categorization | Provides insight into the potential risk of the change activity and facilitates intelligent approval decisions. The info message puts all the risk related information to easily compare the returned value.<br><br>This prediction helps in reducing approval friction and time. For example, when risk = low, you can use Change Approval Policies to automatically approve this low risk activity. |
| Standard change candidates | Clustering | Analyzes and suggests opportunities for Standard Change proposal templates that can be used for automatically creating a change. This solution uses similarity and clustering solution type to identify the common fields in the records and make it a template. |

### Intelligent solutions configurations

Administrators can configure the Change Management Intelligent solutions properties to use predictive intelligence (PI) capabilities.

By configuring these properties, you enable the Change Management application to:

- Predict the risk of the proposed change.
- Use similarity and clustering to identify and suggest potential standard change templates.

Navigate to **Change** > **Intelligent Solution Configuration** to view and edit the properties.

## Risk Intelligence Properties

**Risk Intelligence properties**

| Property | Description |
|---|---|
| Solution type [chg_ml_prop_risk.model_type] | The type of PI solutions used for risk prediction.<br><br>• Similarity: Uses machine-learning solution to collect and compare your existing records to new similar records. This solution type uses the following risk calculation method: |

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**Risk Intelligence properties (continued)**

| Property | Description |
|---|---|
| | ○ Use count of records: Risk of the group that has highest count is used.<br>○ Use confidence of records: Risk of the group that has highest total number of confidence is used.<br>If the risk have same count or confidence, then the higher risk is considered.<br>• Classification: Uses machine-learning algorithms to set field values during record creation, such as setting the risk category based on previous data. |
| Predicted value usage [chg_ml_prop_risk.usage] | Determines how the predictive value must be used.<br>• View risk value<br>• Set risk value |
| Solution enabled [chg_ml_prop_risk.solution_enabled] | Identifies if the solution is enabled or not. |
| Threshold [chg_ml_prop_risk.classification_confidence_threshold] | The minimum confidence value for the returned results. |

## Standard Change Proposal Properties

**Standard Change proposal properties**

| Property | Description |
|---|---|
| Minimum quality level [chg_ml_prop_sctp.quality] | Minimum cluster quality to use for Standard Change candidate. |

### Train the Risk Intelligence solution

Create Risk categorization or similarity solution definitions to use the predictive intelligence that helps in accessing change risk.

### Before you begin

Ensure that Change Management - Risk Assessment (com.snc.change_management.ml.risk) plugin is activated.

Role required: admin

### Procedure

1. Navigate to **All** > **Change** > **Intelligent Solution Configuration** > **Risk Intelligence**.
2. Select the **Solution type**.

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- If the **Solution type** is `Similarity`, then you can see the default, **Change Risk Similarity Definition** solution.
- If the **Solution type** is `Classification`, you can see the default, **Change Risk** solution.

3. Customize the default solution.
   For more information, see Create and train a similarity solution and Create and train a classification solution.
4. Click **Update**.

### Train the clustering solution for Standard change proposal

Train the Standard change proposal solution definition to use clustering capabilities to identify and suggest Standard Change templates to create a change.

#### Before you begin

Ensure that Change Management - Standard Change Template Intelligence (com.snc.change_management.ml.sctp) plugin is activated.

Role required: admin

#### Procedure

1. Navigate to **All** > **Change** > **Intelligent Solution Configuration** > **Standard Change Proposal**.
2. Customize the default solution definition to train the solution.
   By default, the **Std Change Template Candidates** is the solution definition provided. For more information on creating and training the solutions, see Create and train a clustering solution.
3. Click **Update**.

## Applying CSDM guidelines to Change Management

Change Management lets you control every aspect of the IT change process from creation to approval. When you have accurate information, you can minimize risks to your business and avoid conflicts with scheduling. The goal of this product view is to help you to understand how Change Management key entities work with the core CSDM framework.

## Change Management

Change Management includes the following features:

- Manage changes more quickly by using the Change Advisory Board (CAB) Workbench to schedule, plan, and manage CAB meetings from one interface.
- The Change Management backlog analysis dashboard provides increased visibility into any changes.
- Service Maps let you see the change impacts at-a-glance.
- The change approval policies increase DevOps velocity and remove IT friction.

For more details to implement CSDM framework, refer Implementing the CSDM framework in stages.

## Change Request form

The Change Request form references the following attributes and related lists.

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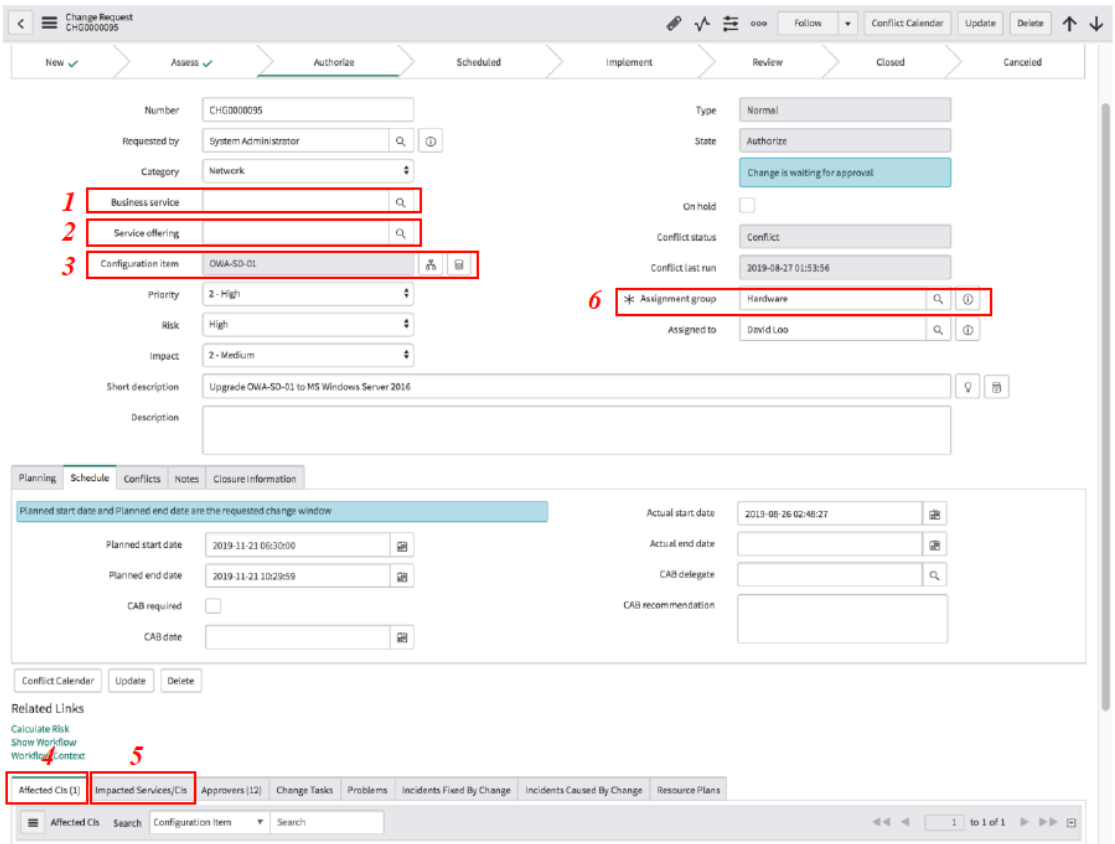
| | |
|---|---|
| 1 Service (Business Service) | References the [cmdb_ci_service_business] table.<br><br>**Note:**<br>Earlier platform releases labeled this attribute **Business Service**. |
| 2 Service Offering | References the [service_offering] table where the offering has a parent service. |
| 3 Configuration Items | References the [cmdb_ci] table. |
| 4 Affected/Causal CIs | Related list [task_ci] table. |
| 5 Impacted Services | Related list [task_cmdb_ci_service] table. |
| 6 Assignment Group | References the Group attribute.<br><br>**Note:**<br>You can populate the Group attribute by using the Assignment Group for the relevant CI. |




## For more information

For additional details on Change Management, see Change Management.

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See the video: How Change Management leverages the CSDM

### Change Management and CSDM tables

Change Management manages and uses CSDM tables. Several ServiceNow products benefit from and add value to Change Management.

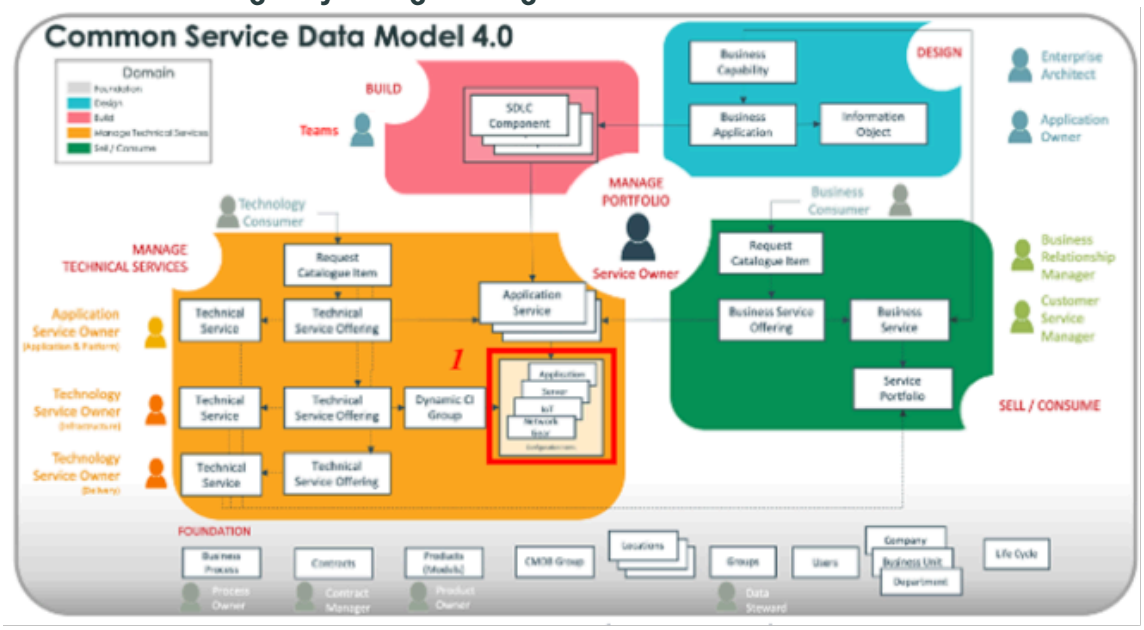
## CSDM tables managed by Change Management

Configuration items (CIs) tables [cmdb_ci_*]:

- Application table [cmdb_ci_appl]
- Server table [cmdb_ci_server]
- Virtual machines table [cmdb_ci_vm_instance]
- Load balancer table [cmdb_ci_lb]
- Network gear table [cmdb_ci_netgear]

The following figure highlights the CSDM tables managed by Change Management.

**CSDM tables managed by Change Management**




## CSDM tables used by Change Management

1. Application Service table [cmdb_ci_service_discovered] or any infrastructure CI.
2. Configuration Item tables [cmdb_ci*]
3. Business Service [cmdb_ci_service_business] table and Technical service [cmdb_ci_service_technical] table: Uses the service classification attribute to identify business services, technical services, and application services as types of services.
4. Service Offering [service_offering] table: Uses the service classification attribute to identify business services, technical services, and application services as types of service offerings.

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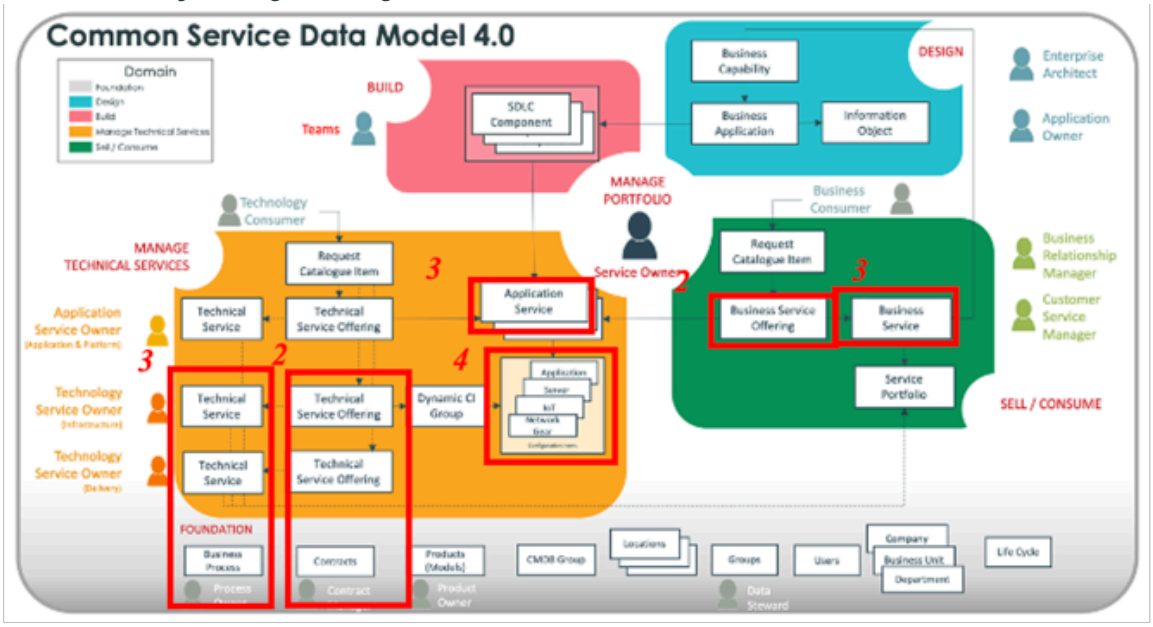
### Tables used by Change Management




## Products that add value to Change Management

When you use Change Management with other ServiceNow products, you increase the value you get from Change Management. These other ServiceNow products include:

**Discovery**

Discovery provides details about the hardware and software CIs you are using.

**Service Mapping**

Service Mapping provides details about the application instance service in the Mapped Application Service [cmdb_ci_service_discovered] table, relating infrastructure and application [cmdb_ci_appl] CIs.

## Products that benefit from Change Management

**Service Portfolio Management (Service Portfolio Management)**

Services have the context of the business and applications, along with the information and technologies that underpin them.

**IT Service Management (ITSM)**

Incidents caused by, impacted by, or fixed by Change Management.

**Asset Management**

Updates assets.

**Information Technology Operations Management**

Updates CIs using a controlled process.

**DevOps**

Provides Change Management governance for pipeline tool chains.

## For more information

See the video: How Change Management leverages the CSDM

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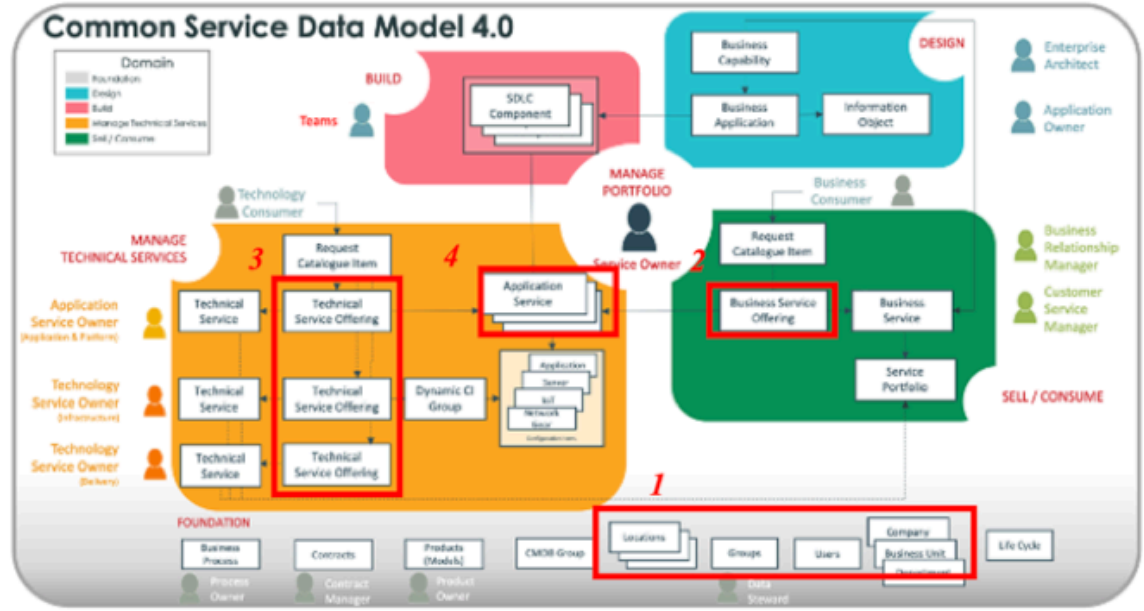
### Change Management use case

For ITSM, specifically incident and change, identifying the location of critical data can help reduce mean time to resolve incidents and eliminate outages caused by change.

## Key features of the Change Management use case

Applying the CSDM framework provides value to Change Management in the following ways:

- Enables users to understand the impact of a change on services and service offerings.
- Changes are dynamically routed.
- Change Management identifies and notifies all affected services to support the approval decision.




1. Subscription: Related lists on service offerings that identify who has access to the offering and thus may be impacted in an outage. An incident or change can identify impact using the subscribed by tables. The related lists are as follows:
   - Service Subscriptions by Company [service_subscribe_company]
   - Service Subscriptions by Department [service_subscribe_department]
   - Service Subscriptions by Group [service_subscribe_sys_user_grp]
   - Service Subscriptions by Location [service_subscribe_location]
   - Service Subscriptions by User [service_subscribe_sys_user]
2. Business service offering may be used to provide the business approver based on approval_group and business_criticality. A business service may have multiple offerings, each with a different criticality.
3. Technical service offering may be used to provide the technical approver approval_group and technical assignment group on the attribute assignment_group. May be used by change for routing of change and change tasks. May be synchronized onto the CI's that the offerings manage thus reducing the manual overhead of maintaining manual data on thousands/ millions of CI's.

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4. Application service may be used to provide prod and non-prod (DEV, QA, UAT, etc.) environments. Non-prod environments may be filtered out if desired. The legacy **used_for** attribute maps to the **environment** attribute. You should use the **environment** attribute.

   **Note:**
   Some service offerings may identify the **environment** of the offering as well.

## Results of the Change Management use case

The CSDM framework provides context for the changes. The context includes the CIs involved in the change and the services affected.

Use the Change Request form to see the impact of the change. Complete the following steps:

1. Populate the Configuration Item attribute [configuration_item] with the target CI for the change activity. You can then use this CI to identify details for change routing. For example, you can use the CI data, such as “Assignment Group” or "Approval Group," and provide information about the service impact by using dependency relationships.
2. Populate the Impacted Services related list [task_cmdb_ci_service] with the services that are related to the populated CI. These may include services and service offerings.
3. (Optional) Use the Service and Service Offering attributes to identify the provider services responsible for managing the selected CIs.
4. (Optional) Use the Affected CI related list [task_ci] to identify the CIs that may have caused the change. These CIs are in addition to the CIs previously populated. The [task_ci] table can be populated dynamically or manually.

   **Note:**
   Dynamic population is not part of the base system. To use dynamic population, you need to configure the Change Request form.

## For more information

See the video: How Change Management leverages the CSDM

### Change Management considerations

Consider these points while implementing the CSDM framework.

- Business applications not referenced in the Change Management use case: Business applications are portfolio objects you can use for designing and planning an Enterprise Architecture. Business application portfolio objects don't contain version, environment, and localization details for deployments using one or more applications.
- Change approval process: It depends on how you implement Change Management. After you populate the CIs on the Change form (if there's a relationship between the CI and the impacted services and service offerings), the Approval group approves the change.
- CI attributes used for routing changes: If you are initiating the change or the change task, use the Assignment Group attribute CI. If you are using build run teams, you could use the Support Group attribute CI for the team assignments.

## For more information

See the video: How Change Management leverages the CSDM

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# Using Change Management

Work on a change request seamlessly and create the approval policies as required to meet your organizational needs.

## Create a change request

Create a change request to implement a controlled process for modifying approved and supported configuration items (CIs).

### Before you begin

Role required: itil, admin, or sn_change_write

### About this task

A change request records the detailed information about the change, such as the reason of the change, the priority, the risk, the type of change, and the change category.

If you use conflict detection, the planned start and end dates and the configuration item (CI) are required.

### Procedure

**1.** Create the change request with one of these options.

| Option | Description |
|---|---|
| **From the Change module** | You can create all three types of change from the **Change** module.<br>**a.** Navigate to **All** > **Change** > **Create New**.<br>**b.** Select **Normal**, **Emergency**, or **Standard** changes.<br>If you are an upgrade customer and willing to use change models, you must enable the change model properties. For information on change models and its properties, see Change models.<br>When you enable the change model properties, you see the following tabs when you navigate to **All** > **Change** > **Create New**.<br>○ **Models**: Shows all the available models available to select.<br>○ **Preapproved**: List of preapproved models to select.<br>○ **Pinned**: Models that you have pinned from the **Models** and **Preap proved** tabs.<br>○ **All**: All models are available to select. |
| **From an incident or a problem** | As a user with the sn_change_write role, you can create a standard, nor mal, or an emergency change from an incident or a problem.<br>**a.** Open the incident or problem.<br>**b.** Right-click the form header and select **Create Normal Change**, **Create Standard Change**, or **Create Emergency Change**. |
| **From an existing change record** | If the administrator enabled the change request copy option, you can create a new change by copying an existing change record.<br>**a.** Open the change record that you want to copy.<br>**b.** Click **Copy Change**. |

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| Option | Description |
| --- | --- |
| | **Note:**<br>If the create task workflow sets the **create_from** field in the [change_task] table to **workflow**, manually created tasks from the existing change record are copied. |

2. On the form, fill in the fields.

**Change Request form**

| Field | Definition |
| --- | --- |
| Number | Change request number. |
| Requested by | User who requested the change. This field is available in the **Change Requests** list view, so that you can see who requested a particular change. |
| Category | Category of the change, for example, **Hardware**, **Network**, **Software**. |
| Service | Business service that you want to make available for the change request.<br>**Note:**<br>If you select a business service as the configuration item and that business service is also listed as the configuration item in any other active task, the active tasks icon ( ) appears. Click this icon to view the list of all the other active tasks that are affecting the business service. You can view the BSM map (dependency view) of the selected business service by clicking the dependency icon ( ). |
| Service Offerings | Consists of one or more service commitments that uniquely define the level of service in terms of availability, scope, pricing, and packaging options. You can choose to receive different levels of performance and features for a given service through service offerings. You must select a service to filter the available service offerings. |
| Configuration item | Select **Add** to add a CI for the change. You can add a CI for a change in **New** state only.<br>CI that the change applies to. Change requests can be associated with any type of CI, including service offerings, providing detailed access to SLA and availability requirements.<br>When you select a dynamic CI group, all the configuration items related to the selected dynamic group will be populated in the Affected CIs related list. In the Affected CIs related list, you can also manually add and delete the dynamic CI groups. When you add a dynamic CI group, all the related CIs are added, and when you remove a dynamic CI group, the related CIs are removed. |

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| Field | Definition |
| --- | --- |
| | After selecting a CI, you can click the health dashboard icon ( ) to view the CI health details.<br><br>**Note:**<br>By default, Service Offering is filtered out and CIs with Principal Class are selected. The Principal Class filter functionality is applicable to new customers starting the Paris release.<br><br>See Refresh impacted services properties |
| Priority | Priority is based on impact and urgency, and it identifies how quickly the service desk should address the task. |
| Risk | Risk level for the change.<br><br>The risk of a change can be defined manually as **High**, **Moderate**, or **Low**. You can also use Risk Calculation and Risk Assessment to drive the risk value of the change. |
| Impact | Impact is a measure of the effect of an incident, problem, or change on business processes. |
| Type | Type of change request. This field is read-only. |
| State | State of the change request. The default state is New. |
| Conflict status | Status that indicates whether there is a conflict for this change or the conflict is not run. |
| Conflict last run | Date and the time when the conflict was last run. |
| Assignment group | Group who will work on the change request.<br><br>The business rule *Populate Assignment Group based on CI/SO* populates the **Assignment group** field available for the CI or the service offering consecutively.<br><br>**Note:**<br>The business rule is triggered when a change request is created or updated and when the **Assignment group** and the **Assigned to** fields are empty.<br><br>If you want to override the default value, you need to create new properties and provide the field in the property value that must be used to populate the **Assignment group** field. Create the properties in the following order of preference:<br>○ *com.snc.change_request.ci_assignment_group.field_name*: Identifies which CI field populates the **Assignment group** field.<br>○ *com.snc.change_request.service_offering_assignment_group* Identifies which service offering field populates the **Assignment group** field. |
| Assigned to | User that the change is assigned to. If an assignment rule applies, the change is automatically assigned to the appropriate user or group. |

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| Field | Definition |
|---|---|
| Short description | Summary of the change. |
| Description | Detailed description of the change. |

3. To plan the change, click the **Planning** tab and enter information.
   This information is critical for change approvers.
4. Click the **Schedule** tab.

   a. Enter as much information about the scheduled dates as you have.
   Some of the fields are available for normal or emergency changes only because standard changes are preapproved.

   **Note:**
   For normal or emergency changes, enter the planned start and end dates and actual start and end dates manually. Populate the actual start and end date fields during the Implement state as the assignee begins and completes the work.

   b. If the form is configured to show the **CAB required** check box, select it to indicate that CAB approval is required before implementation.
   The **CAB date** field in the change request is automatically updated with the date in the **Meeting start time** field of the CAB meeting form.

   c. If there is an unplanned CI activity, select the **Unauthorized** check box to determine if the change is an unauthorized change.

   For more information, see Unauthorized change request.

   **Note:**
   This check box is available only for emergency change requests.

   d. If the form is configured to show the **CAB delegate** field, select the user who attends the CAB meeting to describe the change.

   e. In the **CAB recommendation** field, enter notes or recommendations related for the CAB meeting.

5. Click the **Conflicts** tab.
6. To detect change conflicts, click **Check conflicts**.
7. Right-click the form header and click **Save.**
8. Review entries in the related lists and modify the entries as appropriate.

### Default Change Request related lists

| Field | Description |
|---|---|
| Affected CIs | List of CIs (from the CMDB) affected by the change. You can associate multiple affected CIs with a change. |
| Impacted services/ CIs | List of CIs, such as business services or from other CI classes, that are impacted by the affected CI in the change. You can associate multiple impacted CIs with a change. |

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| Field | Description |
|---|---|
| Service Offerings | List of service offerings affected by the change. You can associate multiple service offerings with a change. This related list is available only when a service offering is selected.<br><br>If there are service offerings associated to the Impacted Services, then refresh the Impacted services/CIs related list to view the offerings.<br><br>**Note:**<br>If you have customized the default view of your form or related list prior to the Paris release, you cannot see the field or the related list by default. Modify the form to add them manually. |
| Approvers | This list is automatically generated from the workflow. You can also view the **Group** of approvers assigned to the task. |
| Change Tasks | The list of tasks can be created from a workflow. The default workflow generates tasks in the **Implementation** state. You can also create a new change task. The **Planned start date** and **Planned end date** in task type **Implementation** must fall within the planned start and end dates specified in the change request. |
| Problems | If the change was generated from a problem, this list is generated automatically. |
| Incidents Fixed by Change | List of incidents that require the change for resolution. |
| Incidents Caused by Change | List of incidents caused by the implementation of the change. |
| CAB Agenda Items | List of agenda items and details of respective items. For example, the meeting start and end time, allocated time for the meeting, state of the meeting, and the decision made for that agenda item.<br><br>**Note:**<br>The CAB Agenda Items related list is not shown on the form when the list is empty. This feature is available only for Jakarta instances. |

9. When the change request is ready to move to the next state, click **Request Approval**.
   The state is moved forward based on the type of change request:
   - Assess state: Group level approval for a normal change request. Approval records are automatically generated based on the **Assignment group**. You can conduct peer and technical reviews of the proposed change.
   - Authorize state: An emergency change request.
   - Scheduled state: Pre-approved standard changes.

   **Note:**

   To mail the change record, click the more options icon ( ) in the content frame and select **Email**. Both the user who requested the change and the user who is assigned to the change are automatically populated in the list of recipients.

   To view the calendar, click **View Calendar** in the title bar of the Change Request form.

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### What to do next
Process a change request

### Related topics
- State model and transitions
- Place a change request on hold
- Conflict calendar

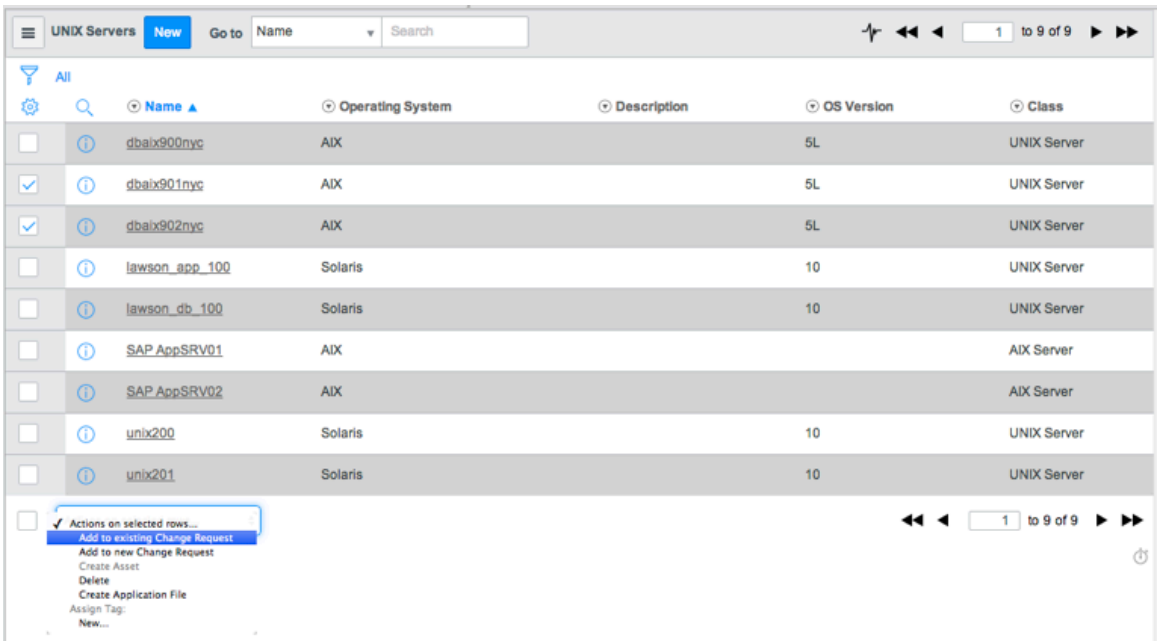
## Create a change request from a configuration item (CI)

Create a change request from a list of configuration items (CIs), or add selected CIs from a list to a change record.

### Before you begin
Role required: itil, admin, or sn_change_write

### Procedure
1. Select a list of CIs.
   For example, navigate to **All** > **Configuration** > **Servers** > **Unix**.
2. Select one or more CIs from the list.
3. Select one of the following options from the Actions list.

| Option | Description |
|---|---|
| **Add to existing Change Request** | Select this option to associate the CIs with an existing change request. |
| **Add to new Change Request** | Select this option to associate the CIs with a new change request. |




**Note:**
CIs with a **Business Service** CI class are added to the **Impacted Services/CIs** related list on the change request. The remaining CIs are added to the **Affected CIs** related list.

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Depending on your selection, either an existing change requested is updated with the selected CIs or a new change request record is created with the selected CIs.

4. Continue to create or modify the change record as required.

### Create a standard change request from the catalog

You can create a standard change request from the published standard change catalog templates.

#### Before you begin

Role required: itil, admin, or sn_change_write

#### Procedure

1. Navigate to **All** > **Change** > **Standard Change** > **Standard Change Catalog**.
2. Select one of the following options depending on the type of standard change you want to create.

| Option | Description |
|---|---|
| **Network Standard Changes** | Create a standard change request for the net work. |
| **Server Standard Changes** | Create a standard change request for servers and attached storage. |

3. Select a template from the **Items** section.

   **Example**
   For example, **Add network switch to datacenter cabinet** in the **Network Standard Changes** > **Items** section.
   When you select the catalog item, a standard change is created. The Change Request form is displayed with values from the standard change template.

4. Complete the form with additional information you have.

   **Example**
   For example, add the **Configuration item** and the **Assignment group**.

5. Open the form context menu and select **Save**.
6. Complete any information in the related lists that apply to the standard change request.
7. Select **Update**.

### Copy a change request

You can copy details of an active or canceled change request to a new change request.

#### Before you begin

Role required: itil, admin, or sn_change_write

#### About this task

The administrator configures which of the following items are copied to the new change request.

- The content that is copied.
- The attributes or fields and values that are copied. All non-copied attributes are reset to default values.
- The configured related tables that are copied.

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**Note:**
You can't copy change details from a standard change.

You can't copy a change request if `com.snc.change_request.enable_copy` is set as `false`.

New change tasks can be created when a change is copied. If your change record has associated workflows that create change tasks, then these change tasks may not be copied because the workflow creates them. Only manually created tasks are copied, if the workflow when creating the task sets the **created_from** field on the **change_task** table to **workflow**. The **created_from** field has a default value of **manual**.

### Procedure

1. Navigate to **Change** > **Open**.
2. Select the change request to be copied.
3. Right-click on the header and then click **Copy Change** to copy change details.
   A preview of the new change record appears with values from the original source change record.
4. Edit values on the newly created change record, as appropriate.
5. Click **Submit** to create a new change request record.

### What to do next
After an existing change request is copied and a new one created. A user with ITIL role then reviews, approves, implements, and closes the change request as necessary.
In addition, you can associate CIs to the newly created change request.

#### Related topics

Configure ability to copy a change request

## Create a change task

You can create change tasks for a change request. A change task is a piece of work related to the change request. For example, there can be tasks to plan the change, implement the change, and test, and review the work.

### Before you begin
Role required: itil, admin, or sn_change_write

### About this task
Change tasks can be created manually or from a workflow. The Change Request form has a **Change Tasks** related list, which includes all manual and workflow change tasks. From this related list, you can edit existing tasks or create tasks. Workflow change tasks are generated automatically in **Review** task type.

### Procedure

1. Navigate to **All** > **Change** > **Open**.
2. Select the change request to add a change task.
3. In the **Change Tasks** related list, click **New**.
4. Fill in the fields, as appropriate.

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### Change Task form

| Name | Definition |
|---|---|
| Configuration item | The configuration item (CI) or service that the change task applies to. |
| Planned start date | The date you plan to begin working on the task. |
| Planned end date | The date the change task is planned to be completed.<br>If the task type is **Implementation**, the **Planned start date** and **Planned end date** values must fall within the planned start and end dates specified in the change request. |
| Type | The type of change task, **Planning**, **Implementation**, **Testing**, or **Review**. The default workflow generates tasks in type **Review**. |
| State | The state of the change task:<br>○ **Pending**: Open and unassigned<br>○ **Open**: Open and unassigned<br>○ **In progress**: Open and actively being worked on<br>○ **Closed**: Inactive and closed. Requires close code and close notes to be provided.<br>○ **Canceled** |
| On hold | The **On hold** check box indicates whether the change task is on hold. Provide an **On hold reason** if a change task is placed on hold. |
| Assignment group | The group that the change task is assigned to. |
| Assigned to | The user that the change task is assigned to. If an assignment rule applies, the change task is automatically assigned to the appropriate user or group. |
| Short description | A summary of the task. |
| Description | A detailed description of the task. |

5. To enter work notes for the change task, click the **Notes** tab.
6. To enter notes on why the task was closed, click the **Closure Information** tab.
7. Click **Submit**.
   The change task is added to the change request. The assigned user receives a notification that a task was assigned to them.

### Unauthorized change request

Understand how an unauthorized change activity on a configuration item (CI) is captured and managed, so that you can review and take timely action on this change.

As part of the ServiceNow® Service Mapping integration with ServiceNow® ITSM , the Change Management application receives an event notification when an unauthorized change activity is detected. As a result, an emergency unauthorized change request is created for the relevant CI. You can review and approve or reject the unauthorized change from the Change Management application.

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**Note:**
Unauthorized change requests are created only for the CIs that are part of the application services. Also, there is a flapper algorithm that uses a learning pattern to minimize false positives.

At times, the discovery process (horizontal or top-down discovery) identifies a change on a CI property that may not be an actual change by definition. This identification is due to a measurement error or just a different representation of the same value, such as case sensitivity. The learning pattern identifies the false positives (flapper changes) and prevents triggering the recomputation and time-line updates as an emergency change request is a critical action. You want to avoid false positives and report only real changes.

The learning pattern identifies the false positives as follows:

1. When a CI property associated with a service changes, the new value (CI and field pair) is logged in the flapper's data table.
2. The system runs a nightly job and executes various algorithms on the data that is collected to identify patterns that point to false positives.
3. The system runs all the relevant strategy predicates for the changed CI fields with a confidence level greater than 90%. This step determines whether all the new values are false positives or not. If all the new values are false positives, then the change is ignored, and the model is not updated.

   **Note:**
   If the CI is associated with an active change request, then this step is skipped.

An unauthorized change request is created when an unplanned CI change activity occurs, and the system triggers the following checks:

- The system checks to see if the CI is part of the allowed CI classes. If it is allowed, then the system checks to see if this specific CI has been flagged previously. If it was flagged and the previously created unauthorized change was within the notification ignore period, then no further action is taken. If not, then further checks are made to see whether this CI is associated to a change request that matches the condition stated in the properties. If not, then the change to the CI that was detected is flagged as unauthorized and a *`ci.change.unplanned`* event is raised.
- On receipt of the *`ci.change.unplanned`* event, the script checks to see if the **Enable event processing** field is **true**. If it is **true**, then an unauthorized change request is created. By default, this property is **false**.

The *`ci.change.unplanned`* event that is generated automatically triggers the creation of an Emergency type change request.

With the help of the following details that are pre-populated on the form, you can identify and review the unauthorized change:

- The **Unauthorized** option is selected. This option indicates that the change is an unauthorized change.
- The **Assignment group** field is populated with **Change Management**.
- The **Configuration item** field is populated with the item that the unauthorized change was made for.
- The **Description** field is populated with the information on the changed fields of the change request.

### Change Request form

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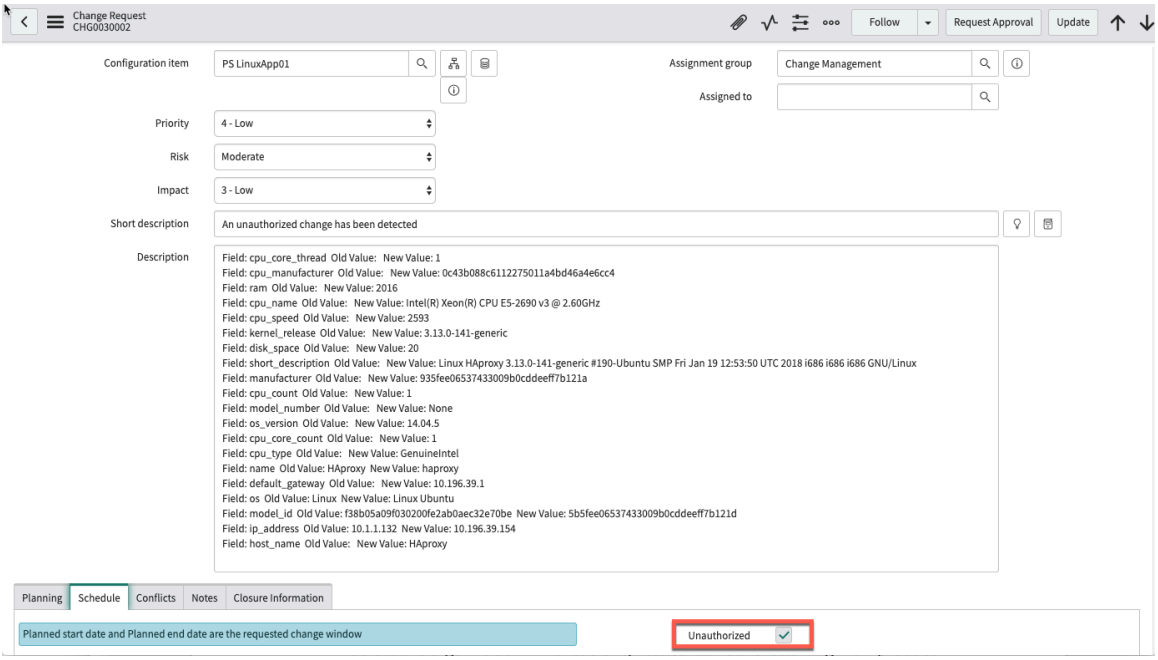


An email notification is sent to the Assignment group, CI Item managed by, Owned by, and Assigned to members for review and approval. However, if there are many CI changes and there are no open change requests created to include the CIs, the system creates unauthorized change requests on these CIs. When this event occurs, the members receive numerous unauthorized change notification emails. In such a case, you can choose to disable these notifications. For more information, see Disable unauthorized change notification.

**Note:**
Email notifications are sent only when there is an unplanned change on the CI that is part of an application service (discovered or manual service).

After this change request is approved, the state changes to **Review** and the regular process is followed to close the request.

## Assign post-implementation review

When a change is implemented without approval, post-implementation review is necessary to evaluate the risk and impact of the unauthorized change.

After the unauthorized change is approved, a change task is created with **State** field as **Review**. This change task is assigned to the Change Management group with the **Short description** field as **Post Implementation Review**. The assigned members who receive the notification can review and close the change task.

## Modify the unauthorized change setting

As a change manager, you can clear the **Unauthorized** check box to convert the unauthorized change request to an emergency change request. When you clear the check box, enter the reason for this modification in the **Work notes** field.

If you are an ITIL user, clear the **Unauthorized** check box by creating an outage from the task record with the **Type** field specified as `Outage`. For more information, see Create an outage from a task.

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**Note:**
When there is an unauthorized change without an outage record associated, then the state flow moves from **Authorize** to **Review** and skips the schedule or implement state. The state changes because the implementation has already happened for this change.

### Disable the creation of an unauthorized change request

You can choose to disable the generation of unauthorized change requests that you receive on any unauthorized change event. When a configuration item (CI) that is part of an application service is updated, the system identifies this update and verifies whether the updated CI is part of an open change request.

#### Before you begin
Role required: admin or change_manager

#### About this task
If the updated CI is not part of an open change request, then the system triggers a change request, and sends a notification. The Change Management application uses this event to create an unauthorized change. If there are many CI changes with no open change request created to include the CIs, then the system creates unauthorized change requests on these CIs. When this event occurs, numerous unauthorized change requests are triggered, and notifications are sent to the members of the group. To avoid this situation, you can disable the *`Enable event processing`* property before you perform the updates. For more information on additional unauthorized change properties, see Unauthorized change properties.

**Note:**
Enable the property when you finish your updates. If this property is disabled, unauthorized change requests are not created.

#### Procedure
1. Navigate to **All** > **Change** > **Administration** > **Unauthorized Change Properties**.
2. Clear the **Enable event processing** property check box.
3. Click **Update**.

#### Result
The creation of an unauthorized change request is disabled, and no notifications are sent.

### Unauthorized change properties

Use the Unauthorized Change Properties page to enable or disable the unauthorized change capability, and to configure the criteria for additional unauthorized change properties.

From this properties page, you can control the capabilities, such as:

- Enabling or disabling the creation of unauthorized change requests when receiving the *`ci.change.unplanned`* event.
- Configuring the type of change requests, which are valid, and fall into the unauthorized change category.
- Configuring a quiet time, whereby, if there is a repeated change to a CI that has been flagged previously, another unauthorized change is not created within that time period.
- Configuring the interval frequency for detection.
- Including a CI class for the change request that must be monitored.

**Note:**
Monitored CIs must be part of an application service.

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Navigate to **Change** > **Administration** > **Unauthorized Change Properties** to view and edit the properties.

**Unauthorized change properties**

| Name | Description |
|---|---|
| Enable event processing | Enable the property to create unauthorized change events when an unplanned CI change (*ci.change.unplanned*) event is triggered.<br><br>Default value: False |
| Notification ignores period | Enter the time duration until which you want to disable sending notifications or creating unauthorized changes for the same CI.<br><br>Default value: 1 day |
| Change request query | Add the query conditions to define what change requests are valid and belong to the unauthorized change category. For example, you can add a condition to view all active change requests that are in the implement or review state for the given CI. If the conditions given are not met, then the change becomes an unauthorized change. |
| CI class inclusion | Choose the CI classes that you want to include and monitor for an unauthorized change to be created. |

## Process a change request

You can approve, implement, review, and close a change request.

### Before you begin

Role required: itil, admin, sn_change_write, or change_manager

As part of processing a change request, ensure that you have detected any change conflicts and performed risk assessment

### Procedure

1. Navigate to **All** > **Change** > **Open**.
2. Select a change request you like to work upon.
3. You can perform the following actions on a change request based on your role.

| Option | Description |
|---|---|
| **Approve or reject a change request** | Open the approval record and click **Approve** to approve the change request or **Reject** to reject it.<br><br>The change request changes to the **Scheduled** state if it is approved or to **New** state if it is rejected. |
| **Implement a change request** | Click **Implement** to put the change request in to action.<br><br>The change request state changes to **Implement**. The workflow creates two change tasks: **Implement** and **Post-implementation** |

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| Option | Description |
| --- | --- |
| | **testing**. Review the change tasks and assign them to a user or group, as appropriate. |
| **Review a change request** | Click **Review** after reviewing the details on the change request.<br><br>The change request is moved to the **Review** state. All open change tasks are set to **Canceled**. |
| **Close a change request** | Click **Close** after entering the **Close code** and **Close notes** in the **Closure Information** section.<br><br>The change request is closed. |
| **Cancel a change request** | From the context menu, click **Cancel Change**. Provide a reason for canceling the change and click **Save**.<br><br>The change request is canceled and the reason for canceling the change is added to the **Work Notes** field. |

**Note:**
Manually created change tasks are not automatically closed or cancelled when state is changed from Implement to Review. You must first close the change tasks and to close the change request.

Users with approval_user role, who approve change requests, do not have access to the change request itself. The following information are made available within the approval record to help these users make the right approval decision:

- Number
- Requested by
- Configuration Item
- Type
- Planned Start Date
- Risk
- Planned End Date
- Impact
- Short Description
- Description
- Justification
- Implementation plan

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- Risk and impact analysis
- Backout plan

You can also add approval history to the change request activity log. Click the activity filter icon and select **Approval history** from the list. When there is a change in the approval process, such as an approval, rejection, or comments, the activity log is updated.

**Related topics**

Create a change request

### Associated CIs on a change request

You can associate additional CIs or services to change requests through related lists on the Change Request form. You can also associate CIs with a change request from the dependency views map.

The **Affected CIs** and **Impacted Services/CIs** related lists enable you to manage CI changes.

When you first access a change request and work with these related lists, you can identify CIs across CI classes using configuration class. You can change the configuration class manually to filter the list and narrow the selection of CIs. For example, to filter for Linux servers only, select **Linux Servers** as the **Configuration Class**.

You can also create and save filters to provide quick access to common CI searches. The next time you access the change request, the **Configuration Class** field displays the last associated CI class. This automatic filter ensures that relevant CIs are displayed.

After identifying the CIs affected by a change request, you can add them to the **Affected CIs** related list on the change request. After saving affected CIs, you can open the form context menu and select the **Refresh Impacted Services** option. This option populates the **Impacted Services/CIs** related lists based on the primary CI i.e. the CI that is mentioned on the form.

The **Impacted Services/CIs** and **Service Offering** related lists represents a many-to-many relationship between the Task [task] and CMDB [cmdb_ci] tables. The related list displays CIs, such as business services or other CI classes, and the offerings that are impacted. You can add this related list to any task form such as an incident or problem form. You can also enter the details of the impacted services and the service offerings manually, as required.

**Note:**

- The manually added CIs are not deleted each time the impacted services are refreshed. However, business services related to the CIs are displayed on the **Impacted Services/CIs** related list.
- Refresh Impacted Services was only available for Change Request table. From this release, it is available for tables that extend the Task table. The list of these tables is driven by the `com.snc.task.refresh_impacted_services` property. This UI action populates the Impacted Services/CIs related list based on the primary CI i.e. the CI that is mentioned on the form.
- The Impacted Services list includes application services discovered by Service Mapping.

### Add affected CIs to change requests using dependency views

You can use dependency views to identify dependent CIs affected by a change request, and then add them to the **Affected CIs** related list.

**Before you begin**

Role required: itil, sn_change_write, or admin

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### About this task

When a change request is associated with a configuration item, the change record becomes accessible from dependency views. Services affected by the change request are easy to assess in dependency views.

If not visible, the administrator can configure the change request form to display the **Affected CIs** related list.

### Procedure

1. In the change request, click the dependency views icon next to the **Configuration item** field.

   **Note:**
   If there are critical change requests attached to a CI for a database, the map includes the business services that rely on that database. The database icon has a blinking glyph on the lower left edge that indicates any issues with the node.

   The configuration item is displayed in the map with all dependent CIs.
2. Click the down arrow next to the CI to display a list of tasks and issues with the CI.
   The list may contain one or more change requests, and follow-on audit tasks. You can open each record from this list.
3. Click the task number to display the complete list of tasks attached to this CI.
   You can view the user assigned to the change and also open the record for more information.
4. To change the map configuration, select a format from the **Layout** field or use the filter panel to filter the map.
   The dependency views map highlights the affected CIs that depend on the database or other CI.
5. To add an affected CI to the change, click the arrow next to the highlighted node and select **Add Affected CIs**.
6. Reload the change request form.
   You can view the CI you added in the **Affected CIs** related list.

## Associate multiple CIs with a change request

You can associate multiple impacted or affected CIs with a single change request.

### Before you begin

Role required: itil, change_manager, sn_change_write, or admin

### About this task

Use the **Configuration Item** > **Configuration** > **CI Class Manager**.

In the Affected CIs related list, a new filter is added for the Principal Class. You can control this functionality by the system property *com.snc.task.principal_class_filter*. The property contains all the task types where the Principal Class filter is applied to.

When you create a change request, you can add multiple CIs to that change request using the **Affected CIs** or **Impacted Services/CIs** related lists in the change record. Affected CIs can be added only when the change request is in the **New** state.

### Procedure

1. Navigate to **All** > **Change** > **Open** and select a change request record.
2. In either the **Affected CIs** or **Impacted Services/CIs** related list, click **Add**.

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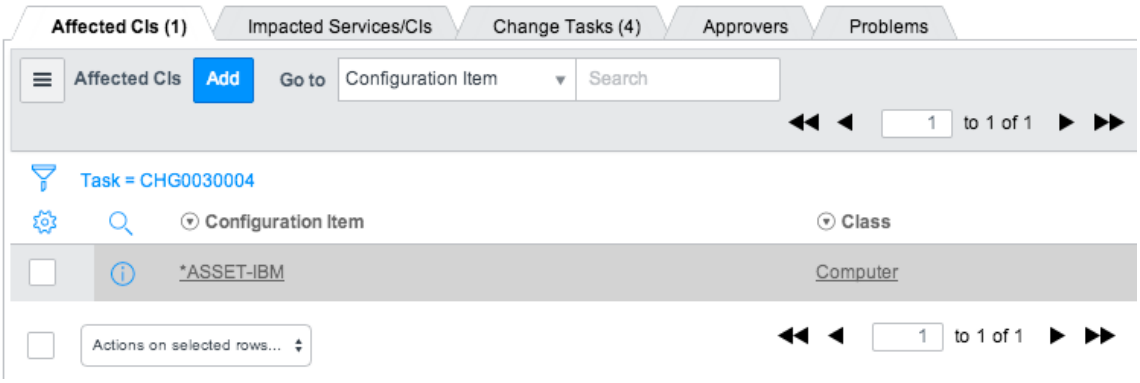
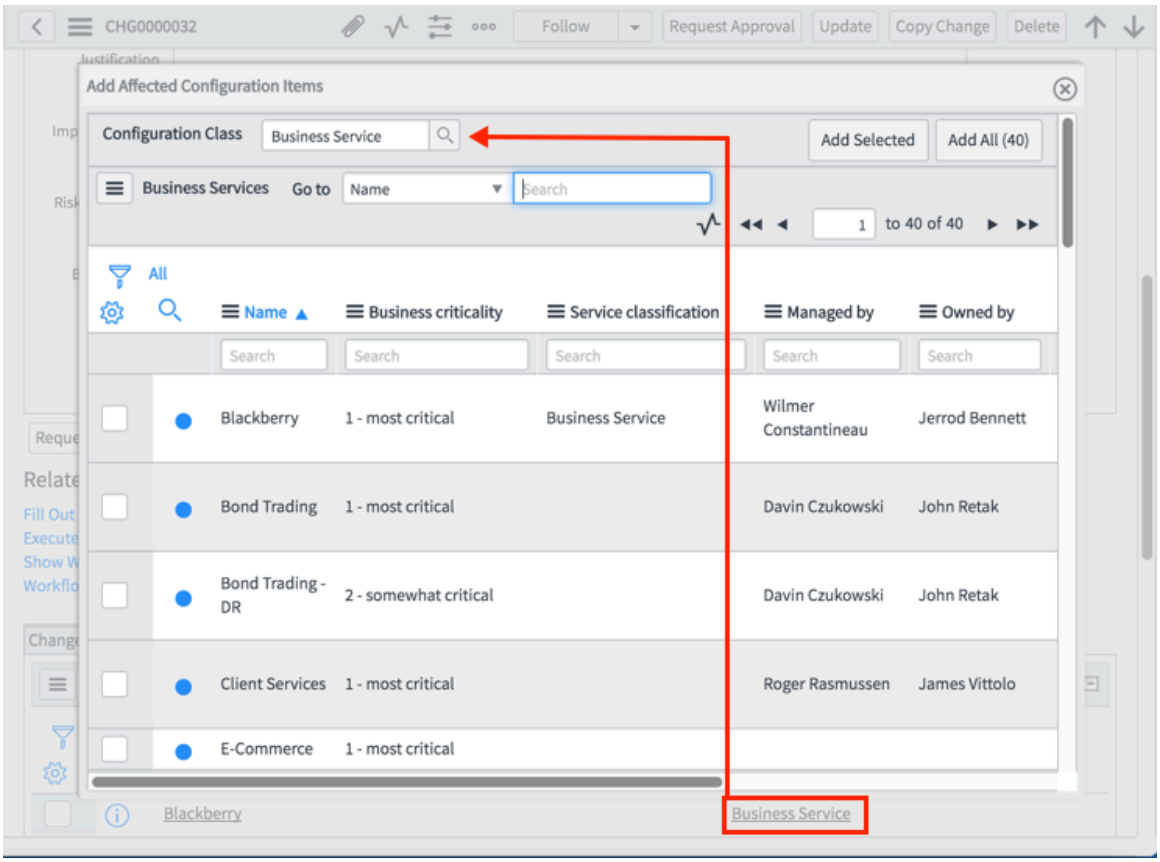



3. Select the appropriate CIs from the list of CIs displayed in the pop-up window.
   The pop-up window for the **Affected CIs** list is filtered for the configuration class of the last added CI. This automatic filter ensures that relevant CIs are displayed. You can change the class to list other CIs, if appropriate.




   The **Impacted Services/CIs** pop-up window lists all CIs and provides standard filtering options. You can also save any filters you create to provide faster access to common CI searches.

4. Perform one of the following actions.
   - Select the CIs to add and click **Add Selected** to add the selected CIs to the change request.
   - Click **Add All** to add all the CIs in the list to the change request.

### Related topics

Mass Update CI

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### Add an affected CI with a calculated application service

From the change request form, you can add an affected CI that is associated with a calculated application service.

#### Before you begin

Role required: itil, sn_change_write, or admin

#### Procedure

1. Navigate to **All** > **Change** > **Open**.
2. Select a change request to add affected CIs to.
3. On the Change Request form, scroll to the Related Links section.
4. Click the **Affected CIs** tab and then click **Add** to add an affected CI to the change request.

   **Note:**
   You can export the Affected CIs in an excel. Right click on the change request and open in a new window. Right click on **Configuration Item**, and select **Export Excel**.

5. Open the form context menu and click **Refresh Impacted Services**.
6. Click the **Impacted Services/CIs** tab to see any dynamic services that are associated with the affected CI and that are impacted by the change request.

### Mass Update CI

The Mass Update CI plugin enable users to apply the same update to a set of CIs for a specific CI class. The Change Management - Mass Update CI plugin is intended to be used when the Change Management - State Model plugin is activated.

To use these features, activate the Change Management - Mass Update CI plugin.

**Note:**
This feature is available for normal and emergency changes only.

When you activate the Change Management - Mass Update CI plugin, the **Mass update CI class** check box appears on the Change Request form. When selected, the **Mass update CI class** tab appears and allows changes to be proposed against the configuration items that match that class associated with the affected CI's related list in that change.

When the change moves to the Implement state, the required update for each CI related to the Change Request is created. These updates can then be applied in the Implement or Review state.

**Note:**
You cannot add or delete a CI when the change request in the **In-progress** state and is not approved.

#### Related topics

- Activate Change Management - Mass Update CI
- Associate multiple CIs with a change request
- State model and transitions
- Configure a form

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### Use Mass Update CI

You can use the proposed changes in a change request to apply the same update to a set of CIs for a specific CI class.

## Before you begin

Role required: itil, sn_change_write, or admin

## About this task

## Procedure

1. Navigate to **All** > **Change** > **Create New** and select **Normal** or **Emergency** change.
2. Select the **Mass update CI class** check box.
   The **Mass update CI class** tab or form section appears.
3. On the **Mass update CI class** tab, select the CI class to update.

   The dynamic CI group is not available for selection. When using mass update, a specific CI class must be selected and not a group that may have different CI classes.

   The parent CMDB [cmdb_ci] table is selected by default. Search for the class name, for example, enter `linux` or `email`.

   **Note:**
   If you have selected a dynamic CI group for the **Configuration item** field, the configuration items that are part of the dynamic group and belong to the selected CI class are updated. For example, if the dynamic CI group that you have selected consists of Linux servers, computers, and network switches, and you select Linux servers for the CI class with proposed changes, only the Linux servers in the dynamic group get updated.

4. Enter the proposed changes that you want to make to all the affected CIs.
   Each time that you select a field and value, another line appears. If you enter a proposed change in error, click the **X** beside the line to remove it.
5. Click **Submit**.
6. Open the change request you submitted.
7. In the Affected CIs related list, click **Add**.
   The Add Affected Configuration Items window that opens lists only the CIs in the selected CI class.
8. Select one or more CIs and click **Add Selected**, or click **Add All**.
   If you change the CI class after selecting affected CIs, the list is cleared when you save the record.
9. Continue with the change management process for this change request.
10. When the record reaches the Implement or Review states, click **Apply Proposed Changes**.
    A message appears informing you that the proposed changes were applied to all the affected CIs.

    **Note:**
    If you are using the Bulk CI Change without Mass Update CI feature, then the proposed changes are applied when the change request is closed.

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**Related topics**

Mass Update CI

Activate Change Management - Mass Update CI

Create a change request

### Place a change request on hold

You can put a change request on hold to get additional information for the created change request.

## Before you begin

The following plugins need to be activated to avail the synchronization of the **On Hold** functionality between change task and change request:

- Change Management — Core [com.snc.change_management]
- Change Management — State Model [com.snc.change_management.state_model]

Roles required: itil, admin, sn_change_write, or change manager

## About this task

Change tasks inherit some state conditions from the parent change request they are related to. When a change request is placed on hold, these conditions are applied to it:

- If the change is waiting for approval, the pending approvals are marked **No Longer Required**. When the change request is no longer **On Hold**, the pending approvals are reinstated and are **Awaiting approval**.
- The change can progress only to the **Canceled** state while it is **On Hold**.
- If a change request is canceled while it is **On Hold**, then its **On Hold** flag is set to **false** so the change cannot be canceled and still be **On Hold**.
- If the change request is set to **On Hold**, the value of the **On Hold** field for all the active change tasks for that change request is set to **true** and the **On hold reason** is copied from the change request to the change tasks.
- If you clear the **On Hold** check box in a change request, the **On Hold** field for all the active change tasks for that change request is set to **false** and the **On hold reason** is cleared from the change tasks.
- If the change request is canceled, all the active change tasks related to that change request are also canceled.
- A change request can only be closed when all the active change tasks related to that change request are closed or canceled otherwise a pop-up appears notifying that there are open change tasks that require to be closed.
- If there are existing change tasks that are manually placed on hold, those change tasks do not get overwritten when the change request is placed to the **On Hold** state. Similarly, when the change request is taken off the hold state, the change tasks that were placed on hold manually stays in the **On Hold** state.

## Procedure

1. Navigate to **All** > **Change** > **Open**.
2. Open the specific change request.
3. Select the **On Hold** check box.
4. In the **On hold reason** field, enter the reason for placing the change request on hold.
5. Click **Update**.

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**Related topics**

State model and transitions

Create a change request

### Refresh impacted services and CIs for Change

The Impacted services and CIs related list refreshes its records and also the records listed in the Service Offerings and Business Applications related lists based on the affected CIs. You can identify the impacted services and CIs and take necessary action.

## Before you begin

Role required: itil, change_manager, sn_change_write, or admin

## About this task

Refreshing impacted Services on a change request form is executed in one of the following ways:

- Conflict detection: When a conflict detection is triggered, refreshing of impacted services may be initiated. The **Automatically include business or application services related to Cis with conflicts in the Impacted Cis/Services related list** property (*`change.conflict.populateimpactedcis`*) controls whether the Impacted Services/CIs related list should be refreshed or not. If this property is enabled, then a call is made to the `ChangeUtils` script include calling a *`refreshImpactedServices`* method for the current change request.
- Automatically when the change request moves from the new state: Impacted services are refreshed when the change request moves from the new state and when the Affected CIs related list is not modifiable.
- Manually when selecting the **Refresh Impacted Services** option from contextual menu.

## Procedure

1. Navigate to **All** > **Change** > **Open**.
2. Open the change record for which you want to refresh the related lists those values are based on affected CIs.
3. Click the Additional actions icon and then select **Refresh Impacted Services**.
   The records in the Impacted Services/CIs, Business Applications, and Service Offerings related lists are updated according to this flow:
   - If the *`change.refresh_impacted.include_affected_cis`* property is set to true, all the services from svc_ci_assoc table are retrieved. If the property is set to false, then services are retrieved from `CIUtils` script include.
   - If the *`change.conflict.populateimpactedcis`* property is set to true, then additional services are retrieved from ChangeCollisionHelper and added to the list of services.
   - If the Service Mapping plugin is active, then Application Services are retrieved. These are retrieved, whereby, the association type is **Runs On**, and the association child is one of the CIs in the affected list.

   Once all these services are correlated, a new list is added, and the existing items in the related list are removed, where the **manually_added** flag is set to false. The list of services is then used to populate the Business Applications and Service Offerings if the properties are enabled.

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### Refresh impacted services properties

Use the refresh impacted services properties to enable or disable the refresh impacted services capability, and to configure the criteria for additional refresh impacted services properties.

By configuring these properties, you can control the capabilities, such as:

- Include the primary configuration item or all the items in the Affected CIs related list.
- Processing of refreshing the impacted services as an event.
- Populate Service Offerings and Business Applications from the Impacted Services related list.

The following properties can be found in sys_properties.list and on the Change properties page.

#### Refresh impacted services properties

| Property | Description |
|---|---|
| com.snc.change_request.refresh_impacted.include_affected_cis | • When true, all the configuration items listed in the Affected CIs related list are checked. These configuration items are checked against the Application services mapping table (svc_ci_assoc) as this is a faster process, and also returns a more concise relationship picture. All the services from svc_ci_assoc table are retrieved.<br>• If the property is false, only the CI on the change form is used. This uses the method of traversing the cmdb tree structure to find the services. The services are retrieved from `CIUtils` script include.<br>**Note:** If dynamic CI groups are used on the Change form, then this property must be set to true as the associations are located in the svc_ci_assoc table.<br>When a business service is converted to an application service (as an example), all the levels included in the svc_ci_assoc table are considered at the time of conversion. |
| change.conflict.populateimpactedcis | If this property is set to true, then the `ChangeCollisionHelper` script include checks the configuration items that have been identified in the list of conflicts against the Application services mapping table (svc_ci_assoc) and also table (cmdb_ci_service) to check if there are any business services that are directly impacted. |
| com.snc.change_request.refresh_impacted.event | • When true, the process of refreshing the impacted services is done through an event. This process is run in the background and |

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**Refresh impacted services properties (continued)**

| Property | Description |
|---|---|
| | you will be notified through a message in Notify that the process has been complete.<br>• When false, this is run in your session. As this is not run in background, there is no notification on completion. |
| com.snc.change_request.populate_service_offering | • When true, the Service Offerings related list is populated from the Impacted Services/ CIs related list.<br>• When false, the related list is not populated or amended in any way. |
| com.snc.change_request.populate_business_application | • When true, the Business Applications related list is populated from the Impacted Services/CIs related list.<br>• When false, the related list is not populated or amended. |
| com.snc.change_request.refresh_impacted_services.message.show | • When true, the `Refresh impacted services is initiated` message appears on the Change request form.<br>• When false, the `Refresh impacted services is initiated` message doesn't appear. |

## Creating change approval policies

Use the change approval policy to create change approval definitions and the change approval policy workflow to control the approval process for a change request.

### Create approval definitions

Use approval definitions to define a set of criteria that are evaluated automatically before the policy is marked as approved.

**Before you begin**

In the approval definitions, you can define to determine

- If the approval is user or group based.
- If it should automatically approve or reject on behalf of a user.
- If a response to the approval is required.

Role required: change_manager or admin

**Note:**
Approval definitions can be applied only once if multiple applied decisions have the same approval definitions associated with them.

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### Procedure

1. Navigate to **All** > **Change** > **Change Policy** > **Approval Definitions**.
2. Click **New**.
3. On the form, fill in the fields.

   **Note:**
   When adding users or groups to which you want to send the approval, specify the **Approval Definition** value as `Approver Source`.

4. Click **Submit**.

## Create change approval policies

Use a change approval policy to define approvals that should be generated for your change.

### Before you begin
Role required: admin or change manager

### Procedure

1. Navigate to **All** > **Change** > **Change Policy** > **Change Approval Policies**.
2. Click **New** to create a new approval policy.
3. Enter the **Name** of the policy.
4. In the **Execution** field, select an option to determine the approach to execute your decision.
   - **First decision that matches**: Uses the first matching decision in the ascending order of the value defined in the **Order** column of the **Decisions** list. The associated approval definition is applied.
   - **Run all decisions that match**: Uses all matching decision and applies the associated approval definition.
5. Click **Submit**.
6. Select the policy you created.
7. Add your decisions to the policy and click **Submit**.

### What to do next
To add additional policy inputs and decisions, see Create Policy inputs and Create Decision records..

## Create policy inputs

Policy inputs are variable sources that you can use while evaluating a decision to determine the approval action. You can create multiple policy inputs to evaluate the decision created, and also access the change request table and any table change request references.

### Before you begin
Role required: admin or change manager

You can create multiple policy input types. By default, the **change_request** policy input of type *`Reference`* is available for all change types. This policy input provides access to the change request table and to any table change request references. For a normal change policy, an extra **manager_approved** policy input of type *`True/false`* is available.

To define additional policy inputs, perform the following steps:

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### Procedure

1. Navigate to **All** > **Change** > **Change Policy** > **Change Approval Policies**.
2. Create a change approval policy or open an existing policy.
   For more information, see Create change approval policy
3. In the **Policy inputs** tab, click **New** to create a record.
   The **Name** and **Application** fields are auto-populated.
4. Click the reference lookup icon for the **Type** field and choose a Type value.
5. Enter a name in the **Label** field.
   The column name for the new record is populated in the **Column Name** field automatically.
6. Depending on the value of the **Type** field, you can configure the other parameters for the policy input.
7. Click **Submit**.

### What to do next
After you create a policy input, reference it within a decision.

## Create Decision records

Decision records contain the conditions that you can use to determine the change approval action. Create decisions using condition builder when creating change approval policies.

### Before you begin
Role required: admin or change manager

You can create decisions to evaluate conditions that reference policy inputs and apply the associated approval definition. To create a decision, perform the following steps:

### Procedure

1. Navigate to **All** > **Change** > **Change Policy** > **Change Approval Policies**.
2. Create a change approval policy or open an existing policy.
   For more information, see Create change approval policy.
3. In the **Policy inputs** tab, create a policy input or update an existing record.
   For more information, see Create a decision.
4. In the **Decisions** tab, open the default decision record.
5. Copy and modify the decision record configuration or click **New** to create a new decision record.
6. Provide a label in the **Label** field.
7. In the **Answer** field, select an approval definition.
8. Add any necessary filter conditions using the condition builder.
   These conditions determine the outcome of the policy. For example, to generate approvals at the Assess state that trigger an approval definition when risk is low, set the condition to **[Change request.state] [is] [Assess] AND [Change request.Risk] [is] [Low]**.
9. Click **Submit**.

## Change Approval Policy workflow activity

Use the Change Approval Policy workflow activity to control the approval process for a change request by creating user and group approvals according to a change approval policy record. Multiple activities can be used in a workflow, where each activity can reference the same or different Change Approval Policies.

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Using the current change request and additional inputs defined in the **Policy Input** script field in the activity, you can evaluate the Change Approval Policy record, which applies the approval definitions from matching decisions.

**Note:**
This activity is only available when the workflow runs on a table that extends or is the [change_request] table.

## Results

The activity assigns a result value according to the outcome of the applied policy. The possible result values are:

- Approved
- Rejected
- Canceled
- Skipped
- Finished

## Input variables

Input variables determine the initial behavior of the activity.

### Change Approval Policy activity input variables

| Field | Description |
|---|---|
| Approval Policy | The Change Approval Policy that you want to apply to the change request. |
| Policy Input | Policy Inputs that are defined on the Change Approval Policy record. Set additional policy inputs here. |
| Finish condition | Determine if the activity should complete while pending approvals remain. Use this condition if the workflow is configured to handle restarting the Change Approval Policy activity. For example, when the Change Request goes on-hold. |

## Condition

The following conditions determine which transition runs after this activity.

### Change Approval Policy activity conditions

| Condition | Description |
|---|---|
| Approved | Change request is approved when the criteria defined by applied Approval Definitions is met. |
| Rejected | Any rejection from applied Approval Definitions will result in the Rejected outcome. |
| Error | The event or condition that generates an error. |

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**Change Approval Policy activity conditions (continued)**

| Condition | Description |
|---|---|
| Skipped | If this condition is not configured on the activity, then the Approved condition is used. This outcome occurs for the following scenarios:<br>• No decisions from the Change Approval Policy match<br>• No approvals can be generated from matched decisions |

## States

The workflow engine uses the activity state to perform the next logical action on the activity.

**Change Approval Policy activity states**

| State | Description |
|---|---|
| Executing | The workflow engine starts the `execute` function of the activity. |
| Waiting | The workflow engine ignores the activity until a specific event to restart the activity is fired. |
| Finished | The activity finished running. See the result value for the outcome of the activity. |
| Cancelled | This activity, or the workflow that contains this activity, was canceled. |
| Error | A JavaScript error occurred. Review the logs for error details. |

## Example

In this example, let us reference the Risk approvals activity in the **Change Request - Normal** workflow. In the workflow, the change approval policy factors if the assigned group's manager has already approved the Change Request.

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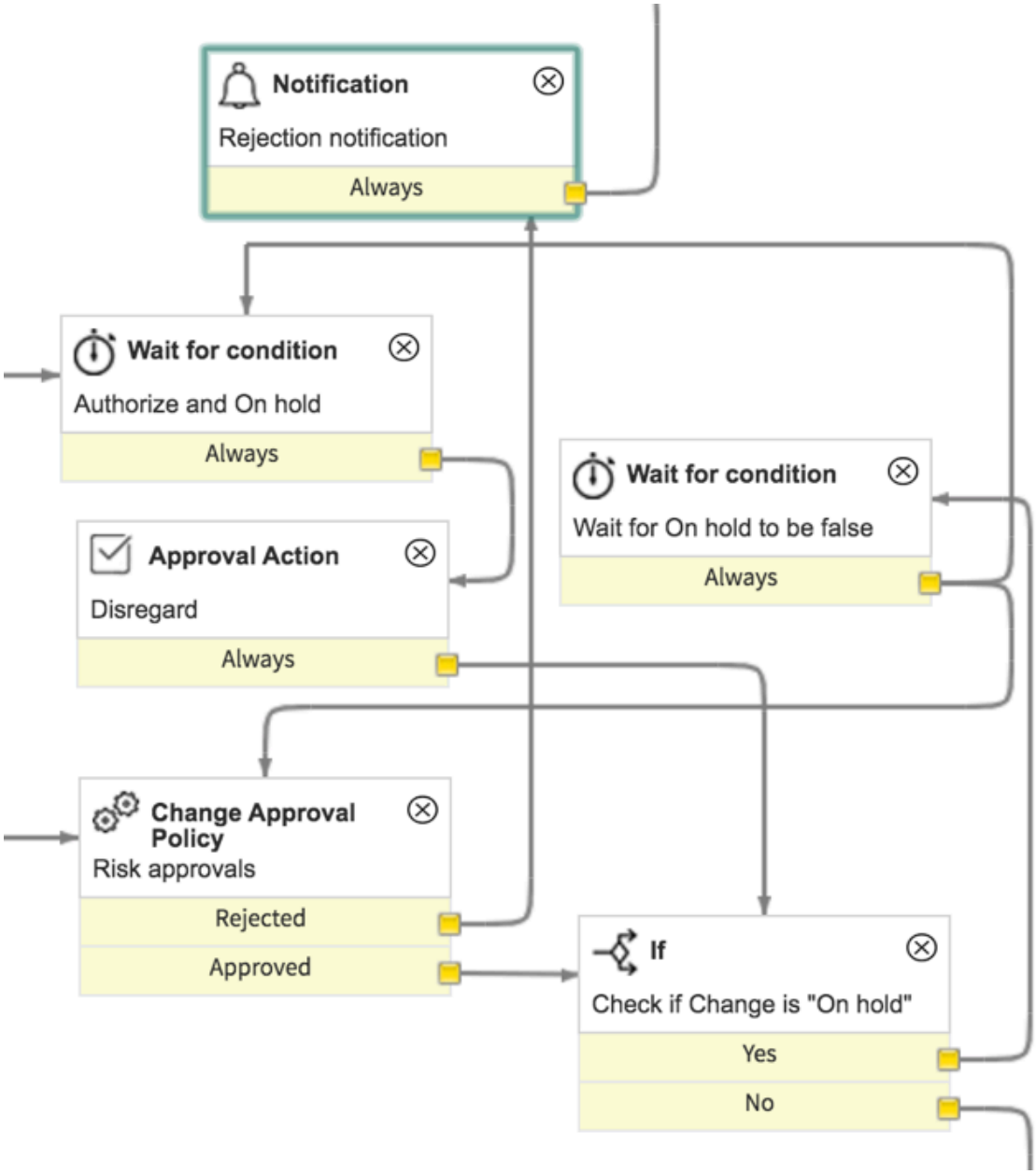


You can use this activity to access the risk of the change request of a normal change policy. When this activity runs, the associated decisions executes the approvals that needs to be requested.

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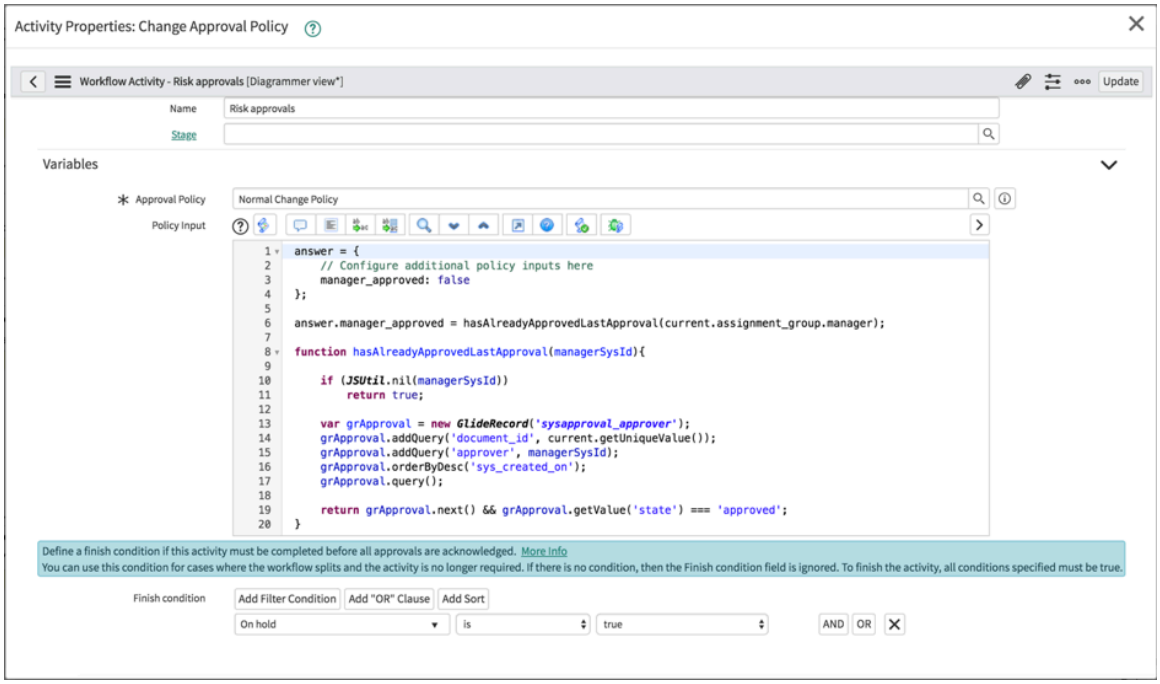


Use the **Policy Input** field to set up additional inputs. In the given example, the activity defines the manager_approved property and performs the query to check if an approved record exists for the approved group's manager.

**Note:**
Ensure that the manager_approved policy input is defined in the Change Approval Policy record.

The **Finish condition** field is used to complete the activity by marking pending approvals as **No Longer Required**. In this workflow example, when the Change Request is put on-hold, the Change Approval Policy activity is completed and the workflow disregards the pending approvals before waiting for the Change Request to resume. When the on-hold state is released, the Change Approval Policy activity is restarted.

### Use the Change Approval Policy workflow activity

Apply your Change Policy in your Change Request workflow to manage the approvals.

#### Before you begin

Role required: admin

#### Procedure

1. Navigate to **All** > **Workflow Editor**.
2. Open the change request workflow that you want to use in the **Change Policy** activity.
3. Drag and drop the **Change Approval Policy** activity from the **Change Policy** section in the **Core** activities tab.

   **Note:**
   This activity is only available when the workflow runs on a table that extends or is the change_request table.

4. Configure the activity by specifying the Change Approval Policy in the workflow.
5. Configure the Policy input field to setup inputs that are defined on the associated Change Approval Policy record.

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6. Configure the **Finish condition** if the workflow needs to handle a scenario where the activity needs to complete ahead of time because of a change in the Change Request.
   For example, when the change request is on-hold.
7. Click **Update**.

### Use the Apply Change Approval Policy flow action

Apply your change approval policy in the Change Management Flow Designer action to control the approval process for a change request. You can create user and group approvals according to a change approval policy record.

#### Before you begin
Role required: admin

#### About this task
This flow action uses the **Ask For Approval** flow action to apply approvals that are derived from the Change approval policy. When approvals are being generated, the **Ask For Approval** action avoids generating more than one approval for the same user. For example, if the policy requires approval from two groups and both groups have the same user, then the shared user is notified only once for the approval.

#### Procedure
1. Navigate to **All** > **Process Automation** > **Flow Designer** > **Flows**.
2. Select the flow that you want to apply the change approval policy to.
3. Select **Action** > **Installed Spokes** > **ITSM** > **Change** > **Apply Change Approval Policy**.
4. On the form, fill in the fields:

**Apply Change Approval Policy form**

| Field | Description |
|---|---|
| Action Label | Unique label for the action. |
| Policy [Change Approval Policy] | Policy that you want to apply to your Change request. |
| Change Request | Source of the change request required by the policy. Select this field using the data pill picker icon ( ). Alternatively, you can select the change request from the Change Request list. |
| Due Date | Due date for the approval policy. Select one of the following options:<br>○ **None**: The approval has no due date.<br>○ **Approve**: Automatically approve the approval policy on the due date.<br>○ **Reject**: Automatically reject the approval policy on the due date.<br>○ **Cancel**: Automatically cancel the approval policy on the due date. |

5. Click **Submit**.

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### Create a Change approval policy using decision builder

Create a change approval policy using the Change approval policy decision builder to define the approvals that should be generated for your change.

## Before you begin

The Decision Builder [sn_decision_design] plugin must be installed.

A change approval policy can be applied to a change request. An approval policy can contain multiple decisions allowing a single policy to handle every approval required for a change type. When a decision condition matches, the related approval definition is evaluated.

Role required: admin or change_manager

## Procedure

1. Navigate to **All** > **Change** > **Change Policy** > .
2. Select **Create new change approval policy**.
3. Enter the name of the policy.
4. In the **Execution** field, select an option to determine the approach to implement your decision.

| Option | Description |
|---|---|
| **First decision that matches** | Uses the first matching decision in ascending order of the value defined in the **Order** column of the **Decisions** list. The associated approval definition is applied. |
| **Run all decisions that match** | Uses all matching decisions and applies the associated approval definition. |

5. Select **Create & Continue**.
6. Select **Add an input**.
7. On the form, fill in the fields.

#### Add an input form

| Field | Description |
|---|---|
| Label | Header of the input. |
| Type | Type of data used for the input.<br>When the data type is **Reference**, a new column titled Reference appears in the form. The reference is the table associated with the input.<br>The available input types are:<br>○ Choice<br>○ Date<br>○ Date/Time<br>○ Decimal |

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| Field | Description |
|---|---|
| | ○ Due Date<br>○ Integer<br>○ Long<br>○ Reference<br>○ String<br>○ String (Full UTF-8)<br>○ True/False |

8. Add a condition by selecting **Add Condition Column**.
9. On the form, fill in the fields.

**Add Condition Column form**

| Field | Description |
|---|---|
| Condition column label | Label for the condition. |
| Description | Brief overview of the condition. |
| Input | Input linked to the condition column.<br><br>To evaluate multiple fields, you can add multiple conditions with the Reference input type. |
| Table | If the data type is **Reference**, this field is automatically set to the name of the reference table. |
| Data to evaluate | If the input type is **Reference**, specifies whether the condition evaluates a reference record or a field from the reference table. |
| Condition type | Data type selected for the input. |
| Default operator | Operator used to evaluate a user-specified value. A default operator is required for all input data types except for True or False. |

10. **Optional:** Add more conditions by navigating to the last condition column and the plus icon (+) or by pointing to a condition column and clicking the plus icon (+).
11. For each condition cell, select an operator and enter a value.
For example, if you wanted to evaluate the change approval policy only for hardware issues, you could set the condition **[Assignment group][is][Hardware]**.
12. Select the result column, and then select a desired Change approval definition from the list.
13. In the form header, click **Save**.

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### Result
A change approval policy is created and is evaluated on a change request that matches the defined condition.

## Working with the CAB Workbench

Use the CAB workbench to review and authorize change requests and review recently implemented changes.

### Create a CAB definition

A Change Advisory Board (CAB) definition is similar to a recurring meeting invitation. When you define a CAB definition, it determines the attributes that are associated with all CAB meetings generated from that definition.

### Before you begin
Role required: sn_change_cab.cab_manager

### Procedure

1. Navigate to **All** > **Change** > **Change Advisory Board** > **My CAB Definitions**.
2. Click **New**.
3. On the CAB Definition form, fill in the fields.

#### CAB Definition form

| Field | Description |
|---|---|
| Name | Name for the CAB definition. |
| CAB Manager | Name of the user who manages the CAB meetings. |
| Delegates | Delegate CAB members who can substitute as the CAB manager during the meeting. |
| Board Members | Board members who are expected to attend the CAB meeting, selected from the list of users. |
| Board Groups | Board groups who are expected to attend the CAB meeting, selected from the list of user groups. |
| Rolling Meeting Window | Number of days for which you want to create CAB meetings.<br>**Note:** The CAB schedule and related schedules, if any, determine the number of CAB meetings that are created. For example, if you have a CAB schedule of once every week and you enter 28 days in the **Rolling Meeting Window** field, then three CAB meetings are created. |
| CAB Type | Type of CAB meeting this definition is used for. |
| Time zone | Time zone for the CAB meeting. |
| Locations | One or more locations for your CAB meetings. For example, meeting rooms in different offices. |
| Active | Check box that specifies whether the CAB definition is active. Clear the check box to deactivate the CAB definition. |

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| Field | Description |
|---|---|
| Conference Details | Information such as meeting links, passwords, and phone numbers. |
| Agenda Management | |
| Use filter criteria to drive Change Request date range | If selected, helps to choose a time range for the planned start and end date from **Change Request additional condition** instead of selecting specific dates based on meeting schedule.<br>**Note:** The same field is selected for all CAB meetings in the CAB definition unless individually overridden. |
| Notification lead time | The advanced notification on the number of agenda items that needs to be discussed. |
| Auto Add Agenda Decisions | Check box for capturing agenda decisions automatically on the meeting widget. The agenda decision is captured in the following format:<br>`(CAB Automation) - <change request number> - <decision> - <CAB Manager name> - <time><AM/PM> <timezone>` |
| Automatically Add Change Requests | Check box to define the types of change requests that are automatically added to the CAB meeting agenda.<br>When you select **Automatically Add Change Requests**, the **Refresh CAB Meetings** related link appears. If you click this link, search is performed for change requests that match the value in the **Change Request Addition Conditions** field. If there are any matching change requests, agenda items are created for them and added to the CAB agenda.<br>If you do not select **Automatically Add Change Requests**, then you need to create individual agenda item for the associated change request for the meeting agenda. |
| Change Request Addition Conditions | Condition builder to specify which change requests are added to the CAB meeting agenda.<br>○ **Add Filter Condition**: Click to add additional filter conditions, or click **AND** next to the existing filter condition.<br>○ **Add "OR" Clause**: Click to display the results of multiple filter criteria in a single list.<br>○ **Add Sort**: Click to define the order of the change requests in this CAB meeting agenda. The agenda order can be defined in CAB Definitions or CAB Meetings, and can be based on one or more fields. |
| Time per Agenda Item | The time, in minutes and seconds, allotted to discuss each change request on the agenda. The allotted time can be adjusted for agenda items before or during the meeting. |

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| Field | Description |
|---|---|
| Complete Pre-approved Changes | Check box to mark each pre-approved change request as **Complete** in the CAB meeting agenda.<br><br>**Note:**<br>Pre-approved changes are automatically marked as complete so that approvers do not have to review them. The pre-approved changes are visible in the CAB Workbench, and can be discussed if necessary. |

4. Open the form context menu and select **Save**.
   The **Schedule Entries**, **Related Schedules**, and **CAB Meetings** related lists appear.
5. To set the meeting schedule for your CAB meeting series, complete the following steps:
   You can add one or more schedule entries to a CAB definition to schedule the series of CAB meetings. These schedule entries let you set valid days and times for holding CAB meetings.

   a. In the **Schedule Entries** related list, click **New**.

   b. On the Schedule Entry fields form, fill in these fields.

**Schedule Entry fields form**

| Field | Description |
|---|---|
| Name | Name for the schedule entry. |
| Type | Type of schedule entry for the specified date and time duration, for example, appointment or meeting.<br>▪ **Time off**: Shown as planned time-off.<br>▪ **Appointment**: Shown as appointment time.<br>▪ **Meeting**: Shown as meeting time.<br>▪ **Phone call**: Shown as time for making phone calls.<br>▪ **Excluded**: The duration is excluded. |
| Show as | How the schedule entry is displayed on the CAB calendar, for example, busy or tentative. |
| When | Start and end date and time for the schedule entry. |
| All day | Check box to make the schedule entry active for the entire duration of the selected dates. |
| Time zone | Time zone for the schedule entry. The time zone cannot be modified. |
| Repeats | Frequency with which the schedule entry repeats, for example, daily or weekly.<br><br>When you select **Monthly**, the **Monthly type** field appears. Enter the number of times in a month when the schedule entry repeats.<br><br>When you select **Yearly**, the **Yearly type** field appears. Select an option, as follows: |

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| Field | Description |
|---|---|
| | ▪ **Day of the year**: Chosen as the current day on which you define the schedule.<br>▪ **Floating**: If you select this option, the following fields appear:<br>  ▪ **Float week**: The week of the month when the schedule entry repeats.<br>  ▪ **Float day**: The day of that week when the schedule entry repeats.<br>  ▪ **Month**: The month when the schedule entry repeats. |
| Repeat every | If the schedule entry is selected to repeat, specifies how often it repeats. For example, if you select weekly repetitions, specify the frequency such as every week or every two weeks.<br><br>This field appears when you select the **Weekly**, **Monthly**, or **Yearly** options. |
| Repeat on | If the schedule entry is selected to repeat, then specify when it repeats. For example, if you select weekly repetitions, specify the days of the week when it repeats.<br><br>This field appears when you select the **Weekly** option. |
| Repeat until | If the schedule entry is scheduled to repeat, specifies an end date until which the schedule entry is repeated. |

**c.** To add the schedule entry to the CAB definition, click **Submit**.

**d. Optional:** To view the series of CAB meetings in a calendar view in a new browser window or tab, click the **Show Schedule** related link.

6. To set a related schedule for your CAB meeting series, complete the following steps:
   You can add one or more related schedules to a CAB definition. Related schedules enable you to set valid schedules for holding CAB meetings. For example, if you set the public holiday schedule as a related schedule, it ensures that no CAB meeting is scheduled on a public holiday.
   **a.** In the **Related Schedules** related list, click **Edit**.
   **b.** Select one or more related schedules and move them to the **Related Schedules List**.
   **c.** Click **Save**.
   **d. Optional:** On the **CAB Definition** form, click the **Show Schedule** related link to view the defined schedule in the calendar.
7. In the **Related Links** section, click **Refresh CAB Meetings**.
   The CAB meeting series created from CAB definitions inherit the criteria of the CAB definition. You can view the series of CAB meetings generated from the CAB definition in the **CAB Meetings** related list.

### What to do next

You can modify CAB meeting details and send meeting requests to attendees. You can also manage agendas by reviewing or adding agenda items to each of the meetings.

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### Related topics

OR conditions

## View the CAB calendar

The CAB calendar provides an overview of your CAB meeting schedule to help with planning and managing CAB meetings.

### Before you begin

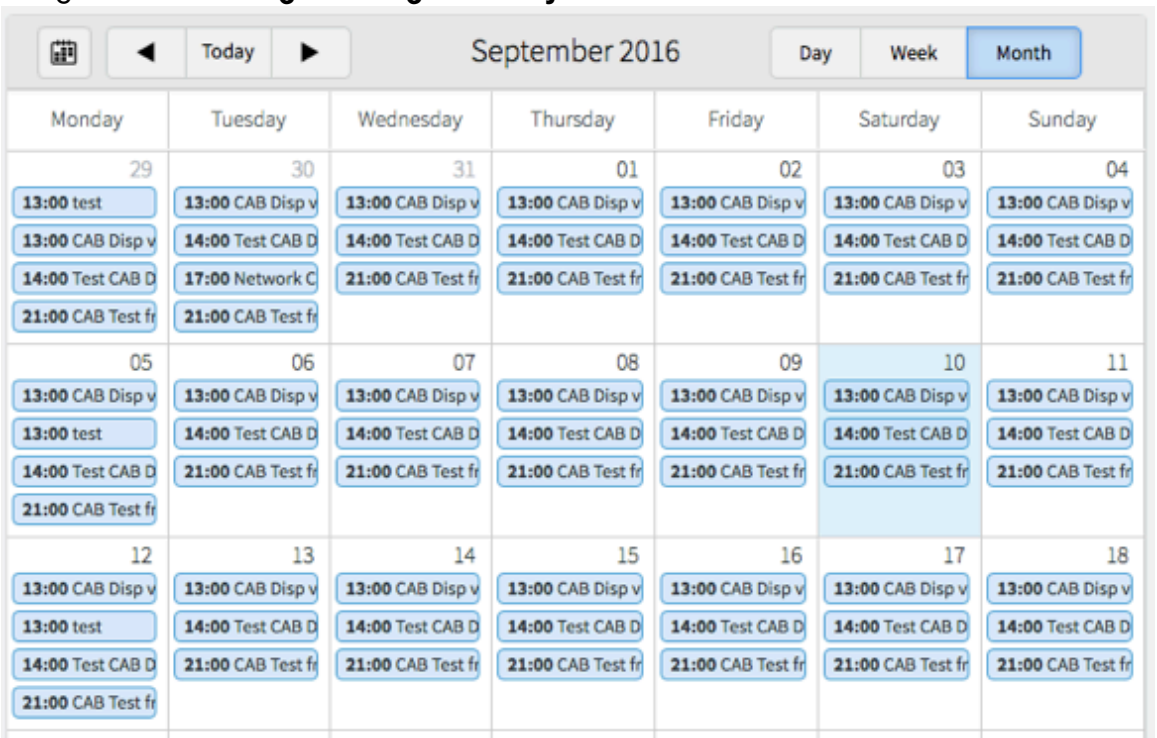
Role required: itil, sn_change_cab.cab_manager, sn_change_read, sn_change_write, or admin

### About this task

You can view the CAB calendar to view and attend specific meetings.

### Procedure

1. Navigate to **All** > **Change** > **Change Advisory Board** > **CAB Workbench**.




2. You can perform the following actions from the CAB calendar.

| Option | Description |
|---|---|
| **View the calendar** | Click the options in the top right of the CAB calendar to display the calendar in daily, weekly, or monthly view. |
| **View CAB meeting details at a glance** | Click a specific CAB meeting to view details such as the CAB manager, meeting start time, and meeting end time. |
| **Attend a specific CAB meeting** | Click the meeting you want to attend and click **Open** to launch the meeting. |

## Create a single CAB meeting occurrence

Depending on your requirements, you can create an individual Change Advisory Board (CAB) meeting occurrence.

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### Before you begin

Role required: sn_change_cab.cab_manager

### Procedure

1. Navigate to **All** > **Change** > **Change Advisory Board** > **My CAB Meetings**.
2. Click **New**.
3. On the CAB Meeting form, fill in the fields.

#### CAB Meeting form

| Field | Description |
|---|---|
| Name | Name of the CAB meeting. |
| CAB manager | Name of the user who manages the CAB meeting. The default is the user that is currently logged in. |
| Delegates | Delegate CAB members who can substitute as the CAB manager during the meeting. |
| Board groups | |
| Board members | |
| State | ○ **Pending**: Indicates that the meeting is yet to begin. It is the default state of the meeting.<br>○ **In progress**: Indicates that the meeting has begun and is in progress.<br>○ **Complete**: Indicates that the meeting has occurred and is finished.<br>○ **Canceled**: Indicates that the meeting has been canceled.<br>**Note:** The system automatically updates the **State** field when the meeting starts and ends from within the CAB workbench. There is no need to manually change this field, unless, for example, the CAB manager wants to cancel a future meeting. If the CAB workbench closes unexpectedly, the CAB manager must manually update the **State** field. |
| Meeting start time | Start date and time for the meeting.<br>**Note:** When you add an agenda item to a CAB meeting, the **CAB date** field in the change request is automatically updated with this date. |
| Meeting end time | End date and time for the meeting. |
| Meeting Notes | Enter notes for the meeting, if any. |
| Locations | One or more locations for your CAB meetings. For example, meeting rooms in different offices. |
| Conference Information | |

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| Field | Description |
|---|---|
| Conference details | Information such as meeting links, passwords, and phone numbers. |
| Agenda Management | |
| Use filter criteria to drive Change Request date range | If selected, helps to choose a time range for the planned start and end date from **Change Request additional condition** instead of selecting specific dates based on meeting schedule.<br>**Note:**<br>If you select **the Use filter criteria to drive Change Request date range** field in a cab meeting, the **Change Requests starting after** field and the **Change Requests starting on or before** field is disabled for the meeting, and therefore ignored. The change request additional conditions drive the date range. |
| Change Requests starting after | Change requests that starts after this date and time should be added to the CAB meeting. |
| Change Requests starting on or before | Change requests that starts on or before this date and time should be added to the CAB meeting. |
| Complete Pre-approved Changes | Check box to mark each pre-approved change request as **Complete** in the CAB meeting agenda.<br>**Note:**<br>Pre-approved changes are automatically marked as complete so that approvers do not have to review them. The pre-approved changes are visible in the CAB Workbench, and can be discussed if necessary. |
| Time per Agenda Item | The time, in minutes and seconds, allotted to discuss each change request on the agenda. The allotted time can be adjusted for agenda items before or during the meeting. |
| Notification lead time | The advanced notification on the number of agenda items that needs to be discussed. |
| Auto Add Agenda Decisions | Check box to capture agenda decisions automatically on the meeting widget. The agenda decision is captured in the following format:<br>`(CAB Automation) - <change request number> - <decision> - <CAB Manager name> - <time><AM/PM> <timezone>` |

4. Open the form context menu and select **Save**.
   The **Agenda Items** and **Attendees** related lists appear.

### What to do next

You can now add agenda items and attendees to the cab meeting.

### View CAB meeting details

You can view the details of any past, scheduled, or in-progress CAB meeting.

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### Before you begin

Role required: itil, sn_change_cab.cab_manager, sn_change_read, sn_change_write, or admin

### Procedure

1. Use one of the following ways to navigate to the CAB meeting.

| Option | Description |
|---|---|
| **CAB meeting** | **a.** Navigate to **Change** > **Change Advisory Board** > **All CAB Meetings** and open the specific CAB meeting to view.<br>**b.** Click the **Go to this meeting in CAB work bench** related link. |
| **CAB workbench** | **a.** Navigate to **Change** > **Change Advisory Board** > **CAB Workbench**.<br>**b.** Click the meeting details you want to view from your calendar.<br>**c.** Click **Open** in the window that appears for the meeting.<br>**Note:** You can only click **Open** if the meeting has an agenda. |

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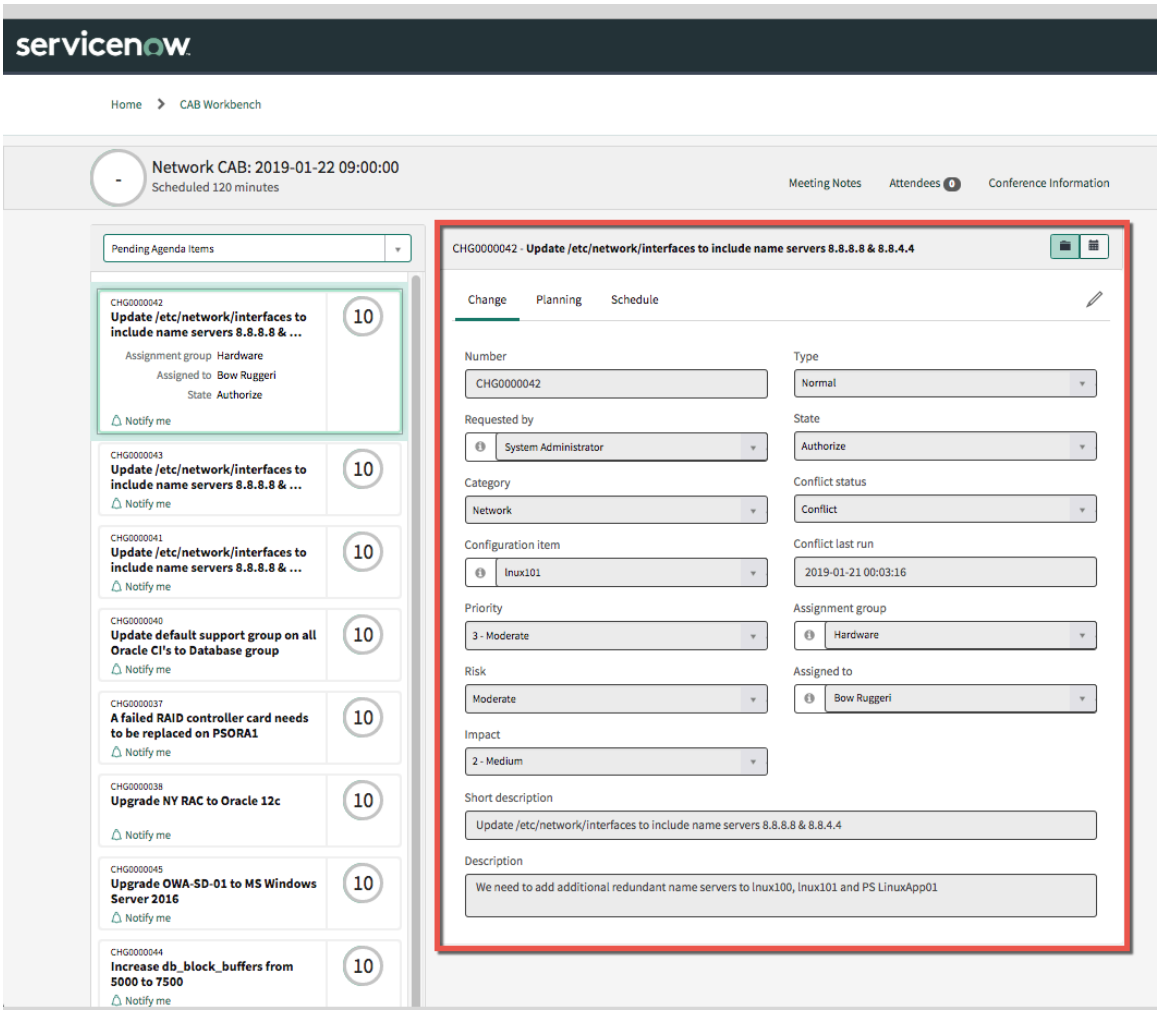


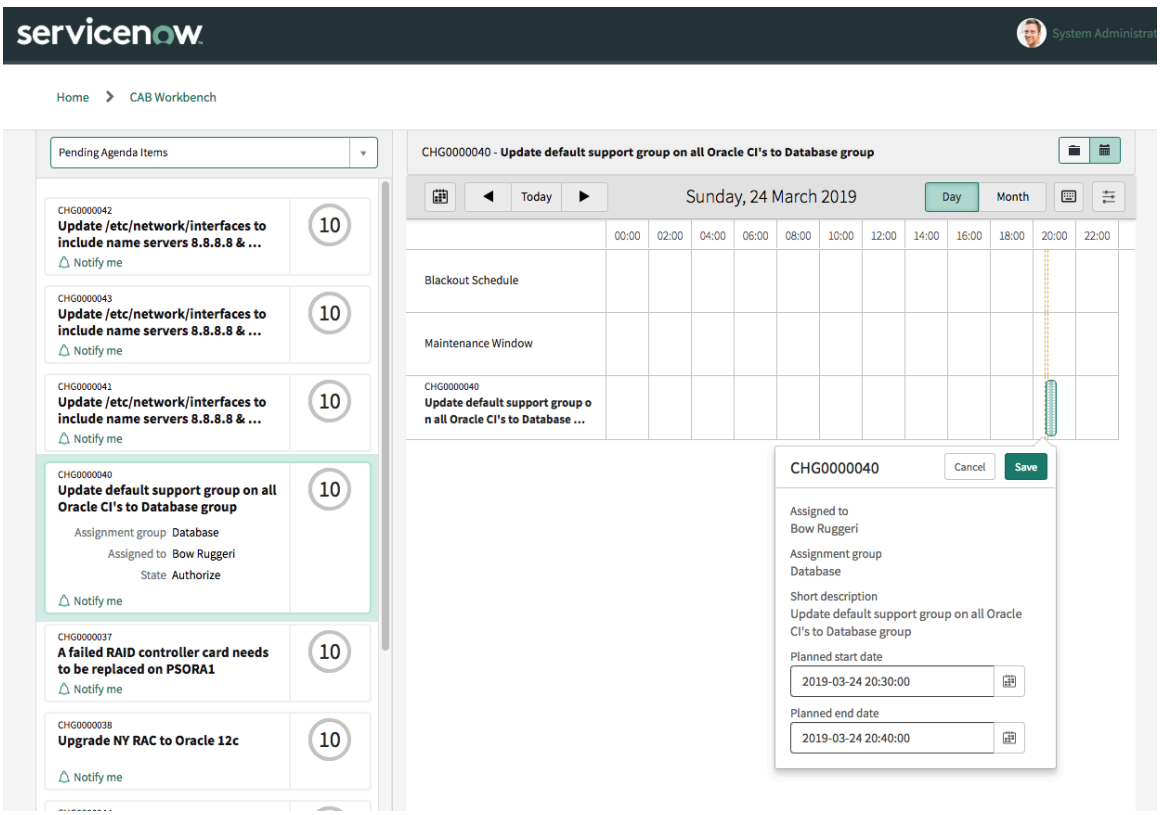


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The following information is available:

**CAB meeting**

| Field | Description |
|---|---|
| Time | ○ Total time scheduled for the CAB meeting<br>○ Time covered until present for a CAB meeting in progress<br>○ Time spent discussing current agenda item<br>○ Time assigned to each agenda item |
| Agenda items | List of agenda items for the CAB meeting. You can view all agenda items or filter the list for current, pending, and completed agenda items. |
| Calendar | The blackout and maintenance windows are displayed on the change calendar. You can also view when the current agenda item is scheduled. You can view the calendar in a daily and weekly format. |
| Meeting Notes | Meeting notes, if any, for a past CAB meeting. If you are the CAB manager, you can take notes during the meeting. |
| Attendees | Details of attendees for the specific CAB meeting including the CAB board and delegates. |
| Conference Information | Conference details of the CAB meeting. |

2. If you are the CAB manager, or one of the CAB delegates who has chosen to host a specific CAB meeting, you can perform the following tasks:

| Task | Steps |
|---|---|
| Edit the change request | Click the edit icon beside the **Change**, **Planning**, and **Schedule** tabs. |
| Start the meeting | Click **Start meeting**. |
| End the meeting | Click **End meeting**. |
| Pause the timer on the current agenda item | Click **Pause** on the **Current Agenda Item** widget. |
| Move to the next agenda item | Click **Next** after a decision is taken on the current agenda item. |
| Host the meeting | Click **Attendees** > **Host** to become the host. You can host the meeting when you are a CAB manager or delegate. |

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| Task | Steps |
|---|---|
| Promote an agenda item | Click **Promote** under a change request name and title to promote it as the next agenda item for discussion. |
| Take meeting notes | Click **Meeting Notes** to take notes during the meeting. These notes can be shared with CAB attendees. |

### Modify CAB meeting details

You can modify the agenda items for a specific CAB meeting.

## Before you begin

Role required: itil, sn_change_read, sn_change_write, or sn_change_cab.cab_manager

## About this task

After you update the CAB board or change request conditions, refresh the CAB meeting to apply the updates. If you add new board members or attendees to the meeting, they are notified via email invitations after the meeting is refreshed.

## Procedure

1. Navigate to the CAB meeting whose agenda you want to modify using one of the following steps.

| Option | Description |
|---|---|
| **Open from the CAB meeting list** | **a.** Navigate to **Change** > **Change Advisory Board** > **All CAB meetings**.<br>**b.** Select and open the CAB meeting to modi fy. |
| **Open from the CAB definition list** | **a.** Navigate to **Change** > **Change Advisory Board** > **All CAB definitions**.<br>**b.** Select and open the CAB definition to send out the meeting request.<br>**c.** Select and open the specific CAB meeting to modify. |

2. Modify the CAB meeting agenda in the **Agenda Management** tab or form section, as appropriate.

### Agenda Management fields

| Field | Description |
|---|---|
| Notification lead time | The advanced notification on the number of agenda items that needs to be discussed. |
| Automatically Add Change Requests | Check box to define the types of change requests that are automatically added to the CAB meeting agenda.<br><br>When you select **Automatically Add Change Requests**, the **Refresh CAB Meetings** related |

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| Field | Description |
| --- | --- |
| | link appears. If you click this link, search is performed for change requests that match the value in the **Change Request Addition Conditions** field. If there are any matching change requests, agenda items are created for them and added to the CAB agenda.<br><br>If you do not select **Automatically Add Change Requests**, then you need to create each agenda item for the associated change request for the meeting agenda. |
| Change Request Addition Conditions | Condition builder to specify which change requests are added to the CAB meeting agenda.<br><br>○ **Add Filter Condition**: Click to add additional filter conditions, or click **AND** next to the existing filter condition.<br>○ **Add "OR" Clause**: Click to display the results of multiple filter criteria in a single list.<br>○ **Add Sort**: Click to define the order of the change requests in this CAB meeting agenda. The agenda order can be defined in CAB Definitions or CAB Meetings, and can be based on one or more fields. |
| Time per Agenda Item | The time, in minutes and seconds, allotted to discuss each change request on the agenda. The allotted time can be adjusted for agenda items before or during the meeting. |
| Complete Pre-approved Changes | Check box to mark each pre-approved change request as **Complete** in the CAB meeting agenda.<br><br>**Note:**<br>Pre-approved changes are automatically marked as complete so that approvers do not have to review them. The pre-approved changes are visible in the CAB Workbench, and can be discussed if necessary. |

3. From **Related Links**, you can perform any of the following tasks.

| Link | Description |
| --- | --- |
| Refresh Agenda Items | The agenda items for the CAB meeting are refreshed. If you added or updated attendees, a confirmation message asks if the meeting request must be resent to these attendees. |

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| Link | Description |
|---|---|
| Send meeting request to attendees | Click to manually resend the meeting request to the list of attendees. |
| Go to this meeting in CAB Workbench | Click to open the meeting in the CAB workbench. This link is available only when it is time for the CAB to begin. |
| Share notes | Share notes captured in the **Meeting Notes** field to the list of meeting attendees. **Share Notes** is only visible when the meeting is **In Progress** or **Complete**. |

4. From related lists, you can perform any of the following tasks.

| Related list | Description |
|---|---|
| Agenda Items | Manually add agenda items. In the **Allotted Time** field, the CAB manager can override the default time for any agenda item. |
| Attendees | Manually add attendees to a CAB meeting. |

5. Click **Update** to save your changes.

### Related topics

OR conditions

## Send CAB meeting request to attendees

You can send CAB meeting invitations to attendees for each CAB meeting.

### Before you begin

Role required: sn_change_cab.cab_manager

### About this task

You can send meeting invitations from a CAB meeting only.

### Procedure

1. Navigate to the CAB meeting for which you want to send out invitations using one of the following steps.

| Option | Description |
|---|---|
| **Open from the CAB meeting list** | **a.** Navigate to **Change** > **Change Advisory Board** > **All CAB meetings**.<br>**b.** Select and open the CAB meeting to modi fy. |
| **Open from the CAB definition list** | **a.** Navigate to **Change** > **Change Advisory Board** > **All CAB definitions**.<br>**b.** Select and open the CAB definition to send out the meeting request.<br>**c.** Select and open the specific CAB meeting to modify. |

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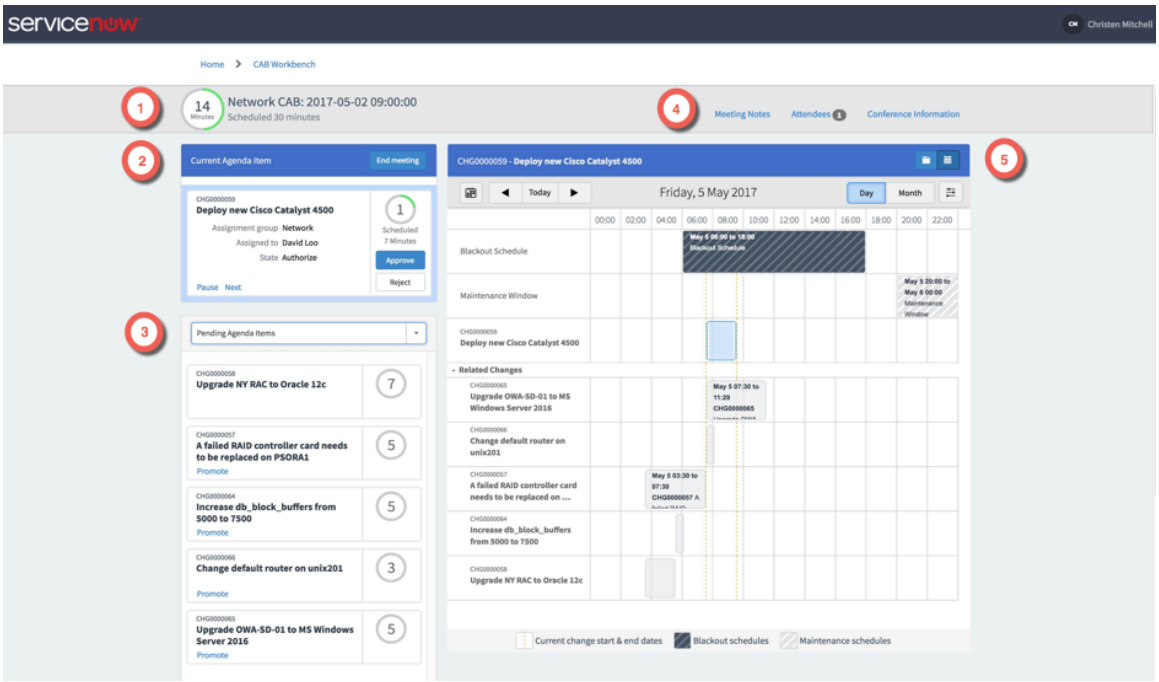
2. Click the **Send meeting request to attendees** related link.
   The CAB meeting invitation is sent to all listed attendees.

### CAB meeting attendance using the CAB workbench

As an itil user, you can attend a Change Advisory Board (CAB) meeting, view the agenda items, and the change schedule. If you are an approver, you can approve a change request.

View the details of a CAB meeting and its agenda by navigating to **Change** > **Change Advisory Board** > **CAB Workbench**. From the calendar, you can view the CAB meeting schedule for a day, week, or month. To view details of a meeting, click the meeting and then click **Open** in the pop-up window.

#### CAB Workbench




The following components describe the different activities that you can perform in the interface:

#### CAB workbench

| Level | Description |
|---|---|
| 1 | View the timer that displays the total elapsed time, the meeting name, and the scheduled date and time of the meeting. The timer count starts from zero. The color code in the timer changes based on the overall percentage of time elapsed from the total duration of the meeting:<br>• 0% - 50%: Green<br>• 50% - 70%: Yellow<br>• 75% - 100%: Orange<br>• > 100%: Red<br><br>The text below the meeting name displays the total time allotted for the meeting. |
| 2 | View the current agenda item. The timer displays the amount of time spent discussing the current meeting agenda item. The form area displays the details of the current agenda item that you have selected. When the current agenda item |

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**CAB workbench (continued)**

| Level | Description |
|---|---|
| | changes, the details on the form and the calendar change accordingly. If you select an agenda item that is not the current agenda item, the form area displays the details of the selected agenda item. The form area does not display details of the current agenda item even when the current agenda item is changed to the next agenda item.<br><br>**Note:**<br>If you are one of the approvers for the agenda item, the **Approve** and **Reject** buttons appear below the timer.<br><br>You can click **Approve** or **Reject** as appropriate, enter your comments in the Confirmation pop-up window, and click **Approve** or **Reject**. |
| 3 | Filter the agenda items that you want to view and click **Notify me** to receive a notification before the agenda item starts. Click the **Pending Agenda Items** list, and select the **All Agenda Items**, **My Agenda Items**, or **Approved Agenda Items** option. The list of agenda items appears under the filter condition list, in the order that the items appear in the agenda. |
| 4 | • **Meeting Notes**: Displays the document note entered by the host of the meeting.<br>• **Attendees**: Displays the list of attendees and also indicates whether the attendees are currently connected to the meeting.<br>• **Conference Information**: Displays any content that was stored in the **Conference Information** field from the related CAB meeting record. |
| 5 | View the details of a current change in the form view or in the calendar view.<br><br>**Show form**: Click the show form icon ( ) to display change details in the form view. The **Change**, **Planning**, and **Schedule** tabs provide information about the change request meeting, planning, and scheduling.<br><br>**Show calendar**: Click the show calendar icon ( ) to display change details on the calendar form. You can select the day or the month that you want to view details of a change for. In a day view, you can click the settings icon ( ) and then click the configuration icon ( ) to set relevant filter conditions. If you turn on any of the configuration filter conditions, the related change records are displayed. The change records appear in the time slot of the day that the current change implementation is planned for. In the configuration settings, you can view other potential conflicts. The conflicts can be other change requests that are scheduled for implementation by the same assignee, assignment group, or for the same configuration item.<br><br>The day and month view of the calendar displays the Blackout Schedule time, Maintenance Window, and the agenda item that is in progress. In the day view, the specific time slot of the planned blackout and maintenance window is highlighted. In the calendar view, the entire day is highlighted. |

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**CAB workbench (continued)**

| Level | Description |
|---|---|
| | **Note:** For standard change proposals, the **Change**, **Proposal**, and **Change Request Values** tabs provide information on change request meeting, proposal, and change request values. The show form ( ) and the show calendar ( ) icons do not appear for standard change proposals. |

## Add new CAB meeting agenda items

You can add an agenda item to your CAB meeting to customize the agenda and make the meeting more effective.

### Before you begin

Role required: admin

### Procedure

1. Navigate to **All** > **Change** > **Change Advisory Board** > **All CAB Meetings**.
2. Click the CAB meeting record that you want to add an agenda item to.
3. On the Agenda Items context menu, click **New**.
4. On the form, fill in the fields.

**CAB Agenda Item form**

| Field | Description |
|---|---|
| Meeting | Name of the meeting that you selected to add the agenda item. |
| Task | Lookup list to select the change request or standard change proposal.<br>**Note:** The standard change proposal is available for selection only from Washington DC . |
| Order | Order that the agenda items will be reviewed during the CAB meeting. |
| Notification recipients | Recipients to receive the notification about the new agenda item. |
| Short description | Short description of the task. |
| Work notes | Detailed description of the task. |
| State | Current state of the agenda item. |
| Decision | Status of the agenda item. |
| Allotted Time | Allotted time for the agenda item in the meeting. |

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| Field | Description |
|---|---|
| Elapsed Time | Time already spent on the agenda item. |

5. Click **Submit**.

### CAB meeting management using the CAB workbench

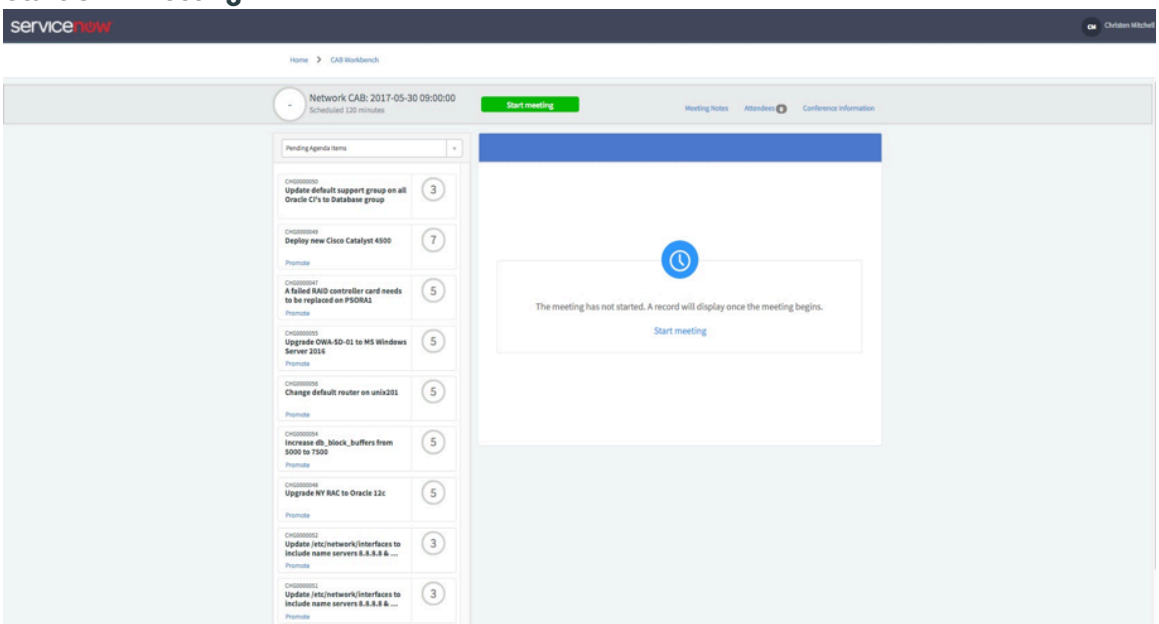
As a Change Advisory Board (CAB) manager, you can view and manage details of a CAB meeting and its agenda items through the CAB workbench.

You can view the details of a CAB meeting and its agenda by navigating to **Change** > **Change Advisory Board** > **CAB Workbench**. The calendar offers a view of your CAB meeting schedules for the day, week, or month. To view your meeting details, click the meeting and then click **Open** in the pop-up calendar. To start a meeting, click **Start meeting**.

**Note:**
If you click the first agenda item for the first time, a Confirmation window appears. If you want to start the meeting, click **Yes**, otherwise, click **No**.

Watch this six-minute video to learn more about CAB meeting management. This video provides an overview of planning and scheduling within the CAB Workbench module.

**Start CAB meeting**




The details of the change request meeting appear.

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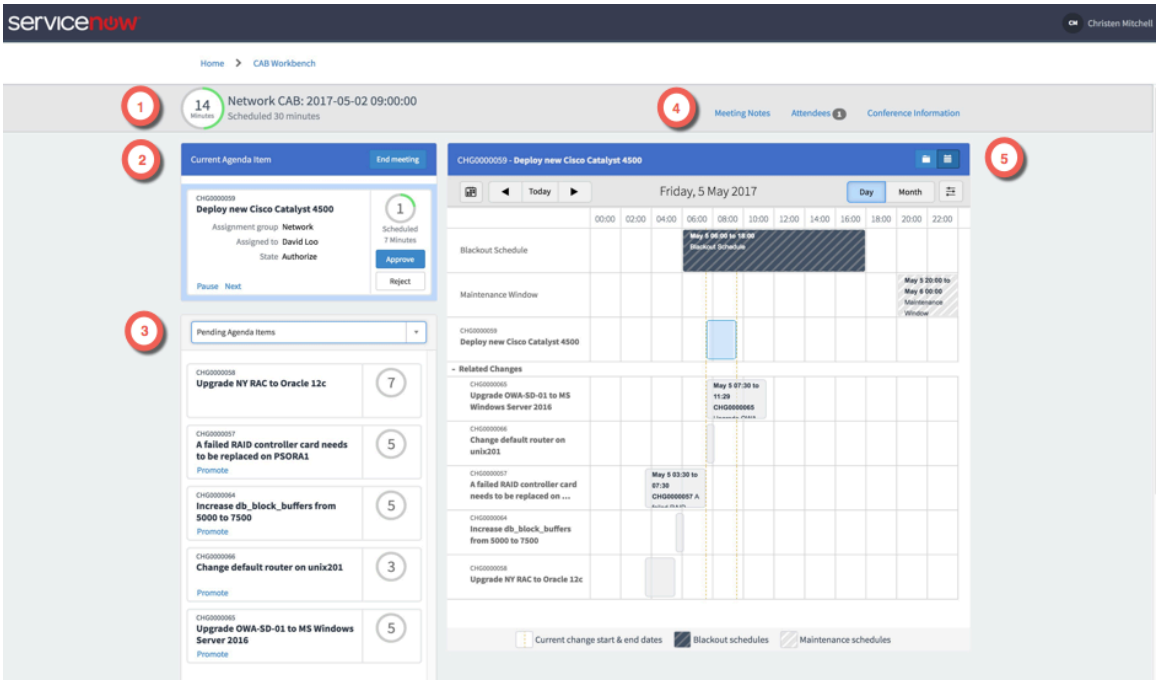
### CAB workbench




The following table describes the CAB workbench components:

**CAB workbench**

| Level | Description |
|---|---|
| 1 | You can view the timer that displays the total elapsed time, the meeting name, and the scheduled date and time of the meeting. The timer count starts from zero. The color code in the timer changes based on the overall percentage elapsed from the total duration of the meeting:<br>• 0% - 50%: Green<br>• 50% - 70%: Yellow<br>• 75% - 100%: Orange<br>• < 100%: Red<br><br>The text below the meeting name displays the total time allotted for the meeting. |
| 2 | • Click **Pause** to pause an agenda item.<br>• Click **Next** if you want to skip an agenda item.<br><br>**Note:**<br>The agenda item is added in the list of **All Agenda Items** list.<br><br>• Click **Restore** if you again want the agenda item back in the **Pending Agenda Items** list.<br><br>**Note:**<br>The agenda item is added to the end of the **Pending Agenda Items** list.<br><br>• Click **Promote** to move the agenda item to the top of the list. |

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**CAB workbench (continued)**

| Level | Description |
|---|---|
| | • Click **Demote** to append the current agenda item in the **Pending Agenda Items** list so that you can discuss the agenda item later.<br><br>**Note:**<br>The timer displays the amount of time spent discussing the current meeting agenda item.<br><br>• Click **End meeting** to end a meeting. |
| 3 | You can filter the agenda items that you want to view.<br>• Click the **Pending Agenda Items** list, and select the **All Agenda Items**, **My Agenda Items**, or **Approved Agenda Items** option.<br><br>**Note:**<br>The list of agenda items appears under the filter condition list, in the order that the items appear in the agenda.<br><br>• Click **Promote** if you want an agenda item to appear at the top of the agenda item list. |
| 4 | You can take meeting notes whether you are a host or a delegate. You can view the list of attendees and conference information.<br>• **Meeting Notes**: Enables the CAB manager and delegates to document notes for the overall meeting. The notes captured in the widget can be shared from the widget. The widget emails the contents to the list of attendees, which are automatically saved to the corresponding **Meeting Notes** field in the CAB Meeting record.<br><br>Any notes specific to a change request can be added directly to the change request. To add a note, use the editable view of the form under the edit icon in the upper left of the form widget.<br><br>**Note:**<br>The agenda decisions made by the CAB and change approvers, such as whether the agenda item is approved or rejected or when CAB manager skips to another agenda item without making a decision, are automatically captured in the meeting notes widget. The agenda decisions are stored in the **Meeting Notes** field in the related CAB Meeting record.<br><br>• **Attendees**: Displays the list of attendees and indicates if the attendees are currently connected to the meeting via the green Presence icon. The list also displays the attendee's response to the meeting invitation such as Accept, Tentative, Decline, or No response.<br>• **Conference Information**: Displays any content that was stored in the **Conference Information** field on the related CAB Meeting record. |
| 5 | You can view the details of a current change in the form view or in the calendar view. |

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**CAB workbench (continued)**

| Level | Description |
|---|---|
| | **Show form**: Click the show form icon  to display change details in the form view. The **Change**, **Planning**, and **Schedule** tab provide information about the change request meeting, planning, and scheduling. You can edit the form view, by using the edit icon  .<br><br>To customize the view, click the list contextual menu  and then click **View** > **cab_workbench**. On the Change Request form, right-click and navigate to **Configure** > **Form Layout**. On the Configuring Change Request form, you can add fields and sections that you want to display in the form view.<br><br>**Show calendar**: Click the show calendar icon  to display current change details on the calendar form. You can select the day or the month that you want to view meeting details for. In the day view, click the settings icon  and then click the configuration icon  to set relevant filter conditions. If you turn on any of the configuration filter conditions, the related change records are displayed. The change records appear in the time slot of the day that the current change implementation is planned for. In the configuration settings, you can view other potential conflicts. The conflicts can be other change requests that are scheduled for implementation by the same assignee, assignment group, or for the same configuration item.<br><br>The day and month view of the calendar displays the Blackout Schedule time, Maintenance Window, and the agenda item that is in progress. In the day view, the specific time slot of the planned blackout and maintenance window is highlighted. In the calendar view, the entire day is highlighted. |

## Mobile experience for Change Management

Manage your change tasks from anywhere using the Mobile Agent mobile application. With this mobile application, you can stay connected and access the information in real time to complete your tasks.

As an ITSM agent or technician, you can use Mobile Agent when connected online to accomplish the following task:

- Access the change tasks assigned to you or to your group.
- Add comments or work notes or reassign the change tasks.
- Receive push notifications for change tasks assigned or commented on.
- Approve or reject change requests, requests, and requested items.

Watch this three-minute video to learn about the Mobile Agent for managing change tasks. This video demonstrates using the ServiceNow Agent mobile app for managing change tasks.

### Download the Mobile Agent mobile application

Access Mobile Agent on your mobile device to manage your change tasks.

**Before you begin**
Role required: itil or sn_change_write

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### About this task

The Mobile Agent mobile application runs on the Studio mobile platform. Activate the ITSM Mobile Experience (com.sn_itsm_mobile) plugin to enable the ITSM mobile application on your device.

### Procedure

1. In your mobile device, go to Apple App store if you are on an iOS platform or Google Play Store if you are on an Android platform.
2. Search for `ServiceNow Agent`.
3. Download and install the ServiceNow Agent application.

## Get started with Change Management mobile tasks

Access Mobile Agent on your mobile device to manage change tasks.

### Before you begin

Download ServiceNow Agent on an iOS platform from the Apple App Store or on an Android platform from Google Play Store. For more information, see Download the Mobile Agent mobile application.

Role required: itil or sn_change_write

### Procedure

1. Open Mobile Agent and tap the plus icon (**+**).
2. Add a ServiceNow instance by tapping the plus icon (+) and then entering the instance address.
   You do not need to include `service-now.com` at the end of the instance name.
3. Tap **Change tasks** to get started with managing your change tasks.

## View change tasks

You can view the state, risk, and the schedule of the change tasks in the Mobile Agent mobile application.

### Before you begin

Role required: itil or sn_change_write

### Procedure

1. Tap **My Work** tab.
2. Tap **Change tasks** to open the list of change tasks.
3. Tap the change task for a detailed view.
4. Tap any field with right arrow to view its details.

## Add comments to your change tasks

You can add comments to a change task from the Mobile Agent mobile application. For example, to add an insight about the change task or a discussion regarding the change task.

### Before you begin

Role required: itil or sn_change_write

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### Procedure

1. Tap **Change Tasks** to open the list of change tasks.
2. Tap the change task to open the detailed view.
3. Tap **Add comment** to add your worknotes.

#### Resolve or close a change task

When you implement the change task, you can close the task from the Mobile Agent mobile application.

### Before you begin

Role required: itil or sn_change_write

### Procedure

1. Tap **My Work** tab.
2. Tap **Change tasks** to open the list of change tasks.
3. From the list of change tasks, swipe left the change task that you want to close.
4. Tap **Close task**.

## Change Management Platform Analytics Solutions

Platform Analytics Solutions and in-form analytics contain preconfigured dashboards. These dashboards contain actionable data visualizations that help you improve your business processes and practices.

## Platform Analytics Solutions

Platform Analytics data visualizations use Performance Analytics indicator data to show you data over time, helping you analyze your business processes and identify areas of improvement. With Platform Analytics Solutions, you can get value from Performance Analytics for your application with minimal setup. You can always create your own objects as well.

**Important:**
Set up and test Platform Analytics Solutions on a non-production instance before enabling them in production.

To enable the solutions for Change Management, an admin can navigate to **Performance Analytics** > **Guided Setup**. Click **Get Started** then scroll to the section for Change Management. The guided setup takes you through the entire setup and configuration process.

## Inactive dashboards

Some dashboards in this content pack are inactive when installed. Complete configuration and run data collection jobs before you activate these dashboards. You can activate dashboards in Dashboard Properties, accessible from the context menu. You have to assign an owner to the dashboard to activate it. For more information about configuring Platform Analytics Solutions, see Configure Platform Analytics Solutions

### Related topics

Platform Analytics Solutions

Activate your Performance Analytics subscription

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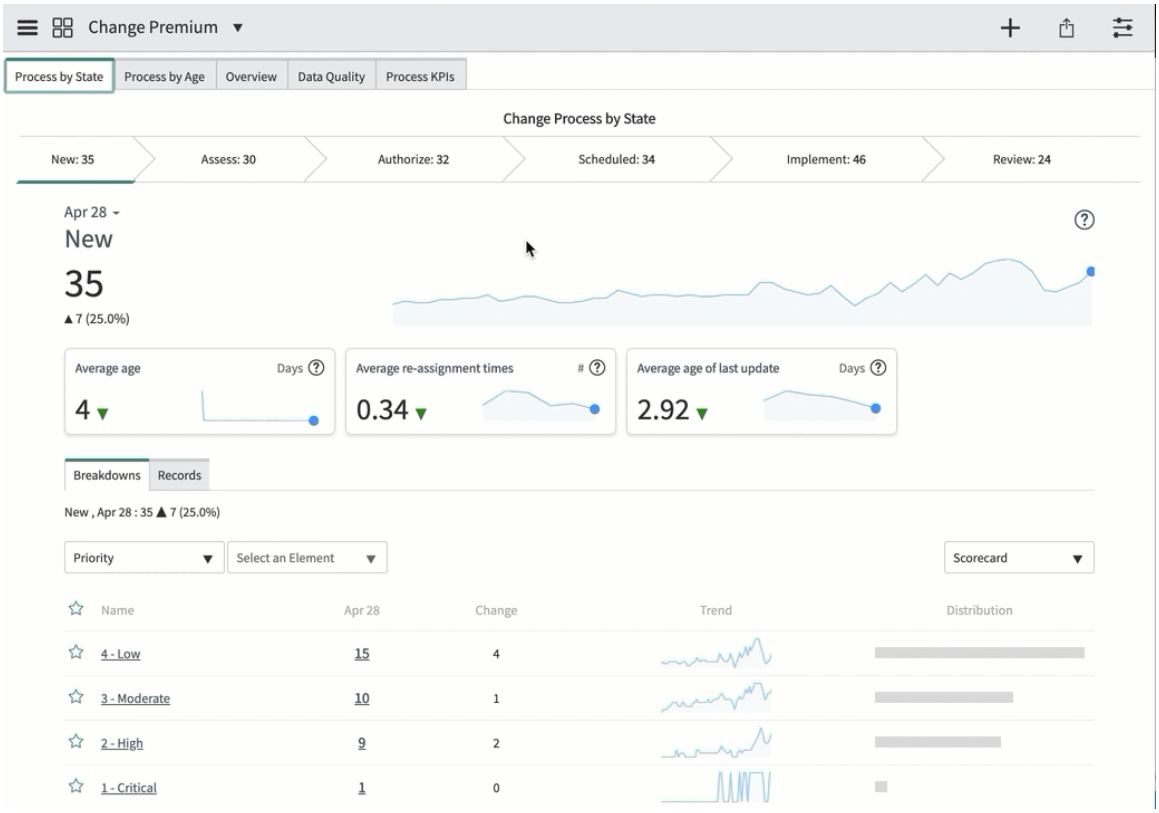
### Change Premium dashboard

This dashboard uses Workbench widgets and other advanced Platform Analytics features to give you all the information about the Change process in one place.




## End user and roles

| End user and goal | Required role |
|---|---|
| Change Manager - Needs to break down the trends in change request resolution over time to spot areas that need attention | itil |

## Indicators

**Number of open changes**

The number of changes open at the end of the collection date. This calculation is the number of changes opened on or before the collection date and not closed by that date.

**Average age of open changes**

[[Summed age of open changes]] / [[Number of open changes]] / 24

**Average re-assignment of open changes**

[[Summed re-assignment of open changes]] / [[Number of open changes]]

**Average age of last update**

The average length of time since the last update made to a change.

**Number of new changes**

The number of new changes with a registration date on the data collection date.

**Change backlog growth**

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The number of closed changes subtracted from the number of new changes.

**Number of closed changes**

The number of changes with a close date on the data collection date.

**% of urgent changes**

Percentage of urgent changes. Is a formula: Number of new changes classified as urgent / Number of new changes * 100

**Average close time of changes**

The average length of time in hours between when a change request is opened and closed.

**Average implementation time of closed changes**

The average length of time in hours between when a change request enters the Implementation state and when it is closed

**Number of reassigned open changes**

The number of changes with a reassignment count of 1 or higher

**Number of unsuccessful changes**

The number of closed changes with a Close Code of "Unsuccessful"

The following indicators are not displayed on the dashboard but are used in formulas:

- Summed age of open changes
- Summed age of updated since of open changes
- Summed duration of closed changes
- Summed implementation time closed changes
- Summed re-assignment of open changes

## Breakdowns

- Age
- Category
- Priority
- Risk
- State
- Assignment Group
- Type

## Data visualizations

| Title | Type | Description |
|---|---|---|
| Changes Opened Today | Single Score | Number of active changes opened on the day the dashboard is viewed. |
| Unassigned Changes | Single Score | Number of active changes that don't have an assignee. |
| Overdue Changes | Single Score | Number of changes that are in one of the following states: |

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| Title | Type | Description |
|---|---|---|
| | | New, Assess, Authorize, or Scheduled and for which the planned start date is before the current date. |
| Changes On Hold | Single Score | Number of changes with the status On hold. |
| Conflicting Changes | Single Score | Number of changes with the status Conflict. |
| Rejected Changes | Single Score | Number of changes for which the approval status is Rejected. |
| Open Changes - Grouped | Horizontal Bar | Open changes grouped by Priority |
| Upcoming Changes (30 days) - Grouped | Horizontal Bar | Active changes for which the planned start date is in the past 30 days and for which the state is Scheduled. |
| Open Changes by Risk and Priority | Heatmap | Active changes sorted by risk on the Y-axis and priority on the X-axis. Cells are highlighted from white for low scores to dark blue for high scores. |
| Upcoming Changes (30 days) by Risk and Priority | Heatmap | |
| Changes Opened per Month by Type | Column | All closed reports opened in the current calendar year. Grouped by type and trended by month opened. |
| Closed Changes per Month | Line | Number of closed changes per month expressed on a line chart. |

### Change Management dashboard

Use this dashboard to see the trends in change request resolution over time across different change request risks, ages, and priorities. Break down change requests over time according to the assignment groups you manage.

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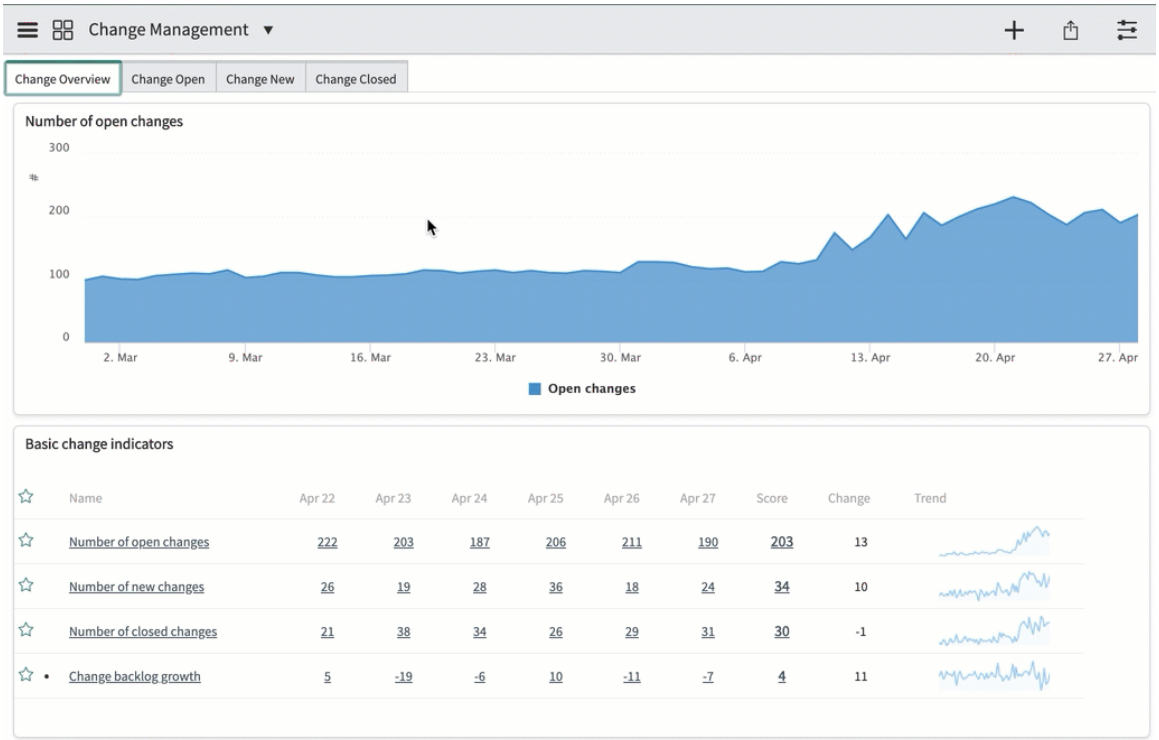


## End user and roles

| End user and goal | Required role |
|---|---|
| Change Manager - Needs to break down the trends in change request resolution over time to spot areas that need attention | itil |

## Change Management dashboard indicators

**Number of open changes**

The number of changes open at the end of the collection date. The number of changes opened on or before the collection date and no close date or a close date after collection date.

**Number of new changes**

The number of new changes with a registration date on the data collection date.

**Number of new emergency changes**

The number of new changes where type=emergency

**Change backlog growth**

The number of closed changes subtracted from the number of new changes.

**Number of closed changes**

The number of changes with a close date on the data collection date.

**Average age of open changes**

The average amount of time a change has been open.

**% of urgent changes**

Percentage of urgent changes. Is a formula: Number of new changes classified as urgent / Number of new changes * 100

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**Average close time of changes**

The average amount of time it has taken to close a change

The following indicators do not appear on the dashboard but are used in formulas:

- Summed age of open changes
- Summed duration of closed changes

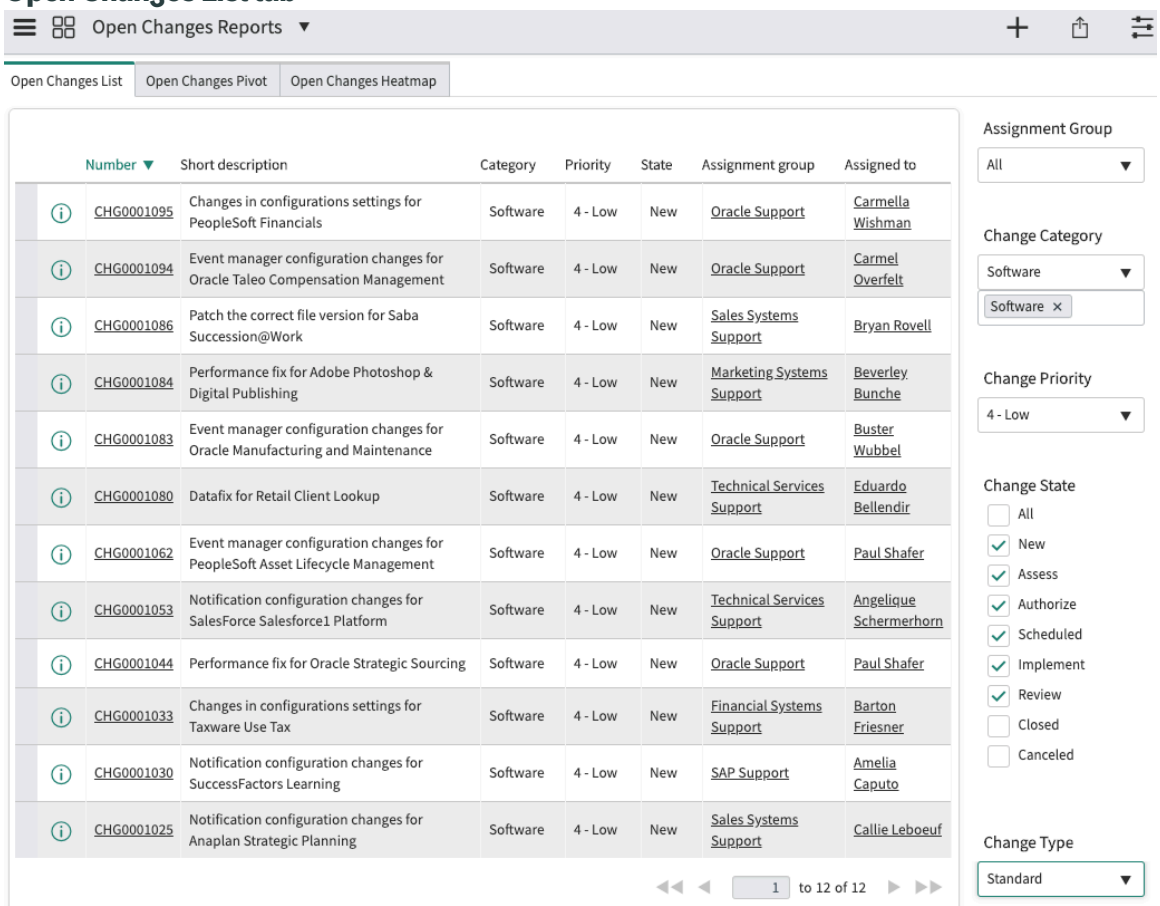
## Breakdowns

- Priority
- Age
- Assignment Group
- Risk
- Stage
- Type

### Open Changes Reports dashboard

Use this dashboard to get an overview of the current status of open reports.

#### Open Changes List tab

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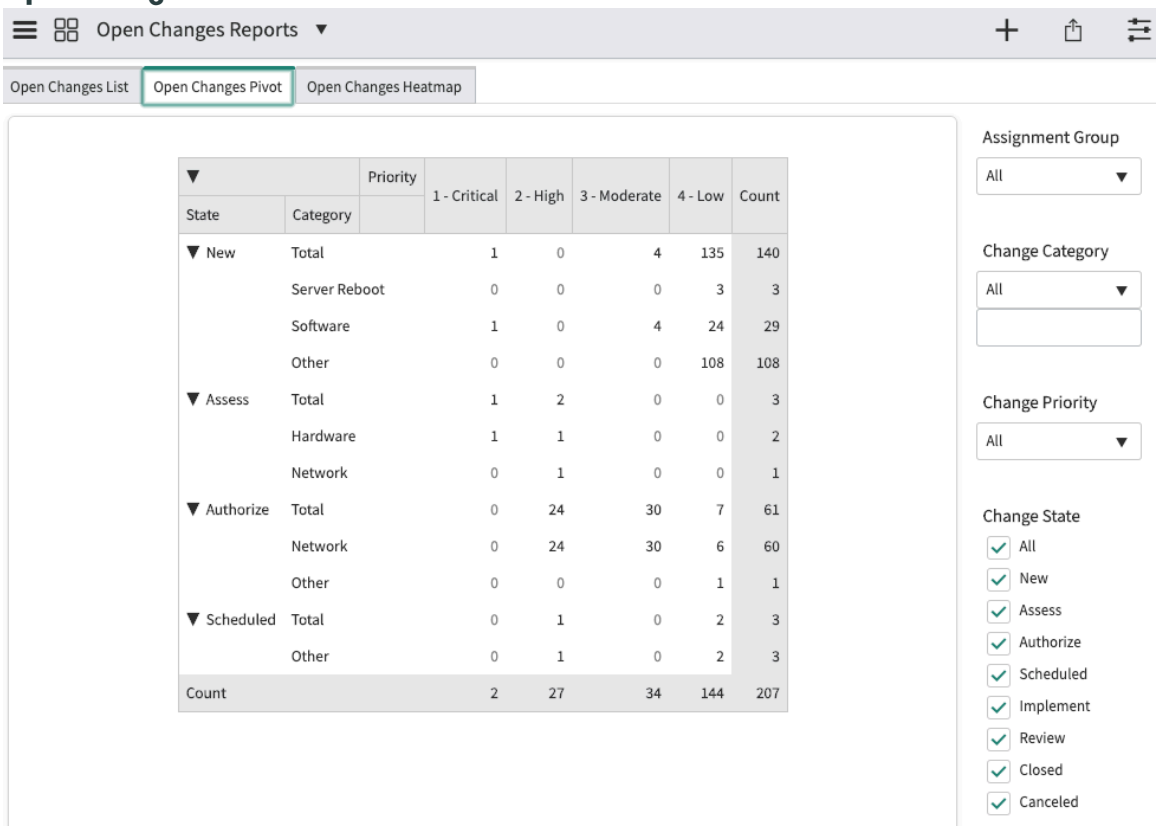
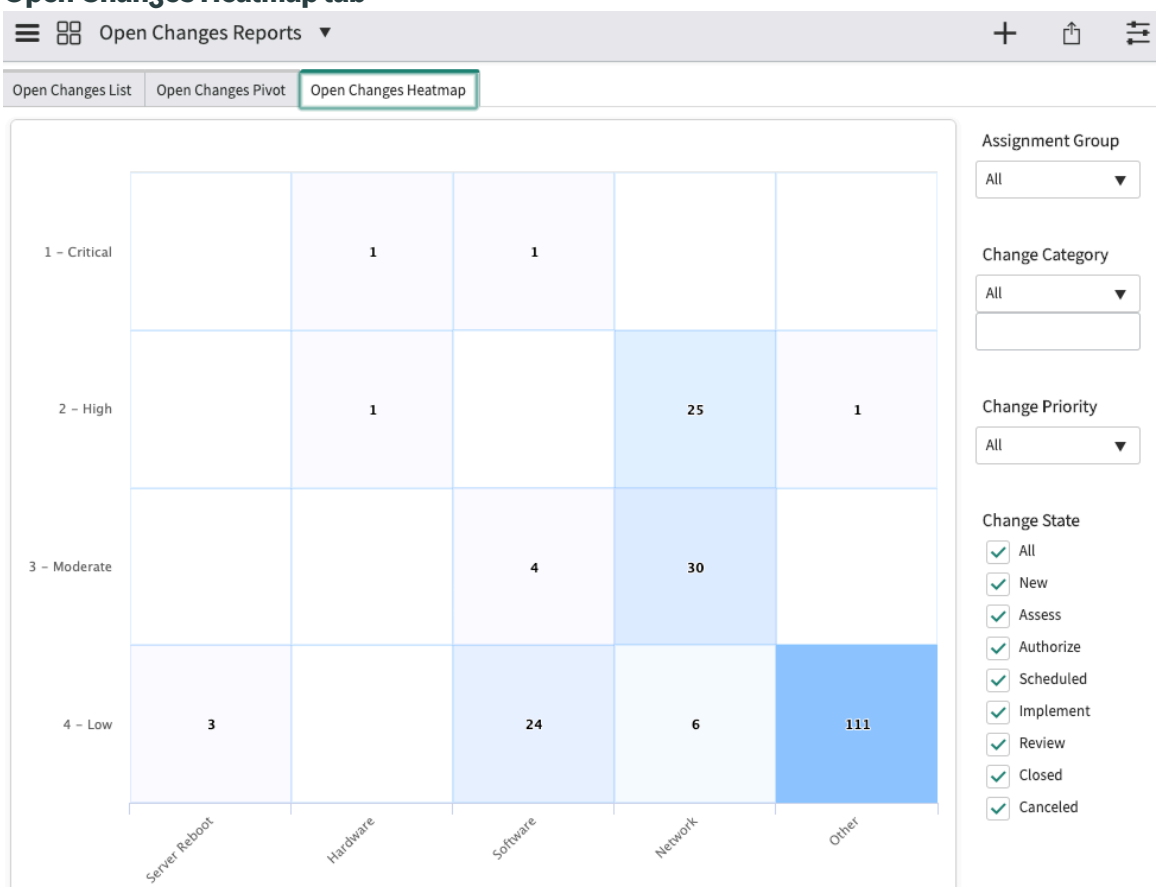
## Open Changes Pivot tab




| State | Category | Priority | 1 - Critical | 2 - High | 3 - Moderate | 4 - Low | Count |
|---|---|---|---|---|---|---|---|
| ▼ New | Total | | 1 | 0 | 4 | 135 | 140 |
| | Server Reboot | | 0 | 0 | 0 | 3 | 3 |
| | Software | | 1 | 0 | 4 | 24 | 29 |
| | Other | | 0 | 0 | 0 | 108 | 108 |
| ▼ Assess | Total | | 1 | 2 | 0 | 0 | 3 |
| | Hardware | | 1 | 1 | 0 | 0 | 2 |
| | Network | | 0 | 1 | 0 | 0 | 1 |
| ▼ Authorize | Total | | 0 | 24 | 30 | 7 | 61 |
| | Network | | 0 | 24 | 30 | 6 | 60 |
| | Other | | 0 | 0 | 0 | 1 | 1 |
| ▼ Scheduled | Total | | 0 | 1 | 0 | 2 | 3 |
| | Other | | 0 | 1 | 0 | 2 | 3 |
| Count | | | 2 | 27 | 34 | 144 | 207 |

## Open Changes Heatmap tab

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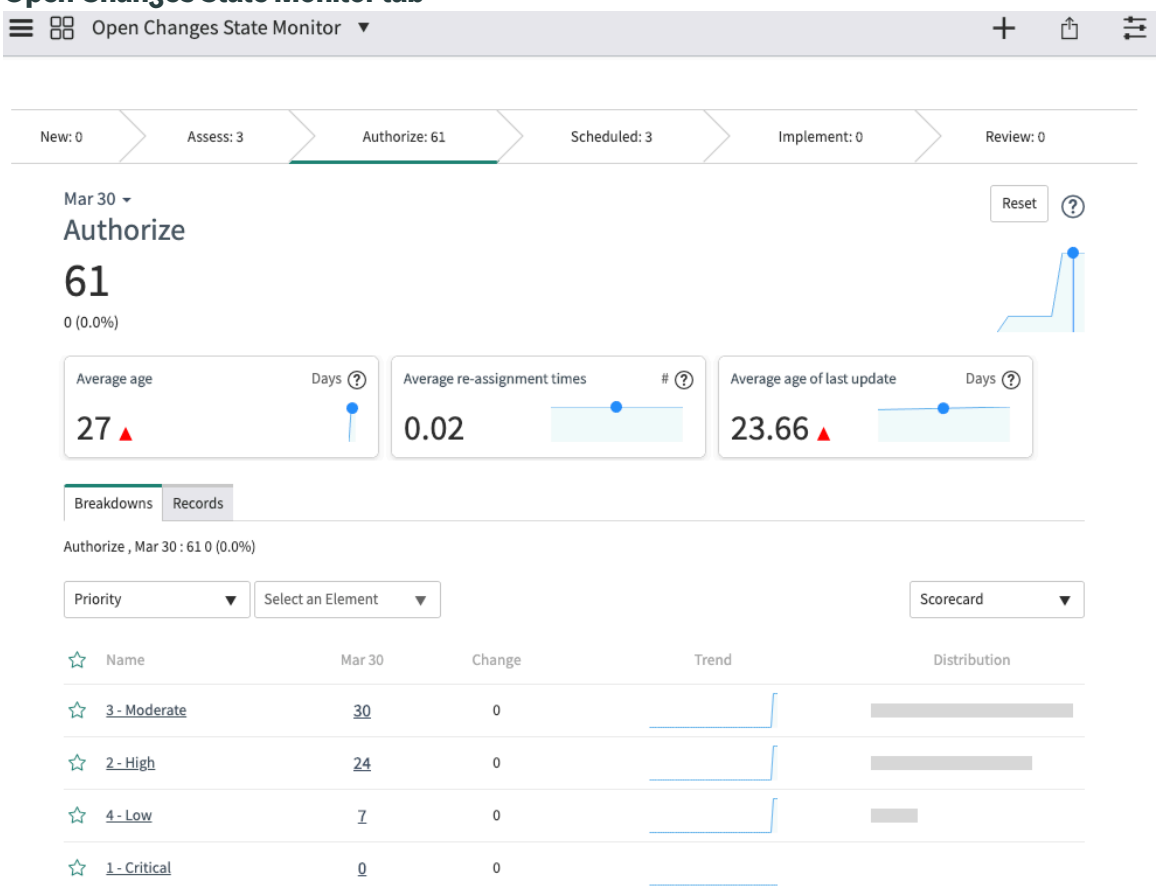
## Data visualizations

| Title | Type | Description |
|---|---|---|
| PA.Source: Open changes - List | List | A list report of the unclosed changes opened on or before the current date. Columns include Number, Short description, Category, Priority, State, Assignment group and Assigned to. |
| PA.Source: Open changes - MPivot - Priority/State/ Category | Pivot | Report that shows unclosed changes opened on or before the current date. The visualization shows changes by Priority, State, and Category. |
| PA.Source: Open changes - Heatmap - Priority/Category | Heatmap | Heatmap report that shows unclosed changes opened on or before the current date. Larger values are highlighted in darker colors. |

### Open Changes State Monitor dashboard

This workbench dashboard enables you to view and assess all open changes separated into status brackets: New, Assessed, Authorized, Scheduled, Implemented, and Reviewed.

#### Open Changes State Monitor tab

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## Indicators

**Number of open changes**

The number of changes open at the end of the collection date. This calculation is the number of changes opened on or before the collection date and not closed by that date.

**Average age of open changes**

[[Summed age of open changes]] / [[Number of open changes]] / 24

**Average re-assignment of open changes**

[[Summed reassignment of open changes]] / [[Number of open changes]]

**Average age of last update**

The average length of time since the last update made to a change.

## Breakdowns

- Priority
- Risk
- Age
- Assignment Group

### Age of Open Changes Monitor dashboard

This workbench dashboard enables you to view and assess all open changes separated into age brackets: less than one day, from 1-5 days, from 6-30 days, from 31-90 days, and over 90 days.

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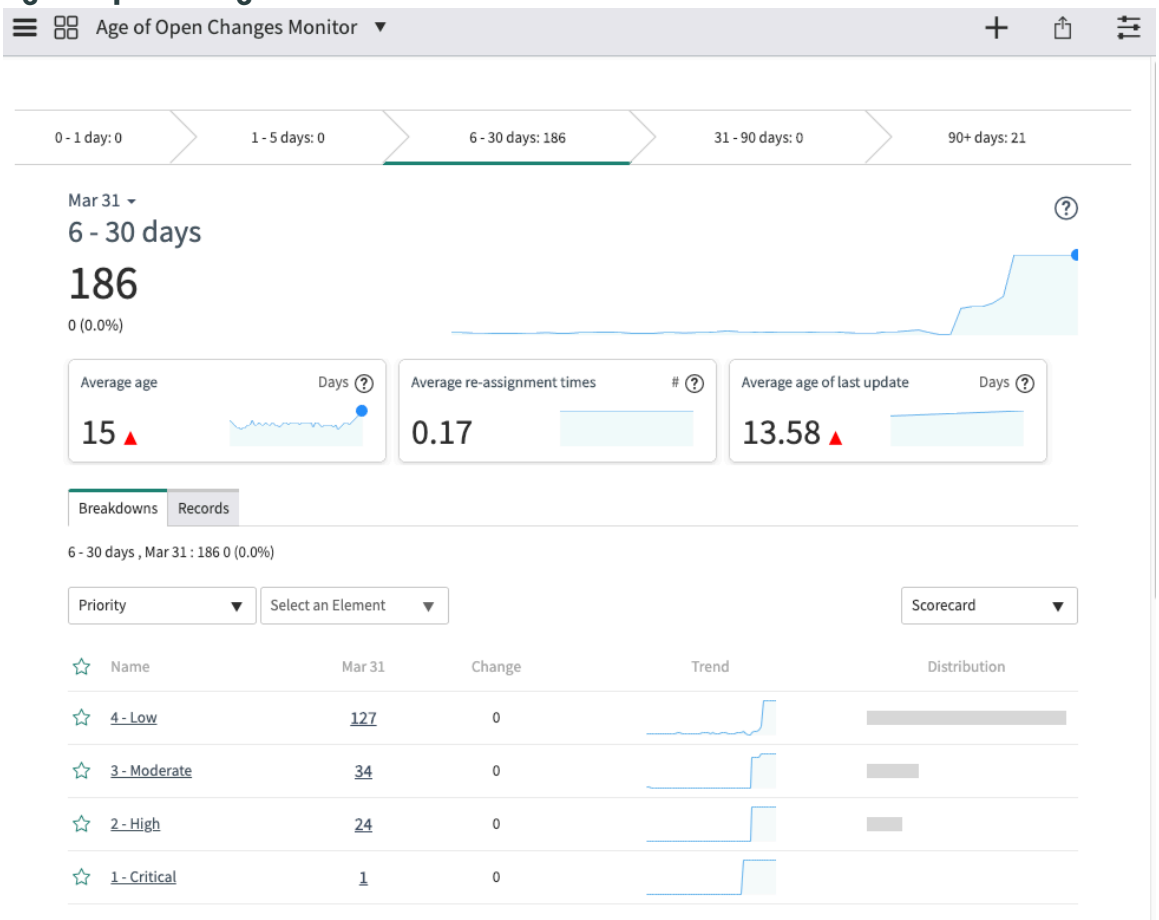
### Age of Open Changes Monitor tab




## End user and roles

| End user and goal | Required role |
|---|---|
| Change Manager - Needs to break down the trends in change request resolution over time to spot areas that need attention | itil |

## Indicators

**Number of open changes**

The number of changes open at the end of the collection date. This calculation is the number of changes opened on or before the collection date and not closed by that date.

**Average age of open changes**

[[Summed age of open changes]] / [[Number of open changes]] / 24

**Average re-assignment of open changes**

[[Summed re-assignment of open changes]] / [[Number of open changes]]

**Average age of last update**

The average length of time since the last update made to a change.

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## Breakdowns

- Priority
- Risk
- Assignment Group
- State

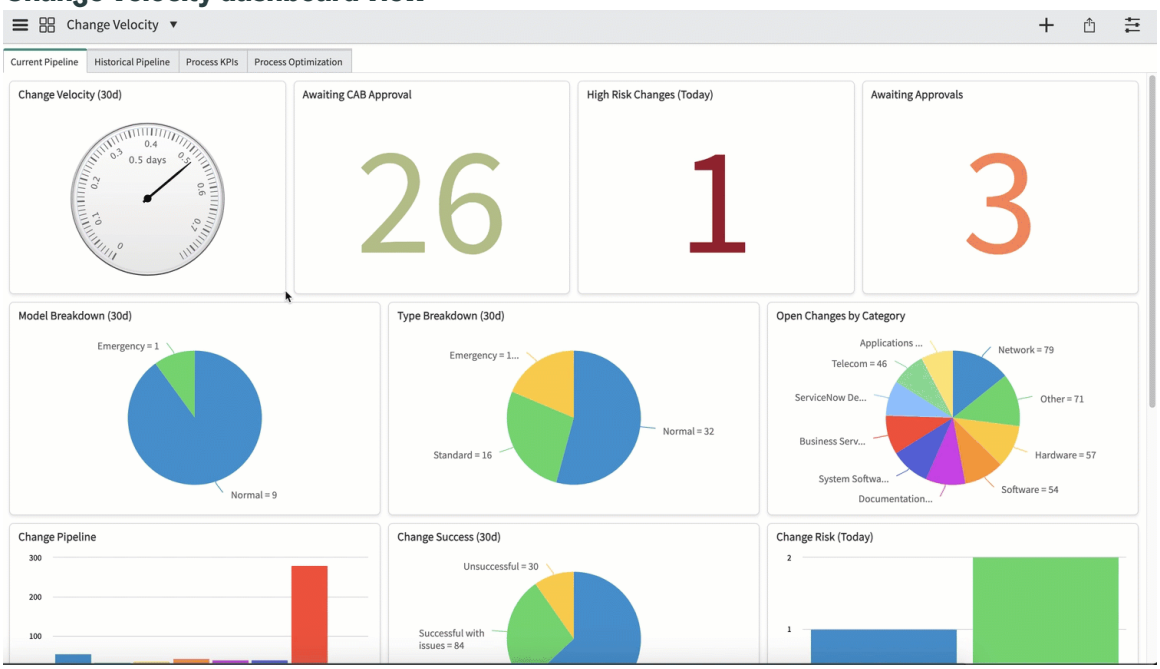
### Change Velocity dashboard

Use this dashboard to track the average duration of change requests in the last 30 days.

The Change Velocity dashboard is divided into the following tabs for effective usage. The ServiceNow® Performance Analytics capability in the Change Velocity dashboard provides the following benefits:

- The **Current Pipeline** tab provides insights into current change activity. The **Historical Pipeline** tab provides details on trends and patterns associated with the change management process flow. The **Process KPIs** tab represents a modern set of Change KPIs that are used to evaluate the change process.

#### Change Velocity dashboard view

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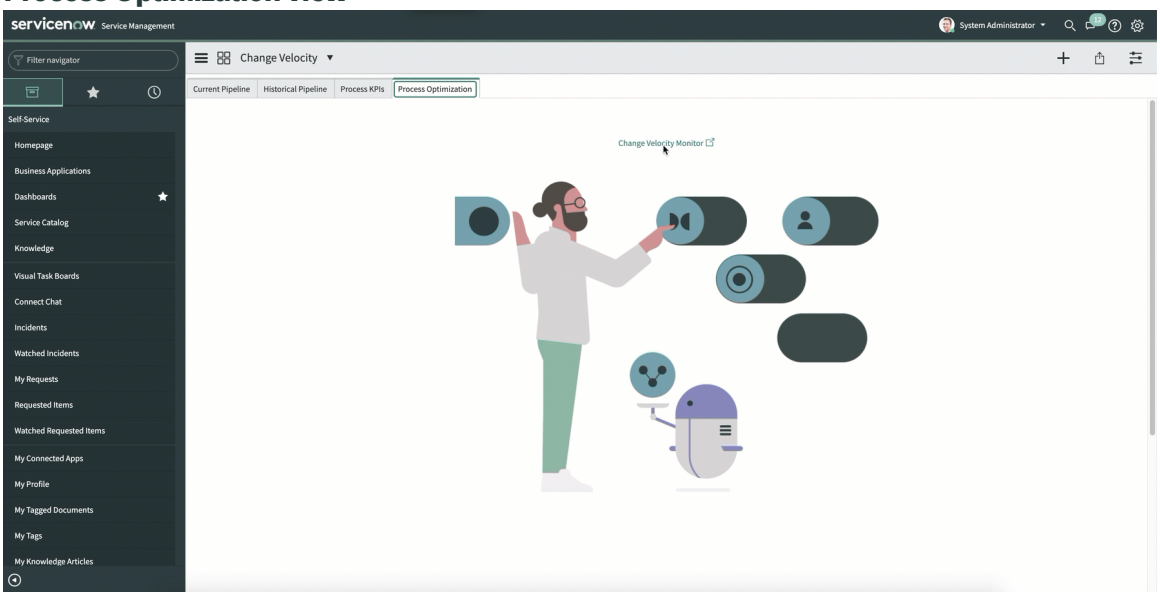
- The **Process Optimization** tab provides change activity assessments that are based on the state model. This capability is available only with an ITSM Enterprise subscription. For more information, see Process Mining.

**Process Optimization view**




## End user and roles

| End user and goal | Required role |
|---|---|
| Change manager - Monitors the success and velocity of change request in the organization at the organization, team, and individual level. | change_manager |

**Note:**
To access the **Process Optimization** tab, the change manager must be part of the Change Assignment group.

## Change Velocity dashboard indicators

**Change Velocity**

Average amount of time that changes have been waiting for approval in the last 30 days. To generate this data on the dashboard, you must run the Change velocity historical data collection job. For information on how to run this job see, Collect historical data.

**Top Change Success Performers**

Performance of assignment groups in processing the change request with the highest performer on the top. For information on how the performance score is calculated, see Success Score Calculation.

**Average age of open changes**

Average amount of time that the change request has been open.

**Average close time of changes**

Average amount of time that it has taken to close the change request.

**Average implementation time of closed changes**

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Average amount of time between the start and close date of the change request.

## Data visualizations

| Title | Type | Description |
|---|---|---|
| Awaiting Cab Approval | Single score ( ) | Number of changes awaiting CAB approval. |
| High Risk Changes | Single score ( ) | Number of high risk changes starting today. |
| Awaiting Approvals | Single score ( ) | Number of changes awaiting approval. |
| Model Breakdown | Pie ( ) | Changes categorized based on the change model over the last 30 days. |
| Type Breakdown | Pie ( ) | Changes categorized based on the change type in the last 30 days. |
| Open Changes by Category | Pie ( ) | Number of open changes from each category. |
| Change Pipeline | Vertical bar ( ) | Number of changes categorized based on their state. |
| Change Success | Pie ( ) | Number of changes categorized based on their close code over the last 30 days. |
| Change Risk | Vertical bar ( ) | Number of changes categorized based on the risk values. |
| High Risk Change List | List ( ) () | List of high risk changes starting today. |
| Highest Change Activity | Line ( ) | Top 10 configuration items associated with changes in the last 3 months. |
| Change Success | Line ( ) | Changes that are successful, unsuccessful, and successful with issues expressed on a line chart. |
| Change Risk | Line ( ) | Changes categorized based on the severity of risk. |
| Change Volume | Line ( ) | Volume of changes in the last 6 months. |
| Unsuccessful Changes | List ( ) | Number of unsuccessful changes in the last 7 days. |
| Emergency Changes | Line ( ) | Number of emergency changes over the last 90 days. |

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| Title | Type | Description |
|---|---|---|
| Change Related Incidents | Line ( ) | Number of closed incidents in last 90 days where they have related changes. |
| Unauthorized Changes | Line ( ) | Number of unauthorized changes over the last 90 days. |
| Active Changes > 7 days | Single score ( ) | Number of active changes that were created more than seven days ago. |

### Change Management troubleshooting properties

Use the Change Management troubleshooting properties and change the value of the properties to get additional logging details for the feature.

The following properties are available for further configuration. To list them, enter `sys_properties.list` in the navigator text box.

| Name | Description |
|---|---|
| change.conflict.log | The logging property that controls logging level displayed for Change Management while detecting the change conflicts.<br>• Type: choice list<br>• Default value: notice |
| com.snc.change_management.cab.log | The logging property that controls the logging level displayed for Change Management when using the CAB functionality.<br>• Type: choice list<br>• Default value: info |
| com.snc.change_management.core.log | The logging property that controls level logging displayed for Change Management .<br>• Type: choice list<br>• Default value: warn |
| com.snc.change_management.policy.approval.log | The debug logging property that provides the detailed logging information of the workflow activity when using Change Approval Policies.<br>Type: choice list |

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# Manage the workspace configuration for a Change request in Service Operations Workspace

Utilize the new table-based configuration to align with the Service Operations Workspace Dynamic Overview Pages with the change process of your organization.

These configuration options allow users to define how the Dynamic Overview pages render throughout the change life cycle. This includes configuration options for overview pages, contextual sidebar and activity stream behavior for each state.

With this you can configure the following components in the workspace configuration:

- Control the display of the cards in the contextual side panel
- Control the order of the cards to be displayed in the Overview pages
- Control the display of activity stream bar in the Overview pages
- Configure the journal fields

## Show the activity stream bar

Show the activity stream bar for a for a change request in Service Operations Workspace.

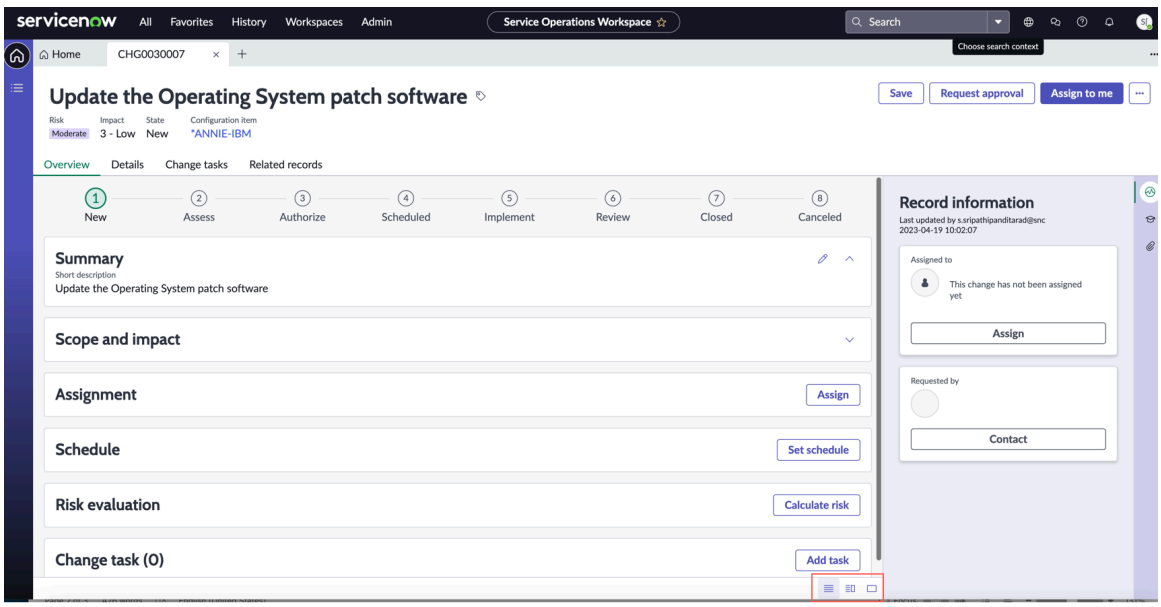
### Before you begin

Role required: admin

### Procedure

1. Navigate to **All** > **Change** > **Workspace Configuration** > **Overview Container**.
2. Select a state.
3. On the Change Overview Container form for the selected state, enable **Display action bar**.
4. Right-click on the form header and select **Save**.

   The action bar is shown on the Service Operations Workspace at the bottom of the screen.




## Configure the order of the cards in Overview section

Configure the order of the cards that display in the Overview section for a change request in Service Operations Workspace.

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### Before you begin
Role required: admin

### Procedure

1. Navigate to **All** > **Change** > **Workspace Configuration** > **Overview Card**.
2. Right-click on Chg overview container column, and select **Group By Chg overview container**.
3. Select a state.
4. In the **Change Overview Cards** section, modify the order of the overview cards using **Display order**.
5. Right-click on the form header, and select **Save**.

#### Configure the journal field of a change request

You can configure if the **Work notes** or **Additional comments** sections to display for a change request.

### Before you begin
Role required: admin

### Procedure

1. Navigate to **All** > **Change** > **Workspace Configuration** > **Overview Journal Field**.
2. Select a Chg overview card.
3. In the **Change Overview Fields** section, to delete select the journal field, and select **Delete** from **Actions on selected rows.**
4. Right-click on the header and select **Save**.

## Reference section for Change Management

Reference sections provide additional information about components installed with Change Management.

### Change Management properties

Administrators can use change properties to configure Change Management behavior.

Navigate to **Change** > **Administration** > **Change Properties** to view and edit these properties.

#### Change Management properties

| Name | Description |
|---|---|
| glide.approval_engine.change_task | Change request tasks approval engine.<br>• Type: choice list<br>• Default value: process_guide |
| glide.ui.risk_calculate_rule | Change risk calculation method. Business rul<br>• Type: choice list<br>• Default value: ui_action<br>For more information, see Risk Calculator pro |

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### Change Management properties (continued)

| Name | Description |
| --- | --- |
| com.snc.change_request.enable_copy | Enable copy change feature.<br>• Type: true \| false<br>• Default value: true |
| com.snc.change_request.copy.attributes | List of attributes (comma-separated) that are<br>• Type: string<br>• Default value: category,cmdb_ci,priority,risk,impact,type,a |
| com.snc.change_request.copy.rl.change_task.attributes | List of attributes (comma-separated) from the<br>• Type: string<br>• Default value: cmdb_ci,priority,assignment_ |
| com.snc.change_request.copy.rl.task_ci.attributes | List of attributes (comma-separated) from the<br>• Type: string<br>• Default value: ci_item |
| com.snc.change_request.attach.enable_copy | Copy attachments from the originating chang<br>• Type: true \| false<br>• Default value: true |
| com.snc.change_request.copy.rl.task_cmdb_ci_service.attributes | List of attributes (comma-separated) from Imp<br>• Type: string<br>• Default value: cmdb_ci_service |
| com.snc.task.refresh_impacted_services | List of all the Task types where **Refresh Impac**<br>• Type: string<br>• Default value: incident, change_request |
| change.refresh_impacted.include_affected_cis | Lists the impacted CIs or Services with any se<br>**Note:**<br>This requires any business services iden<br>application services. For information a |
| com.snc.change_management.enforce_data_requirements | Enforce change request process data require<br>includes, updates made through the change<br>see Change Management API<br>In the User Interface, when this property is tru<br>already exist. |

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**Change Management properties (continued)**

| Name | Description |
|---|---|
| | • Type: true \| false<br>• Default value: true |
| com.snc.task.populate_service_offering | Populates the service offering related list from<br>• Type: true \| false<br>• Default value: false |
| com.snc.change_request.enable_unauthorized | Enables the creation of unauthorized change<br>• Type: true \| false<br>• Default value: false |
| com.snc.change_request.event.state_updated.enabled | Generates the *sn_change.state.updat*<br>• Type: true \| false<br>• Default value: false |
| com.snc.change_request.event.state_updated.states | Enter the change request state field values, e<br>when any of the state value changes, for exar<br>event for all state changes. For more informat<br>**Note:**<br>For this property to take effect, property |

## Change Management properties for Discovery integration

If your organization is subscribed to Discovery , integration with Discovery is automatically enabled. With this integration, any configuration item (CI) with an IP address that is part of a change request process can be maintained automatically. When Discovery is activated, the following three new properties become available.

| Name | Description |
|---|---|
| com.snc.change_request.auto.discovery | Trigger Discovery for the Affected CIs automatically, manually or not at all.<br>• Type: Choice list<br>• Values: Off, Both, Automatic, Manual<br>• Default value: Off |
| com.snc.change_request.disco.auto.state | Defines which Change Request states Discovery will be automatically triggered.<br>• Type: String<br>• Default value: Review |

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| Name | Description |
| --- | --- |
| com.snc.change_request.disco.manual.state | Defines which Change Request states allow Discovery to be manually triggered.<br>• Type: String<br>• Default value: Implement, Review |

## Change Management properties available from sys_properties table

The following properties are available for further configuration. To list them, enter `sys_properties.list` in the navigator text box and filter for *`com.snc.change_request`*.

| Name | Description |
| --- | --- |
| com.snc.change_request.copy.related_lists | Related lists (comma-separated) that will be copied from the originating change.<br>• Type: string<br>• Default value: task_ci,task_cmdb_ci_service,change_task |
| com.snc.change_request.rl.change_task.attach.enable_copy | Copy attachments from originating change task.<br>• Type: true \| false<br>• Default value: true |
| com.snc.change_management.policy.approval.log | The debug logging property that provides the detailed logging information of the workflow activity when using Change Approval Policies.<br>Type: choice list |

## Analyze change request risk and impact

After you create a change request, you can assess and analyze the risk and impact involved in the change request. You can review any conflicts that are detected by reviewing the change request.

Analyze the risk of change and review detected conflicts in the following ways.

### Risk conditions and calculation

Change Management features provide ways to calculate and assess the risk of change requests, and to identify and resolve conflicts.

Risk assessment and calculation assists you with understanding the urgency and impact of change requests. Conflict detection assists you with scheduling change requests for the least impact to stakeholders. This features minimize the risk and cost of rapid changes in your environment.

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### Risk Calculator property

The Best Practice - Change Risk Calculator plugin enables dynamic calculations of the risk and impact of a change. The administrator specifies how and when risk and impact rules are applied.

The Best Practice- Change Risk Calculator plugin bundles some risk calculations using configuration item (CI) attributes and time measures.

A change management system property determines the risk calculation method. In **Change** > **Administration** > **Risk Properties**, the administrator selects one of the following methods.

#### Change Risk calculation method

| Option | Description |
|---|---|
| UI Action | Enables users to click the **Calculate Risk** related link to check condition rules on demand.<br><br>This UI action applies matching conditions according to their order. Each time a rule is applied, an alert is displayed confirming the new values for risk and impact.<br><br>The **Calculate Risk** related link appears on the Change Request form only if the following statements are true.<br>• There are risk and impact conditions that apply to the current change record.<br>• The user has the admin or the itil role. |
| Business Rule | Enables conditions to be evaluated and applied dynamically through a business rule on the Change Request table.<br><br>The conditions are evaluated before a change request record is inserted or updated.<br><br>Users with the admin or the itil role or both can execute this business rule.<br><br>**Note:** The *Run Risk Calculation* business rule replaces the *Calculate Risk* business rule when the Change Management - Risk Assessment plugin is activated. |
| None | Disables the processing of risk and impact rules. |

### Add or modify risk and impact conditions

You can define risk calculation rules on which the risk and impact of a change are calculated. Best Practice - Change Risk Calculator is activated by default in the base system.

#### Before you begin

Role required: itil_admin or admin

#### About this task

Risk Conditions are run against the change request based on their **Order** field from lowest to highest. The first Risk Condition that matches the change request record is applied. All subsequent risk conditions are then ignored whether they match or not. A risk calculation rule is defined with two elements.

- Conditions that can evaluate to *true* or *false*. You can use a condition builder or write a script.
- **Risk** and **Impact** field value settings when the conditions evaluate to **true**.

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### Procedure

1. Navigate to **All** > **Change** > **Administration** > **Risk Conditions**.
2. Click **New**, or click the risk condition to modify.
   You can also edit risk conditions from within the Change Request form by opening the form context menu and clicking **Edit Risk Conditions**.
3. Complete or update the form, as appropriate.

| Field | Description |
|---|---|
| Name | Enter a descriptive name for the rule |
| Risk<br><br>Impact | Select a value for one of these fields. The selection determines which field to update based on this risk calculation. |
| Active | Select the check box to use the rule. |
| Order | Enter the order in which this risk calculation is evaluated. Rules with lower numbers are evaluated first. If there are two or more rules with differing orders, the rule with the lowest order is evaluated and the others are ignored. |
| Use advanced condition | Select the check box to enter a script instead of using the condition builder. |
| Use script values | Select the check box to hide the **Risk** and **Impact** fields. The script specifies the risk and impact values. |
| Description | Enter a description of how this risk calculation is applied. |

4. Specify the rule based on your selected rule method.

   **Example**
   In the following example, the **Advanced condition** script first determines whether the CI is a business service. If so, the script identifies whether the **Business criticality** value is **1 - most critical** or **2 - somewhat critical**. If it does, it sets the global variable answer to `true`.

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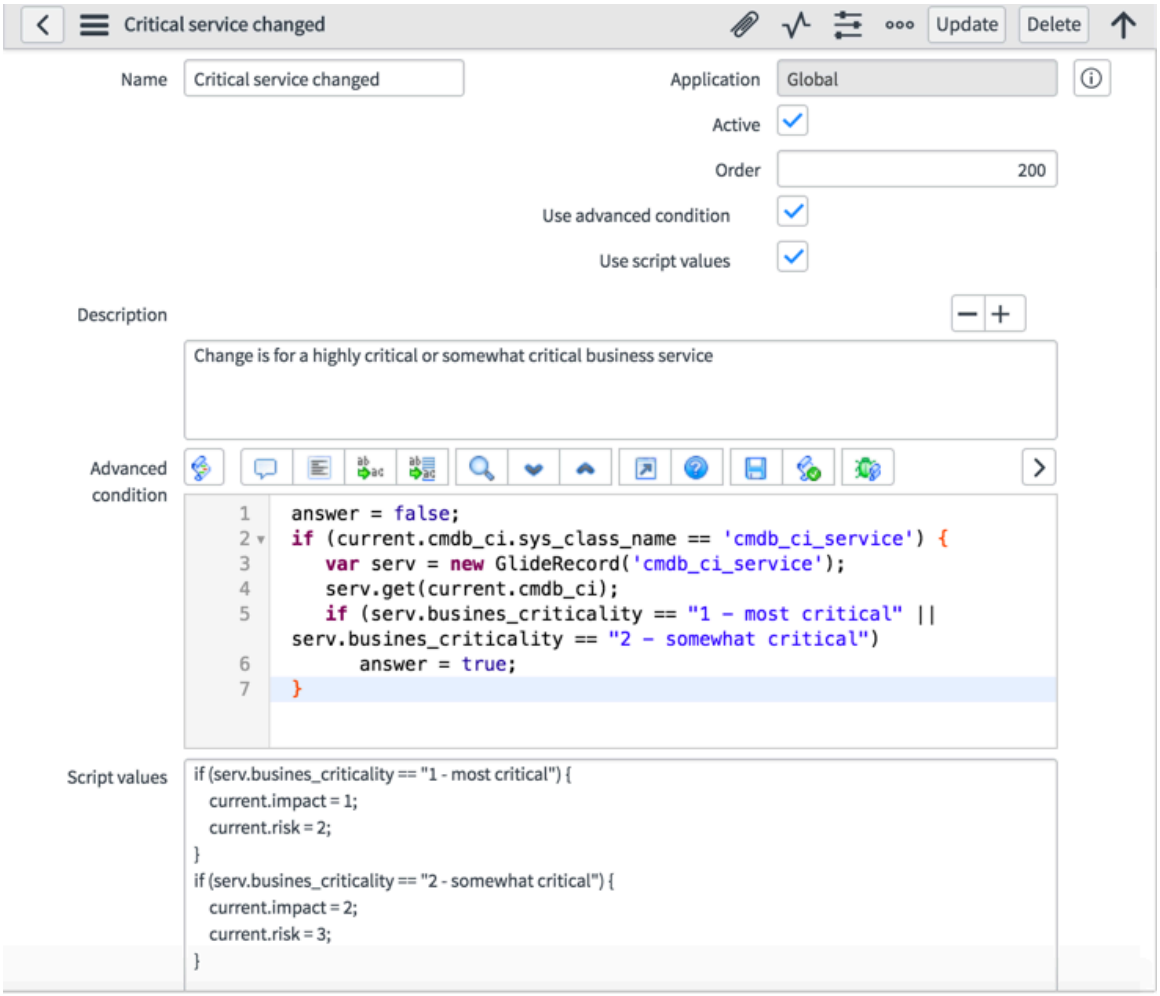


When the **Advanced condition** script returns *true*, the script in the **Script values** field sets the change request **Impact** and **Risk** values based on the **Business criticality** value.

### Risk assessment

There are two methods to calculate the risk of a change. The Best Practice - Change Risk Calculator is activated in the base system by default. Change Management - Risk Assessment is optional.

- Change Risk Calculator uses predefined properties and conditions to calculate a risk value.
- Change Management - Risk Assessment uses information provided by the end user to assess a risk value.

The two methods can be used individually or together, depending on your requirements. If the methods are used together, the highest risk value from both methods is always selected.

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**Risk assessment and calculation**




**Note:**
If both Risk Assessment and Risk Calculator are active but you want to use only one method, remove conditions for the method you do not want to use.

If you activate Change Management - Risk Assessment, the administrator can add the **Assessment Instance** > **Task** related list to the change request form, if necessary. The related list displays risk assessments associated with the change request.

**Related topics**

Perform risk assessment

### Define risk assessments

Change Management - Risk Assessment provides a flexible way to capture information from the end user to calculate the risk of the associated change request. You can define the risk assessment questions, thresholds, and conditions that calculate risk for any change request.

## Before you begin

Role required: itil_admin

Change Management - Risk Assessment must be activated.

## About this task

You can use a series of questions to capture the risk of a change. A different assessment of the questionnaire can be defined on the change record. The assessment uses a weighted score approach for each question. The composite weighted score derived from the answer of the end user is used to calculate risk. This score is based on the thresholds associated with the risk assessment.
Change Risk Assessment is an application built on Survey and Assessment V2 architecture. While it's possible to configure multiple metric categories on this architecture, it is better not to do so to avoid errors.

You can configure multiple change Risk Assessment definitions each with one Metric Category, where the Metric Category filter is identical to the filter of the change Risk Assessment condition.

## Procedure

1. Navigate to **All** > **Change** > **Administration** > **Risk Assessments**.
2. Click **New**.
3. Complete the form, as appropriate.

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| Field | Input value |
|---|---|
| Name | Name for the risk assessment. This name is displayed to the end user. |
| State | The state of the assessment: **Draft** or **Published**. |
| Description | Description of the risk assessment. |
| Condition | Conditions which determines if a risk assessment is attached to the change. Typically, the first attachment that matches the conditions gets attached during evaluation. Therefore, ensure that the conditions result in the correct assessments being attached especially when defining multiple questionnaires.<br>**Note:**<br>Ensure that the conditions are simple and mutually exclusive so that the assessment conditions are easy to understand and maintain. |

4. Click the form context menu and select **Save**.
   The page refreshes with the **Assessment Categories** and **Assessment Thresholds** related lists. The **Assessment Categories** related list enables you to define the questions that the end user answers to assess the risk of a change request.
5. Complete the following steps to create an assessment question.

   a. In the **Assessment Categories** related list, click **New**.

   b. Complete the form, as appropriate.

   **Metric category**

| Field | Description |
|---|---|
| Name | Name of the assessment category. |
| Create Stakeholders | If selected, automatically creates stakeholders for all assessable records linked to this category. |
| Weight | Value that represents importance of this category relative to other categories. The weight is multiplied to the score of the answer to calculate the weighted score. |
| Filter | Only assessable records that meet filter conditions are evaluated by metrics in this category. |
| Description | Description of the assessment category. |

   c. Click **Submit**.

   d. Open the assessment category.

   e. In the related list, click **Assessment Metrics**.

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f. Complete the form, as appropriate.

**Assessment metrics**

| Field | Description |
|---|---|
| Name | Name of the assessment metric. |
| Category | The category of the assessment metric. |
| Method | The method of gathering data for this metric. |
| Weight | Value that represents importance of this metric relative to other metrics. The weight is multiplied to the score of the answer to calculate the weighted score. |
| Order | Order of the question in the assessment. |
| Active | If selected, the metric is activated to be used for assessments and result calculations. |
| Mandatory | If selected, makes a field mandatory in an assessment. |
| General | |
| Question | Question that is displayed on the assessment. |
| Description | Tool tip text for the assessment. |
| Depends on | The condition that determines whether the metric is shown to the user or not. |
| Allow Additional Information | If selected, a text box appears for the user to enter additional information for the question. |
| Field Type | |
| Data type | The data type of the answer that is given by a user for a question.<br>**Note:**<br>Depending on the data type that you select, additional fields may appear. |

g. Click **Submit**.

h. In the **Assessment Threshold** related list, click **New**.

i. Complete the form, as appropriate.

**Change risk assessment threshold**

| Field | Description |
|---|---|
| Risk Assessment | The assessment name for which assessment threshold is applied. |
| Risk | Risk value applied on the change request. |

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| Field | Description |
|---|---|
| | **Note:** Risk value can be overridden by risk conditions. |
| Application | The name of the application that contains the record. |
| Score greater than | The threshold against which the composite score is compared and evaluated. |

**j.** Click **Submit**.

**Note:**
You can create or edit the assessment questionnaire through the Assessment Designer module or by clicking **Edit in Assessment Designer** related link.

For example, after you define the risk assessment, this is how the risk assessment score is calculated and set.

- *asmt_metric_result* stores the score set.
- The weight is calculated as `sum (asmt_metric_result.normalized_value)` where `asmt_metric_result.normalized_value = actual_value * weight`.
- The risk calculated as `sum(actual_value * weight) > threshold`. For example, If the result is 7 and moderate threshold is 6 risk is moderate.

### Perform risk assessment

You can perform risk assessment of existing change requests after the risk assessment criteria are defined. After assessing the risk, you can view the risk assessment responses in the change request.

#### Before you begin
Role required: itil, sn_change_write, or admin

#### About this task
Verify that the **Risk Assessment** related list is configured on the Change Request form. If it is not configured, an administrator can add the **Task Assessment** > **Task** related list.

The **Risk Assessment** related link is available only when the change request meets the risk assessment condition and risk assessment category condition, the change request type is **Normal** or **Emergency**, and the **State** is **New**, **Assess**, or **Authorized**. On clicking the **Risk Assessment** related link, the Change Risk Assessment form appears if you have not assessed the risk for this change request before. When you submit the form, these three things appear at the top of the change request form:

- **Risk assessment evaluated**: The estimation of risk after it is assessed against the Change Risk Assessment form and the criteria set for assessment for the change request.
- **Risk Condition applied**: The result of the risk calculated against pre-defined risk conditions.

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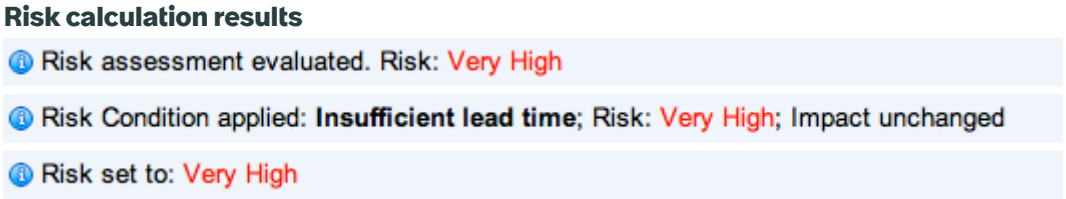
- **Risk set to**: The final weight of risk based on risk assessment and risk calculation.

> **Note:**
> If you have filled the Change Risk Assessment form earlier but clicked **Risk Assessment** related list again, a pop-up window appears informing that you have already completed the risk assessment for the change request and confirms whether you want to edit the existing risk assessment. Click **Yes** to fill the Change Risk Assessment form again. Click **No** to use the existing risk assessment to calculate risk.

### Procedure

1. Open a change request.
2. Click the **Risk Assessment** related link.
3. Answer the questions and click **Submit**.
   After submitting the risk assessment, click the **Risk Calculation** related link to calculate the risk. The result of risk assessment, risk calculation, and the value that appears in the **Risk** field of the change request form appears.




   Users with survey_admin or survey_reader role can navigate to **Legacy Surveys** > **Survey Responses** and filter by **Instance**. Survey instances are individual assessments distinguished by the date and time when they are taken.

### Related topics

Risk assessment

## Migrate to legacy change risk assessments

Users can migrate legacy change risk assessments to versions compatible with the new Change Risk Assessment table schema and logic.

### Before you begin

Few points to remember:

- Customers with Change Management - Risk Assessment [Legacy] (`com.snc.change.risk_assessment`) plugin already installed on their instances should only follow this task.
- The Change Management - Risk Assessment [Legacy] (`com.snc.change.risk_assessment`) plugin cannot be installed for customers who are on Kingston and later releases.
- Migration guidance and best practice suggests that the migration should be performed on a development instance and not on a production instance.
- The development instance must have the new Change Management - Risk Assessment [com.snc.change_management.risk_assessment] plugin installed.
- All migration work must be captured in an update set, moved to a test instance, and then tested before moving them to a production instance.

Role required: itil_admin

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### About this task

The following legacy risk assessment components are migrated:

- Risk assessment definition, questions, and question choices.
- For multiple assessment conditions, the migration might result in the following one or more than one risk assessment records:
  - If all the multiple assessment conditions are on the same table, then the migration results in only one risk assessment.
  - If the multiple assessment conditions are on different tables, then the migration creates as many risk assessments as they pertain to different tables.

### Procedure

1. Create an update set and set it as the current set.
   For more information, see Create and select an update set as the current set.
2. Navigate to **Change** > **Risk Assessment (legacy)**.
3. Open the legacy risk assessment that you want to migrate to a change risk assessment.
4. Click the **Migrate to Risk Assessment** related link.

   **Note:**
   Migrating legacy risk assessment to a new change risk assessment does not modify the existing legacy assessment records.

5. Click **OK**.
6. Repeat steps 4-5 for all the legacy risk assessment to be migrated.

### What to do next

After all the legacy risk assessments are migrated, reach out to the support team to run the following scripts:

```
disable_legacy_change_risk_assessment.js
```

Capture the results in the update set created and later mark the update set as closed complete.
For more information, see Mark an update set complete.

**Note:**
The given procedure is a suggested practice. Alternatively, you can capture each migrated Change Risk Assessment in their own update set. You can also capture the results of disabling of the Change Management - Risk Assessment [Legacy] using `disable_legacy_change_risk_assessment.js` in a separate update set.

#### Migrated risk assessment components

When you migrate a change risk assessment, the system maps records from legacy risk assessment to the new risk assessment tables.

To create a functional risk assessment on the assessment framework, the system converts risk assessment records to the most logical equivalent assessment risk records. This may mean multiple assessment risk records are created from one legacy risk record.

#### Migrated components

| Risk assessment components | Change risk assessment components |
|---|---|
| Assessment Main [assessment_main] | Change Risk Assessment [change_risk_asmt] |

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**Migrated components (continued)**

| Risk assessment components | Change risk assessment components |
|---|---|
| Assessment Question [assessment_question] | Assessment category [asmt_metric_category] |
| | Assessment Metric [asmt_metric] |
| Assessment Question Choice [assessment_question_choice] | Assessment metric definition [asmt_metric_definition] |
| Risk Assessment Thresholds [risk_assessment_threshold] | Assessment Thresholds [change_risk_asmt_threshold] |
| Assessment Conditions [assessment_conditions] | This is included in Change Management - Risk Assessment [com.snc.change.risk_assessment]. |

## Success Probability definitions

Success Probability definition is a configuration that defines the probability and the matching conditions of a change request.

By default, the success probability definition is defined for Change Success Score, Change Model Success, and Calculated.

The order field determines the execution order of the definitions, the order with least value is given higher precedence.

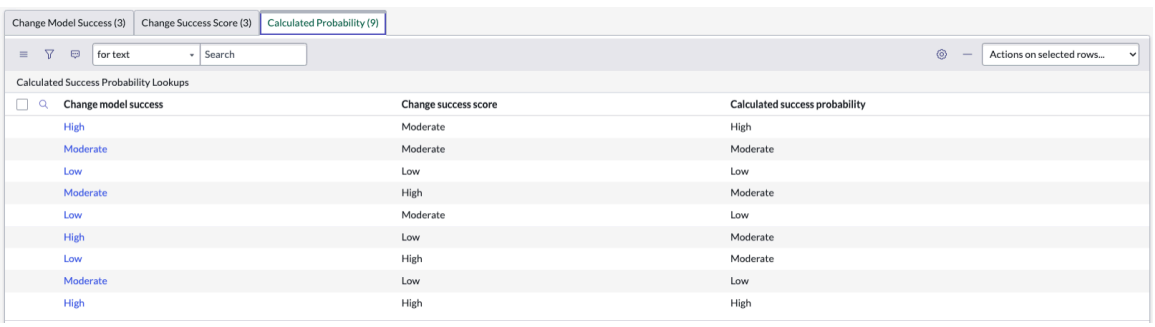
The default values are created for Change Model Success, Change Success Score, and Calculated irrespective of the probability selected on the success probability definition.

Change manager can modify the existing records in the table. The Success Score Validations business rule validates if any record is created with the allowed minimum and maximum values for Change Model Success and Change Success Score.

When Change Model Success or Change Success Score is set as probability on the Success probability definition, the corresponding related list is visible on the Success probability definition record, however, when Calculated is set all the three related lists are visible on the record.

The “Greater than or equal to” field of Change Model Success and Change Success Score related list determines the Success Probability that must be returned by the Success probability definition.

For example, if the Probability is set to Calculated on the record, and if Change Model Success evaluates to High and Change Success Score evaluates to Moderate, the success Probability definition returns High as the Success Probability.

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You can edit the value in the Calculated success probability column for each combination of Change model success and Change success score. When you modify the choices for success probability on a change request, you must click **Refresh probability mappings** under **Related Links** to update the combinations of related records for Change Model Success, Change Success Score, and Calculated probabilities. You can also update the multiple records by executing **Refresh probability mappings** on the list.

**Note:**

Success probability plugin supports domain separation. The **sn_chg_probability_success**, **sn_chg_probability_model_success**, and **sn_chg_probability_calculated_lookup** tables are process separated when you install the domain separation plugin.

## Calculated Risk Score

Risk lookup table is to get the risk value corresponding to the success probability value and impact value.

Ensure that you have activated Change Management Success Probability plugin to calculate the risk for a change request. To activate Change Probability, refer Activate Change Management Success Probability.

sn_chg_probability_risk_lookup table is used to fetch the data to calculate the risk value of the change request.

By default, there are nine records with all the possible mappings for Impact and Success Probability along with their corresponding risk values.

Change manager can add new records and delete existing records in the table. The Check impact and probability combination business rule validates the duplicate mapping entries.

Navigate to **All** > **Change** > **Administration** > **Calculated Risk Score**.

All the risk calculating engines calculate their corresponding risk value, the system picks the highest risk and defines the risk for the Change. You can modify the Risk values irrespective of the values defined for Impact and Success probability.

You can view the success probability definition that has set the success probability on the change request by accessing the sn_chg_probability_details table. This table can be accessed by the users who has read access to the change requests.

On the change request form, in the **Related Links**, click **Calculate risk**. The risk engines calculate the risk for the Change. Click the icon against the **Risk** field to view the risk set for the Change.

Click the icon against **Calculated Risk Score** to find which type of success probability definition is responsible to set the risk for the change. There are three types of calculated risk score:

- Calculated (Impact + Success Probability)
- Calculated (Impact + Change Success Score)
- Calculated (Impact + Change Model Success)
- Not set: When the risk is not evaluated

**Note:**

Risk lookup supports domain separation. The **sn_chg_probability_risk_lookup** table is process separated when you install the domain separation plugin.

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## Change management integrations

You can integrate Change Management with other ServiceNow applications such as Discovery, Software Asset Management, and Hardware Asset Management.

The following topics provides information about integration of different applications with Change Management, prerequisites, and way to enable functionality of those integrated applications.

### Change Management integration with ITOM Visibility

If your organization is subscribed to ITOM Discovery or ITOM Visibility, integration with these ITOM products is automatically enabled. With this integration, any configuration item (CI) with an IP address that is part of a change request process can be maintained automatically. Change request fulfillers can also manually request the discovery process for a CI.

## Enabling integration

Depending on subscriptions purchased by your organization, you must install and configure the following plugins:

- For ITOM Discovery - the Discovery plugin (com.snc.discovery)
- For ITOM Visibility - the Discovery plugin (com.snc.discovery) and Service Mapping plugin (com.snc.service-mapping)

## Integration with ITOM Discovery

When Discovery is activated, Change Management exposes three new properties within the Change Properties module (**Change Management** > **Administration** > **Change Properties**):

**Change Management properties for Discovery**

| Property | Description |
|---|---|
| Configures how discovery is triggered for Affected CIs (automatically, manually or off) | Determines whether to trigger discovery for the affected CIs automatically, manually, both, or not at all.<br><br>Type: Choice list<br><br>Values: Off, Both, Automatic, Manual<br><br>Default value: Off<br><br>**Note:** If the property below is set to Both, and you trigger discovery manually, then the automatic discovery will not be triggered for that change request. |
| List of Change Request states (comma-separated) where discovery can be triggered manually | Defines the change request state values to allow discovery to be manually initiated. For these defined state values, the Initiate Discovery related link is available.<br><br>Type: String<br><br>Default value: Implement, Review |

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**Change Management properties for Discovery (continued)**

| Property | Description |
| --- | --- |
| | **Note:** If there are multiple languages used on the instance, then this property needs to be set to the internal state value for Review. |
| List of Change Request states (comma-separated) where discovery triggers automatically. E.g. when the Change Request's state changes to Review | Defines the change request state values for which discovery is automatically triggered. Discovery initiates when transitioning to the state values listed.<br><br>Type: String<br><br>Default values: Review<br><br>**Note:** If there are multiple languages used on the instance, then this property needs to be set to the internal state value for Review. |

**Note:** For the last two properties in the above table, if there are multiple languages used on the instance, then the property needs to be set to the internal value, which is 0, for Review.

In addition to the new properties, the **Discovery State** and the **Discovery last updated** fields get added to the **Affected CI** related list. **Discovery State** provides one of five status values and a corresponding icon to reflect that status:

- In Progress
- Completed Successfully
- Completed w/Warning
- Completed w/Error
- Cancelled

The Discovery State value is presented as a link to the corresponding Discovery log file. The **Discovery last updated** field contains a date and time stamp indicating the last time Discovery was executed.

If you have opted to manually initiate the Discovery module, or opted for both manual and automatic initiation, then the **Initiate Discovery** related link appears in the Related Links section when the state of the change request matches one of the defined states in the property. When Discovery is triggered, the values in the **Discovery State** and the **Discovery last updated** fields change.

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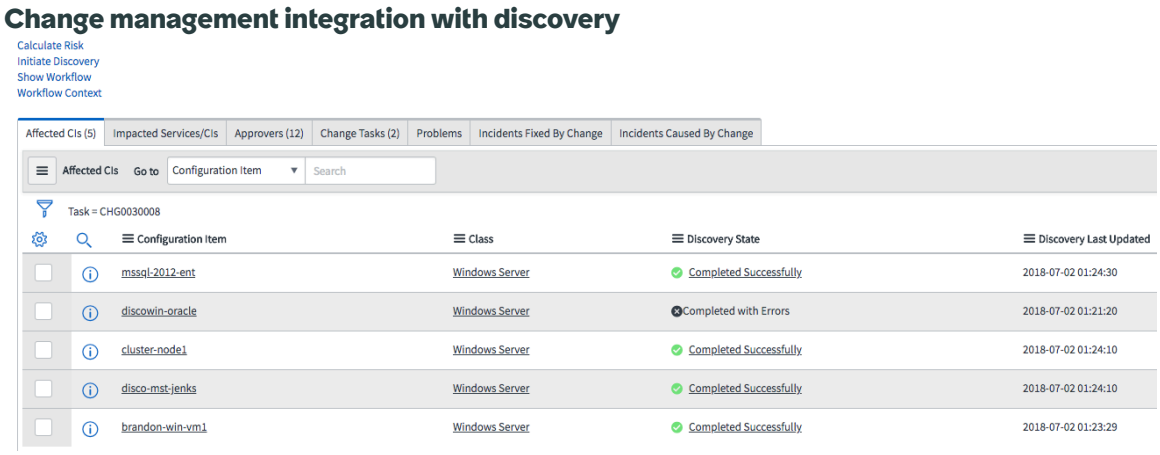


## Integration with ITOM Visibility

You can view the changes in the context of application services. Service maps available in Service Mapping show changes to an application service as a whole and to the individual configuration items (CIs) comprising the service.

If the ServiceNow AI Platform is configured to validate changes, all changes are evaluated and rendered as valid or not. If a change is valid, its change record on the application service map is marked as approved. For more information about configuring the platform for change validation, see Managing proposed changes.

The type of change mark depends on the nature of changes that it represents:

**Light gray balloon ( )**

Unapproved change that does not influence the application service behavior. For example, a change in a network path or adding a node to a cluster.

**Dark gray balloon ( )**

Unapproved change that changes the application service behavior.

**Green balloon ( )**

An approved change in deployments where the ServiceNow AI Platform is configured to validate changes.

**Double balloon ( )**

Multiple separate changes that happened a short time from each other.

**Related topics**

Discovery

View the change history of application services

View the change history of application services in Agent Workspace

### Change Management integration with Software Asset Management

The Change Management integration with Software Asset Management (SAM) displays the projected licensing cost implication of a change.

This integration focuses on the projected license cost change when a change is proposed to one or more configuration item (CI) processor resources (CPU or CPU Core) running software licensed by the processor.

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This integration requires the Software Asset Management Professional (com.snc.samp) and Change Management - License Change Projections (com.sn_samp_change) plugins.

**Note:**
You need to request the activation of the Change management – License Change Projections plugin (com.sn_samp_change) through the HI Service Portal.

When a change request is in the **New** state, users can propose a change to the CPU or CPU Cores of a CI using **Propose Change** or **Mass Update CI**. Those proposed changes are captured in an XML field that is then passed to Software Asset Management when the change request transitions into its first approval state. Once Software Asset Management performs the projected licensing cost change, those results are displayed in a new form section called License change projection.

The License change projection form section displays the license projection change summary for every CI in scope for the change. The left side of the section displays fields relaying the current spend, projected spend, the spend change, and the number of impacted installations. On the right is a bar graph providing a visual representation of that information.

For a more detailed breakdown of the license change projections, a related list can be added to the Change Request form called **CI Projection Summary**. This related list provides a CI-by-CI breakdown of the license change projection summary information and provides easy access to the Software Asset Management CI Project Summary record and additional data.

**Related topics**

Managing proposed changes

Mass Update CI

### Change Management integration with Hardware Asset Management

The Change Management integration with Hardware Asset Management helps in determining the asset action that must be performed on the configuration item (CI) that is associated with a hardware asset. Using this capability, change implementers can quickly update asset records directly from change and the Asset Manager can see current state on all assets that were updated by the change request.

This integration requires the Hardware Asset Management Professional (com.sn_hamp) plugin.

**Note:**
You must request the activation of the Hardware Asset Management Professional (com.sn_hamp) plugin from the ServiceNow® application store.

When the configuration items listed in the Affected CIs related list have an asset associated, then the **Asset action** field is populated.

You can choose an **Asset action** for the CI, from the Affected CI related list. This **Asset action** field provides three possible actions that can be selected which triggers an event.

- **Deploy**: When this action is selected, the *sn_hamp.asset.deploy* event is triggered.
- **Update/Repair**: No event is triggered for this action.
- **Retire**: When this action is selected, the *sn_hamp.asset.retire* event is triggered.

**Note:**
The **Asset action** column can be added to the Affected CI related list if not already available.

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When a change request is in the **Implement** state, the proposed asset action triggers the corresponding event. When the workflow is complete, the asset action updates the asset and the related records and progresses to the **Review** state.

**Note:**
If the asset action is not selected, then the change request will not progress to the **Review** state.

For more information, see Hardware Asset Management

## Domain separation and Change Management

Domain separation is supported in Change Management. Domain separation enables you to separate data, processes, and administrative tasks into logical groupings called domains. You can control several aspects of this separation, including which users can see and access data.

## Support level: Basic

- Business logic: Ensure that data goes into the proper domain for the application's service provider use cases.
- The application supports domain separation at run time. The domain separation includes separation from the user interface, cache keys, reporting, rollups, and aggregations.
- The owner of the instance must set up the application to function across multiple tenants.

Sample use case: When a service provider (SP) uses chat to respond to a tenant-customer's message, the customer must be able to see the SP's response.

For more information on support levels, see Application support for domain separation.

## Change Management overview

Change Management provides a systematic approach to controlling the life cycle of all changes, facilitating beneficial changes with minimum disruption to IT services.

## How domain separation works in Change Management

Change management involves the management of change requests. A change request allows you to implement a controlled process for the addition, modification, or removal of approved and supported configuration items (CIs). The request records the detailed information about the change, such as the reason for the change, the priority, the risk, the type of change, and the change category.

- A change request is an extension of a Task. Records are created in the domain of users creating the task they have in session.
- All change properties are global, meaning they are the same for every application that uses the **[sys_properties]**table properties. The table is not domain separated so any changes made impact all domains.
  - Domain separated tables
  - Change Request [change_request]
  - Use case

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An ITIL user in the Acme domain logs in and creates a change request. The change request is created in the domain that the user has selected.

## How domain separation works in Change Advisory Board (CAB) Workbench

- CAB meetings synchronize with the CAB Definition table if the meeting was generated via a definition, or the meeting was created manually and has the CAB Definition field populated.
- CAB Meetings are created in the domain of the user if the meeting is created manually without an associated CAB definition.
- Meeting records are not supported if in a different domain from the associated definition.
- All other CAB records have their domain master set to the associated CAB Meeting record.

### Domain separated tables

- CAB Definition [cab_definition]
- CAB Meeting [cab_meeting]

### Domain tables (linked to domain of its associated cab_meeting)

- CAB Attendee [cab_attendee]
- CAB Agenda Item [cab_agenda_item]
- CAB Runtime State [cab_runtime_state]

### Use cases

- A CAB manager creates a new CAB definition and generates 20 meetings while in the ACME domain. The result: Both the definition and meetings are created within the ACME domain.
- A CAB manager creates an ad-hoc CAB meeting from the related list on the CAB definition form. Result: The meeting is created in the domain of the CAB meeting.
- All other use cases behave in the same way as when domain separation is not enabled.

## How domain separation works in Change Schedules (New feature)

- Change Schedule definitions encapsulate all the configuration options and related records used to display a given Change Schedule.
- Records are created in the domain of the current user.
- Ancillary records are created in the domain of the Change Schedule definition.

### Domain separated tables

- Change Schedule Definition [chg_soc_definition]
- Related Definition [chg_soc_definition_child]
- Style Rule [chg_soc_definition_style_rule]
- Style Rule [chg_soc_style_rule]
- Style Rule [chg_soc_def_child_style_rule]

### Use cases

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An ITIL user in the ACME domain logs in and navigates to the Change Schedule landing page. The user can view the Change Schedules in both their current or global domain.

**Related topics**

Domain separation for service providers

## Change Management tutorial

Perform the sample tasks in your instance to understand the functionality of Change Management.

### Create a custom field

Create a custom choice field to indicate whether a change request must go through the **Review** state.

**Before you begin**
Role required: admin

**Procedure**

1. Open the **Change Request** form.
2. Complete the following steps to create a new field on the Change Request form.

   a. Open the form context menu and select **Configure** > **Form Layout**.

   b. Enter the following values in the **Create new field** section.

| Field | Value |
|---|---|
| Name | Needs Review |
| Type | Choice |

   c. Click **Add** to add the new field to the slushbucket.
   The new field appears at the bottom of the **Selected** slushbucket.

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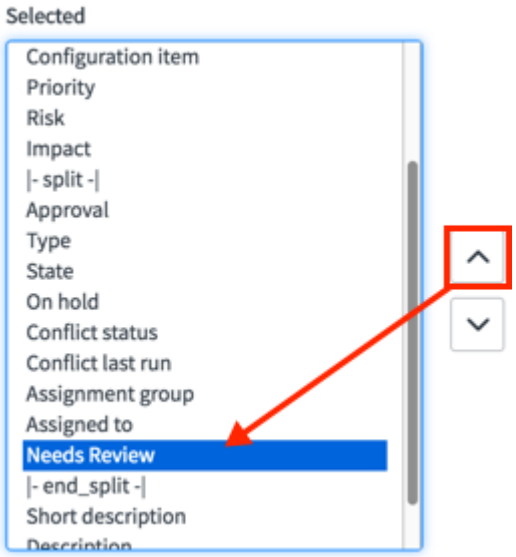
a. Use the up and down arrows next to the slushbucket to move the new field next to the **Assigned to** field.




b. Click **Save**.
The Change Request form reopens with the **Needs review** field below the **Assigned to** field.

3. Complete the following steps to configure the choices for the **Needs review** field.

a. Right-click the **Needs review** field label and select **Configure choices**.

b. In the **Enter new item** field, add **Yes** and **No** choices and click **Add**.
The choices appear in the **Selected** list.

c. Click **Save**.

The Change Request form reopens. The **Needs review** choice list contains the**Yes** and **No** choices.

4. **Optional:** If the value in the **Needs review** field is **Yes**, **No**, or blank, configure the default by completing the following steps.

a. Right-click the **Needs review** field label and select **Configure Dictionary**.

b. In the **Choice List Specification** section, select **Dropdown with – None –**as the default **Choice**.

c. Click **Update**.
The Change Request form reopens. The **Needs review** field displays **-- None --**.

### Add a UI policy

Add a UI policy to display the **Needs review** field for **Normal** change requests when it reaches the **Complete** state.

**Before you begin**
Role required: admin

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### Procedure

1. Open the **Change Request** form.
2. Open the form context menu and select **Configure** > **UI Policies**.
3. Click **New**.
4. Enter the following values on the **UI Policy** form.

| Field | Value |
|---|---|
| Table | Change Request |
| Short description | Show “Needs review” field |
| Conditions | [Type] [is] [Normal]<br>[State] [is one of] [Review, Complete, Closed] |

5. Open the form context menu and select **Save** to create the UI Policy record and stay on the form.
   The **UI Policy Actions** related list appears.
6. Click **New** in the **UI Policy Actions** related list.
7. Enter the following values.

| Field | Value |
|---|---|
| Field name | Needs review |
| Mandatory | True |
| Visible | True |

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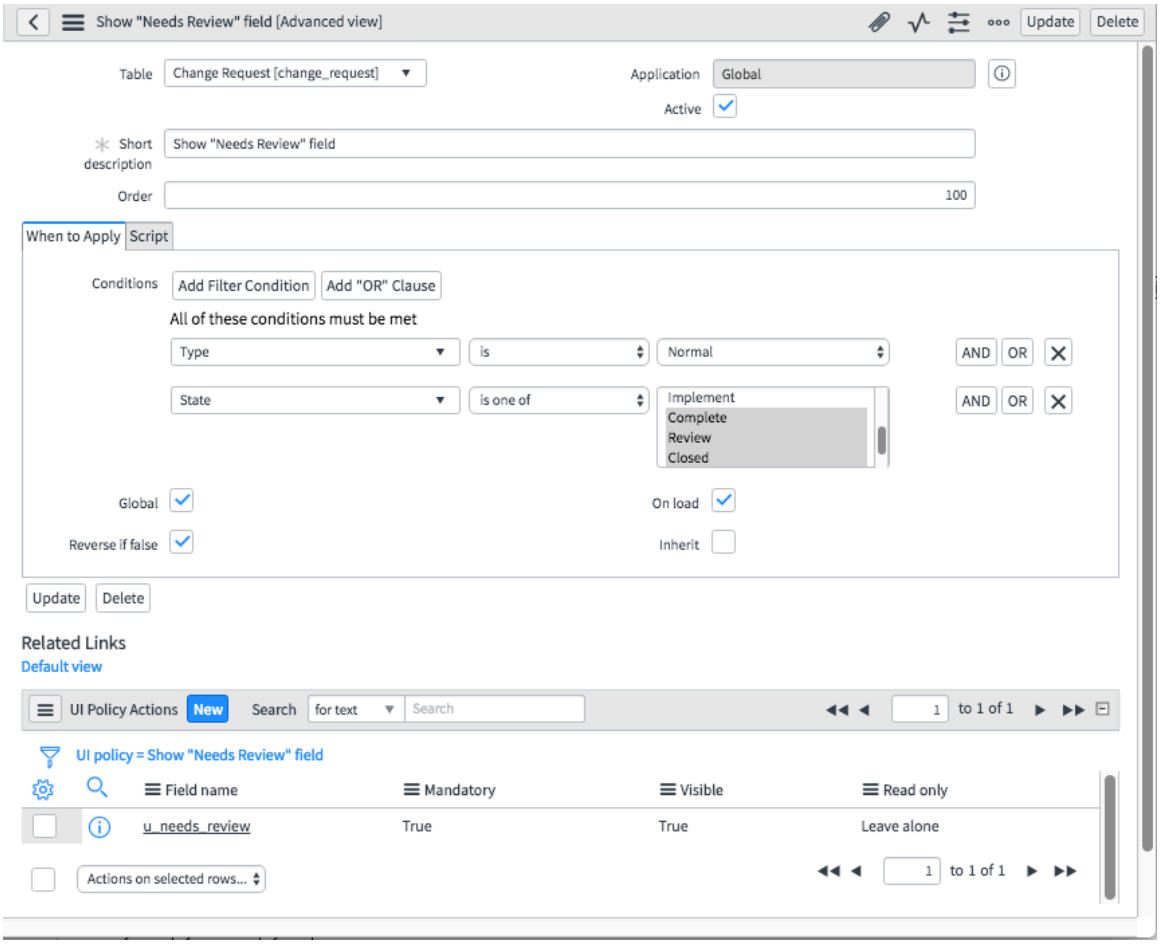
8. Click **Submit** to create the UI Policy action and return to the **UI Policy** form.




## Create an ACL

Create an access control rule (ACL) to prevent the **Needs review** field from being modified after it has been set.

### Before you begin

Role required: admin with elevated security

### About this task

The newly created UI Policy makes the **Needs review** field mandatory when a change request reaches the **Complete** state.

The subsequent configuration of the state model ensures that a value is required in the **Needs review** field before the change request can be saved in the **Complete** state. To prevent the **Needs review** value from being changed after it has been set, create a new access control level record (ACL) to make the field read-only.

### Procedure

1. Open the **Change Request** form.
2. Open the form context menu and select **Configure** > **Security Rules**.
3. Elevate your security role in the user menu that opens when you click your name in the header. Only administrators with elevated security roles can add ACLs.
4. Click **New**.

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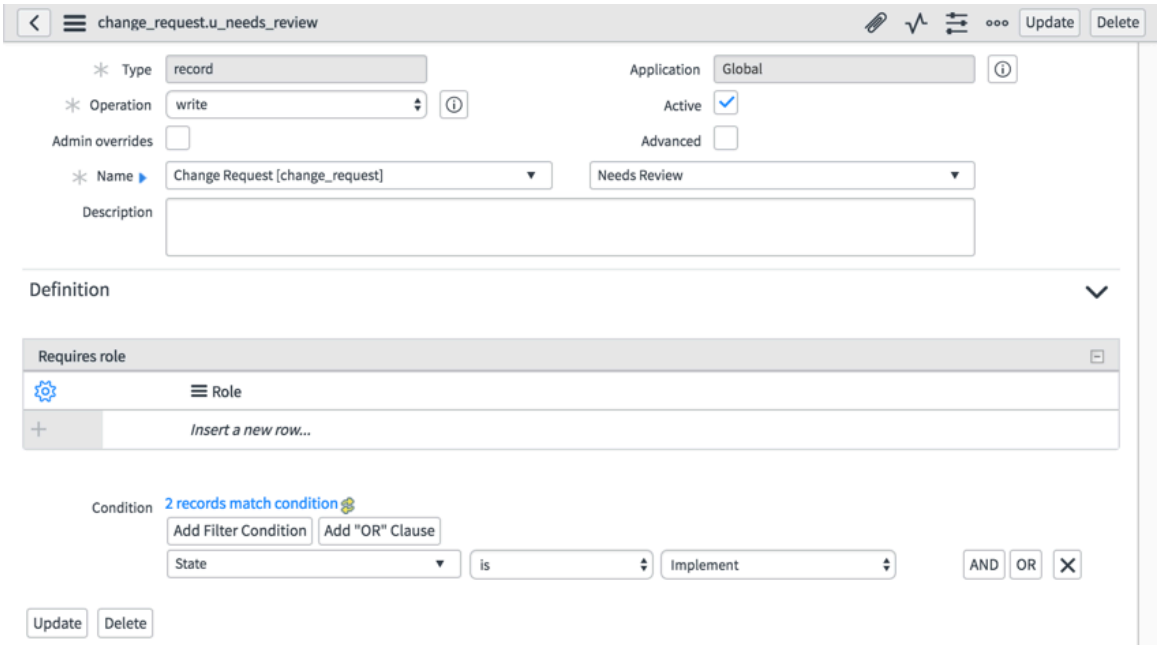
5. Enter the following values.

| Field | Value |
|---|---|
| Type | Record |
| Operation | Write |
| Name (first part) | Change Request |
| Name (second part) | Needs review |
| Condition | [State] [is] [Implement] |




6. Click **Submit**.

## Update the state handler script include

Update the *ChangeRequestStateHandler* script include with the new **Complete** state.

### Before you begin

Role required: admin

### About this task

The *ChangeRequestStateHandler* script include defines the states available for the Change Request state model.

### Procedure

1. Navigate to **All** > **System Definition** > **Script Includes**.
2. Open the *ChangeRequestStateHandler* script include and modify the script as follows.
   a. Add the following line to the top of the script in the **Constants** section:

```
ChangeRequestStateHandler.COMPLETE = "complete";
```

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**b.** Add the following line as the last line of the function in the *Initialize* function:

```
this.STATE_NAMES["-6"] = ChangeRequestStateHandler.COMPLETE;
```

```
1  var ChangeRequestStateHandler = Class.create();
2
3  // All references to statehandler constants should be through this class
   ChangeRequestStateHandler
4  ChangeRequestStateHandler.DRAFT = ChangeRequestStateHandlerSNC.DRAFT;
5  ChangeRequestStateHandler.ASSESS = ChangeRequestStateHandlerSNC.ASSESS;
6  ChangeRequestStateHandler.AUTHORIZE = ChangeRequestStateHandlerSNC.AUTHORIZE;
7  ChangeRequestStateHandler.SCHEDULED = ChangeRequestStateHandlerSNC.SCHEDULED;
8  ChangeRequestStateHandler.IMPLEMENT = ChangeRequestStateHandlerSNC.IMPLEMENT;
9  ChangeRequestStateHandler.REVIEW = ChangeRequestStateHandlerSNC.REVIEW;
10 ChangeRequestStateHandler.CLOSED = ChangeRequestStateHandlerSNC.CLOSED;
11 ChangeRequestStateHandler.CANCELED = ChangeRequestStateHandlerSNC.CANCELED;
12 ChangeRequestStateHandler.COMPLETE = "complete";
13
14 ChangeRequestStateHandler.prototype =
   Object.extendsObject(ChangeRequestStateHandlerSNC, {
15     initialize: function(changeRequestGr) {
16         ChangeRequestStateHandlerSNC.prototype.initialize.call(this,
   changeRequestGr);
17         this.STATE_NAMES["-6"] = ChangeRequestStateHandler.COMPLETE;
18     },
19
20     type: "ChangeRequestStateHandler"
21 });
```

3. Click **Update**.

### Update the state model script include

Update the *ChangeRequestStateModel_normal* script include to add new functions for the **Complete** state.

### Before you begin

Role required: admin

### About this task

You update the *ChangeRequestStateModel_normal* with the following configuration.

- Add new *canMove* and *moving* functions for the **Complete** state. These functions can return a value of **true** since there are no special conditions for or extra actions to perform when moving to the **Complete** state.
- Modify the definition of the existing object for the **Implement** state to ensure that the next state is **Complete**.
- Add an object for the **Complete** state, which defines **Review** and **Closed** as the next two states.

> **Note:**
> The *canMove* functions for the transition to these states from **Complete** checks the **Needs review** custom field to determine the correct next state.

### Procedure

1. Navigate to **All** > **System Definition** > **Script Includes**.
2. Open the *ChangeRequestStateModel_normal* script include and modify the script as follows.

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**a.** Add the following line at the end of the script include but before the line that starts with **type**:

```
toComplete_moving: function() {
              return true;
         },

         toComplete_canMove: function() {
               return true;
         },
```

```
218     canceled: {},
219
220     toComplete_moving: function() {
221         return true;
222     },
223
224     toComplete_canMove: function() {
225         return true;
226     },
227
228     type: "ChangeRequestStateModel_normal"
229 });
```

**b.** Modify the existing *implement* object to *toComplete*:

```
implement: {
            nextState: [ "complete" ],

            complete: {
                moving: function() {
                    return this.toComplete_moving();
                },

                canMove: function() {
                    return this.toComplete_canMove();
                }
            },

            canceled: {
                moving: function() {
                   return this.toCanceled_moving();
                },

                canMove: function() {
                   return this.toCanceled_canMove();
                }
            }
        },
```

**3.** Add the following new state object for *complete*.

```
complete: {
            nextState : [ "review", "closed" ],

            review : {
                  moving : function() {
                        return this.toReview_moving();
                  },

                  canMove : function() {
```

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```
                        if
(this._gr.getValue("u_needs_review") == "Yes")
                              return true;

                        return false;
                  }
            },

            closed : {
                  moving : function() {
                        return this.toClosed_moving();
                  },

                  canMove : function() {
                        if
(this._gr.getValue("u_needs_review") == "No")
                              return true;

                 return false;
                 }
            },

            canceled : {
                  moving : function() {
                        return this.toCanceled_moving();
                  },

                  canMove : function() {
                        return this.toCanceled_canMove();
                  }
            }
       },
```

4. Click **Update**.

### Create a UI action

Create a UI action to display a button on a change request for the **Complete** state.

## Before you begin

Role required: admin

## About this task

The UI action must contain a condition that uses the state model script include to decide when the **Complete** button is displayed on the Change Request form. In this case, the **Complete** button is displayed only when the change has reached the **Implement** state.

## Procedure

1. Open the **Change Request** form.
2. Open the form context menu and select **Configure** > **UI Actions**.
3. Locate and open the existing *Implement* UI action.
4. Open the form context menu and click **Insert and Stay** to create a duplicate record.
5. Modify the following fields with new values.

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| Field | Values |
| --- | --- |
| Name | Complete. |
| Action name | state_model_move_to_complete. |
| Hint | Progresses change to Complete state. |
| Onclick | `moveToComplete();`. |
| Condition | gs.hasRole('itil') && new ChangeRequestStateHandler(current).isNext("**complete**") |
| Script | Update function, state name, and state value.<br>`function moveToComplete(){`<br>`  var ga = new GlideAjax("ChangeRequestStateHandlerAjax");`<br>`ga.addParam("sysparm_name", "getStateValue");`<br>`ga.addParam("sysparm_state_name", "complete");`<br>`ga.getXMLAnswer(function(stateValue) {`<br>`g_form.setValue("state", stateValue);`<br>`  gsftSubmit(null, g_form.getFormElement(), "state_model_move_to_complete");`<br>`}); }`<br>`if (typeof window == 'undefined')`<br>`setRedirect();`<br>`function setRedirect() {`<br>`current.update();`<br>`action.setRedirectURL(current);`<br>`}`<br>. |

6. Click **Update**.

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### Create a process flow record

Create and add a process flow record for the **Complete** state. The process flow formatter displays at the top of the Change Request form.

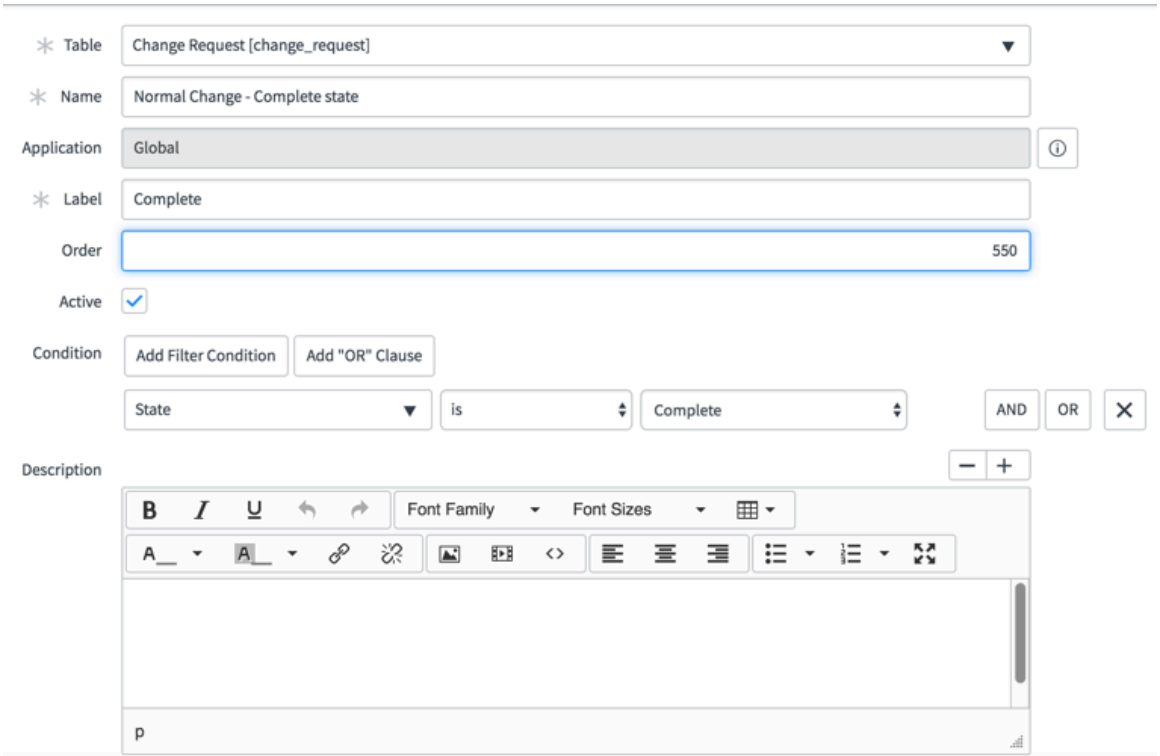
## Before you begin

Role required: admin

## Procedure

1. Navigate to **All** > **System UI** > **Process Flow**.
2. Open the **Normal Change – Implement state** record.
3. Open the form context menu and click **Insert and Stay** to create a duplicate record.
4. Modify the following fields with new values.

| Field | Values |
|---|---|
| Name | Normal Change – Complete State |
| Label | Complete |
| Order | 550 |
| Condition | [State] [is] [Complete] |




5. Click **Update**.

### Update the change request workflow

Update the change request workflow to reflect the addition of the **Complete** state.

## Before you begin

Role required: admin

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### About this task

The Change Request – Normal workflow for the **Normal** type change request must be updated to progress the change request to **Complete** instead of **Review**.

In case of a change request of type **Normal**, in the **Assess** state, any user from the **Assignment group** can approve the change request. When the value of **Risk** is **Moderate** or **High**, a CAB approval is initiated in the **Authorization** state. In case the **Risk** is **Low**, an approval from the CAB team is not required. Instead, the manager of the assignment group can approve the change request.

**Note:**
If the manager of the assignment group also happens to be the user who had approved the change request in the **Assess** state, the **Authorize** state is skipped and the state of the change request is set to **Scheduled**.

The functionality is available only for the new customers.

### Procedure

1. Navigate to **All** > **Workflow** > **Workflow Editor**.
2. Select **Change Request – Normal** from the list of workflows.
3. Select the **Checkout** option from the **Context** menu to create a new version of this workflow.
4. Open the **Set Values** activity that transitions to the **End** activity and modify the following fields.

| Field | Value |
|---|---|
| Name | Move to Complete |
| Set these values | State = Complete |

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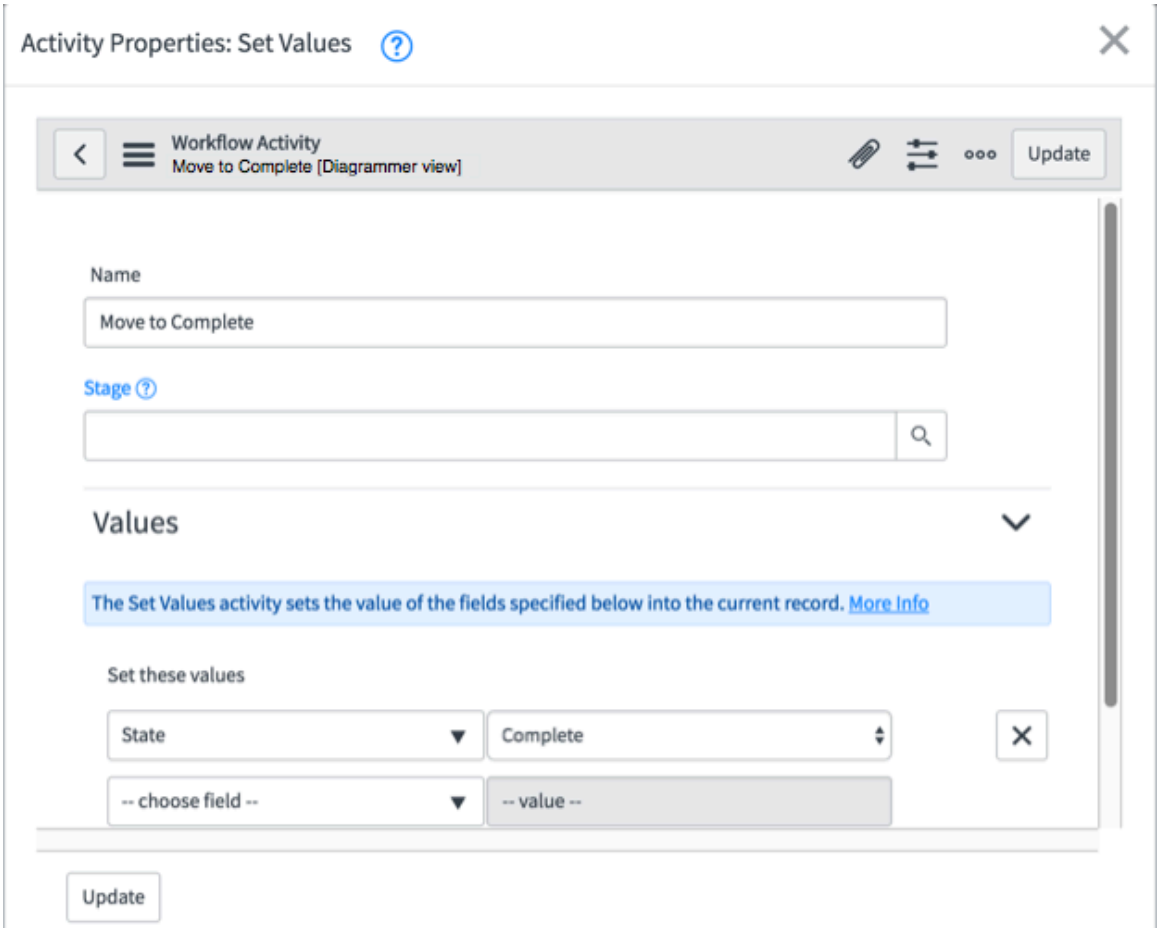


5. Click **Update**.
6. Open the **Wait for conditions** activity that transitions to the End activity and modify the following fields.

| Field | Value |
|---|---|
| Name | Change moves to Complete |
| Set these values | [State] [is] [Complete] |

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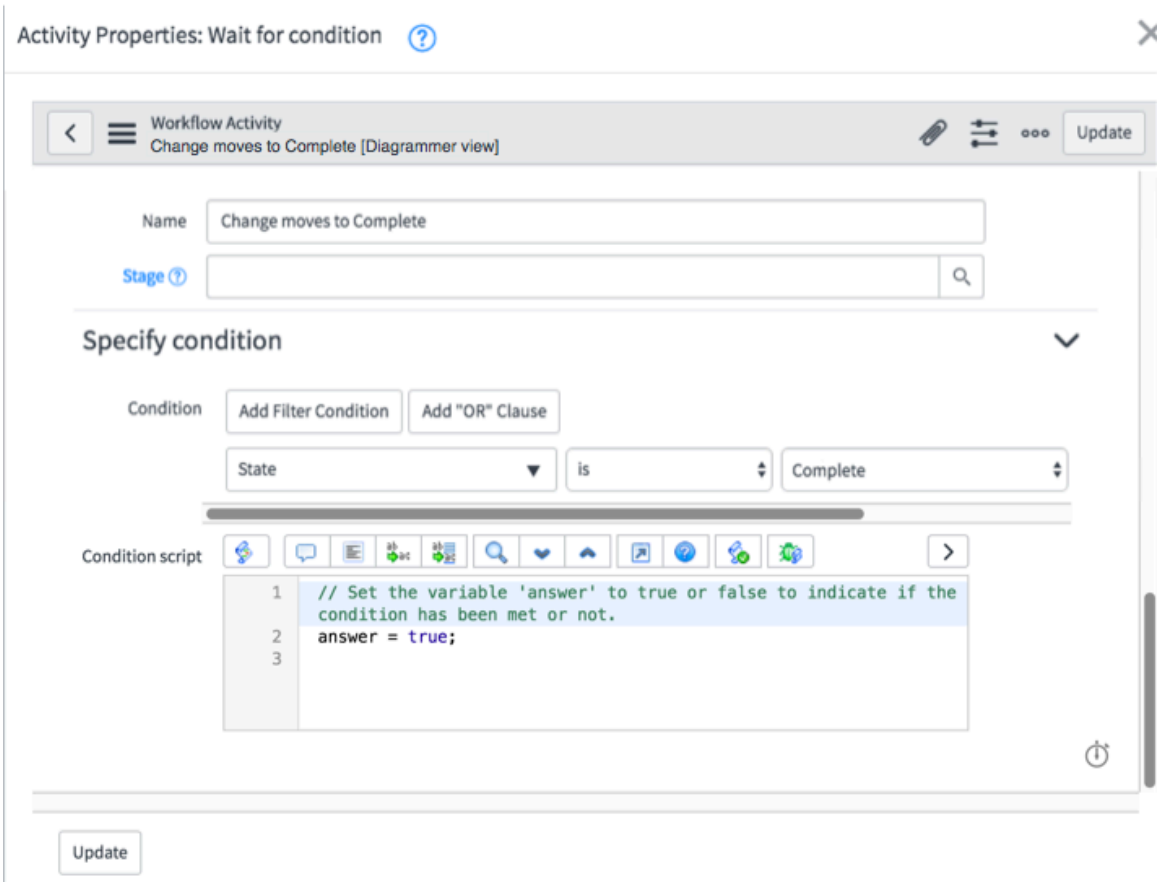


7. Click **Update**.
8. Open the Workflow Actions menu and click **Publish**.

### Create a new choice

Create a new choice for the change request state.

## Before you begin

Role required: admin

## Procedure

1. Open the **Change Request** form.
2. Right-click the **State** field label and select **Configure Choices**.
   The Configuring State Choices slushbucket opens.
3. Enter the following information and click **Add**.

| Field | Description |
|---|---|
| New item text | Enter Complete. |
| Numeric value | Enter -6. |
| Apply to table | Set to Change Request |

   The new state appears in the **Selected** slushbucket on the form.
4. Use the up and down arrows to move the new state between **Implement** and **Review** states.

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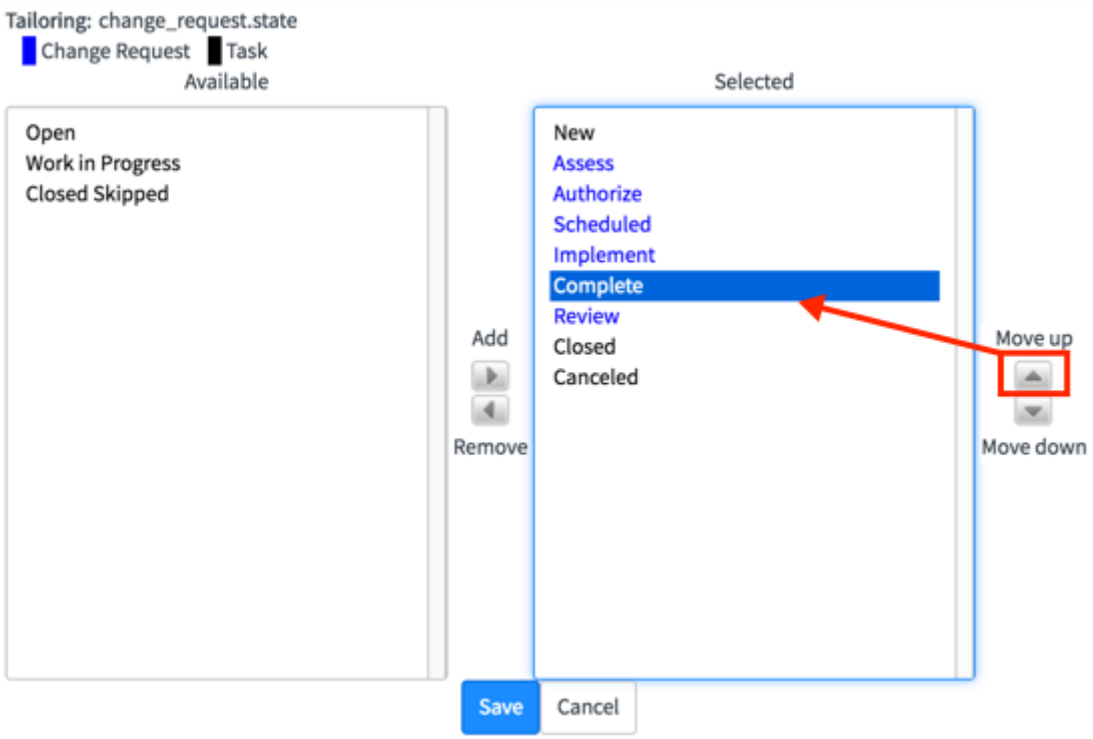


5. Click **Save**.
   The new choice is created and the **Change Request** form reopens.

## Change Management workflows

The Change Management processes for a change request are controlled by workflows defined for a specific change request type. You can use the flow designer to modify one of the default workflows, or to create additional change request workflows.

By default, six change request workflows are provided.

### Default change workflows

| Workflow | Description |
|---|---|
| Change Request - Emergency | The workflow process that an emergency change request follows. |
| Change Request - Emergency change tasks | The child workflow process that handles the creation and management of the change tasks for the emergency change request workflow. |
| Change Request - Normal | The workflow process that a normal change request follow. |
| Change Request - Normal change tasks | The child workflow process that handles the creation and management of the change tasks for the normal change request workflow. |
| Change Request - Standard | The workflow process that a standard change request follow. |

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**Default change workflows (continued)**

| Workflow | Description |
|---|---|
| Change Request - Standard change tasks | The child workflow process that handles the creation and management of the change tasks for the standard change request workflow. |

## Change flows

The Change Management Change flows provide a library of reusable actions and end-to-end implementations of the Change models provided in the base system.

You can use ServiceNow® Flow Designer to create, operate, and troubleshoot flows. Flow Designer is a single interface that provides:

- Natural language descriptions.
- Runtime information.
- Consolidated configuration.

The provided flows are read-only to ensure that they can be upgraded. To change the behaviour of these flows, make a copy of the read-only flow, and contact Support to deactivate the read-only flow. Deactivating the read-only flow ensures that the copied flow is the only version that is triggered.

If you need to activate the change flows in the base system, you must contact the support to log a case to activate the change flows.

By default, these Change flows are provided:

**Default Change flows**

| Flow | Description |
|---|---|
| Change - Cloud Infrastructure - Authorize | Process cloud infrastructure changes for approvals. |
| Change - Emergency - Authorize | Process an emergency change that is in authorize state and is not on hold. |
| Change - Emergency - Implement | Process an emergency change that is in the implement state. |
| Change - Emergency - Review | Process an emergency change in the review state. |
| Change - Implementation tasks | Process to create implementation and post implementation change tasks for change request and wait until completion. |
| Change - Normal - Assess | Process a normal change that is in the assess state and is not on hold. |
| Change - Normal - Authorize | Process a normal change that is in the authorize state and is not on hold. |
| Change - Normal - Implement | Process a normal change that is in the implement state. |
| Change - Standard | Process a standard change. |

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### Default Change flows (continued)

| Flow | Description |
|---|---|
| Change - Standard - Implement | Process a standard change that is in the implement state. |
| Change - Unauthorized - Authorize | Process an unauthorized change for approvals. |

### Change Management Flow Designer actions

Use Flow Designer actions as building blocks to handle the Change models and types. The flow actions are available under the ITSM spoke in Flow Designer.

### Change Management flow actions

| Action | Description |
|---|---|
| Apply Change Approval Policy | Controls the approval process for a change request by creating user and group approvals according to a change approval policy record. Multiple actions can be used in a flow, where each action references the same or different Change approval policies. |
| Cancel Change Tasks from Flow | Cancels all related pending and open change tasks that are created from a flow. |
| Check Change for User Approval | Checks if the specified user has already approved the change request. |
| Disregard change approvals | Sets all related pending approvals to no longer required. |
| Evaluate Change Model | Evaluates the Change Model associated with this change request against the current state of the Change Request.<br><br>Evaluating the change model evaluates all applicable conditions, determines if the state should be changed and changes it if one matches. |

# Coaching

Use ServiceNow® Coaching to monitor your teams' performance and coach your employees to improve their skill set.

Review and assess the quality of your teams' completed interactions and tasks. Based on these assessments, you can assign course items for your teams. When they complete the training, the skills associated with it get added to their skills set.

This 26-minute podcast includes a discussion of the Coaching application, the coaching process, virtual coaching, and building coaching into a workflow.

Podcast discussion of the Coaching application, the coaching process, and how the application can be used in an organization

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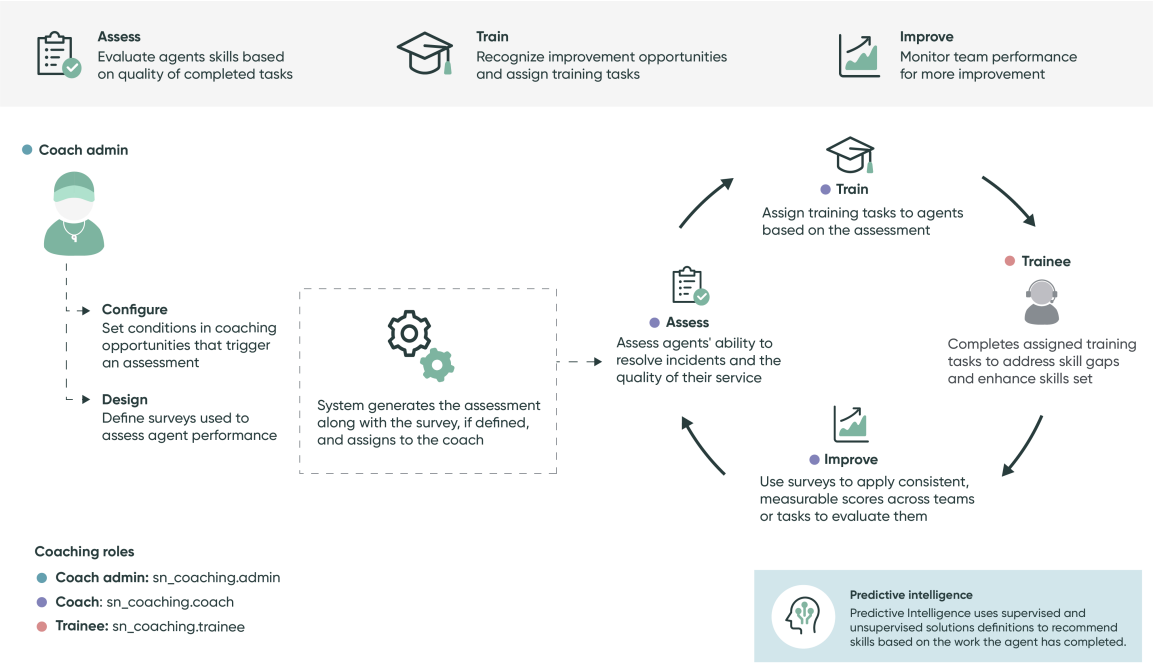
## Get started with Coaching

The image shows a high-level workflow on how coaching admins set up Coaching, and how managers and agents use Coaching.

**Note:**
You can use Predictive Intelligence when you use Coaching with Workforce Optimization for ITSM.




## Coaching terminology

| Terminology | Description |
|---|---|
| Coaching assessment | Assessments allow you to evaluate an agent and then assign training and skills based on the evaluation. An assessment can be generated automatically from a coaching opportunity based on conditions set in the opportunity. As assessment can also be generated manually. |
| Coaching opportunity | A critical moment in a process that generates an assessment based on set conditions. A coaching opportunity can be generated at any time during the life cycle of any task record such as incident, problem, change request, or request items. |
| Virtual coach | A record that can be associated with a coaching opportunity that automatically completes tasks associated with an assessment. |
| Coaching survey | A survey associated with a coaching assessment that lets coaches provide feedback on the agents' completed work and lets agents provide feedback on the coaching effectiveness. |

## Coaching assessments

You can create coaching assessments manually and associate it with a task record or generate them automatically using coaching opportunities. When the trigger conditions set in a coaching opportunity are met, an assessment is automatically generated and automatically assigned to

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the trainee's coach to assess the context in which the assessment was triggered. For example, you can set conditions in the coaching opportunity to create a coaching assessment when an employee does not write clear work notes when they escalate an incident. The coach can evaluate the employee using the assessment and add learning tasks to train them to write better work notes.

After you create coaching assessments manually or automatically, you can do any of the following:

- Award skills
- Assign learning tasks
- Associate coaching surveys to the assessment

**Note:**
You can automate these tasks using a virtual coach that's associated with the coaching opportunity.

**Awarding skills**: After the coach completes an assessment, they can award skills that's related to the assessment to the trainee.

**Assigning learning tasks**: Coaching assessments can have learning tasks associated with it to train the agent based on the assessment. When the agent completes the training, the skills associated with the learning tasks are added to the agent's skills set. For example, if the agent resolved an escalation that required router skills and if the agent does not have that skill, then the learning tasks can include training for router skills. After the agent completes the training, the router skills is added to the agent's skill set. Next time when an incident that requires router skills is assigned to the agent, they will be able to successfully resolve the incident.

**Setting up coaching surveys**: Coaching surveys can be associated with a coaching assessment. When the coach completes the coaching assessment, a survey can be triggered. Coaching surveys let coaches provide feedback on the ability of the agents' to resolve incidents or the quality of their completed tasks. Trainee surveys let agents provide feedback on the coaching effectiveness.

- **Survey for the coach** is taken by the coach where the coach can provide feedback to rate the trainee. For example, did the trainee demonstrate the knowledge and technical competence required?
- **Survey for the trainee** is taken by the agent where the agent can provide feedback to rate the coach. For example, were the learning tasks assigned to the agent useful in building skills?

## Coaching opportunity

A coaching opportunity is a critical moment in a process where coaching assessments get triggered based on conditions set in the coaching opportunity record. A coaching opportunity can be generated at any time during the life cycle of any task record such as incident, problem, change request, or request items. For example, you can set conditions to trigger a coaching opportunity when an incident reassigned or escalated. For examples on identifying coaching opportunities, see Identifying coaching opportunities.

You can do the following in a coaching opportunity record:

- Set trigger conditions.
- Associate skills, learning tasks, or surveys with the coaching opportunity. These items get automatically associated with the assessment that is associated with the opportunity.
- Define a virtual coach. When an assessment is automatically created from an opportunity, and if a virtual coach record is associated with it, then the assessment will automatically be moved to closed, complete state. It will also automatically award skills and any learning tasks

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associated with the assessment to the trainee. The surveys associated with the opportunity will be assigned to the coaches or trainee as well.

**Note:**

- All virtual coach records will have a coaching opportunity associated with it but not all coaching opportunities will have an associated virtual coach record.
- A virtual coach cannot be associated a manually generated assessment.

For information on virtual coach, see Identify and add course items for a virtual coach.

## Example of assessment triggers

| Did the coaching opportunity trigger an assessment? | Is a virtual coach associated with the coaching opportunity and are the conditions set met? | Result |
|---|---|---|
| Yes | Yes | Because a virtual coach is associated with the coaching opportunity, it completes the following tasks automatically:<br>• Award skills<br>• Assign learning tasks<br>• Associate coaching surveys to the assessment |
| Yes | No | Because a virtual coach is not associated with the coaching opportunity, you must complete the following tasks manually:<br>• Award skills<br>• Assign learning tasks<br>• Associate coaching surveys to the assessment |
| No | No | You can create a manual assessment and complete the following tasks manually:<br>• Award skills<br>• Assign learning tasks<br>• Associate coaching surveys to the assessment |

You can use Coaching for any task-based process for such as Change Management, Customer Service Management or Incident Management to set up Coaching. You can also use Coaching for a non-task or custom table source by configuring a business rule.

To gain a general understanding of the application and how it is used, see Coaching overview.

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# Request Coaching

The Coaching (com.sn_coaching) plugin requires a separate subscription and must be activated by ServiceNow personnel.

### Before you begin

Role required: admin

### About this task

Visit the ServiceNow Store website to view all the available apps and for information about submitting requests to the store. For cumulative release notes information for all released apps, see the ServiceNow Store version history release notes.

**Coaching plugins**

| Plugin | Description |
|---|---|
| Coaching<br><br>(com.sn_coaching) | Activates the Coaching application. This plugin includes demo data and activates related plugins if they are not already active. The Coaching application is available with the ITSM Professional subscription only. Please contact your account manager for more information. |
| Coaching with Learning (sn_coach_lrn)<br><br>**Note:**<br>This is a ServiceNow Store plugin. You must install this plugin separately from the ServiceNow Store. | Activates the Coaching with Learning application and enables you to integrate the Learning module with the Coaching application. |

### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.

3. Select **Install** to start the installation process.

   **Note:**
   When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears:
   `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

   You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

# Coaching roles

Assign Coaching roles to specify what different users can see and do.

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| Role | Description | Roles inherited |
|---|---|---|
| sn_coaching.trainee<br><br>[Coaching trainee] | Able to view coaching assessments to which they belong.<br><br>Able to add work notes in a coaching assessment by clicking **Review Assessments**. | • skill_user<br>• survey_reader<br>• pa_viewer |
| sn_coaching.coach<br><br>[Coaching coach] | Able to read and write coaching assessments assigned to the coach group to which they belong.<br><br>Able to assign a training and virtual coaches to a coaching opportunity.<br><br>**Note:** The Coaching coach is not able to create a new coaching opportunity. | • sn_coaching.trainee<br>• pa_viewer<br>• sn_lc.catalog_manager |
| sn_coaching.admin<br><br>[Coaching admin] | Able to perform all functions. | • sn_coaching.coach<br>• survey_admin<br>• sn_cim_improvement_requester<br>• sn_lc.learning_admin |
| Learning catalog group manager [sn_lc.catalog_group_manager] | Grants administrative rights to create, read, or update learning libraries based on groups. | • sn_lc.task_creator<br>• sn_lc.content_writer |

## Coaching overview

After you enable Coaching, you can set up roles and groups, define coaching opportunities, create training material, and start assessing and coaching employees. The Coach and Trainee dashboards provide useful overviews to manage and measure results.

**Note:**
For detailed information on how to get started with Coaching, see Coaching and the Coaching demo.

### Initial Coaching setup

Once you have enabled Coaching, set up the application by assigning user roles, configuring coaching opportunities and creating training content.

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1. Set up Coaching roles and groups
2. Define trigger conditions for a coaching opportunity
3. Identify learning content and a virtual coach
4. Set up surveys

## Workflow of Coaching roles

An employee with the Coaching trainee role is in need of coaching at a critical moment in a process.

An administrator with the Coaching admin role is in charge of setting up coaching opportunities, learning content, virtual coaches, and surveys used in the coaching process.

A manager, or coach, with the Coaching coach role is a subject matter expert of a process and is responsible for providing coaching to an employee, or trainee.

## Coaching dashboards

Use Coaching dashboards to manage and measure results in a simplified view.

- Coaching Dashboard
- Trainee Dashboard

## Identifying coaching opportunities

Coaching opportunities can be found in many tasks that occur throughout your environment.

- Writing better work notes when service desk escalates incidents to a second level.
- Correctly setting affected configuration items when the service desk works on incidents.
- Using the correct naming convention for admin in update sets.
- Coaching during the onboarding and the warranty period of a new application.
- Correctly reassigning a case to another user with pertinent information in comments.
- Engaging a user on closed records when non-positive feedback is received through surveys.
- Spot-checking a user on quality control.
- Helping to guide project managers in projects.
- Improving knowledge article quality when knowledge articles are attached to resolved incidents.

## Common ITSM assessment triggers

You can define activities that occur when trainees work through an ITSM process, such as resolving an incident, as assessment triggers.

| Table | Assessment triggers |
|---|---|
| Incident | Moment of first response |
| | Categorization and prioritization |
| | Reassignment |
| | Proposal of solution to the customer |

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| Table | Assessment triggers |
|---|---|
| Problem | Definition of the Problem statement |
| | Writing the Known Error |
| | Writing the Workaround |
| | Root Cause analysis |
| | Root Cause confirmation |
| | How can this issue be avoided? |
| Change | Categorization and prioritization |
| | Implementation description |
| | Risk analysis |
| | Impact analysis |
| | Approval |
| | Implementation |
| | Post implementation review |

## Integration with other applications

Coaching opportunities, coaching assessments, and assigned training in Coaching are integrated with these applications.

- Continual Improvement Management

  One example of a coaching opportunity with CIM would be to use improvement initiatives to set up external training tasks.

  **Note:**
  The Continual Improvement Management (com.sn_cim) plugin must be active to create an improvement initiative. Continual Improvement Management requires a separate subscription and must be activated by ServiceNow personnel.

- Skills Management

  In a coaching assessment, you can assess trainee skills to identify gaps so the trainee can be coached to acquire new skills or to enhance their existing skill level.

- Knowledge management

  You can assign knowledge articles as assigned training.

## Domain separation and Coaching

Domain separation is supported in Coaching. Domain separation enables you to separate data, processes, and administrative tasks into logical groupings called domains. You can control several aspects of this separation, including which users can see and access data.

## Support level: Basic

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- Business logic: Ensure that data goes into the proper domain for the application's service provider use cases.
- The application supports domain separation at run time. The domain separation includes separation from the user interface, cache keys, reporting, rollups, and aggregations.
- The owner of the instance must set up the application to function across multiple tenants.

Sample use case: When a service provider (SP) uses chat to respond to a tenant-customer's message, the customer must be able to see the SP's response.

For more information on support levels, see Application support for domain separation.

## Domain Separation Overview

All tables including Coaching Opportunity, Coaching Assessment, Virtual Coach, and Trainings support domain separation so the coach and Coaching admin can view records within the (tenant) domain to which they belong.

## How domain separation works in Coaching

Domain separation is supported in Coaching with no setup or configuration required. You can create coaching opportunities and coaching assessments in separate domains, including the global domain.

Coaching assessments extend the platform Task [task] table.

When domain separation is implemented, coach and trainee users can view coaching assessments and trainings only in the domain assigned. The **Domain** and **Domain Path** columns are available for coaching opportunities, coaching assessments, virtual coaching, and trainings provided with the base system.

The **Domain** column contains the name of the domain to which the event or alert belongs, and the **Domain Path** column contains the unique domain identifier.

**Note:**
If the domain column is not shown, click the **Update Personalized List** icon and add the required column. You can also add the domain path column, if desired.

## Domain-separated tables

- Coaching Assessment [sn_coaching_assessment]
- Coaching Opportunity [sn_coaching_opportunity]
- Trainings [sn_coaching_recommendation]
- Assigned Training [sn_coaching_assessment_recommended_learning]
- Assigned Training [sn_coaching_opportunity_recommended_learning]
- Virtual Coach [sn_coaching_opportunity_virtual_coach_m2m]
- Virtual Coaching [sn_coaching_virtual_coach]

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### Use cases

- A Coaching admin that belongs to a parent domain creates a coaching opportunity at a parent domain level or at a child domain level. Coaching opportunities created at a parent level are available to view in all domains.
- A Coaching admin has access to multiple domains but wants to update content in a record within a specific domain. The domain specified in the record drives the functionality of that record and reference fields.
- A Coaching user that belongs to the Acme domain can view the coaching assessment task created in the Acme domain.
- A Coaching user wants to associate an assigned training for an integrated application in the Acme domain. The user must belong to the domain of the integrated application from which a record is associated.
- The trainee user of a parent domain can view a coaching assessment of the parent as well as of all child domains of that parent. A trainee user must belong to the Acme domain, its parent domain, or the global domain to view that coaching assessment.

**Related topics**

Domain separation for service providers

## Setting up Coaching and surveys

To take full advantage of Coaching, configure the Coaching application and set up surveys.

### Setting up Coaching

Configure Coaching to start assessing and coaching trainees.

1. Set up Coaching roles and groups to identify Coaching users, coaches, and admins.
2. Define an assessment trigger on the Coaching Opportunity form.
3. Identify training content that is provided as part of a training or virtual coaching.
4. Configure virtual coaches to add to a coaching opportunity.
5. Set up surveys to provide feedback on the coaching experience so you can make improvements.

### Setting up surveys

You can obtain feedback for both the coach and the trainee by creating surveys that are accessed from a Coaching Assessment form that has been resolved or closed.

- Survey taken by trainee to provide feedback on the coach
- Survey taken by coach to provide feedback on the trainee

Access the Survey designer for Coaching by navigating to **Survey** > **Survey Designer**.

Access the Coaching Survey definitions by navigating to **Coaching** > **Coaching Surveys**.

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## Coaching Properties

### Properties

| Property | Description |
| --- | --- |
| sn_coaching.kb_article_duration | Number of days to read the knowledge article. The admin (sn_wfo.admin) sets the number of days for the trainee to complete reading the article. The number of days is converted to the due date for the trainee to complete the training. It is calculated from the current date taking the trainee's time zone into consideration.<br>• **Type:**Integer<br>• **Default value:**5 |
| sn_coaching.exclude_weekends_on_training_due_date | Excludes weekends when the due date is set for trainees to complete training.<br>• **Type:**true \| false<br>• **Default value:**true |

## Define trigger conditions for a coaching opportunity

Use the Coaching Opportunity form to define a critical moment in a process on which a user can be coached. A coaching opportunity consists of the relationship between a process that can be improved, and coaches and trainees.

### Before you begin

Role required: sn_coaching.admin

### About this task

When the triggered conditions defined in a coaching opportunity are met, an assessment for that trainee is generated. The coaching assessment is then assigned to a coach for training, or is completed using automated virtual learning content.

### Procedure

1. Create a coaching opportunity using the guided setup or by using the application navigator.
2. Click **New**.
3. Fill in the fields on the Coaching Opportunity form.
   a. Select the table that contains the field for coaching in the **Table** field.
   b. Select the **Trainee field** from the source table.
   c. To limit the trainees for which a coaching assessment is generated, select a specific **Trainee group**.

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d. Select a coach or a group of coaches to assess and provide feedback to trainee assessments generated from this coaching opportunity.
   - To select a coach group, from the **Coach group** field, select the group of coaches.
   - To select the assignment group manager as the coach for the selected task record, enable the **Specify coach user** check box and select the coach user from the selected table.

e. Add the condition for the critical moment in the **Trigger** fields.
   See Common ITSM assessment triggers for examples.

4. Fill in the fields in the **Snapshot Settings** tab.

   a. Select the **Snapshot fields** that contain the values to capture in the coaching assessment when an assessment is triggered.

   b. To use an advanced script, select the **Advanced** check box and add your script.
      See Scripts for more information on scripting.

5. Fill in the fields in the **Frequency** tab.

   a. To limit the number of coaching assessments generated, set the **Random sample (%)** to a percentage of the total number.
      If you reduce the random sample size, you can prevent certain trainees from being excluded by specifying **Users who should be coached on every opportunity**. For example, you may want new employees to be coached every time.

   b. Specify the **Assessment duration** after which the coaching assessment is set to **Closed Complete** state.
      You can disable automatic closure behavior by deactivating the *`Close assessments after expiration`* scheduled job.

   c. To **Prevent duplicate assessments** from being created for a trainee for the same coaching opportunity within a certain time period, select the check box.
      Specify the **Time period** within which duplicate assessments are not created.

6. Fill in the fields in the **Surveys** tab.

   a. To select feedback surveys taken by trainees and coaches when the coaching assessment is in **Resolved** state, select a **Survey taken by Coach** and a **Survey taken by Trainee**.

7. Fill in the fields in the **Related KPIs** tab.

   a. Select the primary KPI improved by the coaching opportunity in the **Improvement KPI** field.

   b. Select the **Strategic objective** affected by the coaching opportunity in the **Strategic objective** field.

      **Note:**
      You can set strategic objectives by navigating to **Continual Improvement** > **Strategy Objectives**.

      You can add assigned trainings and virtual coach items to the related lists, if applicable, to complete the coaching opportunity.

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## Example: Coaching admin defines a trigger condition

### Coaching Opportunity form

| Field | Value |
|---|---|
| Number | COP0000109 |
| Name | Incident Process: Coaching on Incident Reassignment |
| Description | Coach a user on the reassignment process of an incident, including adding comments, CI, and category. |
| Table | Incident [incident] |
| Trainee | Assigned to |
| Trainee group | Trainee group |
| Coach group | Coach Group |
| Active | Selected |
| Trigger | Option: Assigned to |
| | Operator: changes |

### Coaching Opportunity tabs

| Field | Value |
|---|---|
| Frequency | |
| Random sample (%) | 100 |
| Assessment duration | 5 days |
| Surveys | |
| Survey taken by Coach | Trainee Assessment Survey (provided by coach) |
| Survey taken by Trainee | Coach Effectiveness Survey (provided by trainee) |
| Related KPIs | |
| Improvement KPI | Number of reassigned open incidents |
| Strategic objective | Retrofit Staffing to include more global logistics |
| Snapshot Settings | |
| Snapshot fields | Resolution code, Resolution notes, Work notes |

**Related topics**

Coaching field descriptions

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## Identify and add course items for a virtual coach

Define filters and add course items for automated virtual coaching. When a coaching assessment is triggered, the course items are automatically attached to the assessment.

### Before you begin

Role required: sn_coaching.admin

### About this task

Typical assigned course item content includes micro trainings, best practices, tips, knowledge articles, videos, and community links.

### Procedure

1. Navigate to **Coaching** > **Virtual Coach** > **All** and click **New** to create a record.
2. Fill in the fields on the form.

| Field | Description |
|---|---|
| Table | The table from which a coaching opportunity is generating assessments. |
| Course Items | Course items you want to associate with the virtual coaching record. This could include a message, a link, a video, or source code.<br><br>**Note:**<br>The course items are automatically attached to the coaching assessment when the conditions in the virtual coaching record are met.<br><br>You can also access course items by navigating to **Coaching** > **Course items**. |
| Advanced | Enable to set advanced conditions.<br><br>See Scripts for more information on scripting. |
| Condition | Set filter conditions that trigger virtual coaching. |
| Autofill fields | Set one or more fields and the value for each value that you want to automatically populate. |

## Example: Coaching admin sets up learning content

### Virtual Coaching form

| Field | Description |
|---|---|
| Number | CVC0000106 |
| Short Description | Virtual Coach for the Incident Process |
| Table | Incident [Incident] |
| Course Items | Core Java |
| Active | Selected |

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**Virtual Coaching form (continued)**

| Field | Description |
|---|---|
| Advanced | Cleared |
| Condition | • Assigned to changes<br>• Configuration item is empty |
| Autofill fields | • State Resolved<br>• Performance rating N/A |

**Training form**

| Field | Value |
|---|---|
| Number | CR0000106 |
| Title | Increase customer satisfaction by solving issues faster |
| Active | Selected |
| Category | Customer Experience |
| Content | Watch this video to increase customer satisfaction by solving issues faster. |

**Related topics**

Coaching field descriptions

## Create a survey and associate with a Coaching opportunity

Create a survey for coaches or trainees to assess the training quality. Add a question bank to the survey. Associate the survey with a coaching opportunity to provide feedback when the coach completes the coaching assessment.

### Before you begin

Role required: sn_coaching.admin

### Procedure

1. Create a survey to associate with a coaching opportunity.

> **Note:**
> If you already have a survey that you want to associate with a coaching opportunity, go to the Associate a survey with a coaching opportunity step.

   a. Navigate to **All** > **Coaching** > **Administration** > **Survey Designer**.
   b. In the **Name** field, enter the name for the coaching survey.
   c. Select the **Configuration** tab.
   d. In the **Survey Owners** field, select **Coaching Admin**.
   e. In the **Description** field, enter a description for the survey.

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f. In the **Source table** field, select Coaching Assessment [sn_coaching_assessment].

g. In the **Duration** field, enter the length of time recipients are given to complete the survey.

h. Select **Save**.
For more information on configuring a survey, see Survey Designer Configuration form.

2. Create a question bank for the survey.

a. Navigate to **All** > **Surveys** > **Question Bank**.

b. In the **Assessment Metric Categories** list, click **New.**

c. In the **Name** field, enter a name for the question bank and then right-click the form header and select **Save**.

d. In the Assessment Metrics related list, click **New**.

e. In the Survey Question form, enter the name, question, and data type, and select **Submit**.
For more information on creating or updating a question bank, see Survey questions.

3. Associate the question bank with the survey.

a. Navigate to **All** > **Coaching** > **Administration** > **Coaching Surveys**.

b. In the Assessment Metric Types list, select the survey you've created.

c. In the Metric Categories related list, select **New Category from Bank**.

d. Select the question bank you've created and select **Add selected**.

e. Select **Update**.

4. Associate a survey with a coaching opportunity.

a. Navigate to **All** > **Coaching** > **Coaching Opportunities**.

b. Select the Surveys related list.

c. Do any of the following:

- To add a survey to be taken by the coach, in the **Survey taken by Coach** field, using the search icon select the survey.
- To add a survey to be taken by the trainee, in the **Survey taken by Trainee** field, using the search icon select the survey.

For more information on the coaching opportunities, see Define trigger conditions for a coaching opportunity.

## Coaching your trainee

A manager, or coach, is a subject matter expert of a process and is responsible for providing coaching to an employee, or trainee. Use the Coach Dashboard to manage and measure the effectiveness of your coaching.

You can access the Coaching Dashboard from the Coaching navigation menu, or directly from the dashboard list. Click a report to view the detailed data.

### Note:

- You must have the Coaching coach role to view the Coach Dashboard.
- The Coach Dashboard page uses the Next Experience user interface. For more information on Next Experience, see Next Experience UI.

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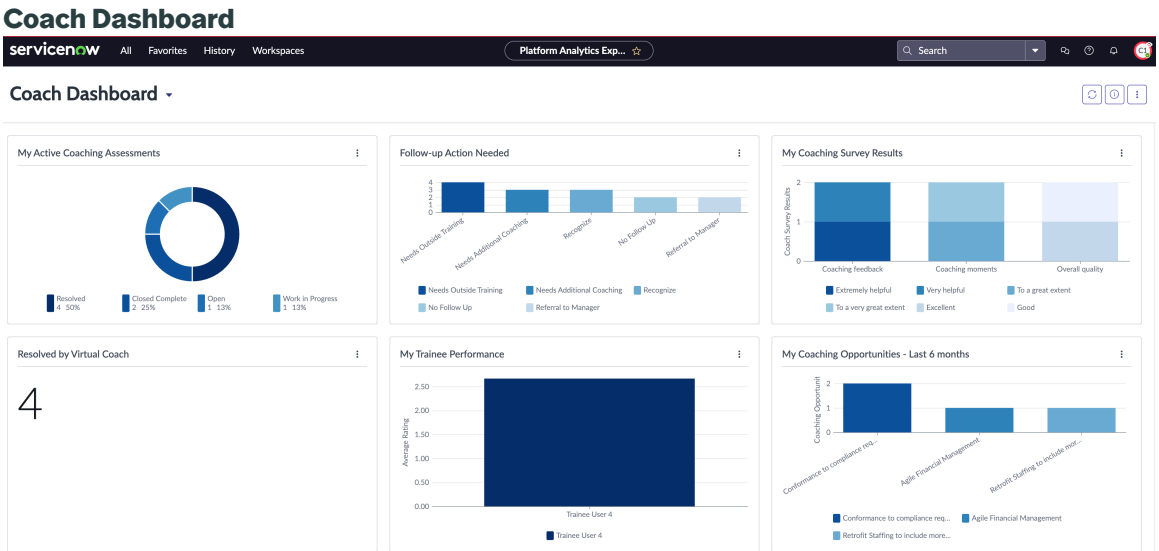
Coaching begins once a trainee assessment has been assigned to you. Coaching assessments are triggered from a coaching opportunity that is set up by the coaching admin. Use coaching assessments to facilitate a dialog with your trainee, assign training content, and set a due date and other details.

The Coach Dashboard lets you manage the details and effect your coaching has on your trainees.

- Check the progress state of your coaching assessments.
- Analyze the number and types of follow-up actions necessary on your resolved coaching assessments.
- View the types of survey feedback from your trainees.
- View the number of your assessments that were resolved by the virtual coach.
- Check the performance rating of your trainees from your coaching.
- View the list of KPIs affected by your coaching.
- Verify the types of coaching opportunities that are being assigned to you (last 6 months).




| Report | Description |
|---|---|
| My Active Coaching Assessments | Coaching assessments assigned to you that are in **New**, **Work in Progress**, and **Resolved** states. |
| Follow-up Action Needed | Coaching assessments grouped by **Followup Needed** field.<br>• **Recognize**<br>• **Needs Additional Coaching**<br>• **Needs Outside Training**<br>• **Referral to Manager**<br>• **Create Virtual Coach**<br>• **No Follow Up** |
| My Coaching Survey Results | Feedback results on coaching from trainees. |

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| Report | Description |
|---|---|
| Resolved by Virtual Coach | Coaching assessments resolved by virtual coaching. |
| My Trainee Performance | Coaching assessments grouped by trainee performance rating. |
| KPI Addressed with my Coaching | KPIs addressed by your coaching. |
| My Coaching Opportunities - Last 6 months | Coaching opportunities assigned to you in the past 6 months. |

## Assess a trainee

Use a coaching assessment to review the work of a trainee and to provide training and feedback.

### Before you begin

Role required: sn_coaching.coach

### About this task

A trainee can view any field on the coaching assessment form and add comments to the to the **Work notes** field. A trainee can submit feedback for a coach using a survey when a coaching assessment is in resolved, closed complete, or closed incomplete state.

When an assessment is generated, all users in the Coach group receive a notification. Assessments are generated automatically (as the result of a coaching opportunity) or created manually. You can provide feedback for your trainees using a survey at any time during the coaching assessment.

You can create a coaching assessment from incidents, problems, change requests, or any other table that extends the task table. Enable the display of the **Create Coaching Assessment** button and create your assessments using that button.To enable display of the button:

- Configure the UI actions on the record.
- In the `sn_coaching.CoachingExtensionPoint` extension point, make sure the `getCreateAssessmentUITables` method is implemented to return the name of the tables.

### Procedure

1. Navigate to **All** > **Coaching** > **Coaching Assessment** and select a coaching assessment in the **Open** state.

   You can take a survey using the **Start Survey** button to provide feedback for the trainee at any point during the assessment. After you complete the survey, the score is calculated using the **Calculate coaching survey score** business rule and is automatically populated in the **Trainee Rating** field. The trainee rating generates an assessment rating that is populated in the **Assessment Rating** field.

   **Note:**
   Surveys are not available for assessments that are created manually.

2. Fill in the fields on the Coaching Assessment form.
   a. Verify the **Coach group**, which is obtained from the coaching opportunity, is accurate.
   b. Set the coaching assessment **Coach** field to a coach.
   c. In the **Due Date** field, enter the date when the assessment is due.

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The coaching assessment is set to **Closed Incomplete** state after the due date. Use system properties to set due dates to complete training. For more information, refer to Coaching Properties. You can disable automatic closure behavior by deactivating the **Close assessments after expiration** scheduled job.

3. Fill in the fields in the **Notes** tab.
   a. Add a **Description** to the coaching assessment.
   b. Add **Work notes** to facilitate a dialog with the trainee.
4. Review the **Snapshot** content in the **Snapshot** tab and add your feedback in the **Notes** field.
5. Fill in the fields in the **Feedback** tab.
   a. Set the **Assessment rating** based on the coaching experience.
   When you submit feedback for a trainee, the score in the **Trainee Rating** field, which is based on a scale of 1-10 is converted to a rating such as good or excellent. This rating displays in the **Assessment rating** field.
   b. Set the **Follow up** action as part of coaching.
6. Review the skills applicable to the trainee in the **Trainee Skillset** related list.
   See Skills Management for more information.
7. Add assigned training content in the **Assigned course items** related list.
8. Review survey feedback for the trainee in the **Survey Results** related list.
9. When coaching is finished:
   a. Add a **Summary** of the coaching experience as an overview of your assessment.
   b. Set the coaching assessment to **Resolved**.

## Example: Coach assesses trainee

### Coaching Assessment form

| Field | Value |
|---|---|
| Number | CAS0001004 |
| Trainee | Trainee User 2 |
| Record | Incident: INC0000055 |
| Opportunity | COP0000109 |
| State | Work in Progress |
| Coach group | Coach Group |
| Coach | Coach User 1 |
| Due date | 2018-10-25 05:18:59 |

### Coaching Assessment tabs

| Field | Value |
|---|---|
| Information for Review | |

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**Coaching Assessment tabs (continued)**

| Field | Value |
|---|---|
| Snapshot | • Configuration item:<br>SAP Human Resources<br>• Additional comments:<br>2018-06-23 21:45:04 - ITIL User (Additional comments)<br>The SAP Human Resources application is not accessible.<br>• Work notes:<br>2018-06-23 21:45:04 - ITIL User (Work notes)<br>I cannot access this application so we may have an outage. |
| Feedback Rating | |
| Assessment rating | Excellent |
| Follow up | Recognize |
| Summary | Trainee showed great interest in learning the trainings and finished them ahead of due date. |

**Related topics**

Coaching field descriptions

## Assign skills after completing an assessment

Automatically assign skills to trainees for specific skill levels based on the course items they have completed. For example, if a trainee completes the course items for learning Japanese at an expert level, then the skill level 'expert' can be assigned to the trainee.

### Before you begin

Role required: sn_coaching.coach and sn_coaching.admin

### About this task

You can associate skills with coaching opportunities, coaching assessments, or course items. When a trainee completes a coaching assessment, you can automatically assign the skill the trainee has acquired during that coaching opportunity.
The coaching assessments generated from coaching opportunities award the skills to the trainee after the assessment is complete. If the assessment is configured to include assigned course items, the skills associated with course items are also added to the assessments.

### Procedure

**1.** Associate skills with coaching assessment or opportunities.

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2. Click **Submit**.
   You can navigate to the **All Awarded Skills** related list in a **Coaching Assessments** record for a trainee to view all skills to be awarded for that trainee. The **Source** field displays whether the award came from an opportunity, assessment, or training.

## Training your agents using Coaching With Learning

Use Coaching with Learning to train your agents with internal and external learning content. Organize similar content in learning libraries. Assign learning tasks and track completion.

**Important:**
Coaching With Learning is available when you enable the Coaching With Learning application from the ServiceNow® Store. To enable this application, see Request Coaching.

Coaching with Learning

### Organize related learning content

Create a learning library to organize related content into categories.

#### Before you begin
Role required: sn_coaching.coach

#### Procedure

1. Navigate to **All** > **Learning** > **Content** > **Learning Libraries**.
2. Create a learning library.
   a. Click **New**.
   b. In the **Title** field, enter a unique name for the learning library.
   c. In the **Description** field, enter a description for the learning library.
   d. Right-click the form header and click **Save**.

   **Note:**
   The learning library is visible to all groups that you directly or additionally manage.

3. Add course items to the learning library.
   a. Click the **Content** related list.
   b. Click **Add**.
   c. In the **Add Learning Courses** pop-up window, select all course items you want to add to the learning library.
   d. Click **Add Selected**. The course items are added to the learning library.

   **Note:**
   To remove any course item you have added, select the course item and click **Remove**.

4. Add user to the library.
   a. Click the **Applicable Users** related list.
   b. Click **Edit**.
   c. Move the desired users to the **Applicable Users List** field.
   d. Click **Save**.

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## Add internal learning content

Add internal courses so that agents can learn new content and enhance their skills set.

### Before you begin

Role required: sn_coaching.coach

### Procedure

1. Navigate to **All** > **Learning** > **Content** > **Learning Content**.
2. Create an internal learning content.
   a. Select **New**.
   b. Fill in the following fields.

| Name | Description |
|---|---|
| Title | Name of the course. |
| Internal source | Select the type of content for the course.<br>Here are the available types of courses:<br>▪ URL—Youtube, Vimeo, or any link for a video<br>▪ Knowledge article<br>▪ Free form |
| Days to complete | The number of days required to complete the course. Default value is set to 5. |
| Course catalog | The catalog associated with the course. |
| Knowledge article | If the internal source is a knowledge article, select the article. |
| URL Domain | If the internal source is URL, select the domain for the URL.<br>Here are the available URL domain types:<br>▪ Youtube<br>▪ Vimeo<br>▪ Other |
| URL | If the internal source is URL, enter the URL for the selected domain. |
| Estimated duration | Length of time when the course has to be completed. For example, for a video, it is the duration of the video. For a KB article, the duration is estimated based on the length of the article. |

3. Select **Save**.
4. Add a skill to the internal learning content.
   a. Select the **Associated skills** related list.
   b. Select **New**.
   c. In the **Skill** field, select a skill you want to associate with the internal content.
   d. In the **Skill level** field, select a skill level for the selected skill.
   e. Select **Save**.

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### Add a learning task to the internal content

Add a learning task to an internal content and track the task completion.

#### Before you begin
Role required: sn_coaching.coach

#### Procedure

1. Navigate to **All** > **Learning** > **Content** > **Learning Content**.
2. Add a learning task to the internal learning content.
   a. Select the **Learning Tasks** related list.
   b. Select **New**.
   c. In the **Assigned to** field, select a trainee to whom you want to assign the learning task.
   d. In the **Course item** field, select the course item to associate with the learning task.
   e. In the **Due date** field, select the calendar icon and select the date and time when you want to trainee to complete the learning task.
   f. Select **Save**.

## Add external learning content

Add courses from third-party applications such as Udemy, Pluralsight, Cornerstone, or ServiceNow University to enable your users to gain skills from external learning content.

#### Before you begin
To add external learning content:

- You must have the Workforce Optimization for ITSM application installed.
- You must integrate Coaching With Learning with third-party learning management systems. For information on how to perform this integration, see Integrating Learning Core with third-party learning management systems.

Role required: sn_coaching.coach

#### Procedure

1. Navigate to **All** > **Learning** > **Content** > **External Content**.
2. Select a course.
3. Click **Go to course**.
   You can review and learn the external course.

## Complete a learning task

Enhance your skills set by completing learning tasks from internal or external learning content.

#### Before you begin
Role required: sn_coaching.trainee

#### Procedure

1. Navigate to **All** > **Learning** > **Tasks** > **Learning Tasks**.
2. Select a learning task.

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3. Complete the learning task.
4. Click **Mark as Complete**.

## Managing your coaching assessments

Employees, or trainees, are assessed on work they have done that has triggered a coaching opportunity. Once assessed, the trainee is assigned training by the coach. Use the Trainee Dashboard to manage your assessments and track results.

You can access the Trainee Dashboard from the Coaching navigation menu, or directly from the dashboard list. Click a report to view the detailed data.

**Note:**
You must have the Coaching trainee role to view your Trainee Dashboard.

Your training starts when your assessment has been assigned to a coach. Coaching assessments are triggered from a coaching opportunity set up by the coaching admin and are used to facilitate your learning, as well as providing a dialogue with your coach.

The Trainee Dashboard lets you manage your assessments and track results.

- Keep track of your active coaching assessments.
- Analyze how your assessments have been rated in the past.
- View the types of survey feedback from your coaches.
- Manage the full list of your coaching assessment details.

### Trainee dashboard




| Report | Description |
|---|---|
| My Active Training Assessments | Coaching assessments for you that are in **New**, **Work in Progress**, and **Resolved** states. |
| My Coaching History | Coaching feedback history (provided by the coach). |
| My Survey Results | Survey feedback results of the coach to the trainee. |
| My Assessment Details | List of active coaching assessments and trainings. |

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## Work with your coach

Use your assessments to work with your coach, including assigned training and due dates. You can view your assessments and track your results using the Trainee Dashboard.

### Before you begin

Role required: sn_coaching.trainee

### About this task

You can provide feedback for your coach when the assessment is in resolved, closed complete, or closed incomplete state.

### Procedure

1. Navigate to **All** > **Coaching** > **Trainee Dashboard**.
2. Select an active **Coaching Assessment** record from the **My Assessment Details** list to view feedback from your coach.
3. View the **Notes** from your coach for coaching instructions.
4. Complete any learning content in the **Assigned Trainings** related list before the **Due date**.
5. Add any **Notes** for your coach that are applicable to your progress or learning status.
6. To provide feedback for the coach, click **Start Survey**.
   The Provide Training Feedback form appears.
7. Complete the feedback and click **Submit**.
   The score for the survey is added to the **Coach rating** field.
8. To assess your survey results and other reports, navigate to **Coaching** > **Trainee Dashboard**.

## Example: Trainee works on a coaching assessment

### Coaching Assessment form

| Field | Value |
|---|---|
| Number | |
| Trainee | Trainee User 1 |
| Record | Incident: INC000055 |
| Opportunity | COP0000109 |
| State | Resolved |
| Coach group | Coach Group |
| Coach | Coach User 1 |
| Due date | 2018-10-25 05:18:59 |
| Resolved by Virtual Coach | Selected |

### Related topics

Coaching field descriptions

# Coaching reference

Coaching reference content includes business rules and field descriptions.

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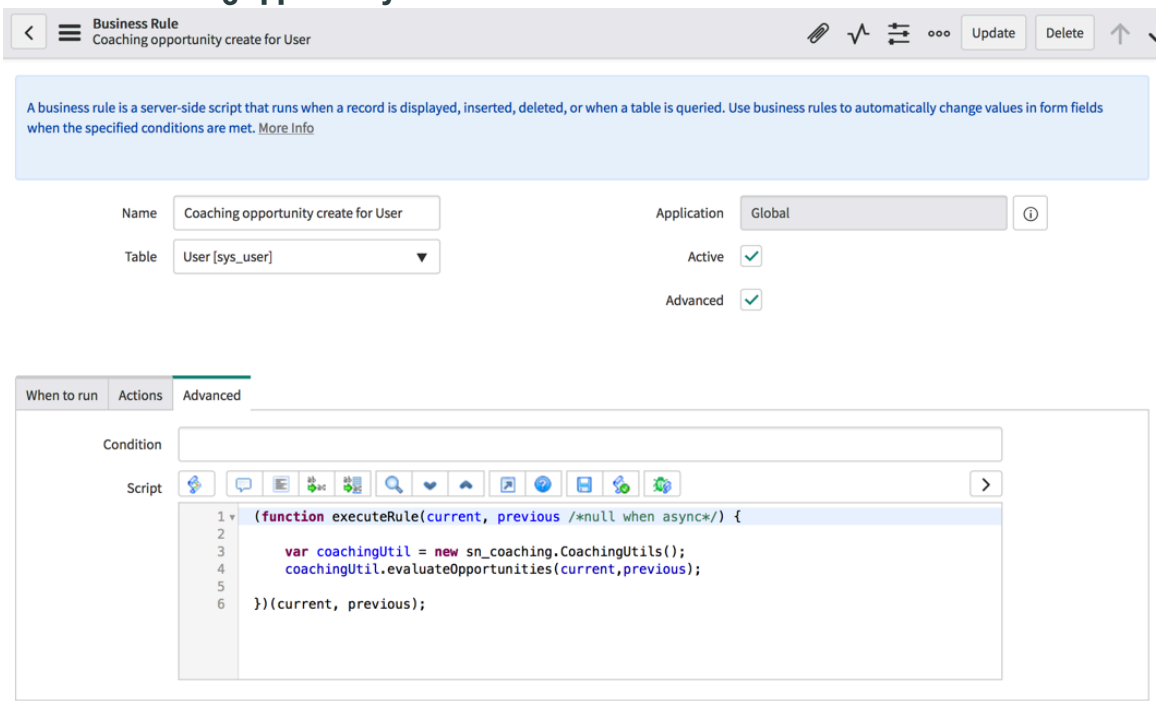
## Coaching on a non-task table

To provide coaching on a table source that does not extend the Task table, you must create a business rule to initiate the coaching process.

The business rule **Evaluate coaching opportunity on tasks** initiates coaching for tables that extend Task. You can copy this business rule and modify it for tables that do not extend the Task table.

### Evaluate coaching opportunity on a non-task table




## Coaching assessment flow states

### Coaching Assessment Flow




| State | Description |
|---|---|
| Open | New coaching opportunity. |
| Work in Progress | Trainee is being coached. |
| Resolved | All learnings and coaching in the assessment have been completed successfully. |
| Closed Complete | Assessment has been resolved and closed. |
| Closed Incomplete | Assessment has been closed but was not completed, typically because the coaching assessment **Due date** has expired. |

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## Form and list permissions

| Element | Permissions |
| --- | --- |
| Coaching Opportunity | • sn_coaching.admin: create, write, delete<br>• sn_coaching.coach: read<br>• sn_coaching.trainee: none |
| Coaching Assessment | • sn_coaching.admin: create, write, delete<br>• sn_coaching.coach: create, write own or group assessment<br>• sn_coaching.trainee: read own assessment, write own assessment work notes |
| Training History | • sn_coaching.admin: view<br>• sn_coaching.coach: view<br>• sn_coaching.trainee: none |
| Assigned Training | • sn_coaching.admin: create, write, delete<br>• sn_coaching.coach: create, write and delete own training action<br>• sn_coaching.trainee: view |
| Training | • sn_coaching.admin: create, write, delete<br>• sn_coaching.coach: create, write and delete own training<br>• sn_coaching.trainee: view |
| Virtual Coachings | • sn_coaching.admin: create, write, delete<br>• sn_coaching.coach: read, and associate existing virtual coach to a coaching opportunity<br>• sn_coaching.trainee: none |
| Virtual Coach | • sn_coaching.admin: create, write, delete<br>• sn_coaching.coach: create, write and delete own virtual coaching<br>• sn_coaching.trainee: none |

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## Coaching Properties

### Properties

| Property | Description |
| --- | --- |
| glide.ui.sn_coaching_assessment_activity.fields | Edit coaching assessment activities.<br>• **Type:** string<br>• **Default value:** assigned_to,cmdb_ci,state,impact,priority,opened_by,work_n |
| sn_coaching.recommended_learning_deprecated | Coaching Recommended Trainings is being deprecated and replaced with the Learning Tasks and course items from Coaching with Learning.<br>• **Type:** string<br>• **Default value:** true |
| sn_coach.lrn.exclude_weekends_on_learning_task_due_date | Enable property to exclude weekends while setting the due date for learning tasks.<br>• **Type:** true\|false<br>• **Default value:** true |
| sn_coach_lrn.learning_list_menu_props | Data array properties for the now-list-menu component on the Learning Tasks tab, coaching module.<br>• **Type:** string<br>• **Default value:** script for data array |

## Coaching field descriptions

Coaching field descriptions also include form related lists and actions.

## Coaching Opportunity form

| Field | Description |
| --- | --- |
| Number | Unique (COP) number for the coaching opportunity. |
| Name | Unique name for the coaching opportunity. |
| Description | Description of the coaching opportunity. |
| Table | Table to use for the coaching opportunity. |
| Trainee | Field from the selected table that identifies the trainee. |
| Trainee group | Limit the trainees identified in the Trainee field to a group or groups of users. |

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| Field | Description |
|---|---|
| Specify coach user | Check box to enable the **Coach** field. |
| Coach | Field from the selected table that identifies the coach. |
| Coach group | Group of coaches that assess and provide feedback to trainees. |
| Active | Check box to activate the coaching opportunity. Clear the check box to disable. |
| Trigger | Event that triggers a coaching opportunity for the selected table.<br><br>Conditions for opportunities are generally unique events, such as when an incident is reassigned. |

### Frequency tab

| Field | Description |
|---|---|
| Random sample (%) | Percentage of the total assessments that get created. Use a random sample percentage to reduce the number of assessments that are created if too many events that meet the criteria for creating a coaching assessment occur. |
| Users who should be coached on every opportunity | Users that always get coached, regardless of random sample percentage.<br><br>Because the specified users are exempted from the random sample percentage, a coaching assessment is always created when the assessment is triggered.<br><br>Selected users might be new hires, for example, or others who require additional coaching.<br><br>**Note:**<br>Only shown if the **Random sample (%)** is less than 100. |
| Assessment duration | Amount of time before the assessment is set to **Closed Complete** state. |
| Prevent duplicate assessment | Check box to prevent an assessment from being created within a specified time period if one exists for that user for the same opportunity. |
| Within time period | Time period within which duplicate assessments are not created. |

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### Frequency tab (continued)

| Field | Description |
|---|---|
| | **Note:** This field appears only when **Prevent duplicate assessment** check box is selected. |

### Surveys tab

| Field | Description |
|---|---|
| Survey taken by trainee | Survey selected for the trainee to provide additional feedback. |
| Survey taken by coach | Survey selected for the coach to provide additional feedback. |

### Related KPIs tab

| Field | Description |
|---|---|
| Improvement KPI | Primary KPI used to measure the success of the coaching opportunity. |
| Strategic objective | Strategic objective affected by the coaching opportunity. |

### Snapshot Settings tab

| Field | Description |
|---|---|
| Snapshot fields | Field values to show in the coaching assessment unless an advanced script is used. |
| Advanced | Check box to use a script to determine the content for the snapshot. |
| Snapshot script | Script that defines the evaluation process applied to the selected table. Select the fields from the table for which you want to capture the values.<br><br>For example, when analyzing the Incident table, use #{number} to display the record number (such as INC0010002) for the incident record that triggered the coaching opportunity.<br><br>**Note:** This field appears only if the **Advanced** check box is selected. |

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## Coaching Assessment form

| | |
|---|---|
| Number | Unique (CAS) number for the coaching assessment. |
| Trainee | Trainee user that triggered the assessment in the coaching opportunity. |
| Record | Record associated with the assessment triggered in coaching opportunity. |
| Opportunity | Coaching opportunity number associated with the coaching assessment. |
| State | State of the assessment.<br>• **Open**: New coaching opportunity.<br>• **Work in Progress**: Trainee is being coached.<br>• **Resolved**: All coaching and learnings have been provided to the trainee.<br>**Note:** Learnings may not have been completed by the trainee.<br>• **Closed Complete**: Assessment has been resolved and closed.<br>• **Closed Incomplete**: Assessment has been closed but was not completed, typically because the coaching assessment **Due date** has expired. |
| Coach group | Group of coaches to which the assessment is assigned.<br>Default value is populated from the coaching opportunity form. |
| Coach | Coach user performing the assessment.<br>This field is typically set by the coach before performing the assessment, but can also be set by a member of the coach group or by the coaching admin. |
| Due date | Date the assessment is due. After this time, the assessment is set to **Closed Incomplete** state. |

### Notes tab

| Field | Description |
|---|---|
| Description | Description of the assessment. |
| Work notes | Notes about the assessment (journal field). |

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### Notes tab (continued)

| Field | Description |
|---|---|
| | Additional notes can be added as the coach and trainee engage in further dialogue. |

### Snapshot tab

| Field | Description |
|---|---|
| Snapshot | Field contents of the task, action, or behavior captured at the time the coaching opportunity was triggered. |

### Feedback tab

| Field | Description |
|---|---|
| Assessment rating | Value of the performance of the trainee for reporting and trend-tracking purposes.<br>• Excellent<br>• Good<br>• Average<br>• Poor<br>• Unacceptable |
| Follow up Needed | Further action required, if any, to improve the performance of the trainee.<br>• **Recognize**: Trainee needs recognition for good performance.<br>• **Needs Additional Coaching**: Trainee needs additional feedback from the coach.<br>• **Needs Outside Training**: Trainee needs additional training outside the scope of the coaching assessment.<br>• **Referral to Manager**: Indicates a major issue with the trainee performance.<br>• **Create Virtual Coach**<br>• **No Follow Up** |
| Summary | Summary of the coaching assessment. |

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## Coaching Assessment actions

| Button | Description |
|---|---|
| Complete Assessment | Set the coaching assessment to **Closed Complete** state. |
| Reopen Assessment | Change the coaching assessment state from **Resolved** or **Closed Complete** back to **Work In Progress** for additional action.<br><br>Either the coach or the trainee can reopen the coaching assessment. |
| Submit feedback | Feedback submitted by either a trainee or a coach from the survey form. |
| Delete | Deletes the coaching assessment from the Assessment Created by Opportunity list. |

## Virtual Coaching form

| Field | Description |
|---|---|
| Short Description | Description of the virtual coaching (CVC) record. |
| Table | Table source of coaching opportunity events. |
| Training | Record that contains related training content. |
| Active | Check box to activate the virtual coaching. Clear the check box to disable. |
| Advanced | Check box to use a script to determine when the automation triggers. |
| Conditions | Event that triggers a virtual coaching for the selected table.<br><br>Conditions for virtual coachings are generally unique events. |
| Script | Script that defines the evaluation process applied to the selected table. Select the fields from the table to capture the values for.<br><br>**Note:**<br>Only shown if **Advanced** check box is selected. |
| Autofill fields | Fields to autofill under certain conditions. |

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### Training form

| Field | Description |
|---|---|
| Number | Unique (CMC) number of the training. |
| Title | A short description for the training. |
| Category | Category of learning content, which is used for reporting.<br>• Customer experience<br>• Best Practice Series<br>• Soft-Skill Communication<br>• Behavioral Coaching<br>• Product Support |
| Content | Content for assigned users to learn. |

The **Preview Message** related list shows the learning content in the context of the trainee.

## Coaching troubleshooting

Troubleshooting actions can help resolve common issues when setting up or running Coaching.

| Issue | Resolution |
|---|---|
| Error after creating a coaching opportunity:<br>`You must create a business rule for a non-task type source table to trigger a coaching assessment. For more information, refer to http://servicenow.com/docs/?context=CSHelp:Coaching-Non-Task-Table.` | Create a business rule to initiate the coaching process for a non-task type table. *`Copy the Coaching Opportunity creator for Task business rule and modify it for tables that do not extend Task.`* |
| Do not automatically close a coaching assessment after the due date has passed. | Deactivate the *`Close assessments after expiration`* scheduled job in **System Definition** > **Scheduled Jobs**. |
| Coaching assessment is not created. | These resolutions are applicable to a coaching assessment not being created:<br>• Add the trainee as a member of the trainee group.<br>• Clear the **Prevent duplicate assessment** check box if the trainee already has a coaching assessment for the same coaching opportunity.<br>• Include the trainee in the **Users who should be coached on every opportunity** list when the **Random sample (%)** is less than 100. |

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| Issue | Resolution |
| --- | --- |
| I need to override ACLs and trainings for the Assigned Training related list on the Coaching Opportunity and Coaching Assessment forms. | Implement Coaching extension points:<br>• CoachingExtensionPoint<br>• CoachingACLExtensionPoint |

**Related topics**

- Using extension points to extend application functionality
- Using scripted extension points in server-side scripts
- Using UI extension points in server-side UI macros
- Using client extension points in client-side UI scripting

## Quick start tests for Coaching

Validate that Coaching still works after you make any configuration change such as apply an upgrade or develop an application. Copy and customize these quick start tests to pass when using your instance-specific data.

Coaching quick start tests require activating the Coaching plugin (com.sn_coaching).

### Coaching test suite

| Test | Description | Release version |
| --- | --- | --- |
| Coaching: Create an assessment manually when logged in as a coach. | As a coach, verify that you can create an assessment and assign it to trainees. | Orlando |
| Coaching: Add skills to an opportunity and verify those skills awarded to trainee. | Add skills to a coaching opportunity and verify that those skills have been awarded to trainees after they complete an assessment. | Orlando |
| Coaching: Complete an assessment as a virtual coach. | Verify that the virtual coach completes an assessment and provides feedback to the trainee when a virtual coach is attached to an opportunity. | Orlando |
| Coaching: Add skills to an assessment and verify those skills awarded to trainee. | Add skills to a coaching assessment and verify that those skills have been awarded to trainees after they complete an assessment. | Orlando |
| Coaching: Add skills to a recommendation and verify those skills awarded to trainee. | Add skills to a coaching recommendation and verify that those skills have been awarded to trainees after they complete an assessment. | Orlando |
| Coaching: Move assessments from one state to another when logged in as a coach. | As a coach, verify that you can move an assessment from one state to another. | Orlando |

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**Coaching test suite (continued)**

| Test | Description | Release version |
|---|---|---|
| Coaching: Attach a recommendation learning to an assessment. | Verify that a recommendation learning on an opportunity gets attached to an assessment when an assessment is generated. | Orlando |
| Coaching: When a coaching opportunity is inactive, assessments are not generated. | Verify that when a coaching opportunity is in inactive state, it does not generate assessments. | Orlando |
| Coaching: Submit Coaching survey as a Coach user. | Verify that coach can submit survey for a trainee. | Quebec |
| Coaching: Submit Coaching survey as a Traineer user. | Verify that trainee can submit survey for a coach. | Quebec |

**Related topics**

Quick start tests

# Continual Improvement Management

Use the ServiceNow® Continual Improvement Management (CIM) application to request improvement opportunities, and implement phases and tasks to meet performance goals, track progress, and measure success.

An improvement initiative consists of:

- Goals to measure success
- Phases to organize work effort
- Tasks with specific actions to complete

To learn more about how your ServiceNow instance supports Continual Improvement Management, see Continual Improvement Management overview for a general understanding of the application and how it is used.

Listen to this 24-minute podcast for a discussion of the Continual Improvement Management application. Discussion of CIM, challenges of managing continual improvement, spotting opportunities, and differences between CIM and change management and other applications.

## Start an improvement

For continual improvement in your environment, select an activity.

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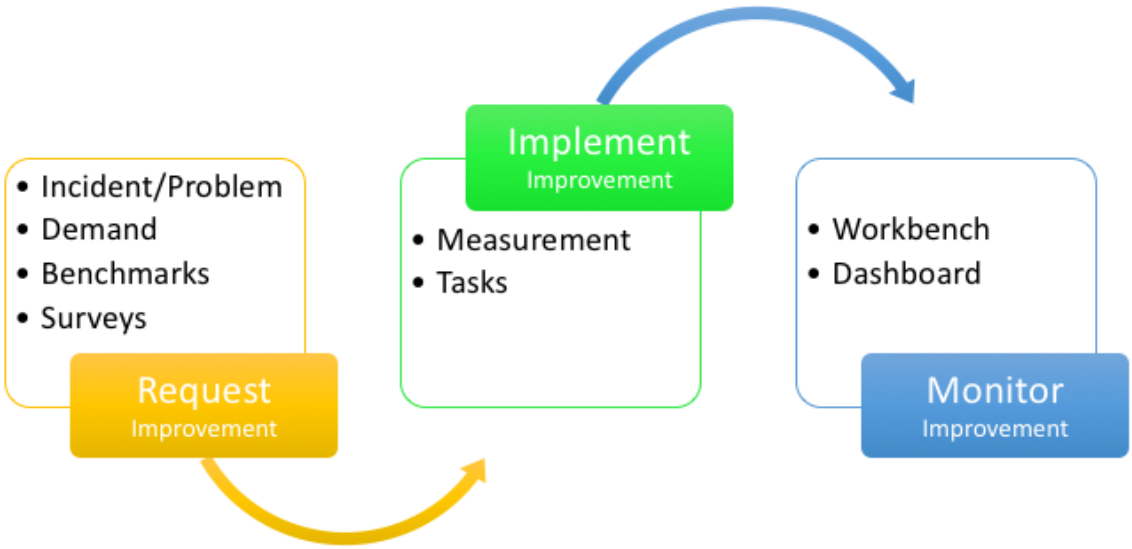


### Understand Continual Improvement Management concepts

- Continual Improvement Management overview
- Requesting improvements
- Managing improvements
- Domain separation and Continual Improvement Management

### Get help from ServiceNow resources

- Ask or answer questions in the Continual Improvement Management forum
- Search the Known Error Portal for known error articles
- Contact Customer Service and Support

## Request Continual Improvement Management

The Continual Improvement Management (com.sn_cim) plugin requires a separate subscription and must be activated by ServiceNow personnel. This plugin includes demo data and activates related plugins if they are not already active. The Continual Improvement Management application is available with the ITSM Professional and CSM Professional subscription only. Contact your account manager for more information.

**Before you begin**
To purchase a subscription, contact your ServiceNow account manager. The account manager can arrange to have the plugin activated on your organization's production and subproduction instances, generally within a few days.

If you don't have an account manager, decide to delay activation after purchase, or want to evaluate the product on a subproduction instance without charge, follow these steps.

Role required: none

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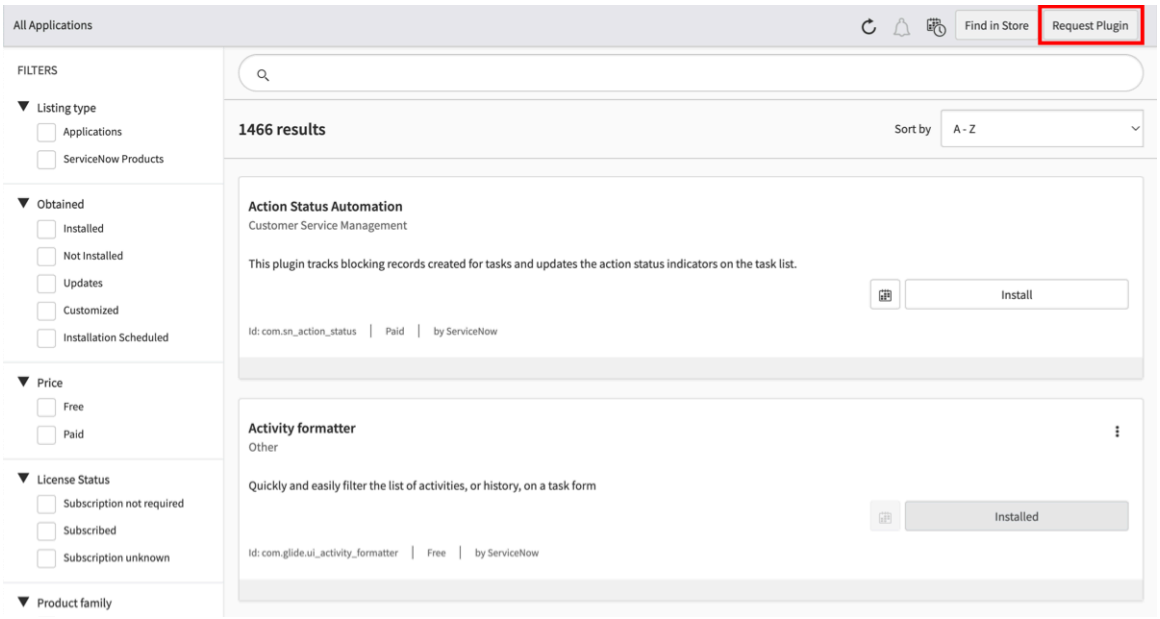
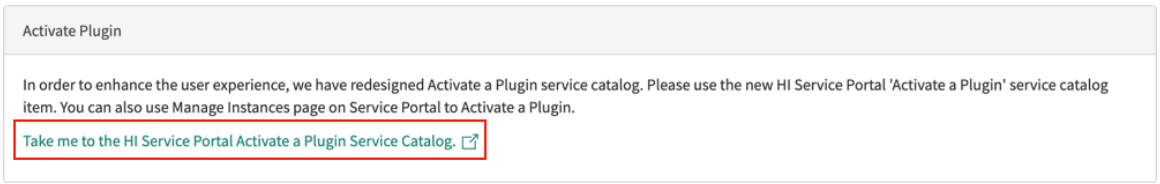
## Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. On the All Applications page, select **Request Plugin** to open the **Activate Plugin** form on Now Support.




3. On Now Support, select the link to access the Now Support Service Portal Service Catalog.




4. Select your instance.
5. Select **Actions > Activate Plugin**.
6. On the **Activate Plugin** form, provide the following information.

### Activate Plugin form

| Field | Description |
|---|---|
| What is your target instance | Instance on which to activate the plugin. |
| Which plugin would you like to activate | Name of the plugin to activate.<br>**Note:** If the system does not list the plugin you want or if you are activating the plugin on an OEM or on-premise instance, select the **Plugin I'm looking for is not listed** check box and then enter the name of the plugin. |

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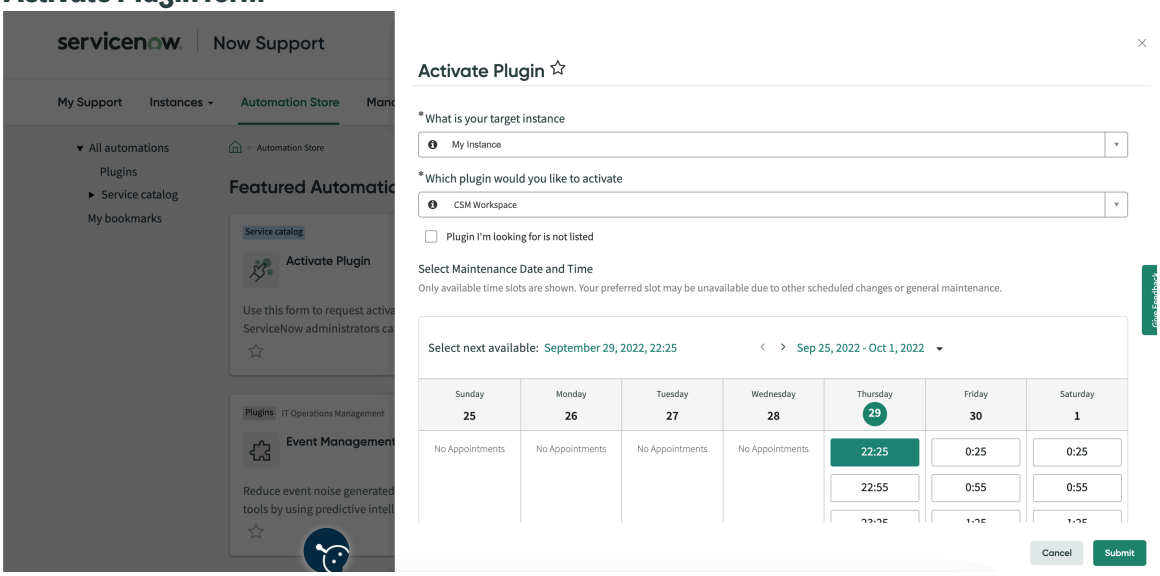
| Field | Description |
| --- | --- |
| Select Maintenance Date and Time | The date and time to activate the plugin.<br><br>**Note:**<br>Plugins are activated in two batches, once in the morning and once in the evening, on every business day in the US Pacific time zone. If the plugin must be activated at a specific time, enter the request in the **Reason/Comments** field. |

### Example

For example, see the following form to activate the CSM Workspace plugin on an instance named My Instance.

**Activate Plugin form**




7. Select **Submit**.
   For additional details about requesting a plugin, see Requesting a Plugin from the Service Catalog [KB0751715] article in the Now Support Knowledge Base.

### Related topics

List of plugins (Washington DC)

## Continual Improvement Management overview

Enable Continual Improvement Management (CIM) and then set up roles, groups, and integration properties to improve your organization's processes and functions. You can use the CIM workbench and dashboard to monitor, plan, and measure improvement success.

The video below gives you an overview of Continual Improvement Management application.
Continual Improvement Management Overview

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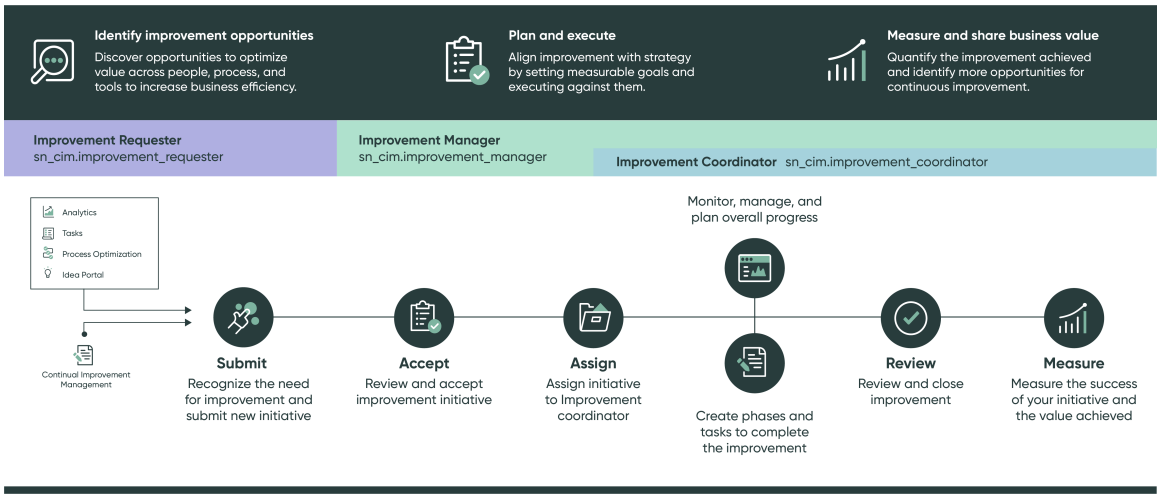
Continual Improvement Management is used to implement service, process, and function improvements. An improvement initiative contains goals to measure success, and phases that contain tasks with specific actions to complete the improvement.




Use the Continual Improvement Workbench to plan and manage improvements. Both tile and list views are supported.

The Continual Improvements dashboard shows progress and results in the form of statistics and charts using Performance Analytics.

To use guided setup to configure and set up Continual Improvement Management application, navigate to **Continual Improvement** > **Administration** > **Guided Setup** and click **Configure** in the Request CIM section.

## Integration with other applications

As part of Continual Improvement Management integration with other applications, an improvement initiative can be created from within other applications, and conversely, records for other applications can be created from within an improvement initiative (or CIM task).

An improvement initiative can be created from these applications.

- Benchmarks
- Coaching
- Configuration Management Database (CMDB)
- Demand Management
- Governance, Risk, and Compliance (GRC)
- Idea Portal
- Incident Management
- Problem Management
- Exploring Process Mining
- Survey Management
- Vendor Management Workspace

As part of an improvement initiative or CIM task, these records can be created.

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- Change record (Change Management)
- Coaching opportunity (Coaching)
- Demand record (Demand Management)
- Knowledge base article (Create a knowledge article)
- Project (Project Management)
- Story record (Agile Development)

## Initial CIM setup

Once Continual Improvement Management has been enabled, set up the application by assigning user roles and groups, and configuring integration properties.

- Assign user roles and groups.
  - Improvement Manager role
  - Improvement Coordinator role
  - Approver group membership (CIM Approvers, default is empty)
- Configure properties for Continual Improvement Management integration with other applications.
  - List of applications from which an improvement initiative can be created
  - List of application task records that can be created from within an improvement initiative

## Workflow of Continual Improvement Management roles

### Roles in Continual Improvement Management




Improvement requests are submitted when an **Improvement Requester**, such as a help desk manager, process owner, or ITL user, for example, recognizes the need for an improvement anywhere within the company.

When an improvement request is submitted, the **Improvement Manager**, reviews the improvements, accepts, and assigns it to an Improvement Coordinator for implementation. The Improvement Manager also runs prioritization meetings with Improvement Coordinators and uses the workbench to monitor, manage, and plan overall progress.

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After the improvement request is assigned, the **Improvement Coordinator** along with the Improvement manager, creates phases and tasks to complete the improvement. The Improvement Coordinator also meets with task owners to ensure that they are on track to meet the deadline.

When all work has been completed, the **Improvement Manager** reviews the improvement for closure, and uses the dashboard reports to measure the status and success of the request.

## Email notification

Email notifications are sent when the state of the improvement request changes or when the target date is breached.

**Email notification list**

| Improvement action | Improvement Manager | Improvement Coordinator | Improvement Requester | Watch list | Task assignee |
|---|---|---|---|---|---|
| Canceled | No | Yes | Yes | Yes | No |
| Approved | Yes | Yes | No | Yes | No |
| Closed | Yes | Yes | Yes | Yes | No |
| Target review date is breached | Yes | Yes | No | Yes | No |
| CIM task assigned | No | No | No | No | Yes |
| CIM task closed | No | Yes | No | No | Yes |

## Domain separation

Domain separation capability is supported in Continual Improvement Management with no setup or configuration required.

You can create improvements separately in a specific domain, or in the global domain.

## Domain separation and Continual Improvement Management

Domain separation in Continual Improvement Management is configured to apply to all features of the application. Separation of data is configured along with separation of logic and process. Domain separation enables you to separate data, processes, and administrative tasks into logical groupings called domains. You can control several aspects of this separation, including which users can see and access data.

## Support level: Basic

- Business logic: Ensure that data goes into the proper domain for the application's service provider use cases.
- The application supports domain separation at run time. The domain separation includes separation from the user interface, cache keys, reporting, rollups, and aggregations.
- The owner of the instance must set up the application to function across multiple tenants.

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Sample use case: When a service provider (SP) uses chat to respond to a tenant-customer's message, the customer must be able to see the SP's response.

For more information on support levels, see Application support for domain separation.

## Domain separation in Continual Improvement Management overview

When an improvement opportunity is discovered within your organization, you can implement the improvement in a structured manner using Continual Improvement Management with domain separation.

Once an improvement initiative is created, the Improvement Manager uses the Improvement Register to review and prioritize the improvement, and assigns improvement tasks. CIM task owners are responsible to fulfill assigned tasks to the desired outcome of that improvement. Both Improvement Register and CIM Task tables support domain separation so the Improvement Requester, task owners, Improvement Coordinator, and Improvement Manager can view only the improvement initiatives and related tasks within the (tenant) domain to which they belong.

## How domain separation works in Continual Improvement Management

Domain separation is supported in Continual Improvement Management with no CIM setup or configuration required. Improvements can be created in separate domains, including the global domain.

Continual Improvement Management extends the platform Task [task] table.

When domain separation is implemented, CIM users can view and request improvements initiatives only in the domain assigned. **Domain** and **Domain Path** columns are available for two main CIM tables (Improvement Register and CIM Tasks) provided with the base system. The **Domain** column contains the name of the domain to which the event or alert belongs, and the **Domain Path** column contains the unique domain identifier.

| Table | Contents |
|---|---|
| [sn_cim_register] | Improvement Initiatives |
| [sn_cim_task] | CIM Tasks |

**Note:**
If the domain column is not shown, click the **Update Personalized List** icon and add the required column. You can also add the domain path column, if desired.

Use cases:

- An Improvement Requester that belongs to the Acme domain creates an improvement initiative and wants to view it.

  A user must belong to the Acme domain, its parent domain, or the global domain to view the improvement initiative.

- An Improvement Manager that belongs to a parent domain tries to view an improvement initiative in a child domain.

  The user of a parent domain can view improvement initiatives of the parent as well as all child domains of that parent.

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- An Improvement Requester that belongs to Acme domain wants to create an improvement initiative on behalf of another user in the Acme domain.

  A user must belong to the same domain as the user for which the improvement initiative is created.

- An Improvement Requester wants to associate a record for an integrated application in the Acme domain.

  A user must belong to the domain of the integrated application from which a record is associated.

- An Improvement Manager has access to multiple domains, but wants to update a record with content within a specific domain.

  The domain specified for the current record drives the functionality of that record and reference fields.

**Related topics**

Domain separation for service providers

## Continual Improvement Management roles

Assign Continual Improvement Management roles to specify what different users and user groups can see and do.

For information about how to assign user roles, see Assign a role to a user.

| Role | Description | Roles inherited |
|---|---|---|
| sn_cim.improvement_requester<br><br>[Improvement Requester] | Able to perform these application functions:<br>• Create improvement initiative<br>• View **My CIM requests**<br>• View **Watched CIM requests**<br>• View **All** CIM requests | None |
| sn_cim.improvement_coordinator<br><br>[Improvement Coordinator] | Able to perform all functions for improvements to which they are assigned as | • sn_cim.improvement_requester<br>• app_service_user<br>• certification<br>• cmdb_query_builder |

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| Role | Description | Roles inherited |
| --- | --- | --- |
| | Improvement Coordinator except:<br>• Create Enterprise Strategies<br>• Delete improvement<br><br>Although able to perform Improvement Manager functions, an Improvement Coordinator can only perform those functions for improvements that they are assigned as Improvement Coordinator by the Improvement Manager.<br><br>Primary responsibility is to coordinate improvements within their area of expertise (at the process or service level).<br><br>Can access both Continual Improvement Workbench and dashboard. | • dependency_views<br>• itil<br>Problem/change/incident records can be added.<br>• knowledge<br>• pa_analyst<br>• pa_contributor<br>• pa_power_user<br>Existing Performance Analytics indicators can be accessed, and new ones created.<br>• pa_target_admin<br>• pa_threshold_admin<br>• pa_viewer<br>• sn_bm_client.benchmark_data_viewer<br>• sn_bm_client.benchmark_recommendation_viewer<br>Benchmarks data and recommendations can be viewed and an improvement initiative can be created from Benchmarks recommendations.<br>• template_editor<br>• view_changer<br>• sn_coaching.admin<br>• scrum_story_creator |
| sn_cim.improvement_manager<br><br>[Improvement Manager] | Able to perform all application functions.<br><br>The Improvement Manager is primarily | • sn_cim.improvement_coordinator<br>• sn_process_optimization_viewer |

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| Role | Description | Roles inherited |
| --- | --- | --- |
| | responsible for all improvements, including initial acceptance of new improvement requests, assignment, and closure. The Improvement Manager also monitors the overall progress of all improvements. | |

## Automatic assignment of the sn_cim.improvement_requester role

The sn_cim.improvement_requester role is automatically assigned to these roles upon Continual Improvement Management activation so these users can create an improvement request.

| Application | Role |
| --- | --- |
| Strategic Portfolio Management (only if SPM plugins are active) | |
| Agile Development | scrum_master |
| Demand Management | it_demand_manager |
| Portfolio Management | it_portfolio manager |
| Program Management | it_program_manager |
| Project Management | it_project_manager |
| Test Management | tm_test_manager |
| ITSM | |
| Benchmarks | • sn_bm_client.benchmark_admin<br>• sn_bm_client.benchmark_recommendation_viewer |
| Change Management | change_manager |
| Coaching | sn_coaching.admin |
| Incident Management | incident_manager |
| ITSM | itil |
| Survey Management<br>Assessments | • survey_admin<br>• survey_reader |

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| Application | Role |
| --- | --- |
| Performance Analytics and Reporting | |
| Performance Analytics | • pa_admin<br>• pa_power_user<br>• pa_viewer |

## Monitor and plan improvements

Use the Continual Improvement Workbench to monitor and plan improvements in a single view. The workbench shows tile and list views of improvements in progress, as well as listings under review, and in the backlog to help you plan your sprint.

### Before you begin

Role required: sn_cim.improvement_manager, sn_cim.improvement_coordinator

### About this task

The workbench is flexible graphical view that you can tailor to your needs, which is helpful for the Improvement Manager when running planning meetings and when doing a quick status update to other stakeholders.

The tile-based drag-and-drop user interface makes it easy to monitor, plan, and approve improvements.

| Section | Description |
| --- | --- |
| Overview tab | Shows two groups of improvements.<br>• Tiles in Implement and On Hold states.<br>• Listings in Review state.<br>This list can be customized in the Workbench Review list layout.<br>Use this section for daily monitoring and assessment of improvements being implemented, as well as those recently implemented that are in review. |
| Planning tab | Lists two groups of improvements.<br>• Listings in Implement and On Hold states.<br>• Listing for backlog (New, Accepted, Assess, and Approved states).<br>Use this section for ranking and prioritization of improvements in the Implement state, or in the backlog (improvement initiatives in Approved, Assess, Accepted, and New states, listed in that order). |

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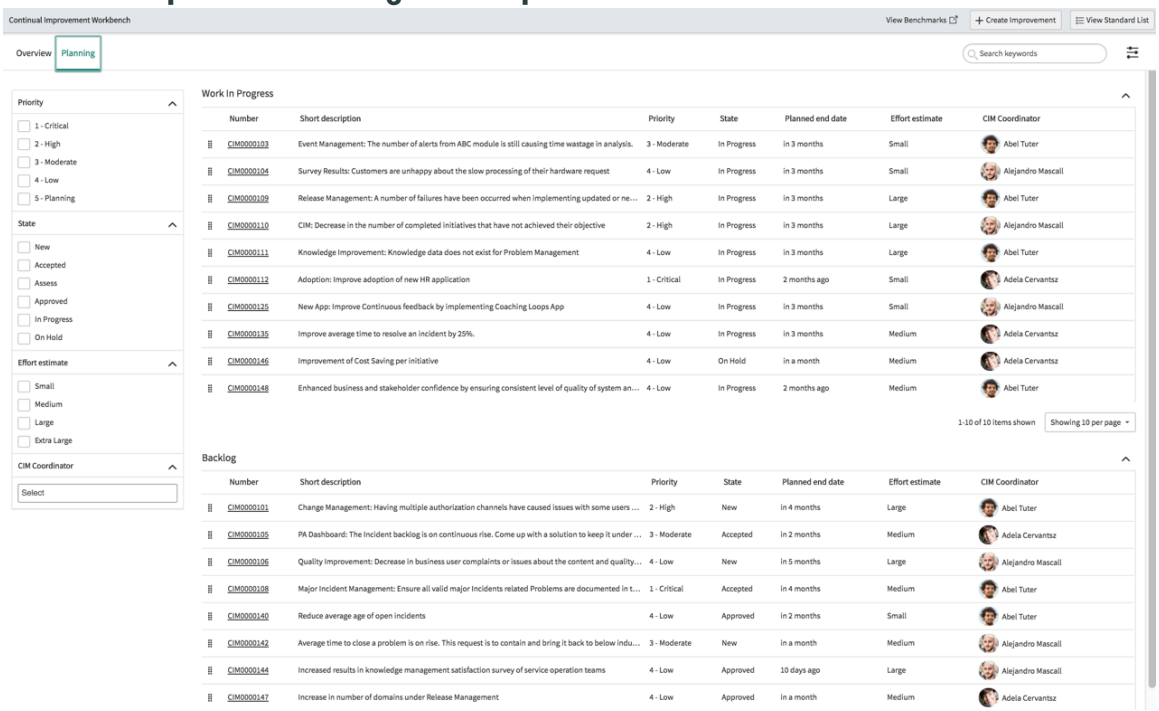
| Section | Description |
| --- | --- |
| | **Note:** Configuration changes made to the Planning workbench are reset when the Planning workbench is reloaded. |

### Continual Improvement Management Improvement Workbench




Features:

- Tile layout (12 improvement tiles shown by default).
- Search by keyword.
- Sort by rank, priority, due date, or effort estimate.
- Status on tile (percentage complete, assignment, priority, and time left)

  Percentage complete is based on the total planned duration of all CIM tasks in each phase of the improvement. For example, if a task in a phase that has a planned duration of 10 days is 100% complete in 10 days, and if another task in the same phase has a planned duration of 5 days and is 0% complete in 10 days, the phase to which these tasks belong will show as 50% complete.

  **Note:** Percent complete values are shown per phase, and per improvement.

- Color-coded status badge on tile.

| Status badge | Description |
| --- | --- |
| Complete | All tasks have been completed (percent complete is 100%). |
| Overdue | Due date has passed. |

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| Status badge | Description |
|---|---|
| Due soon | Less than 15% of duration left until the due date. |
| On Hold | Improvement has been placed on hold. |

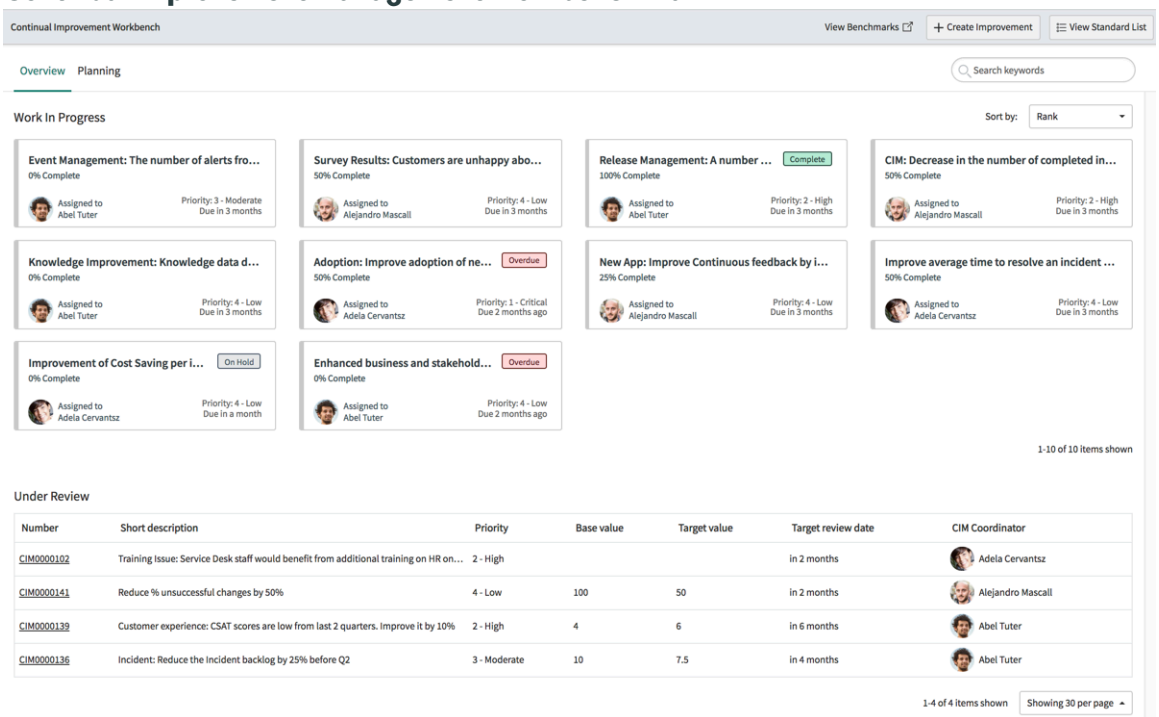
- Customize fields shown in workbench lists using the Workbench Review view.

  Access the Workbench Review view from the List Controls menu ( ) of the Improvement Register (**List Controls** > **View** > **Workbench Review**).

> **Note:**
> Only the fields visible in the Improvement Register [Workbench Review] view are shown in the workbench overview section.

On the planning page, you can prioritize your backlog using an easy-to-use drag-and-drop interface, similar to sprint planning, where you have an active sprint and a list of backlog items. Move backlog items to the Work in Progress list, which is your active sprint.

**Continual Improvement Management Workbench Plan**




Features:

- Color coding on **Planned end date** field (red, green)
- Search by keyword.
- Move items up or down a list.
- Group multiple items together.
- Drag and drop within and between lists.

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**Note:**
Moving an item, or group of items, from one list to another changes the state of the improvement.

For example, moving an item from Backlog to Work in Progress changes the state from **Approved** to **Implement**. Conversely, moving an item from Work in Progress back to the Backlog changes the state to **Approved**.

Only approved items can be moved from the Backlog list to the Implement list.

- Customize fields shown in workbench lists using the Workbench Planning view.

  Access the Workbench Planning view from the List Controls menu ( ) of the Improvement Register (**List Controls** > **View** > **Workbench Planning**).

- Filter by priority, benefits, effort estimate, and CIM Coordinator.

**Note:**
The filters are dynamic and show only the fields visible in the Workbench Planning view.

- Toggle the Filter menu and fields shown using the Configuration menu ( ).

**Note:**
Only the fields visible in the Improvement Register [Workbench Planning] view are shown in the workbench planning section.

### Procedure

1. Navigate to **Continual Improvement** > **Workbench**.
2. On the Overview tab, analyze the Work in Progress tiles to get an overall picture of the improvements in progress.
   Color-coded alert banners call out improvements that need attention. You can click on a tile to view the improvement.
3. Use the Planning tab to build the contents of your current sprint, according to capacity.
   a. Drag and drop items from the Backlog list to the Work in Progress list.
   b. Use the filters (Priority, Benefits, Effort Estimate, and CIM Coordinator) to narrow the data contained in the lists so you can focus on certain groups of improvements.
4. Use the Configuration menu to customize the columns shown in the Planning tab lists that is specific to your needs.

## View improvement reports

Evaluate improvement results using the Continual Improvements dashboard overview and outcome analysis reports to determine how well the improvements are helping your company.

### Before you begin
Role required: sn_cim.improvement_manager, sn_cim.improvement_coordinator

### About this task
Reports and Spotlight list can be filtered by improvement priority, state, business process, business service, benefits, and CIM coordinator.

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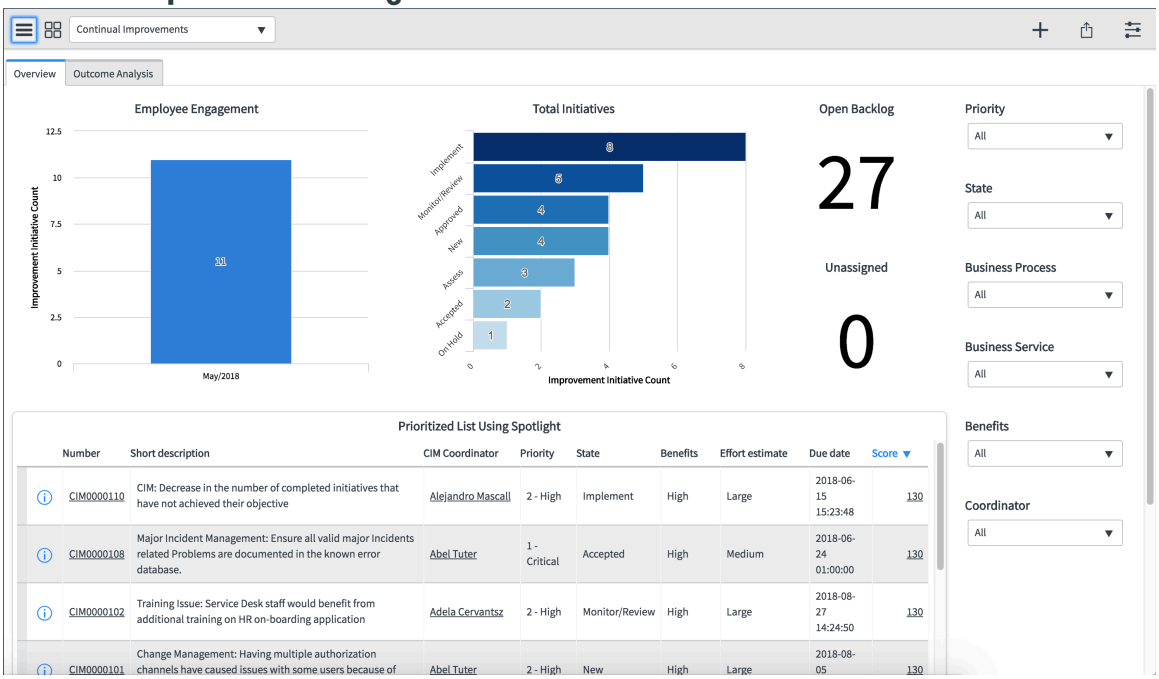
## Continual Improvement Management Dashboard




Overview:

- 

| Report | Description |
|---|---|
| Employee Engagement | Open improvement count from the last six months. |
| Total Initiatives | Improvement count by state. |
| Open Backlog | Number of open improvements. |
| Unassigned | Number of improvements without a CIM Coordinator assigned. |

- Prioritized List Using Spotlight .

  To use Spotlight to help prioritize the improvement backlog, navigate to **Continual Improvement** > **Administration** > **Spotlight Config**.

  Improvements can be prioritized based on multiple weighted criteria so you can quickly identify the most important tasks. The Improvement Register list shows improvement ranking based on specific criteria (priority, benefits, and effort estimate).

Outcome Analysis:

- Outcomes Achieved - Last 6 Months

  Report of closed improvement count in the last six months grouped by:

  - Category
  - Strategy
  - Closure Code
  - Type

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- KPIs Completed in the Last 6 Months

  List of closed improvements in the last six months.

### Procedure

1. Navigate to **Continual Improvement** > **Dashboard**.
2. On the Overview tab, use the filters (Priority, State, Business Process, Business Service, Benefits, and Coordinator) to narrow the data contained in the reports.
   You can click a report to view a list of improvements that make up that report.
3. On the Outcome Analysis tab, select a report from the **Group by** list to view improvement results by different attributes.
   You can click a report to view a list of improvements that make up that report.
4. Compare monthly reports to evaluate the impact improvements have on your company.

## Requesting improvements

Identify improvement opportunities within your environment and create an improvement request to begin implementation.

You can request improvements either manually from Continual Improvement Management, or from an application that is integrated with Continual Improvement Management.

Continual Improvement Management integration with other applications lets you:

- Create an improvement initiative from within other applications
- Create a record for another application as part of an improvement initiative or CIM task

### Identifying improvement opportunities

There are many different ways you can identify improvements in your organization. Improvement opportunities need not to be limited to the applications you use, your area of expertise, or your specific group.

You can identify improvement opportunities based on feedback from other groups.

**Process manager or process owner**

Reach out to the process manager or process owner to identify improvement suggestions for a process that is not working well.

**IT, development, and project management groups**

Reach out to the IT staff, development team, and project management staff for improvement suggestions, and provide the Improvement Requester role so they can submit an improvement request from within an integrated application with one click.

You can also identify improvement opportunities from within many different applications.

| Application | Description |
|---|---|
| Surveys | Review customer feedback and complaints and send additional assessments soliciting customers for improvement opportunity suggestions. |
| Performance Analytics | Monitor process KPIs and internal process assessments in Performance Analytics reports to identify improvement opportunities. |

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| Application | Description |
|---|---|
| Benchmarks | Compare KPI performance with Benchmarks baseline reports, and identify improvement opportunities in Benchmarks recommendations. |
| Service | Review undesirable trends in reports to identify improvement opportunities. |
| Problem Management and Change Management | Review Problem Management and Change Management trend reports to identify improvement opportunities. |
| Risk and GRC Audits | Review Risk registers and GRC Audit test failures to discover improvement opportunities. |
| IT Service Management | Review ITSM regularly to identify improvement opportunities for what is not working well. |

## Create an improvement request

Create an improvement request for improvement opportunities you identify in your environment. Once submitted, the improvement request is analyzed and implemented by the Improvement Manager and Improvement Coordinator.

### Before you begin

Role required: sn_cim.improvement_requester

### About this task

**Continual Improvement Management Process Flow**




### Procedure

1. Identify an opportunity for improvement.
   Any type of improvement identified in your company qualifies as the basis for an improvement request. For example, KPI performance, customer satisfaction, resources, processes, training, to name a few.
2. Determine your improvement goal.
   The improvement goal is the expected result to be achieved from the improvement.
3. Submit an improvement request.

   a. Navigate to **Continual Improvement** > **Create New**.
   A CIM phase is automatically created when you create the initiative, if the *sn_cim.create_default_phase* system property is enabled. For more information, see Properties installed with Continual Improvement Management.

   b. Fill in the short description and the business justification, and click **Submit**.
   The improvement request is created and set to **New** for the Improvement Manager to accept or reject based on alignment with strategic objectives.

4. To track the status of your improvement request, navigate to **Continual Improvement** > **My CIM Requests**.

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### Example: Create improvement request

In the process of reviewing KPI performance in the Performance Analytics application, the incident manager noticed the **Average time to resolve an incident** KPI scorecard was too high (24 hours).

As part of the improvement identification process, the incident manager analyzed the KPI performance by comparing it with values from other companies using the Benchmarks application, determined an improvement was needed, and set a target goal.

#### Improvement Initiative form

| Field | Value |
|---|---|
| Number | CIM0000135 (set internally) |
| Business service | IT Services |
| Business process | Incident Management |
| Short description | (Required) Improve average time to resolve an incident by 25% |
| Business justification | Average time to resolve an incident time is bad compared to Industry average. I compared our value with global values from companies in the same industry using the Benchmarks application. |
| State | New |
| Priority | 4 - Low (default) |

**Related topics**

Improvement field descriptions

## Managing improvements

After an improvement is requested, the Improvement Manager reviews it, assigns an Improvement Coordinator, and monitors progress of all improvements to ensure value and success. The Improvement Coordinator works with the Improvement Manager to implement the improvement.

The Improvement Manager oversees, identifies, drives, and monitors the progress of all improvements.

The Improvement Coordinator manages the improvements to which they have been assigned by the Improvement Manager, and works with the CIM task owners to track task completion.

**Note:**
Although both roles can cancel an improvement, only the Improvement Manager can delete an improvement, which removes it from the Improvement Register list.

### Process flow

#### Continual Improvement Management Process Flow




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1. The process flow starts with a **new** improvement request. A need for improvement is identified in the environment and a new improvement request is submitted by a user with the Improvement Requester role.
2. The Improvement Manager then verifies that the new improvement request aligns with at least one company strategic objective, and assigns an Improvement Coordinator before accepting the improvement as valid. The assigned Improvement Coordinator is notified that the improvement request has been **accepted**.

   There is typically more than one Improvement Coordinator in a company since that role is responsible for implementing and tracking the progress of assigned improvement initiatives at the task level, and there can be many tasks per improvement.
3. Once accepted, the Improvement Manager sets the remaining attributes on the Improvement Initiative form, and progresses it to be **assessed** for approval (by Approver group members).
4. During assessment, users in the approver group (shown in the Approvers related list) are notified of the approval request. One or all of the approver group members evaluate the improvement attributes and either **approve** or reject the improvement.
5. Once approved, the Improvement Coordinator and Improvement Manager work together (in regular implementation meetings, for example) to determine what work is needed to ready the improvement for **implementation**.

   During implementation, the Improvement Coordinator creates and assigns phases and can create tasks directly from an initiative or from a phase to complete the improvement. The Improvement Coordinator works with the task owners (in regular task status meetings, for example) to track the progress of task completion. Records for other supported applications can also be created from within the improvement initiative or CIM task, if needed, and are typically shown in a related list in the improvement initiative or CIM task.

   If, for some reason, implementation for the improvement has been halted, the Improvement Manager or Improvement Coordinator can place the improvement **on hold**. All CIM tasks that are not closed or canceled are also placed on hold. You can cancel a CIM initiative at any stage when the initiative is in progress. When you cancel an initiative, the initiative as well as the tasks associated with the initiative move to **Closed Incomplete**.
6. The Improvement Coordinator places the improvement under **review** when all CIM tasks in all CIM phases are verified 100% complete. The Improvement Manager reviews the improvement completeness and sets the improvement to **closed**.

## CIM task progress rollup calculation

You can create a task directly from an initiative or from a phase. When a task is moved to the Closed Complete state, the progress of the CIM initiative is calculated based on the percentage of all tasks that are in Closed Complete state for that initiative. The duration of the task which is based on the planned end date is also taken into consideration when the progress of the CIM initiative is calculated. The longer the duration, the slower the progress. As you add new tasks to a phase or associate it directly with the CIM initiative, the percentage completion for the CIM initiative is updated accordingly.

The table below shows an example of how the CIM task progress rollup is calculated.

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**Example CIM task progress rollup calculation**

| Parent Record | Task | Task duration | State | Contribution to initiative progress (%) |
|---|---|---|---|---|
| CIM Phase 1 | Task 1 | 2 days | Closed Complete | 20% |
| CIM Phase 1 | Task 2 | 3 days | Closed Complete | 30% |
| CIM Initiative | Task 3 | 2 days | Any state other than Closed Complete | 50%<br>**Note:** This task is directly associated with the CIM initiative. |

## Alignment with company strategic objectives

You can ensure alignment with company goals by setting the **Strategies** field on the Improvement Initiative form to one or more company enterprise strategies from the Strategic Objectives lookup list so they are linked.

**Note:**
Only the Improvement Manager can create a strategy.

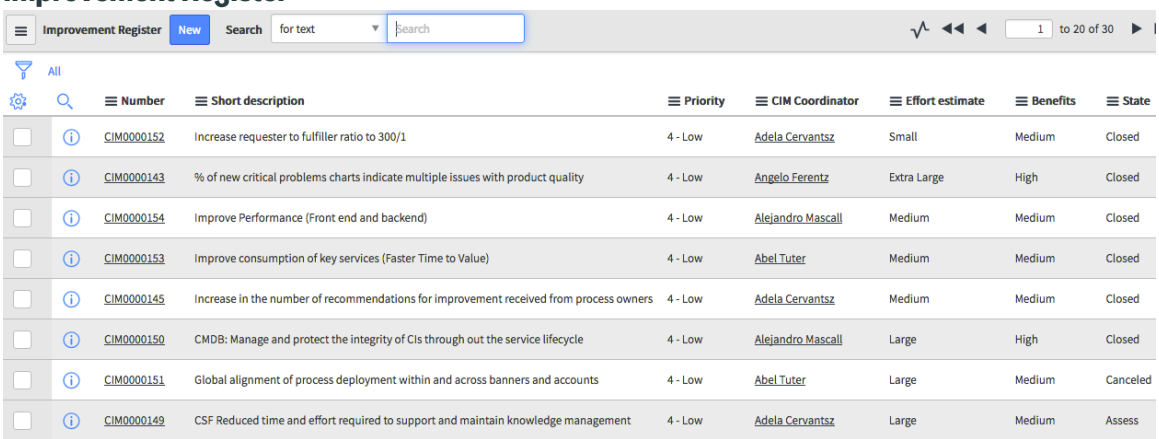
Coordinating improvements with enterprise strategies of the company ensures the improvement contributes to the overall goals of the company.

Access enterprise strategies by navigating to **Continual Improvement** > **Enterprise Strategies** (or **Organization** > **Enterprise Strategy**).

## Improvement Register list

View, prioritize, and track improvements, related tasks, and phases from one Improvement Register list that includes all open and closed improvements in one list.

**Improvement Register**




| Number | Short description | Priority | CIM Coordinator | Effort estimate | Benefits | State |
|---|---|---|---|---|---|---|
| CIM0000152 | Increase requester to fulfiller ratio to 300/1 | 4 - Low | Adela Cervantsz | Small | Medium | Closed |
| CIM0000143 | % of new critical problems charts indicate multiple issues with product quality | 4 - Low | Angelo Ferentz | Extra Large | High | Closed |
| CIM0000154 | Improve Performance (Front end and backend) | 4 - Low | Alejandro Mascall | Medium | Medium | Closed |
| CIM0000153 | Improve consumption of key services (Faster Time to Value) | 4 - Low | Abel Tuter | Medium | Medium | Closed |
| CIM0000145 | Increase in the number of recommendations for improvement received from process owners | 4 - Low | Adela Cervantsz | Medium | Medium | Closed |
| CIM0000150 | CMDB: Manage and protect the integrity of CIs through out the service lifecycle | 4 - Low | Alejandro Mascall | Large | High | Closed |
| CIM0000151 | Global alignment of process deployment within and across banners and accounts | 4 - Low | Abel Tuter | Large | Medium | Canceled |
| CIM0000149 | CSF Reduced time and effort required to support and maintain knowledge management | 4 - Low | Adela Cervantsz | Large | Medium | Assess |

## Embedded Performance Analytics scorecard

Use the Analytics Hub embedded in the Improvement Initiative form for continuous KPI monitoring, and to track the progress of the KPI improvement during the lifecycle of the

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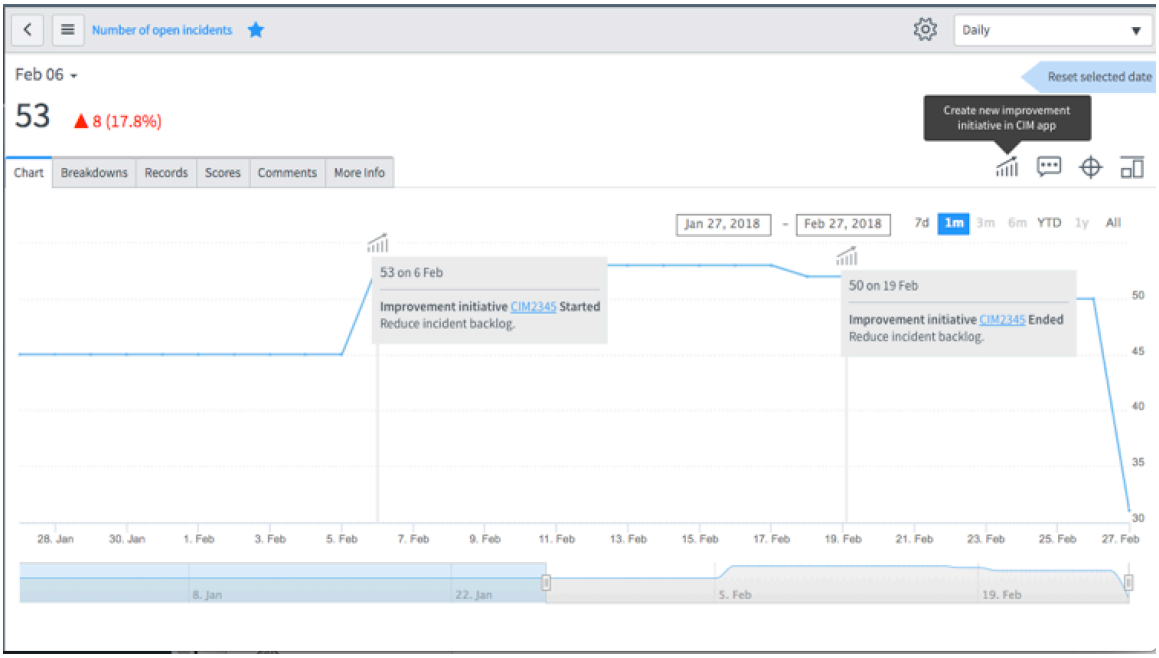
improvement. The KPI scorecard is useful so you can monitor the incremental benefits of the KPI, or adjust CIM tasks and assignments to meet your improvement goal, if needed.

**Embedded KPI scorecard**




The improvement icon ( ) indicates the start and end dates that are tracked on the KPI scorecard chart.

Scorecards are also shown for any KPIs listed in Impacted KPIs related list on the Improvement Initiative form.

### Related topics

- Continual Improvement Management reference
- Improvement field descriptions

## Accept an improvement

Accept and assign a new improvement request so it can be assessed for approval. You can reject the improvement request if it does not align with company strategic objectives.

### Before you begin

Role required: sn_cim.improvement_manager, sn_cim.improvement_coordinator

### About this task

**Continual Improvement Management**




Precondition: Improvement Requester created an improvement request.

### Procedure

1. Identify the new improvement request.
   a. Navigate to **Continual Improvement** > **Open**.
   b. In the Improvement Register list, open an improvement in the **New** state.

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2. Align the improvement request with company strategic objectives, and assign an Improvement Coordinator.

   a. On the Improvement Initiative form, unlock the **Strategies** field to access your company strategic objectives, then click the lookup list.

   b. Select the enterprise strategy aligned with the improvement request.

   **Note:**
   Only the Improvement Manager can create a strategy.

   c. Click the **CIM Coordinator** lookup list and select an Improvement Coordinator to manage the improvement.

3. Complete the fields for business service, business process, priority, effort estimate, benefits, and why this improvement is important.
4. In the header bar, click **Accept** to progress the improvement request to the **Assess** state. Improvement Coordinator is notified of assignment.
5. Complete the content in the Goals, Details, and Schedule tabs on the Improvement Initiative form.

## Example: Accept improvement request

In the process of reviewing KPI performance in the Performance Analytics application, the incident manager noticed the **Average time to resolve an incident** KPI scorecard was too high (24 hours).

As part of the acceptance process, the Improvement Manager determined that KPI performance improvement aligned with the Automation/Effort Reduction strategic objective, assigned the Improvement Coordinator that drives KPI improvements, and accepted the improvement request.

### Improvement Initiative form

| Field | Value |
|---|---|
| Number | CIM0000135 (set internally) |
| Business service | IT Services |
| Business Process | Incident Management |
| CIM Coordinator | Adela Cervantsz |
| Approver Group | CIM Approvers |
| Strategies | Automation/Effort Reduction |
| State | Accepted |
| Priority | 4 - Low |
| Effort estimate | Medium |
| Benefits | High |
| Percent complete | 0 |
| Short description | Improve average time to resolve an incident by 25% |

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### Improvement Initiative form (continued)

| Field | Value |
|---|---|
| Business justification | Average time to resolve an incident time is bad compared to Industry average. I compared our value with global values from companies in the same industry using the Benchmarks application. |

### Goals tab

| Field | Value |
|---|---|
| Success measurement method | Automated: PA Indicator |
| Improvement KPI | Average close time of incidents |
| Breakdown | -- |
| Aggregation | -- |
| Base value | 100 |
| Percentage improvement | 25 |
| Target value | 75 |
| Target review date | 2018-06-30 |
| Expected outcomes | Improvement in average time to resolve an incident. |

### Details tab

| Field | Value |
|---|---|
| Requested for | Mabel Weeden |
| Type | Process |
| Watch list | -- |

### Schedule tab

| Field | Value |
|---|---|
| Planned start date | 2018-03-18 |
| Planned end date | 2018-06-19 |
| Actual start date | 2018-03-11 |
| Actual end date | -- |

### Notes tab

| Field | Value |
|---|---|
| Additional comments (Customer visible) | -- |
| Work notes | -- |

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**Related topics**

Improvement field descriptions

## Prepare an improvement

Once the improvement is approved, you can create CIM phases, tasks, and identify impacted KPIs. The Improvement Coordinator for the improvement works with the Improvement Manager to plan implementation.

### Before you begin

Role required: sn_cim.improvement_manager, sn_cim.improvement_coordinator

### About this task

Plan your implementation as phases to keep track of your project milestones. Add tasks to the phase and monitor the progress for the milestones. You can also track your goals by creating tasks directly from the initiatives.




Preconditions:

- Improvement Requester created the improvement request.
- Improvement Manager accepted and assigned the improvement request.
- Approver group member assessed and approved the improvement.

### Procedure

1. Determine phases and tasks needed for the improvement.
   Improvement Manager and Improvement Coordinator meet to determine the tasks required to complete the improvement, and whether multiple phases are required.
2. Set up CIM phases to track CIM tasks.
   a. Navigate to **Continual Improvement** > **Open** and open the improvement in the **In Progress** state.
   b. In the CIM Phases related list, click **New** and fill in the description and planned end date.
   c. Right-click the form header and select **Save**.
   d. In the CIM Tasks related list, click **New** to create a CIM task.
   e. In the **Parent** field, select the a CIM Phase record to which you want to associate the CIM task.
   f. Set the CIM task attributes, including assignment, priority, state, planned end date, and short description.
   g. Click **Submit**.
3. Create and assign CIM tasks for an improvement.
   a. In the CIM Tasks related list, click **New** to create a CIM task.
   By default, the CIM task is linked to the CIM initiative. To track the task within a phase, in the **Parent** field, select the a CIM Phase record to which you want to associate the CIM task.

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**b.** Set the CIM task attributes, including assignment, priority, state, planned end date, and short description.

**Note:**

- When the planned end date for a CIM task is updated, the planned end date that the CIM initiative that the task is associated with also gets updated. When the state for a CIM task is moved to Work In Progress, the Actual Start Date field is automatically updated with the current date.
- When the task is assigned, the task assignee receives an email notification.

4. To create a separate application task for an integrated application, click the related link for that application task.
5. To monitor a KPI with the improvement, add a record to the Impacted KPIs tab.
6. Meet with CIM task owners to oversee status, monitor work completed, add or update tasks and phases, and track overall progress of the improvement to completion.

   **a.** Oversee the progress of CIM tasks with task owners on a regular basis until all tasks are presented as complete.

   **b.** On the Improvement Initiative form, verify that all tasks in the CIM Tasks related list are **Closed Complete**.
   The improvement coordinator and task assignee receive an email notification when the task is moved to **Close Incomplete**, **Closed Skipped**, or **Closed Complete** state.

   **c.** On the Improvement Initiative form, verify that all phases in the CIM Phases related list are 100% complete.

7. Click **Review** in the header bar to request the improvement be reviewed by the Improvement Manager for closure.

## Example: Implement improvement

In the process of reviewing KPI performance in the Performance Analytics application, the incident manager noticed the **Average time to resolve an incident** KPI scorecard was too high (24 hours).

As part of the implementation process, the Improvement Manager and Improvement Coordinator determined the work required in the next three to six months to complete the improvement, with a target review date 3 months after start.

- Configured default CIM Phase 1 (added two CIM tasks), and created CIM Phase 2 (added two CIM tasks).
- Created a Change Management application task record (CHG0030001) associated with CIM Task 2 using the **Create Change** related link, and set the change record attributes.
- Added four KPIs to the Impacted KPIs tab to monitor with the improvement.

Improvement Coordinator met with CIM task owners regularly to oversee status and monitor work completed, and set the improvement status to review after all implementation was complete.

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### CIM Phase 1 - CIM Tasks 1 and 2

| Field | Value |
|---|---|
| Number | CIMT0000116 (assigned internally) |
| Parent | CIM0000135 |
| Percent complete | 0 |
| Planned end date | 2018-06-19 |
| Actual end date | -- |
| Short description | Resolved incident and reassigned count improvements |
| CIM Task 1 | |
| Number | CIMT0000118 (assigned internally) |
| Parent | CIMT0000116 |
| Configuration item | -- |
| Active | (Selected) |
| Implementing task | -- |
| Assigned to | Bernard Laboy |
| Improvement register | CIM0000135 |
| Priority | 4 - Low |
| State | Open |
| Planned end date | 2018-06-19 |
| Short description | Improve % of incidents resolved by first assigned group by using self service and more automation |
| Work notes | -- |
| CIM Task 2 | |
| Number | CIMT0000119 (assigned internally) |
| Parent | CIMT0000116 |
| Configuration item | -- |
| Active | (Selected) |
| Implementing Task | CHG0030001 |
| Assigned to | Change Manager |
| Improvement register | CIM0000135 |
| Priority | 4 - Low |
| State | Open |
| Planned end date | 2018-06-19 |

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### CIM Phase 1 - CIM Tasks 1 and 2 (continued)

| Field | Value |
|---|---|
| Short description | Reduce the reassigned count by using ServiceNow Auto Categorization and Auto Assignment models |
| Work notes | -- |

### CIM Phase 2 - CIM Tasks 1 and 2

| Field | Value |
|---|---|
| Number | CIMT0000120 |
| Parent | CIM0000135 |
| Percent complete | 0 |
| Planned end date | 2018-06-19 |
| Actual end date | -- |
| Short description | Knowledge improvements and self-service improvements |
| CIM Task 1 | |
| Number | CIMT0000121 (assigned internally) |
| Parent | CIMT0000120 |
| Configuration item | -- |
| Active | (Selected) |
| Implementing task | -- |
| Assigned to | David Loo |
| Improvement register | CIM0000135 |
| Priority | 4 - Low |
| State | Open |
| Planned end date | 2018-06-19 |
| Short description | Add new KB articles for common issues |
| Work notes | -- |
| CIM Task 2 | |
| Number | CIMT0000123 (assigned internally) |
| Parent | CIMT0000120 |
| Configuration item | -- |
| Active | (Selected) |
| Implementing task | -- |
| Assigned to | Adela Cervantsz |

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### CIM Phase 2 - CIM Tasks 1 and 2 (continued)

| Field | Value |
|---|---|
| Improvement register | CIM0000135 |
| Priority | 4 - Low |
| State | Open |
| Planned end date | 2018-06-19 |
| Short description | Provide training and enablement training for new apps |
| Work notes | -- |

### Change Request form

| Field | Value |
|---|---|
| Number | CHG0030001 (set internally) |
| Requested by | Improvement Manager |
| Configuration item | -- |
| Planned start date | 2018-03-18 |
| Planned end date | 2018-06-19 |
| Type | Normal |
| State | New |
| Priority | 4 - Low |
| Impact | 3 - Low |
| Risk | Moderate |
| Short description | Reduce the reassigned count by using ServiceNow Auto Categorization and Auto Assignment models. |
| Description | -- |

### Impacted KPIs related list

| Field | Value |
|---|---|
| Impacted KPI | • % of incidents resolved by first assigned group<br>• % of incidents resolved on same day opened<br>• % of incidents resolved without reassignment<br>• Average age open incidents |

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**Related topics**

Improvement field descriptions

Improvement integration with other applications

## Assess an improvement for approval

Once accepted and set to assess, Approver group members evaluate the improvement for approval before implementation can begin.

### Before you begin

Role required: None (must be a member of the Approver group)

### About this task




**Note:**
Only one Approver group member needs to approve the improvement before moving to the next state. To require additional approvers, configure the CIM Approval workflow in Flow Designer.

The default expiration period for approval requests is seven business days. Pending approval requests are automatically canceled after seven days but can be resubmitted for approval.

Preconditions:

- Incident manager created an improvement request.
- Improvement Manager accepted and assigned the improvement request.

By default, an improvement requires approval before it can progress to the Implement state. You can disable the approval requirement using the *sn_cim.need_approval* property. When disabled, the **Approver group** field and the **Approvers** related list on the Improvement Initiative form are not shown.

### Procedure

1. Navigate to **All** > **Self Service** > **My Approvals**.
2. On the Approval form, scroll down to the **Summary of Item being approved** section and assess the details of the improvement, including alignment with strategic objectives (strategies), business service, business process, priority, effort estimate, benefits, and why this improvement is important.
3. Click **Approve** in the header bar to approve the improvement.
   The improvement is ready for implementation by the Improvement Manager and Improvement Coordinator.

   A default CIM phase (CIMT number) is automatically created.

## Example: Approve an improvement

In the process of reviewing KPI performance in the Performance Analytics application, the incident manager noticed the **Average time to resolve an incident** KPI scorecard was too high (24 hours).

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As part of the approval process, an Approver group member assessed the details of the improvement and approved it to begin implementation.

**Approval form**

| Field | Value |
|---|---|
| Approver | Howard Johnson |
| State | Approved |
| Approving | CIM0000135 |
| Comments | -- |

**Related topics**

Improvement field descriptions

## Review and close an improvement

Once all tasks in each phase of the improvement have been completed, the Improvement Coordinator sets the improvement to review for the Improvement Manager to close.

### Before you begin

Role required: sn_cim.improvement_manager, sn_cim.improvement_coordinator

### About this task

**Continual Improvement Management Review and Close Process**




Preconditions:

- Incident manager created an improvement request.
- Improvement Manager accepted and assigned the improvement request.
- Approver group member approved the improvement.
- Improvement Manager and Improvement Coordinator implemented the improvement.

### Procedure

1. Review the improvement for closure.
   a. Navigate to **Continual Improvement** > **Under Review**.
   b. In the Improvement Register list, open the improvement in the **Monitor/Review** state.
   c. On the Improvement Initiative form, verify that all phases in the CIM Phases related list are 100% complete.
2. Verify the improvement has met the improvement goal.
3. Close the improvement.
   a. In the Closure Notes tab, set the closure code, achieved outcome category, and close notes.
   b. Click **Close** in the header bar to close the improvement.
   The improvement is no longer shown in the Open Improvement Register list.




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## Example: Close improvement

In the process of reviewing KPI performance in the Performance Analytics application, the Incident Manager noticed the **Average time to resolve an incident** KPI scorecard was too long (24 hours).

As part of the review process for **Improve average time to resolve an incident by 25%** improvement, the Improvement Manager verified the work for the improvement is complete (Improvement Initiative form and CIM Phases related list shows 100% complete).

The Improvement Manager also verified the improvement in two places before closing the improvement.

- Performance Analytics now shows that the **Average time to resolve an incident** KPI has a value of 16 hours, which is more improvement than the target value of 18 hours (18 hours is 25% faster than the previous average of 24 hours).
- Benchmarks application now shows that the company result for the **Average time to resolve an incident** KPI has a value of 16 hours, which is 2 hours better than the global industry average.

### CIM Phase 1- CIM Tasks 1 and 2

| Field | Value |
|---|---|
| Number | CIMT0000116 (assigned internally) |
| Percent complete | *100 |
| Actual end date | *2018-03-14 |
| Short description | Resolved incident and reassigned count improvements |
| CIM Task 1 | |
| Number | CIMT0000118 (assigned internally) |
| Active | *(Not selected) |
| State | *Closed Complete |
| Short description | Improve % of incidents resolved by first assigned group by using self service and more automation |
| Work notes | *Self service and automation implemented to improve % of incidents resolved by first assigned group |
| CIM Task 2 | |
| Number | CIMT0000119 (assigned internally) |
| Active | *(Not selected) |
| State | *Closed Complete |
| Short description | Reduce the reassigned count by using ServiceNow Auto Categorization and Auto Assignment models |

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### CIM Phase 1- CIM Tasks 1 and 2 (continued)

| Field | Value |
|---|---|
| Work notes | *Auto Categorization and Auto Assignment implemented to reduce reassigned count |

### CIM Phase 2-CIM Tasks 1 and 2

| Field | Value |
|---|---|
| Number | CIMT0000120 |
| Percent complete | *100 |
| Actual end date | *2018-03-14 |
| Short description | Knowledge improvements and self service improvements |
| CIM Task 1 | |
| Number | CIMT0000121 (assigned internally) |
| Active | *(Not selected) |
| State | *Closed Complete |
| Short description | Add new KB articles for common issues |
| Work notes | *These new KB articles were added |
| CIM Task 2 | |
| Number | CIMT0000123 (assigned internally) |
| Active | *(Not selected) |
| State | *Closed Complete |
| Short description | Provide training and enablement training for new apps |
| Work notes | *Provided training for these new apps |

### Closure Notes tab

| Field | Value |
|---|---|
| Closure code | *Successful |
| Achieved outcome category | *Customer Satisfaction |
| Closure notes | *All improvements verified, closing improvement initiative |

### Improvement Initiative form

| Field | Value |
|---|---|
| State | *Closed Complete |
| Percent Complete | *100 |

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**Related topics**

- Improvement field descriptions
- Improvement integration with other applications

# Continual Improvement Management reference

Continual Improvement Management reference content including states and field descriptions.

## Improvement states

The state of an improvement indicates the progress of the improvement in the process.

| State | Description |
|---|---|
| New | Improvement request is created either manually, or from within an integrated application by an Improvement Requester.<br><br>Integrated applications include Benchmarks, CMDB, Coaching, Demand, GRC, Major Incident Management, Problem Management, and Survey Management.<br><br>**States** list:<br>• Accepted<br>• Canceled<br><br>List Controls menu ( ≡ ) options on the Improvement Initiative form: Copy Initiative. |
| Accepted | Improvement request aligns with company strategic objectives and is considered valid by the Improvement Manager.<br><br>**States** list:<br>• Assess<br>• Canceled<br><br>List Controls menu ( ≡ ) options on the Improvement Initiative form: Copy Initiative. |
| Canceled | Improvement is not accepted (**Reject** action is selected by the Improvement Manager), or can be canceled directly in any state.<br><br>**Note:**<br>Any CIM tasks created for the improvement are also canceled. |

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| State | Description |
| --- | --- |
| | List Controls menu ( ) options on the Improvement Initiative form: Copy Initiative. |
| Assess | All improvement attributes are set by the Improvement Manager, including business process, business service, and success measurement details.<br><br>The improvement is waiting to be assessed by an Approver group member for approval.<br><br>**States** list:<br>• Approved<br><br>(only shown for an Approver group member)<br><br>• Canceled<br><br>List Controls menu ( ) options on the Improvement Initiative form:<br>• Copy Initiative<br>• Revert to Accepted |
| Approved | The improvement is assessed and approved by an Approver group member and is ready for implementation.<br><br>The improvement is set to implement by the Improvement Manager.<br><br>**States** list:<br>• Implement<br>• Canceled<br>• Assess (for reapproval)<br><br>If additional tasks were added, or if the target has changed, the improvement may need to go through approval again.<br><br>List Controls menu ( ) options on the Improvement Initiative form:<br>• Copy Initiative<br>• Submit for Re-Approval |
| In Progress | CIM task creation is completed by the Improvement Manager or Improvement Coordinator. CIM tasks are completed by the task owners. |

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| State | Description |
| --- | --- |
| | The Improvement Coordinator determines either that the improvement is complete and sets it to review, or that progress is halted and places it on hold.<br><br>**States** list:<br>• Monitor/Review<br>• On Hold<br>• Assess (for reapproval)<br><br>If additional tasks were added, or if the target has changed, the improvement may need to go through approval again.<br><br>List Controls menu ( ) options on the Improvement Initiative form:<br>• Copy Initiative<br>• Submit for Re-Approval |
| On Hold | Improvement is no longer in progress but may resume at a later date.<br><br>The Improvement Manager determines the outcome of the improvement including whether it should go back to implementation, or be closed or canceled.<br><br>**States** list:<br>• Implement<br>• Closed<br>• Canceled<br><br>**Note:**<br>When an improvement is placed on hold, all active CIM tasks (not closed or canceled) are also placed on hold, but the state can be changed manually.<br><br>When the improvement is taken off hold, all active CIM tasks (not closed or canceled) are set to Open state (unless they were changed manually).<br><br>List Controls menu ( ) options on the Improvement Initiative form: Copy Initiative. |
| Monitor/Review | All CIM tasks for the improvement are complete, improvements have been measured, and no further action is required by the task owners. |

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| State | Description |
| --- | --- |
| | The improvement is reviewed for closure by the Improvement Manager.<br><br>**States** list:<br>• Implement<br>• Closed<br>• Assess (for reapproval)<br><br>If additional tasks were added, or if the target has changed, the improvement may need to go through approval again.<br><br>List Controls menu ( ) options on the Improvement Initiative form: Copy Initiative. |
| Closed | Improvement is complete and is added to the Closed Improvement Register list. |
| Delete | Improvement is removed from the Improvement Register list.<br><br>Available in each state but only to the Improvement Manager. |

## CIM task states

An improvement contains of one or more CIM tasks to complete the improvement. A CIM task is assigned to an owner to be responsible for the work specified.

The state of a CIM task indicates the level of progress for the task.

| State | Description |
| --- | --- |
| Pending | State of a CIM task added before the improvement has been approved.<br><br>If a CIM task is added after the improvement is approved, the CIM task is set to Pending state until the improvement is approved again.<br><br>Once approved, the CIM task is set to Open state.<br><br>If rejected, the CIM task remains in the Pending state. |
| Open | State of a new CIM task for an improvement that has been approved. |

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| State | Description |
| --- | --- |
| Work in Progress | State of a CIM task for which work has begun. |
| Closed Complete | State of a closed CIM task that has been completed. |
| Closed Incomplete | State of a closed CIM task that has been closed but not fully completed. |
| Closed Skipped | State of a closed CIM task for which no work has been done. |
| On Hold | State of a CIM task for an improvement set to On Hold state.<br><br>The state of a CIM task on hold can be manually changed to Open or Work In Progress states.<br><br>**Note:**<br>When an improvement is placed on hold, all active CIM tasks (not closed or canceled) are also placed on hold, but the state can be changed manually.<br><br>When the improvement is taken off hold, all active CIM tasks (not closed or canceled) are set to Open state (unless they were changed manually). |

## CIM approver states

Each improvement needs at least one approval to progress to the Implement state. The Approvers related list in the improvement contains a list of user approval records and the state of the approval.

The users in the Approvers related list belong to the **Approver Group** specified on the Improvement Initiative form. Once the improvement has been approved by an Approver Group member, approval from other members is no longer required to progress the improvement. However, other Approver Group members can still set their individual approval state.

To require additional approvers, configure the CIM Approval workflow in Flow Designer.

## Improvement process flow

**Process flow for Continual Improvement Management**




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| Process flow | Role | Description | Next action |
|---|---|---|---|
| **Create Improvement Initiative** | Improvement Requester | The need is determined for an improvement and an improvement request is created. | Click **Submit.**<br><br>Required: Short Description |
| New | Improvement Manager | Acceptance is determined by verifying that the improvement objective aligns to a company strategic objective, and an Improvement Coordinator is assigned. | Click **Accept.**<br><br>Required:<br>• Improvement Coordinator<br>• Strategies |
| Accepted | Improvement Manager | Other attributes are set and the improvement request is ready to be assessed for approval (by Approver group members). | Click **Assess.**<br><br>(Waiting for approval)<br><br>Approver group members are notified.<br><br>Required: Approver Group |
| Assess | CIM approver<br><br>(member of the Approver group)<br><br>CIM approver states | The improvement attributes are assessed for approval from the Approvers related list. | Click **Approved.** |
| Approved | Improvement Manager or Improvement Coordinator | Improvement Coordinator and Improvement Manager work together to determine what is needed to ready the improvement for implementation. | Click **Implement**.<br><br>**Actual start date** (Schedule tab) is automatically populated. |
| Implement | Improvement Coordinator | Implementation of the improvement begins with the assigned task owners.<br><br>Any problem, change, or knowledge submission is shown in the corresponding related list. | Click **Review** if implementation is complete.<br><br>Click **On Hold** if the process has halted.<br><br>Required: On Hold Reason |

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| Process flow | Role | Description | Next action |
|---|---|---|---|
| On Hold | Improvement Manager or Improvement Coordinator | Implementation for the improvement has halted (**On Hold** state) but the process flow remains in **Implement**. | Click **Implement** to continue the process.<br><br>Click **Close** if no further work will be done. |
| Review | Improvement Manager | The improvement attributes are reviewed for completeness and efficacy for closure. | Click **Close**.<br><br>Required: Closure Notes tab<br><br>**Actual end date** is automatically populated. |

## Improvement integration with other applications

You can create an improvement request from within multiple integrated applications. You can also create many application tasks from within an improvement initiative. Set the Continual Improvement Management attributes property to determine which field values get copied to integrated application tasks.

Set Continual Improvement Management properties for integration with other applications.

As part of Continual Improvement Management integration with other applications, improvement requests can be created from within other applications and, conversely, records for other applications can be created from within an improvement initiative (or CIM task).

Multiple tasks from outside integrated applications can be linked to a single improvement initiative (or CIM task), and multiple CIM tasks can be linked to a single integrated application task for maximum flexibility when creating improvements.

An improvement initiative can be created from these applications.

- Benchmarks
- Coaching
- Configuration Management Database (CMDB)
- Customer Service Management
- Demand Management
- Governance, Risk, and Compliance (GRC)
- Incident Management
- Problem Management
- Survey Management

As part of an improvement initiative, these records can be created.

- Demand record
- Project (optional)

As part of a CIM task, these records can be created:

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- change record
- Coaching opportunity
- Knowledge management
- Create a story

## Integration property

You can set field values that get copied to the improvement request when the improvement request is created from within another application.

To access Continual Improvement Management properties, navigate to **Continual Improvement** > **Administration** > **Properties**.

**Note:**
System admin role is required to set Continual Improvement Management properties.

| Property | Description |
| --- | --- |
| List of attributes (comma-separated) that will be copied from the originating improvement initiative.<br><br>sn_cim.initiative_copy_attributes | Specifies the field values that are copied from the originating improvement initiative to the application task record (for example, demand, project, change record) created from the improvement initiative.<br>• Short description (short_description)<br>• Description (description)<br>• Priority (priority)<br>• CIM estimate (cim_estimate)<br>• Benefit (benefit)<br>• Assigned to (assigned_to)<br>• Strategic objective (strategic_objective)<br>• Business process (business_process)<br>• Business service (business_service)<br>• Approver group (approver_group)<br>• Type (type) |

## Create Improvement Initiative related link

- Benchmarks

  When you create an improvement initiative from Benchmarks, the improvement is associated with the Benchmarks recommendation candidate, and the Benchmarks KPI is added to the improvement initiative.

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| Benchmarks recommendation candidate | Improvement initiative |
| --- | --- |
| ○ **Create Improvement Initiative** related link is added.<br>○ **Create Improvement Initiative** related link is replaced by the **CIM number** related link once an improvement initiative is created. | Benchmarks recommendation KPI is added to the **Improvement KPI** field on the Goals tab. |

- Coaching

  When you create an improvement initiative from Coaching, the Improvement Initiatives related list is added to the coaching opportunity, and the coaching opportunity details are added to the improvement initiative.

| Coaching opportunity | Improvement initiative |
| --- | --- |
| ○ **Create Improvement Initiative** related link is added.<br>○ Improvement Initiatives related list is added that contains the improvement initiative (CIM) record. | Coaching opportunity record to which the improvement initiative is linked is added to the **Source/Parent** field in the Details tab. |

- Configuration Management Database (CMDB)

  When you create an improvement initiative from CMDB, the Improvement Initiatives related list is added to the task, and the Remediate Duplicate Task details are added to the improvement initiative.

| Remediate Duplicate Tasks record | Improvement initiative |
| --- | --- |
| ○ **Create Improvement Initiative** related link is added.<br>○ Improvement Initiatives related list is added that contains the improvement initiative (CIM) record. | Remediate Duplicate Tasks record to which the improvement initiative is linked is added to the **Source/Parent** field in the Details tab. |

- Demand Management

  When you create an improvement initiative from Demand Management, the improvement initiative is associated with the demand record, and the demand details are added to the improvement initiative.

| Demand record | Improvement initiative |
| --- | --- |
| ○ **Create Improvement Initiative** related link is added.<br>○ Improvement initiative (CIM) record is set in the **Improvement** field. | Demand record to which the improvement initiative is linked is added to the **Source/Parent** field in the Details tab. |

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| Demand record | Improvement initiative |
| --- | --- |
| | **Note:** When the improvement is closed, the demand record is set to complete. |

- Governance, Risk, and Compliance (GRC)

  When you create an improvement initiative from GRC, the improvement initiatives related list is added to the issue, and the issue details are added to the improvement initiative.

| Issue record | Improvement initiative |
| --- | --- |
| ○ **Create Improvement Initiative** related link is added.<br>○ Improvement Initiatives related list is added that contains the improvement initiative (CIM) record. | Issue record to which the improvement initiative is linked is added to the **Source/Parent** field on the Details tab. |

- Incident Management

  When you create an improvement initiative from Incident Management, the improvement initiative is associated with the incident record, and the incident details are added to the improvement initiative.

| Incident record | Improvement initiative |
| --- | --- |
| **Create Improvement Initiative** related link is added.<br>**Note:** You must customize the Incident form to show the Improvement Initiatives related list that contains the improvement initiative (CIM) record. | Incident (INC) record is added to the **Source/Parent** field on the Details tab. |

- Problem Management

  When you create an improvement initiative from Problem Management, the improvement is associated with the problem record, and the problem details are added to the improvement initiative.

| Problem record | Improvement initiative |
| --- | --- |
| **Create Improvement Initiative** related link is added. | Problem (PRB) record is added to the **Source/Parent** field on the Details tab. |

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| Problem record | Improvement initiative |
| --- | --- |
| **Note:** You must customize the Problem form to show the Improvement Initiatives related list that contains the improvement initiative (CIM) record. | |

| Problem record state | Improvement initiative state |
| --- | --- |
| Open | New |
| Pending change | In Progress |
| Closed/Resolved | Closed |

- Survey Management and Assessments

  When you create an improvement initiative from Survey Management, the improvement is associated with the Survey, and the survey details are added to the improvement initiative. (Assessment Metric Type [Survey view] record)

| Survey definition record | Improvement initiative |
| --- | --- |
| ○ **Create Improvement Initiative** related link is added.<br>○ Improvement Initiatives related list is added that contains the improvement initiative (CIM) record. | Survey definition (Assessment Metric Type [Survey view]) record is added to the **Source/ Parent** field on the Details tab. |

## Related links in improvement initiatives

- **Create Demand**

  When you create a demand record from an improvement initiative, the demand record is associated with the improvement initiative, and the Demands related list is added to the improvement initiative.

| Improvement initiative | Demand record |
| --- | --- |
| ○ **Create Demand** related link is added.<br>○ Demands related list is added that contains the demand (DMND) record. | ○ **Continual Improvement Management** is set in the **Type** field.<br>○ Improvement initiative (CIM) record is set in the **Improvement** field. |

- **Create Project**

  When you create a project record from an improvement initiative, the Projects related list is added to the improvement initiative.

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| Improvement initiative | Project record |
| --- | --- |
| ○ **Create Project** related link is added.<br>○ Projects related list is added that contains the project (PRJ) record. | No change. |

- **Create PA Indicator** related link

  Create a Performance Analytics automated indicator.

- **Show Benchmarks** related link

  Shows the benchmarks for the KPI specified in the Improvement Initiative form **Improvement KPI** field using the Benchmarks application.

## Related links in improvement initiative CIM tasks

**Note:**
Related links in CIM tasks are shown only when a CIM task is in Open, Work in Progress, or On Hold state.

- **Create Change**

  When you create a change (CHG) record from an improvement initiative CIM task, the change record is added to the Change Requests related list in the CIM task.

| Improvement initiative CIM task | Change record |
| --- | --- |
| Change (CHG) record is added to the Change Requests related list. | No change. |

| Improvement initiative CIM task state | Change record state |
| --- | --- |
| New | New |
| In Progress | Implement |
| Closed | Closed |

- **Create Coaching Opportunity**

  When you create a coaching opportunity from an improvement initiative CIM task, the coaching opportunity record is added to the Coaching Opportunities related list in the CIM task.

| Improvement initiative CIM task | Coaching opportunity record |
| --- | --- |
| Coaching opportunity (COP) record is added to the Coaching Opportunities related list. | No change. |

- **Create Knowledge**

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When you create a Knowledge Management knowledge base article (KB) record from an improvement initiative CIM task, the KB article record is added to the Knowledge Articles related list in the CIM task.

| Improvement initiative CIM task | Knowledge base article record |
|---|---|
| Knowledge article record is added to the Knowledge Articles related list. | No change. |

- **Create Story**

  When you create an Agile Management story record from an improvement initiative CIM task, the story record is added to the Stories related list in the CIM task.

| Improvement initiative CIM task | Story record |
|---|---|
| The story (STRY) record is added to the Stories related list. | No change. |

## Integration with other applications

| Application | Application record | Create improvement initiative | Create application record from improvement initiative |
|---|---|---|---|
| GRC | | | |
| Audit Management | Issue record | X | -- |
| Strategic Portfolio Management | | | |
| Agile Development | Story record | -- | X |
| Demand Management | Demand record | X | X |
| Project Management | Project record | -- | X |
| IT Operations Management | | | |
| CMDB | Remediate Duplicate Task record | X | -- |
| IT Service Management | | | |
| Benchmarks | Benchmarks recommendation | X | -- |
| Change Management | Change record | -- | X |
| Major Incident Management | Post incident review workbench | X | -- |
| Problem Management | Problem record | X | -- |
| Platform Capabilities | | | |
| Knowledge Management | Knowledge base article | -- | X |
| Survey Management | Survey | X | -- |

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| Application | Application record | Create improvement initiative | Create application record from improvement initiative |
|---|---|---|---|
| Service Management | | | |
| Coaching | Coaching opportunity | X | X |

## Extension point

You can use the Continual Improvement Management integration extension point to define an application to be integrated.

Extend `sn_cim.CIMIntegrationAPI` extension point to integrate Continual Improvement Management with other applications.

**Related topics**

- Using extension points to extend application functionality
- Using scripted extension points in server-side scripts
- Using UI extension points in server-side UI macros
- Using client extension points in client-side UI scripting

## Improvement field descriptions

Improvement Initiative form and related field descriptions.

## Improvement Initiative form

| Field | Description |
|---|---|
| Number | Unique CIM number. |
| Business service | CMDB Business service improved by the improvement initiative. |
| Service offering | Service offering associated with this improvement initiative. |
| Business process | Business process improved by the improvement initiative.<br><br>When a business process is selected, the improvement area **Type** field on the **Details** tab is automatically set to Process. |
| CIM Coordinator | User primarily responsible for ensuring the completion of the improvement initiative.<br><br>The CIM Coordinator must have the Improvement Coordinator role (sn_cim.improvement_coordinator). |
| Approver group | Group of users that have permission to approve the improvement initiative. |

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| Field | Description |
| --- | --- |
| | CIM Approvers group is added with Continual Improvement Management. Default is empty. |
| Strategies | Strategic objectives impacted by the improvement initiative. Multiple strategic objectives can be selected. Strategic objectives can be added from the lookup list.<br><br>The lookup list contains both Continual Improvement Management strategic objectives and business enterprise strategies to align with the improvement initiative.<br><br>An enterprise strategy can be added from the navigation menu **Continual Improvement** > **Enterprise Strategies**.<br><br>Also accessible through **Business Planner** and **Organization** navigation menus.<br><br>**Note:**<br>If the improvement initiative does not align with a company strategic objective, you can click **Reject** in the header bar to reject the improvement initiative. |
| State | State of the improvement initiative. This field is read only.<br>• New<br>• Accepted<br>• Assess<br>• Approved<br>• In Progress<br>• On Hold<br>• Monitor/Review<br>• Closed<br>• Canceled |
| On hold reason | Reason for putting the improvement initiative on hold.<br><br>**Note:**<br>This field is shown only when the state is on hold.<br><br>When an improvement initiative is placed on hold, all CIM tasks are also placed on hold, but the state can be changed manually.<br><br>When the improvement initiative is taken off hold, the CIM tasks are returned back to their previous state unless they were changed manually. |
| Priority | Sequence in which an incident or problem is to be worked on, based on impact and urgency. |

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| Field | Description |
| --- | --- |
| | • 1 - Critical<br>• 2 - High<br>• 3 - Moderate<br>• 4 - Low<br>• 5 - Planning |
| Effort estimate | Estimate of effort to complete all required tasks for the improvement initiative.<br>• Small<br>• Medium<br>• Large<br>• Extra Large |
| Benefits | Expected level of benefits achieved by completing the improvement initiative. |
| Percent complete | Percentage of work completed. The percentage is based on the completed state of the CIM phases that belong to this improvement initiative. For example, if there are five CIM phases, each contributes to 20% completion. |
| Short description | Brief explanation of the improvement initiative. |
| Business justification | Description about the importance of the improvement and additional details that includes metrics or KPIs used to measure the success. |

## Goals tab

| Field | Description |
| --- | --- |
| Success measurement method | • Automated: PA Indicator: An improvement KPI.<br>• Reports: Reports to track progress. Users who do not use performance analytics can add reports to track the initiatives.<br>• Survey and Assessment: An Assessment metric type.<br>• Manual: All other types. |
| Improvement KPI | Primary KPI used to measure the improvement of the improvement initiative.<br>The Show Score Card icon launches the Performance Analytics score card for the improvement KPI. |

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| Field | Description |
| --- | --- |
| | **Note:**<br>This field is shown only when the **Success Measurement Method** field is set to **Automated: PA Indicator**. |
| Breakdown | The breakdown of the improvement KPI, if one exists.<br>**Note:**<br>This field is shown only when an improvement KPI is selected for the **Automated: PA Indicator** success measurement method. |
| Element | The element of the KPI breakdown.<br>**Note:**<br>This field is shown only when a breakdown is selected. |
| 2nd Breakdown | The second-level breakdown of the improvement KPI, if one exists.<br>**Note:**<br>This field is shown only after the first breakdown is selected. |
| 2nd Element | The element of the second-level KPI breakdown.<br>**Note:**<br>This field is shown only when a second-level breakdown is selected. |
| Time Series | Time series for the improvement KPI.<br>**Note:**<br>This field is shown only when an improvement KPI is selected. |
| Survey & Assessment | Assessment metric type associated with the improvement initiative.<br>**Note:**<br>This field is shown only for the Survey & Assessment success measurement method.<br>If the improvement initiative was created from within the Survey Management application, this field is not automatically populated. |
| Base value | Base value of the success measurement method when the target is set. |
| Percentage improvement | Percent improvement target. |

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| Field | Description |
| --- | --- |
| | **Note:**<br>This field is shown only when an improvement KPI is selected.<br><br>If the KPI is a percent type, then this field is calculated automatically (based on **Base value** and **Target value** fields). |
| Target value | Absolute target value.<br><br>**Note:**<br>For the **Automated: PA Indicator** success measurement method, if the KPI is not a percent type, then this field is calculated automatically (based on base value and percentage improvement).<br><br>If the target value is already set on the indicator, breakdown, element, and aggregation, this field is automatically set. However, you can override this value by specifying a percent in the **Percent Improvement** field.<br><br>The target value set in this field is synced with the Performance Analytics indicator target for the KPI (**Performance Analytics** > **Indicator** > **Targets**). |
| Target review date | Date the goal should be achieved.<br><br>**Note:**<br>For the **Automated: PA Indicator** success measurement method, even if the target date is already set on the indicator, breakdown, element, and aggregation, this field is not automatically set. |
| Expected outcomes | Tangible artifacts and updates expected by the improvement initiative (for example, updated process published in new template, work Instructions, and FAQ published in knowledge base). |

## Details tab

| Field | Description |
| --- | --- |
| Requested for | User for which the improvement initiative was created. |
| Type | Area improved by the improvement initiative. One or many areas may be selected.<br>• People<br>• Process<br>• Technology |

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| Field | Description |
| --- | --- |
| | When a value is selected for the **Business Process** field, the **Type** field is automatically set to Process. |
| Watch list | Users notified when updates are made to the improvement initiative. |
| Parent initiative | Parent initiative associated with this child initiative.<br><br>When a parent initiative is selected, all associated child initiatives display in the **Child Initiatives** related list. |
| Source/Parent | Source or parent application from which the improvement initiative was created.<br>• Coaching Opportunity (COP)<br>Coaching opportunity record to which the improvement initiative is linked.<br>• CMDB<br>Remediate Duplicate Tasks record to which the improvement initiative is linked.<br>• Demand (DMND)<br>Demand record to which the improvement initiative is linked.<br>• GRC issue<br>Issue record to which the improvement initiative is linked.<br>• Incident (INC)<br>Incident record to which the improvement initiative is linked.<br>• Problem (PRB)<br>Problem record to which the improvement initiative is linked.<br>• (Survey) Assessment Metric Type<br>Assessment metric type for the survey definition record to which the improvement initiative is linked.<br>**Note:**<br>This field is shown only when an improvement initiative is created from Coaching, CMDB, Demand Management, GRC, Incident Management, Problem Management, or Survey Management applications. |

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## Schedule tab

| Field | Description |
|---|---|
| Planned start date | Expected start date. By default, this field displays the date and time when the CIM initiative was created. |
| Planned end date | Expected end date. By default, this field displays the date and time for the day after the planned start date. |
| Actual start date | The date and time when the progress on a new initiative starts. |
| Actual end date | The date and time when the last task associated with an initiative is completed. |

## Notes tab

| Field | Description |
|---|---|
| Additional comments (customer visible) | Check box to show additional comments that are visible to the customer.<br><br>If checked, the **Additional comments (Customer visible)** field content is shown. |
| Work notes | Work notes relating to the improvement initiative.<br><br>**Note:**<br>Required when submitting the improvement initiative for reapproval. |

## Closure Notes tab

| Field | Description |
|---|---|
| Closure code | • Successful: Goals met.<br>• Withdrawn: No longer needed/applicable.<br>• Unsuccessful: Goals not met. |
| Achieved outcome category | • Cost Reduction<br>• Revenue Generation<br>• Time Savings<br>• Customer Satisfaction<br>• Quality Improvement |
| Close notes | Notes regarding the improvement initiative closure. |

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## CIM Phases related list

| Field | Description |
|---|---|
| Number | Unique CIMT phase number. |
| Parent | Improvement initiative to which the CIM phase belongs. There can be multiple CIM phases per improvement initiative.<br><br>The CIM phase groups the tasks, sets a planned end date, and shows the percent complete for tracking purposes. |
| Percent complete | Percentage of work completed.<br><br>Percentage is based on the completed state of the CIM tasks that belong to this CIM phase.<br><br>For example, if there are five CIM tasks, each contributes to 20% completion. |
| Planned end date | Estimated phase end date. |
| Actual end date | End date of the phase. |
| Short Description | Short description of the phase. |
| Description | (Required) Full description of the phase. |

## CIM Tasks related list

| Field | Description |
|---|---|
| Number | Unique CIMT task number. |
| Parent | If the CIM task is tied to a CIM phase, the improvement phase number to which the CIM task belongs. A CIM task can only be tied to one CIM phase.<br><br>You can also create a CIM task directly from a CIM initiative.<br><br>CIM tasks consist of the work required to complete the improvement initiative. |
| Active | Check box that indicates whether the task is active. |

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| Field | Description |
| --- | --- |
| Assigned to | User primarily responsible for completion of the task. |
| Improvement Initiative | Improvement initiative number to which the CIM task belongs. |
| Priority | Sequence in which an incident or problem is to be worked on, based on impact and urgency.<br>• 1 - Critical<br>• 2 - High<br>• 3 - Moderate<br>• 4 - Low<br>• 5 - Planning |
| State | State of the task.<br>• Pending<br>• Open<br>• Work In Process<br>• Closed Complete<br>• Closed Incomplete<br>• Closed Skipped<br>• On Hold |
| On Hold Reason | Reason for putting the CIM task on hold.<br>**Note:**<br>This field is shown only when the state is on hold.<br>When an improvement initiative is placed on hold, all CIM tasks are also placed on hold, but the state can be changed manually.<br>When the improvement initiative is taken off hold, the CIM tasks are returned back to their previous state (unless they were changed manually). |
| Planned end date | Estimated end date of the task. |
| Short Description | Short description of the task. |
| Description | Full description of the task. |
| Work notes | Work notes for the task. |

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## Impacted KPIs related list

| Field | Description |
|---|---|
| Improvement Initiative | Improvement initiative number to which the impacted KPI belongs. |
| Impacted KPI | Other related KPIs (independent of the **Improvement KPI**) that are affected by changes made as a result of the improvement initiative. |
| Breakdown | The breakdown of the impacted KPI.<br>**Note:** This field is shown only when an impacted KPI is selected. |
| Element | The element of the KPI breakdown.<br>**Note:** This field is shown only when a breakdown is selected. |
| Breakdown Level 2 | The second-level breakdown of the improvement KPI, if one exists.<br>**Note:** This field is shown only after the first breakdown is selected. |
| Element Level 2 | The element of the second-level KPI breakdown.<br>**Note:** This field is shown only when a second-level breakdown is selected. |
| View Scorecard | Related link to view the scorecard for the KPI. |

## Approvers related list

| Field | Description |
|---|---|
| State | State of the approval.<br>• Not Yet Requested<br>• Requested<br>• Approved<br>• Rejected |

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| Field | Description |
|---|---|
| | • Canceled<br>• No Longer Required |
| Approver | User authorized to approve the improvement initiative.<br>Approvers are members of the group set in the **Approver Group** field on the Improvement Initiative form. |
| Comments | Comments for the approval improvement initiative. |
| Created | Date the improvement initiative was created. |

## Components installed with Continual Improvement Management

Several types of components are installed with activation of the com.sn_cim plugin, including tables, user roles, and scheduled jobs.

**Note:**
The Application Files table lists the components that are installed with this application. For instructions on how to access this table, see Find components installed with an application.

Demo data is available for this feature.

## Roles installed with Continual Improvement Management

| Role title [name] | Description | Roles inherited |
|---|---|---|
| Improvement Requester<br>[sn_cim.improvement_requester] | Able to perform these application functions:<br>• Create improvement initiative<br>• View **My CIM requests**<br>• View **Watched CIM requests**<br>• View **All** CIM requests | None |
| Improvement Coordinator<br>[sn_cim.improvement_coordinator] | Able to perform all functions for improvements | • sn_cim.improvement_requester<br>• app_service_user |

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| Role title [name] | Description | Roles inherited |
|---|---|---|
| | to which they are assigned as Improvement Coordinator except:<br>• Create Enterprise Strategies<br>• Delete improvement<br><br>Although able to perform Improvement Manager functions, an Improvement Coordinator can only perform those functions for improvements that they are assigned as Improvement Coordinator by the Improvement Manager.<br><br>Primary responsibility is to coordinate improvements within their area of expertise (at the process or service level).<br><br>Can access both Continual Improvement Workbench and dashboard. | • certification<br>• cmdb_query_builder<br>• dependency_views<br>• itil<br>Problem/change/incident records can be added.<br>• knowledge<br>• pa_analyst<br>• pa_contributor<br>• pa_power_user<br>Existing Performance Analytics indicators can be accessed, and new ones created.<br>• pa_target_admin<br>• pa_threshold_admin<br>• pa_viewer<br>• sn_bm_client.benchmark_data_viewer<br>• sn_bm_client.benchmark_recommendation_viewer<br>Benchmarks data and recommendations can be viewed and an improvement initiative can be created from Benchmarks recommendations.<br>• template_editor<br>• view_changer<br>• sn_coaching.admin<br>• scrum_story_creator |
| Improvement Manager<br><br>[sn_cim.improvement_manager] | Able to perform all application functions. | • sn_cim.improvement_coordinator<br>• sn_process_optimization_viewer |

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| Role title [name] | Description | Roles inherited |
|---|---|---|
| | The Improvement Manager is primarily responsible for all improvements, including initial acceptance of new improvement requests, assignment, and closure. The Improvement Manager also monitors the overall progress of all improvements. | |

## Scheduled jobs installed with Continual Improvement Management

| Scheduled job | Description |
|---|---|
| [PA Continual Improvement] | Daily CIM data collection. |
| [PA Continual Improvement] | Historical CIM data collection. |

## Tables installed

| Table | Description |
|---|---|
| Improvement Initiative [sn_cim_register] | Contains all improvement initiatives. |
| CIM Task [sn_cim_task] | Contains the CIM tasks created for an improvement initiative. |
| Impacted KPIs [sn_cim_related_kpi] | Contains KPIs related to the CIM improvement initiative. |
| Inbound CIM Integration [sn_cim_inbound_m2m] | Contains M2M tables to integrate Continual Improvement Management with other ServiceNow applications. With an inbound CIM integration, you can create a CIM record from the application that is integrated with Continual Improvement Management. |
| Outbound CIM Integration | Contains M2M tables that integrates other ServiceNow applications withContinual Improvement Management. With an outbound CIM integration, you can create an outcome based on the integrated |

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| Table | Description |
|---|---|
| [sn_cim_outbound_m2m] | application, for example, a story or knowledge article from a CIM record. |

## Properties installed with Continual Improvement Management

To access Continual Improvement Management properties, navigate to **Continual Improvement** > **Administration** > **Properties**.

**Note:**
System admin role is required to set Continual Improvement Management properties.

| Property | Description |
|---|---|
| sn_cim.need_approval | Enables approval process for Continual Improvement initiatives. By default, an improvement requires approval before it can progress to the Implement state. When the check box is enabled, it indicates that manual approval is required for the improvement to progress from Accepted state to Approved state.<br>• Type: Yes\|No<br>• Default value: Yes<br>If this property is not checked, the improvement automatically progresses to Approved state once it is accepted, and the **Approver group** field and the **Approvers** related list on the Improvement Initiative form are not shown. |
| sn_cim.initiative_copy_attributes | When a copy of the improvement initiative is created, the list of attributes (field values) that will be copied to the new initiative. |
| sn_cim.create_default_phase | Enable the property to create the default phase when an improvement initiative is created.<br>• Type: Yes\|No<br>• Default value: No |

## Quick tests for Continual Improvement Management

Validate the continued functionality of Continual Improvement Management during application development and after upgrades. Copy and configure these automated tests to identify customizations needing review. All test suites and tests should pass.

**Note:**
To run CIM automated tests:

- The Continual Improvement Management Automated Tests (com.sn_cim_atf) plugin must be enabled.
- The *sn_cim.create_default_phase* system property must be enabled. For more information, see Properties installed with Continual Improvement Management.

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| Name | Description |
| --- | --- |
| CIM Parent test suite | Parent test suite that contains multiple child test suites.<br>• CIM Inbound Integration<br>• CIM Outbound Integrations<br>• CIM Phase and Task<br>• CIM State Flow<br>**Note:** There is no dependency between child test suites. |
| CIM Inbound Integrations | Suite that contains tests to create an improvement initiative from inbound integration applications.<br>• Problem Management<br>• Incident Management<br>• Demand Management<br>• Coaching<br>• Survey Management<br>• Assessments |
| CIM Outbound Integrations | Suite that contains tests for all CIM outbound integrations.<br>• From an improvement initiative:<br>Create demand and create project.<br>• From an improvement initiative task:<br>Create knowledge article, change request, coaching opportunity, and story. |
| CIM Phase and Task | Suite that contains tests for CIM phase and CIM task creation, roll-up tasks, roll up phases, and dates. |
| CIM State Flow | Suite that contains all CIM state-related tests. |
| CIM: Create a demand from an improvement initiative | Tests that a user with the Improvement Manager role can create a demand from an improvement initiative. |
| CIM: Create a project from an improvement initiative | Tests that a user with Project manager and Improvement Manager roles can create a project from an improvement initiative. |
| CIM: Create a change request from an improvement initiative task | Tests that a user with the Improvement Manager role can create a change request from an improvement initiative task. |

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| Name | Description |
| --- | --- |
| CIM: Create a coaching opportunity from an improvement initiative task | Tests that a user with Coaching admin and Improvement Manager roles can create a coaching opportunity from an improvement initiative task. |
| CIM: Create a knowledge article from an improvement initiative task | Tests that a user with Knowledge admin and Improvement Manager roles can create knowledge article from an improvement initiative task. |
| CIM: Create a story from an improvement initiative task | Tests that a user with Project manager and Improvement Manager roles can create a story from an improvement initiative task. |
| CIM: Create a task within a phase | Tests that a task can be created within a phase. |
| CIM: Improvement Coordinator creates a task and phase | Tests that a user with the Improvement Coordinator role can create a task and phase. |
| CIM: Improvement Coordinator state flow from Approved to Implement | Tests that a user with the Improvement Coordinator role can change an improvement initiative from Approved state to Implement state. |
| CIM: Improvement Manager creates a strategic objective | Tests that a user with the Improvement Manager role can create a strategic objective. |
| CIM: Improvement Manager creates a task and phase | Tests that a user with the Improvement Manager role can create a task and phase. |
| CIM: Improvement Manager deletes an improvement initiative | Tests that a user with the Improvement Manager role can delete an improvement initiative. |
| CIM: Improvement Requester cannot create a task or phase | Tests that a user with the Improvement Requester role cannot create a task or phase. |
| CIM: Improvement Requester creates an improvement initiative | Tests that a user with the Improvement Requester role can create an improvement initiative. |
| CIM: Inbound integration from Assessments | Tests that a user with the Survey administrator role can create an improvement initiative from an assessment. |
| CIM: Inbound integration from a coaching opportunity | Tests that a user with the Coaching admin role can create an improvement initiative from a coaching opportunity. |
| CIM: Inbound integration from Demand Management | Tests that a user with the Demand manager role can create an improvement initiative from a demand. |
| CIM: Inbound integration from Incident Management | Tests that a user with the itil role can create an improvement initiative from an incident. |
| CIM: Inbound integration from Problem Management | Tests that a user with the itil role can create an improvement initiative from a problem. |

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| Name | Description |
| --- | --- |
| CIM: Inbound integration from Survey Management | Tests that a user with the Survey administrator role can create an improvement initiative from a survey. |
| CIM: Initiative reject approval state flow from Assess to Accepted | Tests when an improvement initiative in Assess state is rejected by an approver, the state reverts back to Accepted. |
| CIM: Initiative state flow from Implement to On Hold | Tests that an improvement initiative in Implement state can be changed to On Hold state. |
| CIM: Initiative state flow from New through Closed | Tests that an improvement initiative in New state can be progressed through states Accepted, Assess, Approved, Implement, Review, to Closed state. |
| CIM: Initiative state flow from On Hold to Implement | Tests that an improvement initiative in On Hold state can be changed to Implement state. |
| CIM: Initiative state flow from On Hold to Review | Tests that an improvement initiative in On Hold state can be changed to Review state. |
| CIM: Initiative state flow from Review to Implement | Tests that an improvement initiative in Review state can be changed to Implement state. |
| CIM: New phase planned end date check | Tests that the planned end date for a new phase is at least one day later than the planned start date of the improvement initiative. |
| CIM: Phase creation for a new improvement initiative | Tests that a phase is automatically created when an improvement initiative is created. |
| CIM: Planned end date always later than planned start date | Tests that the planned end date of the improvement initiative is not earlier than the planned start date of the improvement initiative. |
| CIM: Roll-up phase to improvement initiative value check | Tests that the phase-level roll-up value for the improvement initiative (percent complete) is accurate. |
| CIM: Roll-up tasks to phase value check | Tests that the task-level roll-up value for the phase (percent complete) is accurate. |
| CIM: Skip approval process flow | Tests that the approval process is skipped when the Enable approval process for Continual Improvement initiatives property is cleared. |
| CIM: Submit an initiative in Accepted state to Cancel | Tests that an improvement initiative in Accepted state can be submitted for Cancel action. |
| CIM: Submit an initiative in Approved state for Re-Approval | Tests that an improvement initiative in Approved state can be submitted for Re-Approval action. |

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| Name | Description |
| --- | --- |
| CIM: Submit an initiative in Assess state for Revert to Accepted | Tests that an improvement initiative in Assess state can be submitted for Revert to Accepted action. |
| CIM: Submit an initiative in Implement state for Re-Approval | Tests that an improvement initiative in Implement state can be submitted for Re-Approval action. |

**Related topics**

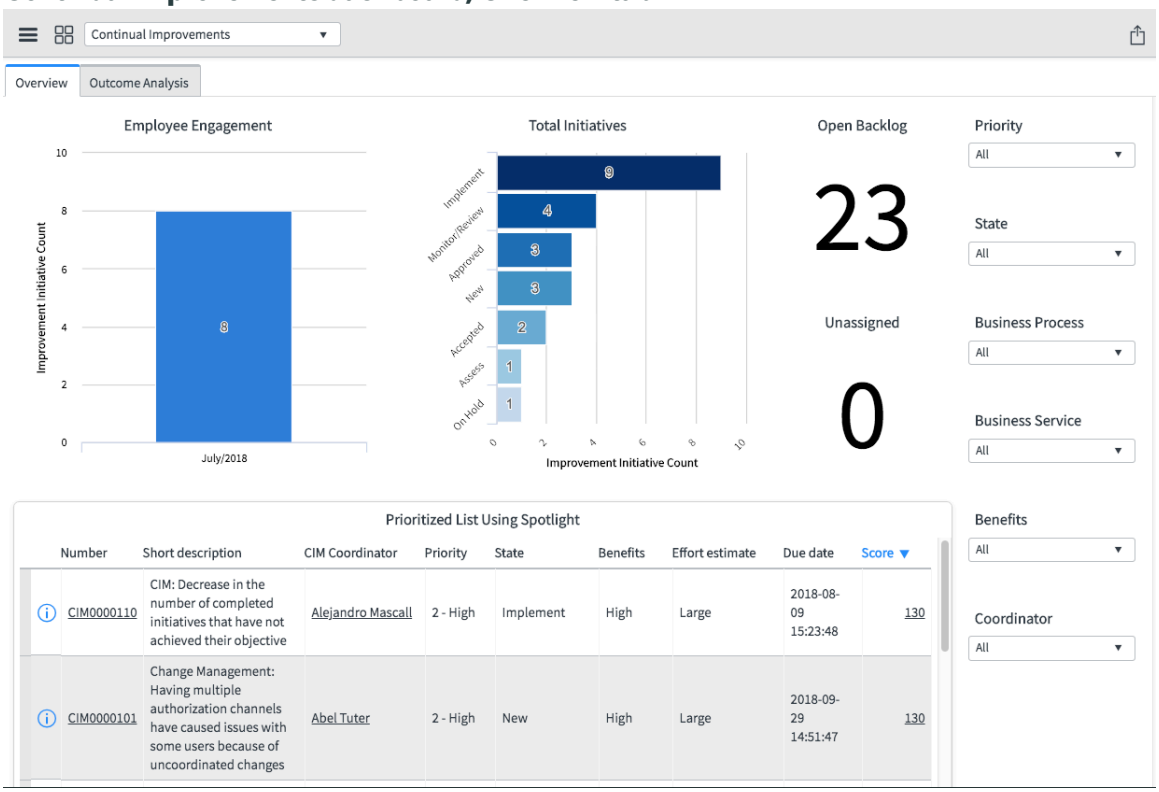
Quick start tests

## Continual Improvements dashboard

The Continual Improvements dashboard enables an Improvement Process Coordinator or Manager to determine which process to start next, how many initiatives they have underway at a given time, and what the employee participation is.

This dashboard is included in the Continual Improvements Management plugin.

**Continual Improvements dashboard, Overview tab**

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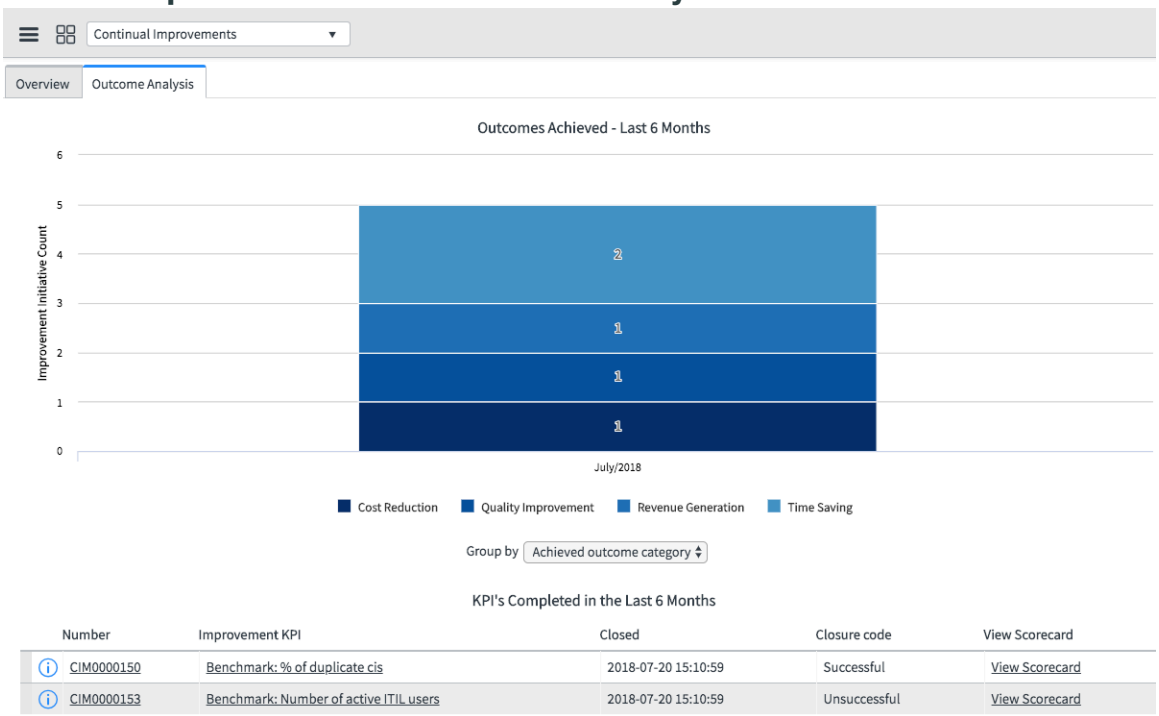
### Continual Improvements dashboard - Outcome Analysis tab




## End users and roles

| End user | Required role |
|---|---|
| Improvement Process Coordinator: Needs to verify the status of their initiatives. | sn_cim.improvement_coordinator |
| Improvement Process Manager: Must be able to see the state of all improvement processes and assign employees where they are needed. | sn_cim.improvement_manager |

## Data visualizations

The Continual Improvements dashboard includes the following visualizations:

| Report Title | Type | Description |
|---|---|---|
| Employee Engagement | Column | State is not Closed or Cancelled Trended by Created |
| Total Initiatives | Horizontal Bar | State is not Closed or Cancelled Grouped by State |
| Open Backlog | Single Score | State is not Closed or Cancelled |
| Unassigned | Single Score | CIM Coordinator is empty and State is n ot Closed or Cancelled |
| Prioritized List Using Spotlight | List | Name: Benefit High Query: benefit=high Weight: 50 |
| | | Name: Benefit Low Query: benefit=low Weight: 30 |
| | | Name: Benefit Medium Query: benefit=medium Weight: 40 |

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| Report Title | Type | Description |
|---|---|---|
| | | Name: Effort Estimate Extra Large Query: cim_estimate=4 Weight: 50 |
| | | Name: Effort Estimate Large Query: cim_estimate=3 Weight: 40 |
| | | Name: Effort Estimate Medium Query: cim_estimate=2 Weight: 30 |
| | | Name: Effort Estimate Small Query: cim_estimate=1 Weight: 20 |
| | | Name: Priority 1 Query: priority=1 Weight: 50 |
| | | Name: Priority 2 Query: priority=2 Weight: 40 |
| | | Name: Priority 3 Query: priority=3 Weight: 30 |
| | | Name: Priority 4 Query: priority=4 Weight: 20 |
| | | Name: Priority 5 Query: priority=5 Weight: 10 |

# DevOps Change Velocity

With ServiceNow® DevOps Change Velocity, you can import data from your DevOps tool chain to the ServiceNow platform and deliver changes faster without sacrificing compliance.

You can automatically create change requests from your Continuous Integration (CI) and Continuous Deployment (CD) pipelines and then automatically approve the change requests based on policies. This enables developers to remain in their tools while providing visibility, accelerate the time required to approve change requests, and provide an audit trail.

## Get started

Explore



Learn the key features and business value that DevOps Change offers

Configure



Set up the core configuration

Integrate



Integrate DevOps Change Velocity with your DevOps toolchain

Use



Reference



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| | | |
|---|---|---|
| Use DevOps Change Velocity to automate change request creation in your pipeline | Get details about components, form fields, and general guidelines | |

### Troubleshoot and get help

- Ask or answer questions in the ServiceNow Community
- Search the Known Error Portal for known error articles
- Contact Customer Service and Support

## Exploring DevOps Change Velocity

Learn how ServiceNow® DevOps Change Velocity helps your Development and Change Management teams accelerate change and connect their DevOps tool chain with ServiceNow so that the DevOps tool data can be used to automate change processes.

### DevOps Change Velocity overview

DevOps Change Velocity collects data from your DevOps planning, coding, testing, and orchestration tool chain to provide visibility across the entire software delivery life cycle. This enables a single view for both the Development team and the Operations team across the end-to-end activities (plan, develop, build, test, deploy, and operate).

The DevOps Change Velocity application provides the following major benefits:

**Change automation**

Automate the change workflow and approval decisions to increase change velocity while ensuring governance and control. Create and complete DevOps change requests automatically and automate approval decisions based on input data (auto-approve, auto-reject or manually approve).

**Change traceability**

Track the progress of your work items, commits, artifacts, builds, and releases using the change requests to lend additional transparency and provide a single source of truth to all the personas involved.

**DevOps Insights**

View flow metrics, change acceleration metrics and other KPIs across the end-to-end software delivery value chain and connected tools.

To learn about the tools that the DevOps Change Velocity application supports, see DevOps Change Velocity integrations.

To understand how you can incrementally progress to get value faster using DevOps Change Velocity, see User journey for DevOps Change Velocity.

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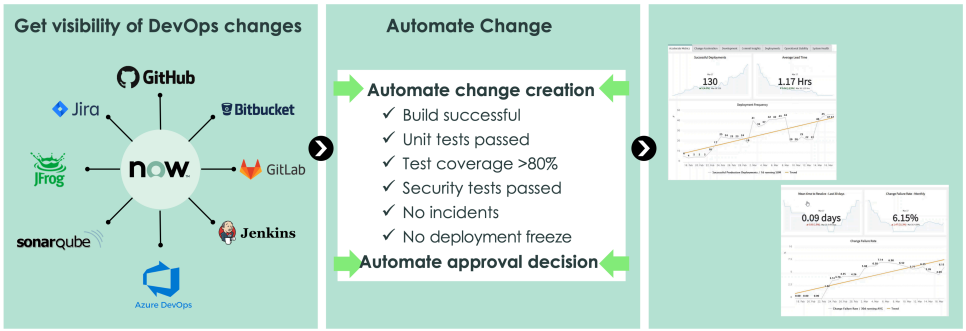


## Benefits of DevOps Change Velocity according to persona

| Persona | Challenges | DevOps Change Velocity benefits |
|---|---|---|
| Developer | • Long feedback loop for change approval<br>• Manual collection of data<br>• Swivel chair (entering data in multiple interfaces) from changes to work items<br>• Lack of end-to-end visibility of the entire DevOps life-cycle<br>• Significant time spent on admin tasks | • Automated data collection process through integrations<br>• No time lost in manually creating a change request or providing evidence manually<br>• More time for actual development work<br>• Developers can keep working in their own tools |
| Change manager | • Difficulty in handling an increasing number of changes<br>• Not able to focus on only the changes that truly need human intervention<br>• Manual work to respond to audit request<br>• Significant time spent on gathering data | • Accelerate change process with automated flows<br>• Visibility over pipeline, tests, and change in a single tool<br>• Automated documentation of change content and controls<br>• Automate appropriate change governance driven by data<br>• One-click audit response |
| Release manager | • Lack of correlation between changes and release to measure progress<br>• Unable to eliminate manual tasks from delivery processes | • Enhanced visibility into the release plan and progress<br>• Automation of more tasks with integrations<br>• Improved release reliability |

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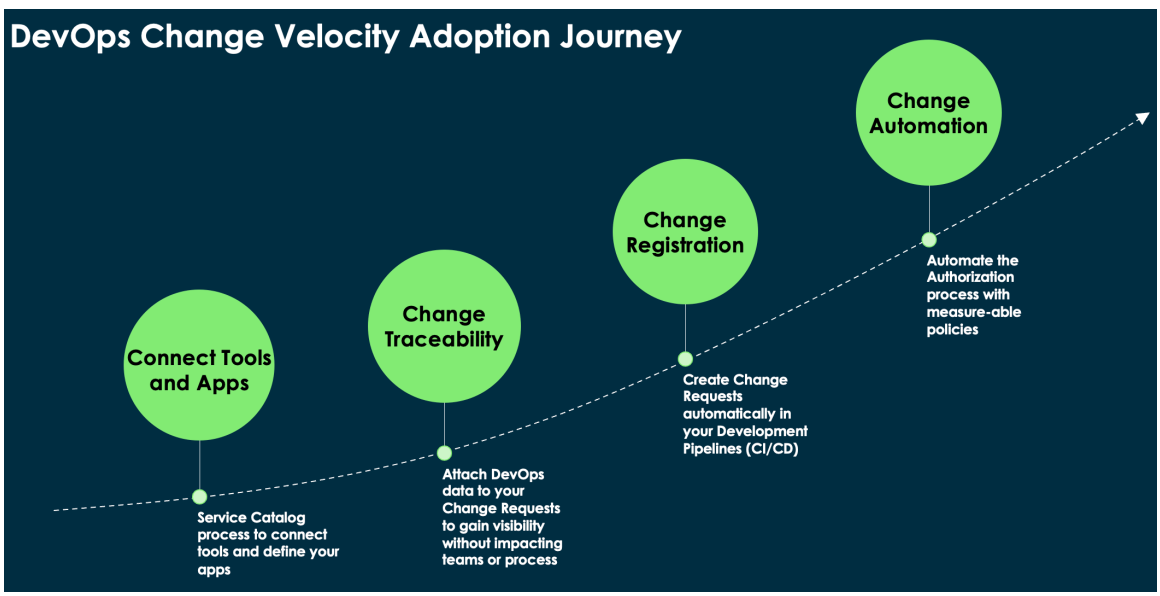
| Persona | Challenges | DevOps Change Velocity benefits |
|---|---|---|
| Application development leadership | • Lack of visibility across teams and value streams<br>• Lack of team performance comparison data<br>• Inability to identify and resolve performance bottlenecks | • Visibility into the entire value stream<br>• Normalized views of team performance<br>• Identify bottlenecks and take appropriate action |
| Operations and Support teams | • Limited forecast and speed of remediation<br>• Lack of visibility over change content and impact<br>• Too many tools to correlate change, release, and incidents | • Single tool to manage changes and incidents<br>• Easier correlation between change and incident<br>• Reduced Mean Time to Resolution (MTTR) from improved visibility |
| IT compliance officer | • Limited visibility to ensure compliance<br>• Lack of transparency of data and process to measure risks | • Ensure compliance with automated change policy<br>• Improved control and visibility with automated gathering of data |

Explore more details such as the user adoption journey, supported integrations, and Insights in the following sections.

## User journey for DevOps Change Velocity

Review the adoption journey of the DevOps Change Velocity application to enable a phased (crawl, walk, run, fly) approach toward complete automation of change approvals.

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While automating change request creation from the Continuous Integration (CI) and Continuous Deployment (CD) pipelines and automatically approving them will be your end goals with DevOps Change Velocity, you can approach your implementation in this phased manner. Each phase here provides incremental value over the previous phase and enables you to get started with minimum changes to your existing processes:

1. Connect Tools and Applications: Get started by integrating your key DevOps tools and choosing the key objects from these tools to track. This can be done without needing to modify your pipelines or any of the development assets. And then create DevOps Apps for the teams that you want to onboard first. Completing this phase is necessary to bring data from your tools over to the ServiceNow AI Platform.

   For more information on integrating tools, see Integrating DevOps Change Velocity with third-party tools.

2. Change traceability: After you have established integration with your key DevOps tools, relevant data from these tools will start coming into ServiceNow. Then you can continue to use your existing process to create changes but save time by having all relevant information added to the change request with just a few clicks. This information includes stories, code commits, test results, quality scans, and others. For more information on modeling a change request flow, see Using DevOps Change Request Manual Approval flow.

   After these two phases are completed, you can progress toward the next two phases, which help you achieve automation of your change process, accelerate deployments, and increase velocity. You can start your implementation with these two phases as they don't need any changes to your existing processes or pipelines.

3. Change registration: This phase builds value further by automating the change request creation from the CI/CD pipelines. With this phase you'll need to modify the team's CI/CD pipeline to enable automatic creation of change requests. This automation saves the time of your developers as they don't have to manually fill the change requests, which reduces the risk of human error. For more information, see Configuring DevOps change request details within the pipeline.
4. Change automation: This is the final phase in value realization where data from the tools will come into ServiceNow in real time, change requests will be automatically created and they'll be automatically approved or rejected based on data driven policies. This phase requires creating policy guidelines and enabling automated change approvals decisions based on input data to reduce risk and increase the rate of change success. For more information, see Accelerating your DevOps change process.

All through these four phases, the Insights dashboards help you analyze operational and business reports and to determine the overall efficiency#and growth of your#development processes.

## DevOps Change Velocity integrations

Get an overview of how DevOps Change Velocity integrates with your external DevOps toolchain and the tools supported for this integration.

The DevOps Change Velocity integration with external tools is achieved by exposing REST endpoints to receive webhook notifications or direct REST calls from these tools in real-time. Additionally, DevOps Change Velocity enables importing of data from these tools using polling. DevOps API enables integration with any coding, planning, or orchestration tools. For more information, see DevOps API.

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## Supported tools

The DevOps Change Velocity application provides connectors by default to connect the following commonly used DevOps tools to import data. If your tool isn't included in this list, you can manually connect and configure an integration. See User-created integrations in DevOps Change Velocity.

| Tool type | Tools and the supported version |
|---|---|
| Planning | • Azure Boards (Azure DevOps latest cloud version)<br>• Azure DevOps Server (ver 2022.0.1)<br>• Jira Server and Jira Cloud (latest cloud version)<br>• ServiceNow Agile Development 2.0<br>• GitHub (latest cloud version)<br>• GitHub Enterprise (ver 3.7)<br>  ○ Basic authentication<br>  ○ OAuth<br>• Rally (latest cloud version) |
| Coding | • Azure Repos (Azure DevOps latest cloud version)<br>• Azure DevOps Server (ver 2022.0.1)<br>• Bitbucket (ver 7.19.2 on-premises)<br>• GitHub (latest cloud version)<br>• GitHub Enterprise (ver 3.7)<br>  ○ Basic authentication<br>  ○ OAuth<br>• GitLab (ver 13.0.6 for on-premises or latest cloud version) |
| Orchestration | • Azure Pipelines (Azure DevOps latest cloud version)<br>Jobs supported:<br>  ○ Agent job<br>  ○ Agentless (server) job<br>• Azure DevOps Server (ver 2022.0.1)<br>• Jenkins (ver 2.289.1)<br>Jobs supported:<br>  ○ Freestyle project<br>  ○ Folder (default is 3 levels)<br>  ○ Pipeline<br>  ○ Multibranch Pipeline<br>• GitLab (ver 13.0.6 for on-premises or latest cloud version) |

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| Tool type | Tools and the supported version |
|---|---|
| | • GitHub (latest cloud version)<br>• GitHub Enterprise (ver 3.7)<br>  ○ Basic authentication<br>  ○ OAuth<br>• Argo CD (latest cloud version) |
| Repository artifacts | • JFrog (ver 7 for on-premises or latest cloud version)<br>• Azure Artifacts (Azure DevOps latest cloud version)<br>• Azure DevOps Server (ver 2022.0.1) |
| Testing | If any test is run as part of the pipeline executions of the following supported Orchestration pipelines, the information is shown in the test summary<br>• GitHub (latest cloud version)<br>• GitHub Enterprise (ver 3.7)<br>  ○ Basic authentication<br>  ○ OAuth<br>• GitLab (ver 13.0.6 for on-premises or latest cloud version)<br>• Azure DevOps (latest cloud version)<br>• Azure DevOps Server (ver 2022.0.1)<br>• Jenkins (ver 2.289.1) |
| Software Quality | SonarQube (ver 8.9.6 or latest cloud version) scans supported on<br>• Azure DevOps pipelines (latest cloud version)<br>• Azure DevOps Server (ver 2022.0.1)<br>• Jenkins (ver 2.289.1) pipelines |
| Feature Flag | Split (latest cloud version) |
| Security | • Veracode (latest cloud version)<br>• Checkmarx One (ver 1.0.17)<br>• Checkmarx SAST (ver 1.0.16) |

## Third-party extensions

Use the ServiceNow extensions to model your pipeline in DevOps and configure branch analysis for tools like SonarQube.

Additional extensions may be required for applications such as Jenkins or Azure DevOps. These extensions are used when ServiceNow DevOps can't integrate using only the native REST API and push notifications.

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**Jenkins plugin for ServiceNow DevOps**

A Jenkins plugin is provided to enable change acceleration so your orchestration tool can communicate and control certain aspects of pipeline executions from within ServiceNow DevOps.

Install the plugin from the Jenkins Marketplace. Navigate to **Manage Jenkins > System configuration > Plugins** in your Jenkins instance. Search for **ServiceNow DevOps Plugin** and select it, and then select **Install**.

**ServiceNow DevOps for Azure DevOps**

Use the **ServiceNow DevOps** extension on Visual Studio Marketplace if you plan to integrate your Azure DevOps pipeline with ServiceNow DevOps.

For more information, see Use the ServiceNow DevOps extension for Azure DevOps and Azure DevOps custom actions.

**ServiceNow DevOps custom actions for GitHub Actions**

Use the **ServiceNow DevOps** custom actions on GitHub marketplace if you plan to integrate your GitHub workflows with ServiceNow DevOps.

For more information, see GitHub Actions configurations.

To start integrating DevOps Change Velocity with your toolchain, see Integrating DevOps Change Velocity with third-party tools.

**Related topics**

Getting started with DevOps Change Velocity

## DevOps dashboards

Use the DevOps Insights dashboard to evaluate the results of your overall DevOps process. Use the DevOps Pipeline UI view to visually analyze your pipeline executions.

After the DevOps toolchain integrations and change policies are configured, all data is connected to provide insights about the process and velocity from the team level to the enterprise level.

Using the DevOps Insights reports, monitor pipeline modeling and change acceleration benefits in your environment.

- DevOps administrators can check the current health of the system.
- DevOps app owners can view the development and quality metrics by app or team.
- Executives and Change managers can track the velocity of changes.

## DevOps Insights dashboard

The DevOps Insights dashboard provides a flexible graphical view of operational and business reports.

DevOps managers, Change managers, and executives can use this dashboard to determine the overall efficiency#and performance of the development teams and processes.

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- Monitor activities, KPIs, and metrics using a centralized dashboard.
- Track performance over time using ServiceNow Performance Analytics.
- View break down of the numbers by application, repository, service, business app, work item type, and product over time.

For more information, see DevOps Insights dashboard - Workspace.

### DevOps System Health dashboard

The System Health dashboard lets the DevOps administrator view the overall health of integrations, connectivity status, as well as view trends of inbound event processing data.

For more information, see DevOps System Health dashboard.

## Getting started with DevOps Change Velocity

Learn about the setup process for DevOps Change Velocity that is required before configuring integrations with your toolchain.

The DevOps playbooks provide a task-oriented view and guides you through the various steps while setting up your applications, tools, and discovering and configuring your pipelines. For more information about Playbooks, see Playbook Experiences. If you have not enabled the Next Experience UI, you can still perform the following tasks using the Classic UI. For more information about migrating to the Next Experience UI and configuring workspaces, see Next Experience UI.

1. Install DevOps Change Velocity.

2. Assign roles and tasks using workspace.

   Roles that are installed with DevOps Change Velocity are listed in Components installed with DevOps Change Velocity.

3. Set up integration user account.

4. Onboard to DevOps Change Velocity.

   Get started by connecting tools, creating applications, and automating change creation.

   - Integrate your third-party (plan, code, orchestration, test, security, and artifact) tools for end-to-end change traceability and automation. See Integrate your third-party tools to enable change outcomes.
   - Create your DevOps application to track and manage its life-cycle in ServiceNow DevOps Change Velocity. See Applications in DevOps Change Velocity.
   - Accelerate your DevOps change process using DevOps Change Velocity. See Accelerating your DevOps change process.

### Install DevOps Change Velocity

Install the DevOps Change Velocity application from the ServiceNow Store.

**Before you begin**
Role required: admin

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Ensure that the application and all of its associated store applications have valid ServiceNow entitlements. For more information, see Get entitlement for a ServiceNow product or application.

If you're installing DevOps Change Velocity in your production instance for the first time, ensure that you opt-in to the following required products. For more information, see Opt in to the ServiceNow Store products.

| | |
|---|---|
| Devops Change Velocity | https://store.servicenow.com/sn_appstore_store.do#!/store/product/e5ff61c51b345d50ee92cb31604bcba4 |
| Playbook Experience | https://store.servicenow.com/sn_appstore_store.do#!/store/product/e4cecaf0db2be81079279ee4db9619f2 |
| CMDB CI Class Models | https://store.servicenow.com/sn_appstore_store.do#!/store/application/ae99d84b2320330006c0110d96bf65b3/1.45.1 |
| Expanded Model and Asset Classes | https://store.servicenow.com/sn_appstore_store.do#!/store/application/7e67d4ff091b4110f87739da6a8d8c7d/2.1.0 |
| Universal Task | https://store.servicenow.com/sn_appstore_store.do#!/store/application/e09af33a533d10103a80ddeeff7b1247/2.2.0 |
| Jira Spoke | https://store.servicenow.com/sn_appstore_store.do#!/store/application/4fab4673db1893009a985404ce961942/4.1.0 |
| GitHub Spoke | https://store.servicenow.com/sn_appstore_store.do#!/store/application/9a025c563b22330006f1600713efc4cf/2.2.6 |
| Jenkins V2 Spoke | https://store.servicenow.com/sn_appstore_store.do#!/store/application/c66af1ca1b8a8c5033fbdbd3cc4bcb75/1.2.0 |

### About this task

To install the DevOps application on a subprod instance, navigate to the DevOps Change Velocity app on the ServiceNow Store and select **Request Install** to send your request.

### Procedure

1. Navigate to **System Applications** > **All Available Applications** > **All**.
2. Select the **Not Installed** tab to view a list of applications available for installation.
3. Find the DevOps Change Velocity application using the filter criteria and search bar.

   You can search for the application by its name or ID (sn_devops_chgvlcty). If you can't find an application, you may have to request it from the ServiceNow store.

   Visit the ServiceNow Store website to view all the available apps and for information about submitting requests to the store. For cumulative release note information for all released apps, see the ServiceNow Store version history release notes.

4. Select **Install**.
5. In the Application installation dialog box, review the application dependencies.

   If your application requires other applications, install them first if they are not already installed.

   Installing your application also automatically installs the dependent applications or plugins if they aren't installed already.

6. If you want to install demo data, select **Load demo data**.

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Demo data includes sample records that describe application features for common use cases. Load demo data when you first install the application on a development or test instance.

**Note:**
If you don't load the demo data for a store application during installation, you can't load it later.

7. Select **Install**.
   Based on your connection, the installation procedure can take almost an hour or more to complete.

**Result**
Installing DevOps Change Velocity also installs the dependent applications, user roles, tables, scheduled jobs, and other components.

See Components installed with DevOps Change Velocity.

**What to do next**
Assign roles and tasks using workspace.

**Note:**
Roles that are installed with DevOps Change Velocity are listed in Components installed with DevOps Change Velocity.

## Assign roles and tasks using workspace

Assign roles and tasks to users and groups so that they can perform the required DevOps tasks.

**Before you begin**
Role required: admin or sn_devops.admin

**Procedure**

1. Navigate to **Workspaces** > **DevOps Change Workspace**.
2. Use one of the following ways to onboard users and groups:
   - From the Home page, from the Accounts and users widget, select **Assign roles** or **Assign users**.
   - From the left navigation panel, navigate to **Administration** > **Onboarding** and select the onboarding task.
3. Onboard users and groups by assigning them roles and tasks.

**What to do next**
Set up integration user account in DevOps Change Velocity

## Set up integration user account in DevOps Change Velocity

Set up the integration user account to enable integrating with your third-party tools.

**Before you begin**
Role required: admin

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### About this task

**Important:**
This setup is required only when DevOps Config is installed, and for Rally and Split tool integrations. For all other tool integrations or if you're using only DevOps Change Velocity, you can skip this procedure.

This is a one-time setup. You can set the integration user password either using Workspace or Classic UI.

The DevOps integration user is the ServiceNow system user that your third-party orchestration tools use to send data to DevOps Change Velocity.

The default integration user credential will be applicable for all the tools. However, if you want to set up separate integration user credential per tool connection you can also do the same but ensure that the user account has the sn_devops.integration role assigned.

### Procedure

Set the integration user password in one of the following ways.

### What to do next

- Onboard to DevOps Change Velocity using Workspace
- Start integrating DevOps Change Velocity with third-party tools.

## Onboard to DevOps Change Velocity using Workspace

After installing DevOps Change Velocity, you can integrate with your DevOps toolchain and automate change requests directly from the DevOps Change Workspace.

You can onboard as a DevOps admin, a tool owner, or an app owner.

## Onboard as DevOps admin

Role required: sn_devops.admin.

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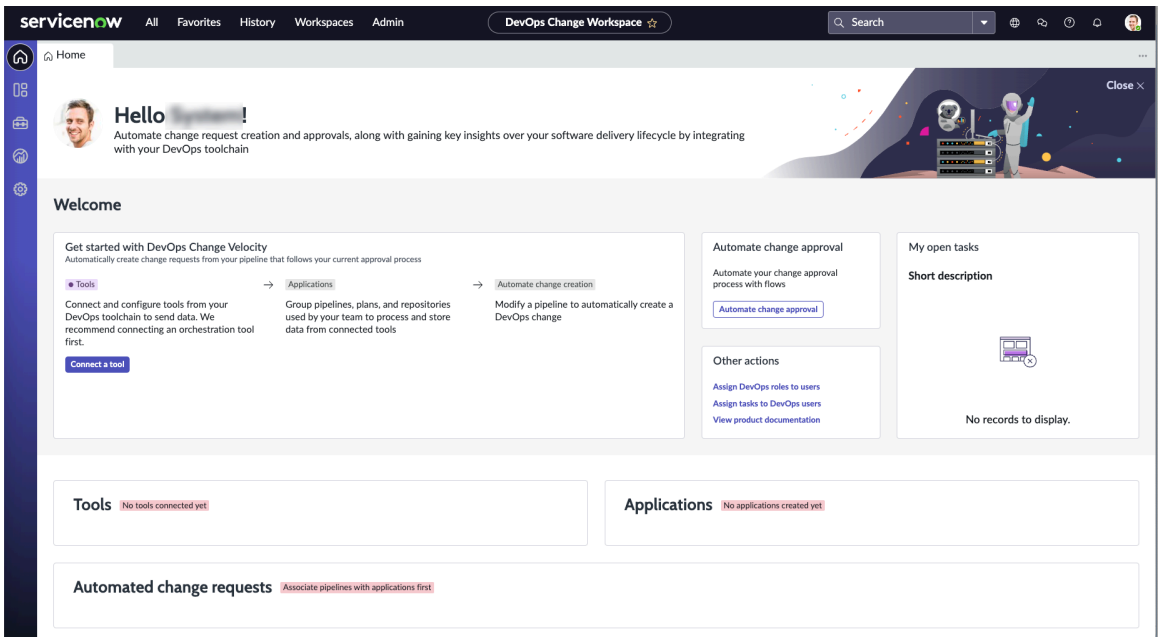
1. From the Home page, from the Get started with DevOps Change Velocity guide, select **Connect a tool**.



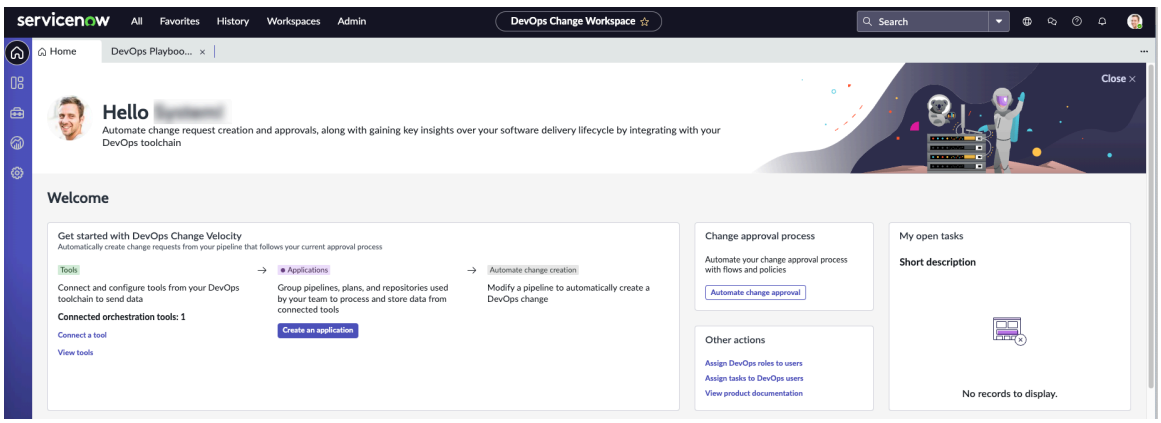

**Note:**
To automate change requests for pipelines, connect your orchestration tool.

2. Using the connect playbook activity, connect to your DevOps tools.

   For more information about connecting to a tool, see Integrating DevOps Change Velocity with third-party tools.

3. Select **Create an application** to create an application and associate objects to it.

   For more information about creating an application, see Create an application - Workspace.




4. To automate change requests for pipelines, connect your orchestration tool and associate the pipelines with your application.

   For more information on associating pipelines, see Associate tool objects to applications - Workspace.

5. Select **Automate change** to create an automated change request.

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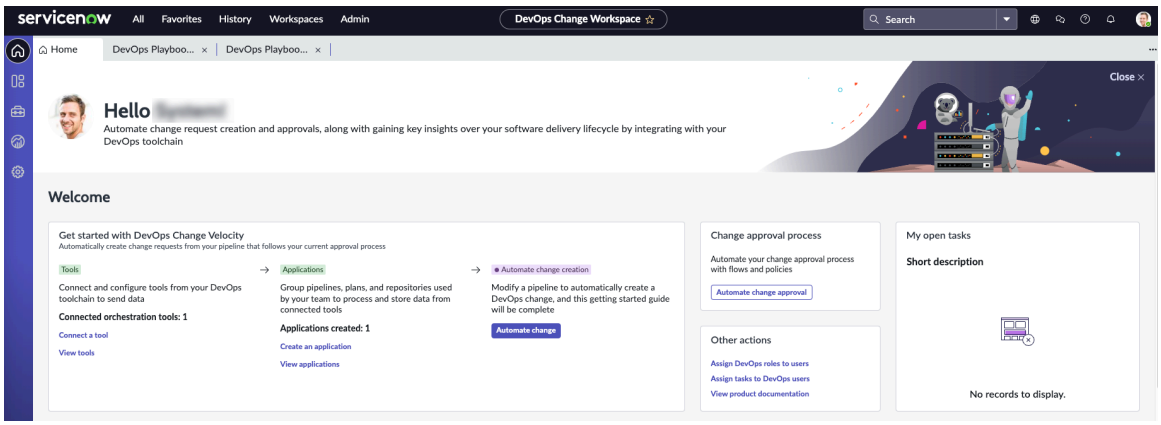
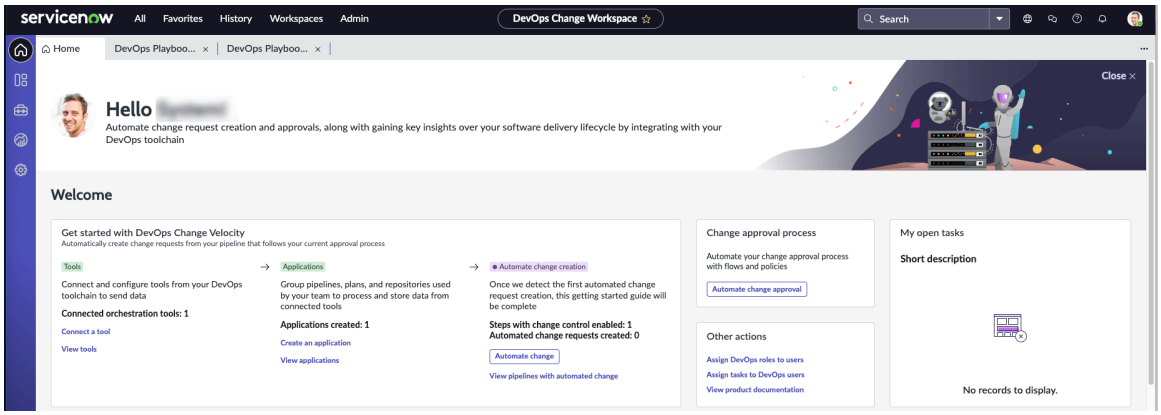
For more information about creating automated change requests, see Automate DevOps change request creation.

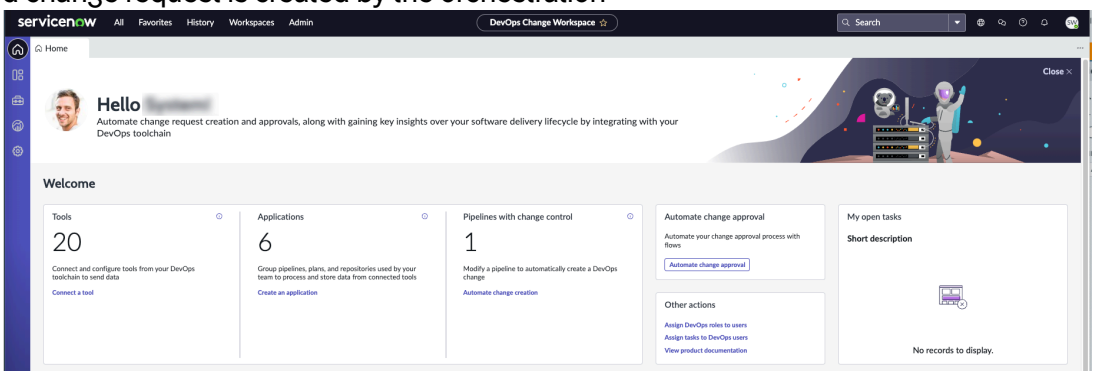



6. Modify your orchestration pipeline to enable change control.

You can run the pipeline to verify that change requests are automatically created.




The getting started guide will be marked as complete when the first automated change request is created by the orchestration pipeline.




## Onboard as a tool owner

Role required: sn_devops.tool_owner.

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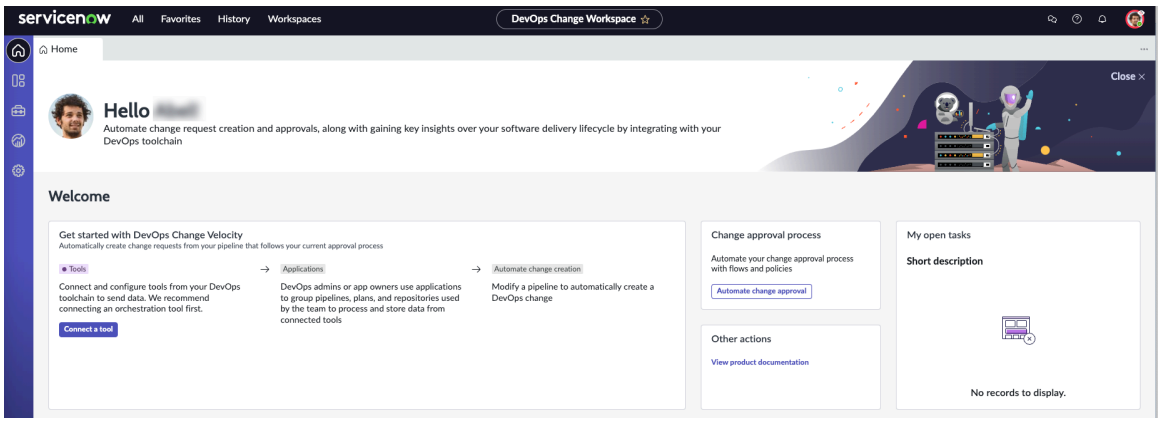
1. From the Home page, from the Get started with DevOps Change Velocity guide, select **Connect a tool**.



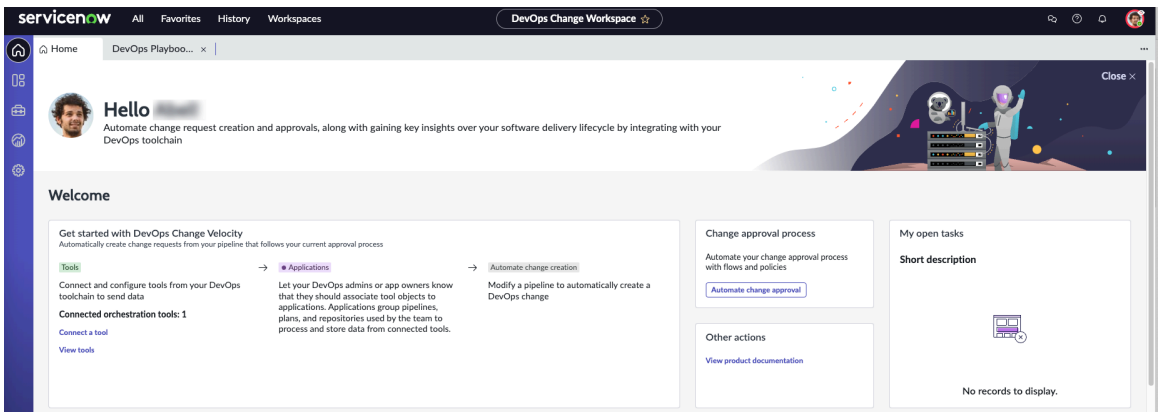

**Note:**
To automate change requests for pipelines, connect your orchestration tool.

2. Using the connect playbook activity, connect to your DevOps tools.

   For more information about connecting to a tool, see Integrating DevOps Change Velocity with third-party tools.

3. If an application hasn't been created, ask your DevOps admin or app owner to create an application and associate objects to it.

   For more information about creating an application, see Create an application - Workspace.




4. To automate change requests for pipelines, connect your orchestration tool and associate the pipelines with your application.

   For more information on associating pipelines, see Associate tool objects to applications - Workspace.

5. Select **Automate change** to create an automated change request.

   For more information about creating automated change requests, see Automate DevOps change request creation.

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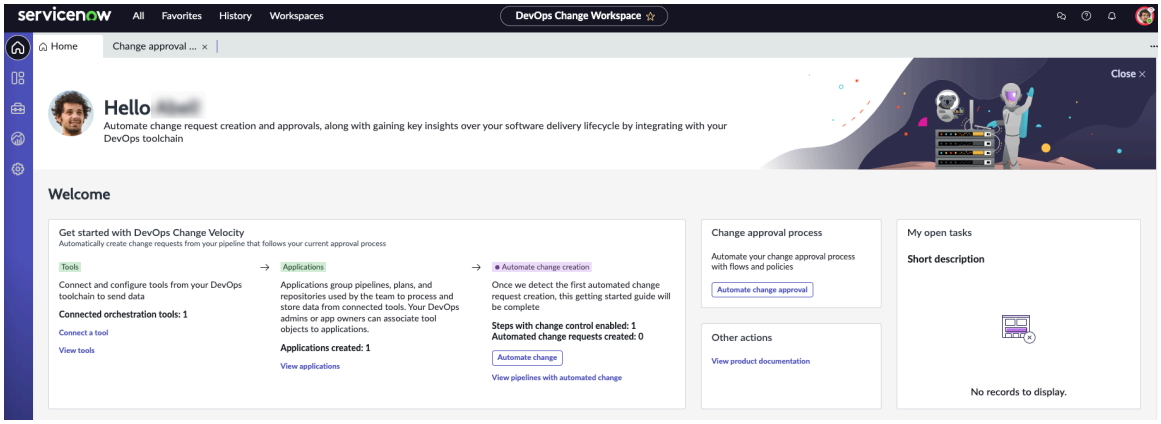
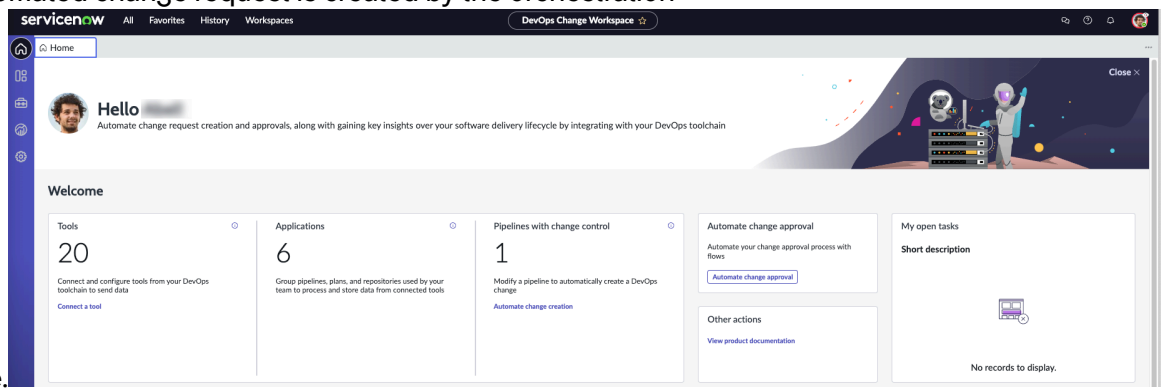



6. Modify your orchestration pipeline to enable change control.

   You can run the pipeline to verify that change requests are automatically created.

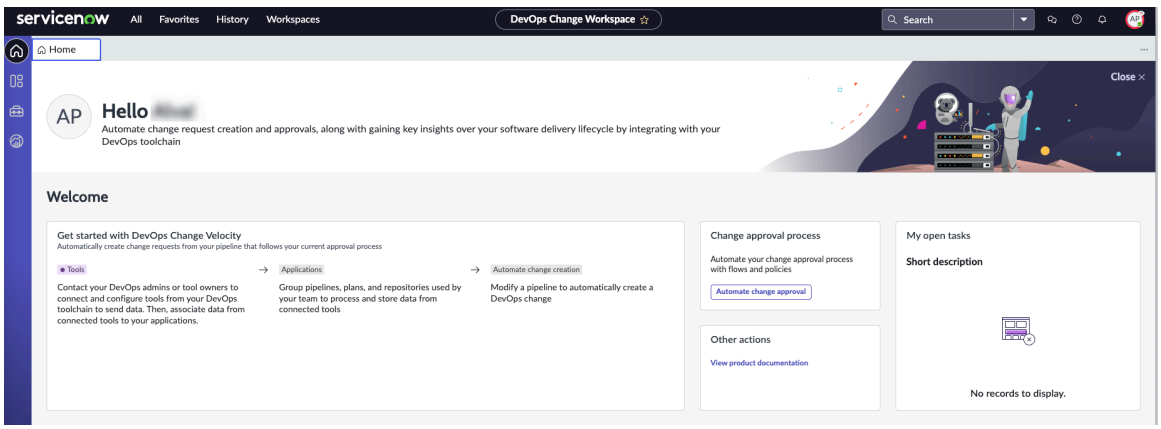
The getting started guide will be marked as complete when the first automated change request is created by the orchestration pipeline.




## Onboard as an app owner

Role required: sn_devops.app_owner.

1. Ask your DevOps admin or tool owner to connect to your DevOps tools.




> **Note:**
> To automate change requests for pipelines, connect your orchestration tool.

2. Select **Create an application** to create an application and associate objects to it.

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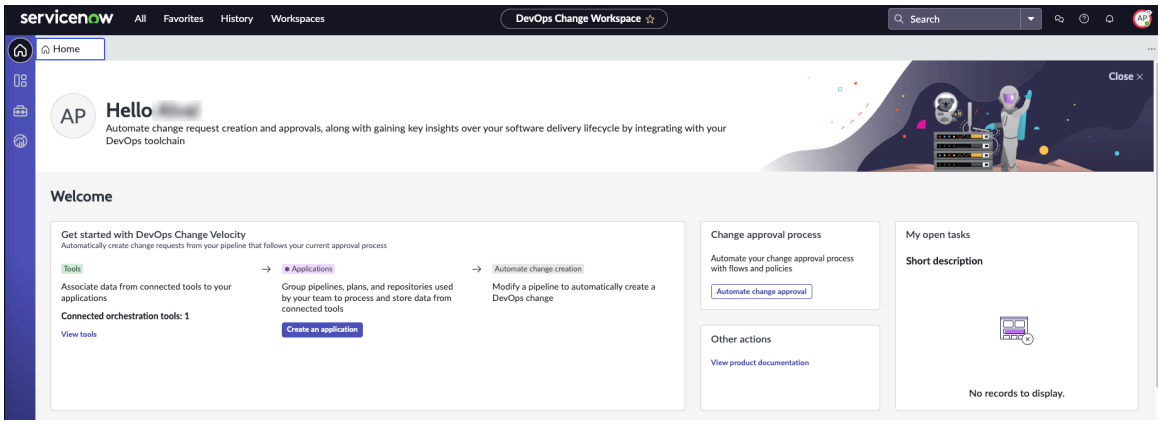
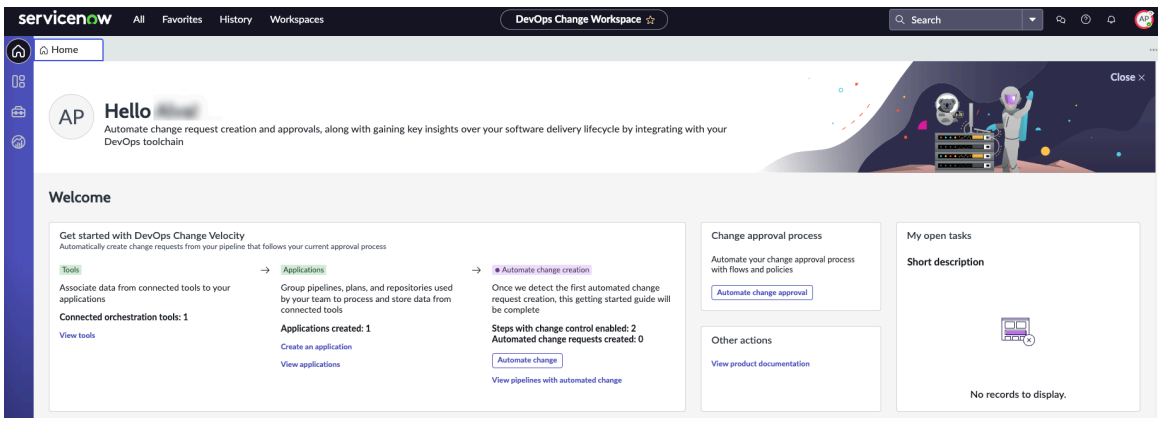
For more information about creating an application, see Create an application - Workspace.




3. To automate change requests for pipelines, ask your DevOps admin or tool owner to connect your orchestration tool.
4. Associate the pipelines for which you want to automate change requests with your application.

   For more information, see Associate tool objects to applications - Workspace.
5. Select **Automate change** to create an automated change request.

   For more information about creating automated change requests, see Automate DevOps change request creation.




6. Modify your orchestration pipeline to enable change control.

   You can run the pipeline to verify that change requests are automatically created.

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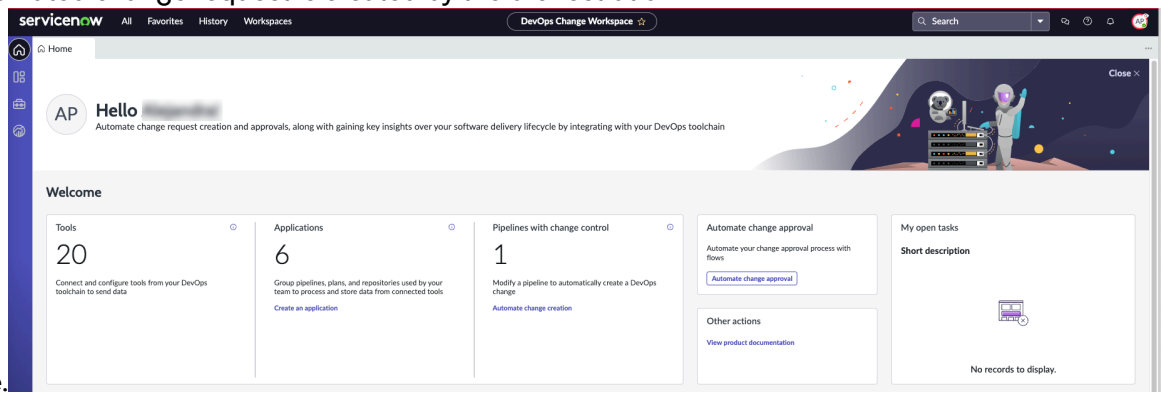
The getting started guide will be marked as complete when the first automated change request is created by the orchestration pipeline.

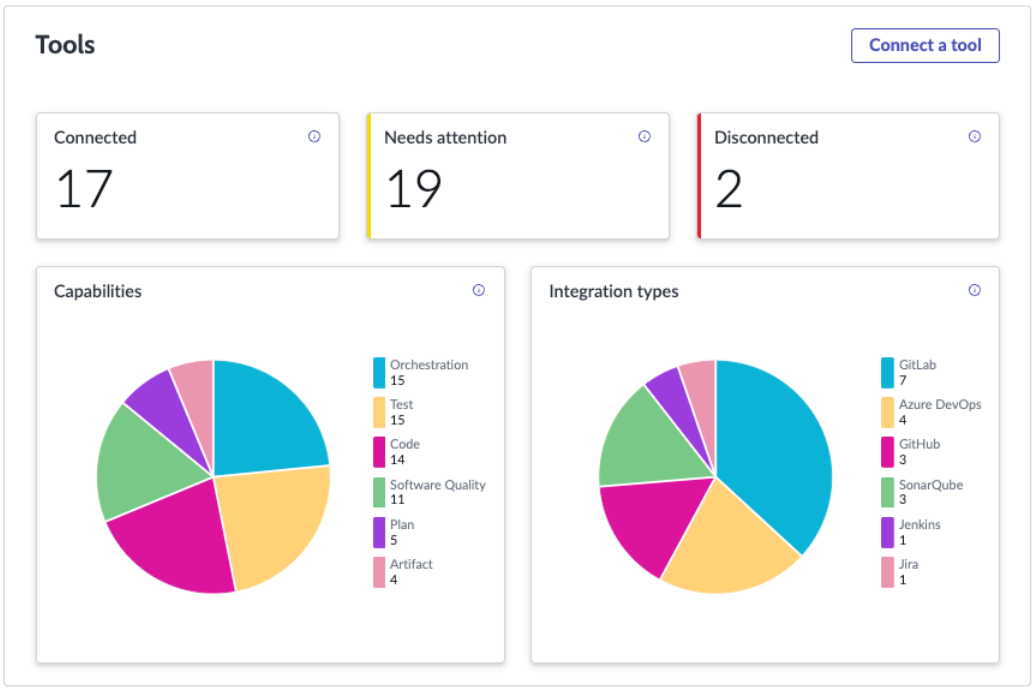



## Workspace widgets

### Tools widget

The Tools widget gives an overview of your connected tools, with the following details:

- Number of tools that are in the connected state. You can select the card to see the list of connected tools.
- Number of tools that need attention. You can select the card to see the list of unconfigured tools.
- Number of tools that are in disconnected state. You can select the card to see the list of disconnected tools.
- Number of tools grouped by their capabilities. You can select a capability to see the list of tools created for that capability.
- Number of tools grouped by their tool types. You can select an integration type to see the list of tools connections created for that particular tool type.
- DevOps admins and tool owners can connect to a tool from the widget.

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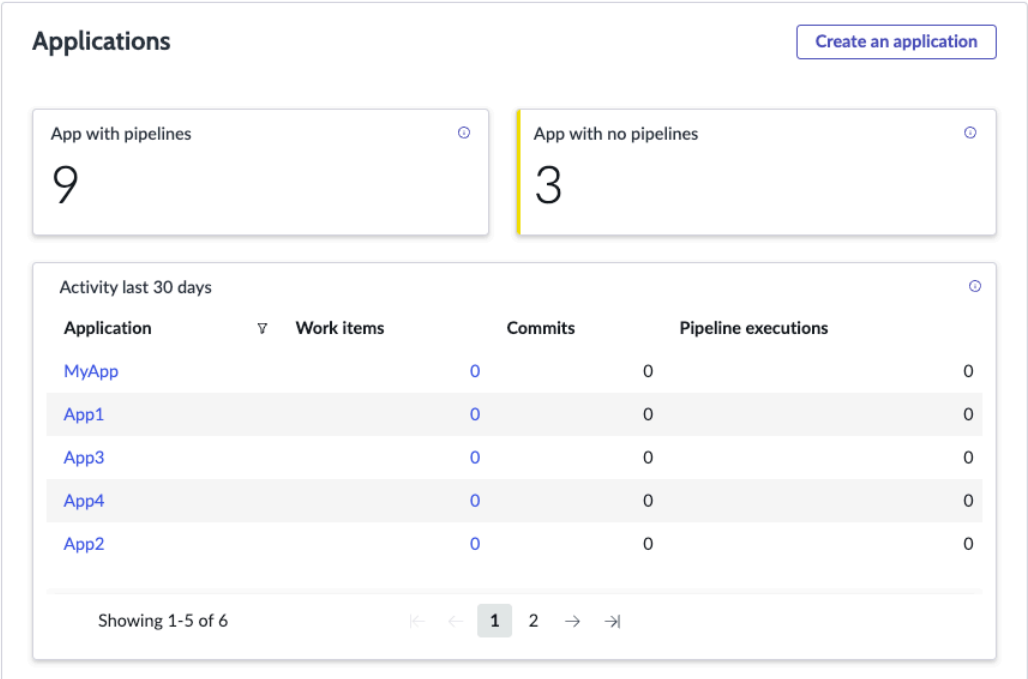
### Applications widget

The Applications widget gives an overview of your applications, with the following details:

- Number of applications with at least one associated pipeline. You can select the card to see the list of apps with pipelines.
- Number of without any pipelines. You can select the card to see the list of apps with no pipelines.
- Number of work items, commits, and pipeline executions from all applications in the last 30 days. You can select the card to see the list of disconnected tools.
- Number of tools grouped by their capabilities. You can select a capability to see the list of tools created for that capability.
- Number of tools grouped by their tool types. You can select an integration type to see the list of tools connections created for that particular tool type.
- DevOps admins and app owners have the option to create an application from the widget.




### Automated change requests widget

The Applications widget gives an overview of your applications, with the following details:

- Number of change requests created in the last 30 days. You can select the card to see the list of change requests.
- Number of change requests that are pending approval in the last 30 days.
- Number of pipelines with change control enabled, but hasn't automatically created a change request.
- Number of tools grouped by their capabilities. You can select a capability to see the list of tools created for that capability.
- Number of tools grouped by their tool types. You can select an integration type to see the list of tools connections created for that particular tool type.

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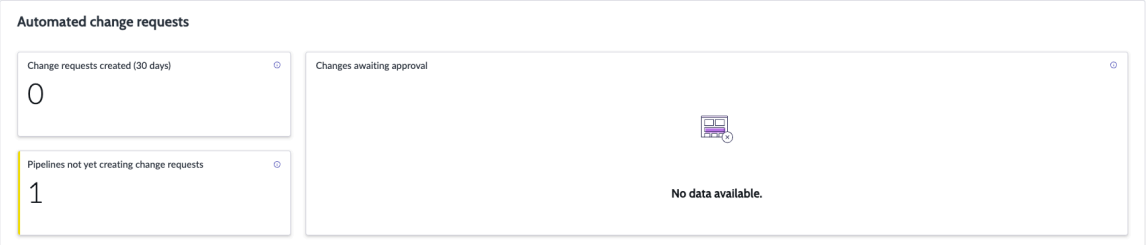


# Integrating DevOps Change Velocity with third-party tools

Integrate your orchestration, planning, coding, artifact, software quality, and security tools with DevOps Change Velocity for end to end change traceability and automation.

You must onboard a minimum of one planning, one coding, and one orchestration tool to enable change outcomes.

Use the workspace to onboard tools for a guided experience. Alternatively, you can use the Service Catalog or Classic environment experience.

## Azure DevOps integration with DevOps Change Velocity

Connect to your Azure DevOps instance to discover boards, repositories, and pipelines to enable change automation and traceability.

## Azure DevOps integration overview

The following Azure DevOps tools are supported:

- Azure Boards (planning)
- Azure Repositories (coding)
- Azure Pipelines (orchestration)
  - Build (CI) pipelines — agent and agentless (server) jobs
  - Release (CD) pipelines

Capture tags from Azure DevOps coding tool commits.

Jenkins also supports testing capabilities with JUnit. Test tool integration lets you view test results in DevOps Change Velocity for Azure DevOps unit, functional, and performance tests.

## Azure DevOps extension

You can use the **ServiceNow DevOps** extension for Azure DevOps on Visual Studio Marketplace to integrate your Azure pipeline with DevOps Change Velocity.

The **ServiceNow DevOps** extension includes:

- ServiceNow DevOps service connection
- ServiceNow DevOps Release Gate
- Azure build (CI) pipeline agent and server job custom tasks
- ServiceNow DevOps Build Sonar Registration (for Build pipelines)
- ServiceNow DevOps Release Sonar Registration task (for Release pipelines)

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## Bulk commits in Azure DevOps

Large commits are supported with Azure DevOps.

To support large commits, perform these actions:

- Install the ServiceNow IntegrationHub Action Template - Data Stream (com.glide.hub.action_type.datastream) plugin.
- For optimal performance, disable flow logging by setting the Flow Designer *com.snc.process_flow.reporting.level* property to **Off**.
- For MID Server settings, view the MID Server support for Data Stream actions section.

The Azure DevOps data stream can currently process up to 8000-9000 commits per code push. The number of run commits listed for a task execution are limited to 200.

## Get started

You can connect to Azure DevOps at the organization level or at individual project levels.

Connecting at an organization level is recommended as it is enables discovery of multiple projects at once using one set of credentials. This makes it easier to discover multiple projects at a time and for updating credentials.

Connecting at a project level if you want to restrict access to the project to a certain group of users. Since DevOps group access controls are at the tool level, to restrict access to a project, you must create an Azure DevOps tool connection for that project.

Use one of the following options to onboard Azure DevOps. For a guided experience, use the workspace to onboard a tool. Alternatively, you can use the Service Catalog or Classic experience.

### Onboard Azure DevOps to DevOps Change Velocity — Workspace

Connect to your Azure DevOps instance using the DevOps Change Workspace playbook to collect data for planning, coding, orchestration, artifact, and software quality functions.

Connecting Azure DevOps with DevOps Change Velocity  Modeling an Azure pipeline in DevOps

You can connect to Azure DevOps (ADO) at your organization level or at individual project level. If you're connecting at the project level, for each project at your organization, you must repeat the connection process. After connecting to an instance of the tool, you can configure additional settings that enable DevOps to import pipelines, task execution records, and step execution records.

When you configure webhooks in your Azure DevOps instance to send data to DevOps Change Velocity, Azure DevOps uses token authentication for the integration user by default. The DevOps Change Velocity APIs are invoked using token authentication and you don’t have to enter the integration user name and password while configuring. If the devops.system user isn’t available in your ServiceNow instance, you must set the **Switch to this user after token based authentication is successful** property. For more information, see DevOps Change Velocity properties. The step to enter the integration user name and password is required only in the following scenarios:

- If DevOps Config is installed, as DevOps Config APIs are invoked using basic authentication.
- If you use the Azure Invoke REST API service connection. You must enable the *This property decides whether to create a Generic Connection on configure operation for Azure DevOps* property in this case.

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**Note:**
DevOps Change Velocity uses the term instance to refer to a particular occurrence of a tool. Azure DevOps uses the term project instead.

### Connect an organization

Connect and configure your Azure DevOps instance directly at your Azure DevOps organization level. All the projects within the organization can be discovered, and you can choose to configure multiple projects within the organization. You can manage the tool at the organization level.

### Before you begin

Complete the tasks specified in the Getting started with DevOps Change Velocity topic.

Role required: sn_devops.admin or sn_devops.tool_owner

### Procedure

1. Navigate to **Workspaces** > **DevOps Change Workspace** and use one of the following options to open the Playbook to onboard Azure DevOps.

   **Important:**
   If you want to discover and track tool objects like pipelines, plans, or repositories while connecting to the tool, you must connect your tool from the Application module.

2. In the Connect to a tool modal, enter the connection details.
   a. Select **Connect an organization** from the drop-down list.
   b. Enter the Azure DevOps URL for the organization.
   c. In the **Tool name** field, enter a name for the tool.
   d. Select **Next**.

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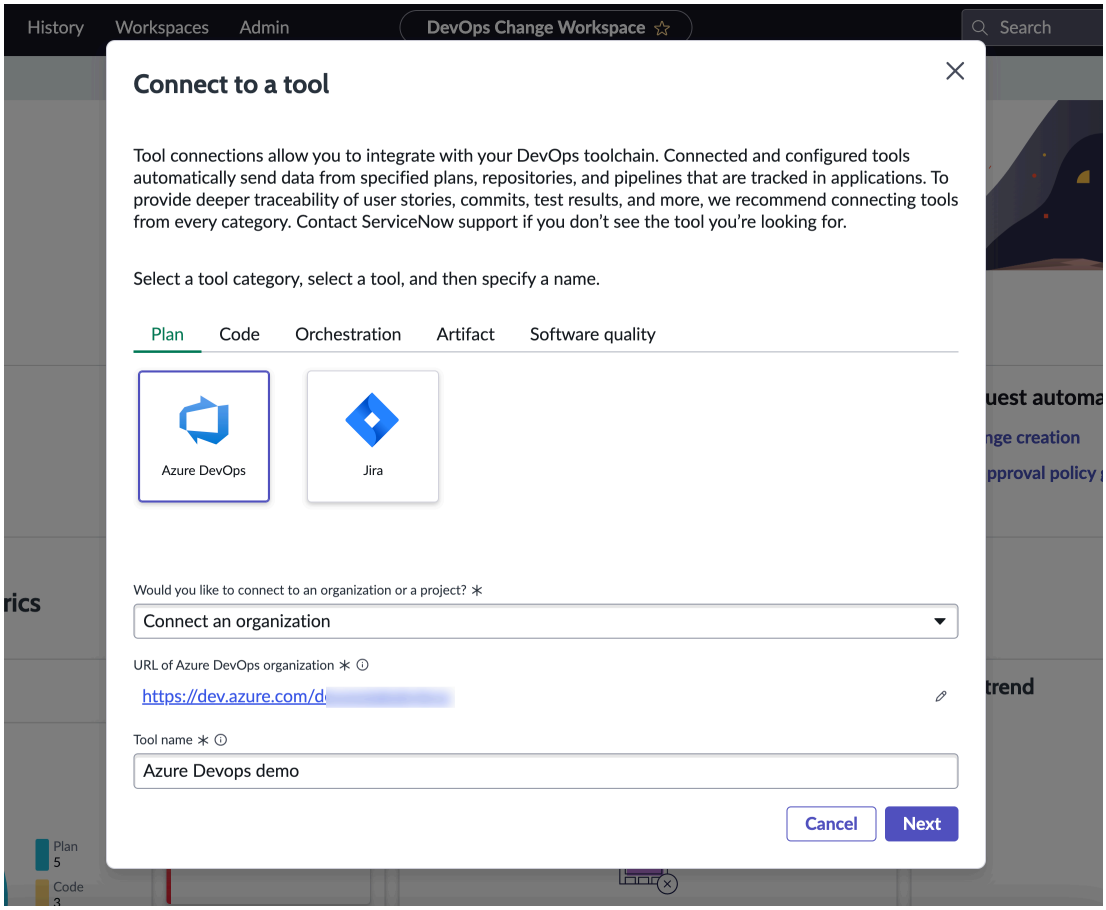
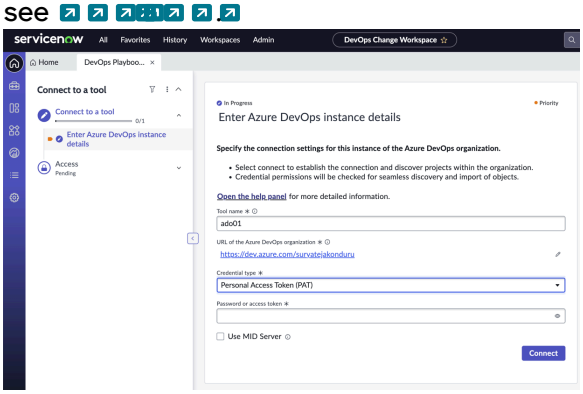



The DevOps playbook opens to help you complete the onboarding tasks.

3. In the Enter Azure DevOps instance details section, select one of the following values in the **Credential type** field.

| Option | Description |
|---|---|
| **Personal Access Token** | Enter the password or access token to ac cess this instance.<br><br>For information on creating a PAT, see<br>  |
| **OAuth 2.0** | Pre-requisites:<br>○ Create a tenant in Microsoft Entra<br>○ Add a user to tenant in Microsoft Entra |

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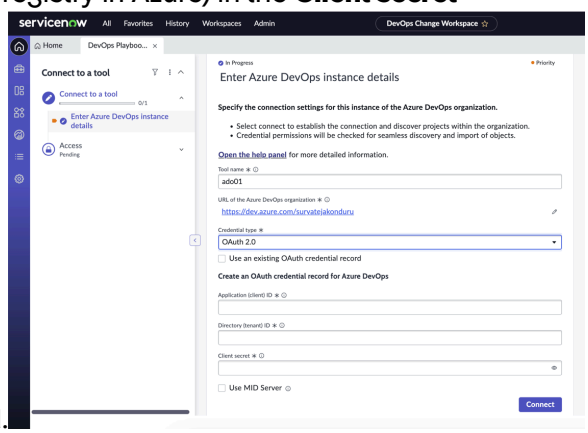
| Option | Description |
| --- | --- |
| | ○ Create an organization in Azure portal<br>○ Create an Azure DevOps app<br>○ Register Azure DevOps as an OAuth provider<br>○ Configure organization and project level set tings<br>○ Create credential record and get OAuth to ken<br>**Use an existing OAuth credential record**<br>**a.** Select the **Use an existing OAuth creden tial record** option.<br>**b.** Select a value in the **Credential** field.<br>**Create a new credential record**<br>**a.** Clear the **Use an existing OAuth credential record** option.<br>**b.** Enter the application ID of your Azure appli cation (available in the Overview section of your Azure application registry in Azure) in the **Application (client) ID** field.<br>**c.** Enter the directory ID of your Azure applica tion (available in the Overview section of your Azure application registry in Azure) in the **Directory (tenant) ID** field.<br>**d.** Enter the client secret of your Azure ap plication (available in the Certificates & secrets section of your Azure applica tion registry in Azure) in the **Client secret** field.<br>  |

4. If your tool instance is attached to a MID Server, select the **MID Server** option and enter its details.

   For more information about MID server, see MID Server selection.

5. Select **Connect**.

6. Permission checks are run on the credentials that you entered.
   Permissions required and permissions that are available are displayed. If you want to enter credentials with better permissions, select **Re-enter credentials**. For detailed information

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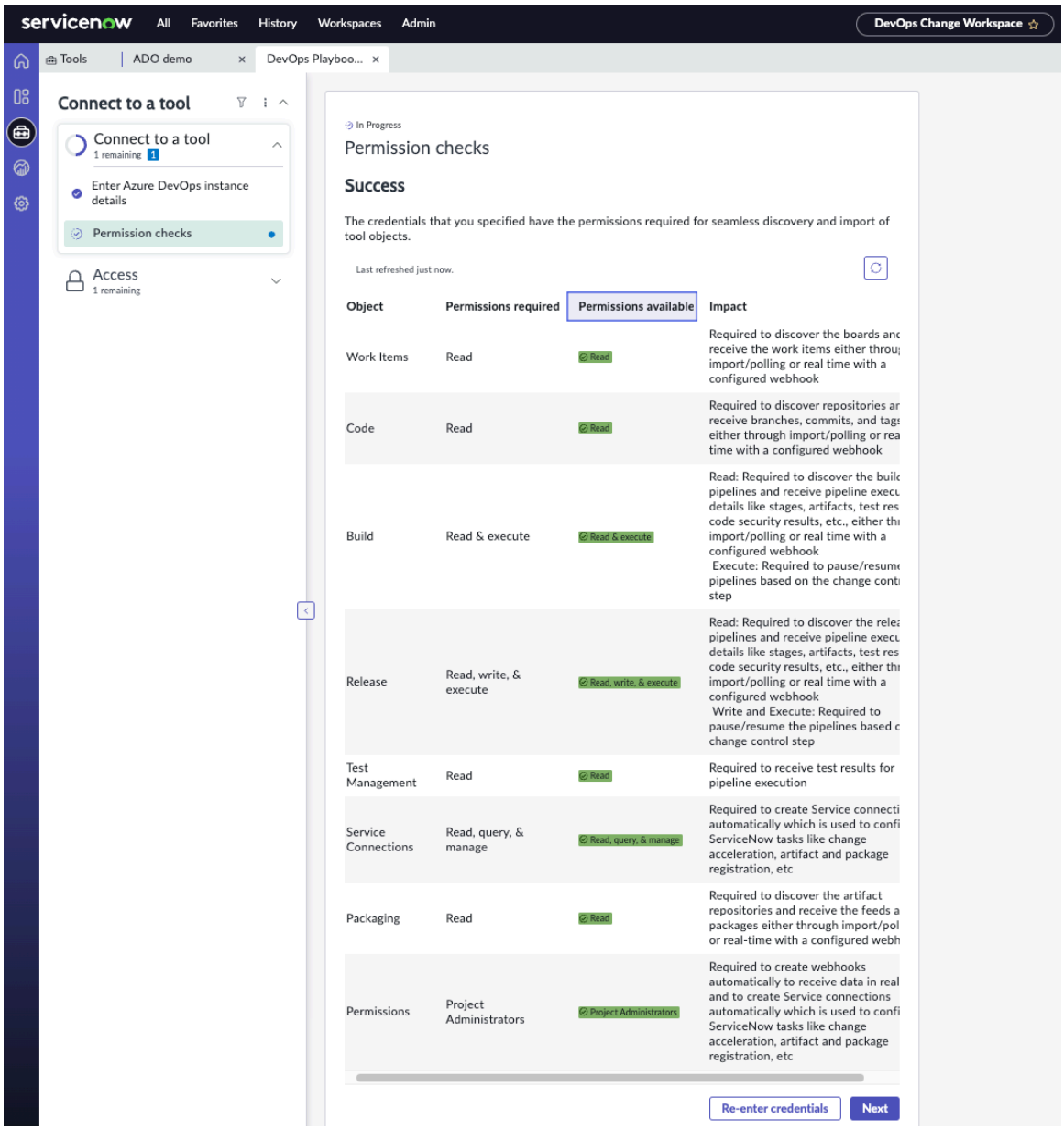
on all the required permissions, see Azure DevOps permissions in Permissions required for DevOps tools.

You can choose to continue with the tool connection even if you don't have all the required permissions.

**Note:**
When onboarding an Organization, the **Project Administrators** privilege requires the owner of the PAT to be a member of the organization's **Project Collection Administrators** group.

You need the Project Administrators privilege only for onboarding the tool. Once the tool is successfully onboarded, you can choose to turn off the Project Administrators privilege from the PAT.




7. Specify the access for the tool.

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**a.** If you want to control access to the tool, add the groups that must be given access to the tool in the **Maintained by** field.

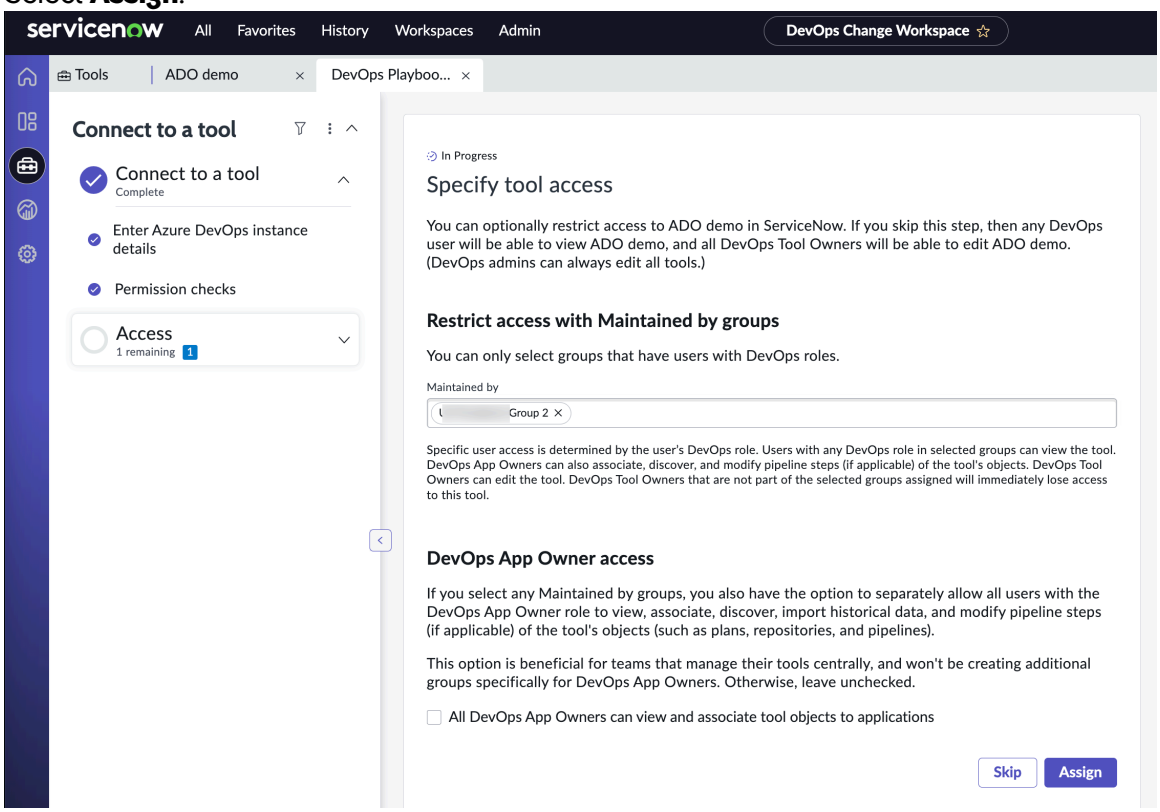
The tasks these users in the groups can perform depends on the role assigned to them.

- DevOps Tool Owner role: Can view and edit the tool.
- DevOps App Owner role: Can view the tool and can associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects (such as plans, repositories, and pipelines).
- DevOps Administrator role: Can edit all tools.
- Other DevOps roles: Can view the tool.

> **Note:**
> If you don't select a group and skip this step, all users with the DevOps Tool Owner role will be able to edit the tool.

**b.** If you choose to control access to the tool, the **All DevOps App Owners can view and associate tool objects to applications** option becomes available for selection.
This option enables all users having the DevOps App Owner role to access the tool. If selected, they'll be able to view, associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects.

**c.** Select **Assign**.




**8.** Install the ServiceNow DevOps extension in your Azure DevOps instance.

The ServiceNow DevOps extension will automatically create service connections while configuring webhooks. Service connections are required for sending build and release notifications from Azure DevOps. The extension also contains custom tasks to modify the Azure DevOps pipelines for change control, artifacts, and packages.

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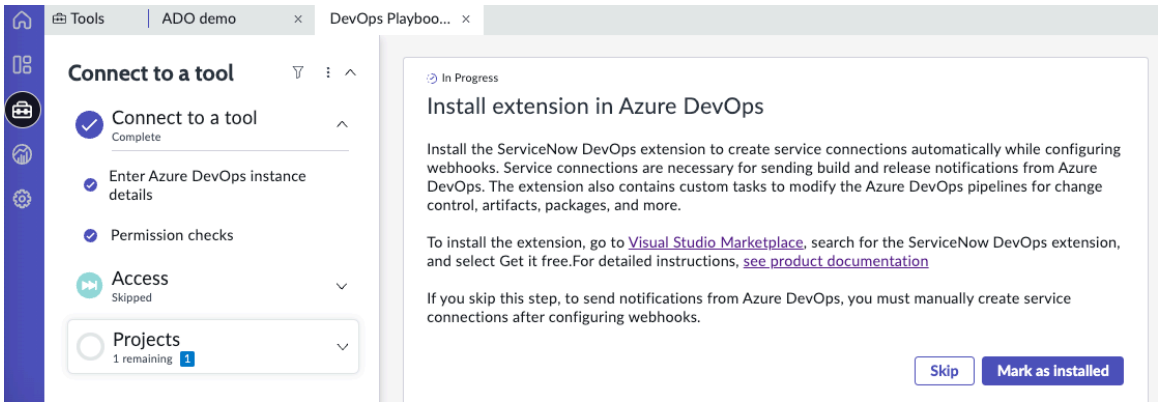
For more information on the extension, see Use the ServiceNow DevOps extension for Azure DevOps and Azure DevOps custom actions.

**Note:**
If you skip this step, to send notifications from Azure DevOps, you must manually create service connections after configuring webhooks.

After installing the extension, select **Marked as installed**.




9. Configure webhooks automatically in your Azure DevOps instance to send data to DevOps Change Velocity.

   Choose to send data by either nightly polling or configuring webhooks to send real-time data.

   - Webhooks: Enable real-time notifications for your pipeline executions. Real-time notifications are ideal to maintain the most up-to-date information particularly for automating change requests.

     To use webhooks, select **Configure.**

   - Nightly polling: If you don't choose to configure now, you can enable nightly polling later to fetch data for any tracked plans by setting the *`Enable Polling`* property to **Yes**.

   **a.** Enter the DevOps integration user name and password.

   For information about creating the DevOps integration user and password, see Set up integration user account in DevOps Change Velocity.

   **Note:**

   - The step to enter the integration user name and password is required to configure only when DevOps Config is installed or the *`This property decides whether to create a Generic Connection on configure operation for Azure DevOps`* property is enabled. If this step is not required, webhooks are configured using token-based authentication.
   - When DevOps Config is installed or the Generic Connection on configure operation for Azure DevOps property is enabled, you can regenerate token (auto-configure with new token) from the workspace UI only, which will update the integration user password. When DevOps Config is not installed, token can be regenerated from both the workspace and classic UI for token based authentication. Re-generate your token periodically for better security.

   **b.** Select the projects for which you want to configure webhooks.

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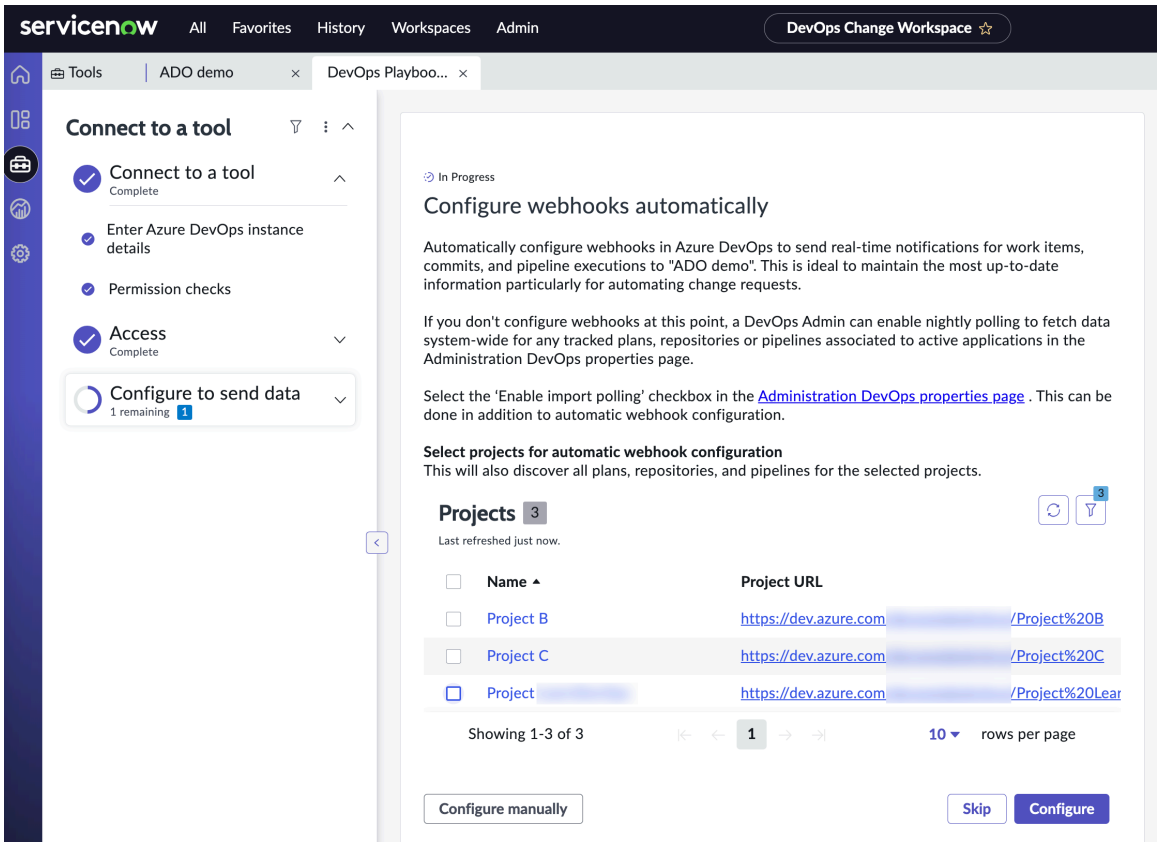
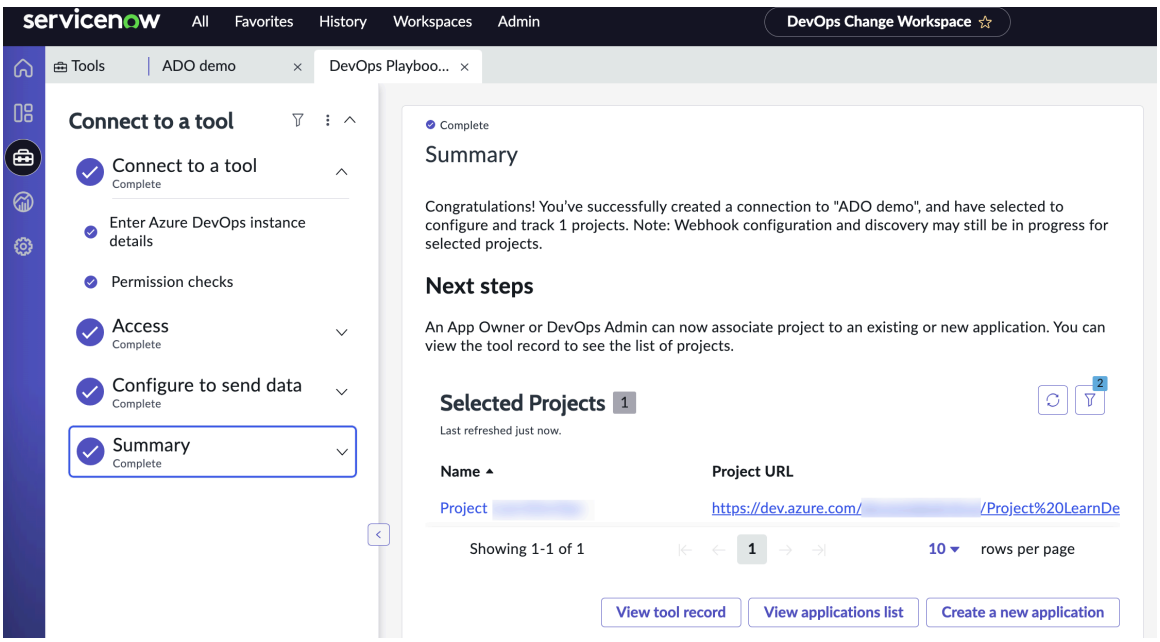
**c.** Select **Configure**.




To configure webhooks manually, select **Configure manually**. See Configure webhooks in Azure DevOps manually for more information.

Webhook configuration and discovery happen in the background, and you're taken to the Summary page.




**10.** From the Summary page, select **View tool record** to review the details of the connected tool.

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### Result
You've successfully onboarded your Azure DevOps tool to DevOps Change Velocity at the organization level.

### What to do next
From the **Projects** tab on the tool record page, select a project to navigate to the project record page. From here, you can discover project objects, and configure webhooks for the project.

- Select **Discover** to discover the project objects, including existing plans (boards), repositories, and pipelines.
- If you created the tool directly at the project level, then selecting **Discover projects** from the **Projects** tab of the tool record page will discover all the projects in your organization as well.
- Select **Configure** and enter the integration user credentials to configure webhooks for the project.
- If you're on the tool records page, selecting **Configure projects** and entering the integration user credentials gives the list of unconfigured projects in your organization. Select the projects that you want webhooks configured for and select **Configure**.

> **Note:**
> The step to enter the integration user name and password is required to configure webhooks only when DevOps Config is installed or the Generic Connection on configure operation for Azure DevOps property is disabled. If this step is not required, webhooks are configured using token-based authentication.

- To import historical data to the project objects like plans, repositories, or pipelines, associate the objects with an application, and import the data. For more information, see Associate tool objects to applications - Workspace.

#### Connect a project

Connect and configure your Azure DevOps instance directly at the project level. If you have multiple projects within the organization, you must connect each of them separately.

### Before you begin
Complete the tasks specified in the Getting started with DevOps Change Velocity topic.

Role required: sn_devops.admin or sn_devops.tool_owner

### Procedure
1. Navigate to **Workspaces** > **DevOps Change Workspace** and use one of the following options to open the Playbook to onboard Azure DevOps.

> **Important:**
> If you want to discover and track tool objects like pipelines, plans, or repositories while connecting to the tool, you must connect your tool from the Application module.

2. In the Connect to a tool modal, enter the connection details.
   a. Select **Connect a project** from the drop-down list.
   b. Enter the Azure DevOps URL for the project.
   c. In the **Tool name** field, enter a name for the tool.

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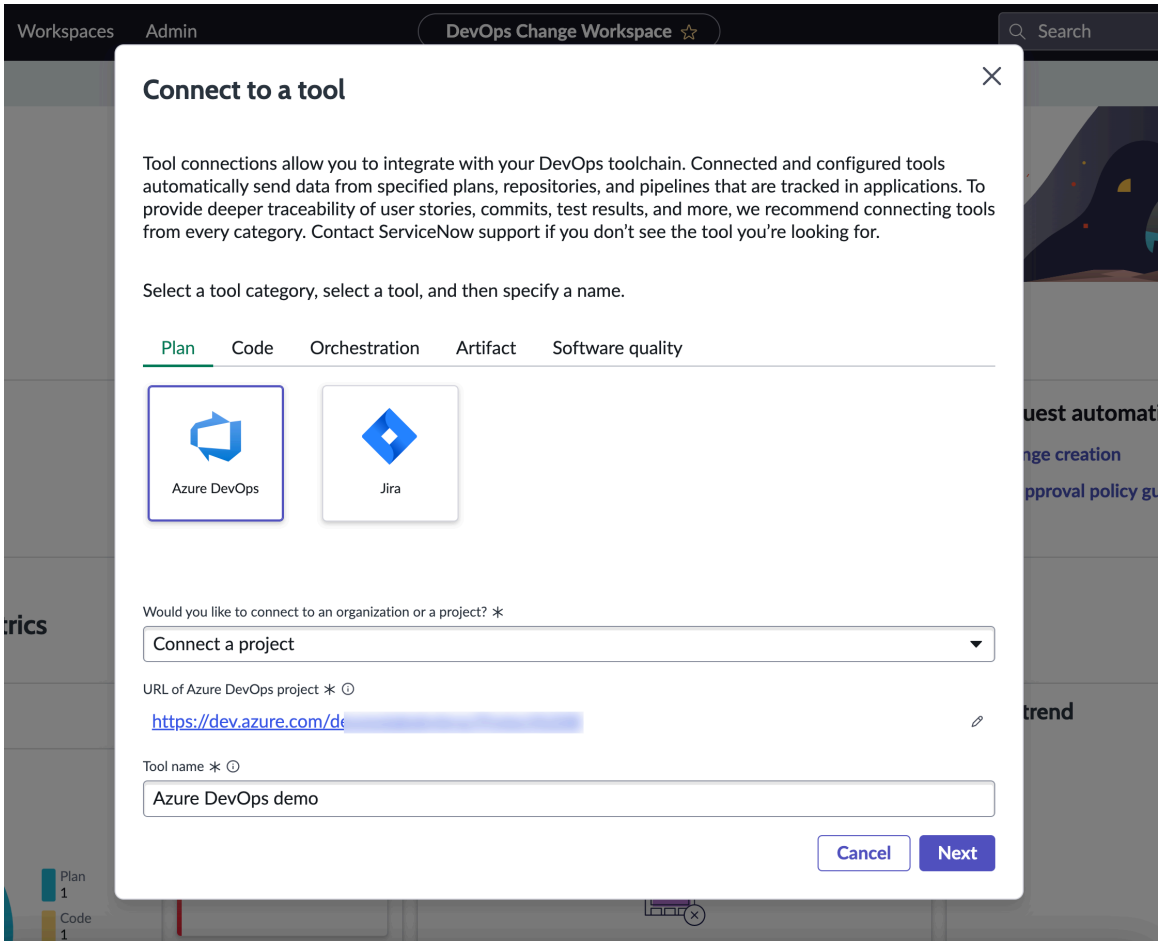
**d.** Select **Next**.

The DevOps playbook opens to help you complete the onboarding tasks.




**3.** Enter the instance details for your tool.

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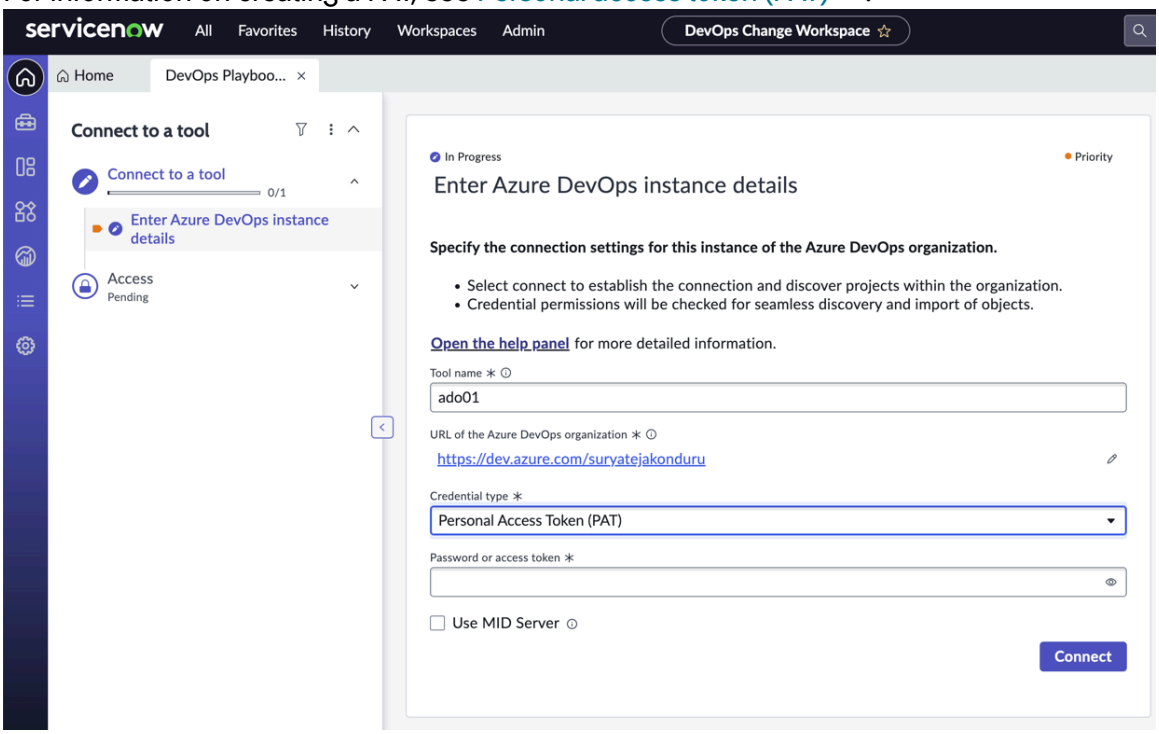
**a.** In the Enter Azure DevOps instance details section, select one of the following values in the **Credential type** field.

- **Personal Access Token**: Enter the password or access token to access this instance.

  For information on creating a PAT, see Personal access token (PAT).




- **OAuth 2.0**: Pre-requisites:
  - Create a tenant in Microsoft Entra
  - Add a user to tenant in Microsoft Entra
  - Create an organization in Azure portal
  - Create an Azure DevOps app
  - Register Azure DevOps as an OAuth provider
  - Configure organization and project level settings
  - Create credential record and get OAuth token

**Use an existing OAuth credential record**

**i.** Select the **Use an existing OAuth credential record** option.

**ii.** Select a value in the **Credential** field.

**Create a new credential record**

**i.** Clear the **Use an existing OAuth credential record** option.

**ii.** Enter the application ID of your Azure application (available in the Overview section of your Azure application registry in Azure) in the **Application (client) ID** field.

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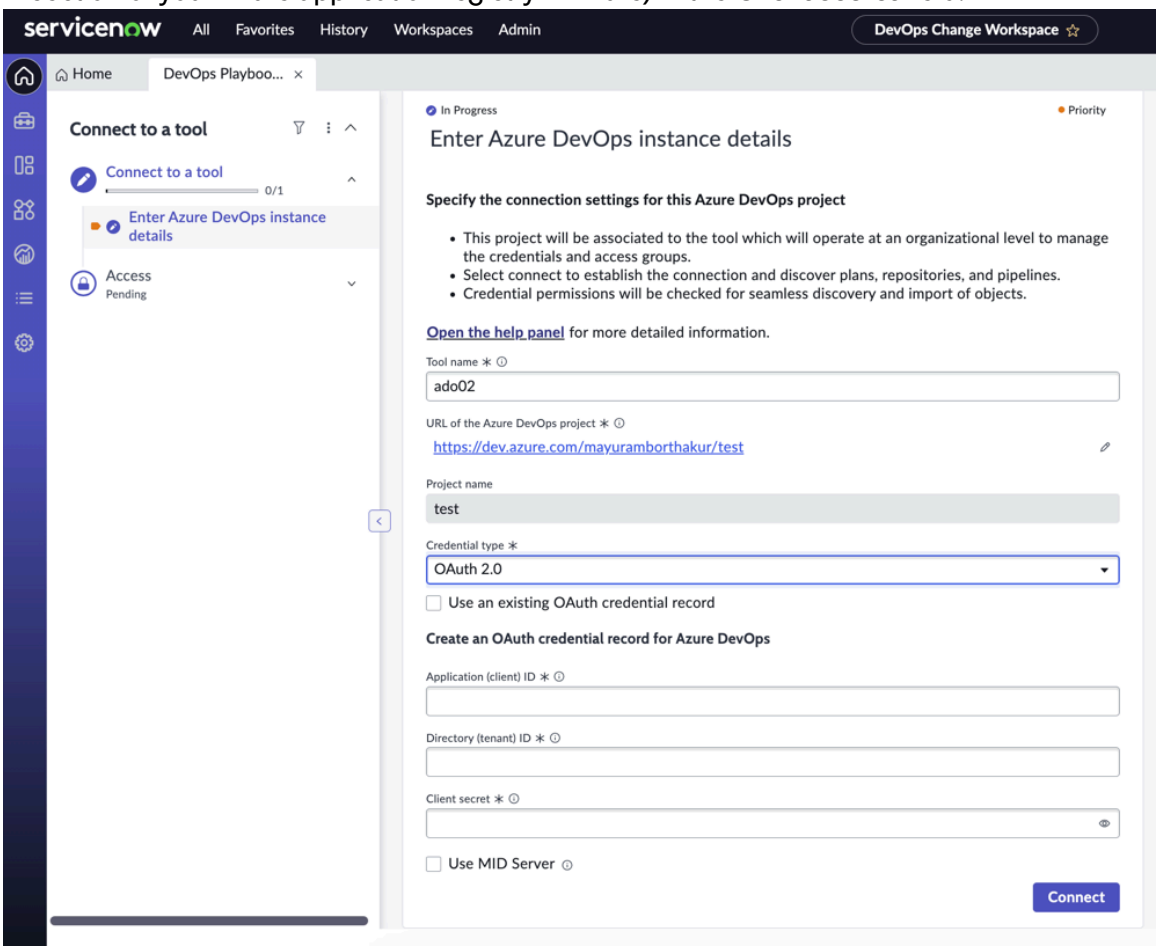
iii. Enter the directory ID of your Azure application (available in the Overview section of your Azure application registry in Azure) in the **Directory (tenant) ID** field.

iv. Enter the client secret of your Azure application (available in the Certificates & secrets section of your Azure application registry in Azure) in the **Client secret** field.




b. **Optional:** If your tool instance is attached to a MID Server, select the **MID Server** option and enter its details.

(Optional) For more information about MID server, see MID Server selection.

c. Select **Connect**.

d. Permission checks are run on the credentials that you entered.
Permissions required and permissions that are available are displayed. If you want to enter credentials with better permissions, select **Re-enter credentials**. For detailed information on all the required permissions, see Azure DevOps permissions in Permissions required for DevOps tools.

You can choose to continue with the tool connection even if you don't have all the required permissions.

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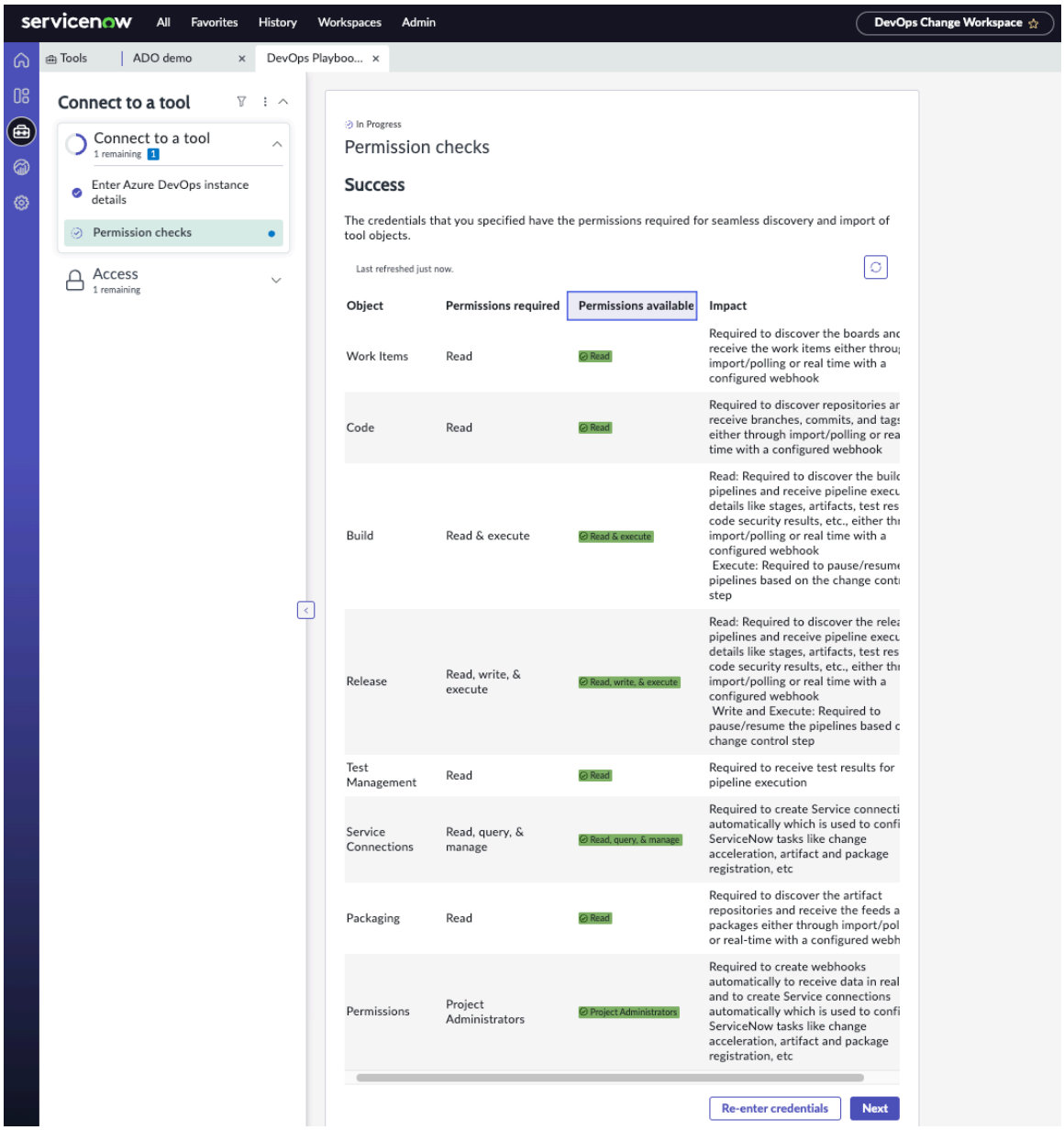
**Note:**
When onboarding a Project, the **Project Administrators** privilege requires the owner of the PAT to be a member of the project's **Project Administrators** group.

You need the Project Administrators privilege only for onboarding the tool. Once the tool is successfully onboarded, you can choose to turn off the Project Administrators privilege from the PAT.




e. Select **Next**.

4. Specify the access for the tool.

a. If you want to control access to the tool, add the groups that must be given access to the tool in the **Maintained by** field.

The tasks these users in the groups can perform depends on the role assigned to them.

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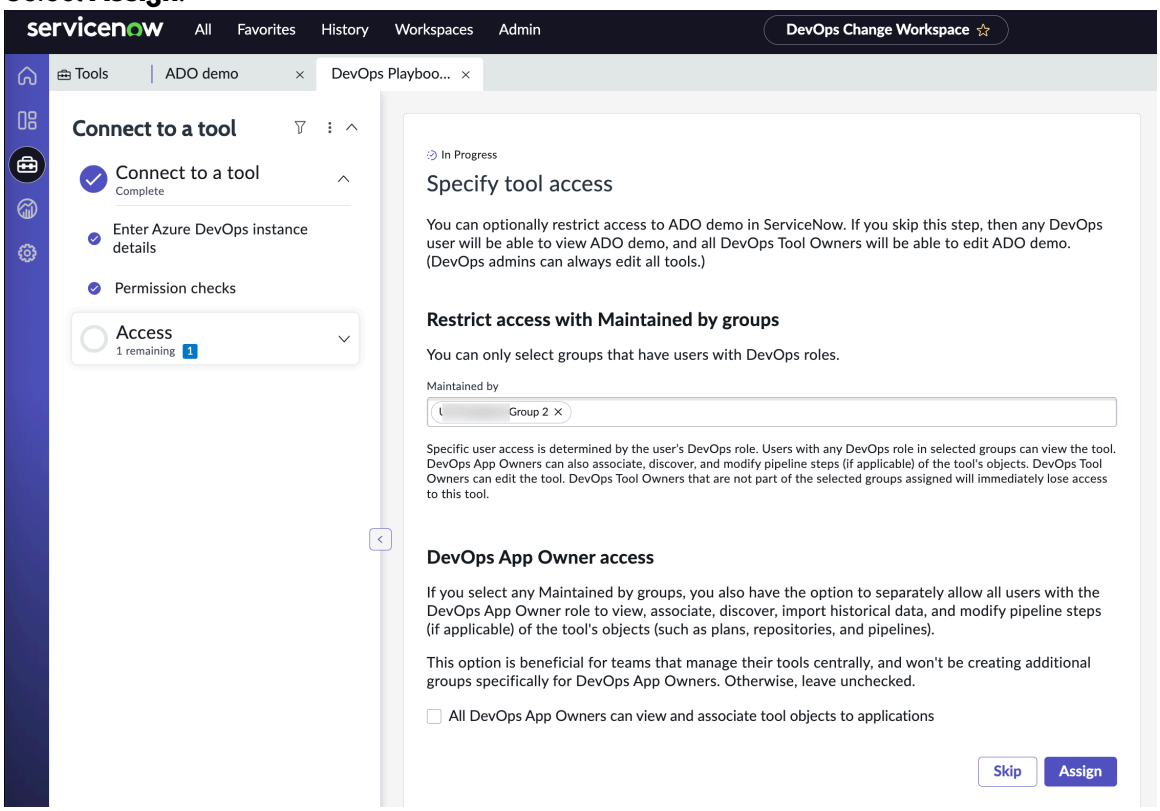
- DevOps Tool Owner role: Can view and edit the tool.
- DevOps App Owner role: Can view the tool and can associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects (such as plans, repositories, and pipelines).
- DevOps Administrator role: Can edit all tools.
- Other DevOps roles: Can view the tool.

**Note:**
If you don't select a group and skip this step, all users with the DevOps Tool Owner role will be able to edit the tool.

**b.** If you choose to control access to the tool, the **All DevOps App Owners can view and associate tool objects to applications** option becomes available for selection.
This option enables all users having the DevOps App Owner role to access the tool. If selected, they'll be able to view, associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects.

**c.** Select **Assign**.




**5.** Install the ServiceNow DevOps extension in your Azure DevOps instance.

The ServiceNow DevOps extension will automatically create service connections while configuring webhooks. Service connections are required for sending build and release notifications from Azure DevOps. The extension also contains custom tasks to modify the Azure DevOps pipelines for change control, artifacts, and packages.

For more information on the extension, see Use the ServiceNow DevOps extension for Azure DevOps and Azure DevOps custom actions.

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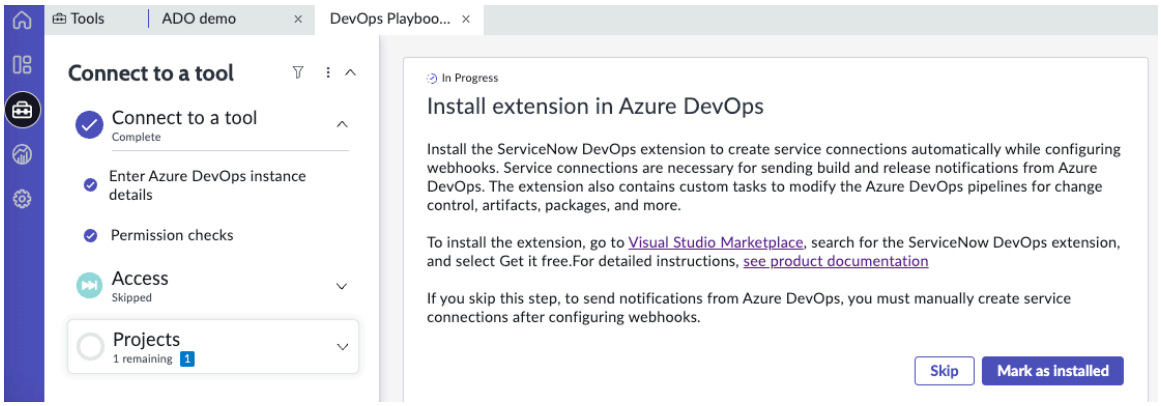
**Note:**
If you skip this step, to send notifications from Azure DevOps, you must manually create service connections after configuring webhooks.

After installing the extension, select **Marked as installed**.




6. Configure webhooks automatically in your Azure DevOps instance to send data to DevOps Change Velocity.

   Choose to send data by either nightly polling or configuring webhooks to send real-time data.

   - Webhooks: Enable real-time notifications for your pipeline executions. Real-time notifications are ideal to maintain the most up-to-date information particularly for automating change requests.

     To use webhooks, select **Configure.**

   - Nightly polling: If you don't choose to configure now, you can enable nightly polling later to fetch data for any tracked plans by setting the *`Enable Polling`* property to **Yes**.

   a. Enter the DevOps integration user name and password.

      For information about creating the DevOps integration user and password, see Set up integration user account in DevOps Change Velocity.

      **Note:**

      - The step to enter the integration user name and password is required to configure only when DevOps Config is installed or the *`This property decides whether to create a Generic Connection on configure operation for Azure DevOps`* property is enabled. If this step is not required, webhooks are configured using token-based authentication.
      - When DevOps Config is installed or the Generic Connection on configure operation for Azure DevOps property is enabled, you can regenerate token (auto-configure with new token) from the workspace UI only, which will update integration user password. When DevOps Config is not installed, token can be regenerated from both the workspace and classic UI for token based authentication. Re-generate your token periodically for better security.

   b. Select **Configure**.

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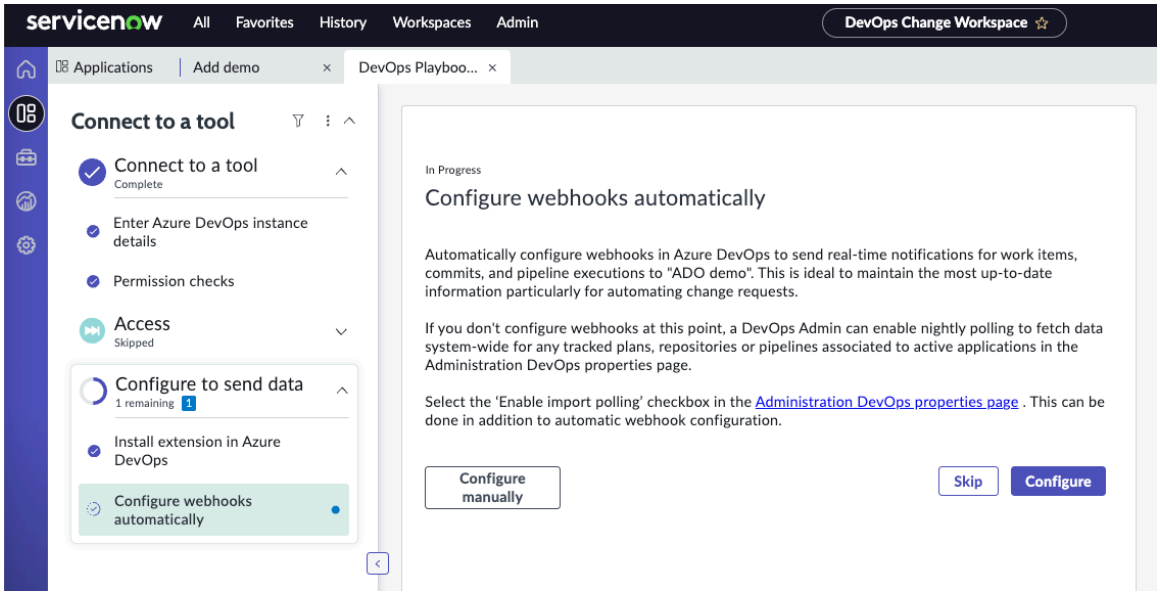
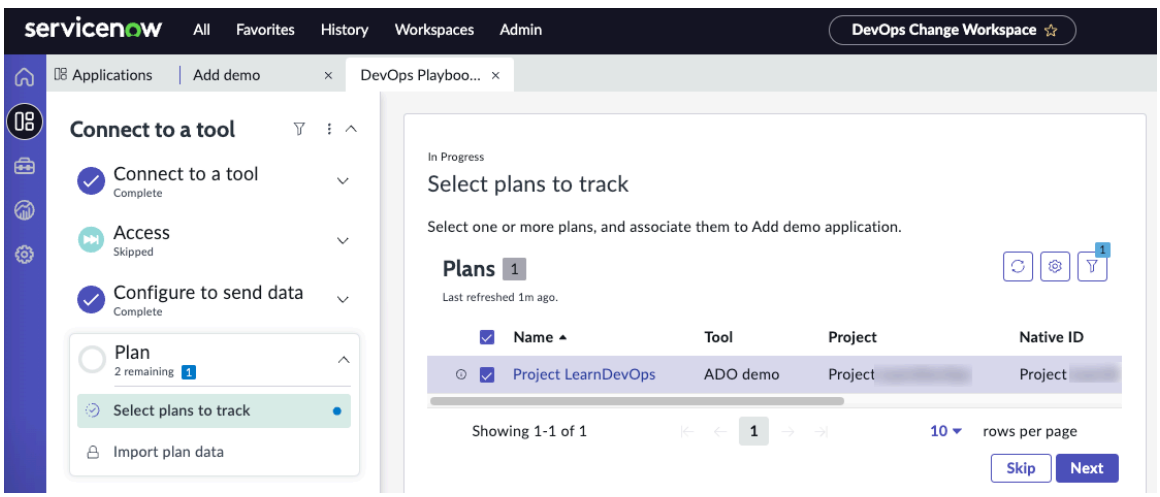



To configure webhooks manually, select **Configure manually**. See Configure webhooks in Azure DevOps manually for more information.

**Important:**

- If you're connecting from the Home page or Tools module, the connection is complete and you're taken to the Summary page.
- If you're connecting from the Applications module, then plans, repositories, and pipelines available in your project are discovered. You can track and import historical data from them.

7. Select the plans to track.
   a. Select the plans for which you want to track updates and associate to the application.
   b. Select **Next**.




   c. If you want to import plan data, select the date range and select **Submit**.

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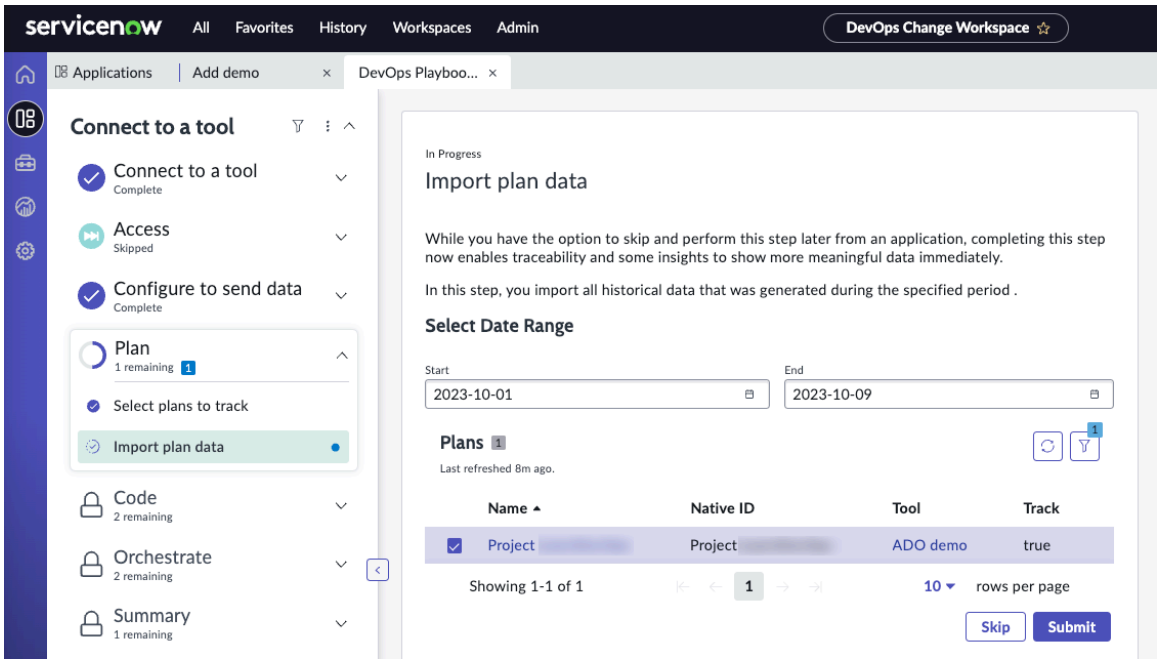
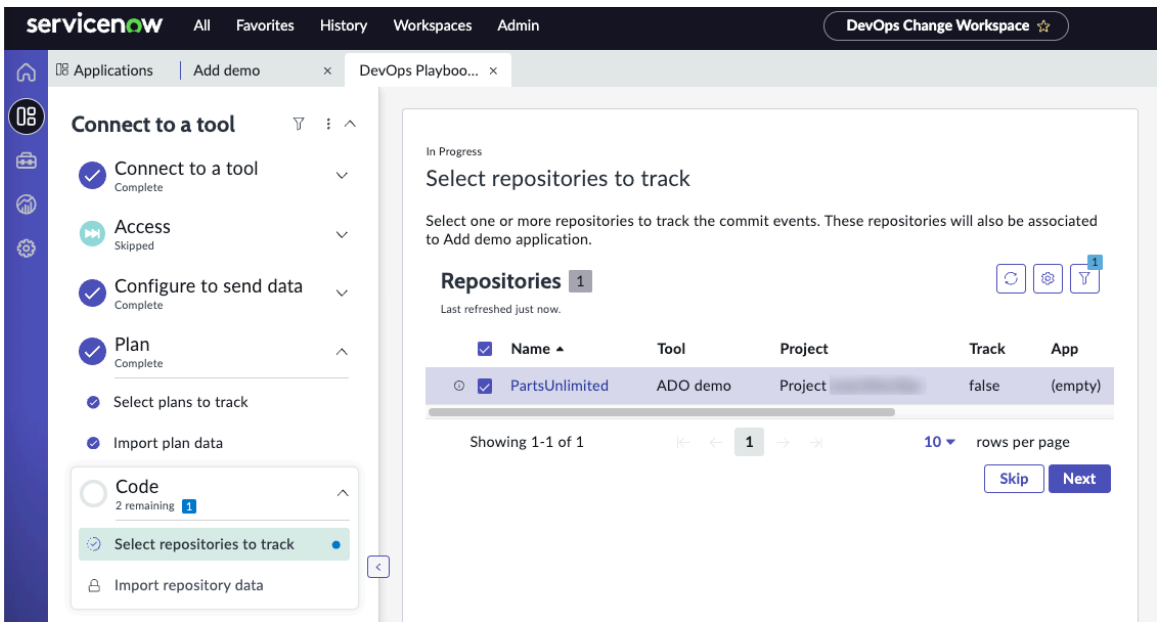
You can import up to 90 days of data.




8. Select the repositories to track.

   a. Select the repositories for which you want to track updates and associate to the application.

   b. Select **Next**.




   c. If you want to import repository data, select the date range and select **Submit**.

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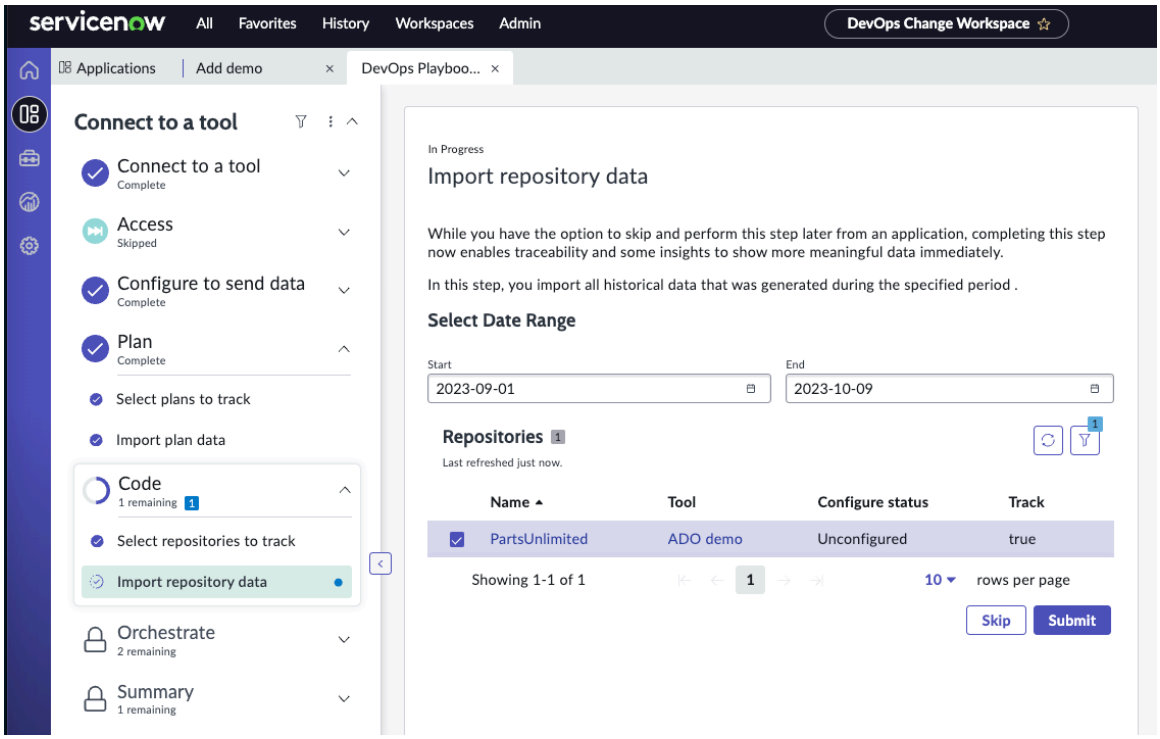
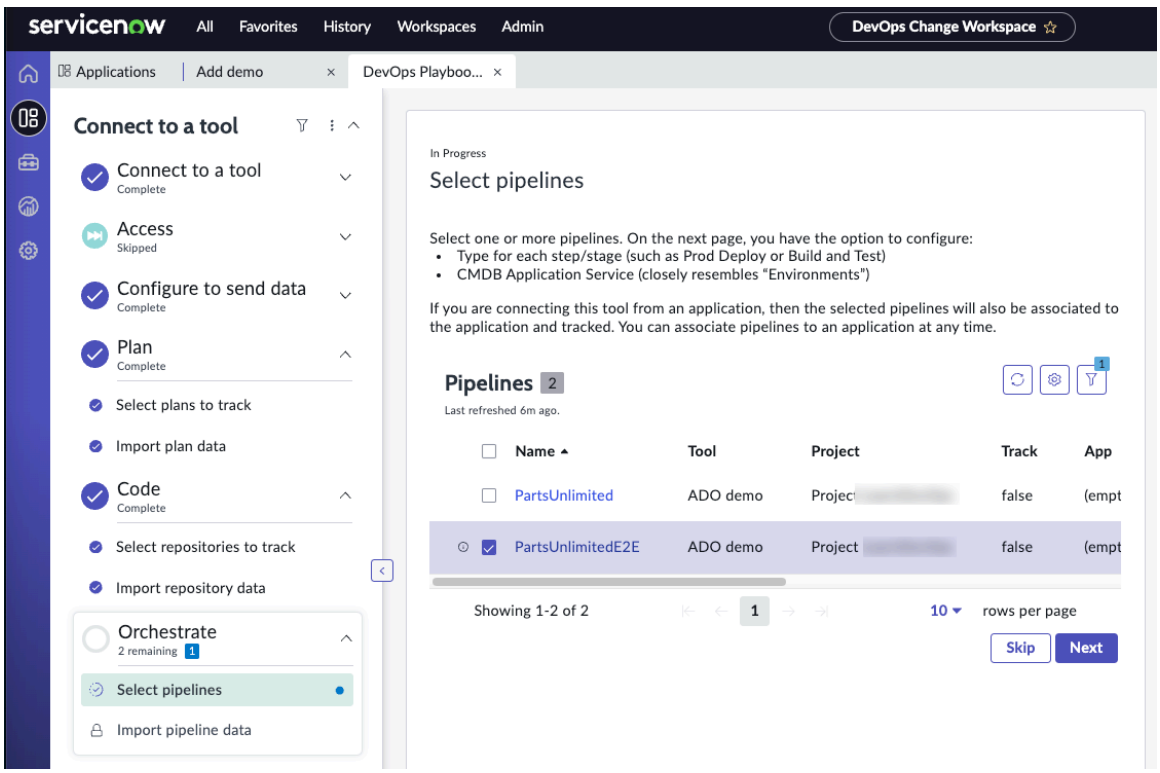
You can import up to 90 days of data.




**9.** Select the pipelines to track.

**a.** Select the pipelines for which you want to track updates and associate to the application.

**b.** Select **Next**.

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**c.** For each selected pipeline, all steps or stages are imported for the last successful execution. In the Assign services to pipeline steps activity, you can select the following for each pipeline step:

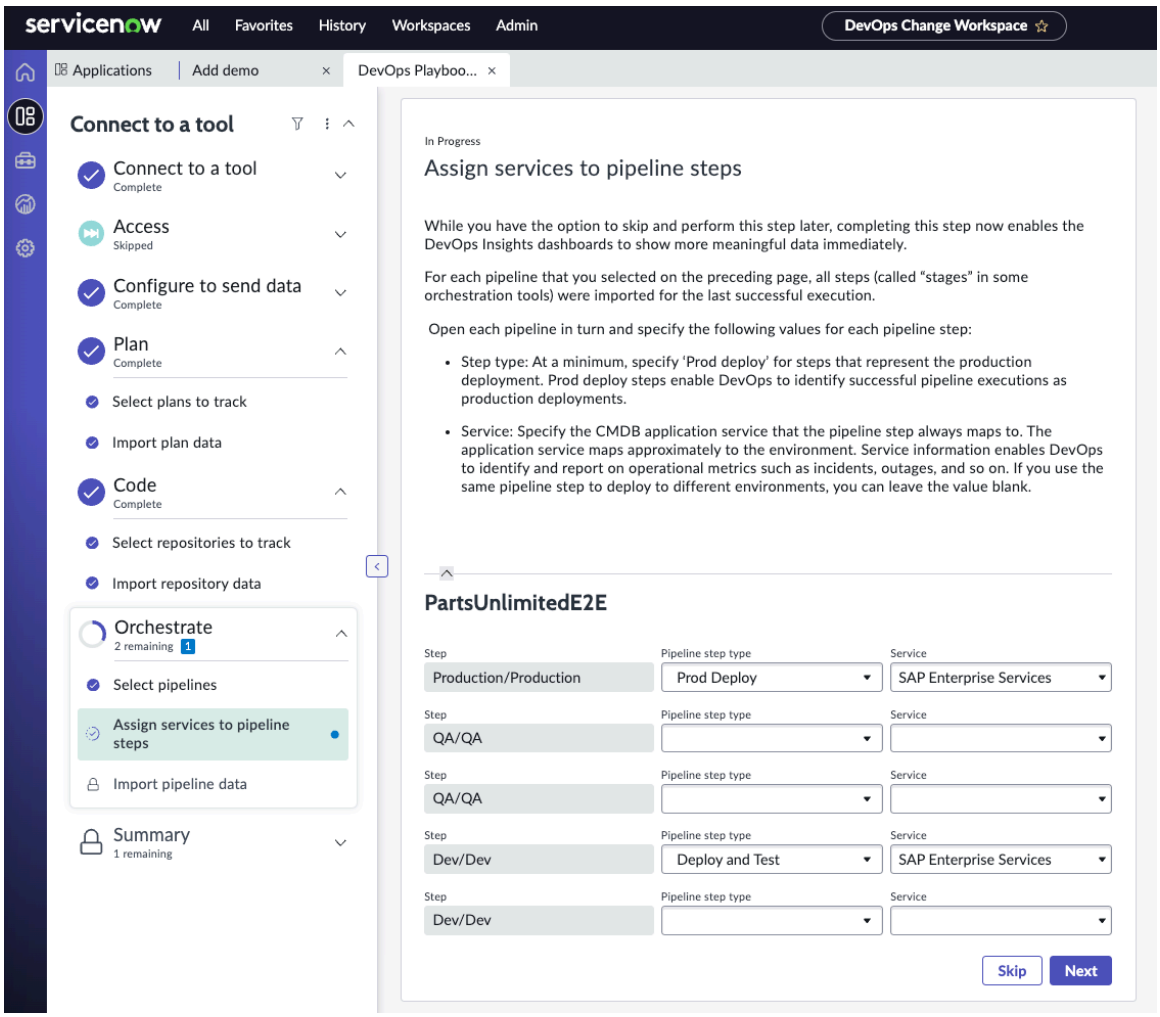
**i. Pipeline step type**: Select a step type for which you want to assign a service.

> **Tip:**
> Specify at least the *`Prod deploy`* step type for steps that represents the production deployment to enable DevOps to identify successful pipeline executions as production deployments.

**ii. Service**: Select the CMDB application service that the pipeline step maps to.

Application service maps approximately to the environment. If you use the same pipeline step to deploy to different environments, leave the field empty. Service information enables DevOps to identify and report on operational metrics such as incidents, outages, and so on.

**d.** Select **Next**.




**e.** If you want to import pipeline data, select the date range and select **Submit**.

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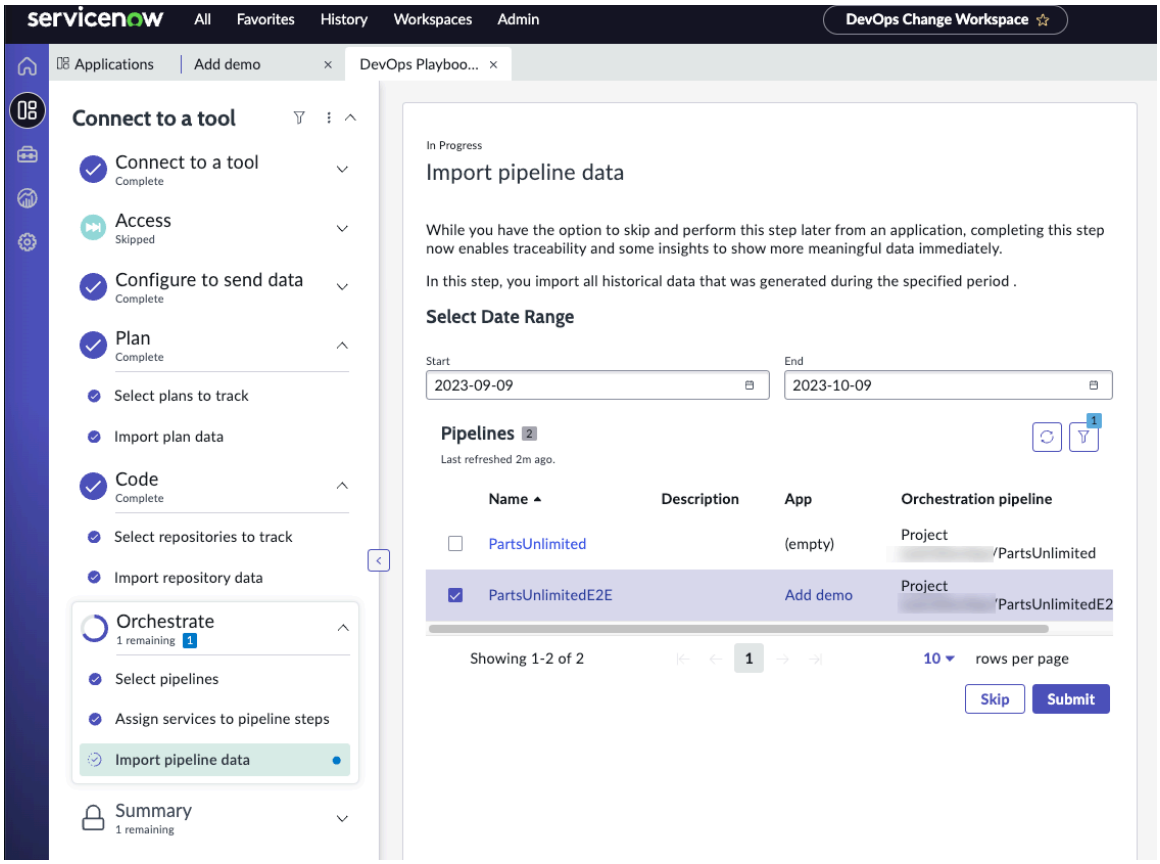
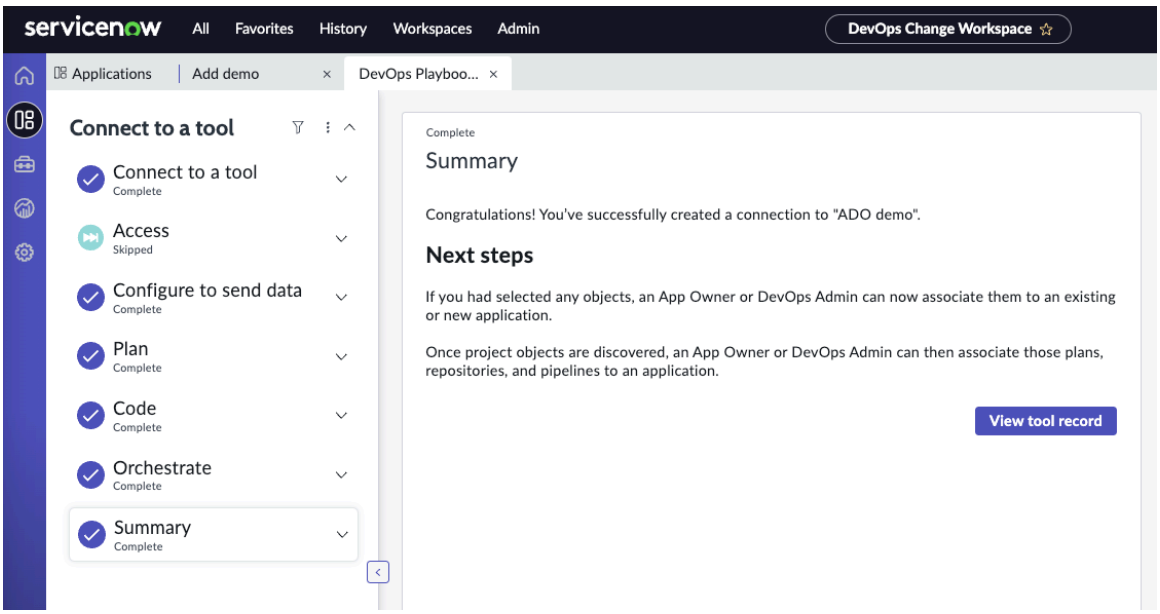
You can import up to 90 days of data.




**10.** You're taken to the Summary page.

From the Summary page, select **View tool record** to review the details of the connected tool.




## Result

You've successfully onboarded your Azure DevOps tool to DevOps Change Velocity at the project level.

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### What to do next

From the **Projects** tab on the tool record page, select a project to navigate to the project record page. From here, you can discover project objects, and configure webhooks for the project.

- Select **Discover projects** to discover the project objects, including existing plans (boards), repositories, and pipelines. This will discover all the projects in your organization as well.
- Select **Configure projects** to configure webhooks for the project.
- If you're on the tool records page, selecting **Configure projects** and entering the integration user credentials gives the list of unconfigured projects in your organization. Select the projects that you want webhooks configured for and select **Configure**.

  **Note:**
  The step to enter the integration user name and password is required to configure webhooks only when DevOps Config is installed or the Generic Connection on configure operation for Azure DevOps property is disabled. If this step is not required, webhooks are configured using token-based authentication.

- To import historical data to the project objects like plans, repositories, or pipelines, associate the objects with an application, and import the data. For more information, see Associate tool objects to applications - Workspace.

### Related topics

Configure webhooks from the tool record

## Onboard Azure DevOps to DevOps Change Velocity — Service Catalog

Create, connect, discover, and configure your Azure DevOps instance using the ServiceNow Service Catalog.

### Before you begin

Role required: sn_devops.admin or sn_devops.tool_owner

### Procedure

1. Navigate to **All** > **Service Catalog** > **Catalog Definitions** > **Maintain Items** and search for DevOps.

   **Note:**
   You can also access the service catalog from Employee Center or Service portal.

2. From the DevOps catalog items, select and activate **DevOps App Onboarding** and **DevOps Tool Onboarding**.
3. After activating, select **DevOps Tool Onboarding** and select **Try it**.
4. In the DevOps Tool Onboarding form, enter the tool details:

| Field | Description |
|---|---|
| Tool name | Name for your Azure DevOps integration. |
| Tool integration | Select Azure DevOps. |
| Connect to an organization or project | Select from the list.<br>○ **Connect an organization**: Connect directly at your Azure DevOps organization level. All the projects within the organization |

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| Field | Description |
| --- | --- |
| | will be discovered, and you can choose to configure multiple projects within the organization.<br>○ **Connect a project**: Connect directly at the project level. |
| Tool URL | Azure DevOps organization URL (for example, `https://dev.azure.com/<your organization>`) or the Azure DevOps project URL (for example, `https://dev.azure.com/<your organization>/<your project>`). |
| Credential type | Type of credential, **Basic Auth** or **OAuth 2.0**.<br>**Basic Auth**<br>**a.** Enter your ADO instance username.<br>**b.** Enter the Personal access token (PAT) or password for your Azure DevOps instance.<br>**Note:** When you generate a Personal access token (PAT) for Azure DevOps, you must select the scopes to authorize if you aren't granting complete access. See Azure DevOps PAT scopes for DevOps.<br>**OAuth 2.0**<br>Pre-requisites:<br>○ Create a tenant in Microsoft Entra<br>○ Add a user to tenant in Microsoft Entra<br>○ Create an organization in Azure portal<br>○ Create an Azure DevOps app<br>○ Register Azure DevOps as an OAuth provider<br>○ Configure organization and project level settings<br>○ Create credential record and get OAuth token<br>In the **Tool credential** field, select an OAuth 2.0 tool credential record.<br>**Note:** Only records that are not in use and configured for ADO can be selected as an existing credential record. |

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| Field | Description |
| --- | --- |
| Do you wish to configure webhook for this tool? | Option to enable configuring webhooks automatically for Azure DevOps. Select to enable.<br><br>**Note:**<br>This option isn't available if you're connecting at the organization level. You can configure webhooks from the tool records page. |
| Integration username | This field is available only when the option to configure webhook is selected.<br><br>Enter the username for the DevOps Integration User account.<br><br>**Note:**<br>○ The step to enter the integration user name and password is required to configure only when DevOps Config is installed or the *`This property decides whether to create a Generic Connection on configure operation for Azure DevOps`* property is enabled. If this step is not required, webhooks are configured using token-based authentication.<br>○ When DevOps Config is installed or the Generic Connection on configure operation for Azure DevOps property is enabled, you can regenerate token (auto-configure with new token) from the workspace UI only, which will update integration user password. When DevOps Config is not installed, token can be regenerated from both the workspace and classic UI for token based authentication. Re-generate your token periodically for better security.<br>. |
| Integration user password | This field is available only when the option to configure webhook is selected.<br><br>Enter the password for the DevOps Integration User account. |

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| Field | Description |
| --- | --- |
| | **Note:**<br>○ The step to enter the integration user name and password is required to configure only when DevOps Config is installed or the *This property decides whether to create a Generic Connection on configure operation for Azure DevOps* property is enabled. If this step is not required, webhooks are configured using token-based authentication.<br>○ When DevOps Config is installed or the Generic Connection on configure operation for Azure DevOps property is enabled, you can regenerate token (auto-configure with new token) from the workspace UI only, which will update integration user password. When DevOps Config is not installed, token can be regenerated from both the workspace and classic UI for token based authentication. Re-generate your token periodically for better security. |
| Use MID Server | Optional. Select#MID Server for an on-premises tool that is attached to a#MID Server. Application is automatically set to #DevOps and capability is set to REST. |

For a list of all the permissions required on the credentials for connecting to Azure DevOps, see Azure DevOps permissions in Permissions required for DevOps tools.

5. Select **Order Now**.
   A request is created. When the request is approved:
   - If connecting to an organization, the tool is created.
   - If connecting to a project, the tool is created, connected, and project objects like plans, repositories, and pipelines are discovered.

When connecting to a project, for the discovered objects, you can import historical data from the tool and also associate an application with it.

6. From the DevOps catalog items, select **DevOps App Onboarding**.
7. Select **Try It**.
8. In the DevOps App Onboarding form, enter the details:

| | |
| --- | --- |
| Are you creating a new app or adding to an existing one? | Select from the options whether to create a new app or use an existing app. |
| App | Enter the name for the app that you're creating or using. |

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| | |
|---|---|
| Onboarding pipelines | Enter the connected Azure DevOps tool name. |
| Pipelines | Select the pipelines for which you want to import historical data. |
| Artifact repositories | Select the artifacts for which you want to import historical data. |
| Onboarding repositories | Enter the connected Azure DevOps tool name. |
| Import from and Import to | Select the dates for which you want to import the pipeline and artifact data. By default, the last 30 days are selected. You can choose to import data for a maximum of 90 days. |
| Repositories | Select the repositories for which you want to import historical data. |
| Import from and Import to | Select the dates for which you want to import the Repositories data. By default, the last 30 days are selected. You can choose to import data for a maximum of 90 days. |
| Onboarding plans | Enter the connected Azure DevOps tool name. |
| Plans | Select the plans for which you want to import historical data. |
| Import from and Import to | Select the dates for which you want to import the Plans data. By default, the last 30 days are selected. You can choose to import data for a maximum of 90 days. |

9. Select **Order Now**.
   A request is created. When the request is approved, the plans, repositories, artifacts, and pipeline objects are associated to the app record and webhooks are configured for real-time tracking. Historical data is imported for the selected items. The **Track** field is automatically enabled for imported plans, repositories, and pipelines. For repositories the **Track file changes** is also automatically enabled.

### Onboard Azure DevOps to DevOps Change Velocity — Classic

Create an Azure DevOps tool record in DevOps Change Velocity to connect, discover, and import Azure DevOps tool data.

## Before you begin

Role required: sn_devops.admin or sn_devops.tool_owner

## About this task

Actions:

- **Connect** to Azure DevOps organization or project.
- **Discover** plans, repositories, orchestration tasks, and pipelines.
- **Configure** webhooks in Azure DevOps.
- **Import** work item, plan version, and feature records, branch and commit records, and task execution and step execution records.

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To customize Azure Boards import of work item states or types, use the *DevOpsAzureDevOpsWorkItemHelper* script include.

### Procedure

1. Navigate to **DevOps** > **Tools** > **Create New (legacy)**.
2. On the Create DevOps tool form, fill in the fields.

| Field | Description |
|---|---|
| Tool name | Name of your choice to identify this tool. |
| Tool Integration | Select **Azure DevOps**. |
| Connect to an organization or project | Select from the list.<br>○ **Connect an organization**: Connect directly at your Azure DevOps organization level. All the projects within the organization can be discovered, and you can choose to configure multiple projects within the organization.<br>○ **Connect a project**: Connect directly at the project level. |
| Tool URL | Azure DevOps organization URL (for example, `https://dev.azure.com/<your organization>`) or the Azure DevOps project URL (for example, `https://dev.azure.com/<your organization>/<your project>`), depending on your earlier selection. |
| Credential type | Type of credential, **Basic Auth** or **OAuth 2.0**.<br>**Basic Auth**<br>**a.** Enter your ADO instance username.<br>**b.** Enter the Personal access token (PAT) or password for your Azure DevOps instance.<br>**Note:** When you generate a Personal access token (PAT) for Azure DevOps, you must select the scopes to authorize if you aren't granting complete access. See Azure DevOps PAT scopes for DevOps.<br>**OAuth 2.0**<br>Pre-requisites:<br>○ Create a tenant in Microsoft Entra<br>○ Add a user to tenant in Microsoft Entra<br>○ Create an organization in Azure portal |

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| Field | Description |
| --- | --- |
| | ○ Create an Azure DevOps app<br>○ Register Azure DevOps as an OAuth provider<br>○ Configure organization and project level settings<br>○ Create credential record and get OAuth token<br>In the **Tool credential** field, select an OAuth 2.0 tool credential record.<br>**Note:** Only records that are not in use and configured for ADO can be selected as an existing credential record. |

For a list of all the permissions required on the credentials for connecting to Azure DevOps, see Azure DevOps permissions in Permissions required for DevOps tools.

3. **Optional:** If your Azure DevOps instance is attached to a MID Server, select the **Use MID Server** option and enter its details.

   (Optional) For more information about MID server, see MID Server selection

4. Select **Submit**.

   The tool is automatically connected using a connection alias and HTTP tool connection (Basic Auth credential) and the tool record details are shown in a form.

   **Note:**
   If you do not have global admin privileges for your tool (to allow automatic configuration of the webhook URL), you might need to have the tool admin user configure it for you (cut and paste the webhook URL into the tool configuration). Once the webhook is configured in the tool, **Enter Manual Configuration Mode** to connect to the tool manually, then exit.

On successful tool creation, you're taken to the tool record page.

5. **Optional:** If you want to control access to the tool, add the groups that must be given access to the tool in the **Maintained by** field on the **Access** tab.

   The tasks the users in the groups can perform depends on the roles assigned to them.

   - DevOps Tool Owner role: Can view and edit the tool.
   - DevOps App Owner role: Can view the tool and can associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects (such as plans, repositories, and pipelines).
   - DevOps Administrator role: Can edit all tools.
   - Other DevOps roles: Can view the tool.

   **Note:**
   Only groups containing users with DevOps roles are available for selection in the **Maintained by** field.

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The **All App Owners can view and associate tool objects to applications** option becomes available for selection if you choose to restrict access to the tool. This option enables all users having the DevOps App Owner role to access the tool. If selected, they'll be able to view, associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects.

6. Discover tool objects, including existing application plans (projects associated with the tool), repositories, orchestration tasks, and pipelines.
   - Connected to organization: Select **Discover projects** to discover the projects from the organization. After discovery, the projects from your organization are available under the **Projects** related list.
   - Connected to a project: The project is discovered during connection creation and is available under the **Projects** related list. Selecting **Discover projects** from the **Projects** tab of the tool record page discovers all the projects in your organization.

   Select a project from the **Projects** related list to navigate to the project record page. Select **Discover** to discover the project objects, including existing plans (boards), repositories, and pipelines.

7. Configure webhook URLs in Azure DevOps.

   a. You can configure directly from the tool records page, or from the project record page for each product.
      - To configure from the tool records page, select **Configure projects**. Select the projects that you want to configure and select **Continue.**.
      - To configure from the project records page, first select the project from the tool records page and select **Configure**.

   b. Enter the DevOps integration user and password and select **Send**.

      On send, webhooks and service connections are automatically created in Azure DevOps. This sends the notifications from Azure DevOps tools to DevOps Change Velocity using the DevOps Integration user. For information on setting up Integration user account, see Set up integration user account in DevOps Change Velocity.

      **Note:**
      - The step to enter the integration user name and password is required to configure only when DevOps Config is installed or the *`This property decides whether to create a Generic Connection on configure operation for Azure DevOps`* property is enabled. If this step is not required, webhooks are configured using token-based authentication.
      - When DevOps Config is installed or the Generic Connection on configure operation for Azure DevOps property is enabled, you can regenerate token (auto-configure with new token) from the workspace UI only, which will update integration user password. When DevOps Config is not installed, token can be regenerated from both the workspace and classic UI for token based authentication. Re-generate your token periodically for better security.

   **Note:**
   For plans, the **Track** field is automatically set to **True**.

8. For the discovered plans, you can import historical data from the tool and also associate an application with it.

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a. Open a plan record from the Plans related list.

b. Select the **Import** related link.
Records are created for the plan in the Work Items, Plan Versions, and Features related lists.

- Work items related list shows tasks, bugs, and stories.

  **Native State** and **Native Type** fields of the work item contain the original state and type values from the source tool.

- Plan Versions related list shows releases.
- Features related list shows epics and features.

**Note:**
Historical import of Azure DevOps work items isn't supported for Agile Boards CMMI process.

c. In the Apps related list, select **Edit...** to select an App to associate with the plan (project), or select **New** to create one.
A plan must have an associated App record to complete the planning tool setup.

9. For the discovered repositories, import historical data for the tool, and associate the repository with an app.

a. Open the repository record from the Repositories related list.

b. Select **Import**.
Imported branch records and commit records from the repository are added to the corresponding related lists.

c. In the **App** field, select the lookup list and select an App record to associate with the repository, or click **New** to create one.

Imported historical data records are added to the corresponding related lists.

### What to do next

For Azure pipelines, Model an Azure pipeline in DevOps to complete the configuration in DevOps Change Velocity.

- Map each pipeline to a specific app.
- Create pipeline steps and map each step to an Azure pipeline job.
- Configure change control.

#### Setting up Azure DevOps OAuth 2.0 credential

Create Azure DevOps OAuth 2.0 credential and use them to connect your Azure DevOps instance.

If you want to use Basic Authentication credentials instead of OAuth 2.0, skip this section and proceed to onboarding Azure DevOps using one of the following options:

- Onboard Azure DevOps to DevOps Change Velocity — Workspace
- Onboard Azure DevOps to DevOps Change Velocity — Service Catalog
- Onboard Azure DevOps to DevOps Change Velocity — Classic

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### Create a tenant in Microsoft Entra

Create a tenant in Microsoft Entra and set up the required permissions to create an Azure DevOps (ADO) app.

## Before you begin

Role required: Tenant Creator in Azure DevOps.

## About this task

Your tenant represents your organization and helps you to manage a specific instance of Microsoft Cloud services for your internal and external users.

If you have an existing tenant, which has access to create an ADO app, you do not need to perform this procedure. If you don't have a tenant, you must create a tenant in Microsoft Entra, which will have access to create an ADO app.

## Procedure

1. In the Microsoft Entra portal, navigate to **Overview > Manage tenants** .
2. Select **Create**.
3. Select the **Workforce** configuration, and select **Continue**.
4. Enter the following information:
   - Your desired Organization name into the **Organization name** box.
   - Your desired Initial domain name into the **Initial domain name** box.
5. Select **Next: Review + Create**.
6. Review the information that you entered and if the information is correct, select **Create** in the lower left corner.

   For more information, see the Microsoft documentation.

### Add a user to tenant in Microsoft Entra

Add a user who contains the admin role, to the tenant created in the previous procedure.

## Before you begin

Role required: User Administrator in Azure DevOps

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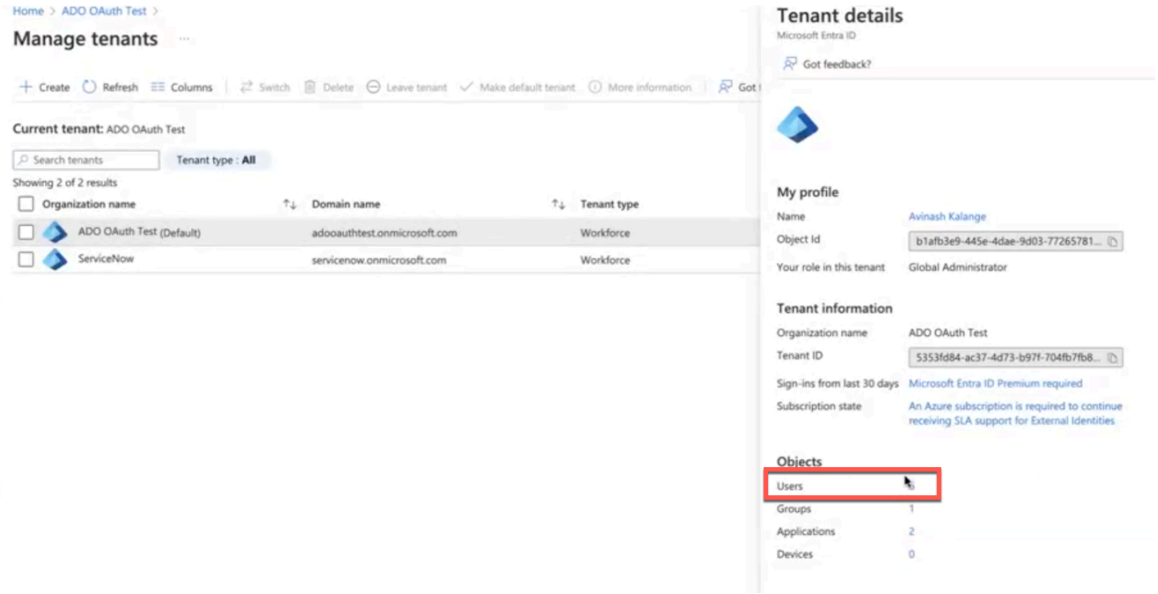
## Procedure

1. In the Microsoft Entra ID tenant page, select the number of users link in the Tenant details section.




2. Select **New user > Create new user**.
3. In the Basics tab, enter the following details.

### Basics tab fields

| Field | Value |
|---|---|
| User principal name | Enter a unique user name and select a domain from the menu after the @ symbol. |
| Mail nickname | If you need to enter an email nickname that is different from the user principal name you entered, clear the **Derive from user principal name** option, then enter the mail nickname. |
| Display name | Enter the user's name. |
| Password | Provide a password for the user to use during their initial sign-in. Clear the Auto-generate password option to enter a different password |
| Account enabled | This option is checked by default. Clear to prevent the new user from being able to sign in. You can change this setting after the user is created. This setting was called **Block sign in** in the legacy create user process. |

4. Select **Next: Properties** to complete the next section.

### Properties tab fields

| Field | Value |
|---|---|
| Identity | Enter the user's first and last name. Set the User type as either Member or Guest. |

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| Field | Value |
| --- | --- |
| Job information | Add any job-related information, such as the user's job title, department, or manager. |
| Contact information | Add any relevant contact information for the user. |
| Parental controls | For organizations like K-12 school districts, the user's age group may need to be provided. Minors are 12 and under, Not adult are 13-18 years old, and Adults are 18 and over. The combination of age group and consent provided by parent options determine the Legal age group classification. The Legal age group classification may limit the user's access and authority. |
| Settings | Specify the user's global location. |

5. Select **Next: Assignments** to complete the next section.
6. In the Assignments section, select **+ Add** role.
7. From the menu that appears, select the **Global Administrator** role from the list and select the **Select** button.
8. Select the **Review + create** button.

   For more information, see the Microsoft documentation.

### Create an organization in Azure portal

Create an organization in the new tenant, which has access to create an app.

#### Before you begin

Role required: Global Administrator in Azure DevOps

#### Procedure

1. Log in to Azure portal with the user created in the previous procedure.
2. Navigate to **Azure DevOps Organizations > My Azure DevOps Organizations**.
3. Select **Create new organization**.

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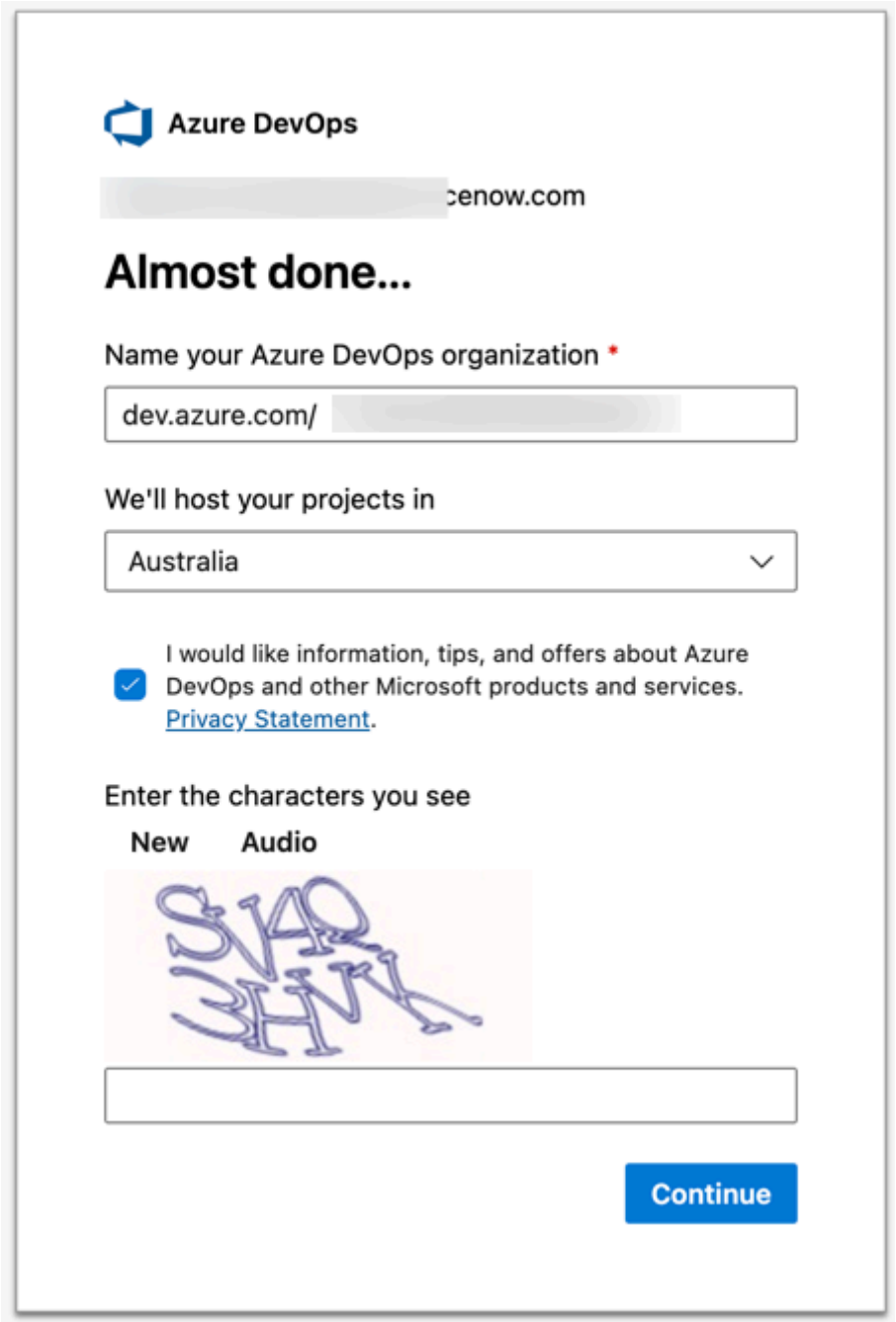
4. Enter the name of your ADO organization and location, and then select **Continue**.




This newly created org will be connected with the tenant created in the Create a tenant in Microsoft Entra topic.

### Create an Azure DevOps app

Create and configure an Azure DevOps (ADO) app and copy the required values to enable OAuth 2.0 authentication with your ServiceNow instance.

**Before you begin**
Role required: Global Administrator in Azure DevOps

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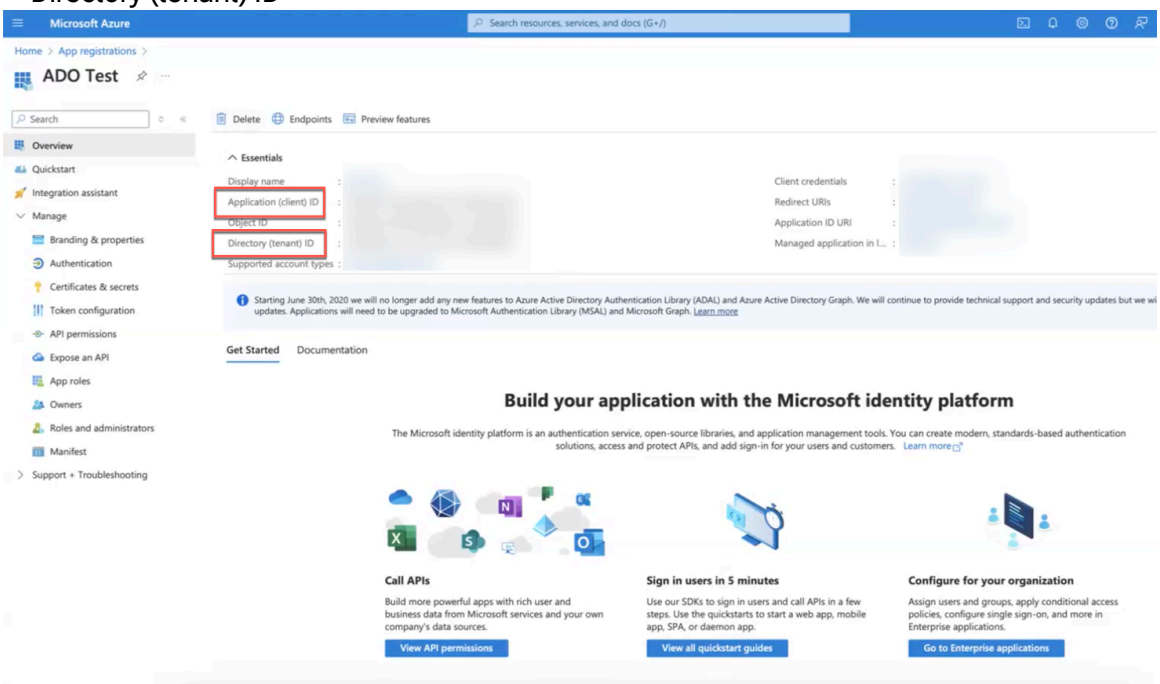
## Procedure

1. In the Azure portal, navigate to **App registrations** .
2. Select **+ New registration**.
3. On the App registrations page, enter your application's registration information as described in the table.

**App registrations page**

| Field | Value |
|---|---|
| Name | Enter a meaningful application name that is displayed to users. |
| Supported account types | Select Accounts in this Organizational directory only (Single tenant) |
| Redirect URL | Enter your ServiceNow instance URL. |

4. Select **Register**.
5. In the newly created application, from the Overview page in the left navigation pane and copy the following details:
   - Application (client) ID
   - Directory (tenant) ID




6. Add a client secret by selecting the **Manage > Certificates & secrets** link in the left navigation pane.
   For more information, see the Add a client secret and Register an application topics in Microsoft documentation.

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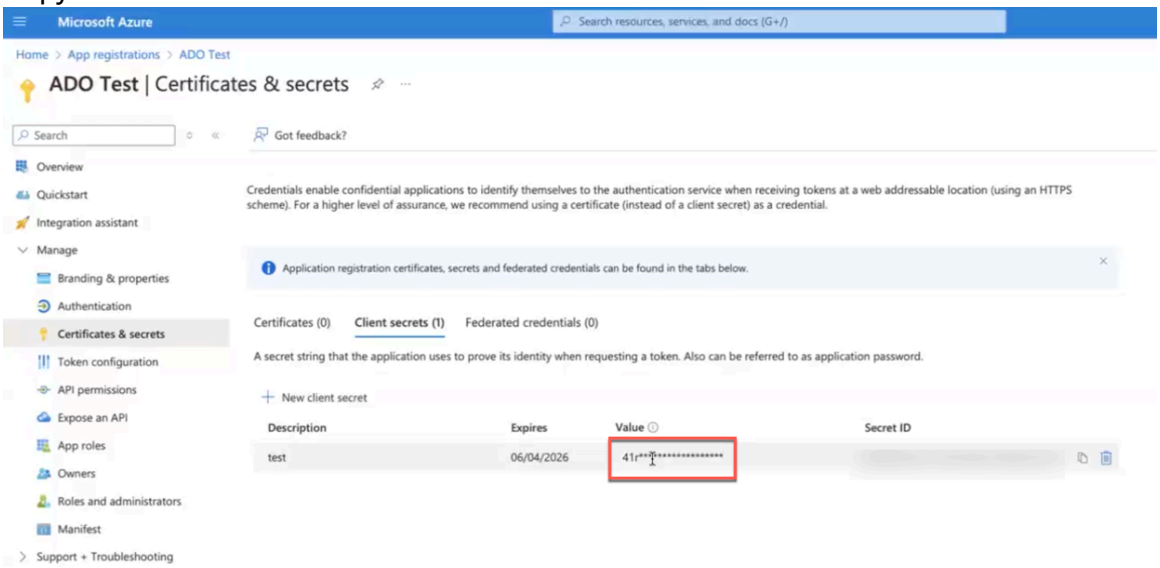
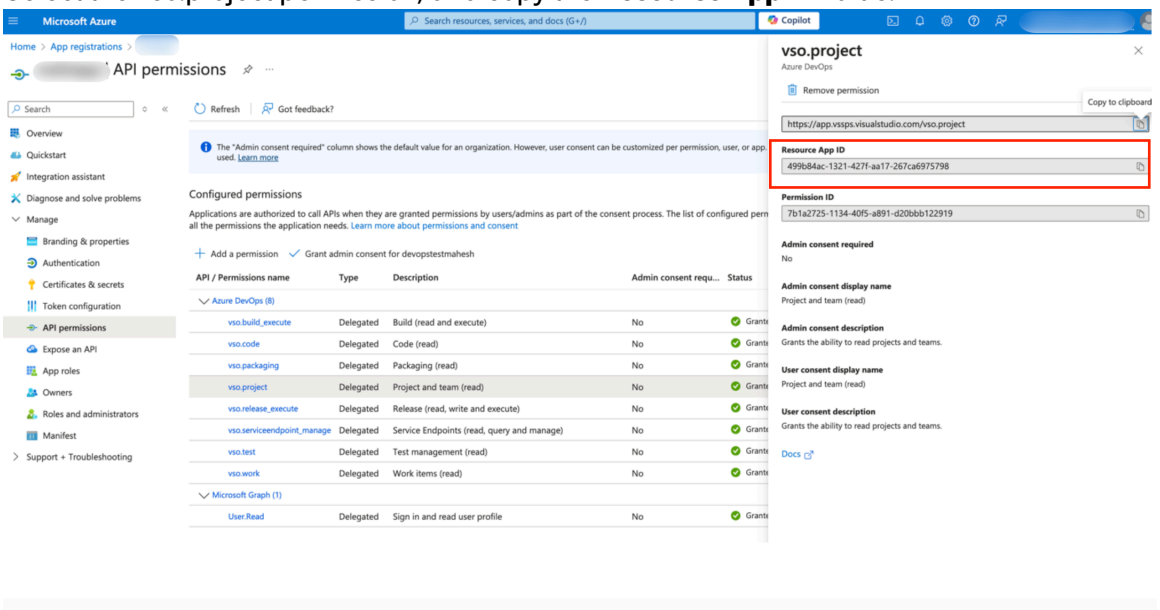
7. Copy the client secret value.




8. Navigate to **Manage > API permissions**.
9. Select **+ Add a permission**, and select the Microsoft APIs tab on the right.
10. Search and select Azure DevOps and add the **vso.project** permission.
11. Select the vso.project permission, and copy the **Resource App ID** value.




**Note:**
The resource app ID value copied here will be added in the OAuth Entity Scopes for the Application Registry.

## Register Azure DevOps as an OAuth provider

Use the information generated during Azure DevOps (ADO) app account configuration to register Azure DevOps as an OAuth provider and enable the instance to request OAuth 2.0 tokens.

### Before you begin

Role required: admin

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### Procedure

1. In ServiceNow DevOps Change Velocity, navigate to **All** > **System OAuth** > **Application Registry**.
2. Select **New**.
   The **What kind of OAuth application?** message is displayed.
3. Select **Connect to a third party OAuth Provider**.
4. On the form, fill in the fields.

#### Application Registry form fields

| Field | Description |
|---|---|
| Name | Name to uniquely identify the record. For example, enter `My ADO App Provider`. |
| Client ID | Client ID of your ADO app (hint: available in the **Overview** section of your ADO app). |
| Client Secret | Client secret of your ADO app (hint: available in the **Certificates & secrets** section of your ADO app). |
| Default Grant type | Type of grant associated with application registry. Select **Client Credentials**. |
| Authorization URL | Enter:<br><br>https://login.microsoftonline.com/<Directory (tenant) ID>oauth2/v2.0/authorize<br><br>Where, Directory (tenant) ID is the alphanumeric value found in the Overview section of your ADO app. |
| Token URL | Enter:<br><br>https://login.microsoftonline.com/<Directory (tenant) ID>oauth2/v2.0/token<br><br>Where, Directory (tenant) ID is the alphanumeric value found in the Overview section of your ADO app. |

5. Leave the rest of the form fields as is.

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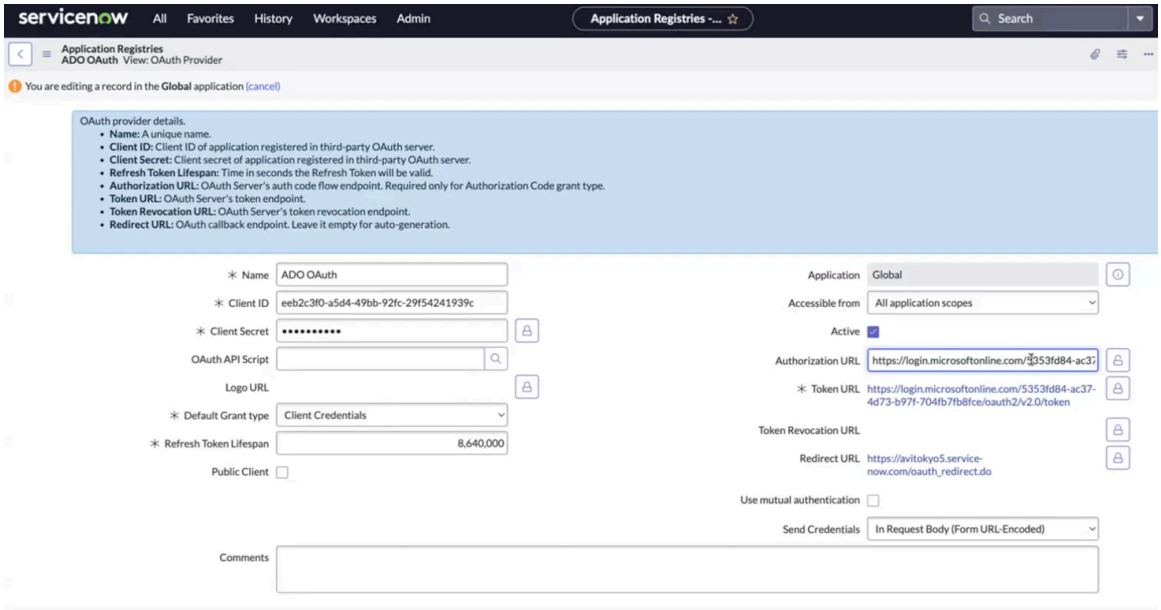
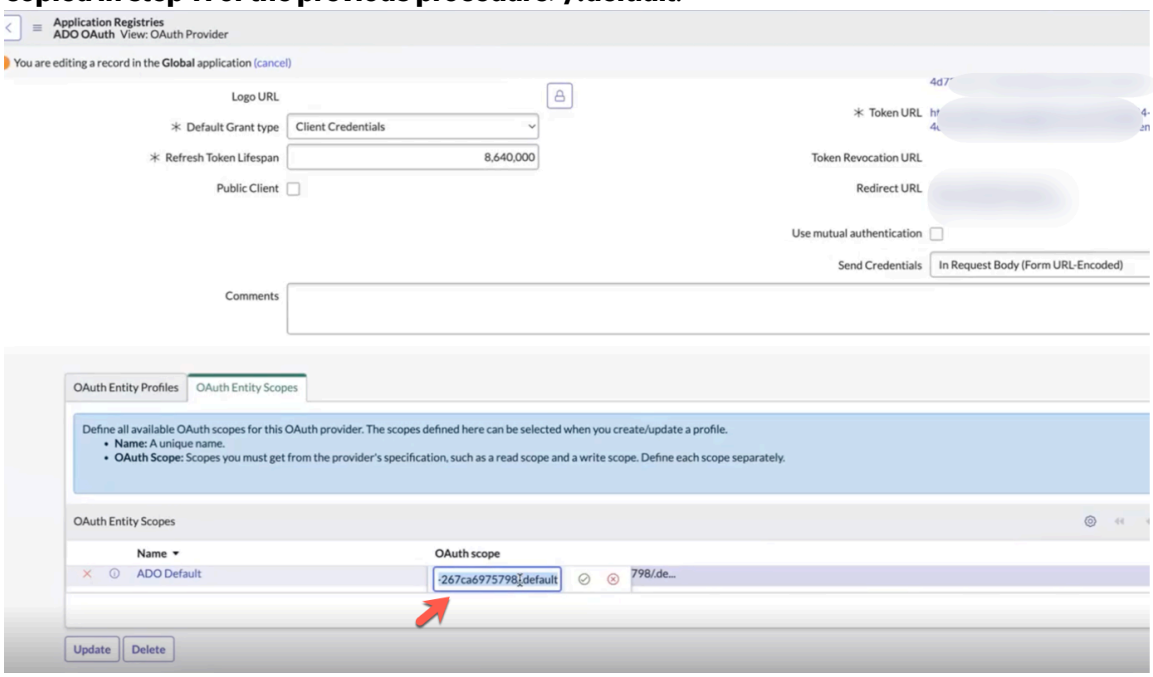



6. Select and hold (or right-click) the form header, and select **Save**.
   The system validates the OAuth credentials and populates the **Redirect URL** (Hint: It should match the redirect URL previously provided in your ADO app creation).
7. Select the **OAuth Entity Scopes** related tab.
8. Add the OAuth scope value as **<Resource App ID value copied in step 11 of the previous procedure>/.default**.




## Configure organization and project level settings

Configure organization and project level settings for your app.

### Before you begin

Role required: Member of the **Project Collection Administrators** group or organization's owner.

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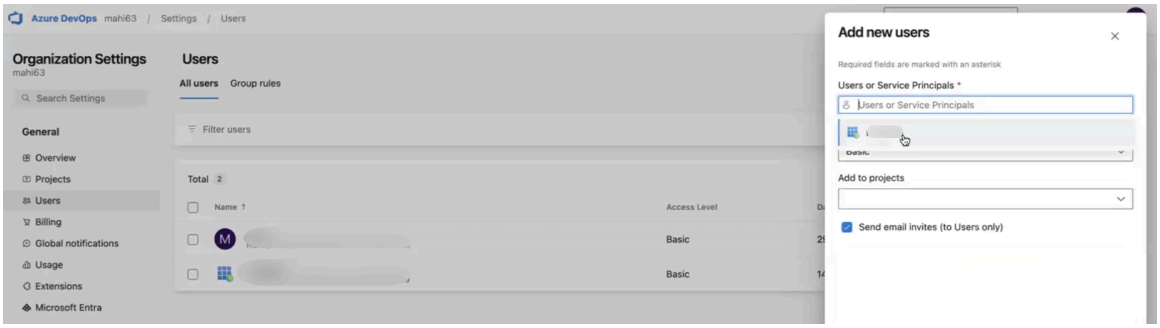
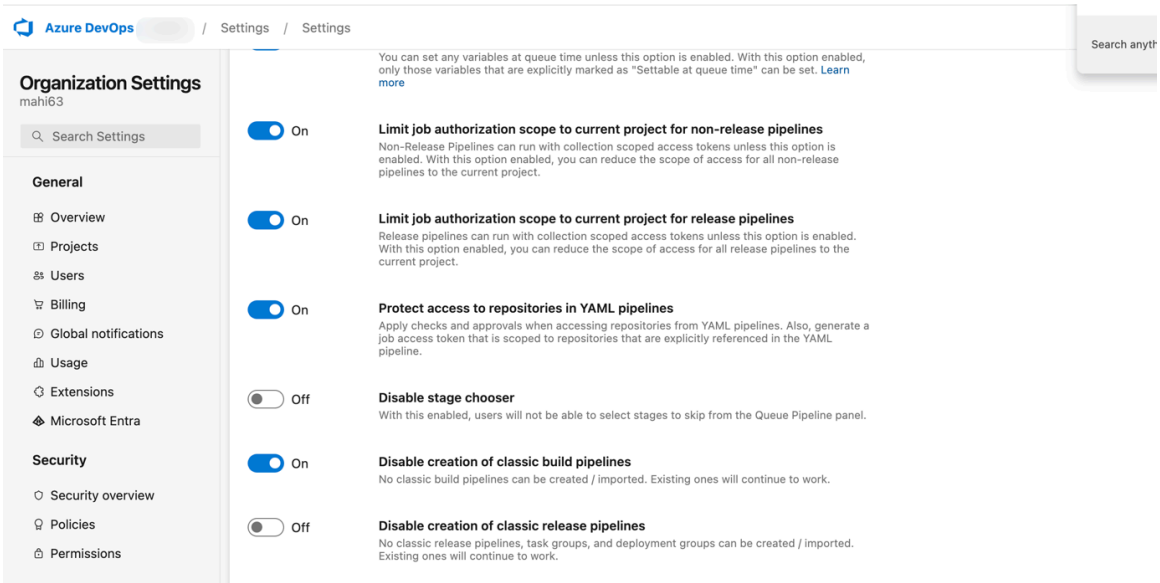
## Procedure

1. Navigate to **Organizational Settings** of your organization in the Azure DevOps portal.
2. Select **Users**.
3. In the **Users or Service Principals** field, select the app you created in the previous procedure to the list.




4. Navigate back to the users list, and select the app user.
5. Select the **Actions** menu, and select **Manage Access**.
6. Add the project that you want to enable the app to access, and assign the **Project Administrator** role to that project.

> **Note:**
> If you aren't seeing your release or classic pipelines, ensure that the **Disable creation of classic release pipelines** setting is switched off for your organization.




7. Navigate to **Project Settings** of your project.
8. Select **Permissions**.

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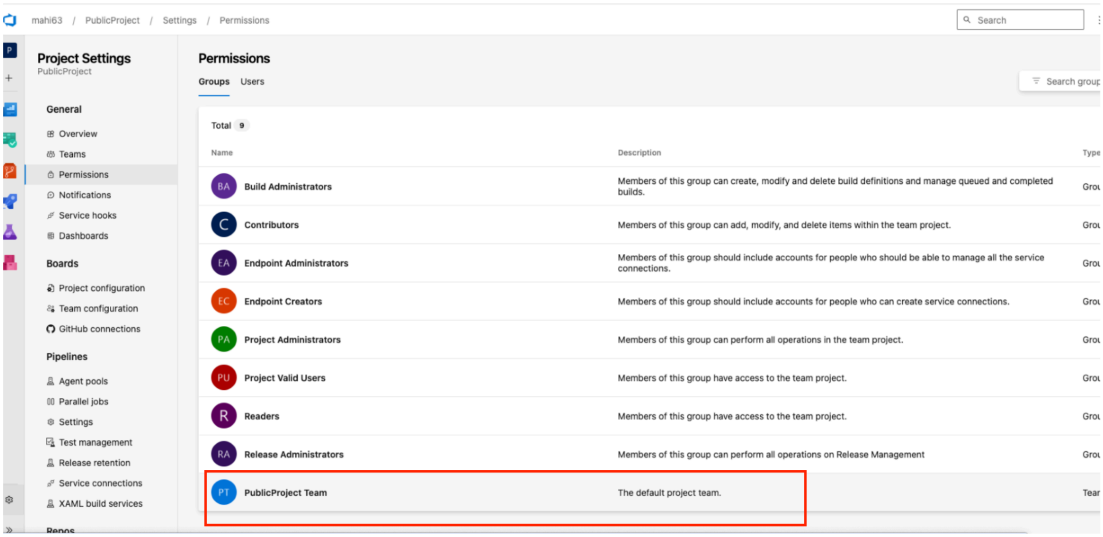
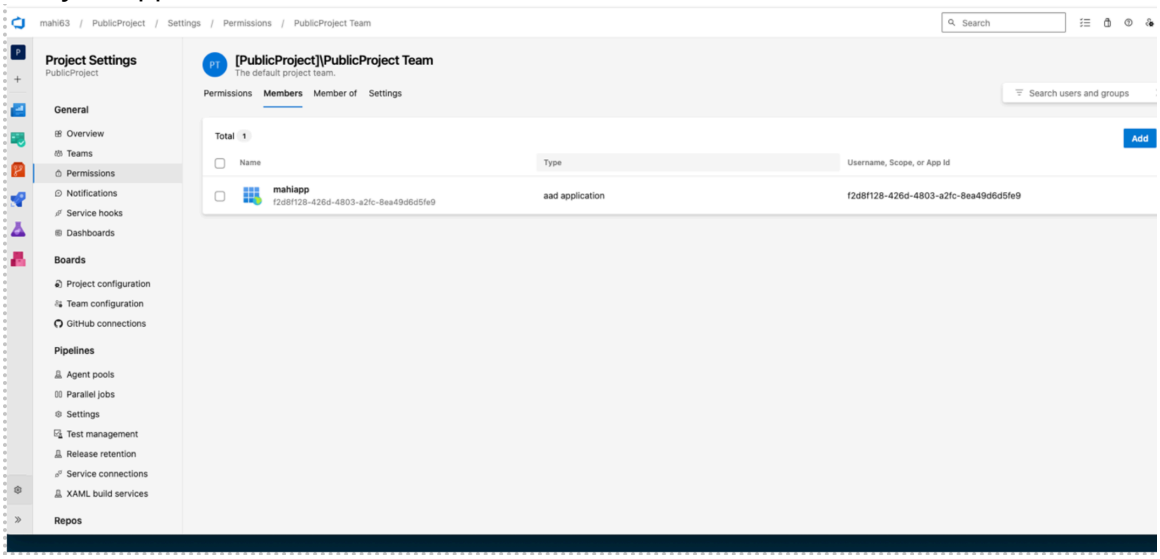
There will be one project team created under permissions by default.




9. Select the default project team, and navigate to the Members tab.
10. Add your app user.




## Create credential record and get OAuth token

Create credential record and get OAuth token.

### Before you begin

Role required: admin, sn_devops.admin

### About this task

For ADO OAuth 2.0, you must create separate credential records for build, release, and feeds in ServiceNow.

### Procedure

1. Navigate to **All** > **Connections & Credentials** > **Credentials**.
2. Select **New**.
   The **What type of Credentials would you like to create?** message is displayed.
3. Select **OAuth 2.0 Credentials**.
4. On the form, fill in the fields.

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#### OAuth 2.0 Credentials form fields

| Field | Value required |
|---|---|
| Name | Name to uniquely identify the record. For example, enter `My ADO APP Build Credential`. |
| Active | Option to enable the record. |
| OAuth Entity Profile | Default OAuth Entity profile created in the Application Registry. |

5. Save the record.
6. Select the **Get OAuth Token** related link to generate the OAuth token.
7. Repeat the procedure to create release and feeds credentials.

### Model an Azure pipeline in DevOps

Model an Azure pipeline by mapping the pipeline to an app, and mapping DevOps Change Velocity pipeline steps to Azure pipeline jobs.

#### Before you begin

Role required: sn_devops.admin

#### Procedure

1. Map your pipeline to an app in DevOps.

   a. Navigate to **DevOps** > **Apps & Pipelines** > **Apps** and open the application record to associate with the pipeline.

   b. In the Pipelines related list, click **Edit...** to select a pipeline to associate with the app, or click **New** to create the pipeline.

   > **Note:**
   > While associating a pipeline with an app, the pipeline steps are also fetched during import.

   For a new pipeline, fill in the **Orchestration pipeline** field using the project name and pipeline name as specified in Azure DevOps Pipelines in path format.

   For example, `My Project/My Classic Build Pipeline`.

   > **Note:**
   > The `project` name must be specified with the pipeline because there could be multiple pipelines with the same name in different projects.

   c. Click **Submit**.

2. Open the pipeline record again and select the **Track** check box so events from the pipeline are received.
   The **Track** check box must be selected to integrate the pipeline with DevOps Change Velocity.
3. Create DevOps steps automatically or manually to map to each Azure pipeline job so an orchestration task can be created.

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**Note:**
Manual creation of steps is not required when you Use the ServiceNow DevOps extension for Azure DevOps and Azure DevOps custom actions.

- Automatically create and map pipeline steps in DevOps by running your Azure pipeline when you Use the ServiceNow DevOps extension for Azure DevOps and Azure DevOps custom actions.

  Pipeline steps are automatically created, mapped, and associated when DevOps receives step notifications from your Azure pipeline during the run.

- Manually create and map each pipeline step to an Azure pipeline job.

  In the Steps related list, click **New** to create a DevOps step for each Azure pipeline job (**Orchestration stage** field).

  **Note:**
  The **Orchestration stage** field value of each step is case-sensitive and must match the original name of the corresponding Azure pipeline job.

| | |
|---|---|
| Name | Name of the pipeline step. |
| Pipeline | Pipeline in which the step is configured. |
| Type | Pipeline step type.<br>▪ Build and Test<br>▪ Test<br>▪ Deploy<br>▪ Deploy and Test<br>▪ Manual<br>▪ Prod Deploy |
| Order | Order in which the steps are run.<br>**Note:**<br>The step order determines the order of the cards in the Pipeline UI.<br>The order of the cards in the Pipeline UI is by task execution. |
| Orchestration stage | Azure pipeline job name (case-sensitive).<br>**Note:**<br>For step association with Azure pipeline jobs, the **Orchestration stage** field must be configured. |

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| | |
|---|---|
| Business service | Configuration service that applies to the step. |

Once orchestration tasks are created, associate each orchestration task in the Orchestration Tasks related list with a DevOps pipeline step.

4. Enable change control automatically or manually.
   - If you are using the ServiceNow DevOps extension for Azure DevOps, run your Azure DevOps pipeline to automatically enable change control.
   - If you are configuring change control manually, select the **Change control** check box in a step to enable change acceleration and the corresponding configuration fields. For Azure release (CD) pipelines, enable change control in the first step of the required stage only. Change control for Azure release (CD) pipelines is supported only in pre-deployment gates.

     **Note:**
     ServiceNow Change Management must be installed for change acceleration.

| | |
|---|---|
| Change receipt | Select to enable change receipt for the step so the pipeline doesn't pause when a change request is created.<br><br>All pipeline data is included in the change, but approval is not required for the pipeline to proceed. |
| Change approval group | Approval group for the change request.<br><br>The change approval group becomes the **Assignment group** in the DevOps change request.<br><br>**Note:**<br>Ensure that the selected group has members and a group manager so the approver field is not empty. |
| Change type | Change request type to create.<br>▪ Normal (default)<br>▪ Standard<br>▪ Emergency |
| Change model | Change model for the change request. For more information, see DevOps change models. |
| Template<br><br>**Note:**<br>This field is shown only when **Change type** is Normal or Emergency. | List of templates to use to auto populate fields for Normal or Emergency change requests.<br><br>Select a template or create a new one. |

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| | |
|---|---|
| Standard change template<br><br>**Note:**<br>This field is shown only when **Change type** is Standard. | List of standard change templates to use for Standard change requests.<br><br>**Note:**<br>This field is required for Standard change type. |
| Change controlled branches | (Multibranch only) Comma-separated list of branches under change control. Wildcards are supported. |

You can set up change control in your Azure DevOps YAML or Classic Azure pipeline using the Azure Invoke REST API or the ServiceNow DevOps extension for Azure DevOps.

### What to do next

Configure the Azure pipeline for DevOps

## Associate Azure pipeline steps in DevOps

For manually created DevOps steps, associate each orchestration task in the Orchestration Tasks related list with a DevOps pipeline step to track the activity of each stage in your Azure pipeline.

### Before you begin

Role required: sn_devops.admin

### Procedure

1. Navigate to **All** > **DevOps** > **Tools** > **Orchestration Tools**, and open the Azure DevOps tool record.
2. In the Orchestration Tasks related list, enter the corresponding DevOps pipeline step in the **Step** field of each orchestration task.

   **Note:**
   The **Track** field is set to **True** by default when you discover orchestration tasks and pipelines. Tracking is required to receive job notifications from Azure DevOps.

   Azure pipeline job run notifications are sent to the DevOps application. Each task execution notification corresponds to an orchestration task and, because orchestration tasks are mapped to a certain step in your DevOps pipeline, you can track the activity in each stage of your pipeline.

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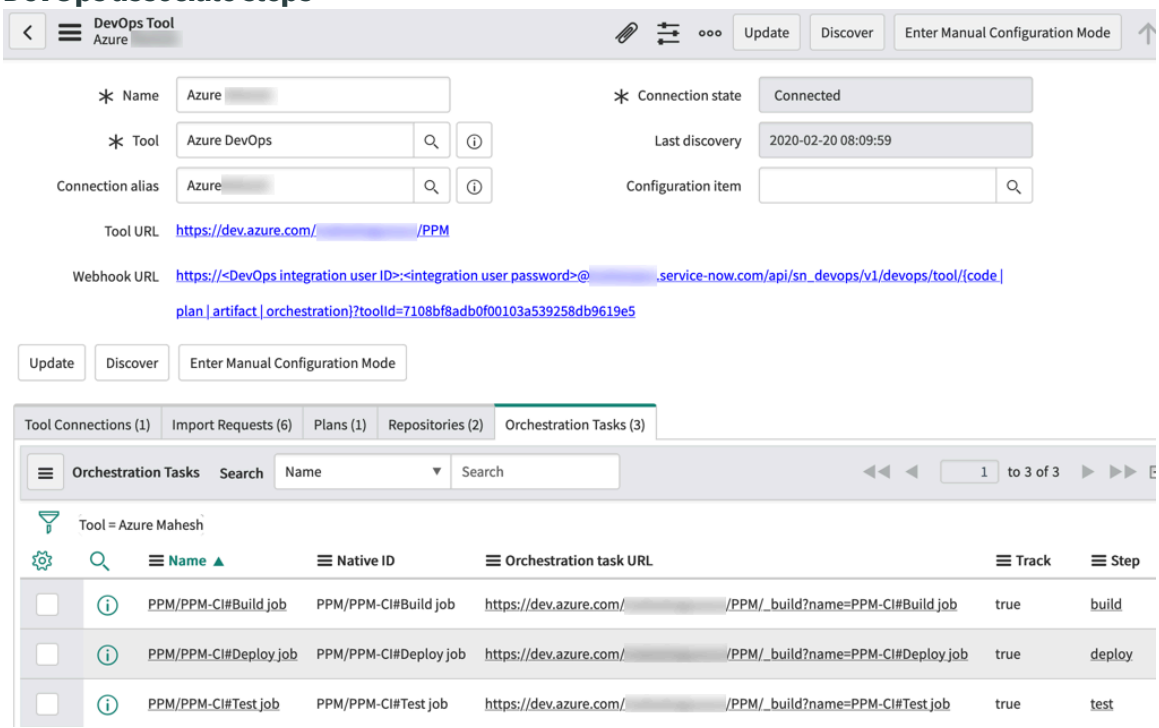
**Example:**

**DevOps associate steps**




## Configuring the Azure pipeline for DevOps

Change control, artifacts, and packages can be configured in the Azure pipeline for integration with DevOps.

You can configure change control in Azure pipelines two ways.

- Use the Azure Invoke REST API.
- Use the ServiceNow DevOps extension for Azure DevOps.

The **ServiceNow DevOps** extension for Azure DevOps includes:

- ServiceNow DevOps service connection
- ServiceNow DevOps Release Gate
- Azure build (CI) pipeline agent and server job custom tasks

## Configuring change control using the Azure Invoke REST API

You can use the Azure Invoke REST API in your YAML or Classic Azure pipeline to configure change control for DevOps.

You must enable the *`This property decides whether to create a Generic Connection on configure operation for Azure DevOps`* property to use Invoke REST API.

For Azure Invoke REST API details, visit the Microsoft documentation site and search for `Invoke HTTP REST API task- Azure Pipelines`.

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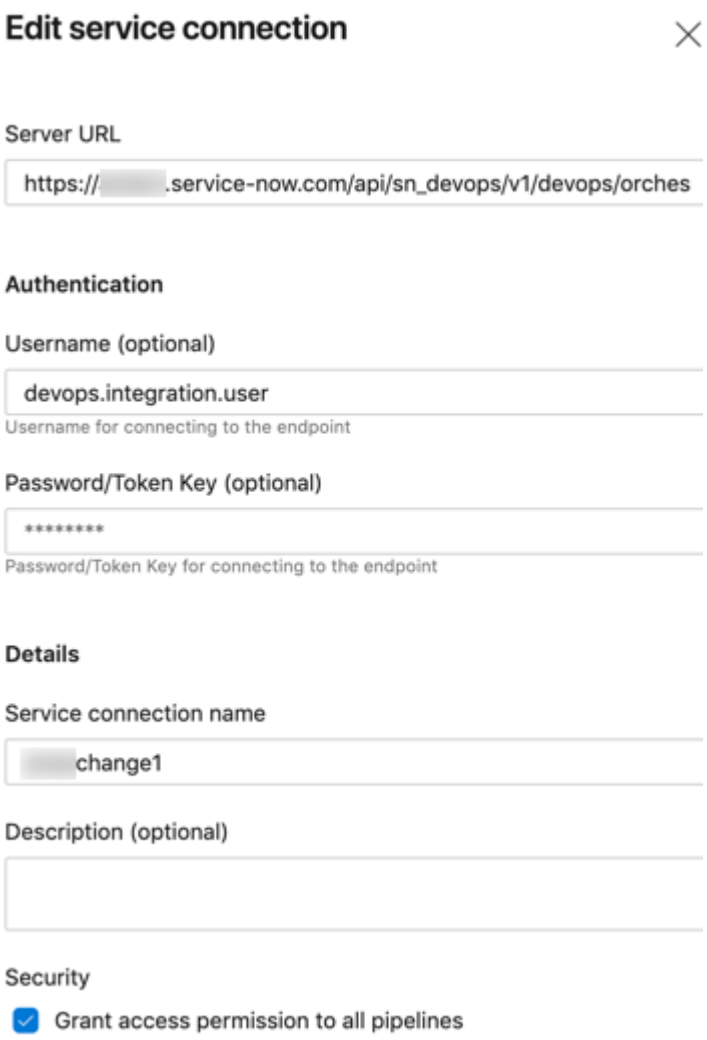
**Important:**

If you have duplicate or reused job names in your pipeline execution steps, ensure that the stageName attribute contains azurestageName/jobName in it's value, i.e. `stageName = azureStageName/jobName`. The artifact registration tasks send both stage and job names to associate the artifact version to the correct task execution.

## Generic service connection

Using the Azure Invoke REST API requires the creation of a generic service connection in Azure DevOps.




## YAML Azure pipeline

In Azure DevOps, a server task must be created with the service connection as the change control endpoint.

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**Invoke REST API payload requirements**

| Azure pipeline type | Values |
|---|---|
| Build | • buildNumber<br>• isMultiBranch<br>• branchName |
| Release | • releaseNumber<br>• projectName |

**Note:**
For release pipelines, set the **Pre-deployment conditions** > **Advanced** > **Completion event** field to Callback.

Build pipeline:

```
- task: InvokeRESTAPI@1
      inputs:
        connectionType: 'connectedServiceName'
        serviceConnection: 'change1'
        method: 'POST'
        body: |
         {
            "buildNumber": "$(build.buildId)",
            "isMultiBranch": "true",
            "branchName": "$(build.sourceBranchName)"
         }
        waitForCompletion: 'true'
```

Release pipeline:

```
- task: InvokeRESTAPI@1
      inputs:
        connectionType: 'connectedServiceName'
        serviceConnection: 'change1'
        method: 'POST'
        body: |
         {
            "releaseNumber": "$(Release.ReleaseId)",
            "projectName": "$(System.TeamProject)"
         }
        waitForCompletion: 'true'
```

## Classic Azure pipeline

For a Classic Azure pipeline, an Invoke REST API server task must be added.

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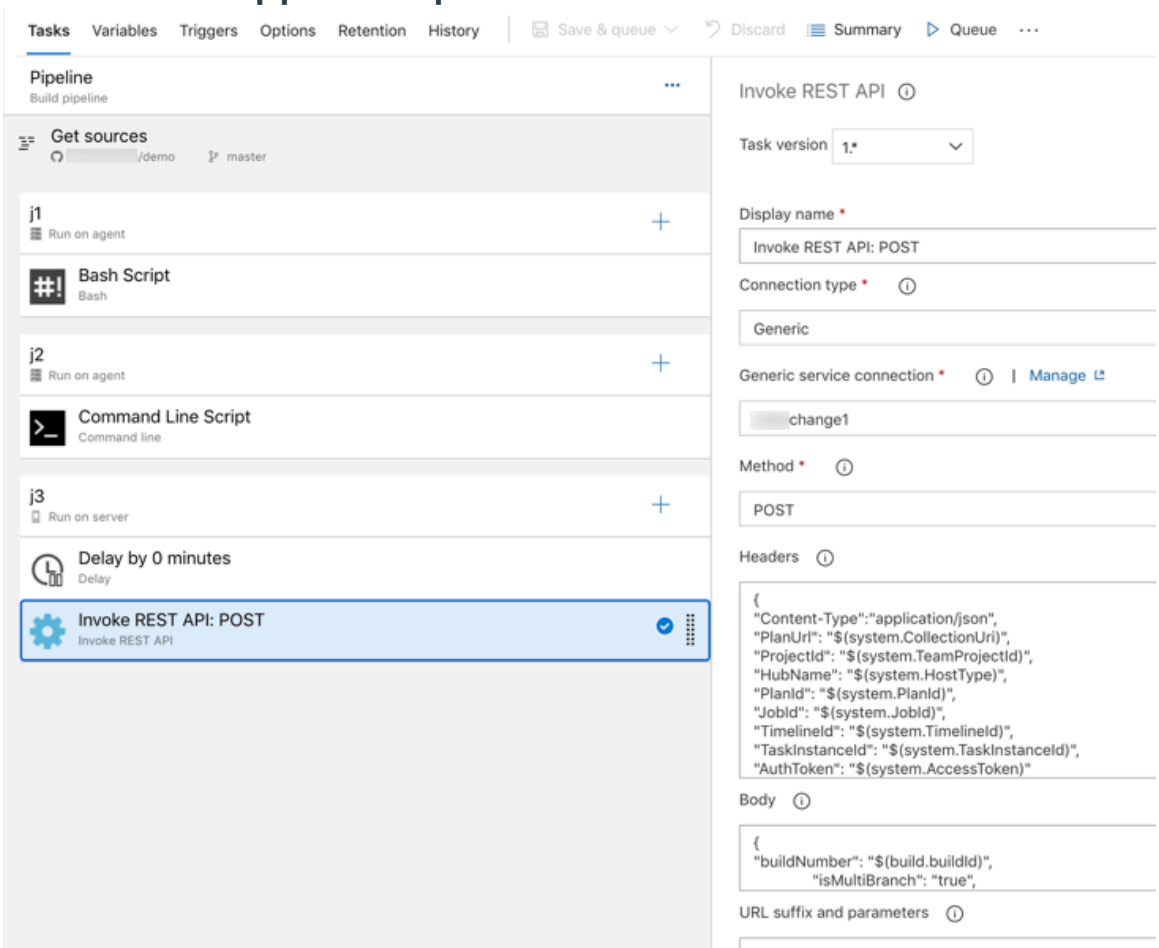
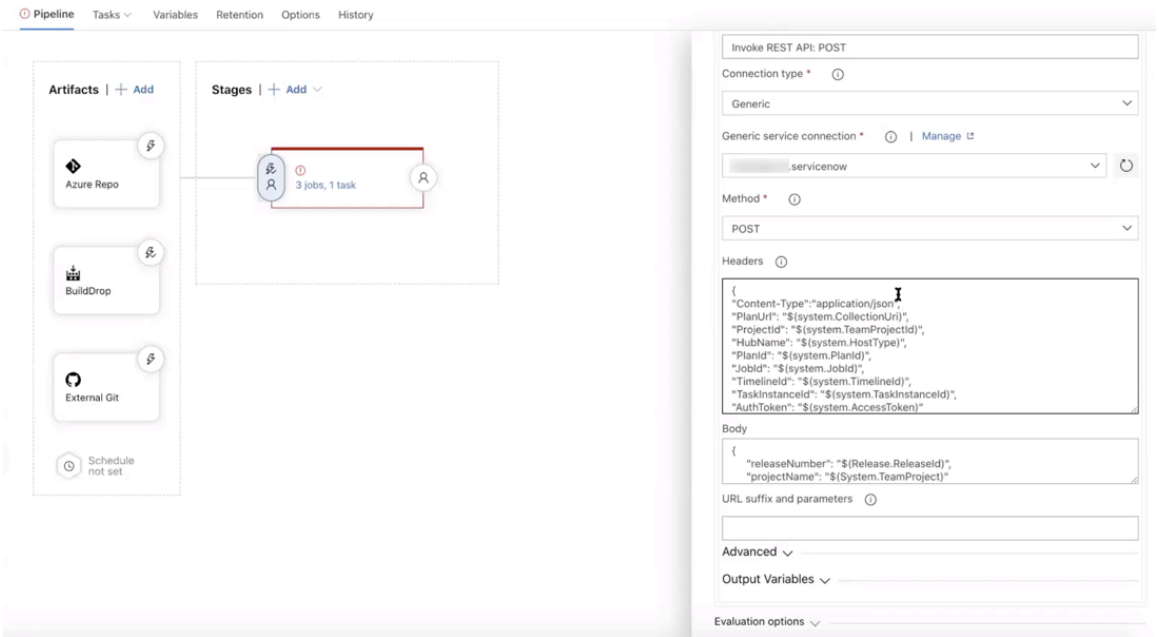
### Classic Azure build pipeline example




### Classic Azure release pipeline example




### Use the ServiceNow DevOps extension for Azure DevOps and Azure DevOps custom actions

Install and configure DevOps extension for Azure DevOps to send build and release notifications from your Azure pipeline to DevOps Change Velocity.

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### Before you begin
Role required: sn_devops.admin

### About this task
You can use **ServiceNow DevOps** extension on Visual Studio Marketplace - Extensions for Azure DevOps to integrate your Azure pipeline with the ServiceNow DevOps application. For more information about artifacts and packages in DevOps Change Velocity, see Artifacts and packages.

- **ServiceNow DevOps** service connection

  Required to connect the Azure pipeline to ServiceNow

- **ServiceNow DevOps Release Gate**

  Required to enable change control in Azure release (CD) pipelines (in pre-deployment conditions only).

Azure build (CI) pipeline custom tasks:

- Agentless (server) job
  - **ServiceNow DevOps Server Artifact Registration** custom task

    Required for agentless (server) jobs to register an artifact in the ServiceNow instance

  - **ServiceNow DevOps Server Package Registration** custom task

    Required for agentless (server) jobs to register a package in the ServiceNow instance

  - **ServiceNow DevOps Server Change Acceleration** custom task

    Required for agentless (server) jobs to automatically create a change request in ServiceNow Change Management as part of the Azure pipeline.

    **Note:**
    The **ServiceNow DevOps Server Change Acceleration** task does not require **ServiceNow DevOps Server Job Notification** tasks.

  - **ServiceNow DevOps Server Get Change** custom task

    Required to retrieve the change request number in a pipeline based on specific change details for a server job.

  - **ServiceNow DevOps Server Update Change** custom task

    Required to update the change request details associated with a pipeline for a server job.

- Agent job
  - **ServiceNow DevOps Agent Artifact Registration** custom task

    Required for agent jobs to register an artifact in the ServiceNow instance

  - **ServiceNow DevOps Agent Package Registration** custom task

    Required for agent jobs to register a package in the ServiceNow instance

  - **ServiceNow DevOps Agent Get Change** custom task

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Required to retrieve the change request number in a pipeline based on specific change details for an agent job.

- **ServiceNow DevOps Agent Update Change** custom task

  Required to update the change request details associated with a pipeline for an agent job.

**Note:**
The **ServiceNow DevOps Agent Artifact Registration** and **ServiceNow DevOps Agent Package Registration** tasks are not supported for Release pipelines.

- Software Quality scans (SonarQube/SonarCloud)
  - **ServiceNow DevOps Build Sonar Registration** custom task (for Build pipelines)
  - **ServiceNow DevOps Release Sonar Registration** custom task (for Release pipelines)

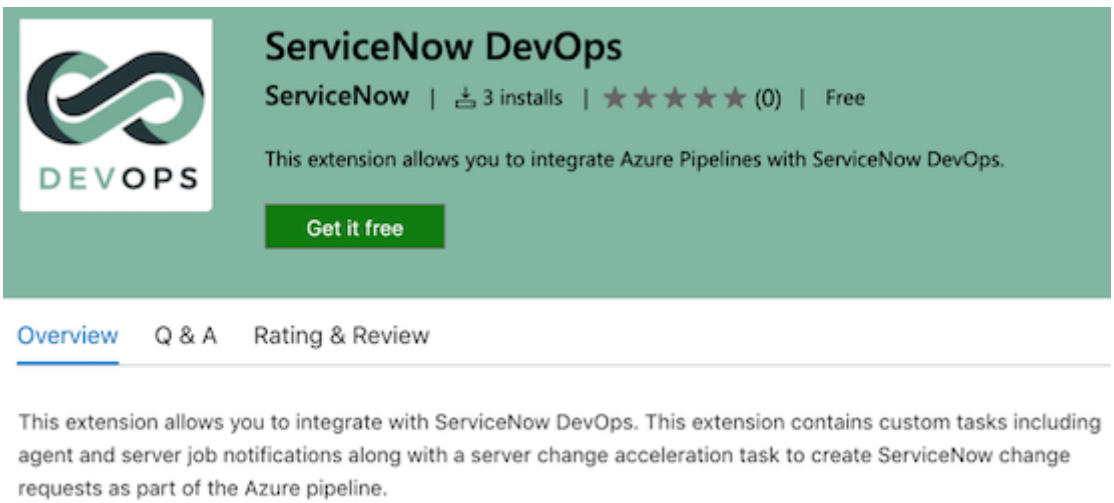
**Note:**
The **ServiceNow DevOps Build Sonar Registration** task is not supported for Release pipelines.

- Security scans:
  - **ServiceNow DevOps Build Security Results** custom task (for Build pipelines)
  - **ServiceNow DevOps Release Security Results** custom task (for Release pipelines)

**Note:**
The **ServiceNow DevOps Build Security Result** task is not supported for Release pipelines.

### Procedure

1. Go to Visual Studio Marketplace, search for the **ServiceNow DevOps** extension, and click **Get it free**.




2. Select your Azure DevOps organization and select **Install**.
3. From your Azure DevOps project, navigate to **Project settings** > **Pipelines** > **Service connections**.
4. Select **New service connection** and from the list select **ServiceNow DevOps**.

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5. Select **Next** and enter the following details:

| | |
|---|---|
| Authentication method | Select whether authentication is done through the token-based or basic method. |
| ServiceNow instance | `https://<your-instance>.service-now.com/` |
| Tool ID | The sys_id of the orchestration tool.<br><br>You can copy this value using the `Copy sys_id` command on the Orchestration Tool form. If you are using the workspace, select **More form options ( ⋮ ) > Copy sys_id** on the Azure DevOps tool connection form. If you are using Service Catalog or Classic, select **Additional actions ( ☰ ) > Copy sys_id** on the Azure DevOps tool connection form. |
| Username | Enter `devops.integration.user`.<br><br>**Note:**<br>The step to enter the integration user name and password is required to configure only when DevOps Config is installed or the *`This property decides whether to create a Generic Connection on configure operation for Azure DevOps`* property is disabled. If this step is not required, webhooks are configured using token-based authentication. |
| Password | Password for DevOps Integration User.<br><br>**Note:**<br>The step to enter the integration user name and password is required to configure only when DevOps Config is installed or the *`This property decides whether to create a Generic Connection on configure operation for Azure DevOps`* property is disabled. If this step is not required, webhooks are configured using token-based authentication. |
| API Token | API token for connection to the endpoint. |
| Service connection name | Enter `DevOps Connection` |
| Grant access permission to all pipelines | Select check box. |

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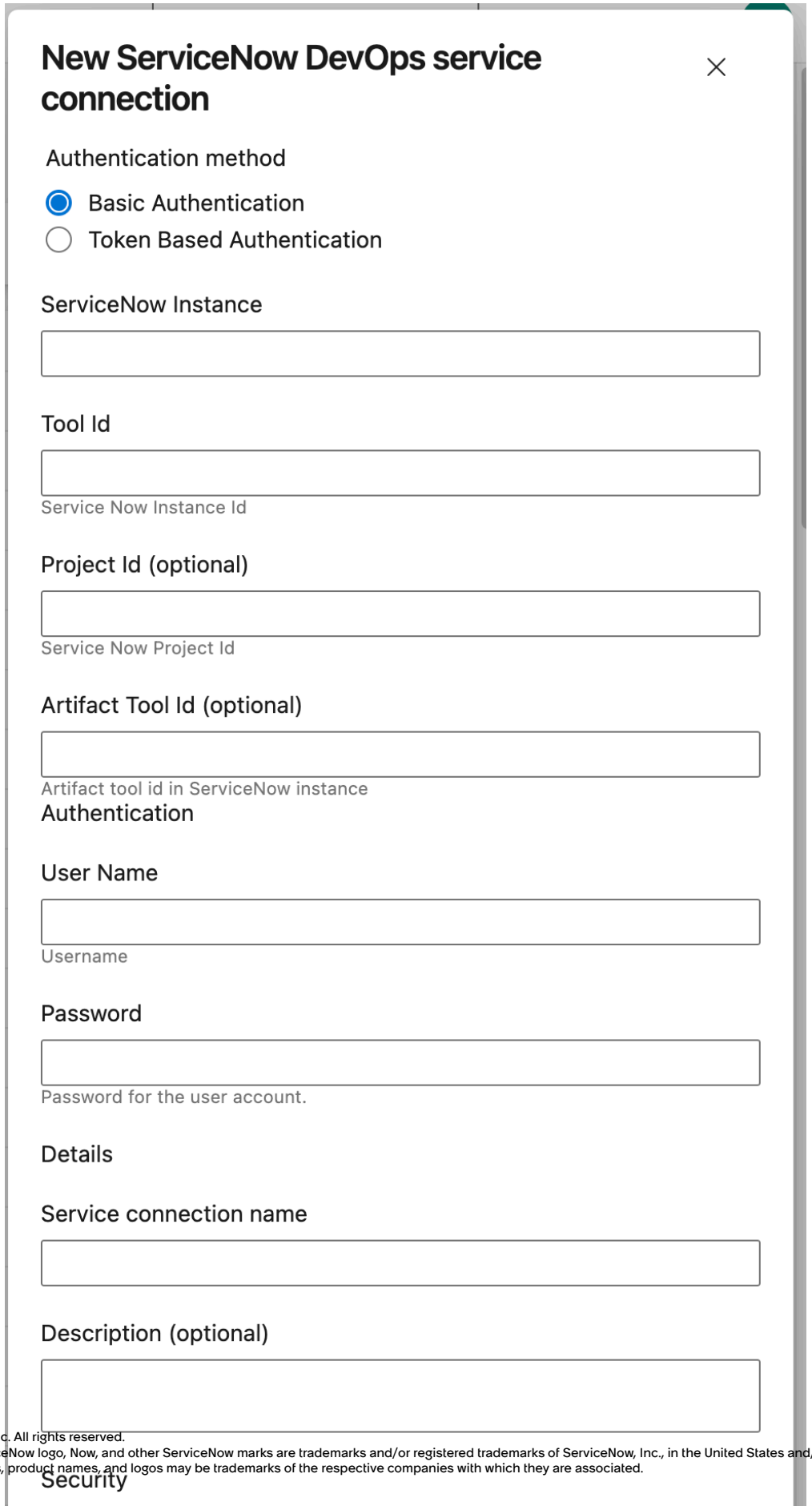
**Example:**

**Azure pipeline - ServiceNow DevOps service connection basic authentication method**

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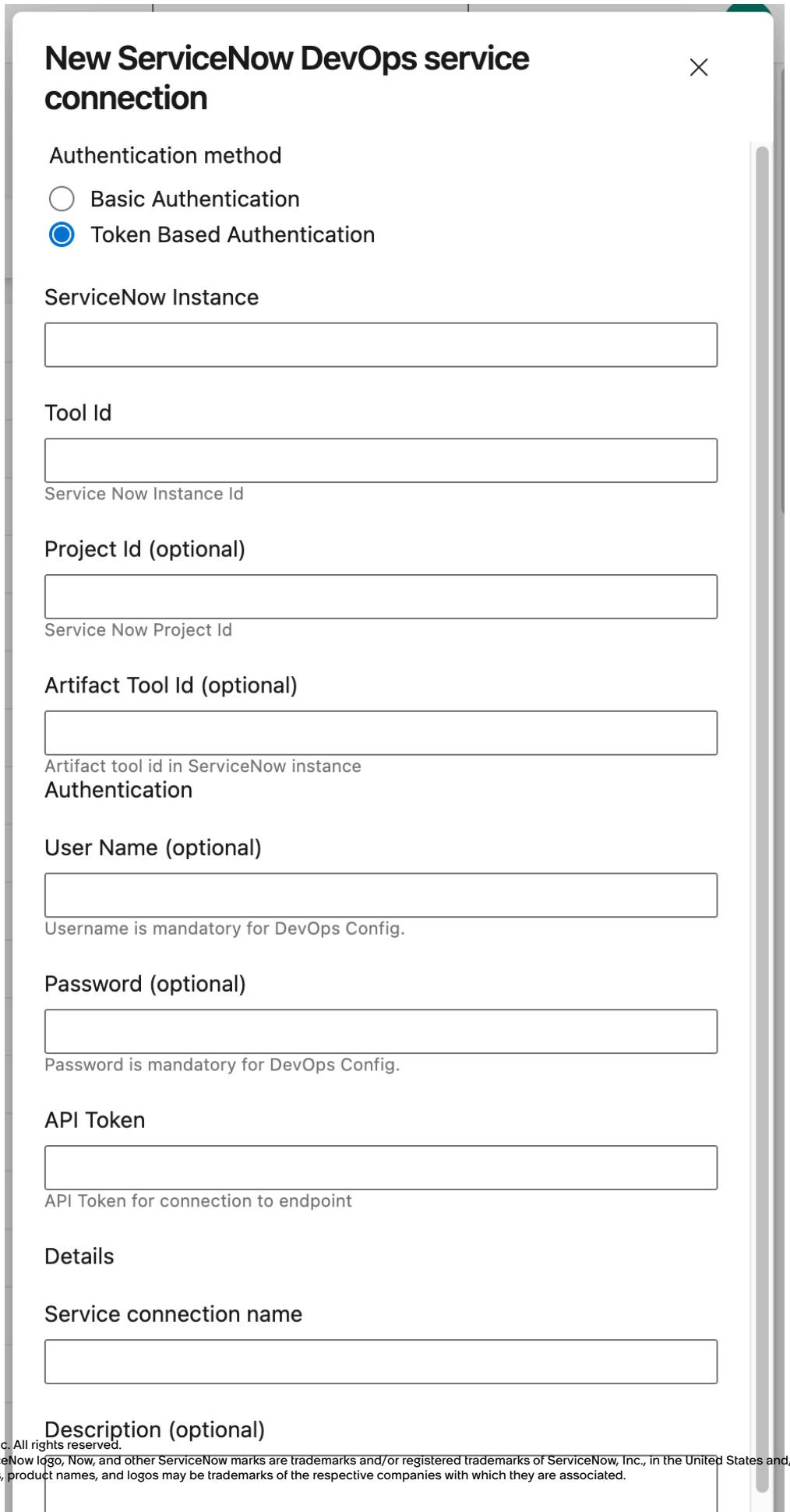
**Azure pipeline - ServiceNow DevOps service connection token based authentication method**

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### Set up an Azure build (CI) pipeline in DevOps

Use the ServiceNow DevOps extension for Azure DevOps to configure change control and artifacts and packages in your Azure build (CI) pipeline.

## Before you begin

Role required: sn_devops.admin

## Procedure

1. Navigate to **Pipelines** in your Azure DevOps instance.
2. Select the pipeline for which you want to enable change control.
3. Select **View**.
   The YAML editor for the pipeline is displayed along with the **Tasks** search pane on the right.
4. Search for the required custom action in the **Tasks** pane and select it.

| Custom action | Steps |
|---|---|
| **ServiceNow DevOps Server Change Acceleration** | **a.** In the **Display name** field, enter **ServiceNow Change Acceleration**.<br>**b.** In the **ServiceNow endpoint** field, enter `My Connection`.<br>**c.** In the **Upstream job executed** field, enter the value that indicates the previous job in line. For example, the job before Server might be `Test`.<br>**d.** In the **Change request details** field, set closure code and change request fields from within the pipeline.<br>Select the information icon to view sample output.<br><br>For more information regarding change acceleration, see change acceleration. |
| **ServiceNow DevOps Agent Artifact Registry** | **a.** In the **ServiceNow endpoint** field, enter `My Connection`.<br>**b.** In the **Artifacts payload** field, enter the JSON containing list of artifacts.<br>For more information regarding artifacts, see Artifacts and packages. |
| **ServiceNow DevOps Agent Package Registry** | **a.** In the **ServiceNow endpoint** field, enter `My Connection`.<br>**b.** In the **Package name** field, enter the name of the package that contains artifacts.<br>**c.** In the **Artifacts payload** field, enter the JSON containing build details and list of artifacts.<br>For more information regarding artifacts, see Artifacts and packages. |
| **ServiceNow DevOps Server Get Change** | Get and update change request details in Azure DevOps pipeline |
| **ServiceNow DevOps Server Update Change** | Get and update change request details in Azure DevOps pipeline |

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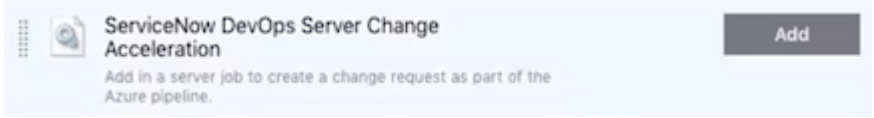
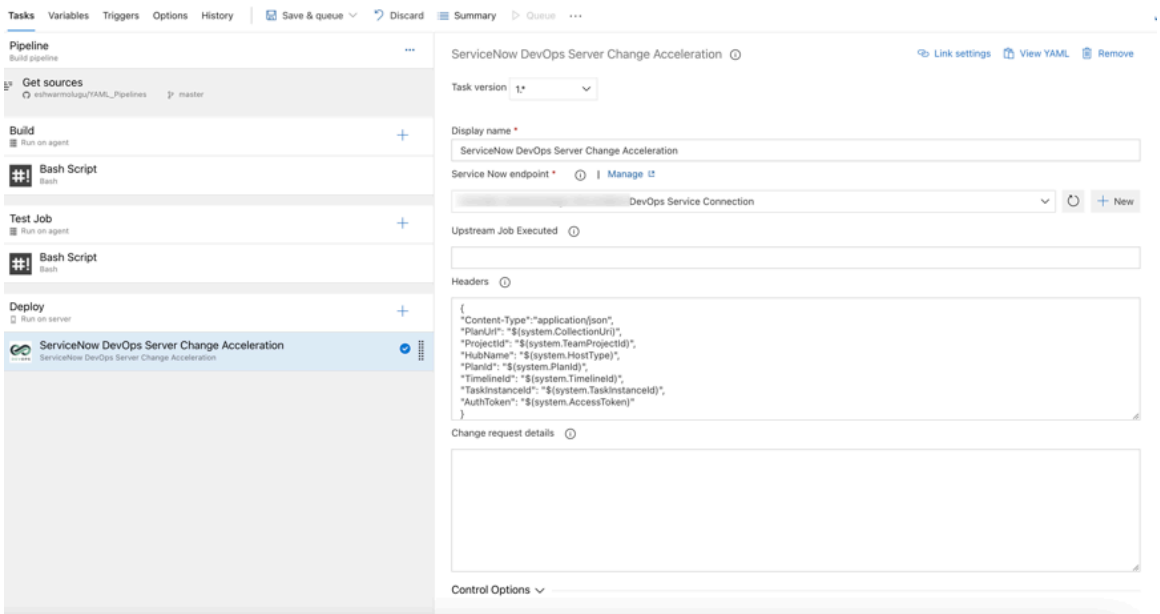
| Custom action | Steps |
| --- | --- |
| **ServiceNow DevOps Agent Get Change** | Get and update change request details in Azure DevOps pipeline |
| **ServiceNow DevOps Agent Update Change** | Get and update change request details in Azure DevOps pipeline |

5. Select **Add**, to add the custom task to the Tasks section of your Azure pipeline.

**Example:**

**Azure pipeline: ServiceNow DevOps Change Acceleration custom task**

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```
- stage: Prod
  #dependsOn: []
  jobs:
  - job: 'P1'
    steps:
    - task: Bash@3
      inputs:
        targetType: 'inline'
        script: |
          # Write your commands here
          echo 'Job j2 '

  - job: 'P2'
    dependsOn: ['P1']
    steps:
    - task: Bash@3
      inputs:
        targetType: 'inline'
        script: |
          # Write your commands here
          echo 'Job j2 '
  - job: "P3"
    dependsOn: ['P2']
    pool: server
    steps:
    - task: ServiceNow-DevOps-Server-Change-Acceleration@1
      inputs:
        connectedServiceName: 'empsunildevops9-eshwarmolugu-ServiceNow DevOps Service Connection'
```

**Change request details example**

```
- stage: Deploy
  dependsOn: Build
  jobs:
    - job: 'now_change'
      pool: server
      steps:
        Settings
        - task: ServiceNow-DevOps-Server-Change-Acceleration@1
          inputs:
            connectedServiceName: '$(ServiceNowConnection)'
            changeRequestDetails: |
                {
                  "autoCloseChange" : true,
                  "attributes": {
                    "comments" : "This update for work notes is from ADO Job",
                    "work_notes" : "Update this to work_notes",
                    "category" : "Service",
                    "priority" : "2"
                  }
                }
```

### Set up an Azure release (CD) pipeline in DevOps

Use the ServiceNow DevOps extension for Azure DevOps to configure change control, and artifacts and packages in your Azure release (CD) pipeline.

## Before you begin

Role required: sn_devops.admin

## About this task

**Note:**

Change control in Azure release (CD) pipelines is supported in pre-deployment gates only. Pre-deployment gate change requests are mapped to the step execution of the first job in that stage.

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Phases in an Azure release pipeline are mapped to a step. The step name for a multi-config or multi-agent job must include the phase name only, and not the actual job name derived at pipeline execution run time.

Task executions for skipped jobs are marked as failed.

### Procedure

1. In Azure DevOps Pipelines, navigate to your release pipeline and open the Pre-deployment conditions window.
2. Enable the Gates setting and click **+Add**.
3. Click the **ServiceNow DevOps Release Gate** and select the ServiceNow endpoint.
4. Exit the release gate configuration, and expand the Evaluation options section to configure the timing fields.

| | |
|---|---|
| Time between re-evaluation of gates | Re-evaluation interval in minutes, hours, or days.<br><br>If the change request is canceled or rejected, the Azure pipeline release gate keeps re-evaluating the change request status at the configured interval until timeout.<br><br>No user intervention is required for further attempts of re-evaluation after the change request has already been approved, rejected, or canceled. |
| Timeout after which gates fail | Timeout value in minutes, hours, or days.<br><br>If the pre-deployment conditions fail, the subsequent jobs of the stage are marked as failed, and the start and end time defaults to the current system time. |

5. **Optional:** Configure artifacts in your Azure release (CD) pipeline.

   To set up artifacts using the build pipeline as the source, these names must match.

   - Repository name, and build pipeline name (for example, DeployableRepo).
   - Name property of the build pipeline artifact, and source alias property of the release pipeline artifact (for example, BuildDrop).

   In addition to the build pipeline, you can select artifacts from any other eight sources. To track commit & work item details, follow these rules.

   - When the source is the build pipeline, the `semantic version` property of the artifacts should be in the format `MAJOR.MINOR.PATCH` (for example 5.1.3).
   - When the source is not the build pipeline, define a `semantic version` by implementing the **DevOpsArtifactSemanticVersionAPI** extension interface.

   See Artifacts and packages for more information regarding artifacts.

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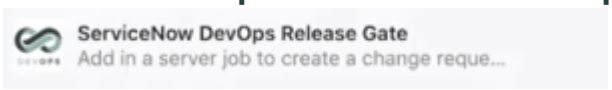
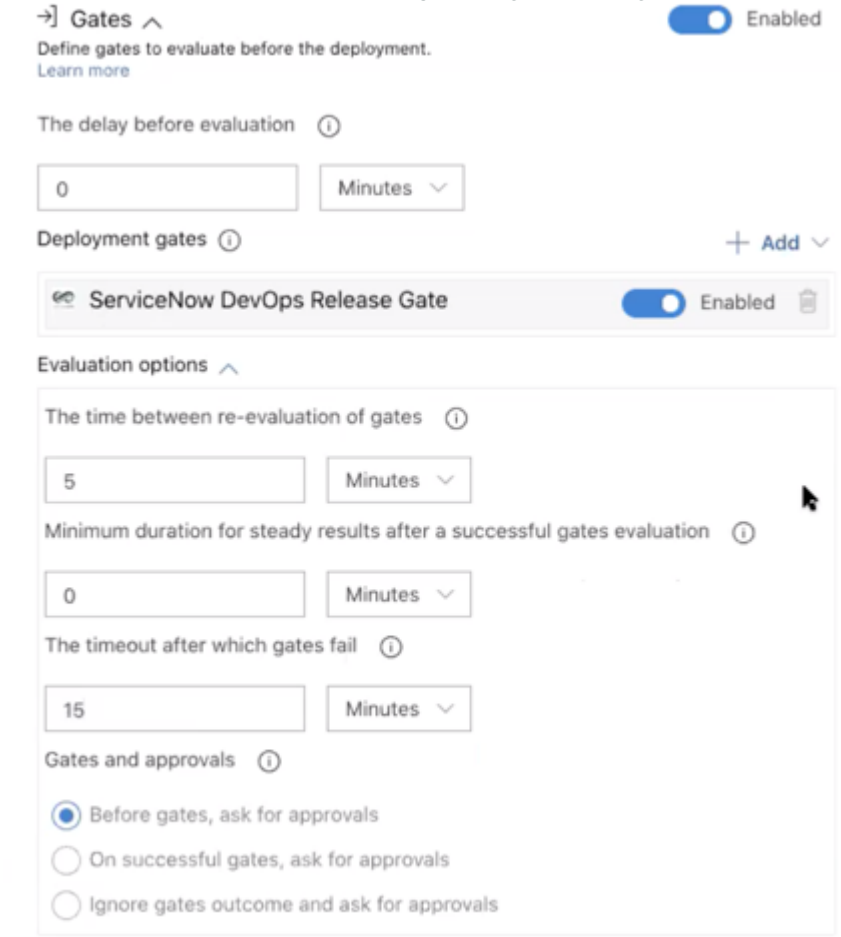
**Example:**

### ServiceNow DevOps extension for Azure DevOps - Release Gate




### Azure release pipeline pre-deployment gate configuration

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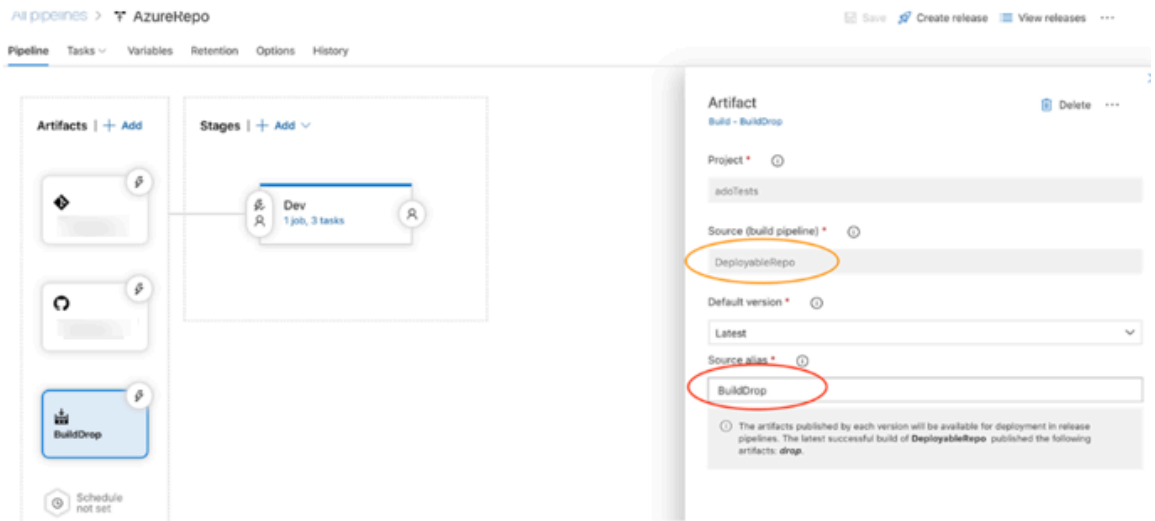
### Artifact setup - build pipeline source




### Artifact setup - release pipeline




### Azure DevOps PAT scopes for DevOps

Scope access levels are required when using a personal access token (PAT) to access Azure DevOps during setup.

Scope access level settings are based on the capability you have configured. Set the corresponding access level for seamless functionality. For information on creating a PAT, see Personal access token (PAT).

**Important:**
With the access level permissions specified in the following table in Azure DevOps, and the ServiceNow DevOps extension, you can connect to Azure DevOps from ServiceNow. Your Azure DevOps admin does not have to manually configure webhooks and service connections in Azure DevOps.

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**Important:**

- When onboarding a Project, the **Project Administrators** privilege requires the owner of the PAT to be a member of the project's **Project Administrators** group.
- When onboarding an Organization, the **Project Administrators** privilege requires the owner of the PAT to be a member of the organization's **Project Collection Administrators** group.

### Scope access level settings per capability and their impact

| Capability | Scope | Access level | Impact |
|---|---|---|---|
| Boards | Work item | Read | Required to discover the boards and receive the work items either through import/polling or real time with a configured webhook. |
| Repos | Code | Read | Required to discover repositories and receive branches, commits, and tags either through import/polling or real time with a configured webhook. |
| Build pipelines | Build | Read & Execute | • Read: Required to discover the build pipelines and receive pipeline execution details like stages, artifacts, test results, code security results, etc., either through import/polling or real time with a configured webhook.<br>• Execute: Required to pause/resume the pipelines based on the change control step. |
| Release pipelines and gates | Release | Read, write and execute | • Read: Required to discover the release pipelines and receive pipeline execution details like stages, artifacts, test results, code security results, etc, either through import/polling or real time with a configured webhook.<br>• Write and Execute: Required to pause/resume the pipelines based on change control step. |
| Test build and release pipelines | Test management | Read | Required to receive test results for pipeline execution. |
| Service Connections | Service connection | Read, query, and manage | Required to create Service connection automatically which is used to configure ServiceNow tasks like change acceleration, artifact and package registration, etc. |
| Packaging | Packaging | Read | Required to discover the artifact repositories and receive the feeds and packages either through import/polling or real-time with a configured webhook. |

**Note:**
You must have the Update build information permission on your pipeline for all pipeline features to work seamlessly. Contact your ADO Project Administrator if you don't have this permission.

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## Limitation of Azure DevOps

If you create an Azure tool with custom defined access level, and you reconfigure such a tool because of change in your Integration user credentials, then the existing service hooks for release created and release deployment are not updated. Instead, two new service hooks are created with new configuration details. To avoid the duplication of these service hooks, you must create the tool with full access level.

### Configure SonarQube scans on Azure DevOps pipelines

Configure SonarQube or SonarCloud scans on MS Azure DevOps pipelines. Check Azure DevOps pipeline executions for SonarQube scans on every stage of the pipeline's execution and fetch lists and details of scans from any stage to DevOps Change Velocity. Drill down on the Scan Details based on categories.

#### Before you begin

Ensure that you meet the following prerequisites before you configure SonarQube scans on your Azure DevOps pipeline:

- You are using a compatible SonarQube version. See DevOps Change Velocity integrations for supported tool versions.
- Connect, configure the Azure DevOps tool and discover existing repositories, orchestration tasks, and pipelines.
- Create a SonarQube tool record. For more information, see SonarQube integration with DevOps Change Velocity.
- Install the SonarQube extension from the Visual Studio Marketplace and configure branch analysis to use the Azure Devops tasks in your build definitions to analyze your projects. For more information, see SonarQube documentation.
- Install the following custom extension tasks on your Azure DevOps instance.
  - ServiceNow extension to integrate Azure Pipelines with DevOps Change Velocity. For more information, see Use the ServiceNow DevOps extension for Azure DevOps and Azure DevOps custom actions.
  - ServiceNow DevOps Build Sonar Registration (for Build pipelines)
  - ServiceNow DevOps Release Sonar Registration task (for Release pipelines)

Role required:

- admin or sn_devops.admin in DevOps Change Velocity
- admin in Azure DevOps
- admin role in SonarQube with access to all projects that the SonarQube scans are configured on.

#### About this task

By default, Azure DevOps provides you with the following tasks to run a SonarQube scan on build and release pipelines:

- Prepare analysis on SonarCloud
- Run Code analysis
- Publish Quality Gate Result

Add and configure custom ServiceNow extension tasks in order to them default tasks, to fetch the scan details to ServiceNow DevOps from Azure DevOps build and release pipelines. The scan details that are fetched are:

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- pipelineName
- buildNumber
- stageName
- branchName
- sonarProjectKey
- sonarInstanceUrl

### Procedure

1. Set up and configure the Azure DevOps and SonarQube Integration to fetch scan analysis from Build pipelines.

   a. In the Azure DevOps console, navigate to **Organization** > **SonarIntegrations** > **Pipelines** > **Jobs**.

   b. Click the **Add Tasks** icon ( ), and search for the ServiceNow extensions in the **Add tasks** search bar.

   c. Add the following tasks.
      - ServiceNow DevOps Build Sonar Registration task.
      - ServiceNow DevOps Release Sonar Registration task.

   d. On the form, fill in the fields.

**ServiceNow DevOps Build/ Release Sonar Registration**

| Field | Description |
|---|---|
| Display name | Auto-populates on entering key and URL. |
| ServiceNow endpoint | The ServiceNow instance endpoint that is automatically created during Tool configuration. Use the same service connection for this task. |
| Sonar project Key | Enter the same project key value which you used while configuring the **Prepare analysis on SonarCloud** task. |
| Sonar Instance Url | Enter the same URL which you used to connect to the Sonar tool during tool creation. |
| Job Name | The name of the Azure DevOps pipeline job.<br><br>This field appears only for the **ServiceNow DevOps Release Sonar Registration** task. |

**Important:**
In the list of tasks for the pipeline job, ensure that the **ServiceNow DevOps Build Sonar Registration** or **ServiceNow DevOps Release Sonar Registration** task is added after the **Run Code Analysis** task.

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You have configured the build pipelines to send sonar scan results to your DevOps application. Scan results are mapped to the Software Quality capability are processed by an associated base system sub flow (*FetchSonarScanId*), once an event is created and processed in the Inbound Events table.

2. Associate Azure pipelines steps in DevOps.
3. Run the pipeline.

### Result

Based on the scan results on various stages of pipeline's execution, the results are shown in the corresponding step of the pipeline in ServiceNow DevOps. Inbound events are created for notifications and subflows are triggered based on the notification type and capability.

### What to do next

- View scan details as part of Task Executions. View details of all the Sonar scans that are part of the task execution mapped to a build or release pipeline execution step.

  1. Navigate to **DevOps** > **Orchestrate** > **Task Execution** click a relevant Task Execution record.
  2. Click the Software Quality Summary related list.
  3. Click a relevant Scan ID record.
     The Software Quality Scan Summary and Scan Details are displayed.

- View scan details as part of Change Request. View all the scans that were part of this build/release pipeline in the **Software Quality Results** > **Software Quality Summary** related list.

  1. Navigate to **DevOps** > **Orchestrate** > **Pipeline Change Requests**
  2. Click the Software Quality Summary related list.
  3. Click a relevant Scan ID record.
     The Software Quality Scan Summary and Scan Details are displayed.

#### Restarting failed build or release pipeline jobs and stages

Rerun or redeploy Azure DevOps build, release changes, or pipelines that are failed or canceled in that stage or pipeline. The reattempts display on the DevOps pipeline UI as continuous runs instead of creating new executions.

## Rerun Azure DevOps pipelines or stages

You can rerun a failed or canceled build or release pipelines or change jobs in Azure DevOps. The reruns are processed as part of the same pipeline execution as the first run in ServiceNow DevOps. You can rerun entire pipelines or specific failed or canceled jobs and stages. You can now choose to reuse a change request instead of creating a new change request each time you restart a stage or a pipeline.

An *attemptNumber* parameter is added to the payload which helps us track reruns. Associated test summary, software quality scan results, commits, work items corresponding to every rerun attempt is also updated in ServiceNow DevOps.

If you are using the Configuring change control using the Azure Invoke REST API you must add the attempt number parameter to your payload body in the specified syntax format for build and release pipelines. If you do not specify the attempt number parameter, the default attempt number is set to 1.

Example attempt number parameter in build pipeline payload:

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```
"attemptNumber": "$(system.jobAttempt)"
```

Example attempt number parameter in the release pipeline payload:

```
"attemptNumber": "$(Release.AttemptNumber)"
```

**Note:**
Do not use the existing started and completed notifications for the stage jobs. If your jobs consider the started and completed notifications the rerun functionality does not work.

## Reusing Change Requests

If a change enabled job is rerun, and a change request exists for the previous run/attempt, you can choose to reuse the previous change request or create a new change request, using the base system 'DevOps Change Request Reusability Decision Subflow'. The default implementation of this subflow, allows you to reuse a change request from the previous attempt if the change request is in implement, or post-implement states. If the Change request is in any other state, by default, a new change request is created when you rerun the job. Per existing behavior, all associated details such as test summaries, and scans, are newly generated while commits and work items are retained unchanged for new change requests.

For example, when a pipeline fails at a specific stage after the change request is approved, and you rerun that stage. The change request is reused, the associated test summary and software quality scans, and the commits and work items associated to the artifact are associated with the same change request which you approved.

To apply a custom logic for reusability, you can copy the existing subflow, make the changes, publish it, and update the new subflow name under **DevOps Properties** > **DevOps Change Request Reusability Decision Subflow**.

In the regular base system flow when a change is created, ' Using DevOps Change Request Manual Approval flow' is used to update the#*State*#field of step execution record after a decision is taken on the change request. However, when you reuse a change, the first trigger condition of a change request being created is not met. A base system subflow 'DevOps Change Request Reusability Model Subflow' is triggered instead, whenever a change request is reused when a job is a rerun. The default implementation of this subflow is similar to the DevOps Model Change Request flow. You can create a custom subflow and update the subflow name at **DevOps Properties** > **DevOps Change Request Reusability Model Subflow**.

## Pipeline UI changes

ServiceNow DevOps synchronizes all the changes that are caused when you restart or rerun a stage or a job, and displays them in the DevOps pipeline UI.

- Click a card to view the latest attempt of that stage.
- Click the **View all attempts** link to see all the step executions and related information associated to the step or stage that is run more than once.
- The View change link displays the change request associated with the latest attempt.

In previous releases, failed jobs were either ignored or a new pipeline execution job was created for reruns and processed accordingly. For more information, see DevOps Pipeline UI.

### Execution sequence and waiting logic for rerun jobs

Processing sequence and waiting logic for rerun jobs are different when you reuse or create a change request as part of a rerun job.

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## Existing Considerations

- A change request should not exist in a stage which contains parallel jobs.
- If more than one stage is running in parallel, change request should not be the first job in both the stages.

**Note:**
Parallel stages in release pipelines are processed and displayed in the pipeline UI as they occur in the Azure DevOps pipeline. Parallel stages in build pipelines are still processed in parallel but appear in a serial order in the pipeline UI.

## Upgrade Considerations

There is no change in the functionality or execution when you run the first pipeline attempt. All stages are processed sequentially and associated tests, software quality scans and change requests are executed and created as modeled.

**Note:**

- Run a new pipeline after you upgrade if you have rerun stages and pipelines before upgrading. Rerun attempts and failed events prior to the upgrade are ignored by ServiceNow DevOps for reattempts.
- If you have only run the pipeline once before upgrade, you can rerun the stage or the pipeline. The rerun functionality applies as designed and is saved in ServiceNow DevOps.

## Execution Sequence and processing logic

- If the same artifact version registration call is received in reattempt, the registration call is ignored.
- Package registration calls with same package name are not ignored. A new package associated to artifact versions and pipeline execution is created during reattempt. The artifacts that are associated to the latest package, will be shown on the change request.

From the Azure DevOps GUI, if you rerun a stage in a build pipeline the subsequent stages reruns are also triggered in it's specified sequence. If you reattempt processing a pipeline before all the stages of the previous attempt are not complete. The subsequent attempt waits until all the events in the previous attempt are processed.

For release pipelines, the stages are run in the specified sequence only during the first run. For subsequent rerun attempts manually run each stage. In release pipelines even if stages are running in parallel in Azure DevOps, from the second attempt onwards the events are processed in the specified sequence.

- When a new change request is created for a reattempt stage job, and the stage that you are reattempting includes a test and a software quality scan only the latest Test Summary and Software Quality scan results display on the change request related list.
- When a change request is reused for a rerun stage job, the Test Summary and Software Quality scan results for each attempt displays in the change request related list.

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### Parallel stages in Azure DevOps release pipelines

Parallel stages in a release pipeline are now processed concurrently and displayed in the DevOps pipeline UI in real time. Base system pre-deployment conditions and release gates enable you to create change requests that include details from parallel stages.

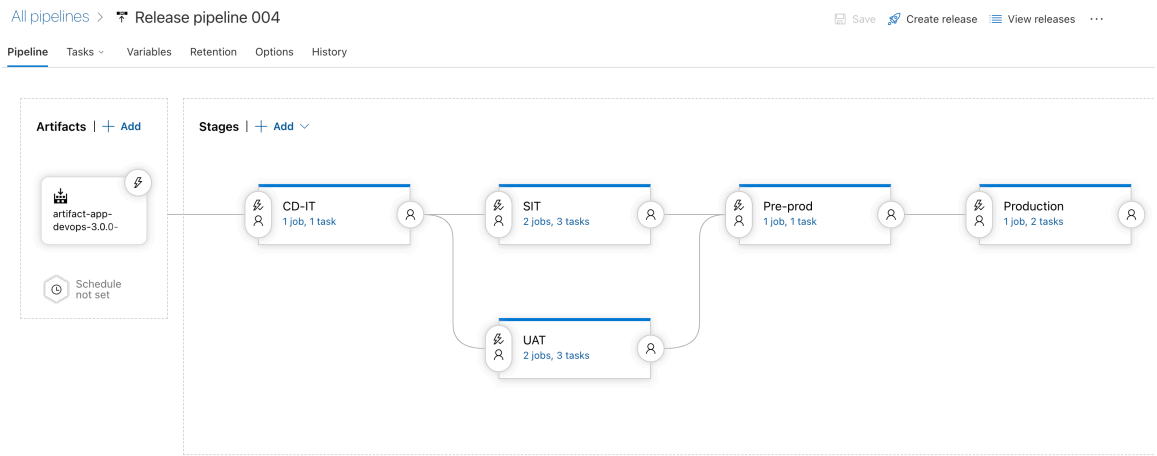
## Base system parallel stage support for Azure DevOps

Organizations use parallel stages to automate and speed up release processes for tasks that can be performed in parallel. For example, a release pipeline has integrated multiple test and software quality tools and has jobs configured to run in parallel. Not running each job sequentially significantly speeds up the release pipeline execution.

ServiceNow DevOps supports processing parallel stages in release pipelines and displays the stages in a parallel view in the DevOps pipeline UI. Effectively, the DevOps pipeline UI replicates the Azure DevOps GUI in real time.

You can also see the details of the processed stages in the pipeline UI.

**Important:**
Support for parallel stages is restricted to Release pipelines. Build pipelines continue to appear in a sequential or serial manner in the DevOps pipeline UI, even if parallel stages are configured for build pipelines in Azure DevOps.




## ServiceNow® DevOps release gate in pre-deployment conditions to create Change requests

A base-system ServiceNow DevOps Release Gate is added along with pre-deployment conditions. Enable base system deployment gates that are configured to call the ServiceNow AI Platform instance, to create a change request before the deploy to production stage. Change requests are now created after all previous (upstream) stages complete processing. The change request captures relevant details from all upstream stages and displays them in the following corresponding related lists.

- Commits
- Work Items
- Test Summaries
- Software Quality Summary
- Artifact Versions

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After the pipeline execution completes processing the parallel stages preceding the production deployment stage, a change request is automatically created and mapped to the deploy to production stage in the Pipeline Executions view. The production stage completes processing once the change request is approved.

From the **Pipeline Execution** view of the relevant pipeline, click the **Pipeline UI** related link to view the real-time state of the pipeline as it appears in Azure DevOps. The associated artifact details which are sourced from the build pipeline, Test Results, Software Quality Summary Results display on the pipeline UI.

## Change creation sequence for parallel jobs

Job information from Azure is received in ServiceNow during the following times:

1. Upon the completion of a stage.
2. When the register-change step executes.

Azure provides job information sequentially based on job queue time, despite jobs potentially running in parallel. Consequently, if the register-change step executes while a parallel job queued earlier remains unfinished, the system assumes the parallel job is an upstream task, causing the change creation process to wait for its completion. However, stage completion notifications are not received until all jobs, including the register-change job, have finished.

This creates a deadlock scenario where the change process in ServiceNow waits for the parallel job to complete, while the parallel job waits for the stage completion notification, which in turn waits for the register-change job to finish.

Due to this deadlock, by the time the change is created, the Azure pipeline job has already failed, leading to the 500 error in the event API. Rerunning the job resolves the issue as the previously queued parallel jobs are marked as completed.

## Upgrade Considerations

Ensure that you review the following considerations before upgrading.

**Important:**
A change request should not exist in a stage which contains parallel jobs.

- The **Upstream execution** column in the Task Executions table is not displayed for fresh installations. Any customizations that you have made using the **Upstream execution** column prior to the upgrade are unaffected.
- If stages are running in parallel, a change request should not be the first job in any stage.
- After upgrading, new release pipeline executions process parallel stages concurrently and display parallel stages and associated details in the pipeline UI. Azure DevOps release pipelines that are already executed and stored in ServiceNow DevOps prior to the upgrade remain unaffected and continue to display parallel stages (that are already executed and persisted) in ServiceNow DevOps serially.
- If the pre-deployment ServiceNow DevOps release gate is enabled in more than one start stage in a release pipeline with multiple start stages, it might result in multiple pipeline executions.

**Note:**
A package is created for each start stage but any one package is associated per pipeline execution.

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### DevOps work item import for Azure Boards

Azure Boards work items are mapped to default ServiceNow DevOps states and types during import. You can use the DevOpsAzureDevOpsWorkItemHelper script include to customize the mappings.

## Default Azure Boards work item mapping

**Native State** and **Native Type** fields of the work item contain the original state and type values from the source tool.

### Work item type mapping

| ServiceNow DevOps | Azure Boards Basic | Azure Boards Agile | Azure Boards Scrum |
|---|---|---|---|
| Task | Task | Task<br>Test case | Task<br>Impediment<br>Test case |
| Bug | Issue | Bug<br>Issue | Bug |
| Story | -- | User story | Product backlog item |
| Epic | Epic | Epic | Epic |
| Feature | -- | Feature | Feature |

**Note:**
Historical import of Azure DevOps work items is not supported for Agile Boards CMMI process.

### Work item state mapping

| ServiceNow DevOps | Azure Boards Basic | Azure Boards Agile | Azure Boards Scrum |
|---|---|---|---|
| Planned | To Do | New | New<br>Open<br>Approved<br>Committed<br>To do |
| WIP | Doing | Active<br>Design | In Progress<br>Design |
| Complete | Done | Ready<br>Closed | Done<br>Ready |

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**Work item state mapping (continued)**

| ServiceNow DevOps | Azure Boards Basic | Azure Boards Agile | Azure Boards Scrum |
|---|---|---|---|
| | | | Closed |
| Deleted | Deleted | Completed<br>Deleted | Removed |

**Note:**
When an imported Azure Boards work item type or state is not recognized, the value is set to **Other**.

## Customize Azure Boards state and type mappings

Access the DevOpsAzureDevOpsWorkItemHelper script include in the **System Definition** > **Script Includes** module.

This script example adds new states and types for custom processes MyScrum and CustomBasic. CustomBasic inherits the state and type defined for Basic process.

```
var DevOpsAzureDevOpsWorkItemHelper = Class.create();

DevOpsAzureDevOpsWorkItemHelper.prototype =
 Object.extendsObject(DevOpsAzureDevOpsWorkItemHelperSNC, {

 setDefaultProcess: function (projectProcess){


 DevOpsAzureDevOpsWorkItemHelperSNC.prototype.setDefaultProcess.
call(this, projectProcess);

  //set custom states and types
  var newStates, newWITypes;
  if (projectProcess == 'NPScrum'){
   // no parent process set. So type and states avaibale will be
 linited to newStates
   // and newWITypes
   newStates = {
    'Delayed': 'planned',
    'Approved': 'wip'
   };
   newWITypes= {
    'Request': 'story',
    'Incident': 'task'
   };

  } else  if (projectProcess == 'CustomBasic'){
   //set parent process to Basic to inherit basic states and
 types
   this.setParentProcess('Basic');
   newStates = {
    'Auto-Approved': 'wip'
   };
   newWITypes= {
```

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```
    'UserStory': 'story'
   };
  }

  this.setStates(newStates);
        this.setWorkItemTypes(newWITypes);
 },

 type: 'DevOpsAzureDevOpsWorkItemHelper'
});
```

### Track specific pipelines in Azure DevOps

Enable and configure specific pipelines in Azure DevOps that you want to track. Select the pipelines you want to monitor and receive job notifications from Azure DevOps.

## Before you begin

- Connect DevOps to Azure DevOps tools.
- Ensure that you have modeled, configured, and associated Azure pipelines to DevOps.
- Review how to configure form layouts. For more information, see Configuring the form layout

Role required: admin, personalize_form

## About this task

By default, the **Track Specific Pipeline** field is set to **False** when you discover Azure DevOps orchestration tasks and pipelines. The **Track** flag for all Azure DevOps pipelines is also disabled. So, by default, this leads to all pipelines sending job notifications to DevOps and increased processing times, which could cause the pipeline you really want to track to be delayed. So, enable the **Track Specific Pipeline** check box to process only notifications for the pipeline events that you specify to track, and ignore all other pipeline notifications.

## Procedure

1. Navigate to **All** > **DevOps** > **Tools** > **Orchestration Tools**, and open the Azure DevOps tool record.
2. Click the **Additional Actions** icon ( ), and select **Configure** > **Form Layout**.
3. Move the **Track Specific Pipeline** field to the selected list.
4. Click **Save**.
   You are redirected back to the Azure DevOps form in the DevOps tool, and the **Track Specific Pipeline** check box appears.
5. Select the **Track Specific Pipeline** check box.
6. Navigate to the Pipelines related list.
7. Click the **Update Personalized List** icon ( ).
8. In the Personalize List Columns form, move the **Track** field to the Selected list.

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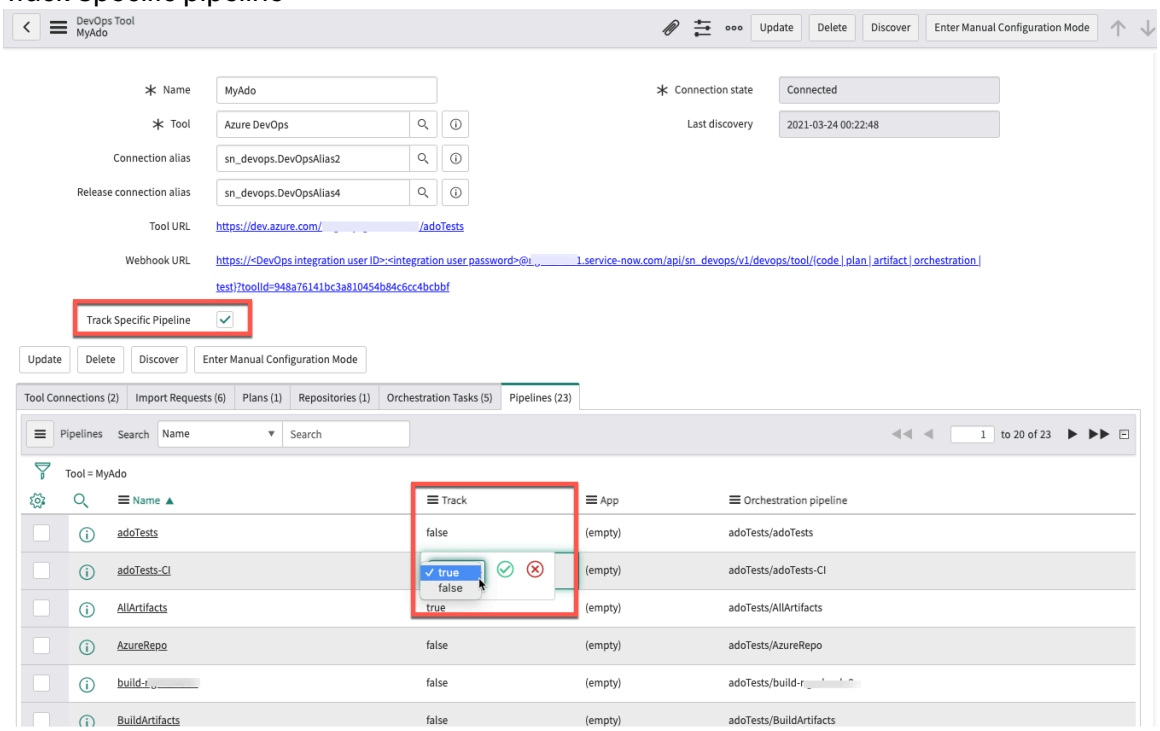
Track Specific pipeline




9. Click **OK**.
   You are redirected back to the Pipelines related list, where the **Track** field now appears.
10. Navigate to the pipeline step which you want to track, double-click the **Track** field.
11. Change the **Track** field's value to **true**, and click **Save**.

### Result

Only the pipelines that have **Track** field set to **true** in the Pipelines related list are now being tracked and sent to the Inbound Events table [sn_devops_inbound_event_list.do]. All pipelines that have the **Track** field set to **false** are ignored.

### Note:

- If the **Track Specific Pipeline** check box is selected only those pipelines that have the **Track** field value set to **true** are tracked and sent to the Inbound Events table. If **Track** field is set to **false** for all pipelines none of the pipelines are tracked.
- If the **Track Specific Pipeline** check box is unselected, all events of the pipeline are tracked and sent to the Inbound Events table.

### Managing Azure DevOps artifacts

DevOps Change Velocity makes it easy to manage artifacts published through Azure DevOps build pipelines. You can import and track these artifacts and manage the packages in DevOps Change Velocity.

Types of artifact sources supported by DevOps Change Velocity:

- Build
- Azure Artifacts

## Build Artifacts

Build and pipeline artifacts published using the Publish Build Artifacts (PublishBuildArtifacts) and Publish Pipeline Artifacts (PublishPipelineArtifacts) tasks respectively on the Azure DevOps are

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automatically created in your DevOps Change Velocity instance. You can also import historical data for build artifacts.

Build artifacts created using the Publish Build Artifacts task will be part of the artifact repository whose name will be defaulted to the build pipeline name.

**Note:**
If two artifacts with the same name, belonging to the same repository, and having different versions are used as release triggers for a release pipeline, then the related lists (like work items, commits, test summaries, and so on) will include DevOps data related to both the artifact versions when a change exists in the release pipeline. For example, if artifact-1.0 and artifact-2.0 are release triggers to manage rollback scenarios in deployment, then change (if part of the release pipeline) will include related lists data for both the versions.

You can also continue to leverage the existing Extension-based artifact registration and import. For more information, see Use the ServiceNow DevOps extension for Azure DevOps and Azure DevOps custom actions and Artifacts and packages.

**Important:**
Using Extension-based artifact registration isn't required if the PublishBuildArtifacts and PublishPipelineArtifacts tasks mentioned above are used.

## Azure Artifacts

You can import and track the artifacts to your DevOps Change Velocity instance. You can import Azure DevOps artifacts that are published to the Azure Artifacts using the Universal Package task only.

**Note:**
Only **Universal** packages are currently supported for importing and tracking.

(DevOps 1.35 and later versions) The **Feed connection alias** field is available on the Azure DevOps Tools form. This field is auto-populated with an alias for the feed connection. For more information about connecting a DevOps tool, see Integrating DevOps Change Velocity with third-party tools.

After upgrade, to select and add the artifact repositories using App Onboarding, you must select **Discover** to discover existing artifact repositories. The records are added to the Artifact Repositories related list. For more information about the adding artifact repositories, see Associate tool objects to applications - Workspace.

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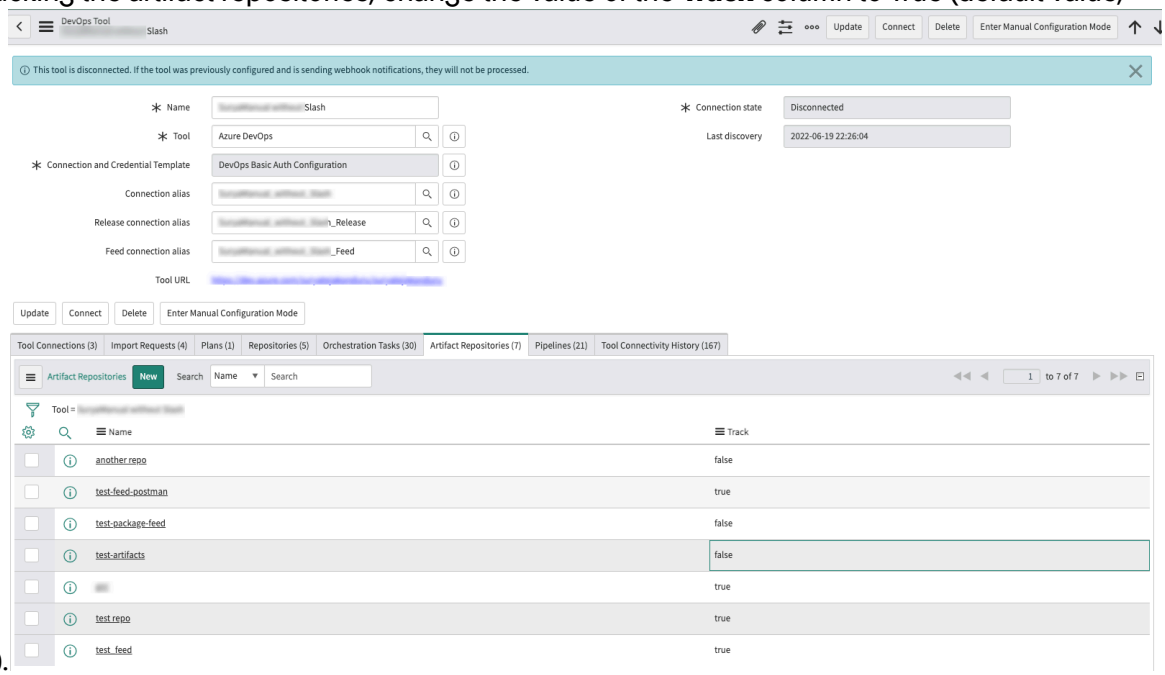
For tracking the artifact repositories, change the value of the **Track** column to True (default value, False).




When an Azure Artifact is published via the Universal Package Task, the artifact information is associated with a build pipeline within 24 hours using the *`ADO Artifacts Daily`* scheduled job.

### Note:

- As Azure DevOps Artifact creation is not dependent on Build Pipeline completion. If Azure DevOps Artifact is used as Trigger for a Release Pipeline, it would be triggered even if Build pipeline is pending completion due to a change request.
- The scheduled job is executed every 24 hours by default and can also be executed on-demand. However, as the scheduled job is performance intensive, it shouldn't be executed frequently.

The following points must be considered while importing Azure DevOps artifacts:

1. Artifacts can't be published from the Release Pipelines due to Azure DevOps limitations.
2. Artifact Repositories are tracked as follows:
   - Historical Import of Azure DevOps artifacts is accomplished using the App Onboarding. For more information, see Associate tool objects to applications - Workspace.
   - For real-time tracking of the artifacts, the value for the **Track** column must be changed to True (default value, False). Otherwise, the Feed or Artifact Repository won't be tracked.
3. The application supports the project-specific feeds but not the Organization specific feeds. Azure DevOps artifacts when published through Azure DevOps pipeline are only supported.
4. Azure DevOps artifacts not linked to any build or release pipeline (orphan artifacts) aren't supported.
5. Azure DevOps Artifacts are stored in the following format:
   - Azure DevOps artifact linked to only Build Pipeline (or) Build and Release Pipeline:

     *`<artifact-name>-<1.build-number.0> (Build Number of Build Pipeline)`*

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- Azure DevOps artifact linked only to Release Pipeline:

  *<artifact-name>-<1.build-number.0> (Build Number of Release Pipeline)*

## Azure DevOps Artifact mapping with DevOps Change Velocity

The following table explains the mapping of Azure DevOps artifacts with ServiceNow DevOps fields:

| Azure DevOps Artifact | DevOps Change Velocity |
|---|---|
| Feeds | Artifact Repositories |
| Packages | Artifacts |
| Provenance/build number | Versions |

## Limitations

- Azure DevOps Artifact Project with 4000 Feeds (or less) is supported.
- Azure DevOps artifact Feed with 800 packages or artifacts (or less) is supported.
- Azure DevOps pipeline with 200 packages or artifacts (or less) publishing is supported.

### Get and update change request details in Azure DevOps pipeline

Get and update the change request details associated with an Azure DevOps pipeline.

#### Before you begin

Ensure that you meet the following prerequisites before you perform this procedure:

- Connect, configure the Azure DevOps tool and discover existing repositories, orchestration tasks, and pipelines.
- Install the following custom extension tasks on your Azure DevOps instance.
  - ServiceNow extension to integrate Azure Pipelines with DevOps Change Velocity. For more information, see Use the ServiceNow DevOps extension for Azure DevOps and Azure DevOps custom actions.

Role required:

- admin or sn_devops.admin in DevOps Change Velocity
- admin in Azure DevOps

#### About this task

When you update the **state** parameter in a change request, only the following transitions are supported:

- cancel: Change request state must be **implement** to move the state to **cancel**. **reason** is a mandatory input to update the state to canceled.
- closed: Change request state must be **implement** or **post implement** to move the state to **close**. **close_code** and **close_notes** are mandatory input to update the state to closed.

Specify the change request state as an integer value:

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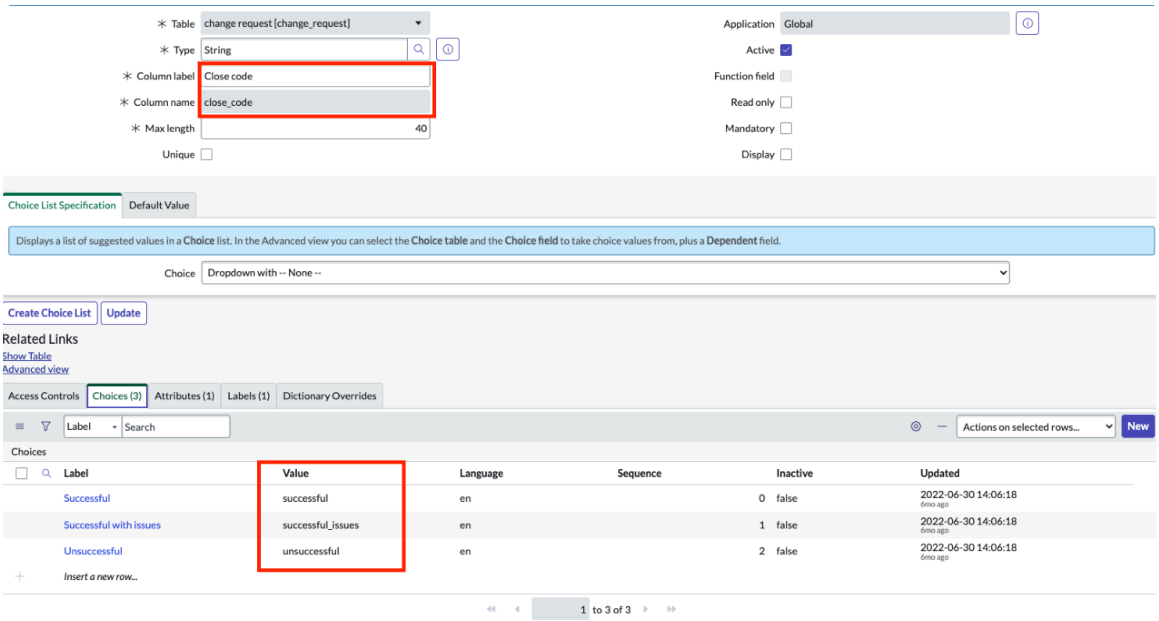
- 4 - Cancel (Value set in the sn_devops.change_request.cancel_state property)
- 3 - Closed (Value set in the sn_devops.change_request.closed_state property)

When you update a choice field, you must specify a valid choice value that is available in the corresponding choice list. For example, the choice list values for the **Close code** field are successful, successful_issues, and unsuccessful.




## Procedure

1. In the Azure DevOps console, navigate to **Organization** > **Pipelines** > **Jobs**.
2. Select the **Add Tasks** icon ( ), and search for the ServiceNow extensions in the **Add tasks** search bar.
3. Add the following extension tasks for get and update functions based on whether you are using a server or agent job.

| | |
|---|---|
| Get function | ○ ServiceNow DevOps Server Get Change<br>○ ServiceNow DevOps Agent Get Change |
| Update function | ○ ServiceNow DevOps Server Update Change<br>○ ServiceNow DevOps Agent Update Change |

4. In the task, update the following input parameters based on the function you are using.

| | |
|---|---|
| Get function | ○ Project Name<br>○ Pipeline Name<br>○ Stage Name<br>○ Job Name<br>○ Build ID |

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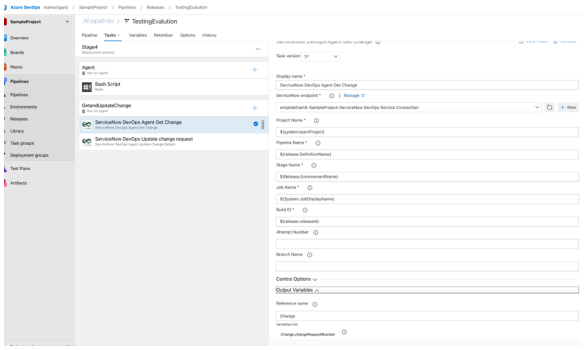
- Attempt Number
- Branch Name (only for multi-branch pipeline)

**Note:**
If you do not provide the change request details as input parameters, the change request number associated with the current pipeline and stage will be retrieved.

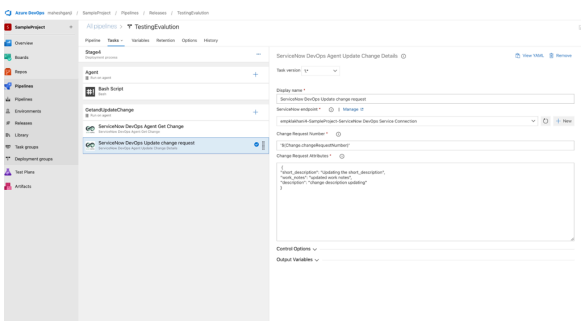
Enter a reference name for the get change request task, which will be used to reference the change request number in the update task. See the following example.



Update function

- Change request number whose details need to be updated.
- Change request attributes to be updated as Key:Value pairs.

```
{ "short_description": "Test description",
 "priority": "1", "start_date": "2021-02-05
 08:00:00",
"end_date": "2022-04-05 08:00:00",
 "justification": "test justification",
 "description": "test description",
"cab_required": <true/false>, "comments":
 "This update for work notes is from ADO
 file", "work_notes": "test work notes",
"assignment_group": "<SYS_ID>",
 "state":"<STATE_CODE>",
 "close_code":"<successful/successful_issues/u
nsuccessful>", "reason":"<As per Choice
 List>" }
```



The changeRequestNumber value must be referenced using the get task reference name in the "<task_name>.<changeRequestNumber>" format. See the following example.

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```
- stage: test
  jobs:
  - job: Job_Get
    steps:
    Settings
    - task: ServiceNow-DevOps-Agent-Get-Change@1
      inputs:
        connectedServiceName: 'emprpolanki8-SampleProject-ServiceNow DevOps Service Connection'
        projectName: 'SampleProject'
        pipelineName: 'TestingDefect'
        stageName: 'Prod'
        jobName: 'j2'
        buildNumber: '391'
        branchName: 'main'
      name: change2
    Settings
    - task: ServiceNow-DevOps-Agent-Update-Change@1
      inputs:
        connectedServiceName: 'emprpolanki8-SampleProject-ServiceNow DevOps Service Connection'
        changeRequestNumber: '$(change2.changeRequestNumber)'
        changeRequestDetails: |
          {
          "short_description": "Updating the short_description",
          "work_notes": "updated work notes",
          "description": "change description updating"
          }
```

```
    Settings
    - task: ServiceNow-DevOps-Server-Get-Change@1
      inputs:
        connectedServiceName: 'empkiranv01-Software Quality Scans-ServiceNow DevOps Service Con
        projectName: '$(system.teamProject)'
        pipelineName: '$(build.definitionName)'
        stageName: 'Deploy'
        jobName: 'd1'
        buildNumber: '$(build.buildId)'
        branchName: '$(Build.SourceBranchName)'
      name: ServerChange


- task: ServiceNow-DevOps-Server-Update-Change@1
  inputs:
    connectedServiceName: 'empklakhani4-SampleProject-ServiceNow DevOps Service Connection'
    changeRequestNumber: '$(ServerChange.changeRequestNumber)'
    changeRequestDetails: |
      {
      "short_description": "Testing from the pipeline2 ",
      "work_notes": "worknotes update from the pipeline2 ",
      "description": "description update from the pipeline file2"

      }
```

**Note:**
Attempt number is optional. If not specified, the latest CHG number from the current pipeline execution is retrieved. Otherwise, you can explicitly specify the attempt number without using any environment variables.

5. Save the changes.

### ServiceNow DevOps change request state in Azure DevOps pipeline logs

View the change request state and the corresponding policy conditions in the Azure DevOps pipeline console logs whenever the state of a change request is updated.

You can navigate to the console logs in your Azure DevOps pipeline to view the state of a change request when a change request is created or when the state of the change request is updated. The policy conditions associated with the change request state will also be evaluated and displayed in the logs. For example, if the DevOps Change Request Advanced Automation Policy is activated, the policy conditions will be evaluated and the corresponding decision made (auto-approve/auto-reject/manual-approval) will be displayed in the logs.

The following change request details are displayed:

- number
- details
- status
- sys_id
- type
- risk
- priority
- changeState
- plannedStartDate
- plannedEndDate
- changeRequestURL

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**Note:**
**changeState** is the state of the change request, and **status** is the status of the step execution.

The logs for policy conditions will be displayed for the base system change flows as follows:

- DevOps Model Change Policy: Only logs will be displayed on change creation and when the change state is updated.
- DevOps Change Request Minimal Automation Policy: Logs along with change decision and policy conditions corresponding to the change decision will be displayed.
- DevOps Change Request Advanced Automation Policy: Logs along with change decision and policy conditions corresponding to the change decision will be displayed.

The change policy input and decision conditions are stored in the Decisions [sys_decision_question] table. Logs will be displayed if the following fields and operators are used as input for policy conditions:

**Fields**

- code_coverage
- commits_without_work_item
- integration_tests_failed
- load_tests_failed
- regression_tests_failed
- num_of_outages_in_last_7_days
- num_of_current_outages
- num_of_open_incidents
- total_num_of_commits
- tests_passing_percent
- risk
- code_security
- commits

**Operators**

- <=
- >=

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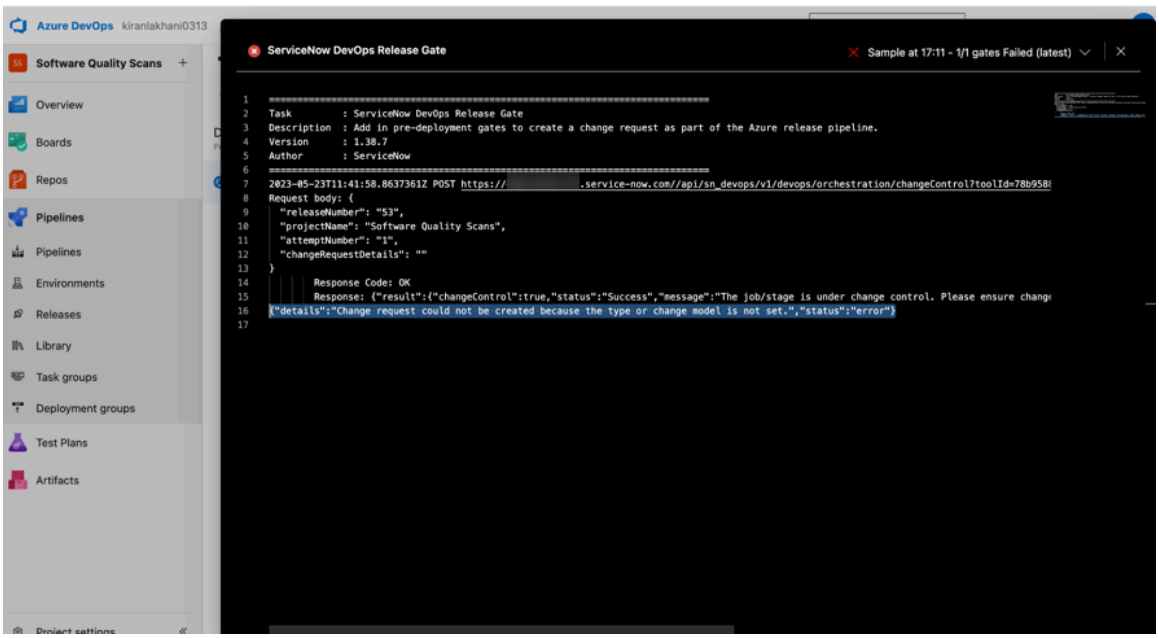
- !=
- =
- <
- >
- ISNOTEMPTY
- ISEMPTY
- BETWEEN
- ANYTHING
- NSAMEAS
- SAMEAS
- GT_FIELD
- LT_FIELD

**Note:**
If any field is modified in a change policy other than the base system fields, then those fields must be manually added to the flow for policy conditions to be evaluated.

If a change request does not get created due to any issue, then the reason for the failure and the state is also logged in the console.




**Note:**
For Azure DevOps, if change receipt is enabled, the very first log may not be displayed onto the console. That is, when the change is created and is in the New state.

### Configure and test webhooks

Manually configure webhooks in Azure DevOps and test them.

### Configure webhooks in Azure DevOps manually

Configure webhooks in Azure DevOps to send sync notifications to the DevOps Change Velocity application.

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## Before you begin

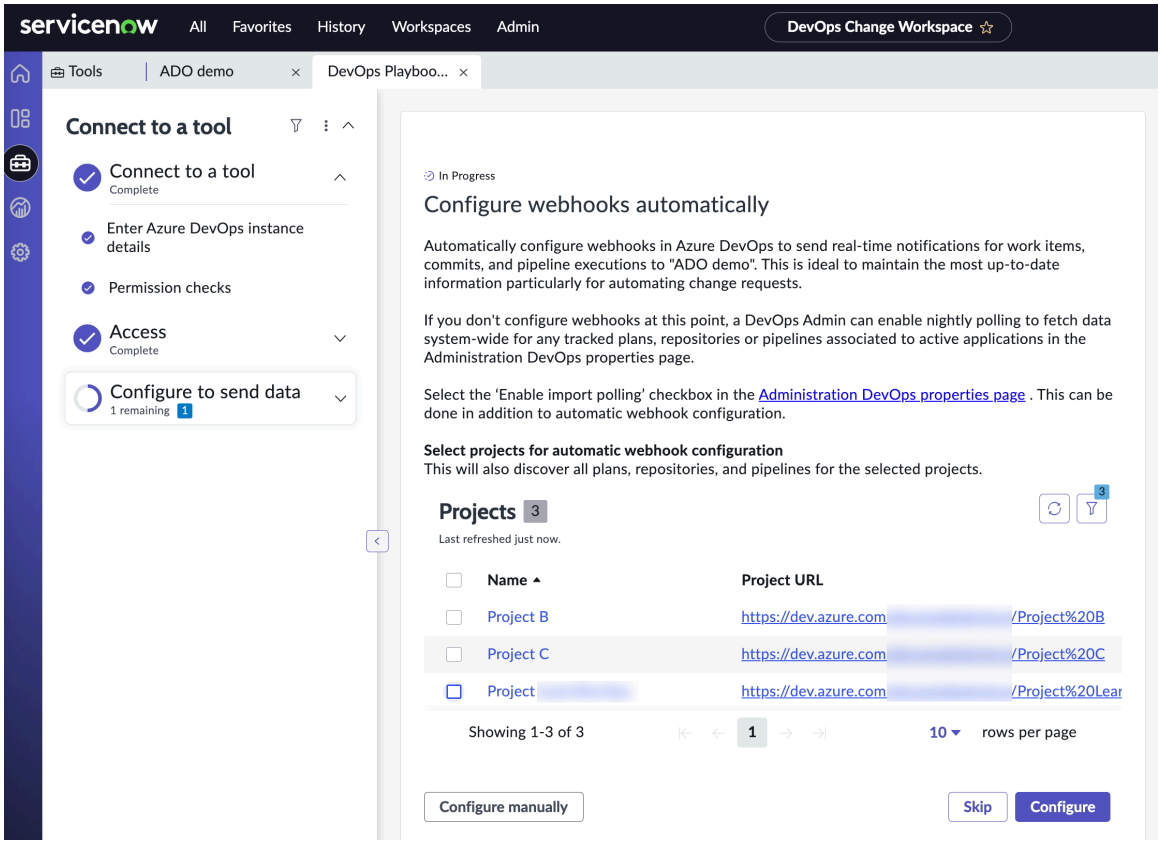
Role required: sn_devops.admin or sn_devops.tool_owner in DevOps Change Velocity, Azure DevOps admin

## About this task

You can also access manual configuration from the Azure DevOps tool record in DevOps Change Velocity.

## Procedure

1. In Azure DevOps, open the project for which you are configuring webhooks.
2. Navigate to **Settings** > **Service Hooks** and create a NEW SERVICE HOOKS SUBSCRIPTION, in Azure DevOps.
3. In DevOps Change Velocity, choose **Configure manually** when configuring the tool instance to send data.




4. In DevOps Change Velocity, copy the **Webhook URL** field from the ServiceNow instance connection details for Azure DevOps.

> **Note:**
> Select **Copy** in the appropriate field to copy the value to your clipboard. The field label changes to **Copied**, but you can copy multiple times.

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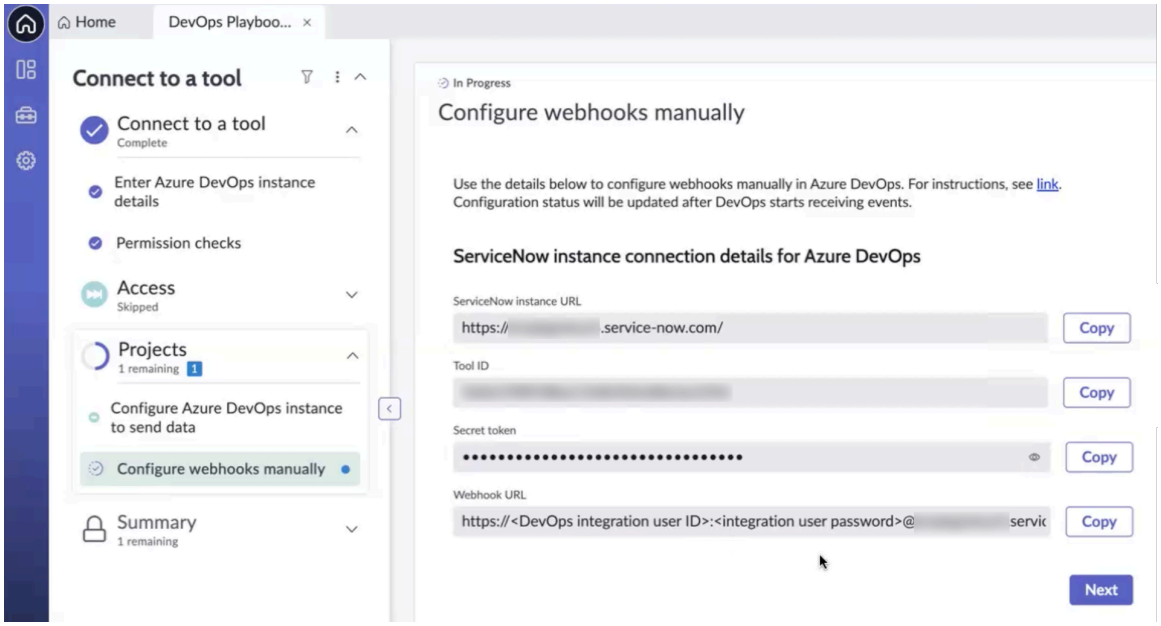


5. Modify the copied Webhook URL to reflect your tool details, and paste the URL in Azure DevOps.

   For example:

   ```
   https://myinstance.service-now.com/api/
   sn_devops/v2/devops/tool/{code | plan | artifact
   | orchestration | test | softwarequality }?
   toolId=23410545938c71d0db5bfe686cba1036&projectId=<project_sys_id>
   ```

   a. Select one of the tool capabilities `{code | plan | artifact | orchestration | test | softwarequality }` to match your tool.
   For example:

   ```
   https://myinstance.service-now.com/api/
   sn_devops/v2/devops/tool/orchestration?
   toolId=23410545938c71d0db5bfe686cba1036&projectId=<project_sys_id>
   ```

   b. Replace `<project_sys_id>` with your Azure DevOps project ID in ServiceNow (native_id column in the sn_devops_project table).

   c. Copy the modified URL to the **URL** field of the NEW SERVICE HOOKS SUBSCRIPTION in Azure DevOps.

6. In DevOps Change Velocity, copy the **Secret token** field from the ServiceNow instance connection details for Azure DevOps.
7. In Azure DevOps, in **Header** field of the NEW SERVICE HOOKS SUBSCRIPTION, paste the copied **Secret token** in the correct format.

   a. Use this format for the Azure DevOps **HTTP headers** field:
   `"token : <tokenValue>"`

   b. Replace `<tokenValue>`, with the copied **Secret token** from the ServiceNow instance connection details for Azure DevOps.

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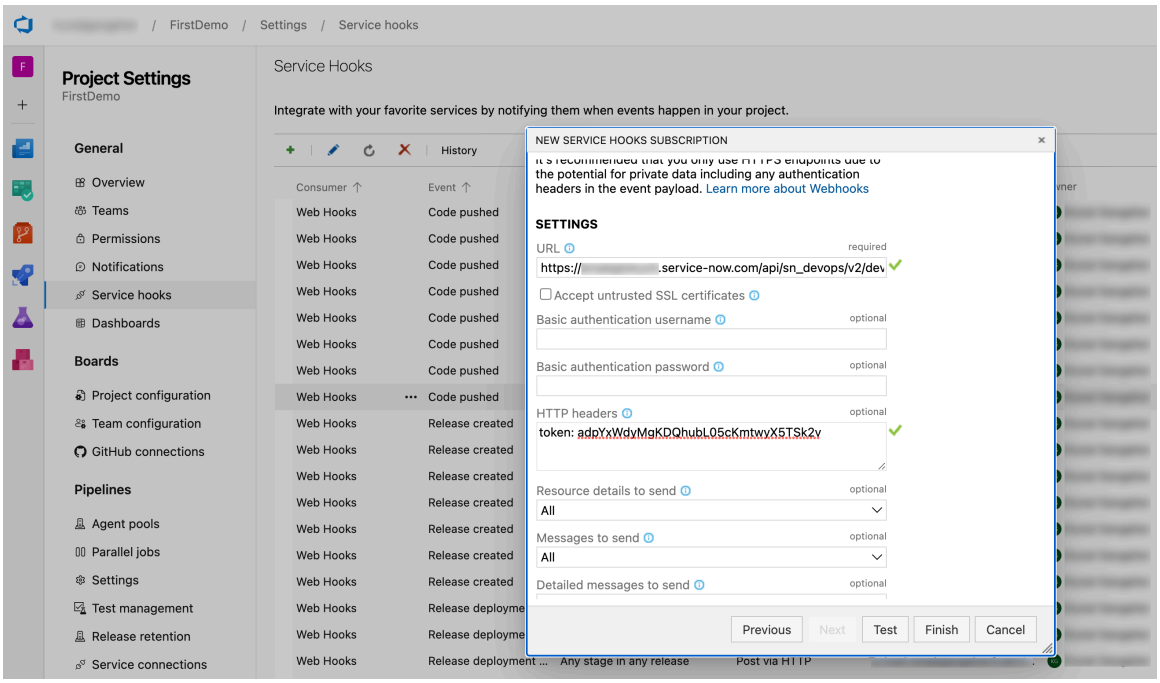
### Copy field values

| From DevOps Change Velocity field | To Azure DevOps field |
|---|---|
| Webhook URL (modified) | URL |
| Secret token | HTTP headers<br>In the format:<br>`token : <tokenValue>` |




## Test webhooks in Azure DevOps

You can manually test if webhooks are configured correctly directly from Azure DevOps for each project.

### Before you begin

Role required: Azure DevOps admin privileges

### Procedure

1. Navigate to Azure DevOps and select the project for which you want to test webhooks.
2. Navigate to **Project settings** > **Service hooks**.
   For each project, DevOps Change Velocity creates webhooks for these events:
   - Build completed
   - Code pushed
   - Release created
   - Release deployment completed
   - Run stage state changed
   - Work item created

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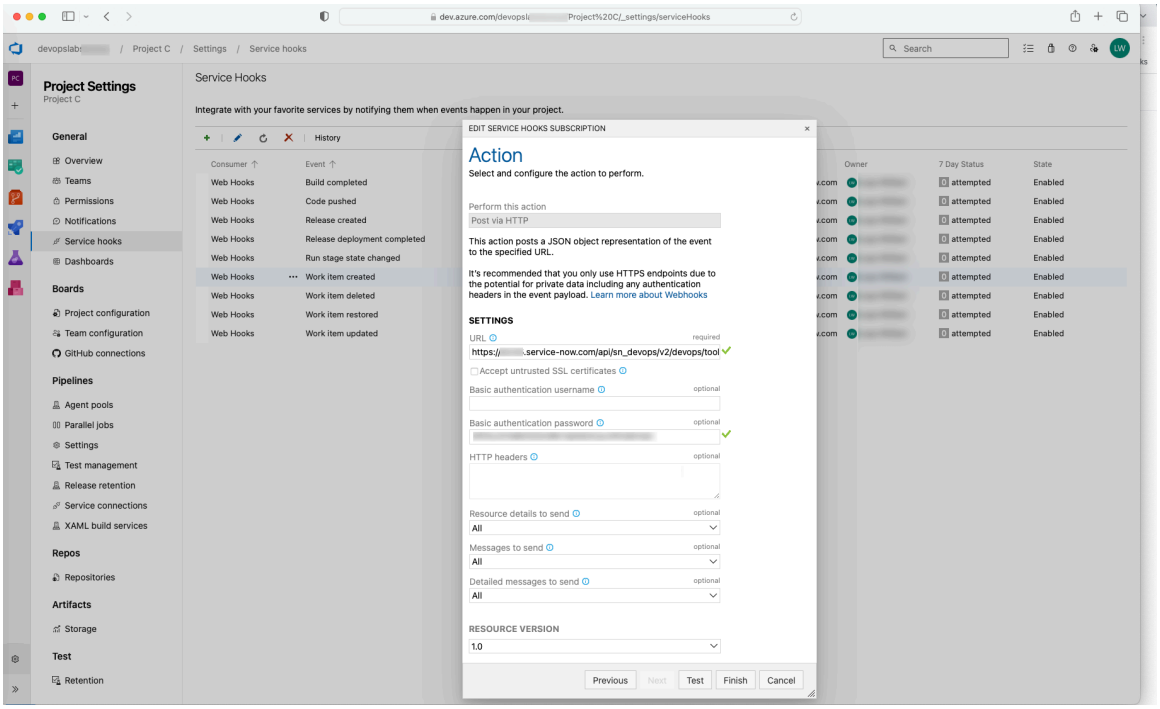
- Work item deleted
- Work item restored
- Work item updated

3. Select a webhook and select **Edit**.
4. Select **Next** to see the URL and authentication details.




5. To test the webhook, select **Test**.

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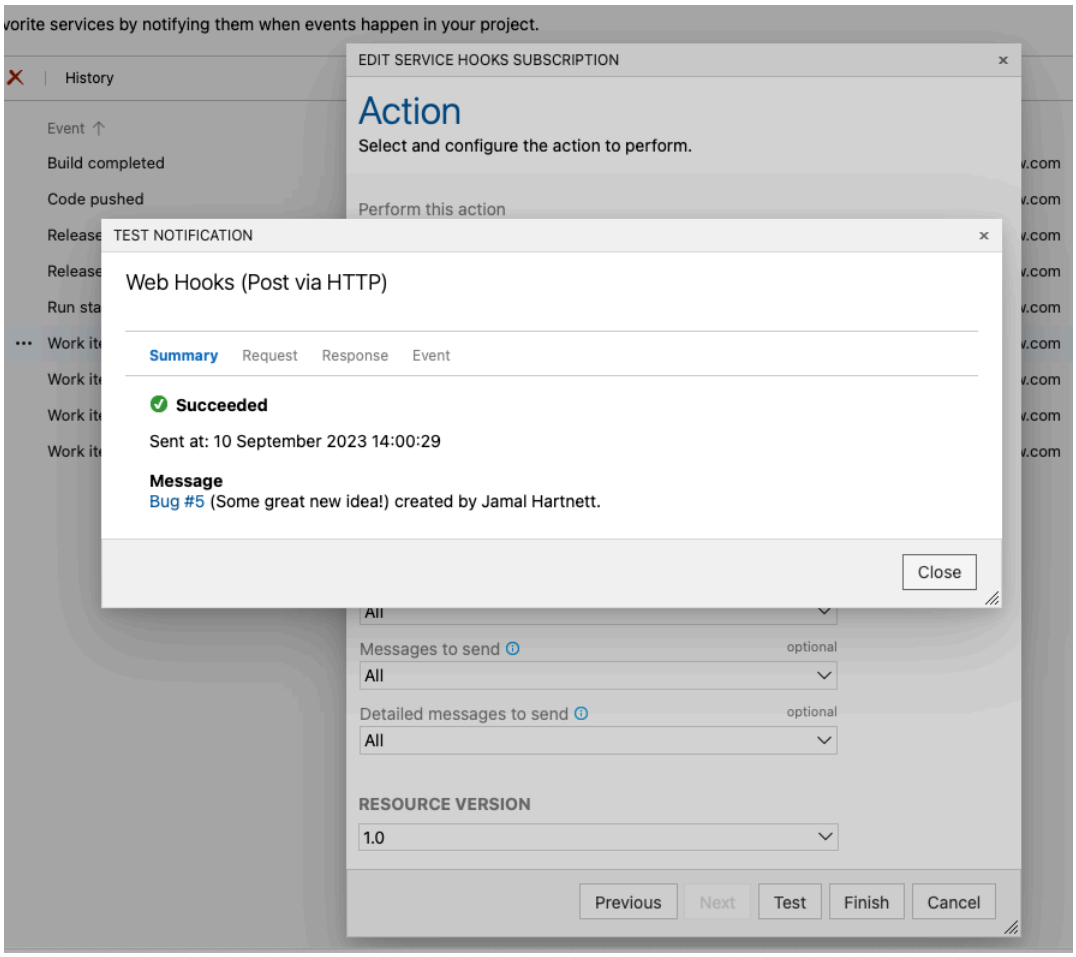
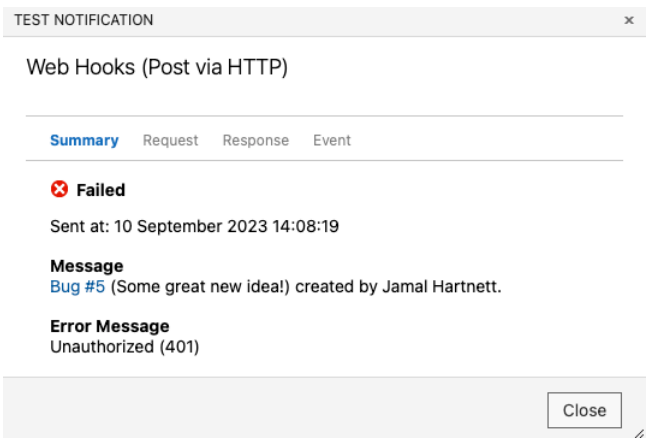
- If the webhook is configured correctly, you'll receive a **Succeeded** message.




- If the webhook is configured incorrectly, you'll receive a **Failed** message.




To fix a webhook, you can try the following options:

- Reconfigure the webhooks by selecting **Configure** from the project record page in DevOps Change Velocity. This will reconfigure all the existing webhooks for the project.
- Verify if the *`toolId`* and *`projectId`* are correct in the **URL** field. You can find the correct values in the tool record page in DevOps Change Velocity.

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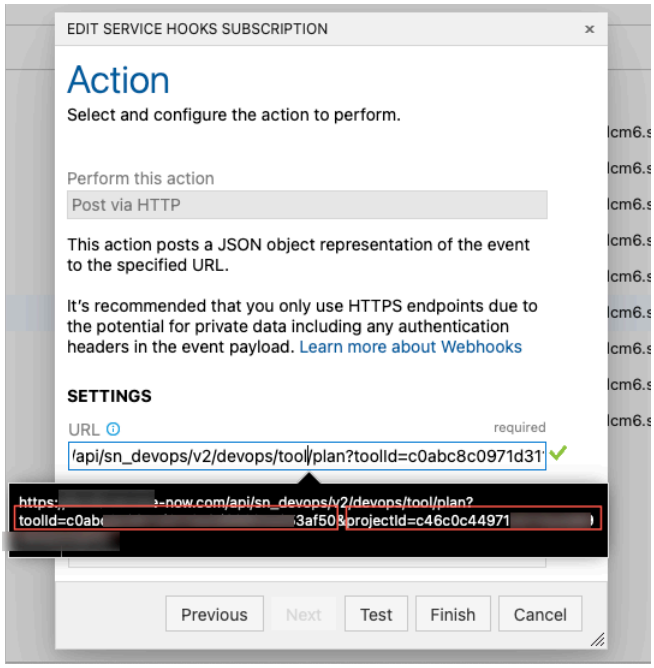
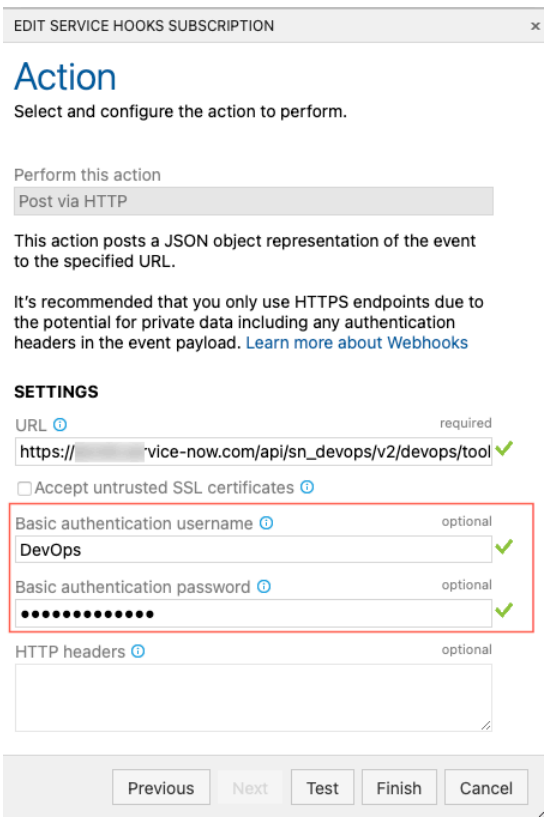



- If you're using the integration user credentials for authentication, check if the credentials are correct in the **Basic authentication** username and password fields.

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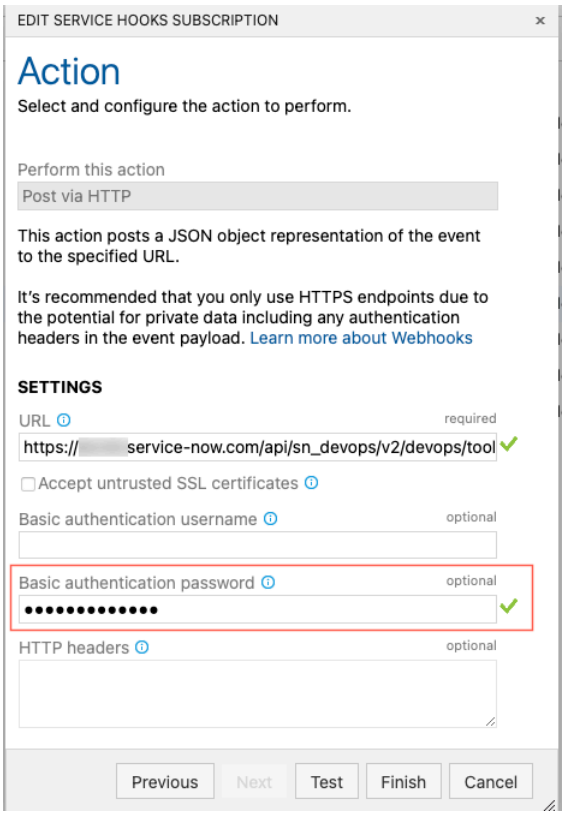
- If you're using the secret token for authentication, the token value is masked in the **Basic authentication password** field. You can replace the token in this field.




## GitHub integration with DevOps Change Velocity

Connect to your GitHub instance to discover repositories, plans, pipeline definitions and configure real-time notifications or polling to enable change traceability and automation.

## GitHub integration overview

DevOps Change Velocity supports Plan (Plans), Code (Repository) and Orchestration (Actions) capabilities for the GitHub tool.

Both GitHub and GitHub Enterprise are supported.

The following operations are performed as part of integrating GitHub:

- Connect: Discover repositories, plans, and pipeline definitions by connecting your GitHub instances to DevOps Change Velocity.
- Configure: Enable sending real-time notifications for commits, work items, and pipelines by automatically creating a Webhook (push, issues, and workflow_job) in GitHub so that this data can be used to create change policies.

Repositories under an organization can also be discovered and configured if you have the following base permissions for the organization (member privileges):

- Discover: Base permission of Read.
- Configure: Base permission of Admin.

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If Base permissions is specified as **No permission** for an organization, repositories under that organization can't be discovered even if they're public. The owner of an organization can either select all repositories or specific repositories for an organization and only the selected repositories are discovered. Even if a repository is public, it can't be discovered unless the owner selects it for an organization.

For repositories under an organization, you must not have the same repository configured in more than one tool on an instance. If the same repository is configured for multiple tools, then data is associated with a random tool as part of notifications events. If you want to configure the same repository in a different tool, you must delete the webhooks created from the first tool, untrack the repository under that tool, and then configure the same repository in the different tool.

## Authentication methods

You can connect to GitHub using one of the following authentication methods:

- Basic authentication

  If you connect your GitHub instance with basic auth, you can use the custom actions from the GitHub marketplace. GitHub environments aren't supported for basic auth connection.

- OAuth 2.0 credentials
  - If you connect your GitHub instance with OAuth 2.0 credentials for Authorization code, you can use the custom actions from the GitHub marketplace and create secrets to use in workflows. For more information, see OAuth 2.0 credentials for GitHub Apps - Authorization Code.
  - If you connect your GitHub instance with OAuth 2.0 credentials for GitHub Apps - JWT, you can use the custom actions from the GitHub marketplace, create secrets to use in workflows, and GitHub environments to deploy to an environment. For more information, see OAuth 2.0 credentials for GitHub Apps - JWT. For GitHub repositories under an organization, only one organization can be installed per tool (i.e - One GitHub App can be installed with One GitHub Org and with One GitHub tool). If you want to add more organizations, you can create separate tools and apps.

Custom actions by ServiceNow are available in GitHub Marketplace for the orchestration capability, to push information from Actions (workflows) and to pause or resume workflows from DevOps Change Velocity. For more information on custom actions, see ServiceNow DevOps custom actions from GitHub marketplace.

To capture the workflow data in DevOps Change Velocity, you must configure Secrets in your GitHub tool. For more information, see GitHub Actions configurations.

There are a few limitations for GitHub Actions support, see GitHub Actions configurations.

## Get started

Use one of the following options to onboard GitHub. For a guided experience, use the workspace to onboard a tool. Alternatively, you can use the Service Catalog or Classic experience.

### Onboard GitHub to DevOps Change Velocity — Workspace

Connect to your GitHub instance using the DevOps Change Workspace playbook to discover, configure, and import repositories, plans, and pipelines.

#### Before you begin

Complete the tasks specified in the Getting started with DevOps Change Velocity topic.

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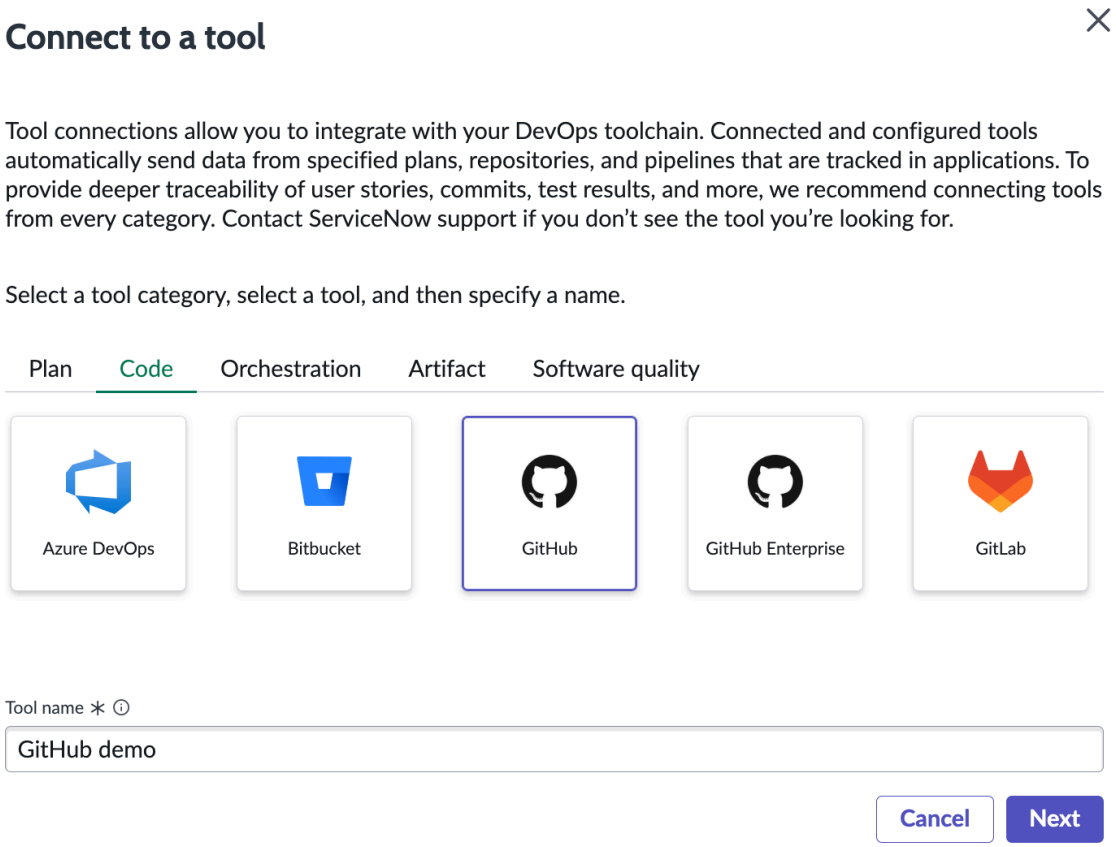
Role required: sn_devops.admin or sn_devops.tool_owner

### Procedure

1. Navigate to **Workspaces** > **DevOps Change Workspace** and use one of the following options to open the Playbook to onboard GitHub.

   **Important:**
   If you want to discover and track tool objects like pipelines, plans, or repositories while connecting to the tool, you must connect your tool from the Application module.

2. In the **Tool name** field, enter a name for the tool.




3. Select **Next**.

   The DevOps playbook opens to help you complete the onboarding tasks.

4. Complete the connection and configuration using the playbook.

   a. In the **Credential type** field, select one of the following credential type.
      - Basic Auth
      - OAuth 2.0 with Authorization Code
      - OAuth 2.0 with JSON Web Token (JWT)

   b. Enter the credentials.

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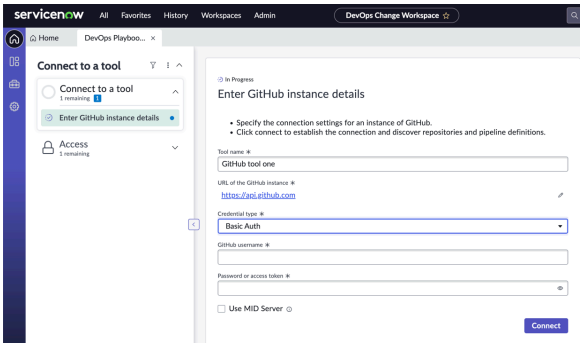
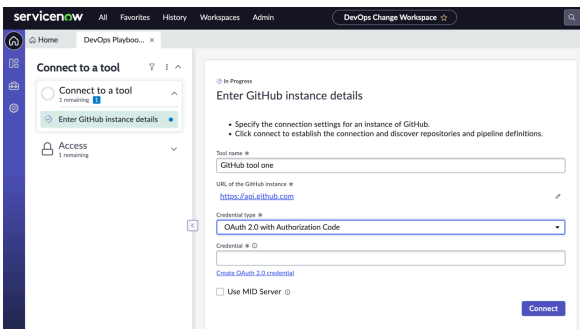
| | |
|---|---|
| **Basic Auth** | Enter the username and password/access token of your GitHub instance.<br>  |
| **OAuth 2.0 with Authorization Code** | Select an existing OAuth 2.0 with Authorization Code credential record or create an OAuth 2.0 with Authorization Code credential record. For more information, see Create a credential record for GitHub App provider (Authorization Code).<br>  <br>**Note:**<br>If you are connecting using a GitHub App and are experiencing issues with the permissions check, ensure that your GitHub App's Client ID prefix is available in the DevOps property: **Client ID specifier for GitHub App**. For more information, see Add Client ID to DevOps property. |
| **OAuth 2.0 with JSON Web Token (JWT)** | To connect using OAuth 2.0 with a JWT, you must first perform the following:<br>▪ Create and configure a GitHub App<br>▪ Generate the Java KeyStore certificate for GitHub<br>▪ Attach the GitHub Java KeyStore certificate to your instance<br>After completing the prerequisites, you can continue with the DevOps Change Velocity Connect playbook activity:<br>i. Select the **Use an existing JWT credential record** option if you want to use an already existing JWT credential record. If this option is not selected, the fields to create a new JWT credential record are displayed. Proceed to the next step.<br>ii. In the **JKS certificate** field, select an existing JKS certificate. This is the name you entered to uniquely identify the JWT provider. |

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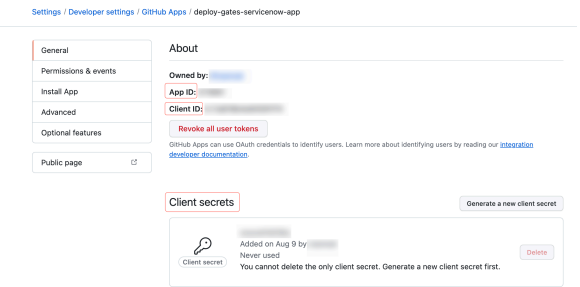
JKS certificates are created using shell commands to create a sys_certificate record.

For more information, see Create a JWT signing key for the GitHub JKS certificate.

iii. In the **Signing key** field, enter the signing key to be assigned to your JKS certificate. This is the export password entered while generating the JKS certificate.

iv. In the **GitHub App ID** field, select the app ID of your GitHub App (available in the About section of your GitHub App configuration in GitHub). The following image displays an example of the About section of a GitHub App configuration from where you can access the GitHub App ID, Client ID, and Client secret.




v. In the **Client ID** field, select the client ID of your GitHub App (available in the About section of your GitHub App configuration in GitHub).

vi. In the **Client secret** field, select the client secret of your GitHub App (available in the About section of your GitHub App configuration in GitHub).

vii. In the **Token URL** field, select the location of the token endpoint that the instance uses to retrieve and refresh tokens.

For cloud version, enter: `https://api.github.com/app/installations/<installation_id>/access_tokens`.

For enterprise version, enter: `https://<HOST_URL>/api/v3/app/installations/<installation_id>/access_tokens`.

For the installation id, go to Install App section in your GitHub App configuration in GitHub and select the gear icon to configure your

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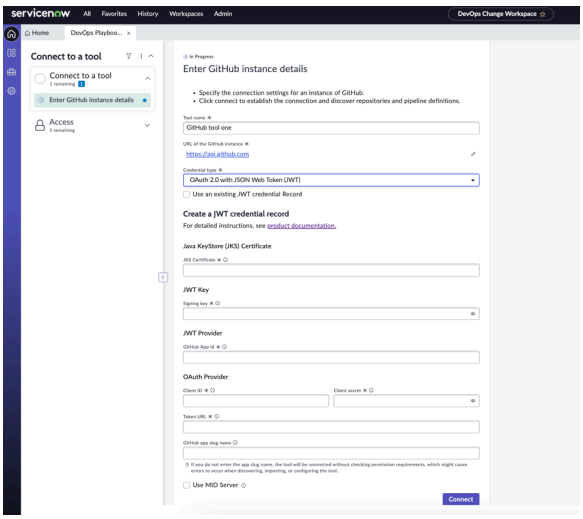
app. The installation id will be in the webpage URL. For example, https://github.com/settings/installations/<installation_id>.




If the OAuth credential is created using GitHub Apps - JWT, the **Configure with GitHub App** option will be available on the tool record page.

> **Note:**
> If you are connecting using a GitHub App and are experiencing issues with the permissions check, ensure that your GitHub App's Client ID prefix is available in the DevOps property: **Client ID specifier for GitHub App**. For more information, see Add Client ID to DevOps property.

For more information on OAuth2.0 credentials, see Setting up GitHub OAuth 2.0 credentials for DevOps Change Velocity.

c. **Optional:** Enter a value in the **GitHub app slug name** field to check the permission requirements of the tool before connecting if you have created your Oauth 2.0 credentials using GitHub Apps.
You can find the app slug name on the settings page of your app.

d. **Optional:** If your GitHub instance is attached to a MID Server, select the **MID Server** option and enter its details.

(Optional) For more information about MID server, see MID Server selection.

> **Note:**
> For GitHub Enterprise Server (on-premises instance), OAuth is not supported if you are connecting using a MID server.

e. Select **Connect**.

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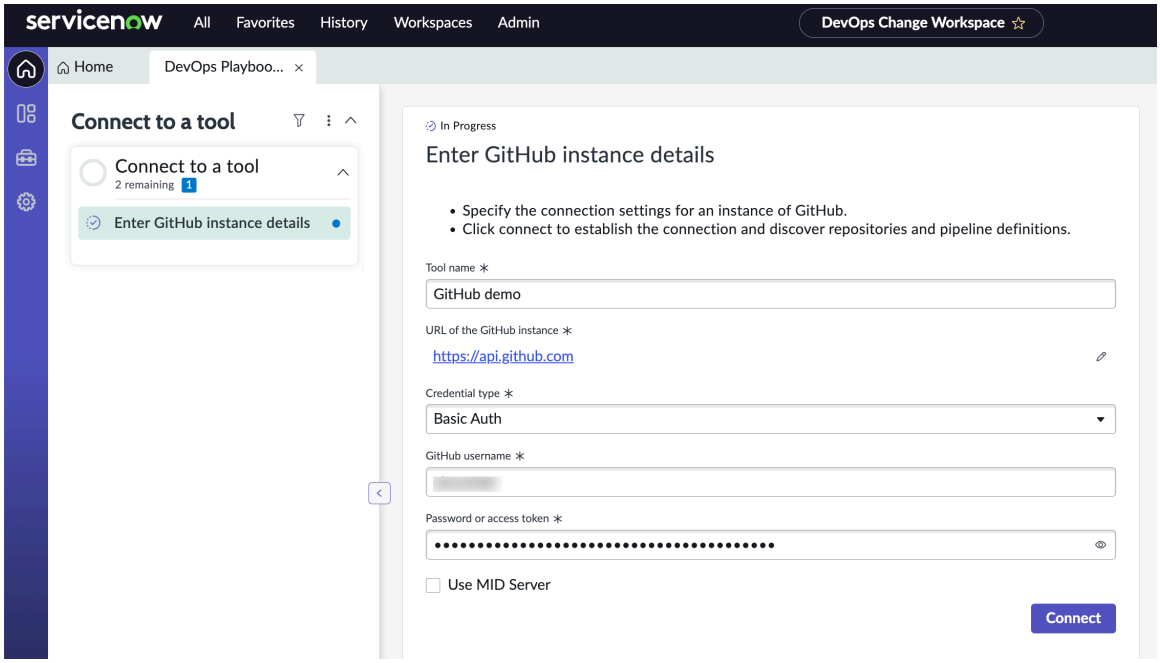


**f.** Permission checks are run on the credentials that you entered.

Permissions required and permissions that are available are displayed. If you want to enter credentials with better permissions, select **Re-enter credentials**. For detailed information on all the required permissions, see GitHub permissions in Permissions required for DevOps tools.

For OAuth 2.0, if you haven't entered the GitHub app slug name, the tool is connected without checking permission requirements.

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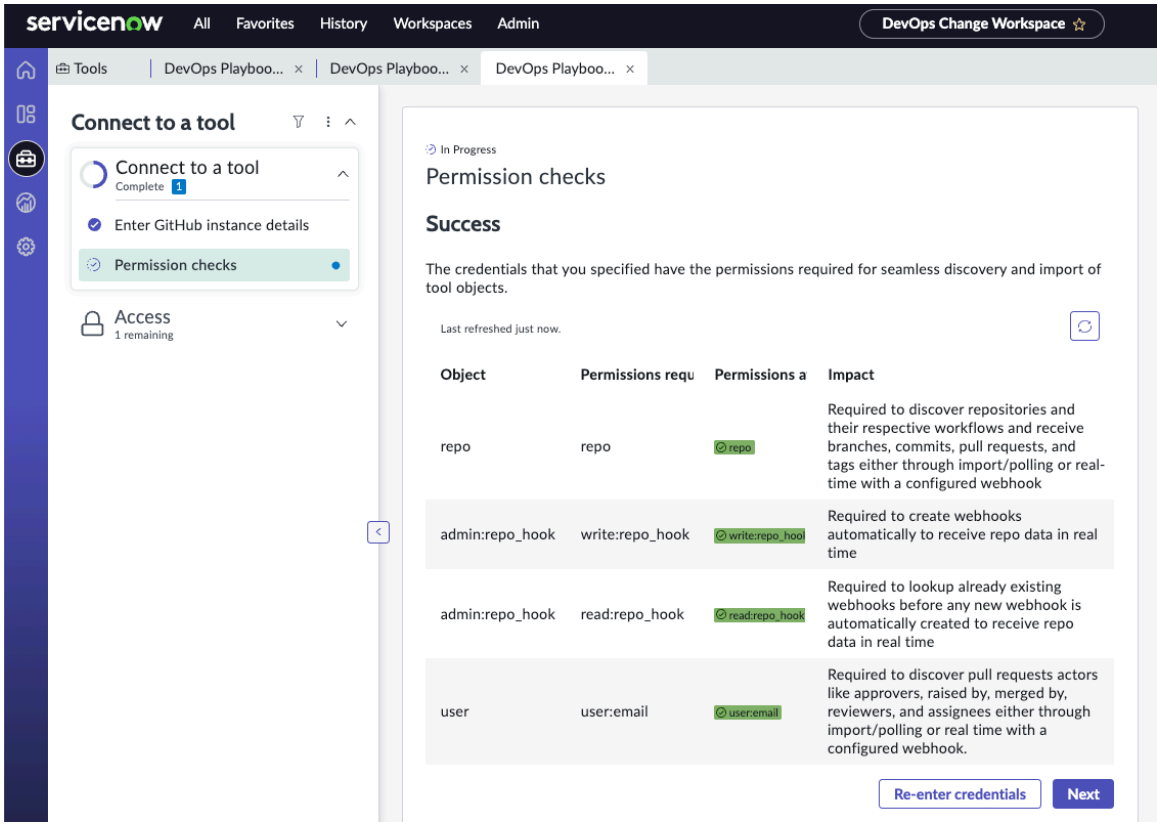
g. Select **Next**.




5. Specify the access for the tool.

   a. If you want to control access to the tool, add the groups that must be given access to the tool in the **Maintained by** field.

      The tasks these users in the groups can perform depends on the role assigned to them.

      - DevOps Tool Owner role: Can view and edit the tool.
      - DevOps App Owner role: Can view the tool and can associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects (such as plans, repositories, and pipelines).
      - DevOps Administrator role: Can edit all tools.
      - Other DevOps roles: Can view the tool.

      **Note:**
      If you don't select a group and skip this step, all users with the DevOps Tool Owner role will be able to edit the tool.

   b. If you choose to control access to the tool, the **All App Owners can view and associate tool objects to applications** option becomes available for selection.

      This option enables all users having the DevOps App Owner role to access the tool. If selected, they'll be able to view, associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects.

   c. Select **Assign**.

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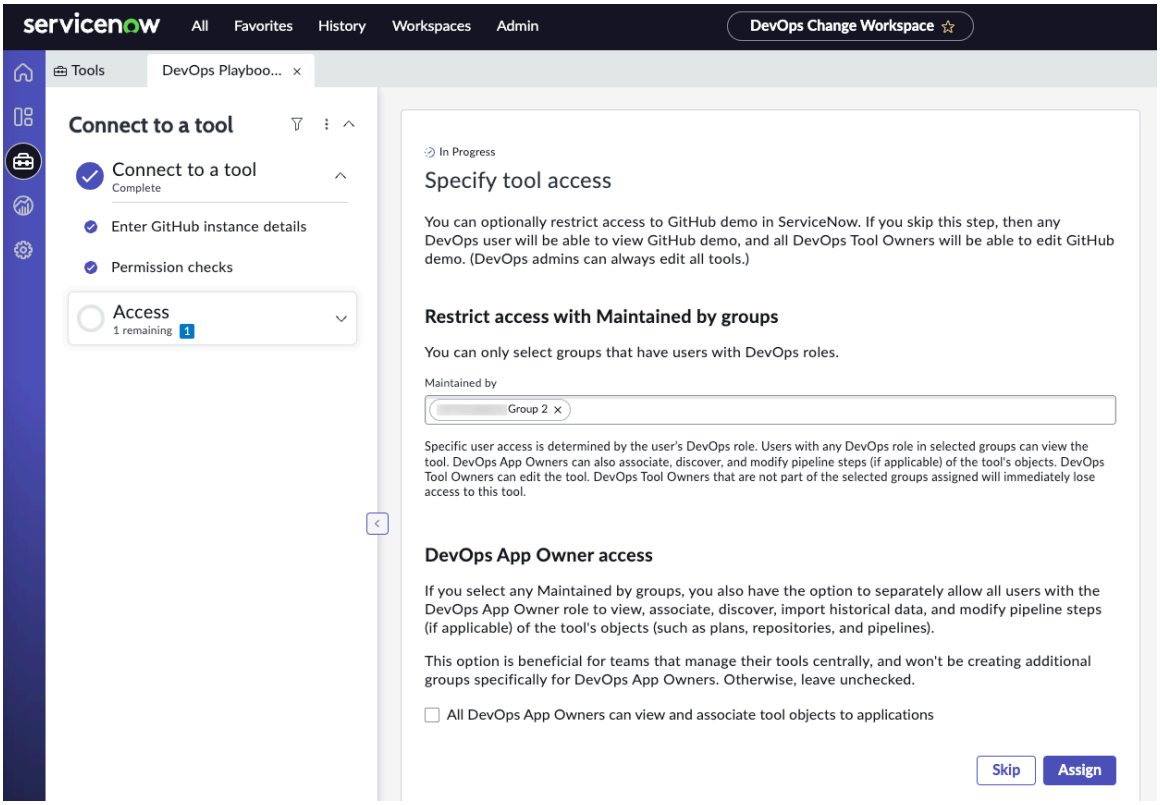


6. Configure webhooks automatically in your GitHub instance to send data to DevOps Change Velocity.

   This action configures the following webhooks:

   - *`push`*: To gather repository commits, branches, and tags
   - *`workflow_job`*: To gather pipeline data
   - *`issues`*: To gather issues (work item) data

   **Note:**
   Completing the configuration as part of this task is recommended as real-time notifications are ideal to maintain current information, particularly for automating change requests. Otherwise, you can set up the webhook by configuring it manually later by enabling nightly polling to fetch data system for any tracked repositories or pipelines by setting the *`Enable Polling`* property to **Yes**.

   Select the repositories for which you want to configure webhooks and select **Configure**.

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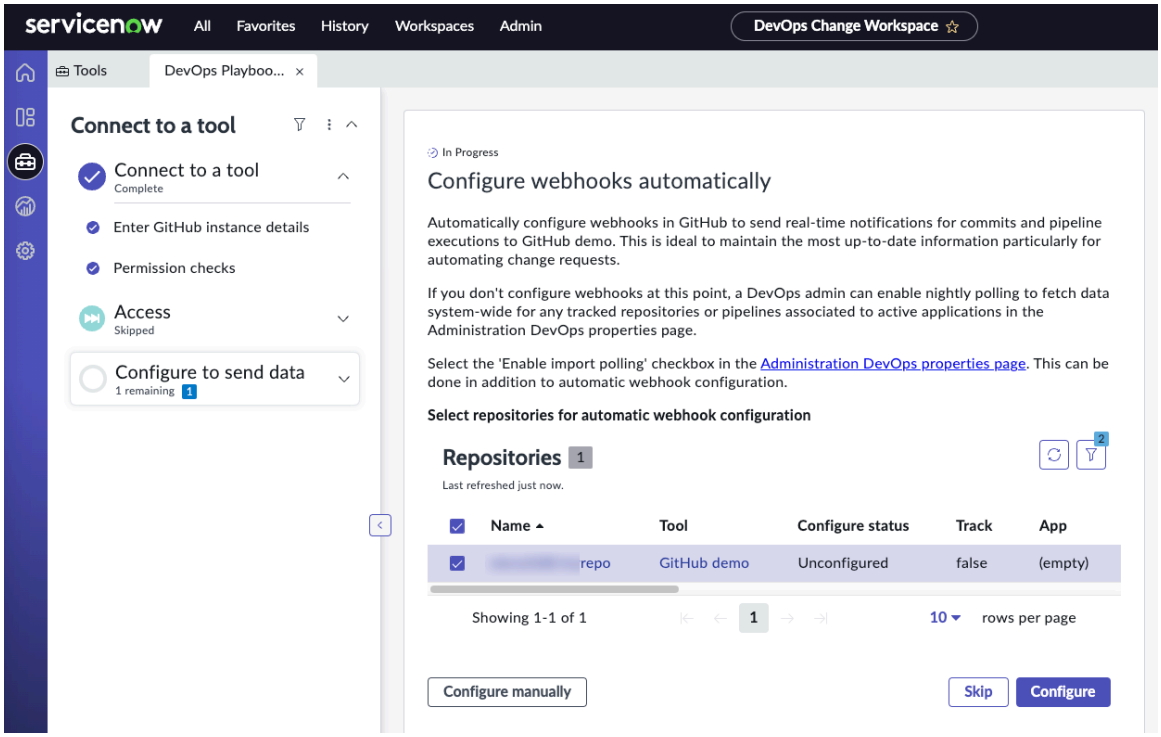


To configure manually, select **Configure manually**. See Configure webhooks in GitHub manually for more information.

**Important:**

- If you're connecting from the Home page or Tools module, the connection is complete and you're taken to the Summary page.
- If you're connecting from the Applications module, then repositories and pipelines available are discovered. You can track and import historical data from them.

7. Select the plans to track.

   a. Select the plans for which you want to track updates and associate to the application.

      After the tool onboarding is complete, the work items only for these selected plans are automatically imported.

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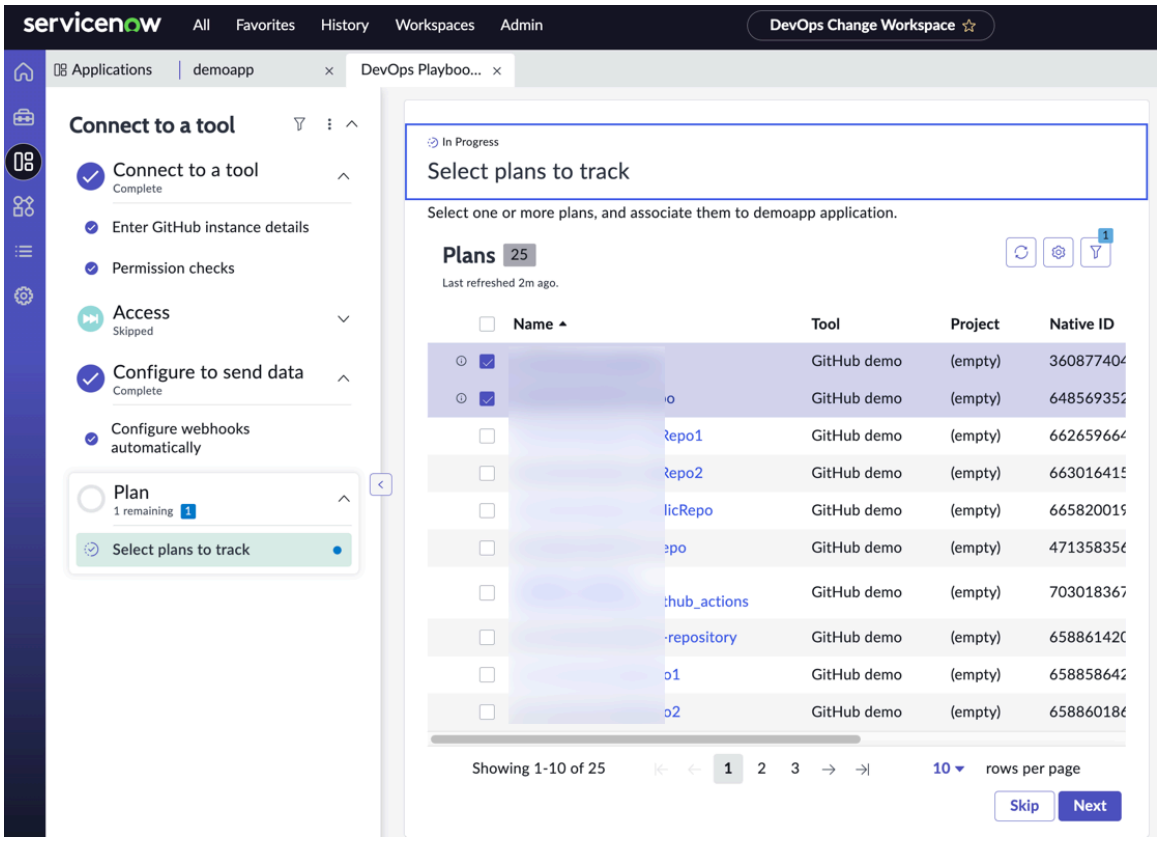
**b.** Select **Next**.




**8.** Select the repositories to track.

**a.** Select the repositories for which you want to track updates and associate to the application.

**b.** Select **Next**.

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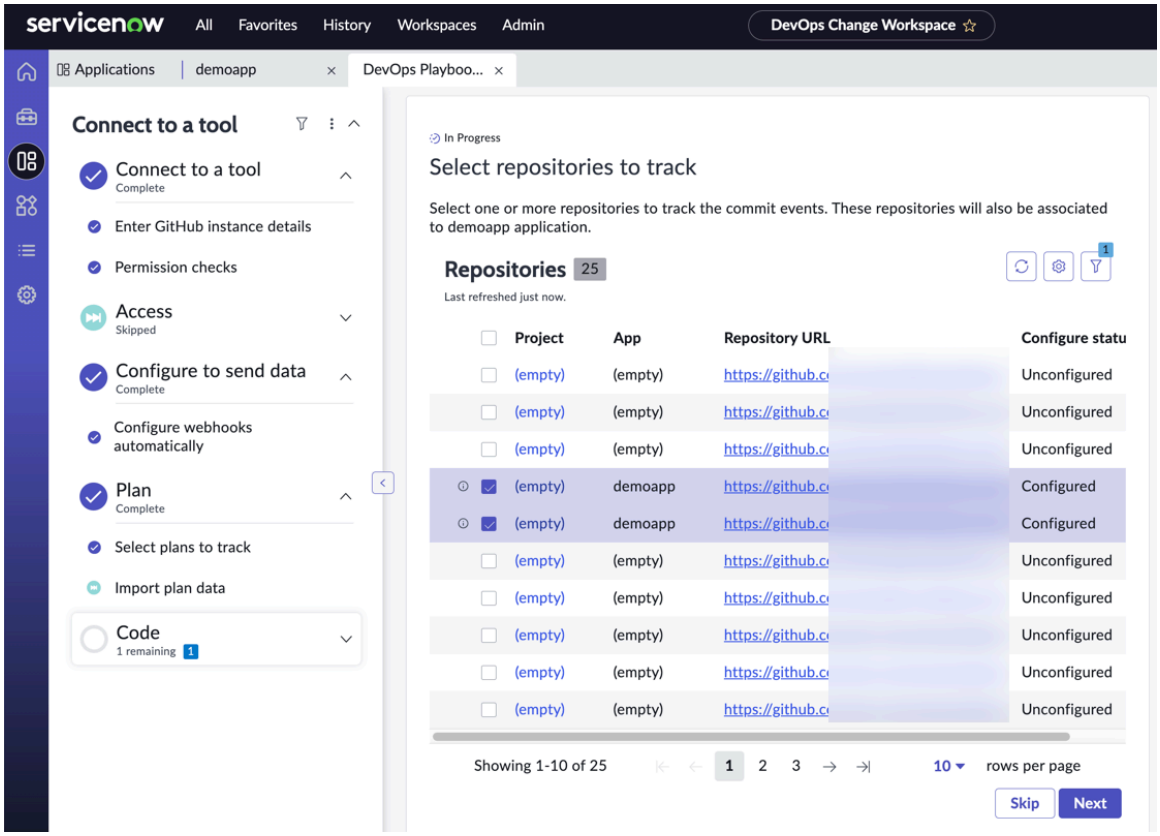


**c.** If you want to import repository data, select the date range and select **Submit**.

You can import up to 90 days of data. Workflows associated with the repositories will also be imported.

**9.** Select the pipelines to track.

**a.** Select the pipelines for which you want to track updates and associate to the application.

**b.** Select **Next**.

**c.** For each selected pipeline, all steps or stages are imported for the last successful execution. In the Assign services to pipeline steps activity, you can select the following for each pipeline step:

**i. Pipeline step type**: Select a step type for which you want to assign a service.

**Tip:**
Specify at least the *`Prod deploy`* step type for steps that represents the production deployment to enable DevOps to identify successful pipeline executions as production deployments.

**ii. Service**: Select the CMDB application service that the pipeline step maps to.

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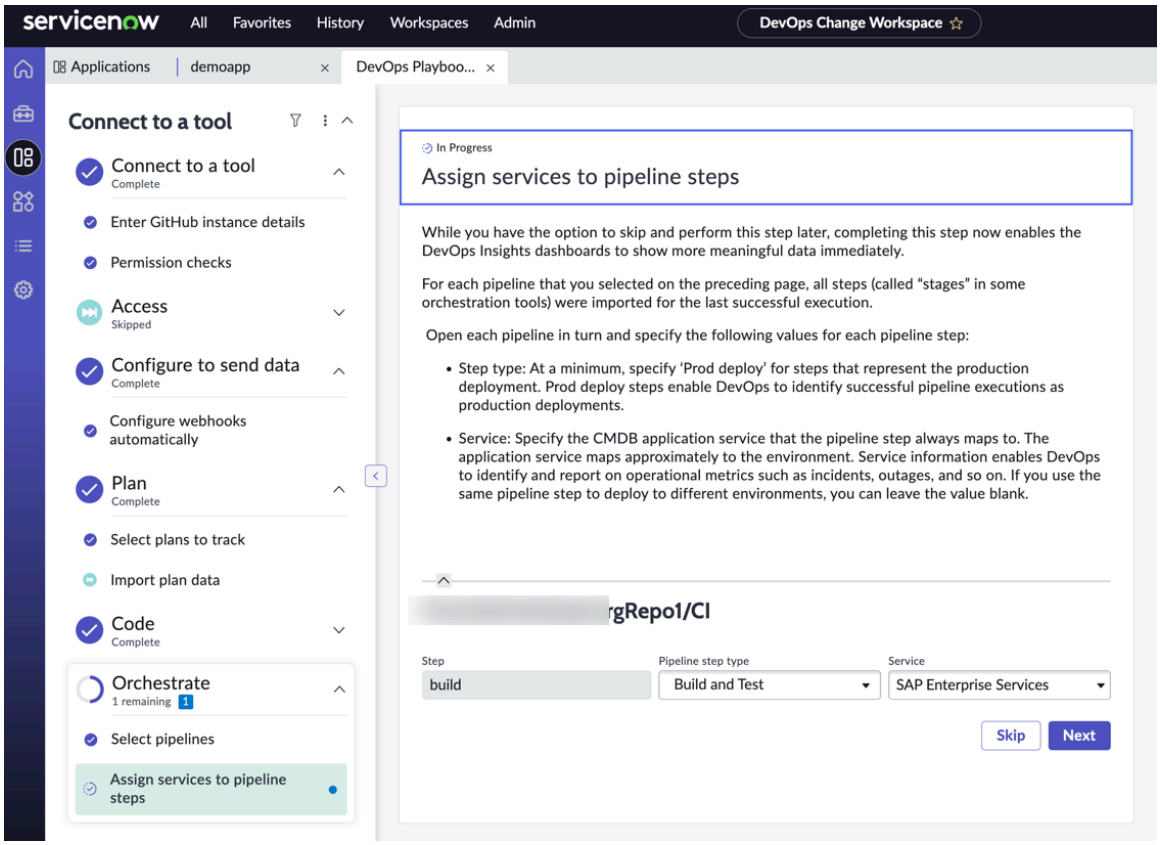
Application service maps approximately to the environment. If you use the same pipeline step to deploy to different environments, leave the field empty. Service information enables DevOps to identify and report on operational metrics such as incidents, outages, and so on.

**d.** Select **Next**.




**10.** From the **Summary** page, select **View tool record** to review the details of the connected GitHub tool.

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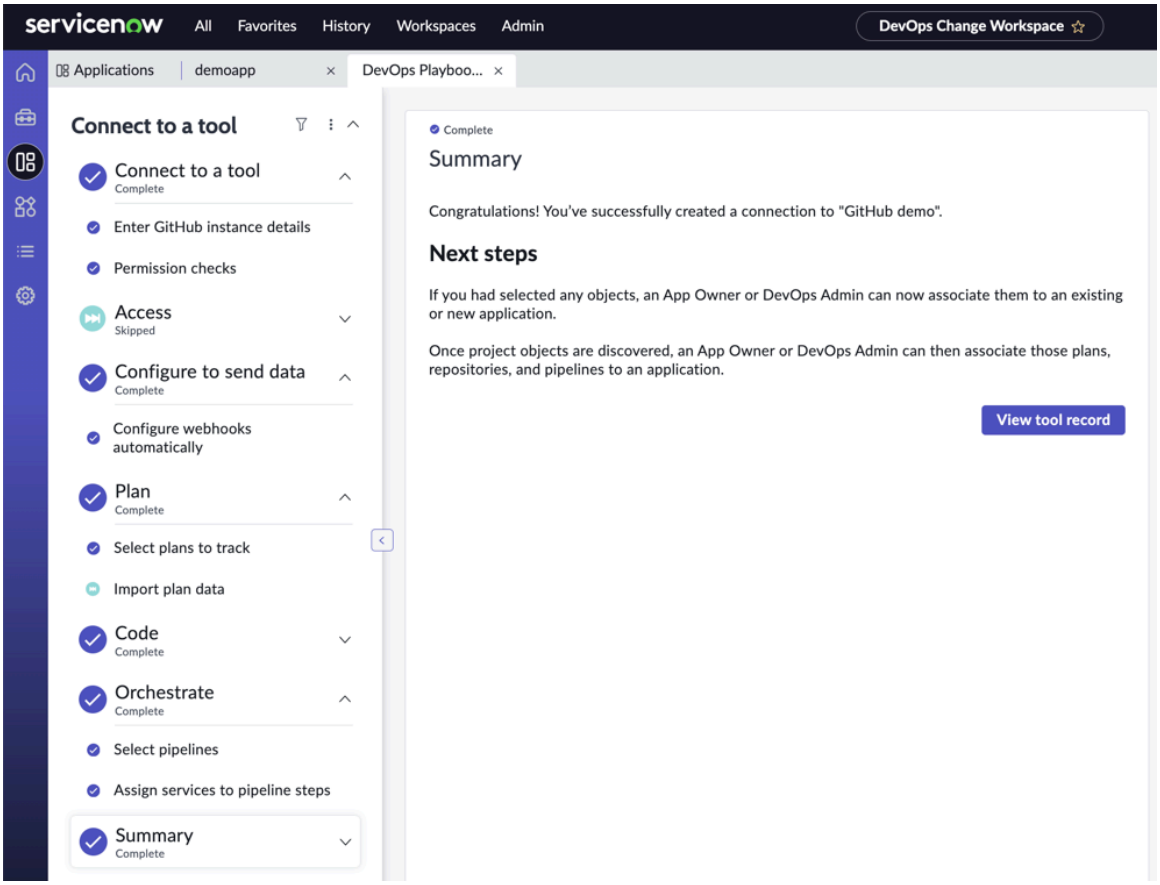


For GitHub Actions pipelines, you must perform some additional steps like creating secrets, defining the workflow configuration in GitHub, and so on. For more information, see GitHub Actions configurations.

### Result

You've successfully onboarded your GitHub tool to DevOps Change Velocity.

### What to do next

You can manually discover plans after your GitHub tool is onboarded as well. As there is no plan entity in GitHub, the repositories will be considered to discover corresponding plan records in ServiceNow.

1. From the tool record page, select **Discover** to discover plans.
2. Select **Configure**. Plans are tracked and a webhook called *issues* is created to send real-time notifications for work items.

The following information is updated for a work item in ServiceNow when the corresponding issue is updated in GitHub.

- Change in issue title
- Assignees update
- Transfer issue

**Note:**
When an issue is transferred, the same will be marked as transferred in the repository from which it is being transferred and opened in the repository to which it is being transferred.

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- Delete issue

> **Note:**
> When an issue is deleted in GitHub, the corresponding work item is not deleted in ServiceNow but the state of the work item will be marked as deleted.

If you are an upgrading customer, plans will be discovered for your repositories through the scheduled job to discover periodically or through manual discovery. After your plans are discovered, you can enable the *sn_devops.track.github.issues* property to re-configure all the previously configured repositories at once so that all plans are tracked and the issues webhook is created for work items.

> **Note:**
> Historical import of plans is not supported.

**Related topics**

Configure webhooks from the tool record

### Onboard GitHub to DevOps Change Velocity — Service Catalog

Create, connect, discover, and configure your GitHub instance using the ServiceNow Service Catalog.

**Before you begin**
Role required: sn_devops.admin or sn_devops.tool_owner

**Procedure**

1. Navigate to **All** > **Service Catalog** > **Catalog Definitions** > **Maintain Items** and search for DevOps.

   > **Note:**
   > You can also access the service catalog from Employee Center or Service portal.

2. From the DevOps catalog items, select and activate **DevOps App Onboarding** and **DevOps Tool Onboarding**.
3. After activating, select **DevOps Tool Onboarding** and select **Try it**.
4. In the DevOps Tool Onboarding form, enter the tool details:

| Field | Description |
|---|---|
| Tool name | Name for your GitHub integration. |
| Tool integration | Select GitHub or GitHub Enterprise. |
| Tool URL | Enter https://api.github.com. |
| Credential type | Select Basic Auth or OAuth, depending on the credentials you're using.<br>○ For Basic Auth, enter the username and password or access token.<br>○ For OAuth, enter the credentials. |
| Use MidServer | Optional. Select#MID Server#for an on-premises tool that is attached to a#MID |

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| Field | Description |
| --- | --- |
| | Server. Application is automatically set to #DevOps and capability is set to REST.<br><br>**Note:**<br>For GitHub Enterprise Server (on-premises instance), OAuth is not supported if you are connecting using a MID server. |

For a list of all the permissions required on the credentials for connecting to GitHub, see GitHub permissions in Permissions required for DevOps tools.

5. Select **Order Now**.
   A request is created. When the request is approved, the tool is created, connected, and discovered.
6. From the DevOps catalog items, select **DevOps App Onboarding**.
7. In the DevOps App Onboarding form, enter the details:

| | |
| --- | --- |
| Are you creating a new app or adding to an existing one? | Select from the options whether to create a new app or use an existing app. |
| App | Enter the name for the app that you're creating or using. |
| Onboarding pipelines | Leave empty. |
| Onboarding repositories | Enter the connected GitHub tool name. |
| Repositories | Select the repositories for which you want to configure webhooks and import historical data.<br><br>**Note:**<br>Workflows associated with the repositories will also be imported. |
| Import from and Import to | Select the dates for which you want to import the data. By default, the last 30 days are selected. You can choose to import data for a maximum of 90 days. |
| Do you wish to configure webhook for the tool? | Select the check box if you want to configure webhooks for the selected repositories. |
| Onboarding plans | Leave empty. |

8. Select **Order Now**.
   A request is created. When the request is approved, the repository and pipeline objects are associated to the app record and webhooks are configured for real-time tracking. Historical data is imported for the selected repositories and the associated workflows. The **Track** field is automatically enabled for imported repositories and pipelines. For repositories the **Track file changes** is also automatically enabled.

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### Onboard GitHub to DevOps Change Velocity — Classic

Connect your GitHub instance to discover, configure, and import repositories, plans, and pipelines.

## Before you begin

Role required: sn_devops.admin or sn_devops.tool_owner

Complete the steps specified in the Getting started section before connecting to a tool.

## About this task

- **Connect** to GitHub and get the webhook URL when you submit a DevOps tool record.
- **Discover** repositories and plans.
- **Configure** the webhook in the GitHub repository.
- **Import** branch and commit records.

## Procedure

1. Enter the GitHub instance details to connect to DevOps Change Velocity by navigating to **All** > **DevOps** > **Tools** > **Create New (legacy)**.
2. Enter a value in the **Tool Name** field and fill in the tool details.

**Create DevOps Tool form**

| Field | Description |
|---|---|
| Tool integration | Tool to integrate. In this case, select **GitHub**. |
| Tool URL | URL of the existing GitHub instance to integrate. For e.g, https://api.github.com |
| GitHub credential type | ○ Basic Auth<br>▪ GitHub username<br>▪ Personal access token (classic)<br>Only a personal access token (classic) is supported with basic authentication. When you generate a personal access token (classic) for GitHub, you must specify the scopes to authorize if you are not granting complete access. The minimum scopes that you must select for authorization are repo, admin:repo_hook, and user:email.<br>○ OAuth<br>GitHub Tool Credential. See Setting up GitHub OAuth 2.0 credentials for DevOps Change Velocity. |

For a list of all the permissions required on the credentials for connecting to GitHub, see GitHub permissions in Permissions required for DevOps tools.

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3. **Optional:** Select **MID Server** for an on-premises tool that is attached to a MID Server.

   (Optional) Application is automatically set to DevOps and capability is set to REST.

   **Note:**
   For GitHub Enterprise Server (on-premises instance), OAuth is not supported if you are connecting using a MID server.

4. Select **Submit**.

On successful tool creation, you are taken to the tool record page.

5. If you want to control access to the tool, add the groups that must be given access to the tool in the **Maintained by** field on the **Access** tab.

   The tasks the users in the groups can perform depends on the roles assigned to them.

   - DevOps Tool Owner role: Can view and edit the tool.
   - DevOps App Owner role: Can view the tool and can associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects (such as plans, repositories, and pipelines).
   - DevOps Administrator role: Can edit all tools.
   - Other DevOps roles: Can view the tool.

   **Note:**
   Only groups containing users with DevOps roles are available for selection in the **Maintained by** field.

   The **All App Owners can view and associate tool objects to applications** option becomes available for selection if you choose to restrict access to the tool. This option enables all users having the DevOps App Owner role to access the tool. If selected, they'll be able to view, associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects.

6. Select **Discover** to discover existing repositories, plans, or pipelines for the tool.
   Repository records are added to the Repositories related list.
7. Automatically configure the webhook URL in a GitHub repository to send notifications to the DevOps tool by selecting **Configure**.
   Alternatively, you can choose to enable nightly polling to fetch data system for any tracked repositories or pipelines by setting the **Enable Polling** property to **Yes**.

   **Note:**
   If you do not have admin privileges for your GitHub tool (to allow automatic configuration of the webhook URL), you might need to have the tool admin user configure it for you (create and configure the webhook URL manually in your tool instance). Once the webhook is configured in the tool, Enter Manual Configuration Mode to connect to the tool manually, then exit.

8. Click **Import** to import historical data from the repository.
   Imported branch records and commit records from the repository are added to the corresponding related lists.
9. In the **App** field, click the lookup list and select an App record to associate with the repository, or click **New** to create one.

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### Setting up GitHub OAuth 2.0 credentials for DevOps Change Velocity

Create OAuth 2.0 credentials for GitHub Apps or OAuth apps and use them to connect your GitHub instance.

If you want to use Basic Authentication credentials instead of OAuth 2.0, skip this section and proceed to onboard GitHub using one of the following options:

- Onboard GitHub to DevOps Change Velocity — Workspace.
- Onboard GitHub to DevOps Change Velocity — Classic.

**Note:**
DevOps connection and credential aliases (DevOpsAlias1 through DevOpsAlias10) are used to connect automatically when you set up your GitHub instance using OAuth 2.0. To connect to more than 10 tools, or if you receive an error saying all DevOpsAlias connection and credential aliases are being used, an admin can create additional aliases in the sn_devops application scope. For more information, see Create a Connection & Credential alias. If necessary, you can reuse a DevOpsAlias alias that is no longer in use by inactivating the HTTP connection.

### OAuth 2.0 credentials for GitHub Apps - JWT

Perform the following steps to integrate your GitHub Apps using the JWT bearer token.

#### Before you begin

Role required:

- oauth_admin in DevOps Change Velocity.
- Admin account in GitHub.

**Note:**
For GitHub Enterprise Server (on-premises instance), OAuth is not supported if you are connecting using a MID server.

### Configure the GitHub App in your GitHub account (JWT)

Create a custom GitHub App from your GitHub account to enable OAuth 2.0 authentication with your ServiceNow instance.

#### Before you begin

GitHub requirement: GitHub App configured to integrate with ServiceNow

Role required: No instance role required

#### About this task

Complete these steps from your GitHub account. See Building GitHub Apps on the GitHub Developer site for instructions on creating and configuring custom applications.

#### Procedure

1. From your GitHub account, create your GitHub App by navigating to **Developer Settings** > **GitHub Apps**.
2. In the **Homepage URL** field, enter `https://<instance-name>.service-now.com`.
3. In the **User authorization callback URL** field, enter `https://<instance-name>.service-now.com/oauth_redirect.do`.
4. In the **Identifying and authorizing users** section, deselect the **Expire user authorization tokens** field.

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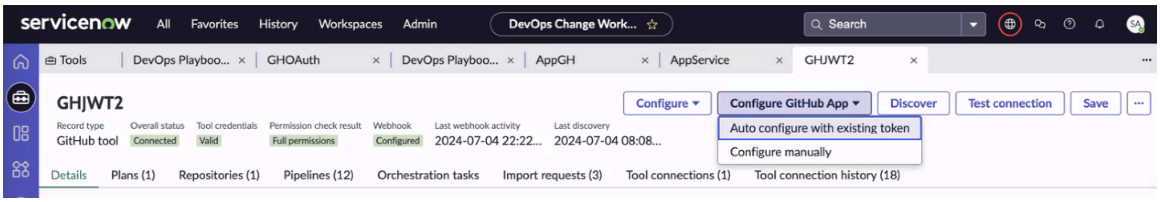
5. In the **Webhook** section, select the **Active** field.
6. In the **Webhook URL** field, enter `https://<instance-name>.service-now.com/api/sn_devops/v2/devops/tool/apps?toolId=<Tool ID>`, where Tool Id is your GitHub tool id (sys_id) from DevOps Change Velocity.

   **Note:**

   If you are newly creating the tool and don't have the Tool ID, you can enter the webhook URL without the Tool ID and configure it later. To configure later:

   a. Navigate to the connected tool's tool record page.

   b. Select **Configure GitHub App**, then select **Auto configure with existing token**.

   This configures the Webhook URL of the GitHub App automatically.

   You can get the Tool ID in one of the following ways:

   - While connecting with the tool in DevOps Change Velocity, the Tool Id is available in the page URL. For example, `https://<instance-name>.service-now.com/.../sn_devops_tool/<Tool ID>/...`.
   - You can copy the webhook URL from the GitHub tool record page in DevOps Change Velocity, from **Configure** > **Configure manually** > **Webhook URL**.
7. Leave the remaining fields empty (default).
8. In the **Repository permissions** section, configure the following settings.

| | |
|---|---|
| Action | Read-only |
| Checks | Read-only |
| Contents | Read-only |
| Deployments | Read and write |
| Environments | Read-only |
| Metadata | Read-only |
| Pull requests | Read-only |
| Secrets | Read-only |
| Webhooks | Read and write<br>**Note:**<br>Read and write permissions are required to configure webhooks from ServiceNow. |

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**Note:**
If you are already using a GitHub App and you update any of the permissions, you must review and accept those permissions for your GitHub App. You can navigate to your app, and select **Configure > Review request > Accept new permissions**.

9. Leave the remaining permissions as `No access` (default).
10. In the **Subscribe to events** section, select the **Deployment protection rule** option.
11. Save the changes.
12. After creating the GitHub App, generate a new private key and save it to your machine.
13. Install the newly created GitHub App on the accounts of your choice.

    a. From the GitHub Apps settings page, select your app.

    b. In the left sidebar, select **Install App**.

    c. Select **Install** next to the organization or personal account containing the correct repository.

    d. Install the app on all repositories or select repositories.
    For more information, see Installing GitHub Apps.

### Add Client ID to DevOps property

After configuring your GitHub App, you must ensure that the Client ID prefix (first 3 or more characters of the ID) is added to the DevOps property: **Client ID specifier for GitHub App**.

#### Before you begin
Role required: sn_devops.admin

#### Procedure

1. Navigate to **Workspaces** > **DevOps Change Workspace** > **Administration** > **System configuration** > **Properties**.
2. Change the Application scope to DevOps Data Model.
3. Search for the property: **Client ID specifier for GitHub App** [sn_devops.github_oauth_client_id_specifier].
4. Enter the Client ID prefix (first 3 or more characters of the ID) of your GitHub App to the property.
5. Select **Save**.

### Generate the Java KeyStore certificate for GitHub

Generate a Java KeyStore (JKS) certificate for the JWT authentication.

#### Before you begin
Role required: admin

#### Procedure

1. Create a CA signed certificate using the GitHub App private key:

```
openssl req -new -x509 -key <file-name>.pem -out
 <certificate-name>.pem -days 1095
```

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2. Enter the required details.
3. Create the PKCS 12 file using the GitHub App private key and CA signed certificate:

```
openssl pkcs12 -export -in <certificate-name>.pem -inkey
 <file-name>.pem -certfile <certificate-name>.pem -out
 <PKCS-12-file-name>.p12
```

4. Provide the export password.
5. Create the JKS file:

```
keytool -importkeystore -srckeystore
 <PKCS-12-file-name>.p12 -srcstoretype pkcs12 -destkeystore
 <JKS-certificate-filename>.jks -deststoretype JKS
```

6. Provide the destination and source keystore passwords.

### Attach the GitHub Java KeyStore certificate to your instance

Enable the JWT Bearer Grant token authentication by attaching the valid GitHub Java KeyStore (JKS) certificate to your ServiceNow instance.

#### Before you begin

Ensure the availability of a valid Java KeyStore certificate.

Role required: admin

#### Procedure

1. Navigate to **All** > **System Definition** > **Certificates**.
2. Select **New**.
3. On the form, fill in the fields.

#### X.509 Certificate form fields

| Field | Description |
|---|---|
| Name | Name to uniquely identify the record. For example, `My GitHub App Certificate`. |
| Notify on expiration | Option to specify the users to be notified when the certificate expires. |
| Warn in days to expire | Number of days to send a notification before the certificate expires. |
| Active | Option to enable the certificate. |
| Type | Option to select the type of the certificate. Select **Java Key Store**. |
| Expires in days | Number of days until the certificate expires. |
| Key store password | Password associated with the certificate (hint: the destination KeyStore password previously created). |
| Short description | Summary about the certificate. |

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4. Select the attachments icon (  ) and attach a JKS certificate.
5. Select **Validate Stores/Certificates**.

### Create a JWT signing key for the GitHub JKS certificate

Create a JSON Web Token (JWT) signing key to assign to your GitHub Java KeyStore certificate.

#### Before you begin

Role required: admin, sn_devops.admin

#### Procedure

1. Navigate to **All** > **System OAuth** > **JWT Keys**.
2. Select **New**.
3. On the form, fill in the fields.

**JWT Keys form fields**

| Field | Description |
|---|---|
| Name | Name to uniquely identify the JWT signing key. For example, `My GitHub App JWT Key`. |
| Signing Keystore | Valid JKS certificate attached in the previous task. For example, `My GitHub App Certificate`. |
| Key Id | Unique Id to identify which key is used when multiple keys are used to sign tokens. |
| Signing Algorithm | Algorithm to sign with the JWT key (hint: RSA 256). |
| Signing Key Password | Password associated with the signing key (hint: the source keystore password previously created). |
| Active | Option to enable the key. |

4. Select **Submit**.

### Create a JWT provider for your GitHub signing key

Add a JSON Web Token (JWT) provider to your ServiceNow instance for GitHub.

#### Before you begin

Role required: admin, sn_devops.admin

#### Procedure

1. Navigate to **All** > **System OAuth** > **JWT Providers**.
2. Select **New**.
3. On the form, fill in the fields.

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#### JWT Provider form fields

| Field | Description |
|---|---|
| Name | Name to uniquely identify the JWT provider. For example, `My GitHub App JWT Provider`. |
| Expiry Interval (sec) | Number in seconds to set the lifespan of JWT provider tokens (Hint: You can leave it as default). |
| Signing Configuration | Valid JWT signing key previously created. For example, `My GitHub App JWT Key`. |

4. Right-click the form header, and select **Save**.
5. Enter your GitHub App **App ID** (available in the **About** section of your GitHub App configuration in GitHub ) as the value of the **iss** claim, in the Standard Claims related list.
6. Leave **aud** and **sub** values blank (default).

### Register GitHub as an OAuth Provider (JWT)

Use the information generated during GitHub App account configuration to register GitHub as an OAuth provider and allow the instance to request OAuth 2.0 tokens.

#### Before you begin

Role required: admin, sn_devops.admin

#### Procedure

1. Navigate to **All** > **System OAuth** > **Application Registry**.
2. Select **New**.
   The **What kind of OAuth application?** message is displayed.
3. Select **Connect to a third party OAuth Provider**.
4. On the form, fill in the fields.

#### Application Registry form fields

| Field | Description |
|---|---|
| Name | Name to uniquely identify the record. For example, enter `My GitHub App Provider`. |
| Client ID | Client ID of your GitHub App (hint: available in the **About** section of your GitHub App configuration in GitHub ). |
| Client Secret | Client secret of your GitHub App (hint: available in the **About** section of your GitHub App configuration in GitHub ). |
| OAuth API script | Option that enables you to reference an amended OAuthUtil script include. Select **OAuthDevOpsGitHubJWTHandler**. |
| Default Grant type | Type of grant associated with application registry. Select **JWT Bearer**. |
| Token URL | The location of the token endpoint that the instance uses to retrieve and refresh tokens. |

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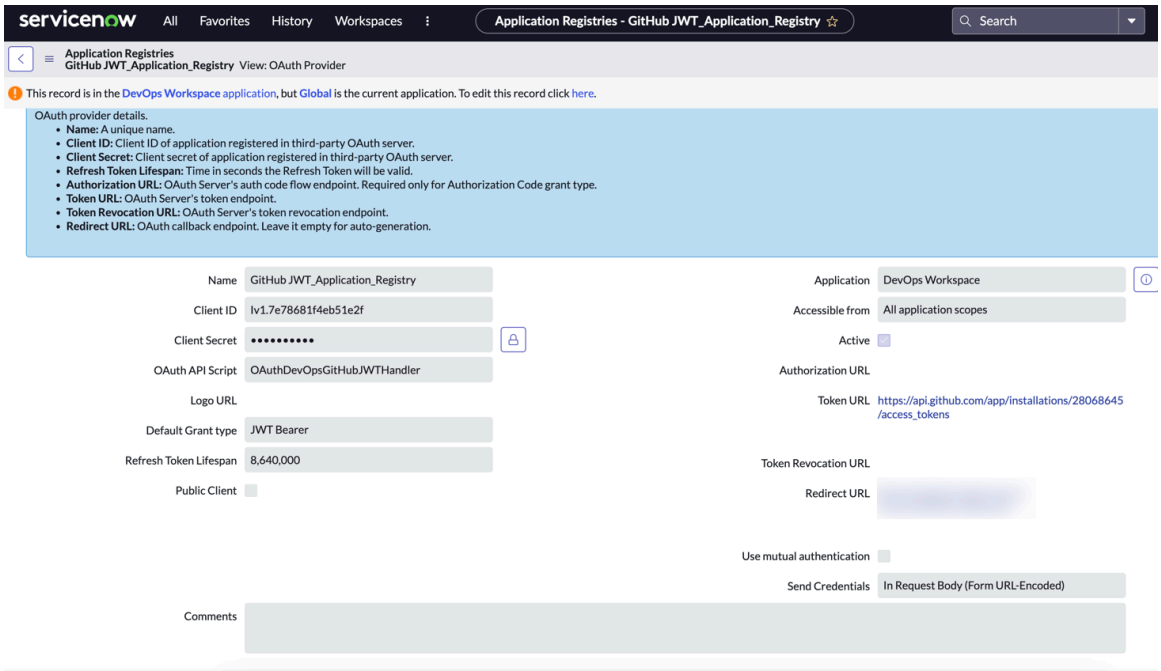
| Field | Description |
| --- | --- |
| | For cloud version, enter: `https://api.github.com/app/installations/<installation_id>/access_tokens`.<br><br>For enterprise version, enter: `https://<HOST_URL>/api/v3/app/installations/<installation_id>/access_tokens`.<br><br>For the installation id, go to Install App section in your GitHub App configuration in GitHub and select the gear icon to configure your app. The installation id will be in the webpage URL. For example, https://github.com/settings/installations/<installation_id>. |

5. Leave the rest of the form fields as default.




6. Right-click the form header, and select **Save**.
7. Open the default profile created in the **OAuth Entity Profiles** related list.
8. Populate the **JWT Provider** field with the JWT provider previously created and save the form.
9. Navigate to **Key Management > Module Access Policies > All**.
10. Select the policy that has **com_snc_platform_security_oauth_glideencrypter** as the **Crypto module** field value and **Script Include: OAuthDevOpsGitHubJWTHandler** as the **Target script** field value.

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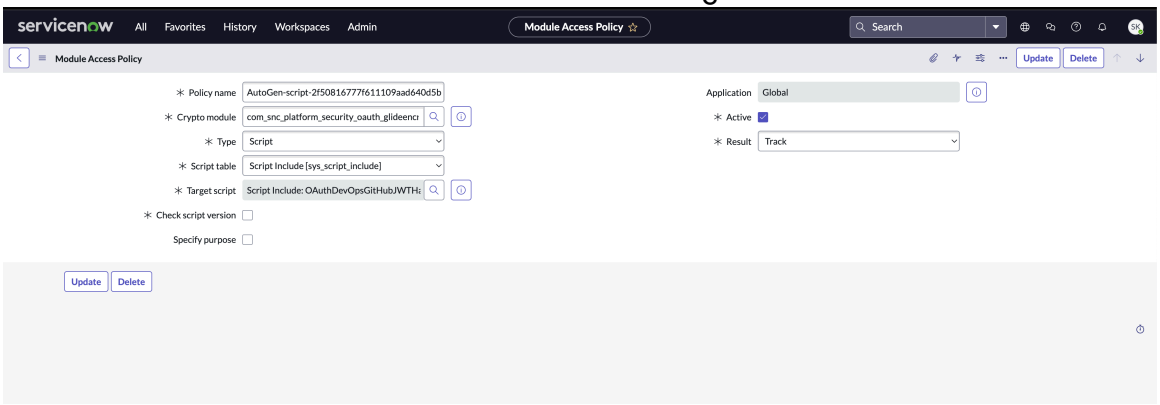
11. Ensure the **Result** field is set to **Track** and save the changes.




## Create a credential record for GitHub App provider (JWT)

Create a credential record to the GitHub App provider previously created to authorize actions.

### Before you begin

Role required: admin, sn_devops.admin

### Procedure

1. Navigate to **All** > **Connections & Credentials** > **Credentials**.
2. Select **New**.
   The **What type of Credentials would you like to create?** message is displayed.
3. Select **OAuth 2.0 Credentials**.
4. On the form, fill in the fields.

#### OAuth 2.0 Credentials form fields

| Field | Value required |
|---|---|
| Name | Name to uniquely identify the record. For example, enter `My GitHub App Credential`. |
| Active | Option to enable the record. |
| OAuth Entity Profile | Default OAuth Entity profile created in the Application Registry. |

5. Save the record.
6. Select the **Get OAuth Token** related link to generate the OAuth token.

### Related topics

GitHub Actions configurations

ServiceNow DevOps custom actions from GitHub marketplace

GitHub Deployment Gates for ServiceNow DevOps Change

## OAuth 2.0 credentials for GitHub Apps - Authorization Code

Perform the following steps to integrate your GitHub Apps using Authorization code.

### Before you begin

Role required:

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- oauth_admin in DevOps Change Velocity.
- Admin account in GitHub.

**Note:**
Only user-level repositories are supported. You must have access to all the GitHub repositories that you want to configure in DevOps Change Velocity using Authorization code.

**Note:**
For GitHub Enterprise Server (on-premises instance), OAuth is not supported if you are connecting using a MID server.

### Configure the GitHub App in your GitHub account (Authorization Code)

Create a custom GitHub App from your GitHub account to enable OAuth 2.0 authentication with your ServiceNow instance.

#### Before you begin

GitHub requirement: GitHub App configured to integrate with ServiceNow

Role required: No instance role required

#### About this task

Complete these steps from your GitHub account. See Building GitHub Apps on the GitHub Developer site for instructions on creating and configuring custom applications.

#### Procedure

1. From your GitHub account, create your GitHub App by navigating to **Developer Settings** > **GitHub Apps**.
2. In the **Homepage URL** field, enter `https://<instance-name>.service-now.com`.
3. In the **User authorization callback URL** field, enter `https://<instance-name>.service-now.com/oauth_redirect.do`.
4. In the **Identifying and authorizing users** section, deselect the **Expire user authorization tokens** field.
5. In the **Webhook** section, deselect the **Active** field.
6. Leave the remaining fields empty (default).
7. In the **Repository permissions** section, configure these settings.

| | |
|---|---|
| Action | Read-only |
| Checks | Read-only |
| Contents | Read-only |
| Deployments | Read and write |
| Environments | Read-only |
| Metadata | Read-only |
| Pull requests | Read-only |
| Secrets | Read-only |
| Webhooks | Read and write |

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**Note:**
Read and write permissions are required to configure webhooks from ServiceNow.

8. Leave the remaining permissions as `No access` (default).
9. Install the newly created GitHub App on the accounts of your choice.

### Add Client ID to DevOps property

After configuring your GitHub App, you must ensure that the Client ID prefix (first 3 or more characters of the ID) is added to the DevOps property: **Client ID specifier for GitHub App**.

#### Before you begin
Role required: sn_devops.admin

#### Procedure

1. Navigate to **Workspaces** > **DevOps Change Workspace** > **Administration** > **System configuration** > **Properties**.
2. Change the Application scope to DevOps Data Model.
3. Search for the property: **Client ID specifier for GitHub App** [sn_devops.github_oauth_client_id_specifier].
4. Enter the Client ID prefix (first 3 or more characters of the ID) of your GitHub App to the property.
5. Select **Save**.

### Register GitHub as an OAuth Provider (Authorization Code)

Use the information generated during GitHub App account configuration to register GitHub as an OAuth provider and allow the instance to request OAuth 2.0 tokens.

#### Before you begin
Role required: admin, sn_devops.admin

#### Procedure

1. Navigate to **All** > **System OAuth** > **Application Registry**.
2. Click **New**.
   The system displays the message **What kind of OAuth application?**
3. Select **Connect to a third party OAuth Provider**.
   The system displays an empty Application Registries form.
4. Complete the form.

| Field | Value required |
|---|---|
| Name | Enter any name to uniquely identify the record. For example, enter `My GitHub App Provider`. |
| Client ID | Enter the client ID of your GitHub App (hint: available in the **About** section of your GitHub App configuration in GitHub ). |

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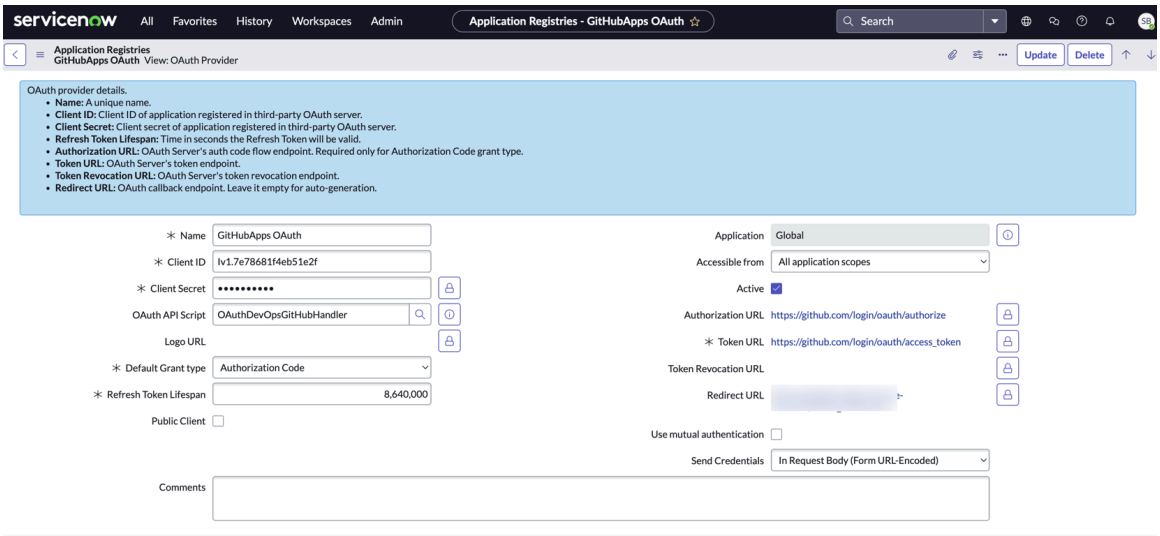
| Field | Value required |
|---|---|
| Client Secret | Enter the client secret of your GitHub App (hint: available in the **About** section of your GitHub App configuration in GitHub ). |
| OAuth API script | Select **OAuthDevOpsGitHubHandler**. |
| Default Grant type | Select **Authorization Code**. |
| Authorization URL | Enter `https://github.com/login/oauth/authorize`.<br>For an on-premises deployment, use the proper GitHub host URL. |
| Token URL | Enter `https://github.com/login/oauth/access_token`.<br>For an on-premises deployment, use the proper GitHub host URL. |

5. Leave the rest of the form fields as default.




6. Right-click the form header, and click **Save**.
   - The system validates the OAuth credentials and populates the **Redirect URL** (Hint: It should match the **User authorization callback URL** previously provided in your GitHub App configuration).
   - The system populates **OAuth Entity Profile** with **Grant Type** as **Authorization Code**. For example, **OAuth Entity Profile** is created with default **Name**, **My GitHub App Provider default_profile**

### Create a credential record for GitHub App provider (Authorization Code)

Create a credential record to the GitHub App provider previously created to authorize actions.

#### Before you begin

Role required: admin, credential_admin

#### Procedure

1. Navigate to **All** > **Connections & Credentials** > **Credentials**.
2. Click **New**.

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The system displays the message **What type of Credentials would you like to create?**.

3. Select **OAuth 2.0 Credentials**.
   The pop-up window displays an empty OAuth 2.0 Credentials form.
4. Fill in these values.

| Field | Value required |
|---|---|
| Name | Enter any name to uniquely identify the record. For example, enter `My GitHub App Credential`. |
| Active | Enable |
| OAuth Entity Profile | Select the default OAuth Entity profile you created previously. |
| Applies to | Select the MID Servers that can use this credential. For example, select **All MID Servers**.<br>**Note:**<br>You must connect to your GitHub tool instance using MID Server to use this credential. |
| Order | Select the order to apply this credential. For example, enter `100`. |

5. Save the record.
6. Click the **Get OAuth Token** related link to generate the OAuth token.

**Related topics**

GitHub Actions configurations

ServiceNow DevOps custom actions from GitHub marketplace

### GitHub Actions configurations

Configuration information on GitHub Actions, such as, secrets, workflows, and limitations.

## Secrets in GitHub Actions

Create secrets (credentials) in GitHub repository or GitHub organization. Secrets are environment variables (encrypted) that you create in an organization or repository. These secrets are available to use in GitHub Actions workflows. For more information, see Encrypted secrets.

| Secret | Description |
|---|---|
| SN_INSTANCE_URL | ServiceNow instance URL. For example, https://<instance_name>.service-now.com. |
| SN_ORCHESTRATION_TOOL_ID | Sys_id for the GitHub tool created in ServiceNow instance. |
| SN_DEVOPS_INTEGRATION_TOKEN | Secret token for the GitHub tool created in DevOps (`devops-integration-token` parameter). To access your secret token navigate to your GitHub tool record in ServiceNow (**All > Tools > Orchestration** |

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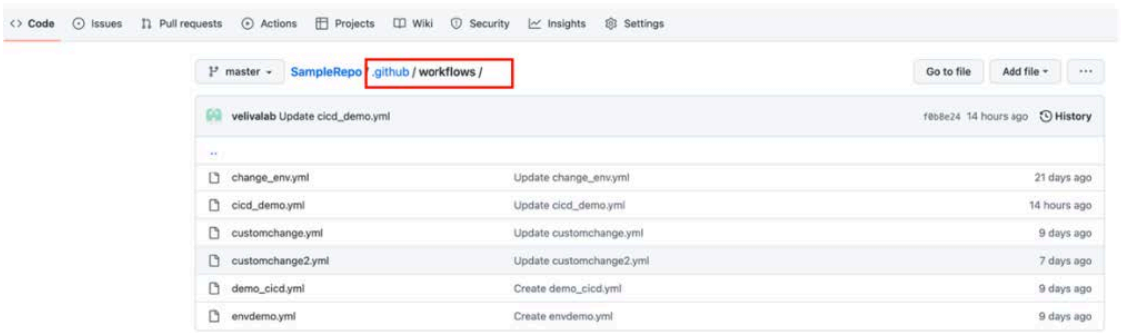
| Secret | Description |
| --- | --- |
| | **Tools**), and select **Copy token** in the Classic UI. |

## Workflows in the GitHub repository

Create a YAML file to define workflow configuration in your GitHub repository.

The following points must be considered while defining the workflow:

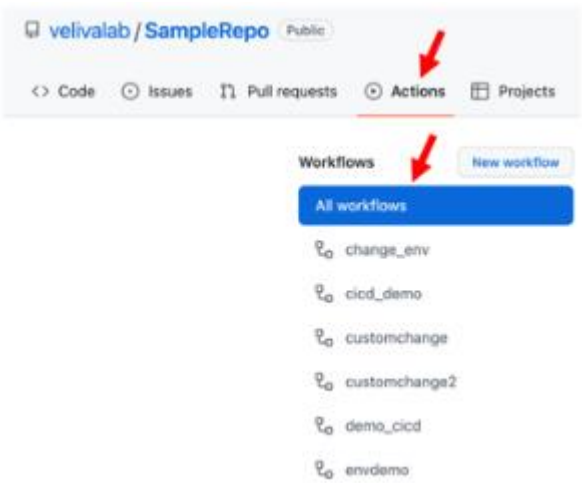
- All workflows of your repository must have either a .yml or .yaml file extension. All workflows must be under `.github/workflows` directory and follow the syntax defined in the Workflow syntax for GitHub Actions.




- The name of the workflow must match with the workflow file name.




- The names of the workflows under **All workflows** on the **Actions** tab must match with the workflows saved under the `.github/workflows` directory of your repository.




- A display name must be given for every job and must be unique for every job in the workflow. The job name must match with the stage name in the custom action.

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```
change:
  name: Change Request Attributes
  runs-on: ubuntu-latest
  needs: registerPackage
  steps:
    - name: ServiceNow DevOps Change Attributes
      uses: ServiceNow/servicenow-devops-change@v2.0.0
      with:
        devops-integration-token: ${{ secrets.SN_DEVOPS_TOKEN }}
        instance-url: ${{ secrets.SN_INSTANCE_URL_ADEVOPS2 }}
        tool-id: ${{ secrets.SN_ORCHESTRATION_TOOL_ID_ADEVOPS2 }}
        context-github: ${{ toJSON(github) }}
        job-name: 'Change Request Attributes'
        change-request: '{"setCloseCode":"true","attributes":{"short_description":"Automated Software Deploymen
        interval: '100'
        timeout: '3600'
        deployment-gate: '{"environment":"deploy-gates-demo","jobName":"Deploy"}'
```

- Use the `workflow_dispatch` event to trigger a workflow manually.




## GitHub Actions workflow run details in DevOps

After you configure the webhooks, the notifications from GitHub Actions are sent to ServiceNow DevOps whenever a workflow is executed or triggered.

The following details are sent to the ServiceNow instance when a workflow is manually executed or triggered automatically on a GitHub repository.

- The workflow_job webhook notifies the ServiceNow instance with status of the job (queued, in_progress, completed) when the workflow is manually run or automatically triggered on a GitHub Repository.
- Inbound Events are created in the ServiceNow instance for status of the job (queued, in_progress, and completed) and in_progress events are ignored.
- Queued and completed inbound events are processed and ServiceNow DevOps Pipeline Steps and Orchestration Tasks are created for jobs configured in the workflow.
- Pipeline Execution is created for every workflow run with Task Executions and Step Executions records created for each job executed in the workflow run.
- You can use the Pipeline UI to visualize interactions and results across a pipeline execution.

## GitHub re-runs

Change requests created for GitHub jobs are re-used if the change requests are in the implement and post-implement stages. For example, for a pipeline execution:

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- If a job fails before the change request is in the implement stage, the change request created will not be re-used when the failed jobs are re-run.
- If the failed jobs or all jobs are re-run, a new change request will be created.
- Now if a job fails when the change request is in the implement or post-implement stages, the change request will be re-used when the failed jobs or all jobs are re-run.

> **Note:**
> If the change request is already implemented in a previous step before the job failed, then the during re-runs, the pipeline execution will not be stopped. The change request is considered as already approved and implemented.

#### Composite workflows

For composite workflows where one workflow calls another workflow and the change step is in the child workflow, the *job-name* parameter for the change step must be of the format `job-name: '<parent-job-name> / <child-job-name>'`. Here the space before and after the forward slash (/) is mandatory.

**Example of a job-name parameter in the child workflow**

```
steps:
  - name: Custom Change
    uses: ServiceNow/servicenow-devops-change@v4.0.0
    with:
      devops-integration-token: ${{ inputs.devops-integration-token }}
      instance-url: ${{ inputs.instance-url }}
      tool-id: ${{ inputs.tool-id }}
      context-github: ${{ toJSON(github) }}
      job-name: 'call-devops-change / Deploy'
      change-request: '{"setCloseCode":"true","attributes":{"short_description":
      interval: '100'
      timeout: '3600'
```

## GitHub Actions limitations for DevOps Change Velocity integration

- GitHub Actions and GitHub Environments are supported in GitHub Enterprise Server starting from version 3.3.
  - For detailed information about GitHub environments, see Using environments for deployment.
  - GitHub environments are available to private repositories only in GitHub Enterprise Cloud.
- For GitHub Organizations, use a specific account (with access to the required organizations) with personal access token for integrating with ServiceNow DevOps or you can also use GitHub Apps through Authorization Code 2.0 or JWT.

  For tool creation using GitHub Apps - JWT, you must create separate tool for separate organization.
- Only the latest GitHub Actions scan results can be pulled from an instance for a workflow run.
- ServiceNow DevOps Change Automation using custom action or environment is not supported for parallel jobs. For parallel jobs, the webhook notification payload does not contain information on the jobs executed in parallel with a sequence number. Due to this limitation, the

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sequence of jobs depends on the execution order returned by the response of the (/repos/{owner}/{repo}/actions/runs/{run_id}/jobs) API.

- Callback URL to pause and resume workflow run from the ServiceNow instance is supported only with GitHub Actions Deployment Gates feature. However, change creation is possible through both deployment gates and GitHub Custom Action.
- User who creates GitHub tool in the ServiceNow instance must be a reviewer to approve the workflow for GitHub Environments.

**Related topics**

Configure webhooks in GitHub manually

### ServiceNow DevOps custom actions from GitHub marketplace

Use the custom actions from the GitHub marketplace to collect SonarQube scan data, security data, pause or resume workflow, or resume workflow until a change request is approved or rejected in your instance, or get and update change request details and so on.

Alternatively, you can use Docker container images to implement custom actions for GitHub Actions pipelines. For more information, see Implement custom actions for pipelines using generic Docker container image.

### ServiceNow DevOps SonarQube custom action

Save the SonarQube scan results of a project initiated by the workflow run in your ServiceNow instance. You must create the SonarQube tool in your instance and use the ServiceNow DevOps SonarQube custom action at the steps level of a job in the workflow.

View the SonarQube analysis results using one of the following methods:

- Navigate to **DevOps** > **Software Quality Results** > **Software Quality Summary**.
- Navigate to **DevOps** > **Orchestrate** > **Task Execution** and selecting a relevant **Task Execution** record.

Perform the following tasks to use the custom action.

- Create SonarQube tool in your instance.

  Generate token from **User** > **My Account** > **Security** page in your SonarQube tool and create tool in the ServiceNow instance using the generated token. For more information, see Onboard SonarQube to DevOps Change Velocity — Workspace and Onboard SonarQube to DevOps Change Velocity — Classic.

- Create the following Secrets to save SonarQube scan results in the ServiceNow instance.
  - SONAR_HOST_URL: SonarQube instance URL. For example, `https://sonarcloud.io`
  - SONAR_PROJECT_KEY: The key to identify a project in the SonarQube instance. For example, `org.examples:demo`
- Configure the ServiceNow DevOps SonarQube custom action in the workflow.

  The custom action `servicenow-devops-sonar` must be configured at steps level of job in the workflow with **uses** keyword. The inputs of this custom action must not be tampered to save SonarQube analysis results in the ServiceNow instance. For more information, see ServiceNow DevOps Sonar.

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### ServiceNow DevOps Test Report custom action

Save unit test results of the project initiated by the workflow run in your ServiceNow instance. The ServiceNow DevOps Test Report custom action must be used at the steps level of job in the workflow.

View the unit test results saved in your ServiceNow instance by navigating to **DevOps** > **Test Results** > **Test Summaries**.

You can also view by navigating to **DevOps** > **Orchestrate** > **Task Execution** and clicking a relevant **Task Execution** record.

Perform the following tasks to use the custom action.

- Create Secrets in the GitHub Repository.
- Configure the DevOps Test Report custom action in the workflow.

  The custom action `servicenow-devops-test-report` must be configured at steps level of job in the workflow with **uses** keyword. The inputs of this custom action must not be tampered to save the unit test results in your ServiceNow instance. For more information, see ServiceNow DevOps Test Report.

### ServiceNow DevOps Register Artifact custom action

Save artifacts created or deployed by the workflow run in your ServiceNow instance. Use the ServiceNow DevOps Register Artifact custom action at steps level of job in the workflow.

View the artifacts details saved in your instance by navigating to **DevOps** > **Artifact** > **Artifacts**.

Perform the following tasks to use the custom action:

- Create Secrets in the GitHub Repository.
- Configure ServiceNow DevOps Register Artifact custom action in the workflow.

  The custom action `servicenow-devops-register-artifact` must be configured at steps level of job in the workflow with **uses** keyword. The inputs of this custom action must not be tampered to save artifact details in your instance. For more information, see ServiceNow DevOps register artifacts.

### ServiceNow DevOps Register Package custom action

Save packages created or deployed by the workflow run in the ServiceNow instance. Use the ServiceNow DevOps Register Package custom action at steps level of job in the workflow.

View the package details saved in the ServiceNow instance by navigating to **DevOps** > **Artifact** > **Packages**.

Perform the following tasks to use the custom action.

- Create Secrets in the GitHub Repository.
- Configure ServiceNow DevOps Register Artifact custom action in the workflow.

  The custom action `servicenow-devops-register-package` must be configured at steps level of job in the workflow with **uses** keyword. The inputs of this custom action must not be tampered to save artifact details in your instance. For more information, see ServiceNow DevOps register package.

### ServiceNow DevOps Change Automation custom action

Create a change request in the ServiceNow instance to pause and resume the workflow run from the ServiceNow instance.

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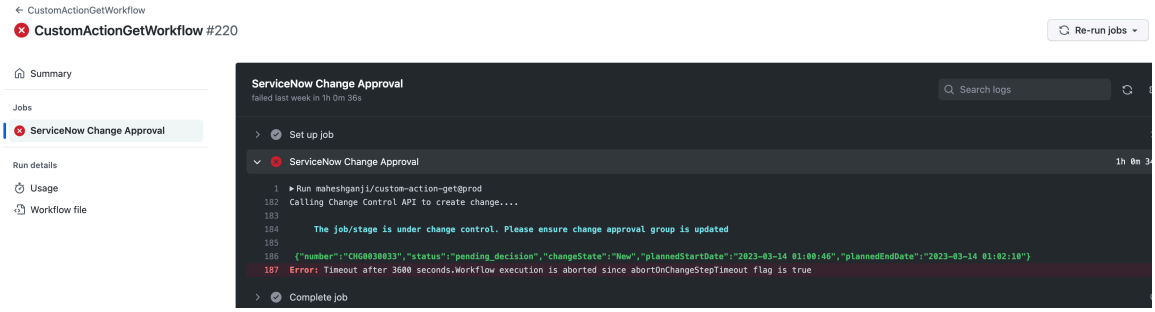
Use the ServiceNow DevOps Change Automation custom action at steps level of job in the workflow. If the change is not created within the time period specified in the threshold (changeCreationTimeOut), and the **abortOnChangeCreationFailure** parameter is enabled, the pipeline will be aborted.

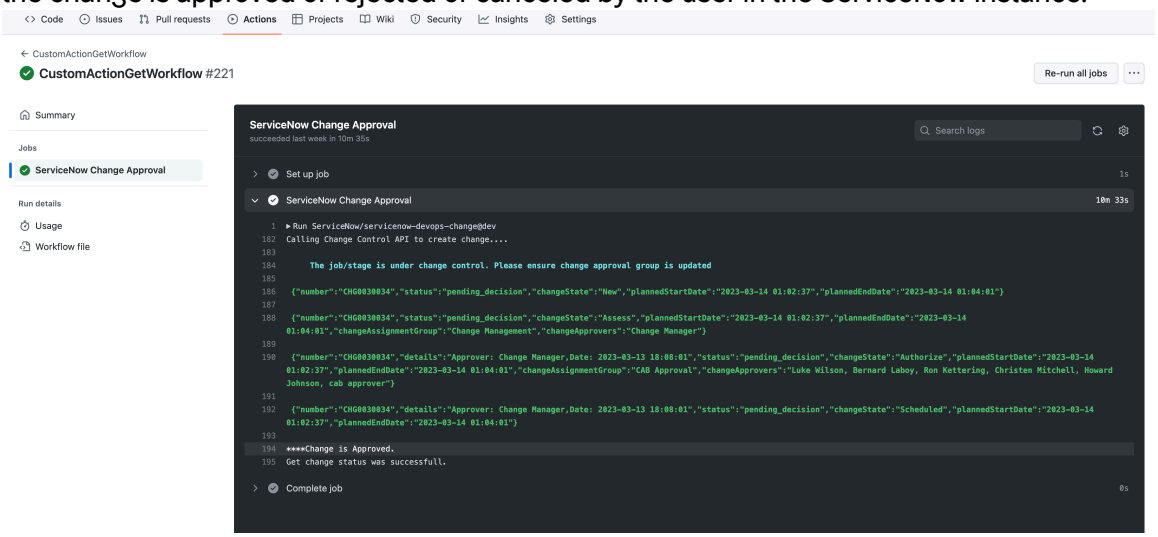
This custom action creates a change request in ServiceNow, enables the **Change Control** option, and polls the ServiceNow instance at the defined time interval for change status until either the change is approved or rejected or the timeout threshold (timeout) is reached. GitHub aborts the workflow run if the timeout threshold is reached and the **abortOnChangeStepTimeout** parameter is enabled.




This custom action immediately resumes the workflow run when change receipt is enabled for pipeline in ServiceNow without waiting for the change to be approved or rejected in the ServiceNow instance.

View the change created for the workflow run in the ServiceNow instance by navigating to **DevOps** > **Orchestrate** > **Pipeline Change Requests**.

The change number with status **pending_decision** is displayed in the GitHub Actions console while polling the ServiceNow instance for change status. The details like change comments, approved by, approved on, and status are logged in GitHub Actions console after the change is approved or rejected or canceled by the user in the ServiceNow instance.




You can navigate to the console logs in your pipeline to view the state of a change request when a change request is created, change details will be displayed as per the polling time interval. The policy conditions associated with the change request state will also be evaluated and displayed in the logs. For example, if the DevOps Change Request Advanced Automation policy is activated, the policy conditions will be evaluated and the corresponding decision made (auto-approve/auto-reject/manual-approval) will be displayed in the logs.

The following change request details are displayed:

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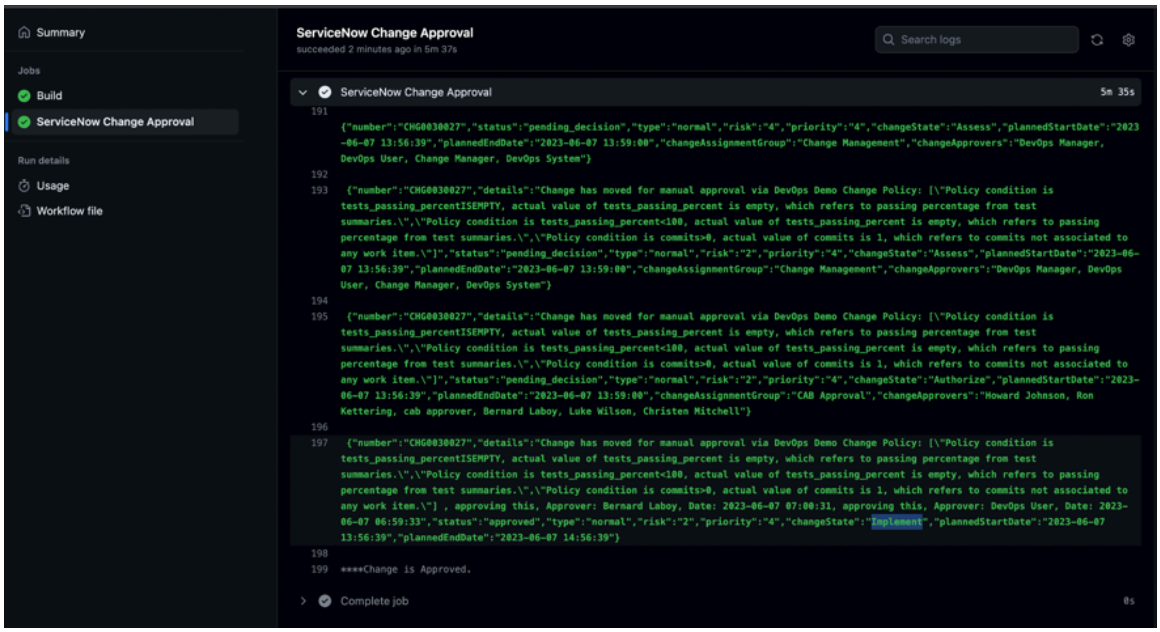
- number
- details
- status
- sys_id
- type
- risk
- priority
- changeState
- plannedStartDate
- plannedEndDate
- changeRequestURL




**Note:**
**changeState** is the state of the change request, and **status** is the status of the step execution.

The logs for policy conditions will be displayed for the base system change flows as follows:

- DevOps Model Change Policy: Only logs will be displayed on change creation and when the change state is updated.
- DevOps Change Request Minimal Automation Policy: Logs along with change decision and policy conditions corresponding to the change decision will be displayed.
- DevOps Change Request Advanced Automation Policy: Logs along with change decision and policy conditions corresponding to the change decision will be displayed.

The change policy input and decision conditions are stored in the Decisions [sys_decision_question] table. Logs will be displayed if the following fields and operators are used as input for policy conditions:

**Fields**

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- code_coverage
- commits_without_work_item
- integration_tests_failed
- load_tests_failed
- regression_tests_failed
- num_of_outages_in_last_7_days
- num_of_current_outages
- num_of_open_incidents
- total_num_of_commits
- tests_passing_percent
- risk
- code_security
- commits

**Operators**

- <=
- >=
- !=
- =
- <
- >
- ISNOTEMPTY
- ISEMPTY
- BETWEEN
- ANYTHING
- NSAMEAS
- SAMEAS
- GT_FIELD
- LT_FIELD

**Note:**
If any field is modified in a change policy other than the base system fields, then those fields must be manually added to the flow for policy conditions to be evaluated.

Perform the following tasks to use the custom action.

- Create Secrets in the GitHub Repository.
- Configure ServiceNow DevOps Change Automation custom action in the workflow.

  The custom action `servicenow-devops-change` must be configured at steps level of job in the workflow with **uses** keyword. The inputs of this custom action must not be tampered to create change in your instance and poll for change status every number of seconds. For more information, see ServiceNow DevOps change automation.

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### ServiceNow DevOps Get Change Github Action

Retrieve the change request number in a GitHub Actions pipeline based on specific change details.

The ServiceNow DevOps Get Change Github Action custom action must be added at the step level in a pipeline job to retrieve the change request number from a ServiceNow instance by specifying change details.

### ServiceNow DevOps Update Change Github Action

Update change request details associated with a GitHub Actions pipeline.

The ServiceNow DevOps Update Change Github Action custom action must be added at the step level in a pipeline job to update the change request in a ServiceNow instance. The change request number whose details need to be updated and the change request details to be updated must be specified as input.

### ServiceNow DevOps Security Results Action

Retrieve security scan results in ServiceNow.

The ServiceNow DevOps Security Results Action custom action must be added at the step level in a pipeline job to retrieve security scan results in ServiceNow.

### GitHub Deployment Gates for ServiceNow DevOps Change

Use the GitHub Deployment Gate capability to decide on whether a new deployment should proceed or halt.

## Before you begin

GitHub deployment gates are supported only if you have connected your GitHub instance with Oauth 2.0 credentials for GitHub Apps using the JWT bearer token. For more information, see OAuth 2.0 credentials for GitHub Apps - JWT.

By default, the Deployment protection rules section is available for environments in all the repositories selected in the installed GitHub App.

Role required: Permission to create environments in GitHub

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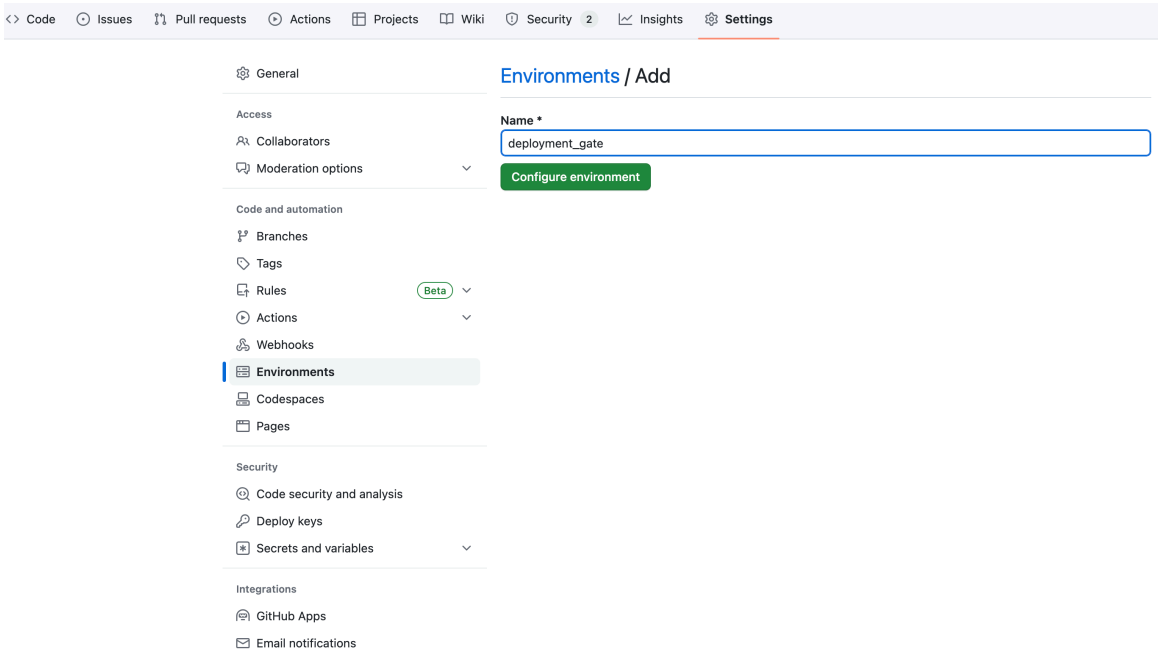
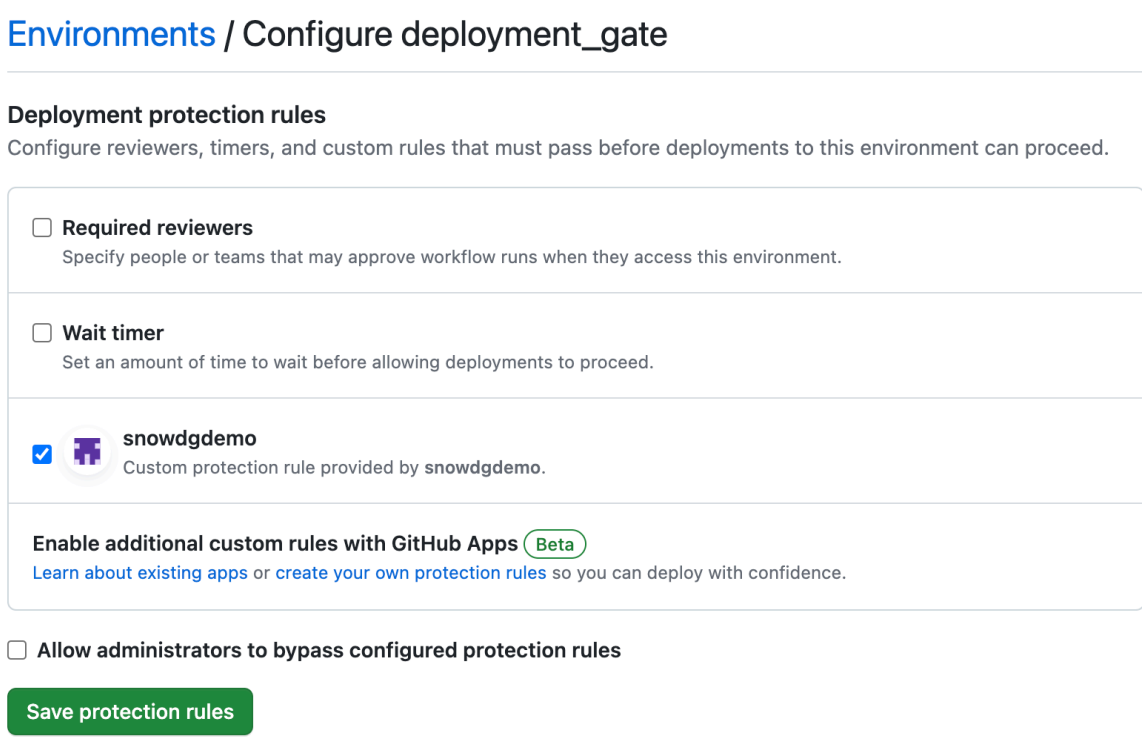
## Procedure

1. Navigate to **Settings > Environments** from a repository and click **New environment** to create an environment.




2. In the Deployment protection rules section, select the installed GitHub App name, and select **Save protection rules**.




3. Add the ServiceNow DevOps Change Automation custom action at the step level (for example, changeRequest job in workflow/yaml file) in a pipeline job to create the change for deployment gates.
   The *deployment-gate* parameter must be added in the following JSON format.

```
'{"environment":"deployment_gate","jobName":"Deploy"}'
```

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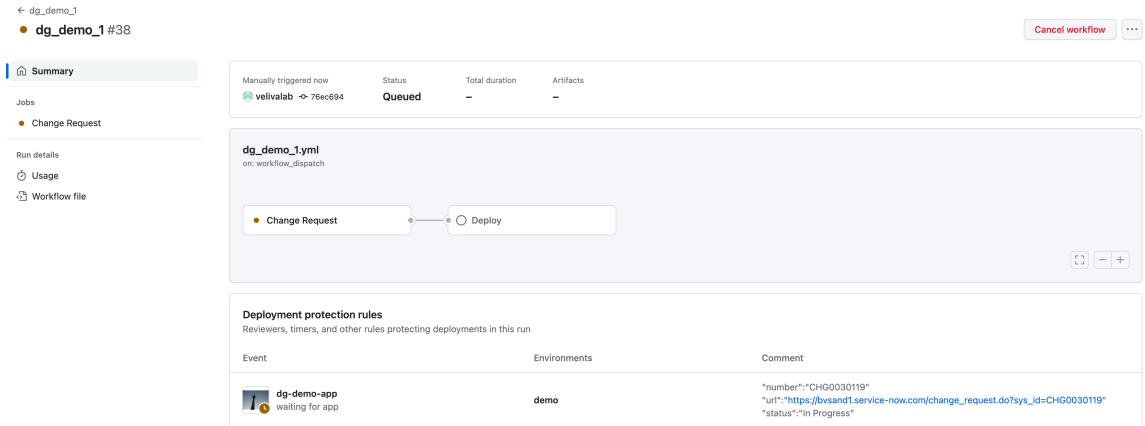
Here *environment* key value is the environment created with deployment protection rules, and *jobName* key value is the deployment job created in the workflow/yaml file with dependency on the change request job configured with the ServiceNow DevOps Change Automation custom action.

```
  change:
    name: Change Request Attributes
    runs-on: ubuntu-latest
    needs: registerPackage
    steps:
      - name: ServiceNow DevOps Change Attributes
        uses: ServiceNow/servicenow-devops-change@v2.0.0
        with:
          devops-integration-token: ${{ secrets.SN_DEVOPS_TOKEN }}
          instance-url: ${{ secrets.SN_INSTANCE_URL_ADEVOPS2 }}
          tool-id: ${{ secrets.SN_ORCHESTRATION_TOOL_ID_ADEVOPS2 }}
          context-github: ${{ toJSON(github) }}
          job-name: 'Change Request Attributes'
          change-request: '{"setCloseCode":"true","attributes":{"short_description":"Automated Software
Deployment","description":"Automated Software
Deployment.","assignment_group":"a715cd759f2002002920bde8132e7018","implementation_plan":"Software update is tested and
results can be found in Test Summaries Tab; When the change is approved the implementation happens automated by the CICD
pipeline within the change planned start and end time window.","backout_plan":"When software fails in production, the
previous software release will be re-deployed.","test_plan":"Testing if the software was successfully deployed"}}'
          interval: '100'
          timeout: '3600'
          deployment-gate: '{"environment":"deploy-gates-demo","jobName":"Deploy"}'


  deploy:
    name: 'Deploy'
    needs: change
    runs-on: ubuntu-latest
    environment: deploy-gates-demo
    steps:
      - name: Run deployment scripts
        run: echo Completed Deployment.
```

When the deployment gate specific workflow/yaml file is run in GitHub Actions, the details like change number, change url, and status will be displayed once the change request is created in ServiceNow.

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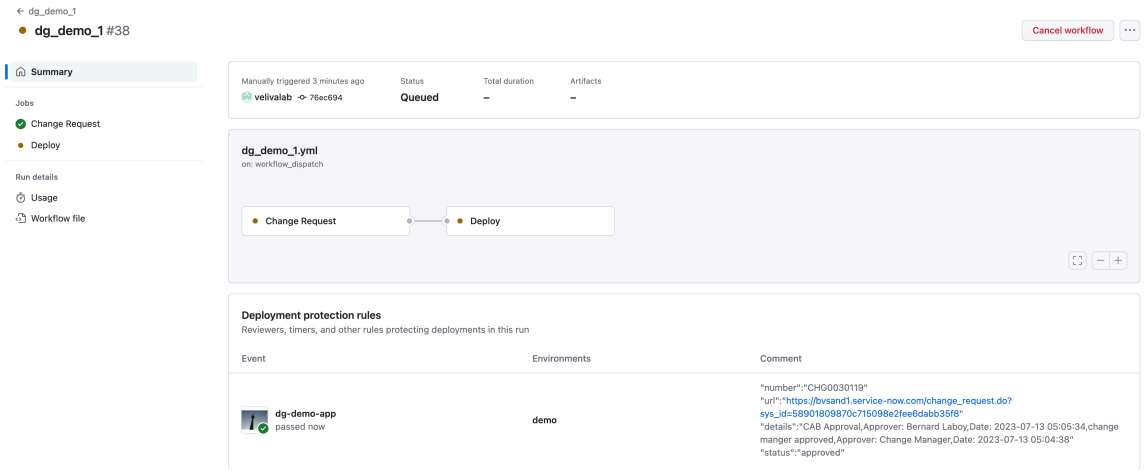
The details like change comments, approved by, approved on, and status are logged in the GitHub tool after the workflow run is resumed from ServiceNow, i.e. when change request is approved and the change request state is updated to Implement in ServiceNow.




## Configure webhooks in GitHub manually

Configure webhooks in GitHub to send sync notifications to the DevOps Change Velocity application.

### Before you begin

Role required: sn_devops.admin or sn_devops.tool_owner in DevOps Change Velocity, GitHub admin

### About this task

You can also access manual configuration from the GitHub tool record in DevOps Change Velocity.

### Procedure

1. In GitHub, navigate to **Settings** > **Webhooks** and add a webhook.
2. In DevOps Change Velocity, choose **Configure manually** when configuring the tool instance to send data.

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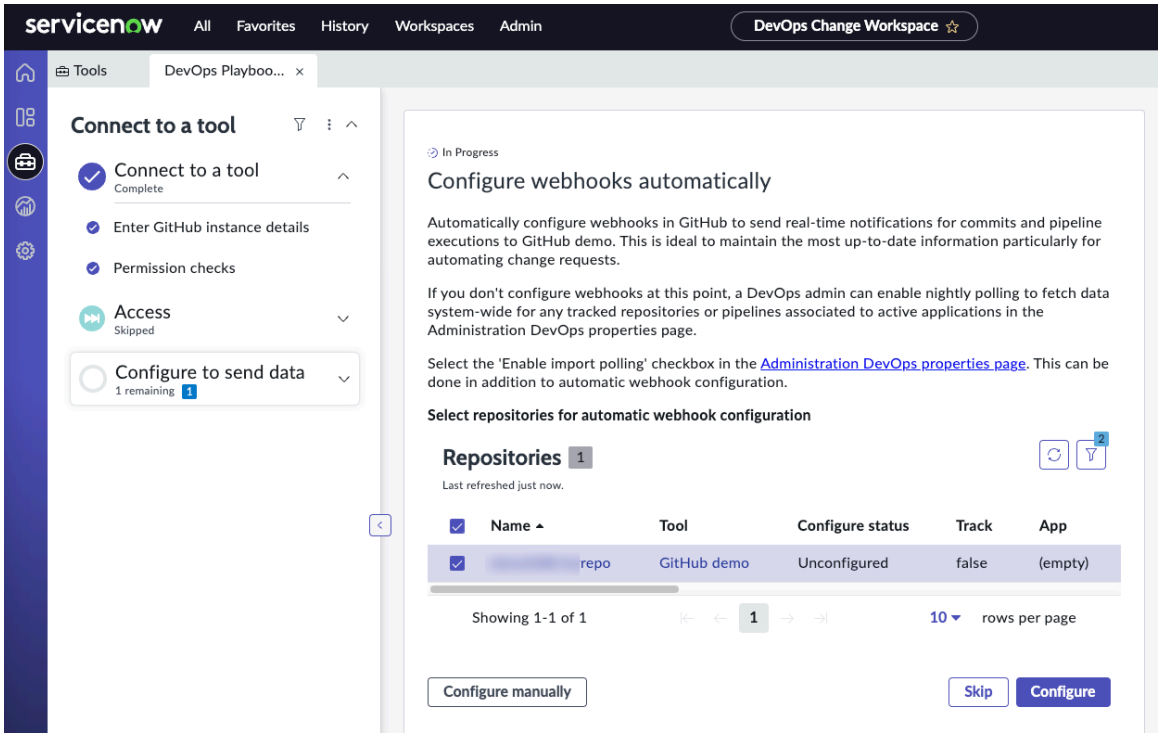
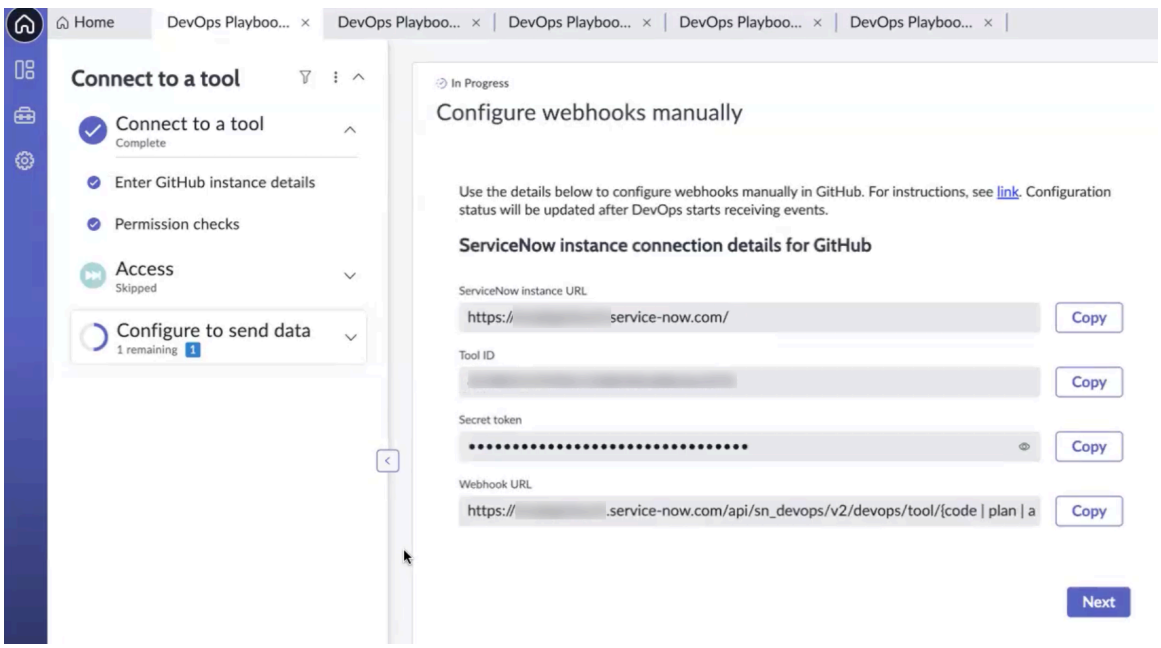



3. In DevOps Change Velocity, copy the **Webhook URL** field from the ServiceNow instance connection details for GitHub.

> **Note:**
> Select **Copy** in the appropriate field to copy the value to your clipboard. The field label changes to **Copied**, but you can copy multiple times.




4. Modify the copied Webhook URL to reflect your tool details, and paste the URL in GitHub.

   For example:

```
https://myinstance.service-now.com/api/sn_devops/v2/devops/
tool/{code | plan | artifact | orchestration | test |
softwarequality }?toolId=23410545938c71d0db5bfe686cba1036
```

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a. Select one of the tool capabilities `{code | plan | artifact | orchestration | test | softwarequality }` to match your tool.
For example:

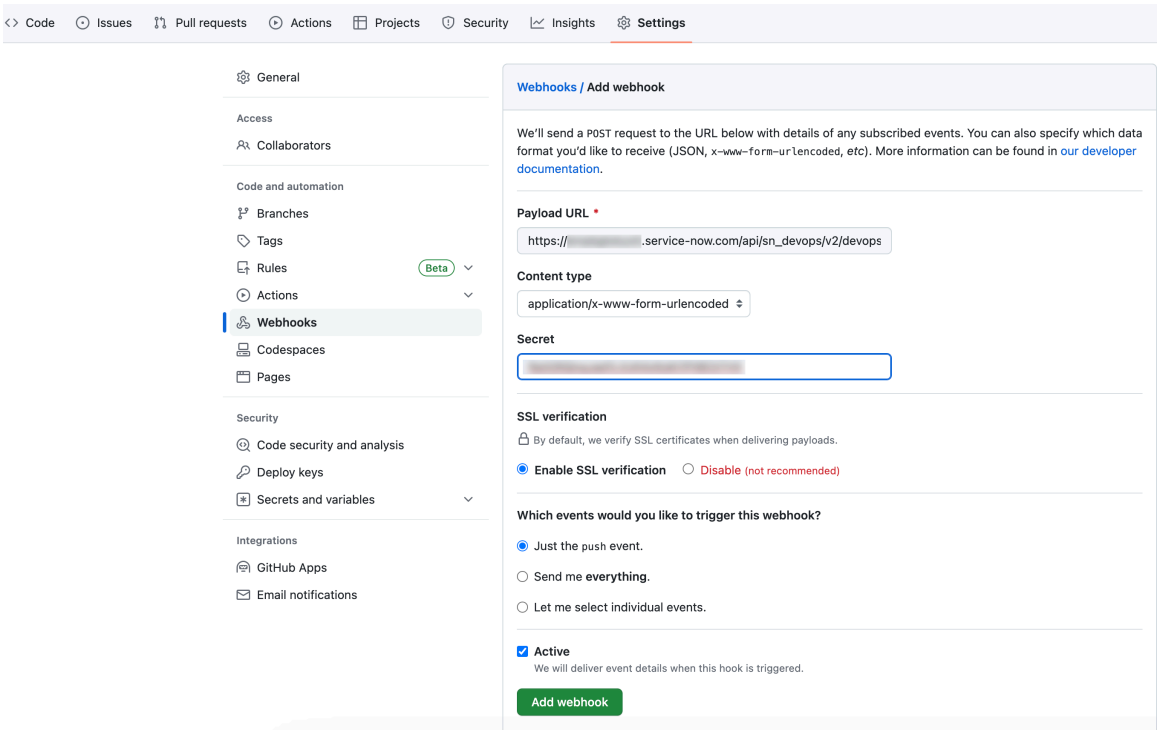
```
https://myinstance.service-now.com/api/sn_devops/v2/devops/tool/orchestration?toolId=23410545938c71d0db5bfe686cba1036
```

b. Copy the modified Webhook URL to the **Payload URL** field of the new webhook in GitHub.

5. In DevOps Change Velocity, copy the **Secret token** field from the ServiceNow instance connection details for GitHub, and paste in the **Secret** field of the new webhook in GitHub.

### Copy field values

| From DevOps Change Velocity field | To GitHub field |
|---|---|
| Webhook URL (modified) | Payload URL |
| Secret token | Secret |




## GitLab integration with DevOps Change Velocity

Connect to your GitLab instance to discover plans, repositories, and pipeline definitions and configure real-time notifications or polling to enable change traceability and automation.

## GitLab integration overview

Versions supported:

- On premises - base version 13.x and above
- GitLab Cloud

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DevOps Change Velocity supports Plan (Issues), Code (Repository) and Orchestration (Pipelines) capabilities for the GitLab tool. In case of pipelines, only basic pipelines are supported but not the multi-project ones.

- **Connect**: Discover plans, repositories, and pipeline definitions by connecting your GitLab instances to DevOps Change Velocity.
- **Configure**: Enable sending real-time notifications for commits, pipelines, and work items by automatically creating a webhook in GitLab so that this data can be used to create change policies.

**Note:**
If you are upgrading to version 5.0.0 from a previous release, you must re-configure your tool to receive GitLab Issues (planning) related events.

Trigger events required for code capability:

- Push events
- Tag push events
- Comments
- Merge request events

Trigger events required for orchestration capability:

- Job events
- Pipeline events

Trigger events required for planning capability:

- Issues events
- Confidential issues events

## Key points

- A pipeline must be run and completed at least once before enabling change control.
- If a manual job in GitLab is canceled, or times out before completion, the corresponding change remains in **Open** state until the change request approval process is completed manually.
- Pipeline discovery is limited to the first 100 results using the project search filter. To discover additional pipelines, modify the search filter (which appears when you select **Discover**) to expand the results for the discovery request.
- Milestone discovered from a GitLab plan is displayed as release version in ServiceNow DevOps Change Velocity.
- Repositories or pipelines created or updated after the project has already been discovered and configured are tracked manually.
- JUnit test type integration is supported for GitLab. GitLab unit test reports support test reports only in the JUnit report format. You can convert different test types to JUnit and persist it. For detailed information, see Unit test reports and Unit test report examples.
- Test tool integration lets you view test results in DevOps for GitLab unit, functional, and performance tests.

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## Get started

Use one of the following options to onboard GitLab. For a guided experience, use the workspace to onboard a tool. Alternatively, you can use the Service Catalog or Classic experience.

### Onboard GitLab to DevOps Change Velocity — Workspace

Connect to your GitLab instance using the DevOps Change Workspace playbook to discover plans, repositories, and pipelines.

### Before you begin

Complete the tasks specified in the Getting started with DevOps Change Velocity topic.

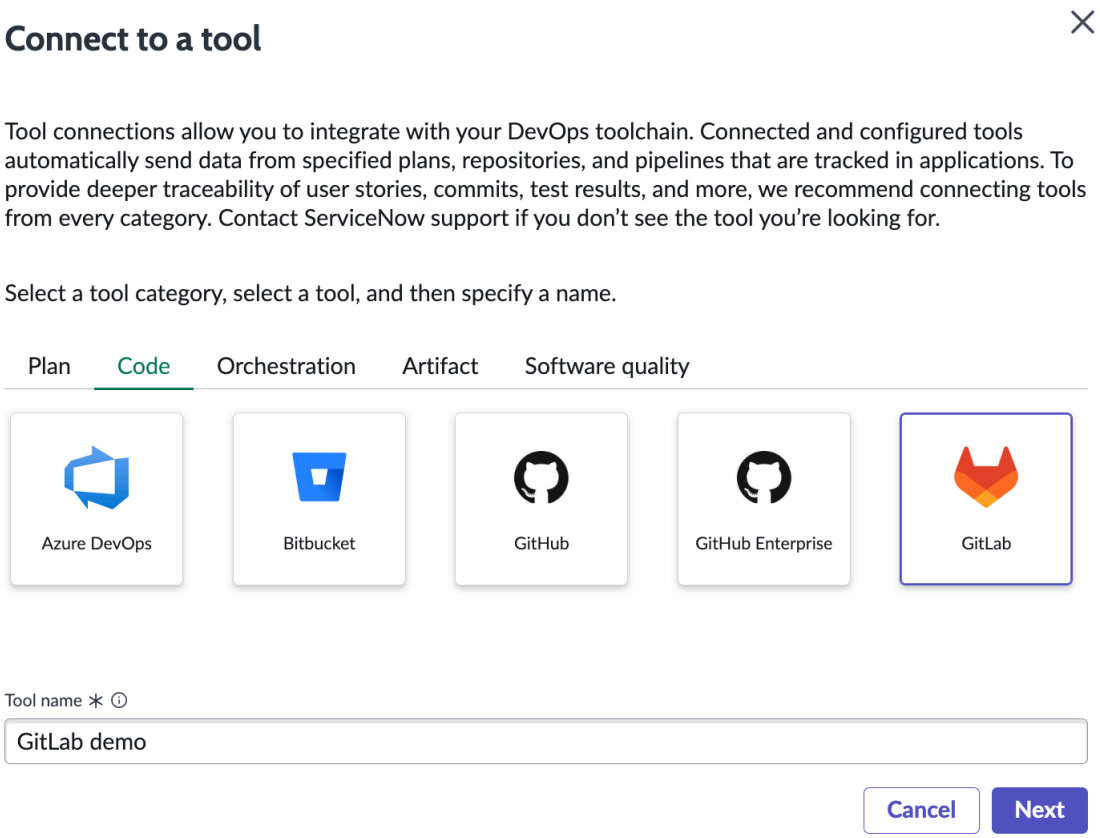
Role required: sn_devops.admin or sn_devops.tool_owner

### Procedure

1. Navigate to **Workspaces** > **DevOps Change Workspace** and use one of the following options to open the Playbook to onboard GitLab.

   **Important:**
   If you want to discover and track tool objects like plans, pipelines, or repositories while connecting to the tool, you must connect your tool from the Application module.

2. In the **Tool name** field, enter a name for the tool.




3. Select **Next**.

   The DevOps playbook opens to help you complete the onboarding tasks.

4. Enter your GitLab instance details.

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**a.** Enter your GitLab instance URL.

**b.** In the **Credential type** field, select one.

- Basic Auth
- OAuth 2.0

**c.** Enter the credentials.

- Basic Auth: Enter the username and password/access token of your GitLab instance.

  **Note:**
  Only personal access token is supported. When you generate the token, select the scope API and grant read/write access including all the groups and projects, container registry, and package registry.

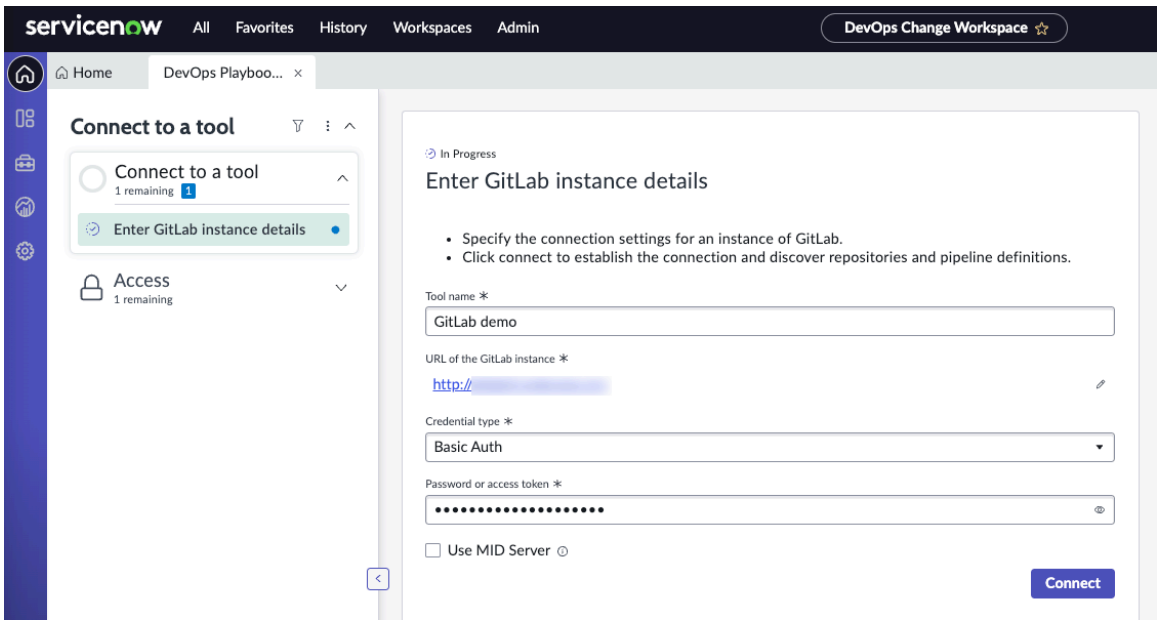
- OAuth 2.0: Enter your OAuth credential.

  For more information on OAuth2.0 credentials, see Setting up GitLab OAuth 2.0 credentials for DevOps.

**d. Optional:** If your GitLab instance is attached to a MID Server, select the **MID Server** option and enter its details.

(Optional) For more information about MID server, see MID Server selection

**e.** Select **Connect**.




**5.** Permission checks are run on the credentials that you entered.
Permissions required and permissions that are available are displayed. If you want to enter credentials with better permissions, select **Re-enter credentials**. For detailed information on all the required permissions, see GitLab permissions in Permissions required for DevOps tools.

You can choose to continue with the tool connection even if you don't have all the required permissions.

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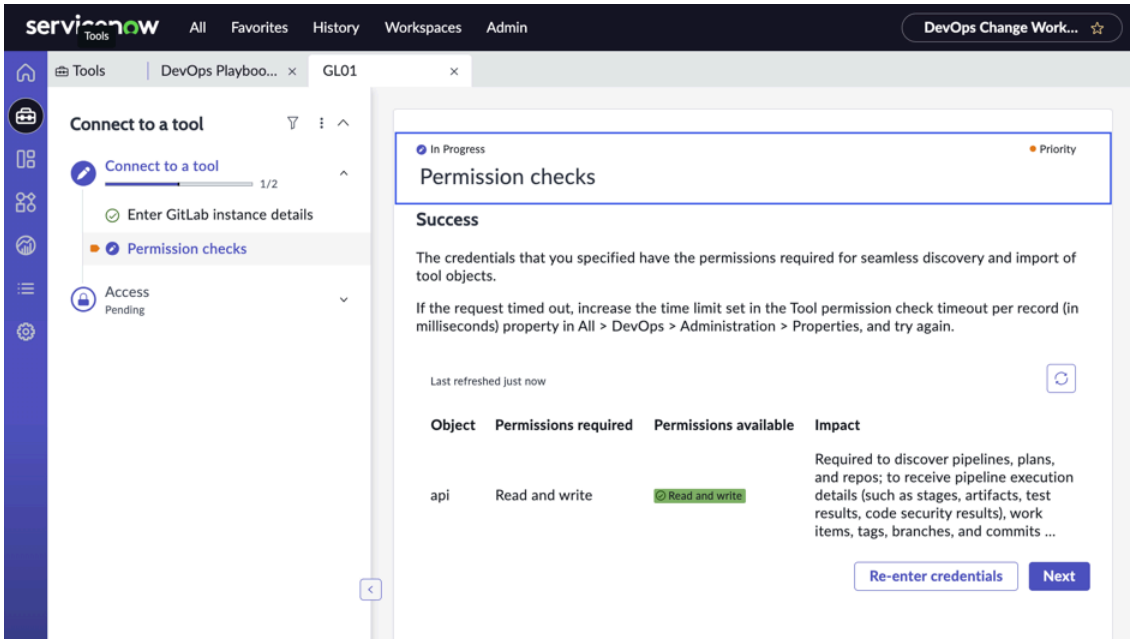


6. Select **Next**.
7. Specify the access for the tool.
   a. If you want to control access to the tool, add the groups that must be given access to the tool in the **Maintained by** field.

      The tasks these users in the groups can perform depends on the role assigned to them.

      - DevOps Tool Owner role: Can view and edit the tool.
      - DevOps App Owner role: Can view the tool and can associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects (such as plans, repositories, and pipelines).
      - DevOps Administrator role: Can edit all tools.
      - Other DevOps roles: Can view the tool.

      **Note:**
      If you don't select a group and skip this step, all users with the DevOps Tool Owner role will be able to edit the tool.

   b. If you choose to control access to the tool, the **All App Owners can view and associate tool objects to applications** option becomes available for selection.

      This option enables all users having the DevOps App Owner role to access the tool. If selected, they'll be able to view, associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects.

   c. Select **Assign**.

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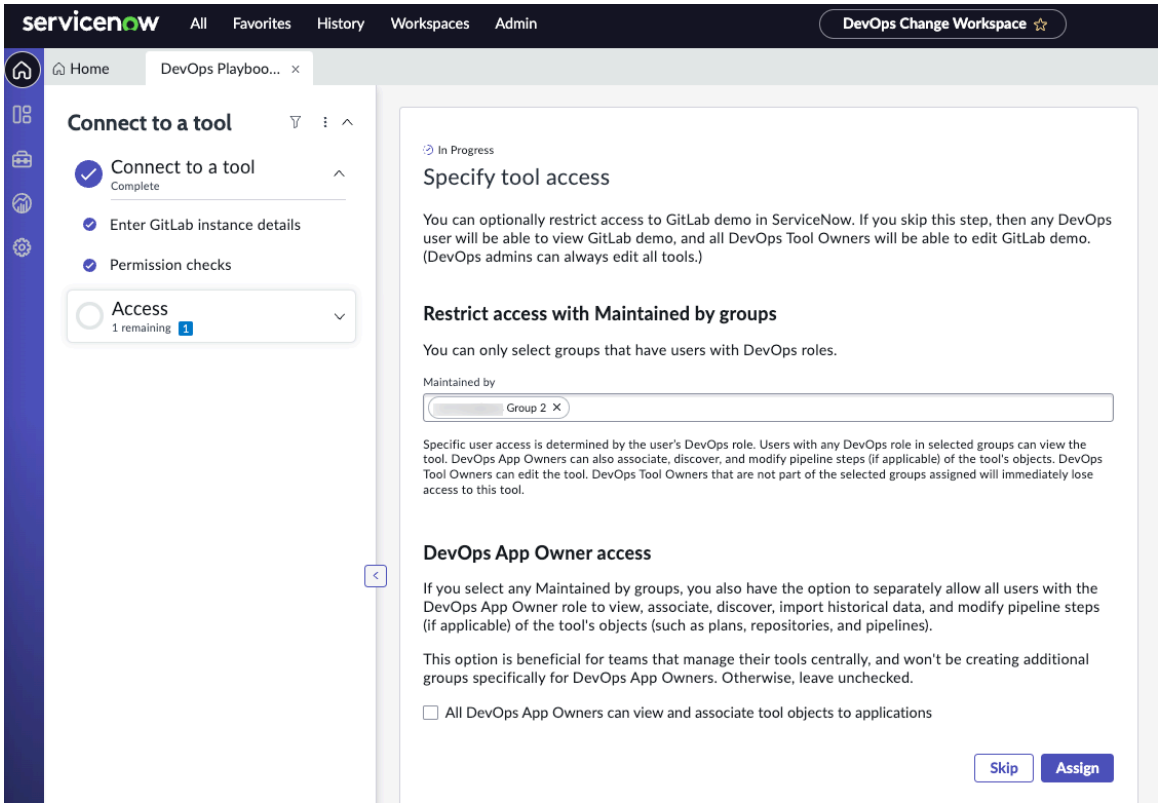
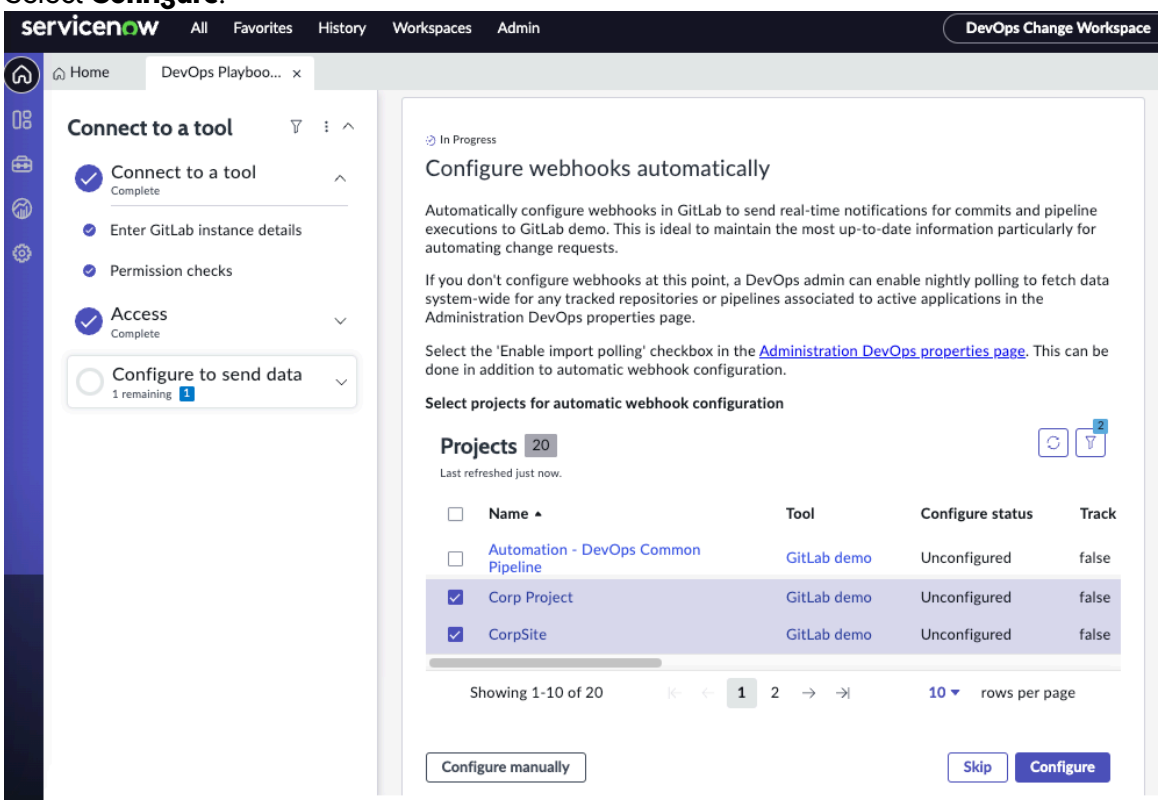



8. Select the projects for which you want to configure webhooks automatically.

   You can also choose to enable nightly polling to retrieve data for any tracked pipelines by selecting the **Enable Polling** property option in the **Administration** module. See DevOps Change Velocity properties.

9. Select **Configure**.

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To configure manually, select **Configure manually**. See Configure webhooks in GitLab manually for more information.

**Important:**

- If you're connecting from the Home page or Tools module, the connection is complete and you're taken to the Summary page.
- If you're connecting from the Applications module, then plans, repositories, and pipelines available in your project are discovered. You can track and import historical data from them.

10. Select the pipelines that you want to associate to the application, and select **Associate pipelines**.

    For each selected pipeline, all steps are imported for the last successful execution.

11. **Optional:** In the Assign services to pipeline steps activity, specify **Step type** and **Service** for each pipeline step.

    (Optional) Completing this step as part of tool onboarding enables the DevOps Insights dashboards to show more meaningful data immediately.

12. Select the plans you want to associate to the application, and select **Associate plans**.
13. Select the repositories you want to associate to the application, and select **Associate repositories**.
14. In the Import historical data step, select the date range in the **Start date** and **End date** fields and select **Import data**.

    **Note:**
    You can import up to 90 days of data.

15. Select **Next**.
16. From the **Summary** page, review the details of the successfully connected GitLab tool.

    Select **View tool record** to review the details of the connected instance.

### Result

You've successfully onboarded your GitLab tool to DevOps Change Velocity.

**Note:**
If your tool credential changes, you must also update the credentials in DevOps Change. For more information, see Update third-party tool credentials in DevOps Change Velocity.

### Related topics

Configure webhooks from the tool record

## Onboard GitLab to DevOps Change Velocity — Service Catalog

Create, connect, discover, and configure your GitLab instance using the ServiceNow Service Catalog.

### Before you begin

Role required: sn_devops.admin or sn_devops.tool_owner

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### Procedure

1. Navigate to **All** > **Service Catalog** > **Catalog Definitions** > **Maintain Items** and search for DevOps.

   **Note:**
   You can also access the service catalog from Employee Center or Service portal.

2. From the DevOps catalog items, select and activate **DevOps App Onboarding** and **DevOps Tool Onboarding**.
3. After activating, select **DevOps Tool Onboarding** and select **Try it**.
4. In the DevOps Tool Onboarding form, enter the tool details:

| Field | Description |
|---|---|
| Tool name | Name for your GitLab integration. |
| Tool integration | Select GitLab. |
| Tool URL | URL of your GitLab instance. |
| Credential type | Select Basic Auth or OAuth, depending on the credentials you're using.<br>○ For Basic Auth, enter the username and password or access token.<br>○ For OAuth, enter the credentials. |
| Tool password/ Access token/API Key | GitLab password or access token. |
| Use MidServer | Optional. Select#MID Server#for an on-premises tool that is attached to a#MID Server. Application is automatically set to #DevOps and capability is set to REST. |

   For a list of all the permissions required on the credentials for connecting to GitLab, see GitLab permissions in Permissions required for DevOps tools.

5. Select **Order Now**.
   A request is created. When the request is approved, the tool is created, connected, and discovered.
6. From the DevOps catalog items, select **DevOps App Onboarding**.
7. In the DevOps App Onboarding form, enter the details:

| | |
|---|---|
| Are you creating a new app or adding to an existing one? | Select from the options whether to create a new app or use an existing app. |
| App | Enter the name for the app that you're creating or using. |
| Onboarding pipelines | Leave empty. |
| Onboarding repositories | Enter the connected GitLab tool name. |

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| | |
|---|---|
| Repositories | Select the repositories for which you want to configure webhooks and import historical data. |
| Import from and Import to | Select the dates for which you want to import the data. By default, the last 30 days are selected. You can choose to import data for a maximum of 90 days. |
| Do you wish to configure webhook for the tool? | Select the check box if you want to configure webhooks for the selected repositories. |
| Onboarding plans | Enter the connected GitLab tool name. |
| Plans | Select the plans for which you want to import historical data. |
| Import from and Import to | Select the dates for which you want to import the Plans data. By default, the last 30 days are selected. You can choose to import data for a maximum of 90 days. |

8. Select **Order Now**.
   A request is created. When the request is approved, the plan and repository objects are associated to the app record and webhooks are configured for real-time tracking. Historical data is imported for the selected plans and repositories. The **Track** field is automatically enabled for imported repositories. For repositories the **Track file changes** is also automatically enabled.

### Onboard GitLab to DevOps Change Velocity — Classic

Create an GitLab tool record in DevOps Change Velocity to connect, discover, and import GitLab tool data.

#### Before you begin

Complete the steps specified in the Getting started section before connecting to a tool.

Role required: sn_devops.admin or sn_devops.tool_owner

#### About this task

- **Connect** by using your GitLab instance details.
- **Discover** plans, repositories, and pipelines.
- **Configure** webhooks in GitLab.
- **Import** branch and commit records, work items, task execution and step execution records.

#### Procedure

1. Enter the GitLab instance details to connect to DevOps Change Velocity.

   a. Navigate to **DevOps** > **Tools** > **Create New (legacy)** and create a record.

   b. Enter a **Tool Name** and fill in the tool details.

| | |
|---|---|
| Tool URL | GitLab tool URL. |

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| | |
|---|---|
| | For example:<br>`https://gitlab.com` |
| Tool Username | GitLab username |
| Tool Password / Access Token | GitLab access token<br>**Note:** Only personal access token is supported. When you generate the token, select the scope api and grant read/write access including all groups and projects, the container registry, and the package registry. |

For a list of all the permissions required on the credentials for connecting to GitLab, see GitLab permissions in Permissions required for DevOps tools.

c. **Optional:** Select **MID Server** for an on-premises tool that is attached to a MID Server. The **Application** value is automatically set to DevOps and the **Capability** value is set to REST.

d. Click **Submit**.
The tool is connected successfully.

On successful tool creation, you're taken to the tool record page.

2. If you want to control access to the tool, add the groups that must be given access to the tool in the **Maintained by** field on the **Access** tab.

   The tasks the users in the groups can perform depends on the roles assigned to them.

   - DevOps Tool Owner role: Can view and edit the tool.
   - DevOps App Owner role: Can view the tool and can associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects (such as plans, repositories, and pipelines).
   - DevOps Administrator role: Can edit all tools.
   - Other DevOps roles: Can view the tool.

   **Note:**
   Only groups containing users with DevOps roles are available for selection in the **Maintained by** field.

   The **All App Owners can view and associate tool objects to applications** option becomes available for selection if you choose to restrict access to the tool. This option enables all users having the DevOps App Owner role to access the tool. If selected, they'll be able to view, associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects.

3. Click **Discover** to discover existing plans, repositories, and pipelines, and fill in the fields in the project Search Filter window.

   **Note:**
   GitLab plans, repos, and pipelines discovered are determined by these filter conditions. To discover additional repos, modify the project filter to expand the results.

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| | |
|---|---|
| Owned by me (recommended) | Searches for the repositories in the project that the current user owns. |
| Currently member of | Searches for the repositories in the project that the current user is a member of. |
| Search | Searches for the repositories in projects with the specified text string. |

**Note:**
GitLab plans, repositories, and pipelines discovered are also determined by the credentials (level of access) configured in the connection.

Records are added to the corresponding related lists.

4. Automatically configure the webhook URL in a GitLab repository to send notifications to the DevOps tool by selecting **Configure**.
   Alternatively, you can choose to enable nightly polling to fetch data system for any tracked plans, repositories, or pipelines by setting the **Enable Polling** property to **Yes**.
5. For discovered plans, repositories, and pipelines, import historical data for the tool and associate with an app.

   a. Open the repository or plan or pipeline record from the corresponding related list and click **Import**.
   Imported branch records, commits, pipeline executions, work items and so on are added to the corresponding related lists.

   b. In the **App** field, click the lookup list and select an App record to associate with the repository, plans, or pipeline.

   Imported historical data records are added to the corresponding related lists.

### Setting up GitLab OAuth 2.0 credentials for DevOps

Integrate your GitLab account with your ServiceNow instance by creating a custom OAuth application in GitLab and authenticating requests from ServiceNow DevOps.

Configure your GitLab account, register GitLab in the application registry, and create a credential record for the GitLab App provider.

Role required: oauth_admin.

### Configure the GitLab App in your GitLab account (Authorization Code)

Create a custom GitLab App from your GitLab account to enable OAuth 2.0 authentication with your ServiceNow instance.

#### Before you begin
Role required: admin

#### About this task
Configure GitLab as an OAuth 2.0 authentication identity provider. For more information, see GitLab documentation.

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### Procedure

1. From your GitLab account, create your App by navigating to **Edit Profile** > **Applications**.
2. In the **Add new application** form, specify a **Name**, and in **Redirect URI** field, enter `https://<instance-name>.service-now.com/oauth_redirect.do`.
3. In the **Scopes** section, ensure that you select the **api** check box.
4. Leave the remaining fields empty (default).
5. Click **Save application**.
   The application is created. You can open the application to access the Application ID, Secret key, and Callback URL.
6. Install the newly created GitLab App on the accounts of your choice.

#### Register GitLab as an OAuth Provider (Authorization Code)

Use the information generated during GitLab App account configuration to register GitLab as an OAuth provider and allow the instance to request OAuth 2.0 tokens.

### Before you begin

Role required: admin

### Procedure

1. Navigate to **System OAuth** > **Application Registry**.
2. Click **New**.
   The system displays the message **What kind of OAuth application?**
3. Select **Connect to a third party OAuth Provider**.
   The system displays an empty Application Registries form.
4. Complete the form.

| Field | Value required |
|---|---|
| Name | Enter any name to uniquely identify the record. For example, enter `My GitLab App Provider`. |
| Client ID | Enter the Application ID of your GitLab App. |
| Client Secret | Enter the secret key of your GitLab App. |
| OAuth API script | Select **OAuthDevOpsGitLabHandler**. |
| Default Grant type | Select **Authorization Code**. |
| Authorization URL | Enter `https://gitlab.com/oauth/authorize`.<br><br>For an on-premise deployment, use the proper GitLab host URL. |
| Token URL | Enter `https://gitlab.com/oauth/token`.<br><br>For an on-premise deployment, use the proper GitLab host URL. |

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5. Leave the rest of the form fields as default.
6. Right-click the form header, and click **Save**.
   - The system validates the OAuth credentials and populates the **Redirect URL** (Hint: It should match the **Redirect URI** value previously provided in your GitLab App configuration).
   - The system populates **OAuth Entity Profile** with **Grant Type** as **Authorization Code**. For example, **OAuth Entity Profile** is created with default **Name**, **My GitLab App Provider default_profile**.
7. Validate that the **OAuth Entity Scopes** related list contains the **api** scope.

### Create a credential record for GitLab App provider (Authorization Code)

Create a credential record to the GitLab App provider previously created to authorize actions.

#### Before you begin

Role required: admin

**Note:**
The user who creates the credential record, and generates the OAuth token in ServiceNow must have at least the Maintainer role in GitLab for project webhooks, and Owner role for group webhooks to ensure that webhooks can be auto-configured. For more information, see GitLab documentation.

#### Procedure

1. Navigate to **Connections & Credentials** > **Credentials**.
2. Click **New**.
   The system displays the message **What type of Credentials would you like to create?**.
3. Select **OAuth 2.0 Credentials**.
   The pop-up window displays an empty OAuth 2.0 Credentials form.
4. Fill in these values.

| Field | Value required |
|---|---|
| Name | Enter any name to uniquely identify the record. For example, enter `My GitLab App Credential`. |
| Active | Enable |
| OAuth Entity Profile | Select the default OAuth Entity profile you created previously. |
| Applies to | Select the MID Servers that can use this credential. For example, select **All MID Servers**. |
| Order | Select the order to apply this credential. For example, enter `100`. |

5. Save the record.
6. Click the **Get OAuth Token** related link to generate the OAuth token.
   A successful token generation indicates that you can now authenticate connection between ServiceNow DevOps and GitLab via OAuth.

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### GitLab pull request configurations

GitLab pull (merge) request pipeline executions, which goes through change acceleration before moving to production, can be tracked in DevOps Change Velocity. This integration also collects GitLab merge requests meta data to persist in DevOps Change Velocity. The data is linked with the change created in the merge request pipeline execution and can be used for applying change policies, review, and approval.

- Create, update, close, re-open, and merge of pull requests are supported.
- Pull request pipeline execution for change acceleration in GitLab pipelines is supported. Pull request details will be available for use in the change approval policy.
- Status of GitLab pipeline is updated with the pull request status automatically after the change creation. The pipeline is paused and resumed automatically.
- Email ids are defaulted to the format `<user_name>@noreply.gitlab.com`.
- Comments are supported as part of merge request support. Create and update to pull requests are supported, while delete and edit are not supported.
- Maximum of 100 commits will be shown in DevOps Change Velocity. If you need to access more than 100, you must refer your GitLab instance. Only the latest comment is populated.

## Settings to enable pull (merge) requests for change approval

The DevOps property **Enable to track GitLab pull (merge) requests. If not enabled, then pull (merge) requests and related events will be ignored** enables the tracking of pull (merge) requests from GitLab in DevOps Change Velocity.

**Note:**
The property is enabled by default. If you don't want the merge (pull) requests to be tracked, you must disable it.

When enabled, the pull (merge) request changes will be reflected in DevOps Change Velocity. When disabled, DevOps Change Velocity ignores the pull request events.

For pull request and orchestration pipeline linking and to enable change approval tracking, the following are required:

- Use GitLab Docker for change tracking. For detailed information, see Implement custom actions for pipelines using generic Docker container image.
- From your GitLab project,

1. Navigate to
   - For GitLab cloud: **Settings** > **Merge requests**.
   - For On premises (13.x): **Settings** > **General** > **Merge requests**.
2. Select the **Pipelines must succeed** check box.

   With this selection, only if the change is approved, you can proceed with the merge request. That is, when the check box is selected, pull requests will be blocked until the change is approved.

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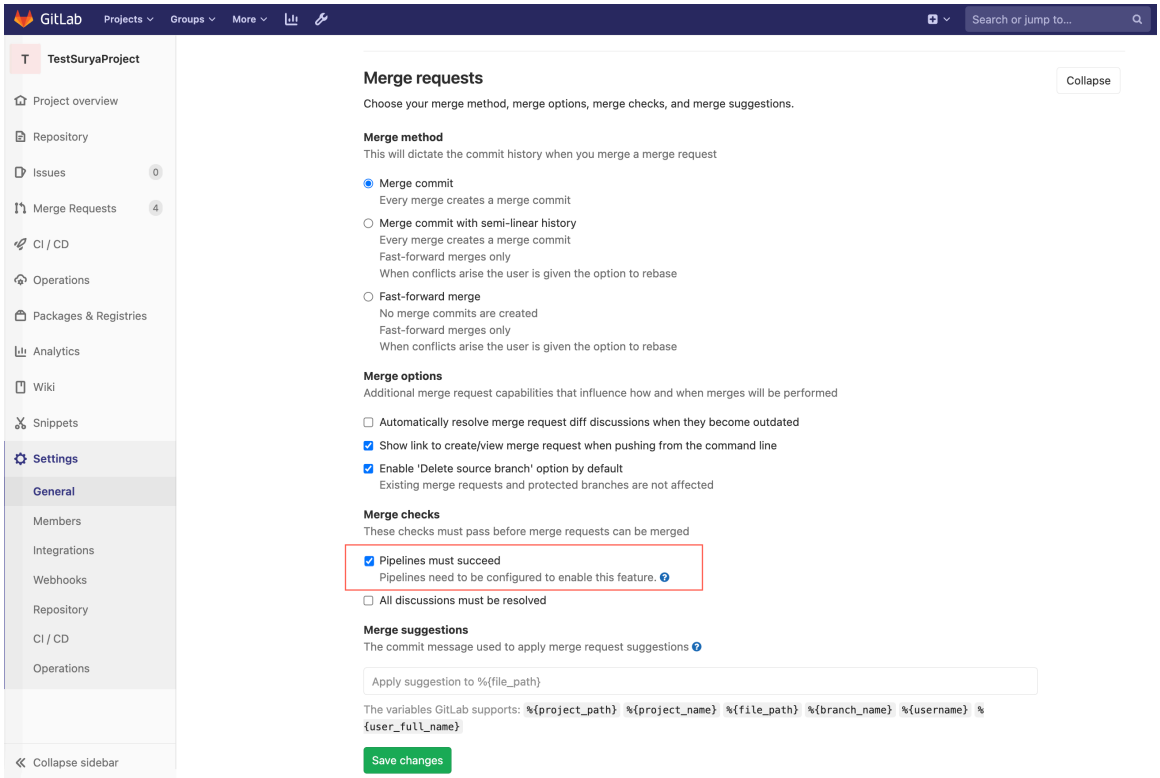


**3.** Select **Save changes**.

- Navigate to your project and open the `.yml` file.

To the `.yml` file, add the following rule at the pipeline level or at specific job levels.

```
rules:
 - if: $CI_PIPELINE_SOURCE == 'merge_request event'
 - if: $CI_PIPELINE_SOURCE != 'merge_request_event'
```

Example for pipeline level:

```
workflow:
  rules:
  - if: $CI_PIPELINE_SOURCE == 'merge_request_event'
  - if: $CI_PIPELINE_SOURCE != 'merge_request_event'
```

Example for job level:

```
changeapproval:
   stage: changeapproval
   script:
     - sndevopscli create change -p
 '{"changeStepDetails":{"timeout":3600,"interval":100},"attribu
tes":{"short_description":"Automated Software
 Deployment","description":"Automated Software
 Deployment.","assignment_group":"a715cd759f2002002920bde8132e7
018","implementation_plan":"Software update is
 tested and results can be found in Test Summaries
 Tab.","backout_plan":"When software fails in
 production, the previous software release will be
 re-deployed.","test_plan":"Testing if the software was
 successfully deployed or not"}}'
   rules:
```

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```
  - if: $CI_PIPELINE_SOURCE == 'merge_request_event'
  - if: $CI_PIPELINE_SOURCE != 'merge_request_event'
```

### Model a GitLab basic CI pipeline in DevOps

Model a GitLab basic CI pipeline by mapping the pipeline to an app, and mapping DevOps pipeline steps to GitLab pipeline jobs.

#### Before you begin

Role required: sn_devops.admin

#### Procedure

1. Map your pipeline to an app.

   a. Navigate to **DevOps** > **Apps & Pipelines** > **Apps** and open the application record to associate with the pipeline.

   b. In the Pipelines related list, click **Edit...** to select a pipeline to associate with the app, or click **New** to create the pipeline.

   > **Note:**
   > While associating a pipeline with an app, the pipeline steps are also fetched during import.

   For a new pipeline, fill in the **Orchestration pipeline** field using the group name, subgroup name (if applicable), and project name as specified in GitLab.

   For example, `My Group/My SubGroup/My Project`.

   If a project is not under a group, simply specify `My Project`.

   c. Click **Submit**.

2. Open the pipeline record again and create DevOps steps to map to each GitLab pipeline job so an orchestration task can be created.
   Steps can be created in one of the following ways.
   - Automatically create and map pipeline steps in DevOps by running your GitLab pipeline.

     Pipeline steps are automatically created, mapped, and associated when DevOps receives step notifications from your GitLab pipeline during the run.

   - Manually create and map each pipeline step to a GitLab pipeline job.

     In the Steps related list, click **New** to create a DevOps step for each GitLab pipeline job (**Orchestration stage** field).

     > **Note:**
     > The **Orchestration stage** field value of each step is case-sensitive and must match the original name of the corresponding GitLab pipeline job.

| | |
|---|---|
| Name | Name of the pipeline step. |
| Pipeline | Pipeline in which the step is configured. |
| Type | Pipeline step type. |

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| | |
|---|---|
| | ▪ Build and Test<br>▪ Test<br>▪ Deploy<br>▪ Deploy and Test<br>▪ Manual<br>▪ Prod Deploy |
| Order | Order in which the steps are run.<br><br>**Note:**<br>The step order determines the order of the cards in the Pipeline UI.<br><br>The order of the cards in the Pipeline UI is by task execution. |
| Orchestration stage | GitLab pipeline job name (case-sensitive).<br><br>**Note:**<br>For step association with GitLab CI pipeline jobs, the **Orchestration stage** field must be configured. |
| Business service | Configuration service that applies to the step. |

Once orchestration tasks are created, associate each orchestration task in the Orchestration Tasks related list with a DevOps pipeline step.

3. **Optional:** Select the **Change control** check box in a step to enable change acceleration and the corresponding configuration fields.

**Note:**
The Change Management feature must be installed for change acceleration.

| | |
|---|---|
| Change receipt | (Optional) Select to enable change receipt for the step so the pipeline doesn't pause when a change request is created.<br><br>All pipeline data is included in the change, but approval is not required for the pipeline to proceed. |
| Change approval group | (Optional) Approval group for the change request.<br><br>The change approval group becomes the **Assignment group** in the DevOps change request. |

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| | |
|---|---|
| | **Note:** Ensure that the selected group has members and a group manager so approver field is not empty. |
| Change type | Change request type to create.<br>○ Normal (default)<br>○ Standard<br>○ Emergency |
| Change model | Change model for the change request. For more information, see DevOps change models. |
| (Optional) Template<br>**Note:** This field is shown only when **Change type** is Normal or Emergency. | (Optional) List of templates to use to auto populate fields for Normal or Emergency change requests.<br>Select a template or create a new one. |
| (Optional) Standard change template<br>**Note:** This field is shown only when **Change type** is Standard. | List of standard change templates to use for Standard change requests.<br>**Note:** This field is required for Standard change type. |
| Change controlled branches | (Optional) (Multibranch only) Comma-separated list of branches under change control. Wildcards are supported. |

You can set up change control in GitLab for manual GitLab jobs.

**Note:**
A pipeline must be run and completed at least once before enabling change control.

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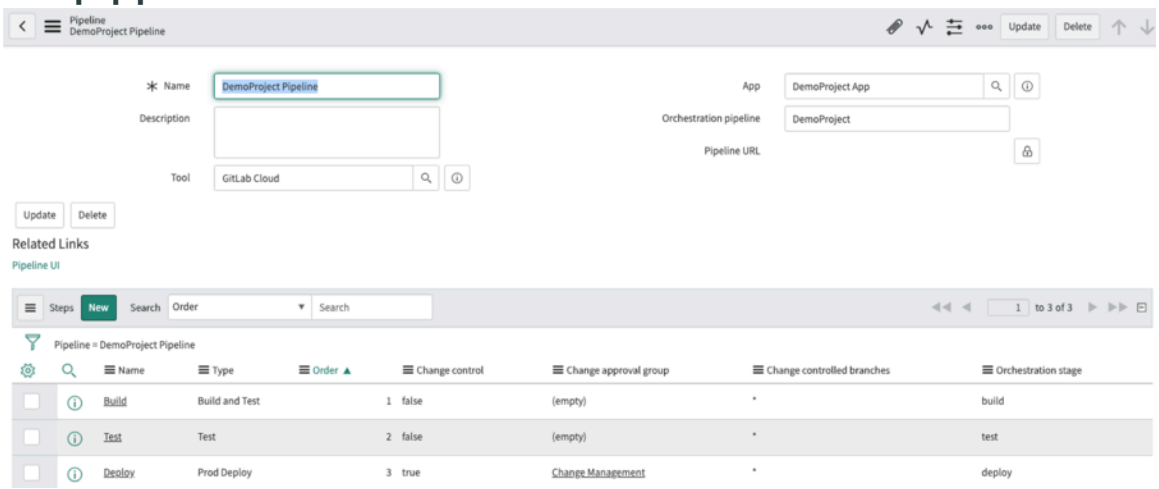
**Example:**

**DevOps pipeline**




## What to do next

Change acceleration in GitLab

### Bulk commits in GitLab

Bulk commits are supported with GitLab.

To support large commits, perform these actions:

- Install the ServiceNow IntegrationHub Action Template - Data Stream (com.glide.hub.action_type.datastream) plugin.
- For optimal performance, disable flow logging by setting the Flow Designer com.snc.process_flow.reporting.level property to **Off**.
- For MID Server settings, view the MID Server support for Data Stream actions section.

GitLab code push webhook sends a maximum of 20 commits in a notification. If the number of commits in the push are less than 20, a single inbound event is created and processed in the ServiceNow instance.

If the number of pushed commits are equal or greater than 20, multiple inbound events are created from the original event with each new event containing a batch of 19 commits. The original inbound event is marked as ignored.

Currently, GitLab Data stream action can process up to 10,000 commits in a single push.

### Configure webhooks in GitLab manually

Configure webhooks in GitLab manually to send job, push, and issues notifications to the DevOps application.

## Before you begin

Role required:

- sn_devops.admin or sn_devops.tool_owner in DevOps Change Velocity
- GitLab admin

## About this task

Create webhooks for the following two triggers in GitLab for every project you want to track.

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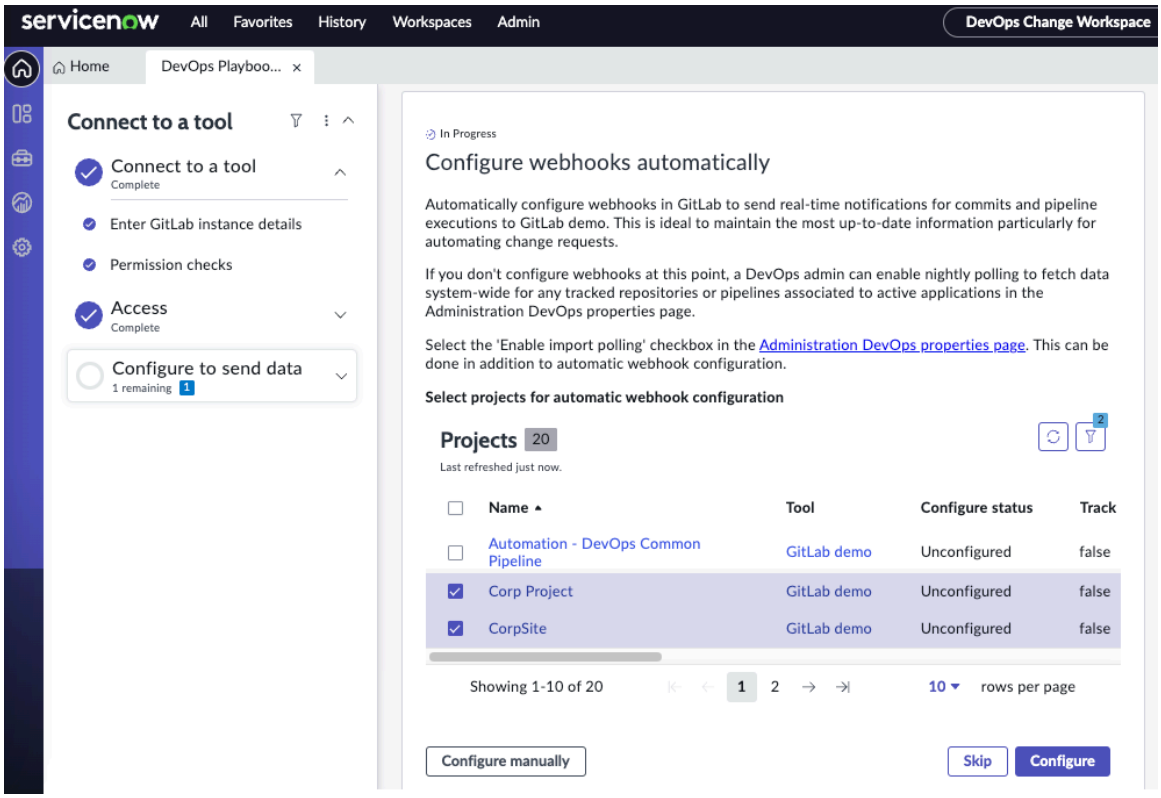
- Push events (code capability)
- Job events (orchestration capability)
- Issues events (planning capability)

You can also access manual configuration from the GitLab tool record in DevOps Change Velocity.

### Procedure

1. In GitLab, navigate to **Project** > **Settings** > **Webhooks** and add a webhook.
2. In DevOps Change Velocity, choose **Configure manually** when configuring the tool instance to send data.




**Note:**
You can also access manual configuration from the GitLab tool record in DevOps Change Velocity. From the tool record, select **Configure** > **Configure manually**.

3. Copy the **Webhook URL** field from DevOps Change Velocity connection details for GitLab.

**Note:**
Select **Copy** in the appropriate field to copy the value to your clipboard. The field label changes to **Copied**, but you can copy multiple times.

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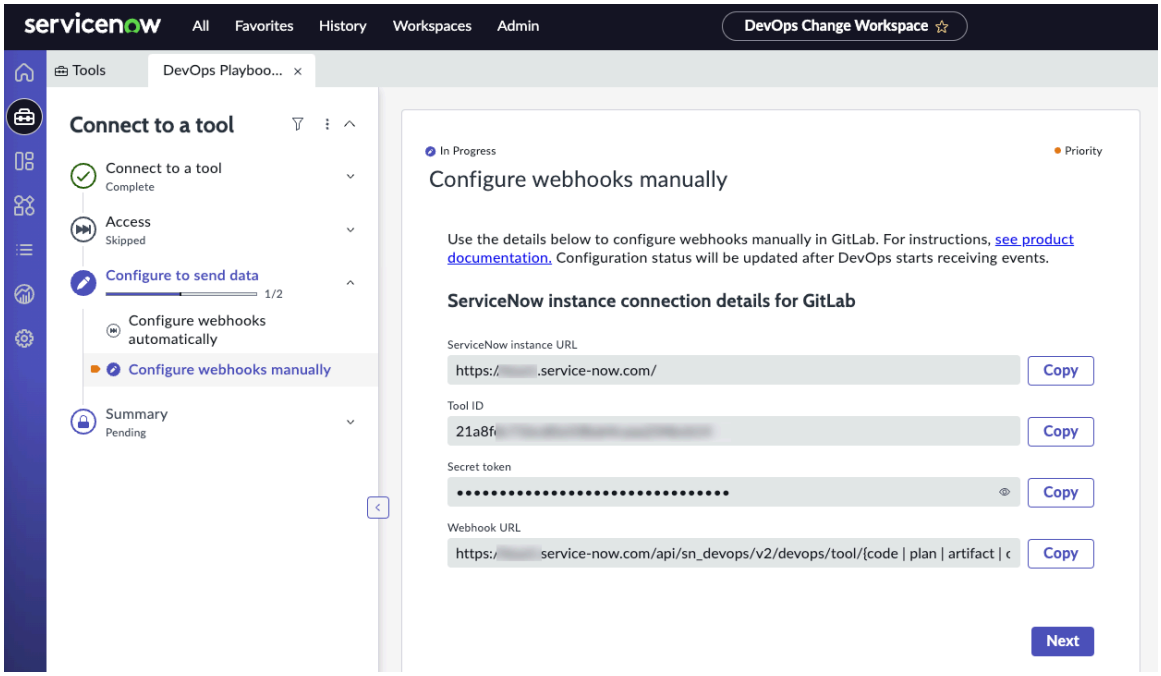


4. Modify the copied Webhook URL to reflect your tool details, and paste the URL in GitLab.

   For example:

   ```
   https://<your instance>.service-now.com/api/sn_devops/
   v2/devops/tool/{code | plan | artifact | orchestration | test |
   softwarequality }?toolId=<your ToolId>
   ```

   a. Select one of the tool capabilities `{code | plan | artifact | orchestration | test | softwarequality }` to match your tool.
   For example:

   ```
   https://<your instance>.service-now.com/api/sn_devops/
   v2/devops/tool/code?toolId=<your ToolId>
   ```

   b. Copy the modified Webhook URL to the **URL** field of the new webhook in your GitLab instance.

5. Copy the **Secret token** field from the ServiceNow instance connection details for GitLab, and paste in the **Secret Token** field of the new webhook in your GitLab instance.

### Copy field values

| From DevOps Change Velocity | To GitLab |
|---|---|
| Webhook URL (modified) | URL |
| Secret token | Secret Token |

6. Select the check boxes for **Push events**, **Tag push events**, **Comments**, and **Merge request events** for coding capability events.

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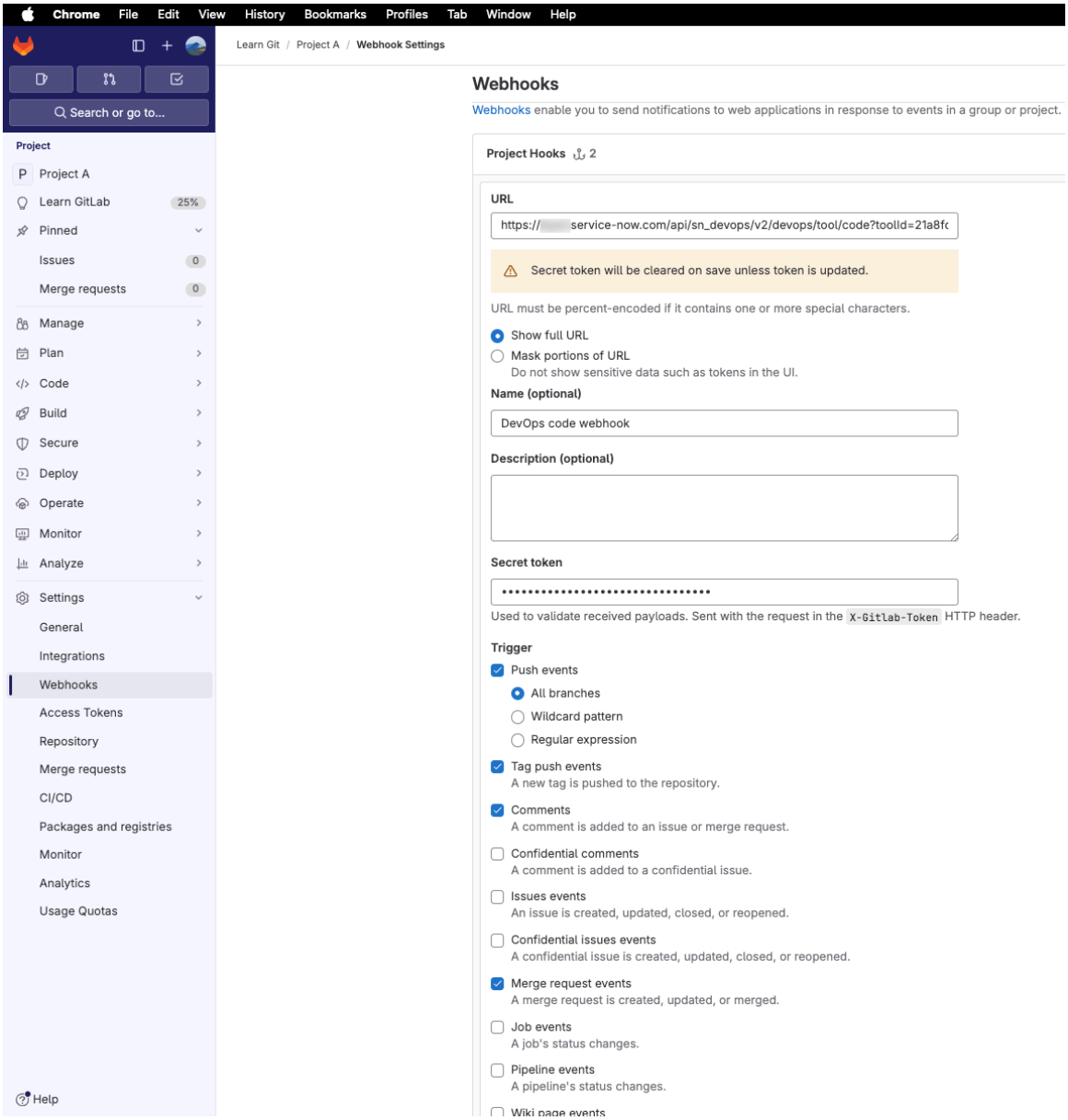


7. Select **Add webhook**.
8. Repeat the procedure to create webhooks for planning and orchestration capability events in GitLab.

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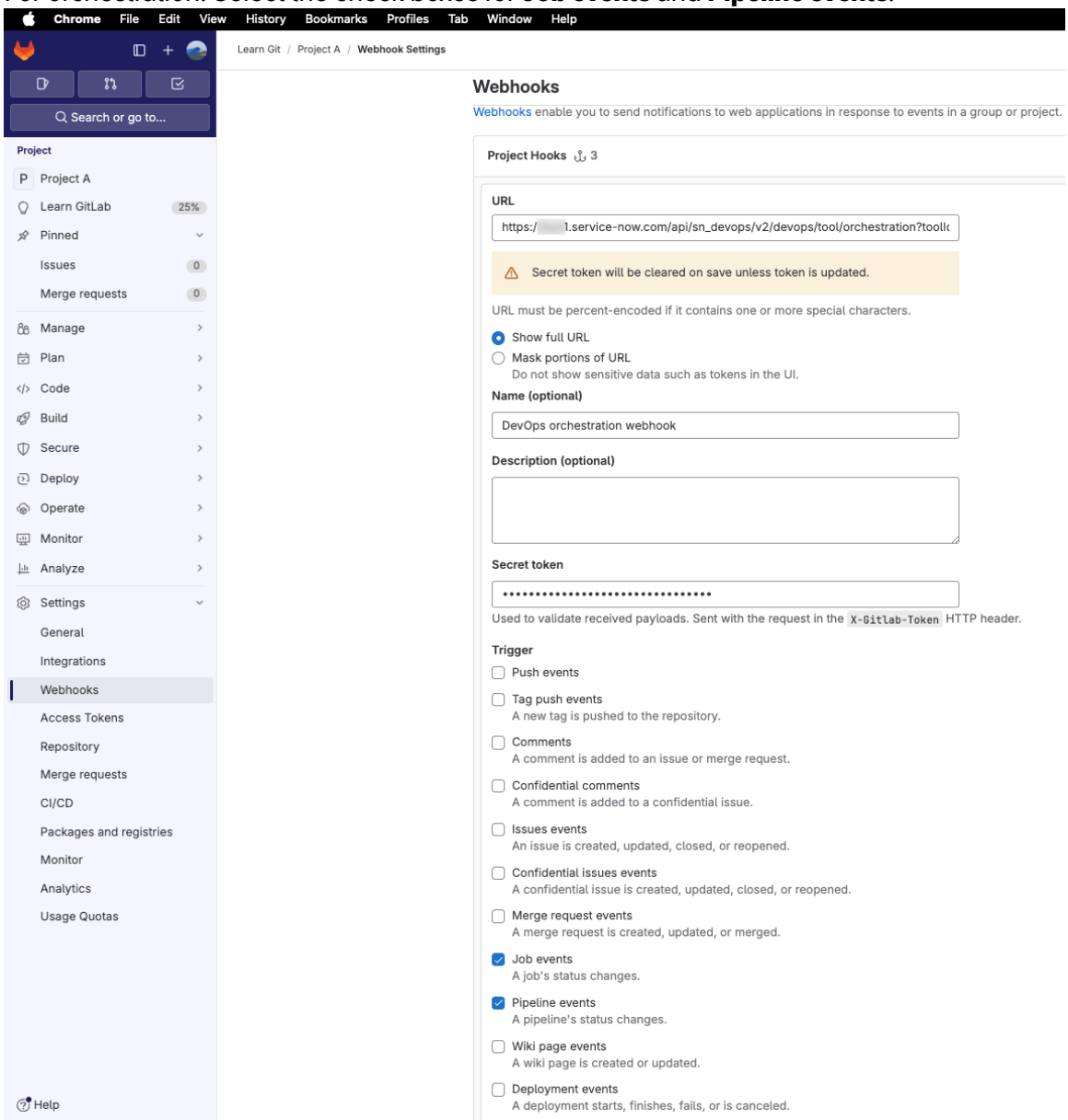
- For orchestration: Select the check boxes for **Job events** and **Pipeline events**.

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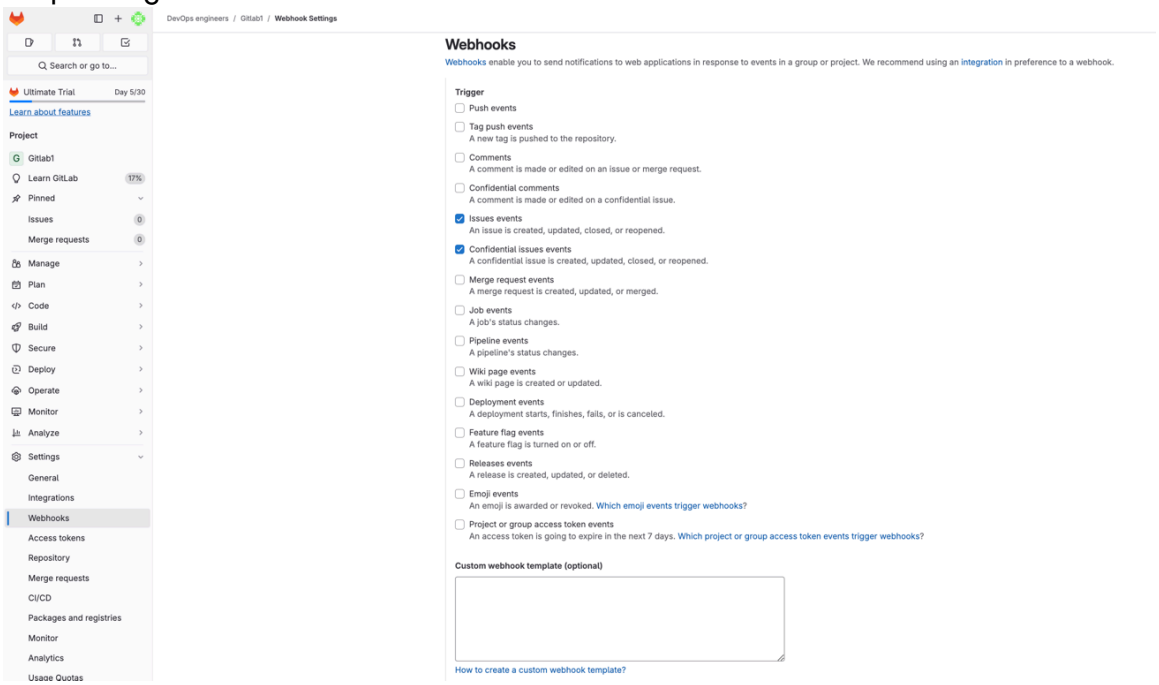
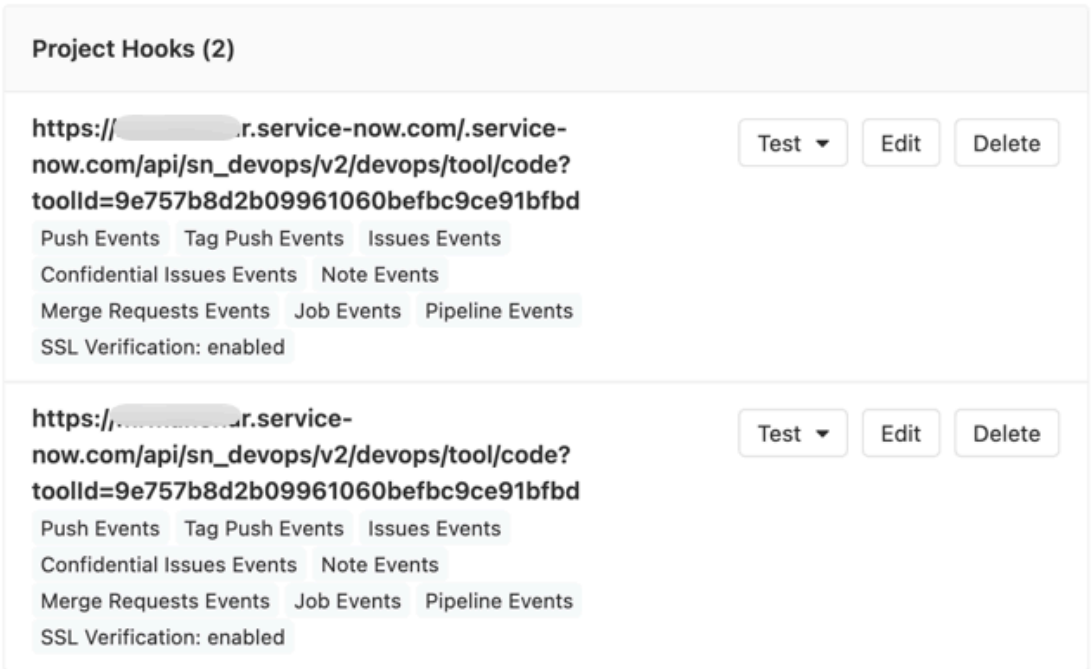
- For planning: Select the check boxes for **Issues events** and **Confidential issues events**.




9. Select **Add webhook**.

GitLab webhooks for DevOps Change Velocity integration:




### Change acceleration in GitLab

Change acceleration is supported in DevOps Change Velocity for GitLab jobs.

Change acceleration can be enabled using the following ways:

- Using ServiceNow custom actions for GitLab
- Using manual jobs

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## Publishing test results from GitLab pipelines

JUnit test type integration is supported for GitLab. GitLab unit test reports support test reports only in the JUnit report format. You can convert different test types to JUnit and persist it. For detailed information, see Unit test reports and Unit test report examples.

Test tool integration lets you view test results in DevOps for GitLab unit, functional, and performance tests.

### GitLab pipelines with parallel jobs

GitLab Docker Image supports change creation in GitLab pipelines containing parallel jobs.

**Note:**
If your GitLab pipeline has parallel jobs, it is better to use the GitLab Docker Image, rather than *when:manual*. For detailed information about GitLab Docker Image, see Implement custom actions for pipelines using generic Docker container image.

Sample yaml pipeline demonstrating parallel jobs:

```
image: servicenowdocker/sndevops:3.1.0  # Update docker version
 per your current version.
stages:
  - pre-build
  - build
  - test
  - pre-prod
  - prod


Scan PreProd:
  stage: pre-build
  script:
    - echo $CI_JOB_NAME

Check policies in PreProd:
  stage: build
  needs:
    - job: "Scan PreProd"
  script:
    - exit 1  # Simulating a failed test job
  allow_failure: true  # Allow this job to fail without stopping
 the pipeline

Check policies in Prod:
  stage: build
  needs:
    - job: "Scan PreProd"
  script:
    - echo $CI_JOB_NAME

Deploy App in Test:
  stage: test
  needs:
    - job: "Scan PreProd"
  script:
    - echo $CI_JOB_NAME
```

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```
Deploy App in PreProd:
  stage: pre-prod
  needs:
    - job: "Deploy App in Test"
    - job: "Check policies in PreProd"
  allow_failure: false
  script:
    - echo $CI_JOB_NAME
    - sndevopscli create change -p
 "{\"changeStepDetails\":
{\"timeout\":3600,\"interval\":100},\"autoCloseChange\":true}"



Deploy App in Prod:
  stage: prod
  needs:
    - job: "Deploy App in PreProd"
    - job: "Check policies in Prod"
  allow_failure: false
  script:
    - echo $CI_JOB_NAME
    - sndevopscli create change -p
 "{\"changeStepDetails\":
{\"timeout\":3600,\"interval\":100},\"autoCloseChange\":true}"
```

### Change acceleration for manual jobs

Enable change tracking for the pipeline in the tool record page in DevOps Change Velocity.

The GitLab job under change control must have these instructions for the pipeline execution to be resumed or canceled via the change request:

- *when:* `manual`
- *allow_failure:* `false`

For example:

```
deploy:
  stage: deploy
  tags:
    - local-runner1
  when: manual
  allow_failure: false
  script:
    - echo 'Deploy'
```

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**Note:**
For *when:manual* based changes, for a change request to get created at a certain stage, all the previous stages must complete successfully. If any of the previous stages is not invoked or not successful, even though there is no dependency of the current stage on its immediate previous stage, a change request will not get created in ServiceNow.

GitLab pipeline parallel stages is supported with GitLab Docker Image. For more details, see GitLab pipelines with parallel jobs and Implement custom actions for pipelines using generic Docker container image.

Refer to the CI/CD pipeline configuration reference for more information on how to configure a GitLab job.

Additional considerations:

- If *allow_failure* is set to `true`, the pipeline continues even when the change is rejected.
- A user with the appropriate role access in GitLab can unblock and continue a pipeline regardless of the change request state.

**GitLab change acceleration behavior**

| Manual execution | Change acceleration in step | Change request approved | Result |
|---|---|---|---|
| Yes | Yes | N/A | If the manual job is under change control, the change is automatically created. |
| | | Yes | The manual job is automatically executed. |
| | | No | The manual job is automatically rejected/failed. |
| | No | N/A | The manual job waits for manual intervention from the pipeline owner via the GitLab UI (default behavior). |
| No | Yes | N/A | The change request is not created. |

**Note:**
Parallel jobs are displayed sequentially, based on the order in which the jobs are queued for execution.

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# Jenkins integration with DevOps Change Velocity

Connect to your Jenkins instance to discover pipeline definitions and configure real-time notifications or polling to enable change traceability and automation.

## Jenkins integration overview

DevOps Change Velocity supports Orchestration capability for the Jenkins tool and various kinds of pipeline types like Single Pipeline, Multibranch Pipeline, Folder, and Freestyle project types. For Folder, three levels are supported by default. Integrating Jenkins with DevOps Change Velocity enables you to retrieve the data from your Jenkins pipeline for end-to-end traceability and policy creation for change automation.

## Get started

### Onboard Jenkins to DevOps Change velocity

Connect your Jenkins instance to DevOps Change Velocity to retrieve data like artifacts, test results, scan results, and so on from your Jenkins pipelines. We recommend that you onboard using Workspace Onboard Jenkins to DevOps Change Velocity — Workspace for an intuitive experience.

You can connect to using one or both of the following authentication methods:

- Basic authentication, using the DevOps Integration User credentials.

  For more information about the integration user credentials, see Set up integration user account in DevOps Change Velocity.

- Secret token generated during tool connection.

### Set up Jenkins plugin to send real-time data

Automatically configure Jenkins to send real time notifications for your pipeline executions to DevOps Change Velocity. Real time notifications are ideal to maintain the most up-to-date information, particularly for automating change requests. For more information on setting up the plugin, see Configure Jenkins plugin.

**Note:**

- If you're using DevOps Config, it's recommended to connect to Jenkins using basic authentication.
- You must ensure that the basic authentication credentials and secret token used are valid.

**Note:**
Jenkins also supports testing capabilities with J Unit. Test tool integration lets you view test results in DevOps for Jenkins unit, functional, and performance tests.

Use one of the following options to onboard Jenkins. For a guided experience, use the workspace to onboard a tool. Alternatively, you can use the Service Catalog or Classic experience.

### Onboard Jenkins to DevOps Change Velocity — Workspace

Connect to your Jenkins instance using the DevOps Change Workspace playbook to discover pipelines.

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### Before you begin

Complete the tasks specified in the Getting started with DevOps Change Velocity topic.

Install and enable the **ServiceNow DevOps** plugin for Jenkins. If you've already installed it, update to the latest version. For instructions, see Configure Jenkins plugin.

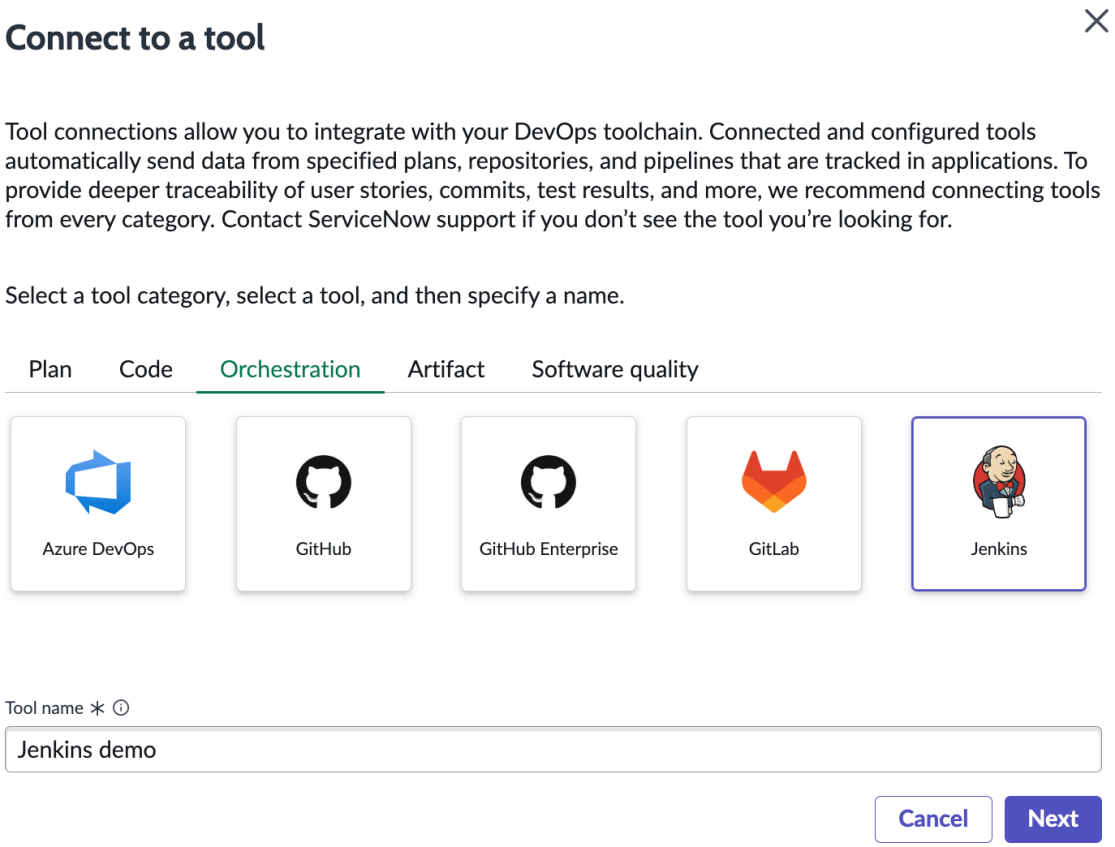
Role required: sn_devops.admin or sn_devops.tool_owner

### Procedure

1. Navigate to **Workspaces** > **DevOps Change Workspace** and use one of the following options to open the playbook to onboard Jenkins.
   You can connect a tool from an application if you also know which specific pipelines should be associated and tracked under that application to streamline the setup. This will allow you to easily associate and import data from Jenkins as well.

   **Important:**
   If you want to discover and track tool objects like pipelines while connecting to the tool, you must connect your tool from the Application module.

2. In the **Tool name** field, enter a name for the tool.




3. On the **Jenkins instance details** playbook activity:

   a. Enter the URL of your Jenkins instance.

   b. Enter the login credentials (password or access token or API token) of the Jenkins instance. To generate API token, see Connect to Jenkins using API token authentication.

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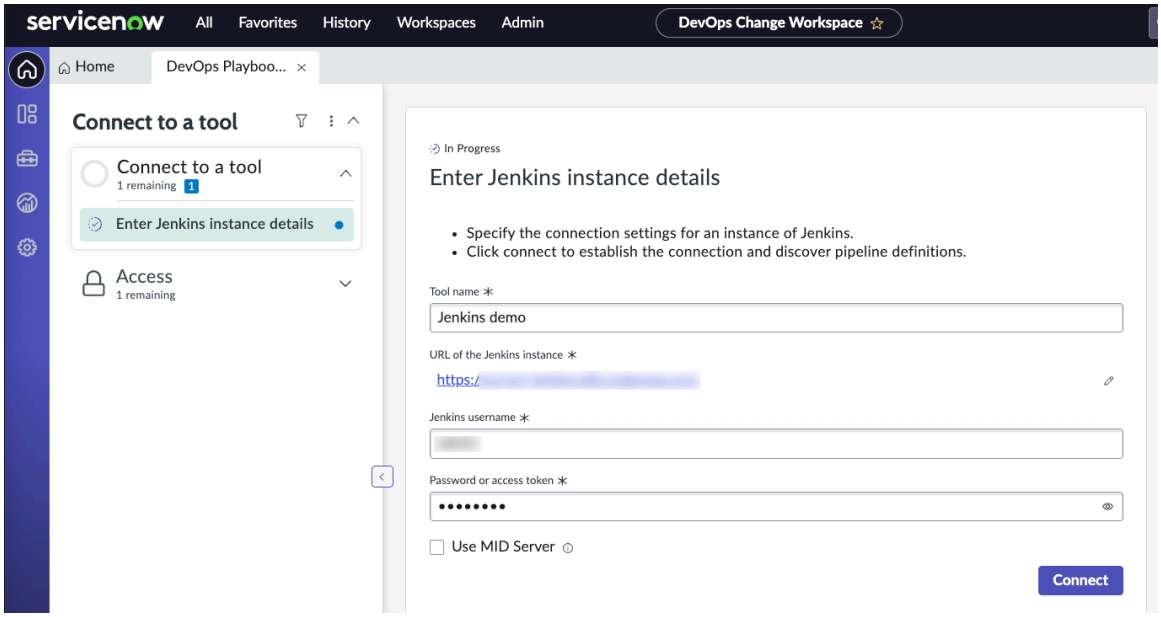
c. If your Jenkins instance is attached to a MID Server, select the MID Server option and enter its details.
A MID server is required if your tool instance is hosted on-prem. For more information about MID server, see MID Server selection

4. Select **Connect**.




5. Permission checks are run on the credentials that you entered.
Permissions required and permissions that are available are displayed. If you want to enter credentials with better permissions, select **Re-enter credentials**. For detailed information on all the required permissions, see Jenkins permissions in Permissions required for DevOps tools.

You can choose to continue with the tool connection even if you don't have all the required permissions.

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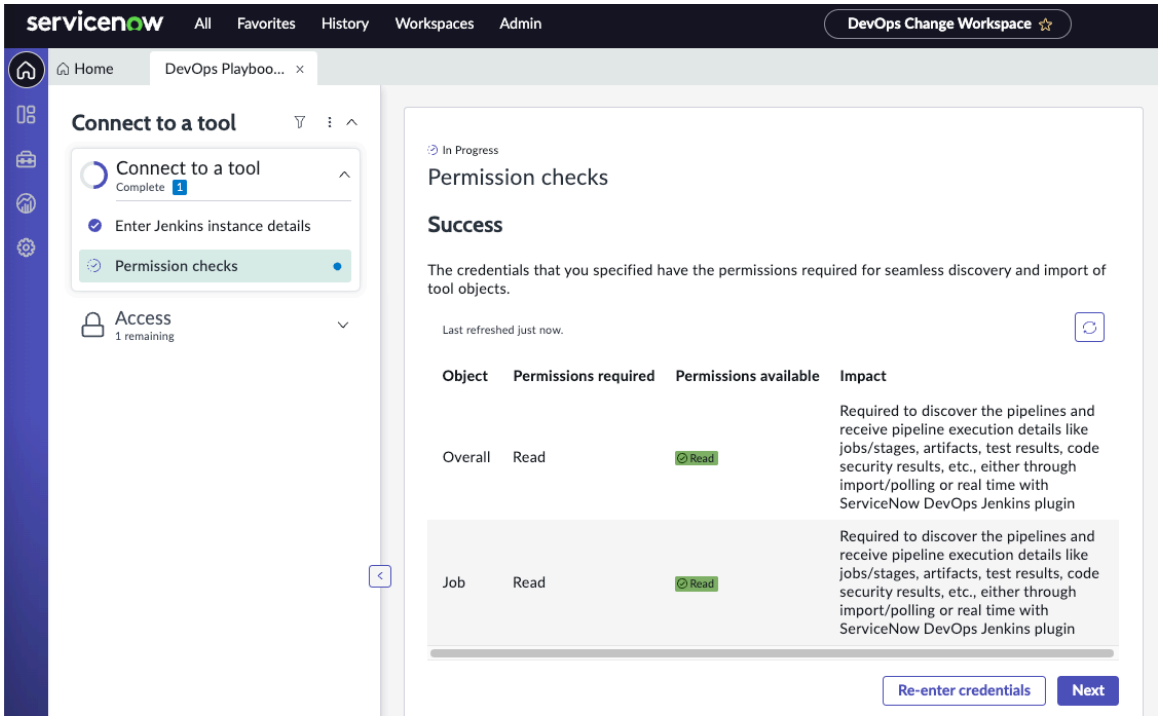


6. Select **Next**.
7. Specify the access for the tool.
   a. If you want to control access to the tool, add the groups that must be given access to the tool in the **Maintained by** field.

      The tasks these users in the groups can perform depends on the role assigned to them.

      - DevOps Tool Owner role: Can view and edit the tool.
      - DevOps App Owner role: Can view the tool and can associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects (such as plans, repositories, and pipelines).
      - DevOps Administrator role: Can edit all tools.
      - Other DevOps roles: Can view the tool.

      **Note:**
      If you don't select a group and skip this step, all users with the DevOps Tool Owner role will be able to edit the tool.

   b. If you choose to control access to the tool, the **All App Owners can view and associate tool objects to applications** option becomes available for selection.

      This option enables all users having the DevOps App Owner role to access the tool. If selected, they'll be able to view, associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects.

   c. Select **Assign**.

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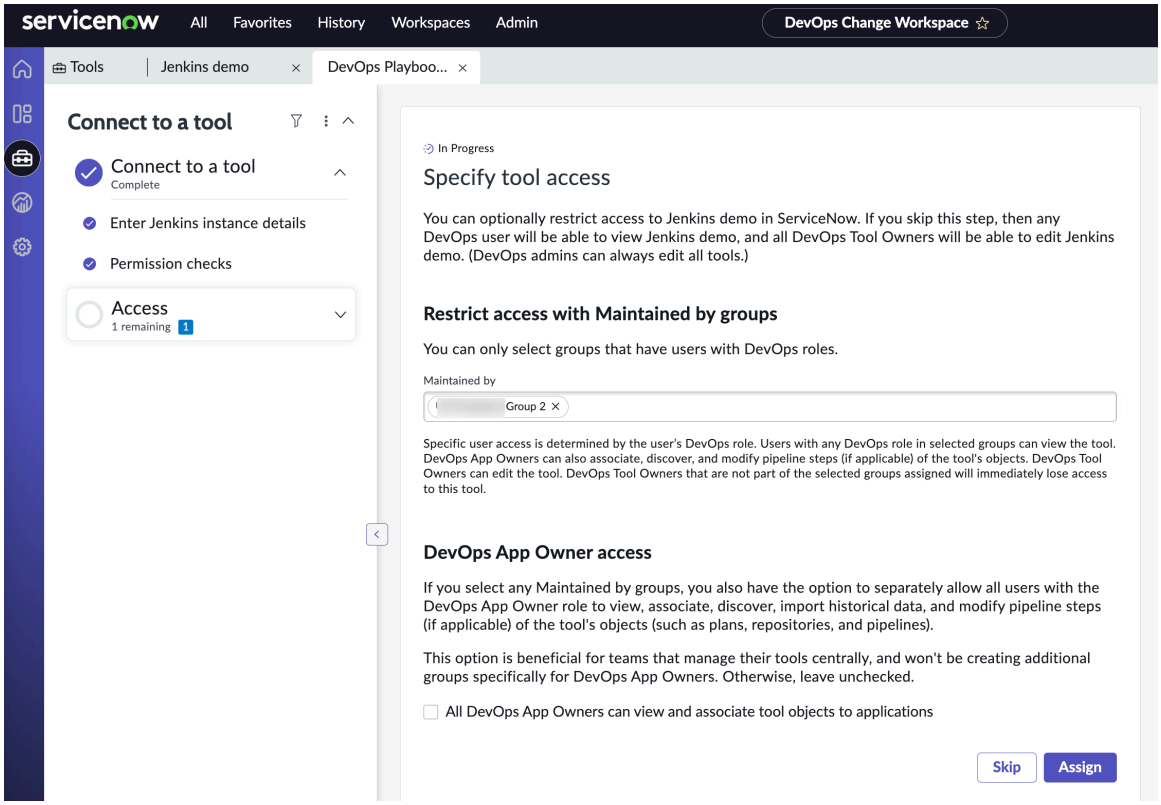
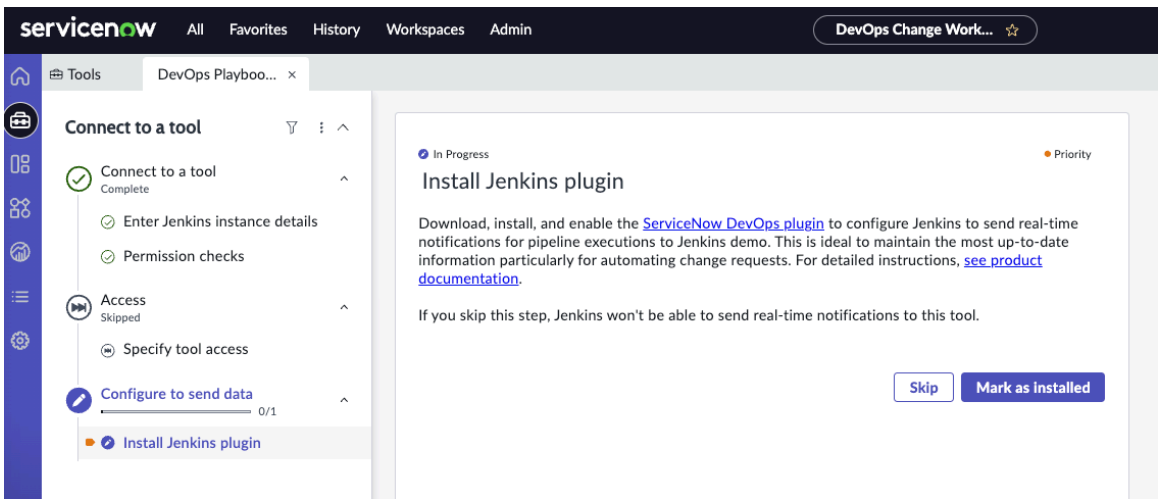



8. Install the ServiceNow DevOps plugin for Jenkins.

   For more information on the extension, see Configure Jenkins plugin.




9. Select **Configure** to automatically set up **ServiceNow DevOps Configuration** in your Jenkins instance.

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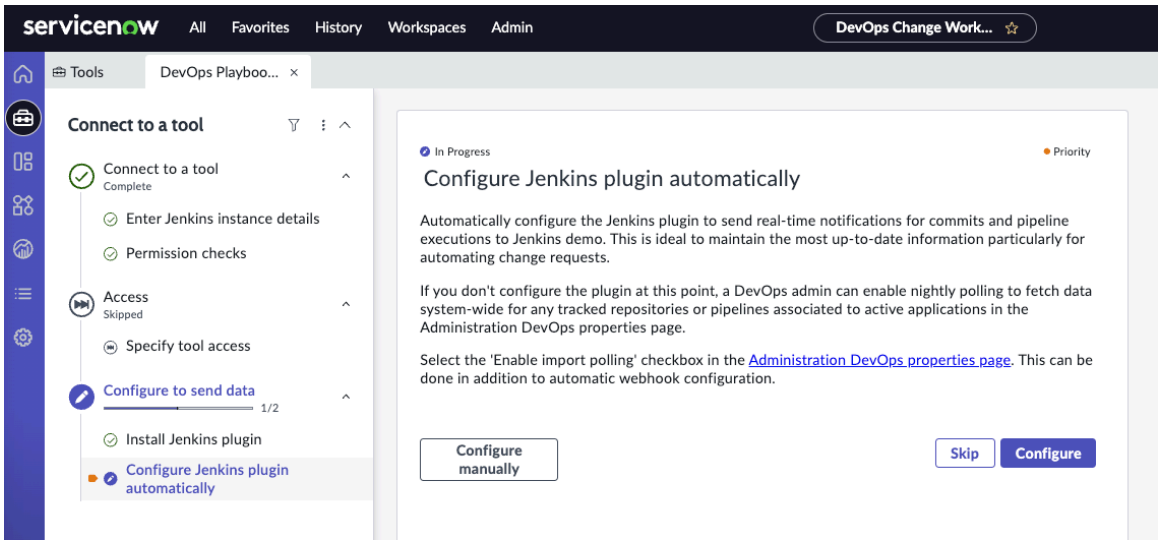
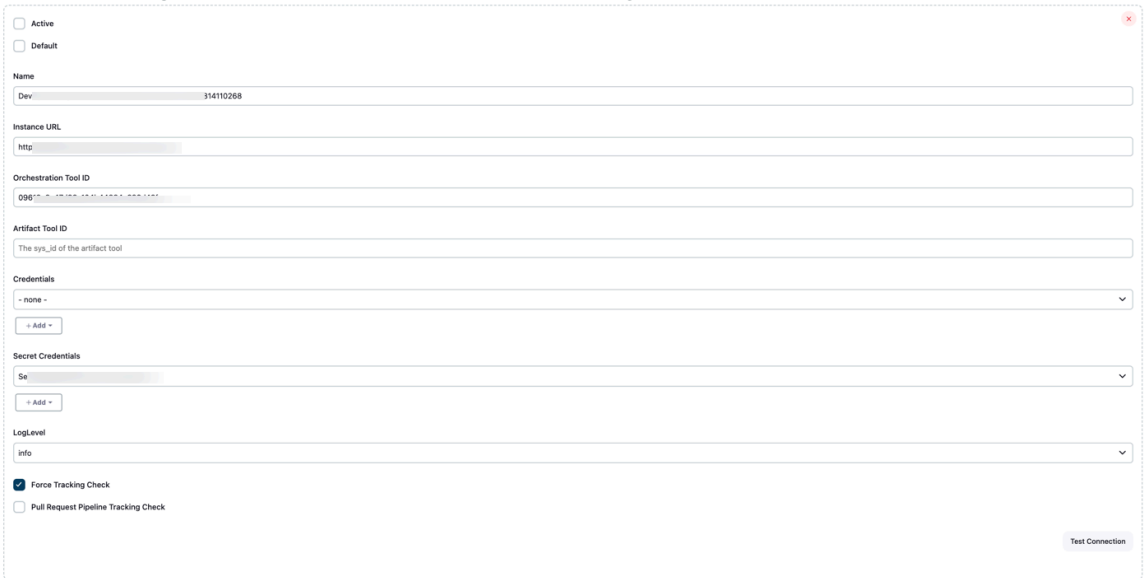
**Important:**

- You must first install and enable the **ServiceNow DevOps** plugin for Jenkins. If you've already installed it, update to the latest version. For instructions, see Configure Jenkins plugin.
- To configure webhooks automatically, Jenkins admin access is required.
- If you choose to automatically configure this tool, then the existing set up for **ServiceNow DevOps Configuration** in Jenkins will be over-written.
- You can add a total of ten ServiceNow configurations.




**Automatically sets up ServiceNow DevOps Configuration in Jenkins**




To configure webhooks manually in Jenkins, see Configure webhooks manually for Jenkins.

You can also choose to enable nightly polling to retrieve data for any tracked pipelines by selecting the **Enable Polling** property option in the **Administration** module. See DevOps Change Velocity properties.

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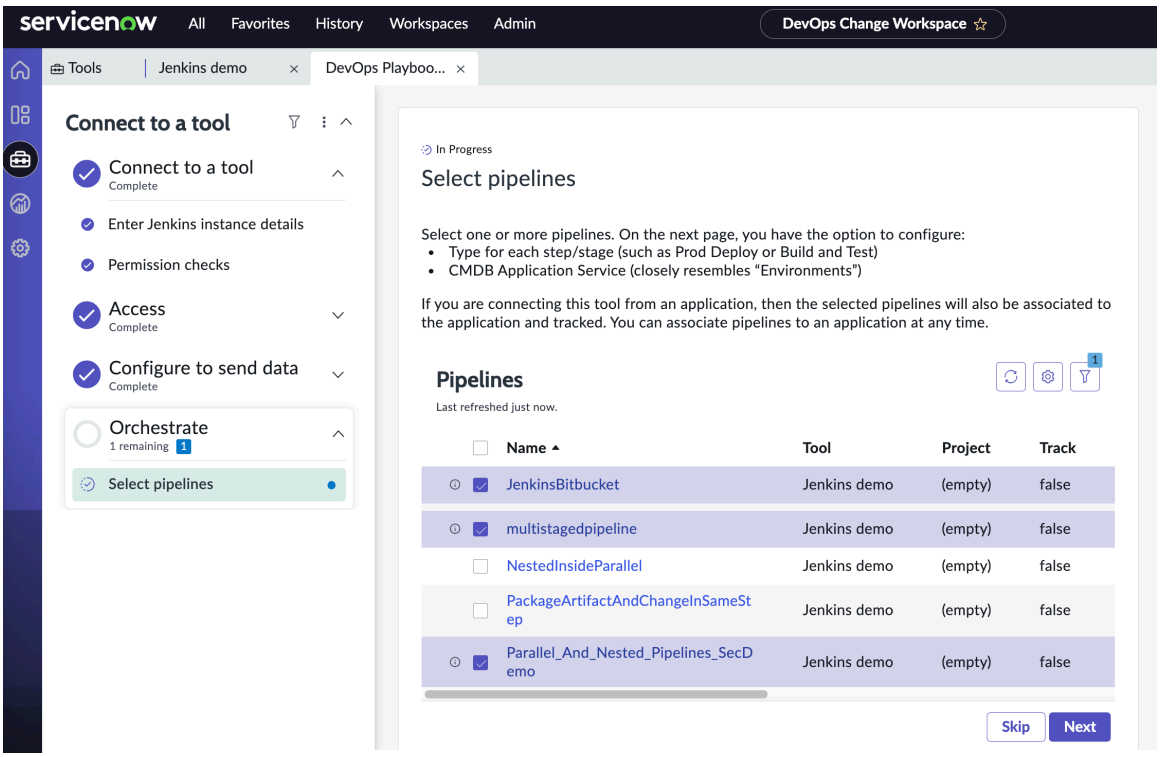
**Important:**

- If you're connecting from the Home page or Tools module, the connection is complete and you're taken to the Summary page.
- If you're connecting from the Applications module, then pipelines available in your instance are discovered. You can track and import historical data from them.

10. Select the pipelines that you want to track from **Select pipelines** playbook activity. For each selected pipeline, all steps are imported for the last successful execution.




11. **Optional:** In the Assign services to pipeline steps activity, specify **Step type** and **Service** for each pipeline step.

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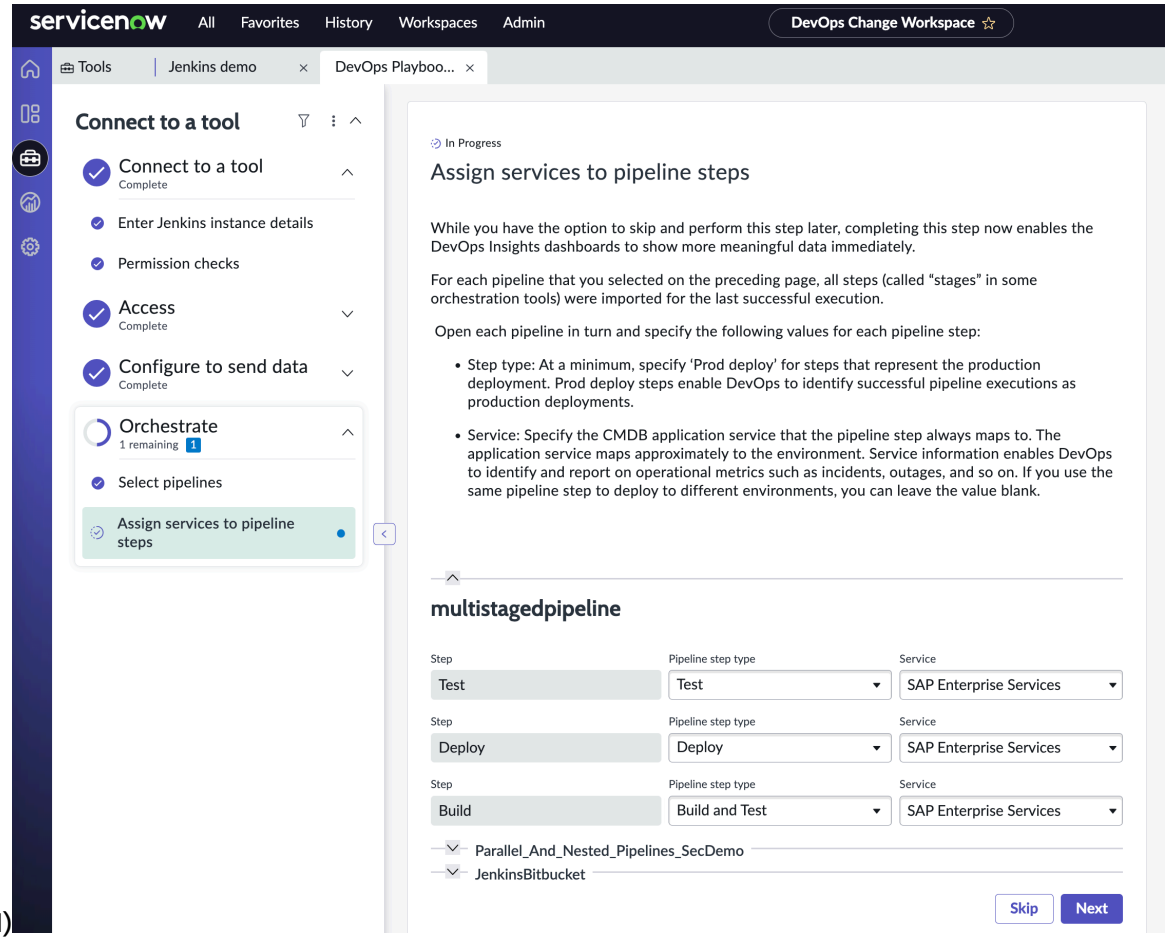
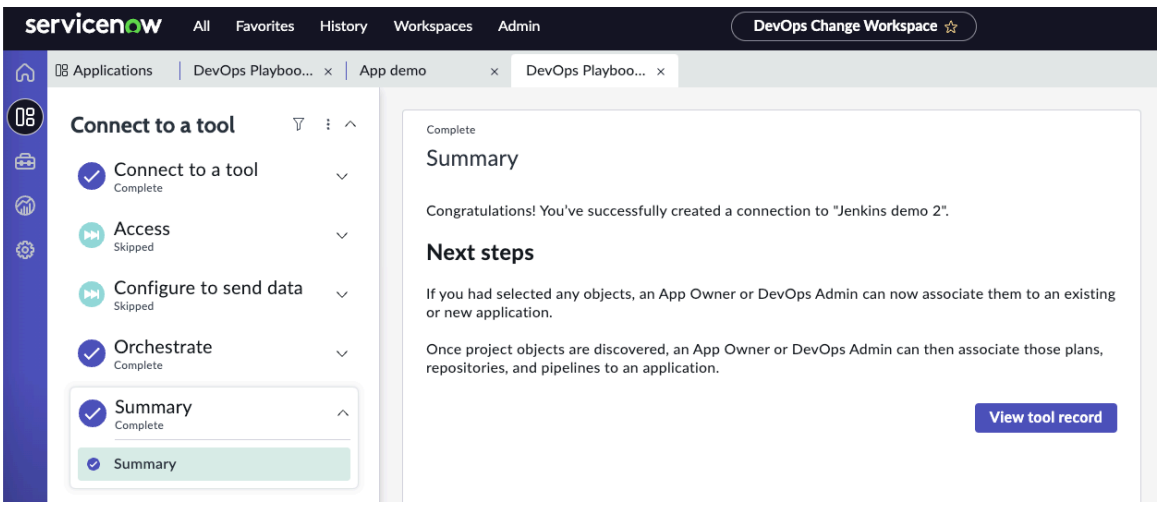



(Optional)

Completing this step as part of tool onboarding enables the DevOps Insights dashboards to show more meaningful data immediately.

12. If you want to import pipeline data, select the date range and select **Submit**.
13. From the **Summary** page, select **View tool record**to review the details of the connected Jenkins tool.




**Note:**
If your tool credential has changed, you must update the credentials in your ServiceNow instance. For more information, see Update third-party tool credentials in DevOps Change Velocity.

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### Result
You've successfully onboarded your Jenkins tool to DevOps Change Velocity.

### Related topics
Configure webhooks from the tool record

## Onboard Jenkins to DevOps Change Velocity — Service Catalog

Connect your Jenkins instance using the ServiceNow Service Catalog to retrieve data like artifacts, test results, scan results, and so on.

### Before you begin
Role required: sn_devops.admin or sn_devops.tool_owner

### Procedure
1. Navigate to **All** > **Service Catalog** > **Catalog Definitions** > **Maintain Items** and search for DevOps.

   **Note:**
   You can also access the service catalog from Employee Center or Service portal.

2. From the DevOps catalog items, select and activate **DevOps App Onboarding** and **DevOps Tool Onboarding**.
3. After activating, select **DevOps Tool Onboarding** and select **Try it**.
4. In the DevOps Tool Onboarding form, enter the tool details:

| Field | Description |
|---|---|
| Tool name | Name for your Jenkins integration. |
| Tool integration | Select Jenkins. |
| Tool URL | URL for your Jenkins instance. |
| Tool username | Username for your Jenkins instance. |
| Tool password/ Access token | Access credentials for your Jenkins instance. |
| Use MidServer | Optional. Select#MID Server#for an on-premises tool that is attached to a#MID Server. Application is automatically set to #DevOps and capability is set to REST. |

   For a list of all the permissions required on the credentials for connecting to Jenkins, see Jenkins permissions in Permissions required for DevOps tools.

5. Select **Order Now**.
   A request is created. When the request is approved, the tool is connected and discovered.
6. From the DevOps catalog items, select **DevOps App Onboarding**.
7. In the DevOps App Onboarding form, enter the details:

| | |
|---|---|
| Are you creating a new app or adding to an existing one? | Select from the options whether to create a new app or use an existing app. |

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| | |
|---|---|
| App | Enter the name for the app that you're creating or using. |
| Onboarding pipelines | Enter the connected Jenkins tool name. |
| Pipelines | Select the pipelines for which you want to configure webhooks and import historical data. |
| Import from and Import to | Select the dates for which you want to import the data. By default, the last 30 days are selected. You can choose to import data for a maximum of 90 days. |
| Onboarding repositories | Leave empty. |
| Onboarding plans | Leave empty. |

8. Select **Order Now**.
   A request is created. When the request is approved, the pipeline objects are associated to the app record, which enables real-time tracking. Historical data is also imported for the selected pipelines. The **Track** field is automatically enabled for imported pipelines.

### Onboard Jenkins to DevOps Change Velocity — Classic

Connect your Jenkins instance to discover and track your pipelines, and import your orchestration tasks for end to end traceability and change automation.

#### Before you begin

Role required: sn_devops.admin or sn_devops.tool_owner

Install and enable the **ServiceNow DevOps** plugin for Jenkins. If you've already installed it, update to the latest version. For instructions, see Configure Jenkins plugin.

#### About this task

Actions:

- **Connect** to Jenkins and get the webhook URL when you submit a DevOps tool record.
- **Discover** orchestration tasks and pipelines.
- **Import** task execution and step execution records.

**Note:**
You can authenticate your connection with Jenkins using Jenkins API tokens. For more information, see Connect to Jenkins using API token authentication.

#### Procedure

1. Create a tool record in DevOps to automatically connect to Jenkins and get the webhook URL.

   a. Navigate to **DevOps** > **Tools** > **Create New (legacy)** and create a record.

   b. Enter a **Tool Name** and fill in the tool details.

| | |
|---|---|
| Tool Integration | Jenkins |
| Tool URL | Jenkins tool URL |

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| | |
|---|---|
| | For example:<br>`https://jenkins.com` |
| Tool Username | Jenkins user name |
| Tool Password / Access Token | Jenkins password, access token or the API token you generate.<br>**Note:**<br>To generate API token, see Connect to Jenkins using API token authentication. |

For a list of all the permissions required on the credentials for connecting to Jenkins, see Jenkins permissions in Permissions required for DevOps tools.

**c.** Select MID Server for an on-premises tool that is attached to a MID Server.
The Application value is automatically set to DevOps and the Capability value is set to REST.

**d.** Click **Submit**.
The tool is connected successfully.

On successful tool creation, you're taken to the tool record page.

**2.** If you want to control access to the tool, add the groups that must be given access to the tool in the **Maintained by** field on the **Access** tab.

The tasks the users in the groups can perform depends on the roles assigned to them.

- DevOps Tool Owner role: Can view and edit the tool.
- DevOps App Owner role: Can view the tool and can associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects (such as plans, repositories, and pipelines).
- DevOps Administrator role: Can edit all tools.
- Other DevOps roles: Can view the tool.

**Note:**
Only groups containing users with DevOps roles are available for selection in the **Maintained by** field.

The **All App Owners can view and associate tool objects to applications** option becomes available for selection if you choose to restrict access to the tool. This option enables all users having the DevOps App Owner role to access the tool. If selected, they'll be able to view, associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects.

**3.** Click **Discover** to discover the existing orchestration tasks (Jenkins stages) and pipelines.

**Note:**
Orchestration tasks and pipelines are discovered for folders nested to the level specified in the *sn_devops.discover.folder.depth* property. For more information, see Properties installed with DevOps.

Records are added to the corresponding related lists.

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4. Open a discovered record from the Orchestration Tasks related list and click the **Import** related link to import historical data from the orchestration task.
   Imported task execution records and step execution records are added to the corresponding related lists.

### Model a Jenkins pipeline in DevOps

Model a Jenkins pipeline by mapping the pipeline to an app, and mapping DevOps pipeline steps to Jenkins stages.

#### Before you begin

The Jenkins plugin for ServiceNow DevOps is provided to enable change acceleration so your orchestration tool can communicate with ServiceNow DevOps and control certain aspects of pipeline executions.

Install the plugin from the Jenkins Marketplace. Navigate to **Manage Jenkins > System configuration > Plugins** in your Jenkins instance. Search for **ServiceNow DevOps Plugin** and select it, and then select **Install**.

Role required: sn_devops.admin

#### About this task

Both scripted pipelines (Jenkinsfile) and freestyle jobs are supported.

For Jenkinsfile pipelines, pipeline steps are created, mapped, and associated to orchestration tasks automatically, instead of manually.

#### Procedure

1. Map your pipeline to an app in DevOps.

   a. Navigate to **DevOps** > **Apps & Pipelines** > **Apps** and open the application record to associate with the pipeline.

   b. In the Pipelines related list, click **Edit...** to select a pipeline to associate with the app, or click **New** to create the pipeline.
   For a new pipeline, fill in the **Orchestration pipeline** field using the full project name as specified in Jenkins.

   **Note:**
   While associating a pipeline with an app, the pipeline steps are also fetched during import.

   c. Click **Submit**.

2. Open the pipeline record again and select the **Track** check box so events from the pipeline are received.

   **Note:**
   The **Track** check box must be selected to integrate the pipeline with DevOps.

3. Create DevOps steps automatically or manually to map to each Jenkins pipeline stage so an orchestration task is created.

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- For declarative or scripted pipelines, run your Jenkins pipeline to automatically create and map pipeline steps in DevOps.

  Pipeline steps are automatically created, mapped, and associated when DevOps receives step notifications from your Jenkins pipeline during the run.

- For freestyle jobs, manually create and map each pipeline step to a Jenkins pipeline job.

  In the Steps related list, click **New** to create a DevOps step for each Jenkins pipeline stage (**Orchestration stage** field)

  **Note:**
  The **Orchestration stage** field value of each step is case-sensitive and must match the original name of the corresponding Jenkins pipeline stage.

| | |
|---|---|
| Name | Name of the pipeline step. |
| Pipeline | Pipeline in which the step is configured. |
| Type | Pipeline step type.<br>▪ Build and Test<br>▪ Test<br>▪ Deploy<br>▪ Deploy and Test<br>▪ Manual<br>▪ Prod Deploy |
| Order | Order in which the steps are run.<br>**Note:**<br>The step order determines the order of the cards in the Pipeline UI.<br>The order of the cards in the Pipeline UI is by task execution. |
| Orchestration stage | Jenkins pipeline stage name (case-sensitive).<br>**Note:**<br>For step association with Jenkins pipeline stages, the **Orchestration stage** field must be configured. |
| Business service | Configuration service that applies to the step. |

  Once orchestration tasks are created, associate each orchestration task in the Orchestration Tasks related list with a DevOps pipeline step.

4. **Optional:** Enable change control automatically or manually based on the type of pipeline.

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- For declarative or scripted pipelines, if you have used the snDevOpsChange script in your pipeline, run your Jenkins pipeline to automatically enable change control. You can also enable change control manually by following the steps provided for freestyle jobs.
- For freestyle jobs, select the **Change control** check box in a step to enable change acceleration and the corresponding configuration fields.

**Note:**
ServiceNow Change Management must be installed for change acceleration.

| | |
|---|---|
| Change receipt | (Optional) Select to enable change receipt for the step so the pipeline doesn't pause when a change request is created.<br><br>All pipeline data is included in the change, but approval is not required for the pipeline to proceed. |
| Change approval group | (Optional) Approval group for the change request.<br><br>The change approval group becomes the **Assignment group** in the DevOps change request.<br><br>**Note:**<br>Ensure that the selected group has members and a group manager so the approver field is not empty. |
| Change type | Change request type to create.<br>▪ Normal (default)<br>▪ Standard<br>▪ Emergency |
| Change model | Change model for the change request. For more information, see DevOps change models. |
| (Optional) Template<br><br>**Note:**<br>This field is shown only when **Change type** is Normal or Emergency. | (Optional) List of templates to use to auto populate fields for Normal or Emergency change requests.<br><br>Select a template or create a new one. |
| (Optional) Standard change template | List of standard change templates to use for Standard change requests. |

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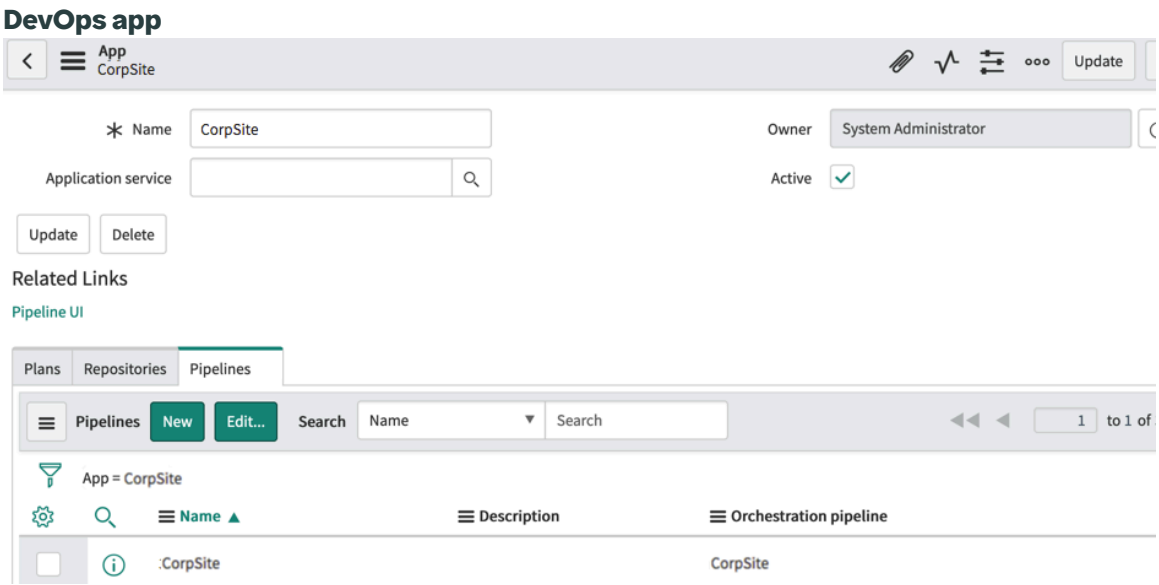
| | |
|---|---|
| **Note:** This field is shown only when **Change type** is Standard. | **Note:** This field is required for Standard change type. |
| Change controlled branches | (Optional) (Multibranch only) Comma-separated list of branches under change control. Wildcards are supported. |

5. Navigate to **DevOps** > **Tools** > **Orchestration Tools** and in the Jenkins tool record, copy the DevOps **Webhook URL** field value.
   The webhook URL contains the DevOps location for Jenkins to send messages, including the sys_id for the tool:

   ```
   https://<devops.integration.user>:<password>@<your-instance>.service-now.com/api/sn_devops/v1/devops/tool/event/{sys_id of the record}
   ```

**Example:**

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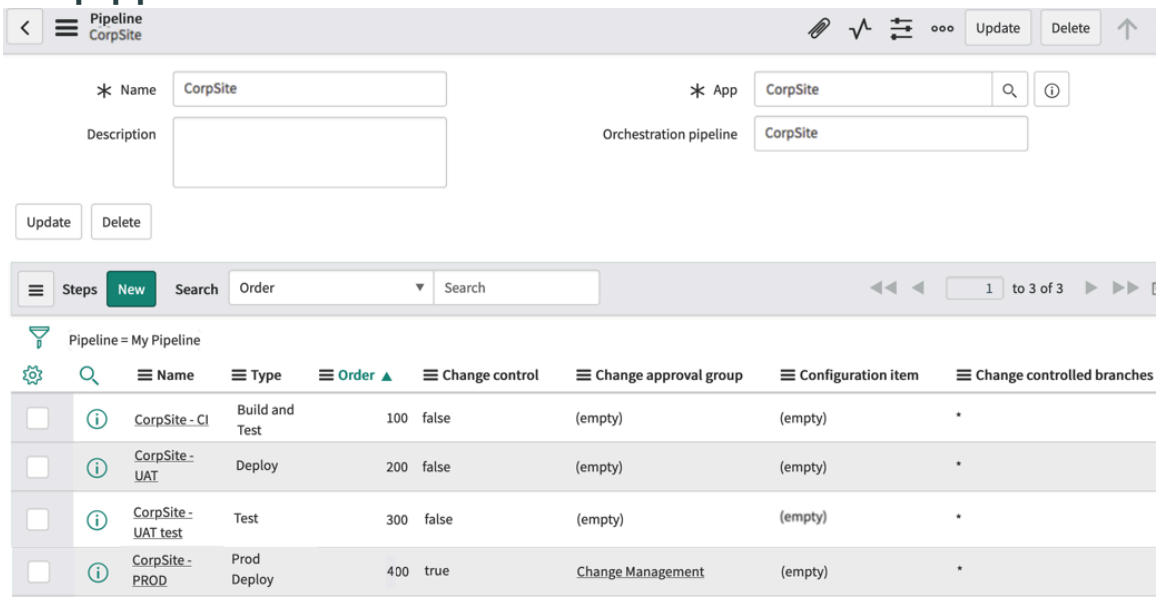
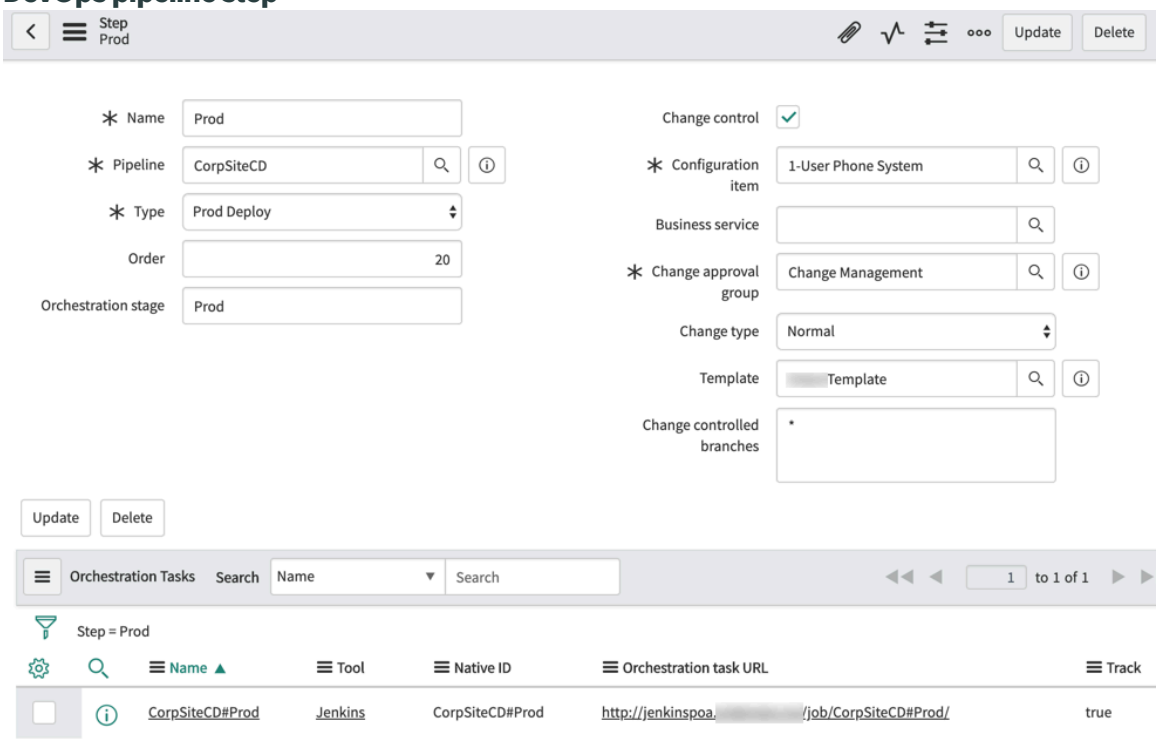
### DevOps pipeline




### DevOps pipeline step




### Additional information - Jenkins

Additional information on Jenkins.

### Configure Jenkins plugin

Configure Jenkins to send real time notifications for your pipeline executions to DevOps Change Velocity.

## Before you begin

Role required: Jenkins admin

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### Procedure

1. Install the **ServiceNow DevOps** plugin from the Jenkins Marketplace by navigating to **Manage Jenkins > System configuration > Plugins** in your Jenkins instance.
2. Search for **ServiceNow DevOps Plugin** and select it, and then select **Install**.

### Related topics

Configure webhooks manually for Jenkins

## Configure webhooks manually for Jenkins

Configure webhooks in Jenkins to send sync notifications to the DevOps Change Velocity application.

### Before you begin

Role required: sn_devops.admin or sn_devops.tool_owner in DevOps Change Velocity, Jenkins admin

### About this task

You can add a total of ten ServiceNow DevOps configurations. For example, you can configure Jenkins connections for your Development, Testing, Production instances, and so on.

If you are an upgrading customer, you must download and install the latest Jenkins plugin to enable multiple ServiceNow configurations. After installation, your existing configuration will be retained and made the default configuration.

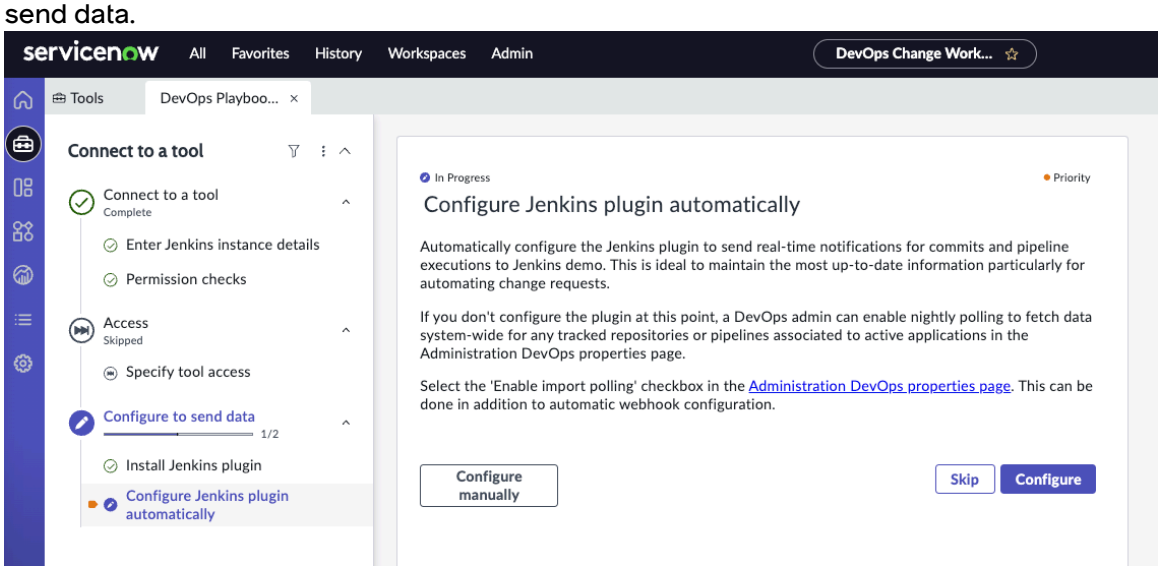
In the ServiceNow DevOps Configuration section in Jenkins, the values in the **Name** field and the combination of the **Instance URL** and **Orchestration Tool ID** fields must be unique.

If you choose to automatically configure a tool from ServiceNow, then the existing set up for ServiceNow DevOps Configuration will be over-written in Jenkins.

If DevOps Config is installed, you will only be able to configure Jenkins manually.

### Procedure

1. In DevOps Change Velocity, choose **Configure manually** when configuring the tool instance to send data.




2. Select **Copy** in the appropriate field to copy the value to your clipboard.

   The field label changes to **Copied**, but you can copy multiple times.

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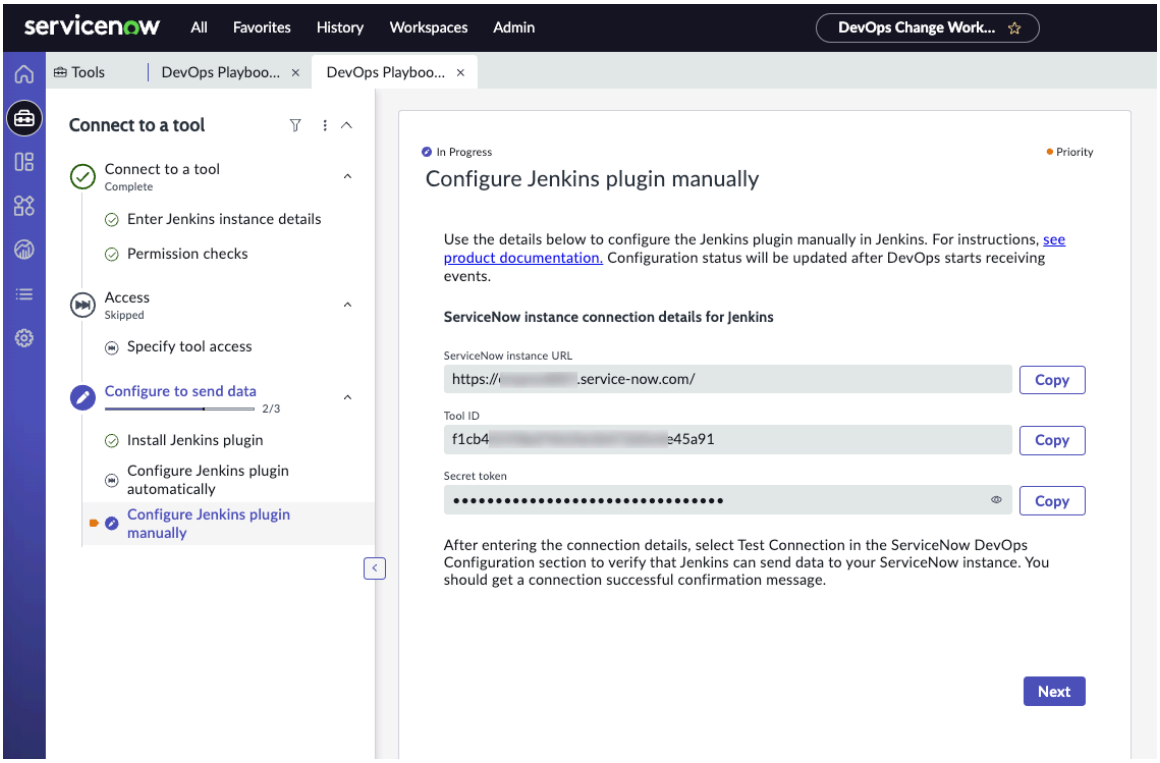


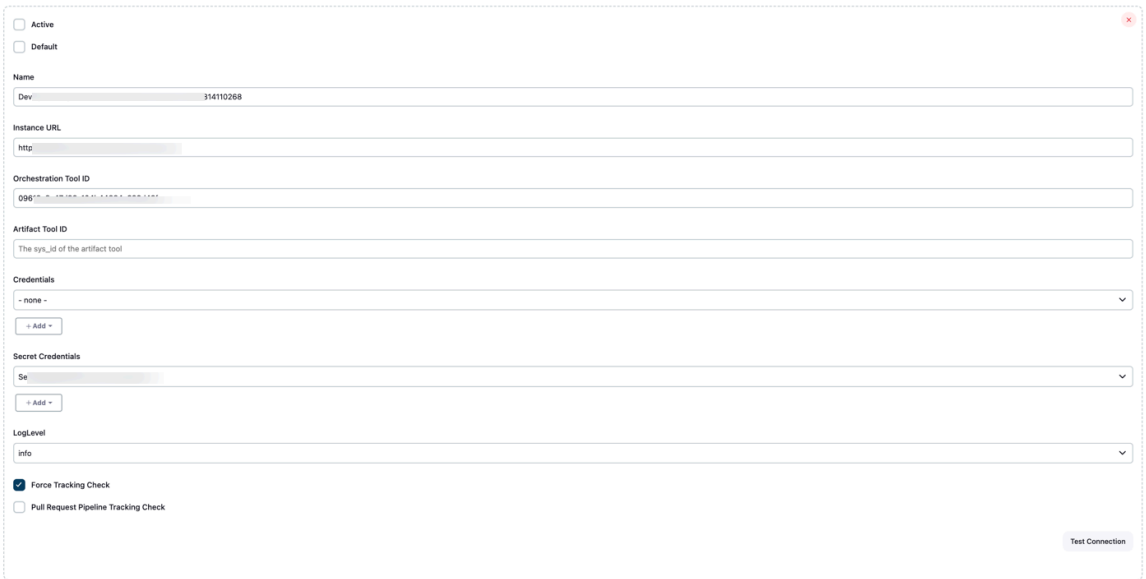

3. In Jenkins, navigate to **Manage Jenkins** > **System configuration** > **Manage Plugins** > **Configure System**.
4. In the ServiceNow DevOps Configuration section, select **Add**.

> **Note:**
> You can add multiple connections by selecting **Add** for each new configuration.

5. Configure the plugin by filling in the fields.

   When enabled, Jenkins starts sending events to DevOps as inbound events.

> **Note:**
> Values are case-sensitive.

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| Field | Description |
| --- | --- |
| Active | Select this option to make the connection active. By default this option is selected when you select **Add** for a new connection.<br><br>**Note:**<br>All the connections that have Active enabled, will send webhook notifications for your pipeline execution,however for the change step only the connection specified will be considered. |
| Default | Select this option to make the connection the default one when the connection name is not passed in an existing step on a pipeline.<br><br>**Note:**<br>Not selecting this option when only one connection is available will result in error. |
| Name | Unique name of the connection.<br><br>**Note:**<br>The name value is auto-generated when you auto configure a connection from ServiceNow. |
| Instance URL | Enter your ServiceNow instance URL you copied in step 2. For example, `https://<your-instance>.service-now.com`. |
| Orchestration Tool ID | The sys_id of the orchestration tool you copied in step 2.<br><br>Alternatively, you can copy this value from the webhook URL (*`toolid`* value), or obtain it directly using the `Copy sys_id` command on the Orchestration Tool record.<br><br>**Note:**<br>The combination of the Instance URL and Orchestration Tool ID values must be unique for each connection. |
| Artifact Tool ID | The sys_id of the artifact tool. |

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| Field | Description |
| --- | --- |
| Credentials | Select the basic authentication credentials that you want to use for connecting to Jenkins.<br>**a.** To add credentials, select **Add**.<br>**b.** In the **Username** field, enter your DevOps Integration User details. By default, it is devops.integration.user.<br>**c.** In the **Password** field, enter your DevOps Integration User password. |
| Secret Credentials | Select the secret token that you copied in step 2. Alternatively, you can perform the following steps to obtain the secret token from the tool record.<br>**a.** Copy the secret token for your Jenkins tool in DevOps Change.<br>▪ Workspace: Navigate to the tool record, select **Configure** and copy the secret token.<br>▪ Classic UI: Navigate to the tool record and select **Copy token**.<br>**b.** To add tokens, select **Add**.<br>**c.** From the **Kind** list, select **Secret text**.<br>**d.** In the **Secret** field, enter the secret token generated while creating the Jenkins tool connection in DevOps.<br>**e.** In the **ID** field, enter a name for the token. |
| Log Level | The level of log messages you want to store in Jenkins logs/ ServiceNow log recorder.<br>Select from one of the following options:<br>○ inherit<br>○ off<br>○ severe<br>○ warning<br>○ info<br>○ config<br>○ fine<br>○ finer<br>○ finest<br>○ all |

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| Field | Description |
| --- | --- |
| | For more information on Log levels and log recorders, see Jenkins log levels and Log Recorders |
| Force Tracking Check | Select the check box to make a REST (POST) API call to Jenkins for each pipeline execution to determine whether the pipeline is tracked or not.<br><br>Clear the check box to store details in the *snPipelineInfo.json* file and stop making API calls for every pipeline execution.<br><br>**Note:** When a pipeline is tracked, all active Jenkins configurations will receive job notifications. |
| Pull Request Pipeline Tracking Check | Select the check box to enable tracking for pull request pipelines.<br><br>**Note:** When a pipeline is tracked, all active Jenkins configurations will receive job notifications. |

6. Select **Test Connection**.
   Verify that the connection successful message displays.
   - If you've added basic authentication credentials, on successful connection, you will see the message: `Connection using 'Credentials' is successful.`
   - If you've added the secret token, on successful connection, you will see the message: `Connection using 'Secret Credentials' is successful.`
7. Select **Apply** to apply the changes and select **Save**.

### Connect to Jenkins using API token authentication

Connect to Jenkins using API token authentication instead of user name and password.

#### Before you begin

Role required:

- Jenkins: admin or any user with overall Read and Job Read roles

#### About this task

You can have multiple active API tokens at the same time and track the usage of your tokens. You can also revoke API tokens as needed. You can also use the Jenkins API token for authentication when you're using the Jenkins CLI.

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### Procedure

In the Jenkins banner frame, click your user name to open the user menu.

**a.** Navigate to **Your Username** > **Configure** > **API Token**.

**b.** Click **Add new Token**.

**c.** Click **Generate**.

**d.** Copy the API token that is generated

**Note:**

- Regenerate the tokens every 6 months (depending on your context). Jenkins displays an indicator concerning the age of the token
- Use a different token for each application so that if an application is compromised you can revoke its token individually.
- If your token expires, regenerate the token and update it in the ServiceNow AI Platform instance
- ServiceNow DevOps DevOps does not support using Legacy API Tokens because Jenkins does not recommend the use of Legacy API Token. For more information, see the Jenkins blog post.

#### Reduce calls from Jenkins to ServiceNow DevOps to fetch pipeline information

Enable the Force Tracking Check field in the Jenkins configuration form to create a pipeline tracking file in Jenkins. ServiceNow DevOps makes a REST call to Jenkins to update the tracking file when the Track field in a pipeline is modified.

## Force Tracking Check

The ServiceNow DevOps configuration section in Jenkins includes a **Force Tracking Check** check box to reduce the number of calls made from Jenkins to DevOps to fetch pipeline information such as pipelines being tracked. Base-system flows:

- DevOps Jenkins File Update- Track flow
- DevOps Jenkins File Update- Test Info flow

## How it works

In previous versions, a REST call fetched the pipeline information for every Jenkins build triggered. If you had multiple pipelines in your Jenkins environment and were tracking only a few of them, this meant that a call was made to fetch the tracking information for each pipeline even if you were tracking a few of them.

The first time you trigger a Jenkins build or pipeline execution, Jenkins makes a pipeline information API call and creates *`snPipelineInfo.json`* file in `/{JENKINS_HOME}/jobs/{jobName}` directory. For each subsequent pipeline execution Jenkins checks the information available in the *`snPipelineInfo.json`* file before making a pipeline info API call.

If you disable the **Force Track Check** check box:

- The DevOps Jenkins File Update- Track flow triggers when you update the **Track** field on the pipeline form. The **Track** field info is updated in the *`snPipelineInfo.json`* file.
- DevOps Jenkins File Update- Test Info flow triggers when you update Test type mapping for Jenkins tool integration and verify that Test info is updated in *`snPipelineInfo.json`* file.

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If you enable the **Force Track Check** check box, Jenkins makes pipeline info API calls to DevOps even if track/test information exists in the *snPipelineInfo.json* file.

### Using a declarative or scripted pipeline in DevOps

When you use a Jenkinsfile, steps are created, mapped, and associated to orchestration tasks automatically instead of manually.

Jenkinsfile is a text file that contains the definition of a Jenkins pipeline and is checked into source control.

Each root-level stage configured in the Jenkinsfile is discovered as a separate orchestration task in DevOps that is mapped to an individual step.

**Note:**
The **Track** field for the pipeline must be set to **True** in DevOps to receive job notifications from Jenkins. All active Jenkins configurations will receive job notifications when this field is set to **True**.

## DevOps Jenkinsfile commands

- *snDevOpsChange(ignoreErrors:{true/false},changeRequestDetails:{setCloseCode:{true/false},attributes:})*

  Where *ignoreErrors* specifies the setting to prevent job failure if there is an error (true/false)

  Where *changeRequestDetails* specifies closure code and change request fields from within the pipeline

  Enables change control for each root-level stage that is mapped to a DevOps step.

- *snDevOpsArtifact*

  Registers artifacts when configuring Artifacts and packages.

- *snDevOpsPackage*

  Creates a package for artifacts when configuring Artifacts and packages.

- *snDevOpsGetChangeNumber*

  Retrieves the change request number in a Jenkins pipeline based on specific change details.

- *snDevOpsUpdateChangeInfo*

  Updates the change request details associated with a Jenkins pipeline.

- *snDevOpsSecurityResult*

  Configures security scans on any stage of the pipeline and the scan details are retrieved from the corresponding stage to DevOps Change Velocity.

You can specify the Jenkins server configuration in any of these steps by passing the *configurationName* attribute in your pipeline. If the configuration name is not specified in any step, the default configuration will be used in that step. Passing an incorrect configuration name will result in the step to fail unless the **Ignore ServiceNow DevOps errors** option is selected while configuring the Jenkins plugin.

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**Note:**
Stage mapping is only supported for stages at the root level, not nested or parallel stages.

## Jenkins snippet generator for DevOps

You can use the Jenkins Snippet Generator utility to generate a template code for the orchestration tasks for scripted pipelines. You can use the snippet generator utility to create template for the following orchestration tasks.

- SnDevOpsArtifact
- SnDevOpsChange
- SnDevOpsPackage
- snDevOpsGetChangeNumber
- snDevOpsUpdateChangeInfo
- snDevOpsSecurityResult

To generate a step snippet, navigate to the Pipeline Syntax from a configured pipeline, select the step from the **Sample Step** list, and update the values for different variables in the step. Select the **ignore error** option to prevent job failure if there is an error. Select **Generate Pipeline Script** to create a snippet. You can copy and paste the snippet into a pipeline.

Example of a pipeline script for the SnDevOpsChange task:

```
snDevOpsChange changeCreationTimeOut: 3600,
 changeRequestDetails: '{ "attributes": { "short_description":
 "Test description", "priority": "1", "start_date": "2021-02-05
 08:00:00", "end_date": "2022-04-05 08:00:00", "justification":
 "test justification", "description": "test description",
 "cab_required": true, "comments": "This update for work
 notes is from jenkins file", "work_notes": "test work notes",
 "assignment_group": "a715cd759f2002002920bde8132e7018" },
 "setCloseCode": false, "autoCloseChange": true }',
 changeStepTimeOut: 18000, configurationName: 'Jenkins1',
 pollingInterval: 60
```

## Parallel and sub-stage support

When a stage (or set of parallel stages) is nested within a pipeline stage, these rules apply:

- Any action from the nested stage is processed as part of the parent root-level stage
- Only one change request is created (at the parent root level) even if multiple stages nested under the parent root-level stage trigger a change
- Orchestration tasks created are always associated with the parent root-level stage (not the nested stage)

## Example: Sub stage

In this sub-stage example, if a change request gets created from the sub stage (deploy PROD), the details of the parent root-level stage (deploy) are used in the change request, and orchestration tasks are also associated with the parent root-level stage (deploy).

```
stage("deploy") {
        stages{
```

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```
            stage('deploy UAT') {
               when{
                  branch 'dev'
               }
            stage('deploy PROD') {
               when {
                  branch 'master'
               }
                steps{

                  snDevOpsChange()
                }
            }
        }
```

### Example: Parallel stage

In this parallel stage example, if a change request is created from a sub stage (UAT test-1 and/or UAT static code test), only the first change request is created (using the details of the parent root-level stage, UAT test) regardless of whether both sub stages (UAT test-1 and UAT static code test) get triggered.

There is no indication of which parallel stage generated the change, and orchestration tasks are associated with the parent root-level stage (UAT test).

```
stage('UAT test') {
      parallel {
          stage('UAT test-1') {
              steps {
                  snDevOpsChange()
                  // 'UAT test-1' tasks
              }
                post {
                  success {
                    // post success tasks. E.g.: junit
 '**/target/surefire-reports/*.xml'
                  }
              }
          }
          stage('UAT static code test') {
              steps {
                  snDevOpsChange()
                  // 'UAT static code test' tasks
              }
          }
      }
 }
```

#### Configure SonarQube scans on Jenkins pipelines

Configure SonarQube scans on Jenkins pipelines.

### Before you begin

Ensure that you meet the following pre-requisites before configuring your Jenkins pipelines for SonarQube scans

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- SonarCloud or SonarQube version 8.6.1 community edition
- SonarQube Scanner for Jenkins 2.4 or higher is installed on your Jenkins instance/ environment.
- ServiceNow DevOps plugin version 1.27 or later for Jenkins.
- Ensure that SonarQube scans are configured and exist on your Jenkins pipelines using the SonarQube Scanner plugin for Jenkins. For more information, see
  - SonarQube Scanner for Jenkins
  - SonarScanner for Jenkins
- A SonarQube tool is created and is connected to the SonarQube server. For more information, see SonarQube integration with DevOps Change Velocity.

Role required: sn_devops.admin

### About this task

When you run a pipeline which has SonarQube scan executions, the details are fetched into ServiceNow DevOps from the Jenkins pipeline. Using the Jenkins plugin, we check if the scan execution is configured in the Jenkins pipeline and check for SonarQube scans on every orchestration stage, using the `withSonarQubeEnv` tag. If a SonarQube analysis has happened on any stage of the pipeline's execution, as part of our end notification we add a model with the `scanID` and `url` details for every scan that occurs in a particular stage. These scan analytics or details are correlated and displayed in the Software Quality Summary related list from Change requests and Task executions.

### Procedure

1. In Jenkins, navigate to **Manage Jenkins** > **Configure System**, select the **Enable injection of SonarQube server configuration as build environment variables** check box in the **SonarQube Servers** section, and fill in the fields.

   **SonarQube Installations**

   | Field | Description |
   |---|---|
   | Name | A unique name for the configuration/project. |
   | Server URL | URL or IP address of the SonarQube server. |
   | Server authentication | Select the relevant authentication token type for the configuration. |

   **Note:**
   Use these same SonarQube server details or values while creating the SonarQube tools in ServiceNow DevOps as well as in the Jenkins pipeline.

2. Click **Test Connection**.
   Verify that the connection successful message is shown.
3. Click **Apply** and **Save**.
4. Run the pipeline.

### Result

Based on the scan results on various stages of pipeline's execution, the results are shown in the corresponding step of the pipeline. Inbound events are created for notifications and subflows are triggered based on the notification type and capability.

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### What to do next

**Note:**

Navigate to the pipeline UI to view the scan details under the **Quality** > **Software Quality Results**.

- View scan details as part of Task Executions. View details of all the Sonar scans that are part of the task execution mapped to a build or release pipeline execution step.

  1. Navigate to **DevOps** > **Orchestrate** > **Task Execution** click a relevant Task Execution record.
  2. Click the Software Quality Summary related list.
  3. Click a relevant Scan ID record.
     The Software Quality Scan Summary and Scan Details are displayed.

- View scan details as part of Change Request. View all the scans that were part of this build/release pipeline in the **Software Quality Results** > **Software Quality Summary** related list.

  1. Navigate to **DevOps** > **Orchestrate** > **Pipeline Change Requests**
  2. Click the Software Quality Summary related list.
  3. Click a relevant Scan ID record.
     The Software Quality Scan Summary and Scan Details are displayed.

## Configure JFrog in Jenkins

Configure JFrog plugin for Jenkins to publish, deploy, or download artifacts.

### Before you begin

Role required: admin role in Jenkins

### Procedure

1. Install the Artifactory plugin, to integrate Jenkins with JFrog , to publish, deploy, or download artifacts.
2. After the installation, configure the JFrog server details from **Manage Jenkins** > **Configure System**.

**Note:**

To be able to integrate JFrog with Jenkins, the build info must be published for JFrog along with the artifacts.

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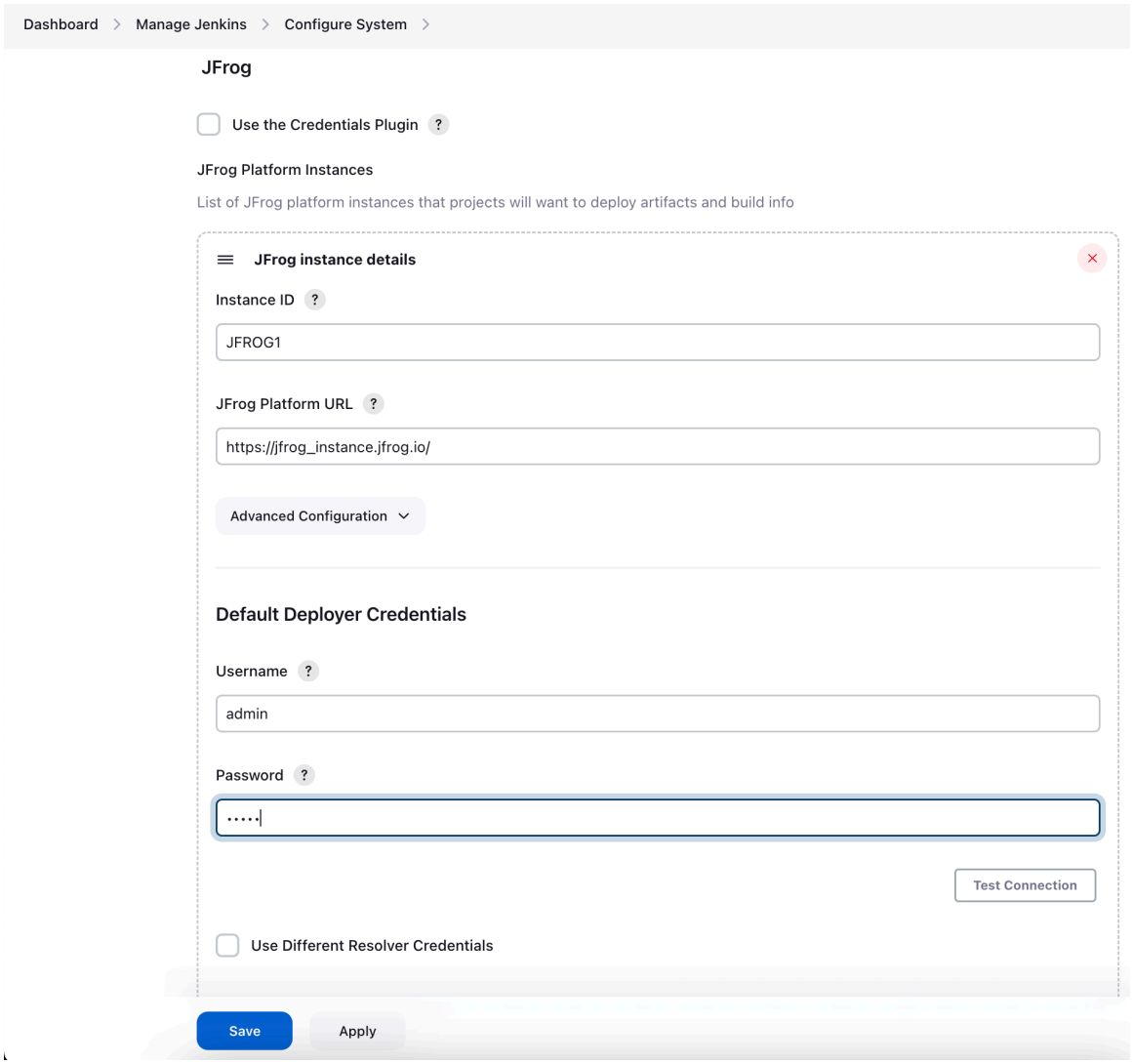


**3.** Use the following scripts to download or upload artifacts to Jenkins.

Scripted pipeline to upload:

```
     def server = Artifactory.server 'JFROG1'
               def uploadSpec = """{
                  "files": [{
                    "pattern":
"${env.WORKSPACE}/target/artifact-1.3.jar",
                     "target": "default-docker-virtual/"
                  }]
               }"""

            def buildInfo = server.upload(uploadSpec)
            server.publishBuildInfo buildInfo
```

Scripted pipeline to download:

```
         def server = Artifactory.server 'JFROG1'
               def downSpec= """{
                  "files": [{
```

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```
                    "pattern":
"default-docker-local/artifact-1.3.jar",
                    "target":"/var/jfrog_artifacts/"
                  }]
                }"""

            def buildInfo = server.download(downSpec)
            server.publishBuildInfo buildInfo
```

### Notify change request rejection or cancellation reason to Jenkins pipeline

Send change request rejection or cancellation reason along with approver name and the change request number to Jenkins pipeline logs.

## Before you begin

- Ensure that you have upgraded to ServiceNow DevOps version 1.28 or later.
- Have an active Jenkins integration.

Role required: sn_devops.admin

## About this task

You can send change request rejection or cancellation reasons or comments to the Jenkins pipeline logs.

- Ensure that you enter appropriate reasons or comments when rejecting or canceling a Change Request manually.
- If you have loaded demo data during upgrade, and are using the DevOps Demo Change Automation flow or a custom flow based on it, a notification with default message values is sent to the Jenkins pipeline logs.

**Note:**

- The Change request number is also automatically sent to the Jenkins pipeline logs (for both scripted and freestyle pipelines) as soon as the change is created.
- The *Approver name* and time stamp of the cancellation/rejection is also automatically sent to the Jenkins pipeline logs.

## Procedure

1. To manually reject or cancel change requests, follow these steps:
   a. Navigate to **DevOps** > **Orchestrate** > **Pipeline Change Requests** > **Change Request record**.
   b. Open the required Change Request record.
   - From the context menu, click **Cancel Change**. In the **Cancel Change Request > Reason** field, enter an appropriate reason for cancelling the change, and click **Save**.
   - In the Approvers related list, provide your inputs in the **Comment** field, right-click the record, and click **Reject**.

   The change request is canceled/rejected and the reason for canceling the change is added to the **Comments** field and sent to the Jenkins pipeline log.
2. To send custom messages (from auto-rejected change requests) to Jenkins, follow these steps:

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a. Navigate to **Flow Designer** > **DevOps Demo Change Automation flow** > **DevOps Demo Change Policy**.

b. Navigate to the *DevOps Auto Reject* decision >*DevOps Apply Change Approval Definition* subflow > *Devops Create Auto Approval Record* action.

c. Modify the action's input script for the `approval.comments` attribute value.
By default, the auto-rejected change requests stores and sends the `approval.comments = 'Auto ' + state + ' via Change Policy';` variables as messages to the Jenkins pipeline as notifications.

3. In Jenkins, navigate to the pipeline (that is corresponding to the rejected change request), and then select **Console Output**.
The Change Request's rejection or cancellation comments that are stored as part of the step execution reflect in the Jenkins Console Output.

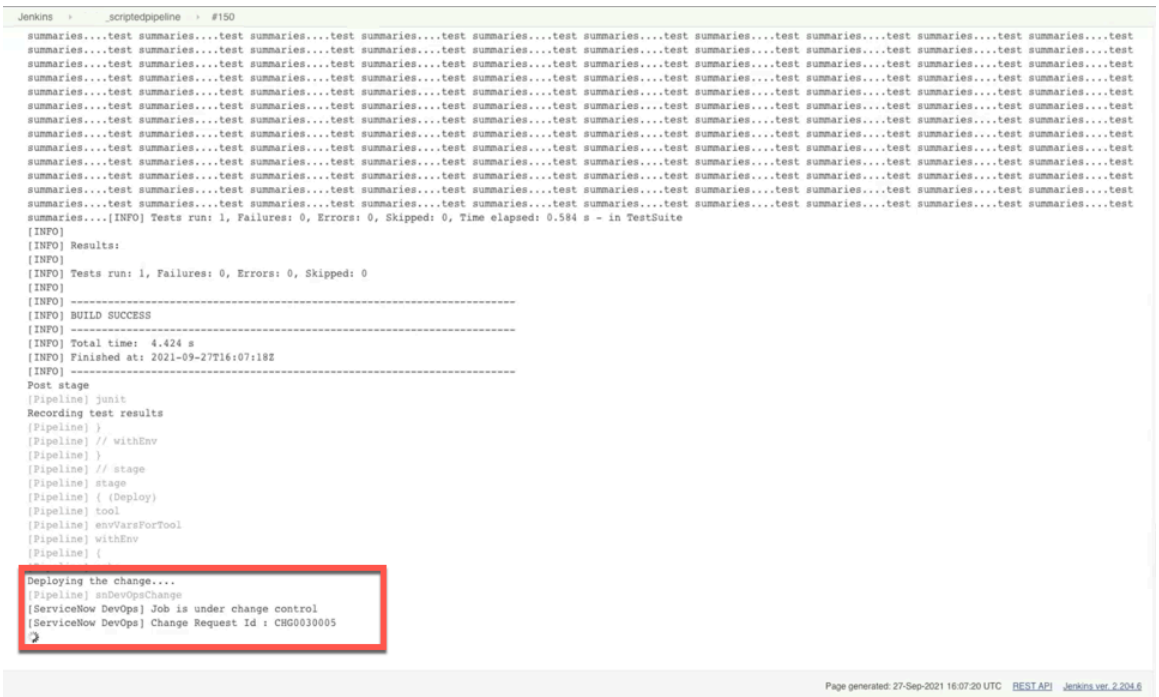
### Notify ServiceNow DevOps change request number to Jenkins pipelines

Send change request numbers to the Jenkins pipeline steps or logs when a change request is created in ServiceNow DevOps.

## Sending ServiceNow DevOps change request to Jenkins pipeline

Change requests that are created as part of Jenkins pipeline executions for both scripted and free-style pipelines are notified to the Jenkins pipeline console.

When you trigger a scripted Jenkins pipeline and a change request is created as part of the pipeline execution stage in ServiceNow DevOps, the change request number is notified to Jenkins. The change request number displays in the Jenkins pipeline job logs for scripted pipelines.




Upon triggering a free-style Jenkins pipeline, the change request that is created as part of the ServiceNow DevOps pipeline execution stage waits for the approval action to be performed on the change. The change request number and details display against the relevant build in the Jenkins console's **Build History** section.

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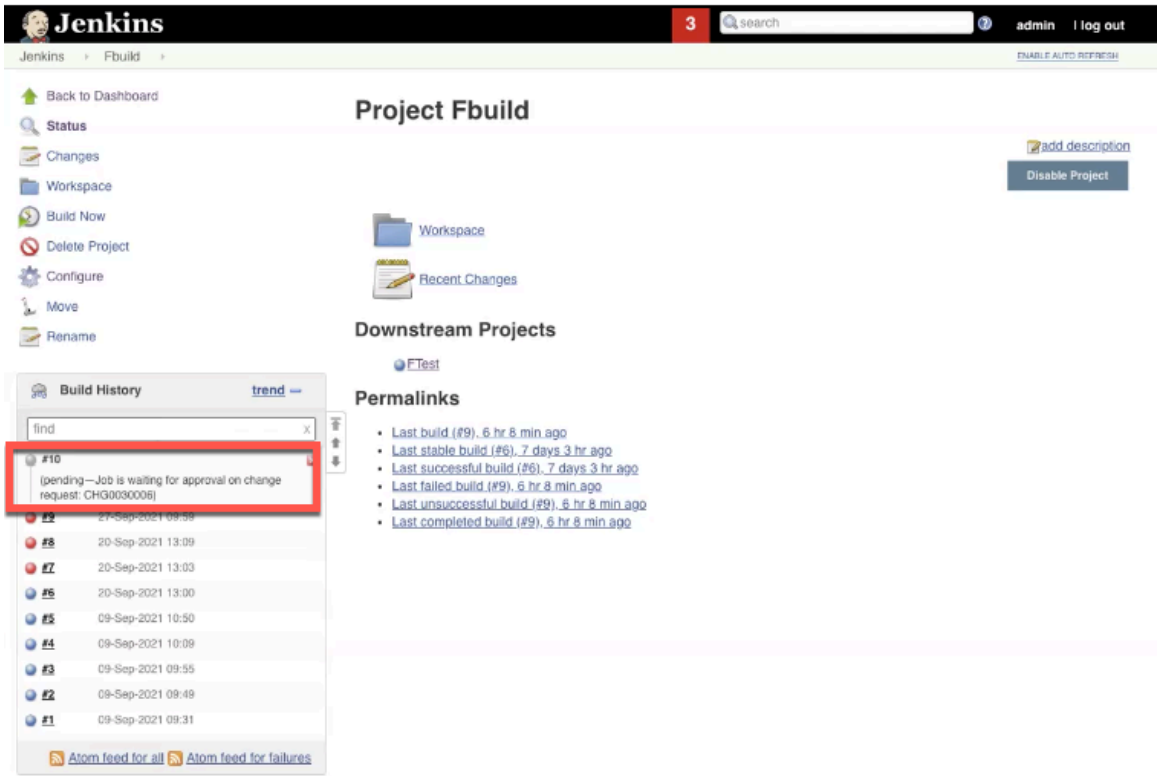


**Note:**
After an approval or rejection action is performed on the change request in ServiceNow DevOps, the change request displays in the Jenkins pipeline build logs, similar to scripted pipelines.

### Get change request number in Jenkins pipeline

Retrieve the change request number in a Jenkins pipeline based on specific change details by running the snDevOpsGetChangeNumber script.

### Before you begin

Role required: Jenkins admin

### Procedure

1. In your Jenkins dashboard, open the pipeline for which you want to retrieve the change request number.
2. Navigate to **Configure > Pipeline**.
3. In the Pipeline script section, update the `snDevOpsGetChangeNumber` script with the following input parameters:
   - Pipeline Name

     **Note:**
     For a multi-branch pipeline, the pipeline name must be suffixed with the branch name.

   - Build Number
   - Stage Name

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**Note:**
For a nested-stage, the stage name must be prefixed with the parent stage name.

- Branch Name (only for multi-branch pipeline)

**Note:**
If you do not provide the change request details as input parameters, the change request number associated with the current pipeline and stage will be retrieved.

Example of a multi-branch pipeline:

```
snDevOpsGetChangeNumber (changeDetails: """{ "pipeline_name":
 "github_multi_branch_pipeline/scratch/release",
 "build_number": "${env.BUILD_NUMBER}", "stage_name":
 "Prod/Deploy", "branch_name": "scratch/release" }""");
```

Example of a Jenkins pipeline:

```
snDevOpsGetChangeNumber (changeDetails: """{ "pipeline_name":
 "github_pipeline", "build_number": "${env.BUILD_NUMBER}",
 "stage_name": "Prod/Deploy" }""");
```

4. Save the script.
5. Navigate to **DevOps > Orchestrate > Pipeline Change Requests**.
6. Select the change record associated with the pipeline.
7. Approve the change request by selecting#**Approved**# in the**State** #field.
8. In Jenkins, open the pipeline for which you are retrieving the change request number.
9. Select **Build Now**.
   The change request number associated with the pipeline will be displayed as an output in the pipeline.

### Update change request details in Jenkins pipeline

Update the change request details associated with a Jenkins pipeline by running the snDevOpsUpdateChangeInfo script in the pipeline.

#### Before you begin
Role required: Jenkins admin

#### About this task
When you update the **state** parameter in a change request, only the following transitions are supported:

- cancel: Change request state must be **implement** to move the state to **cancel**. **reason** is a mandatory input to update the state to canceled.
- closed: Change request state must be **implement** or **post implement** to move the state to **close**. **close_code** and **close_notes** are mandatory input to update the state to closed.

Specify the change request state as an integer value:

- 4 - Cancel (Value set in the sn_devops.change_request.cancel_state property)
- 3 - Closed (Value set in the sn_devops.change_request.closed_state property)

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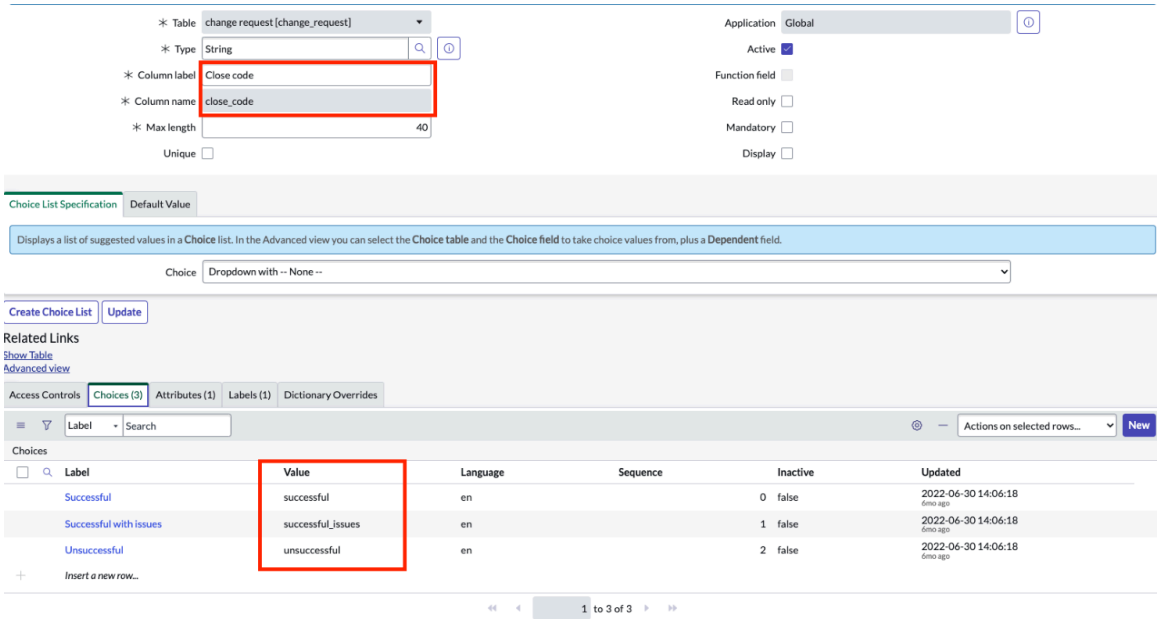
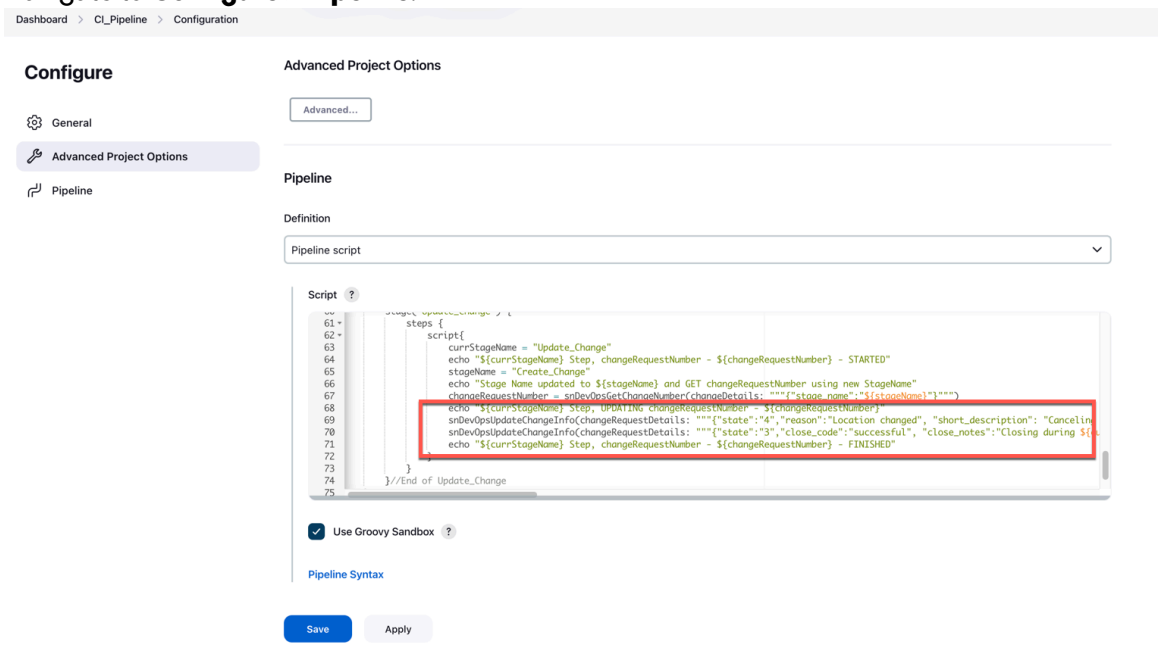
When you update a choice field, you must specify a valid choice value that is available in the corresponding choice list. For example, the choice list values for the **Close code** field are successful, successful_issues, and unsuccessful.




## Procedure

1. In your Jenkins dashboard, open the pipeline for which you want to update the change request details.
2. Navigate to **Configure > Pipeline**.




3. In the Pipeline script section, update the `snDevOpsUpdateChangeInfo` script with the following input parameters:
   - Change request number whose details need to be updated.
   - Change request details to be updated as Key:Value pairs.

```
{ "short_description": "Test description", "priority": "1",
 "start_date": "2021-02-05 08:00:00",
```

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```
"end_date": "2022-04-05 08:00:00", "justification": "test
 justification", "description": "test description",
"cab_required": <true/false>, "comments": "This update for work
 notes is from jenkins file", "work_notes": "test work notes",
"assignment_group": "<SYS_ID>", "state":"<STATE_CODE>",
 "close_code":"<successful/successful_issues/unsuccessful>",
 "reason":"<As per Choice List>"
```

4. Save the script.
5. Navigate to **DevOps > Orchestrate > Pipeline Change Requests**.
6. Select the change record associated with the pipeline.
7. Approve the change request by selecting#**Approved**# in the**State** #field.
8. In Jenkins, open the pipeline for which you are updating the change request details.
9. Select **Build Now**.
   The change request details specified in step 3 will be updated for the pipeline.

### ServiceNow DevOps change request state in Jenkins pipeline logs

You can use the Jenkins Snippet Generator utility to configure how and when the change state and the corresponding policy conditions must be displayed in the Jenkins pipeline job logs. This enables developers to view the status of the change in the console logs of the pipeline itself.

To generate a step snippet, navigate to the Pipeline Syntax from a configured pipeline, select the **SnDevOpsChange** step from the **Sample Step** list, and update the values for the change state variables in the step. Select the **ignore error** option to prevent job failure if there is an error. Select **Generate Pipeline Script** to create a snippet. You can copy and paste the snippet into the pipeline to start receiving the change state notifications. Update the following variables in the **SnDevOpsChange** step to receive change state notifications:

- **Polling Interval**: Specifies the frequency (in seconds) at which Jenkins polls ServiceNow for the change status and updates the console logs with the status. The change status is updated in the console logs only when the **Change state transitions**, **Assignment Group updates**, **Approval updates**, **Planned Start/End date**, or **Change Details** (if any) fields are updated.

  **Note:**
  If no value is entered in the field, polling interval check won't be run to update the change status in the console logs.

- **Change Creation Timeout**: Specifies the change creation timeout value in seconds. On timeout, Jenkins checks the change creation status in ServiceNow. If the change did not get created, the pipeline is resumed or aborted based on the **Abort on change creation failure** flag. By default, the pipeline is aborted when timeout is specified and the **Abort on change creation failure** flag is selected.

  **Note:**
  If no value is entered in the field, change creation timeout check won't be run to update the pipeline.

- **Abort on change creation failure**: Abort or resume the pipeline if change is not created till the change creation timeout.
  - Selected: Abort
  - Cleared: Resume
- **Change Step Timeout**: Specifies the change step timeout value in seconds. On timeout, Jenkins checks the change step status in ServiceNow. If the change step is still in progress,

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the pipeline is resumed or aborted based on the **Abort on change step timeout** flag. By default, the pipeline aborted when timeout is specified, and the **Abort on change step timeout** flag is selected.

**Note:**
If no value is entered in the field, change step timeout check won't be run to update the pipeline.

- **Abort on change step timeout**: Abort or resume the pipeline if the change step is still in progress on change step timeout.
  - Selected: Abort
  - Cleared: Resume

You can navigate to the console logs in your pipeline to view the state of a change request when a change request is created or when the state of the change request is updated. The policy conditions associated with the change request state will also be evaluated and displayed in the logs. For example, if the DevOps Change Request Advanced Automation policy is activated, the policy conditions will be evaluated and the corresponding decision made (auto-approve/auto-reject/manual-approval) will be displayed in the logs.

The following change request details are displayed:

- number
- details
- status
- sys_id
- type
- risk
- priority
- changeState
- plannedStartDate
- plannedEndDate
- changeRequestURL

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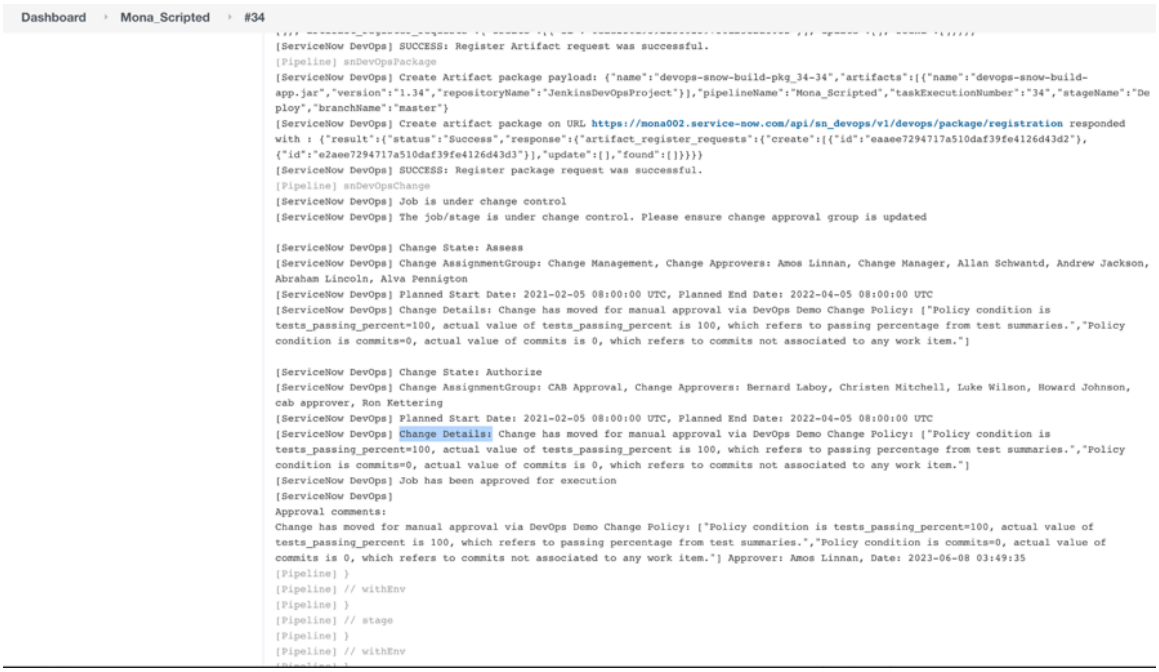


The logs for policy conditions will be displayed for the base system change flows as follows:

- DevOps Model Change Policy: Only logs will be displayed on change creation and when the change state is updated.
- DevOps Change Request Minimal Automation Policy: Logs along with change decision and policy conditions corresponding to the change decision will be displayed.
- DevOps Change Request Advanced Automation Policy: Logs along with change decision and policy conditions corresponding to the change decision will be displayed.

The change policy input and decision conditions are stored in the Decisions [sys_decision_question] table. Logs will be displayed if the following fields and operators are used as input for policy conditions:

**Fields**

- code_coverage
- commits_without_work_item
- integration_tests_failed
- load_tests_failed
- regression_tests_failed
- num_of_outages_in_last_7_days
- num_of_current_outages
- num_of_open_incidents
- total_num_of_commits
- tests_passing_percent
- risk
- code_security
- commits

**Operators**

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- <=
- >=
- !=
- =
- <
- >
- ISNOTEMPTY
- ISEMPTY
- BETWEEN
- ANYTHING
- NSAMEAS
- SAMEAS
- GT_FIELD
- LT_FIELD

**Note:**
If any field is modified in a change policy other than the base system fields, then those fields must be manually added to the flow for policy conditions to be evaluated.

If a change request does not get created due to any issue, then the reason for the failure and the state is also logged in the console.

[store-future: BEGIN review]

### Processing bulk Jenkins events in parallel

You can enable bulk processing for Jenkins pipeline events from the DevOps Tool integration table and see the events status updates while processing, in the Inbound events table.

## Process Jenkins events using bulk flows

New base system scheduled jobs are added to the instance when you upgrade to version 1.26. If you enable bulk processing for your Jenkins events, the following scheduled jobs and corresponding flows are triggered. Currently, each event triggers an orchestration flow which runs the entire duration, one event at a time. Enabling the bulk processing feature initiates the scheduled jobs and starts parallel processing of events in batches based on their state.

In the bulk flow, the earlier orchestration flow is now divided into three stages: Pre-processing, Processing and Post-processing. Events are grouped by the stage they are in and processed in parallel instead of one event at a time.

**Bulk Processing-Pre**

Inbound events for Jenkins in **New**/**Retry** state are moved to **Ready** state if the tool ID and connection status are valid. Verifies that no flow executions exist in Flow Designer.

**Bulk Event Processor**

Bulk processing phase picks all the events from **Ready** state and transforms the payload and marks them as **Transformed** on completion.

**Bulk Processing-Post**

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This job picks up all the events from **Transformed** state and moves them to **Processed** state. If event should wait, then it should update them as **Transformed** state and update the **Waiting Reason** field.

**Bulk Processing-Monitor**

Resets any workflow if event is stuck during bulk_processing. When the Bulk processing is set to **True** from **False** state, new events are assigned the new bulk flow. If Bulk processing is set to **False** from **True** the state of the inbound event is set to **New** and the old workflow is assigned.

[End]
[store-future: BEGIN review]

### Enable bulk processing of Jenkins events

You can enable bulk processing of Jenkins events, which uses a new bulk flow for event processing.

#### Before you begin
Role required: sn_devops.admin

#### Procedure

1. Navigate to **All** > **DevOps** > **Integrations** > **Tool Integrations**.
2. Open the **Jenkins** record.
3. Open the Tool Integration Capability Mapping related list.
4. Click the update personalized list icon ( ).
5. Move **Bulk Processing** from the **Available** list to the **Selected** list.
6. Click **OK**.
7. For the **Orchestration** tool type capability, turn the **Bulk processing** field to `true`.

#### Result
New Jenkins events that show up on the Inbound Events table display their processing status with a timestamp that indicates the time of processing for the event's status.

[End]

### Nested and parallel stages in Jenkins pipelines

Use nested and parallel stages in scripted Jenkins pipelines to speed up your pipeline execution. Change requests are created for nested and parallel stages and not just for the parent stage.

## Support for nested and parallel stages in Jenkins pipelines

You can use nested and parallel stages in scripted Jenkins pipelines to automate and speed up tasks that can be run in parallel. For example, you have a scripted Jenkins pipeline with nested and parallel stages for various test cases such as different quality checks for different operating systems and browsers.

ServiceNow DevOps supports processing parallel and nested stages in Jenkins pipelines and displays the pipeline, in the DevOps pipeline UI. In effect, the ServiceNow DevOps pipeline UI renders or replicates the Jenkins pipeline UI in real time. From the **Pipeline Execution** view of the relevant pipeline, click the **Pipeline UI** related link to view the real-time state of the pipeline as it appears in Jenkins. The associated artifact details that are sourced from the build pipeline, Test

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Results, Software Quality Summary Results, and Change request details display on the pipeline UI.

**Important:**
Support for parallel and nested stages is restricted to scripted pipelines in Jenkins. Freestyle pipelines continue to appear in a sequential or serial manner in the DevOps pipeline UI, even if parallel and nested stages are part of freestyle pipelines in Jenkins.

## Change requests in nested and parallel stages

Change requests are created for all nested and parallel stages, once all upstream events (prior to the change request) are received. In previous releases, nested or parallel stages in Jenkins pipelines were not identified nor processed in ServiceNow DevOps. Only parent stages were identified and processed in a linear or sequential manner. If change requests existed as part of any nested and parallel stages, those change requests were ignored and a single change request was processed as part of the parent stage. When you run a new pipeline after upgrading, new steps and steps executions are created for nested stages.

Nested and parallel stages were not processed previously, and approval groups were mapped only to the parent stage. Because nested and parallel stages are identified during processing, you must verify that relevant approval groups are mapped to the appropriate nested or parallel stage. If subsequent steps of the pipeline are dependent on the change request's being approved, the pipeline execution is paused, and resumed when the change request is approved.

## Upgrade Considerations

If you are already using Jenkins with nested and parallel pipelines as your orchestration tool, consider the following while upgrading.

- Upgrade during off-peak hours.
- Ensure that you do not have any pipeline executions that are currently in progress by ServiceNow DevOps. If pipeline executions are being processed, step executions might not be created as expected for the in-progress pipeline runs. Rerun the pipeline to create appropriate step executions.

### Jenkins log levels and Log Recorders

Set log levels in the Jenkins plugin for ServiceNow DevOps based on the extent of log detail you need for debugging.

## Base system Log Recorder in Jenkins logs

You can set the level of detail that your log messages capture. In previous versions of the plugin, you could only enable or disable the **Debug** mode, which meant that you could either enable or disable all Jenkins logs without the ability to select the level of information or detail you want to save in your logs. Often, this leads to excessive information in your logs, used up more disk space, and collected information that might not always be relevant or useful.

The flexibility to set log levels allows you to select the right log level information that is appropriate for your organizational needs. You can select custom log levels based on the log levels or categories that Jenkins currently supports.

The log level is turned off by default for first-time DevOps installations. Consider the following items after successfully upgrading:

- if the **Debug** check box was previously selected, the log level is enabled and set to *`Info`* by default.
- If the **Debug** check box was cleared previously, by default, log levels are tuned off.

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**Note:**

The Jenkins log does not record log messages at a level lower than *Info*. The base system ServiceNow DevOps log recorders are used to record this message.

You can select a custom level from the Jenkins plugin- ServiceNow DevOps Configuration form > Log level list. A base system ServiceNow DevOps log recorder is created in the Jenkins Log Recorders list. For more information, see Jenkins documentation on viewing logs.

**Note:**
Do not modify the log recorder from the Jenkins > Log Recorders > Configure log recorders. Editing the log recorder from Jenkins creates a duplicate entry for any changes to the log levels that you make. Please use the list of log levels in the ServiceNow DevOps Configuration form, to modify the log levels.

## Argo CD integration with DevOps Change Velocity

Connect to your Argo CD instance to automate the deployment of applications from GitHub repositories.

## Argo CD integration overview

This integration enables the ServiceNow platform to manage the change request closure process based on the sync status received from Argo CD for continuous deployment of applications.

You must activate the DevOps Integration with Argo CD plugin (sn_devops_argocd) before connecting your Argo CD instance in ServiceNow. For more information on activating a plugin, see Activate a plugin.

### Workflow

Here is the workflow of how the continuous deployment process works through Argo CD in ServiceNow DevOps.

- Create an Argo CD tool connection in ServiceNow DevOps Change Velocity using the Classic or Workspace UI.
- Create a webhook in Argo CD manually.
- Update your Config file in the GitHub repository for deployment. While updating the Config file, specify the change request number in the commit tag (sn_devops_change-<change request number>).

  **Note:**
  The change request number specified in the commit tag must already be created by the CI pipeline and in the implement state.

- Sync the required app associated with your Config file and repository in Argo CD.
- Once sync is successful, notifications are sent to ServiceNow DevOps and inbound events are created.
- Change request number is retrieved from the inbound events and updated with the Argo CD synchronization status.
- Change request is closed and based on the sync status, the close code, worknotes, and close notes fields are updated in the change request.

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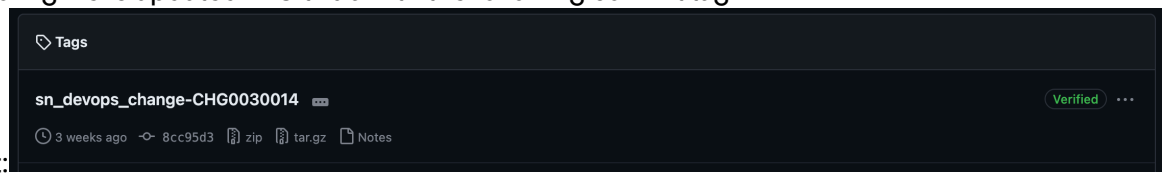
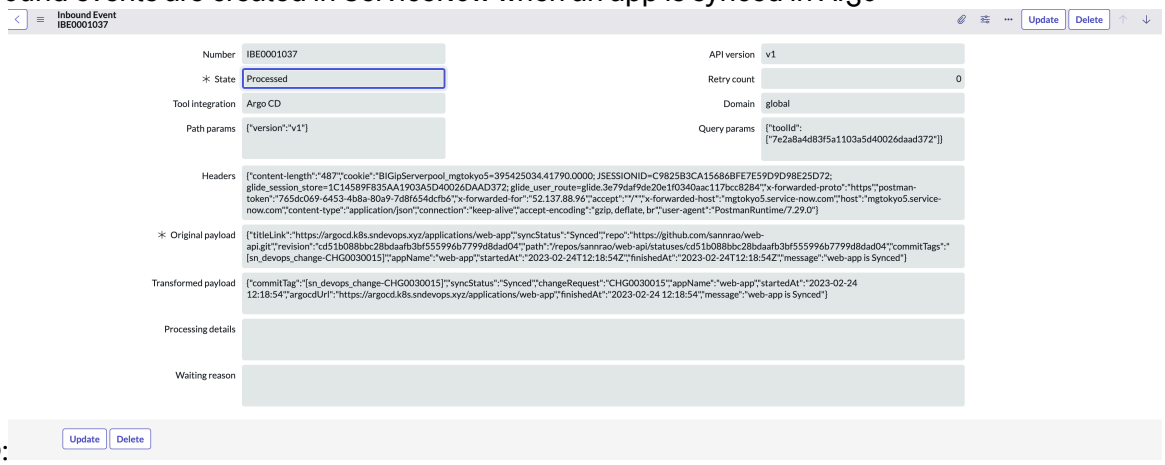
## Example

The following examples specify how changes made in Argo CD are notified to ServiceNow DevOps through the webhook.

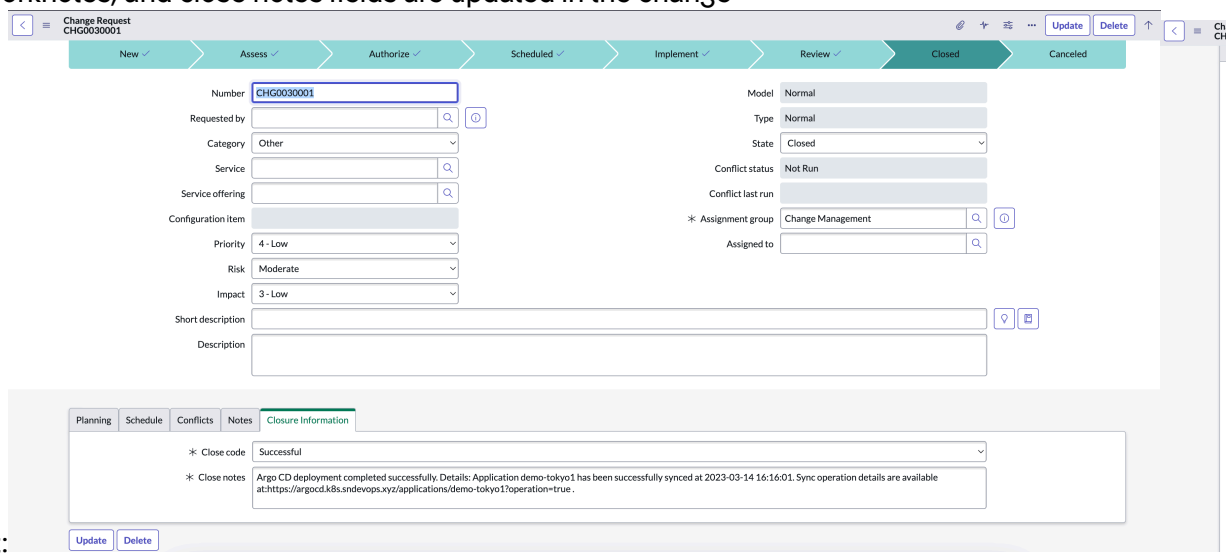
- The Config file is updated in GitHub with the following commit tag format:




- Inbound events are created in ServiceNow when an app is synced in Argo CD:




- If sync is successful, the change request is closed and the close code, worknotes, and close notes fields are updated in the change request:




### Onboard Argo CD to DevOps Change Velocity – Workspace

Connect to your Argo CD instance using the DevOps Change Workspace playbook to automate the deployment of applications from GitHub repositories.

### Before you begin

Complete the tasks specified in the Getting started with DevOps Change Velocity topic.

Role required: sn_devops.admin or sn_devops.tool_owner

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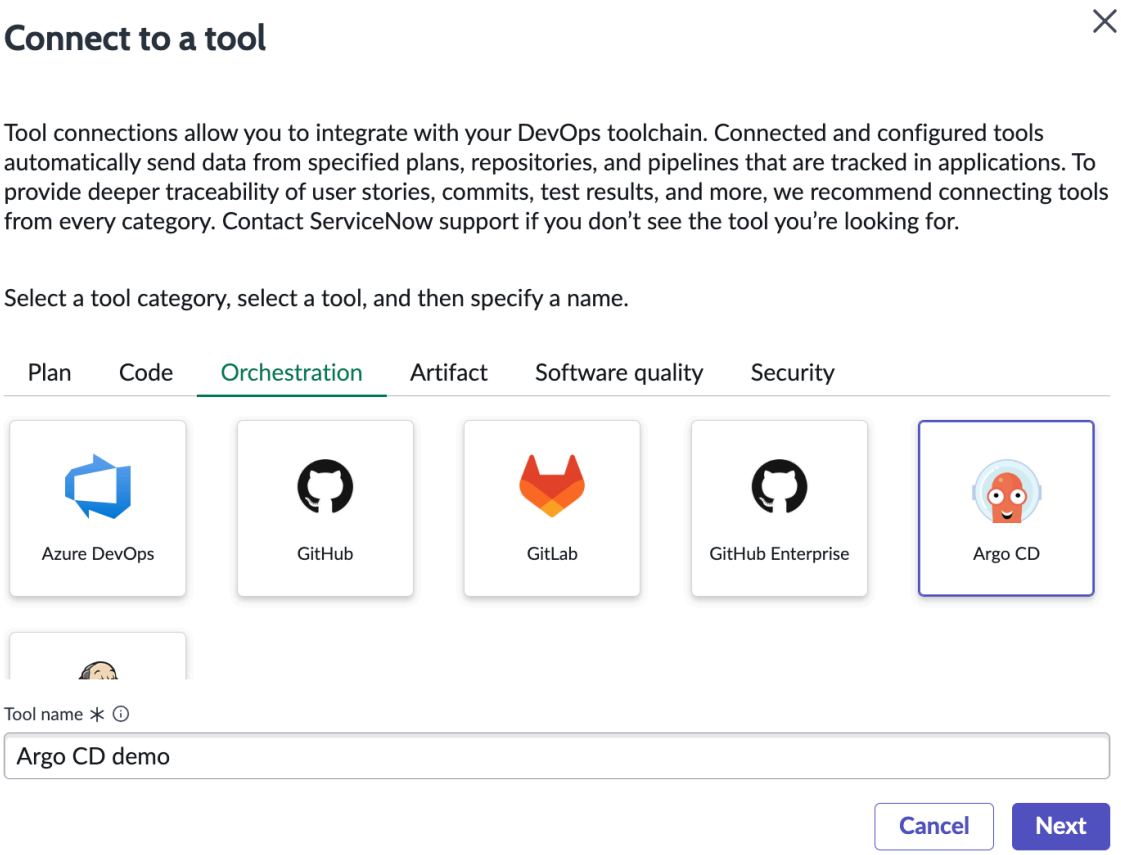
## Procedure

1. Navigate to **Workspaces** > **DevOps Change Workspace** and use one of the following options to open the Playbook to onboard Argo CD.

2. Specify a name for the tool in the **Tool name** field, and select **Next**.




3. On the Argo CD instance details playbook activity:

   a. Enter the URL of your Argo CD instance.

   b. Enter the login credentials of the Argo CD instance.

   > **Note:**
   > To generate a token for the user in Argo CD, go to **Accounts**. Ensure that the user has the capability: apiKey. For more information, see Argo CD documentation.

   c. **Optional:** Select the MID Server option and enter its details if your Argo CD instance is attached to a MID Server.
   A MID server is required if your tool instance is hosted on-prem. For more information about MID server, see MID Server selection.

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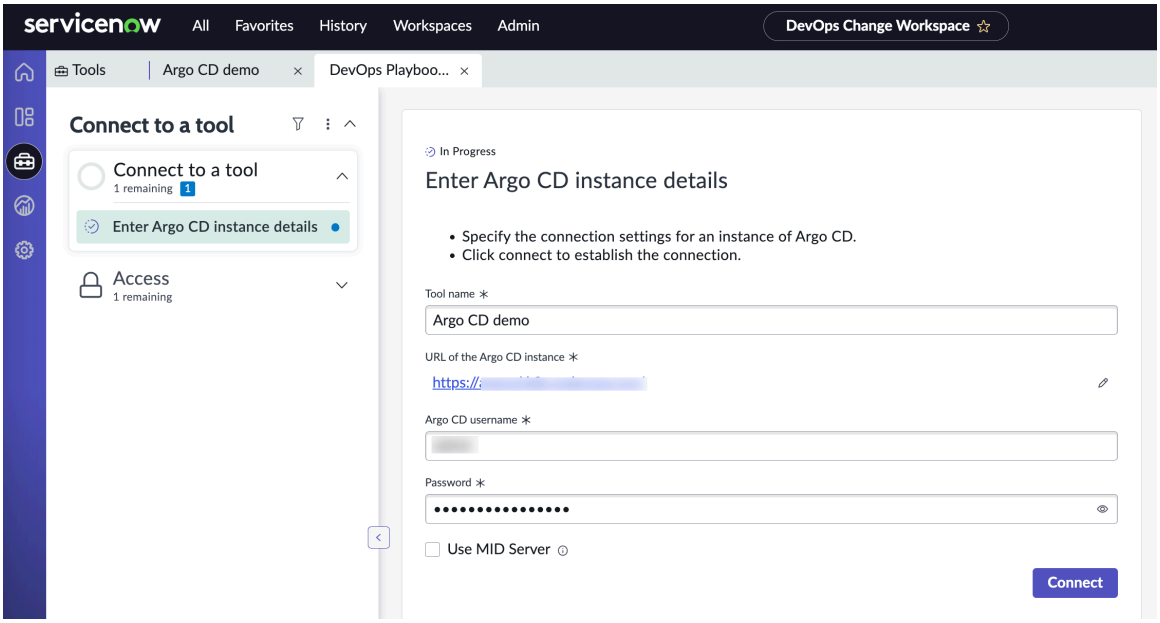


4. Select **Connect**.
5. Specify the access for the tool.
   a. If you want to control access to the tool, add the groups that must be given access to the tool in the **Maintained by** field.

      The tasks these users in the groups can perform depends on the role assigned to them.

      - DevOps Tool Owner role: Can view and edit the tool.
      - DevOps App Owner role: Can view the tool and can associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects (such as plans, repositories, and pipelines).
      - DevOps Administrator role: Can edit all tools.
      - Other DevOps roles: Can view the tool.

      **Note:**
      If you don't select a group and skip this step, all users with the DevOps Tool Owner role will be able to edit the tool.

   b. If you choose to control access to the tool, the **All App Owners can view and associate tool objects to applications** option becomes available for selection.

      This option enables all users having the DevOps App Owner role to access the tool. If selected, they'll be able to view, associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects.

   c. Select **Assign**.

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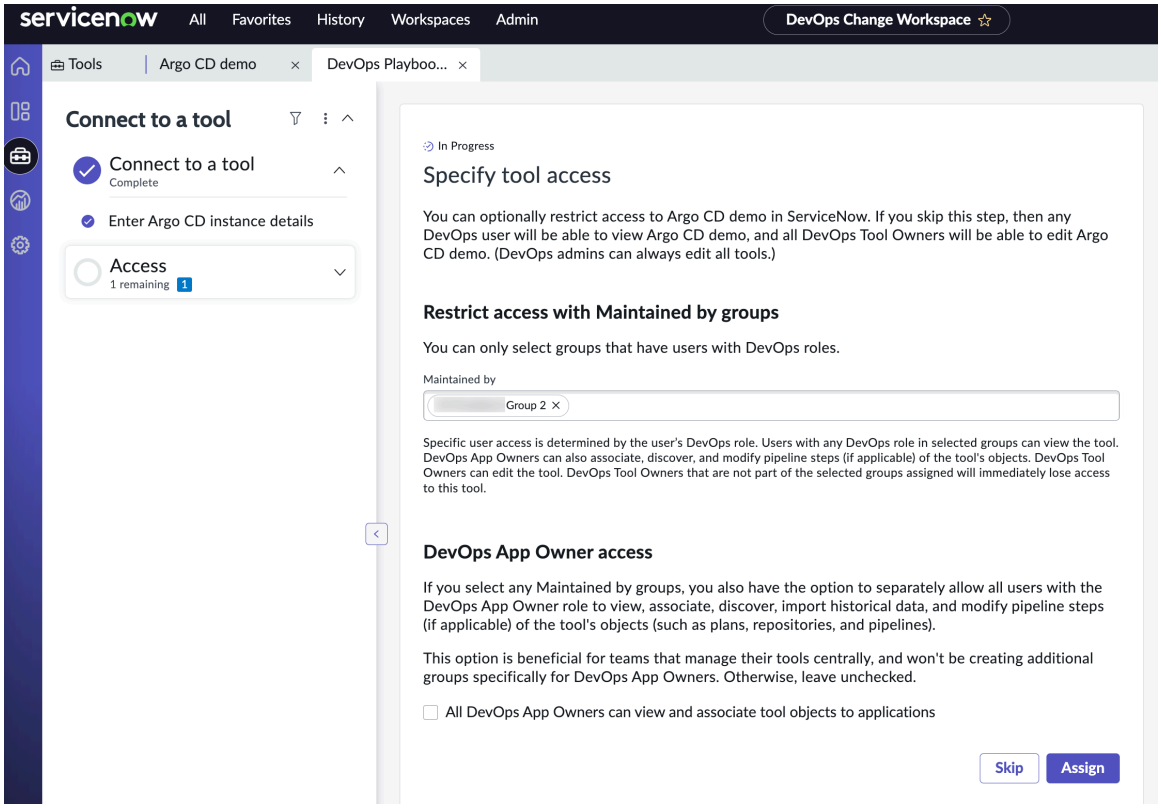
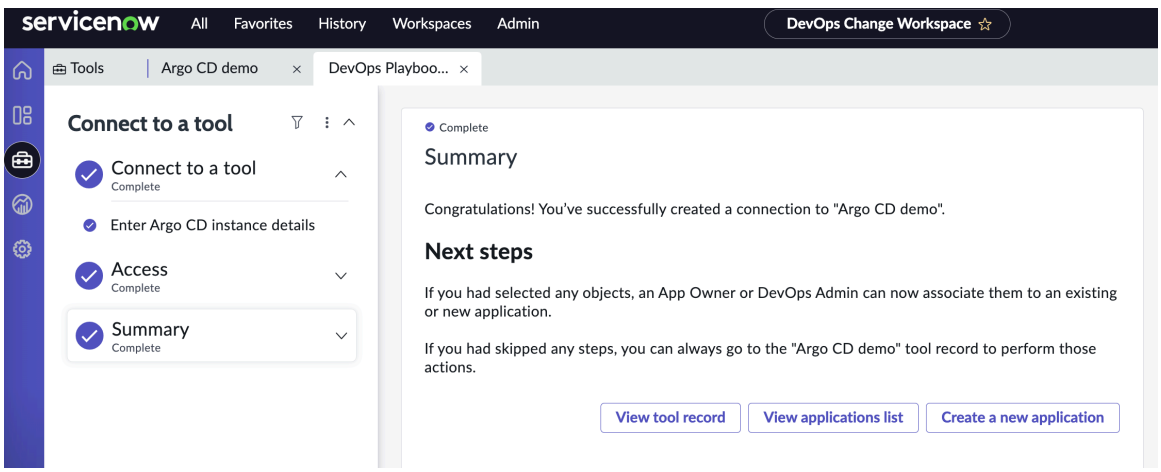



6. From the **Summary** page, select **View tool record** to review the details of the connected instance.




## Result

You've successfully onboarded your Argo CD tool to DevOps Change Velocity.

## Onboard Argo CD to DevOps Change Velocity — Service Catalog

Connect your Sonar instance using the ServiceNow Service Catalog.

## Before you begin

Role required: sn_devops.admin or sn_devops.tool_owner

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### Procedure

1. Navigate to **All** > **Service Catalog** > **Catalog Definitions** > **Maintain Items** and search for DevOps.

   **Note:**
   You can also access the service catalog from Employee Center or Service portal.

2. From the DevOps catalog items, select and activate **DevOps App Onboarding** and **DevOps Tool Onboarding**.
3. After activating, select **DevOps Tool Onboarding** and select **Try it**.
4. In the DevOps Tool Onboarding form, enter the tool details:

| Field | Description |
|---|---|
| Tool name | Name for your Argo CD integration. |
| Tool integration | Select Argo CD. |
| Tool URL | Argo CD instance URL. |
| Tool username/API ID | Username of your Argo CD instance. |
| Tool password/ Access token/API key | Argo CD user token or password. |
| Use MidServer | Optional. Select#MID Server#for an on-premises tool that is attached to a#MID Server. Application is automatically set to #DevOps and capability is set to REST. |

5. Select **Order Now**.
   A request is created. When the request is approved, the tool is connected and discovered.
6. From the DevOps catalog items, select **DevOps App Onboarding**.
7. In the DevOps App Onboarding form, enter the details:

| | |
|---|---|
| Are you creating a new app or adding to an existing one? | Select from the options whether to create a new app or use an existing app. |
| App | Enter the name for the app that you're creating or using. |
| Onboarding pipelines | Enter the connected Argo CD tool name. |
| Pipelines | Select the pipelines for which you want to configure webhooks and import historical data. |
| Import from and Import to | Select the dates for which you want to import the data. By default, the last 30 days are selected. You can choose to import data for a maximum of 90 days. |
| Onboarding repositories | Leave empty. |
| Onboarding plans | Leave empty. |

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8. Select **Order Now**.
   A request is created. When the request is approved, the pipeline objects are associated to the app record, which enables real-time tracking. Historical data is also imported for the selected pipelines. The **Track** field is automatically enabled for imported pipelines.

### Onboard Argo CD to DevOps Change Velocity — Classic

Connect your Argo CD instance using the Classic UI in DevOps Change Velocity.

#### Before you begin

Role required: sn_devops.admin or sn_devops.tool_owner

#### Procedure

1. Navigate to **DevOps > Tools > Create New (legacy)** and create a record.
2. Enter a **Tool Name** and fill in the tool details.

**Create DevOps Tool form**

| Field | Description |
|---|---|
| Tool integration | Tool to integrate. In this case, select **Argo CD**. |
| Tool URL | URL of the existing Argo CD instance to integrate.<br>For example:<br>https://argocd.k8s.sndevops.xyz/ |
| Tool username | Username of your Argo CD instance. |
| Tool password | Password of your Argo CD instance. |

3. **Optional:** Select **MID Server** for an on-premises tool that is attached to a MID Server. Application is automatically set to DevOps and capability is set to REST.
4. Select **Submit**.
   The tool is automatically Connected Successfully using a connection alias, and HTTP tool connection (basic authentication credential).

### Configure webhooks in Argo CD manually

Configure webhooks in Argo CD to send sync notifications to the DevOps Change Velocity application.

#### Before you begin

Role required: Argo CD admin

#### About this task

The subscription to Argo CD application events can be defined using the `notifications.argoproj.io/subscribe.<trigger>.<service>:<recipient>` annotation.

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### Procedure

1. In Argo CD, update the `ConfigMap: argocd-notifications-cm.yaml` to set up the notifications that are send to DevOps Change Velocity.

```
apiVersion: v1
kind: configMap
metadata:
  name: argocd-notifications-cm
  namespace: default
data:
  context: |
    argocdUrl: "https://<argocdURL>"
  service.webhook.sn_devops_argocd: |
    url:
 https://<instance>.service-now.com/api/sn_devops/v2/devops/to
ol/orchestration?toolId=<toolId>
    basicAuth: #optional username password
      username: ""
      password: ""
  template.app-sync-succeeded: |
    webhook:
      sn_devops_argocd:
        method: POST
        body: |
          {
          "titleLink" :
 "http://<argocdURL>/applications/{{.app.metadata.name}}",
          "syncStatus" : "{{.app.status.sync.status}}",
          "repo" : "{{.app.spec.source.repoURL}}",
          "revision": "{{.app.status.sync.revision}}",
          "path":
 "/repos/{{call .repo.FullNameByRepoURL .app.spec.source.repoUR
L}}/statuses/{{.app.status.operationState.operation.sync.revisi
on}}",
          "commitAuthor" :
 "{{(call .repo.GetCommitMetadata .app.status.sync.revision).Au
thor}}",
          "commitMessage" :
 "{{(call .repo.GetCommitMetadata .app.status.sync.revision).Me
ssage}}",
          "commitTags" :
 "{{(call .repo.GetCommitMetadata .app.status.sync.revision).Ta
gs}}",
          "startedAt" :
 "{{.app.status.operationState.startedAt}}",
          "finishedAt" :
 "{{.app.status.operationState.finishedAt}}",
          "message": "{{.app.metadata.name}} app is synced"
          }
  trigger.on-sync-status-unknown: |
    - description: Application status is 'Unknown'
      send:
      - app-sync-status-unknown
      when: app.status.sync.status == 'Unknown'
  trigger.on-sync-succeeded: |
    - description: Application syncing has succeeded
```

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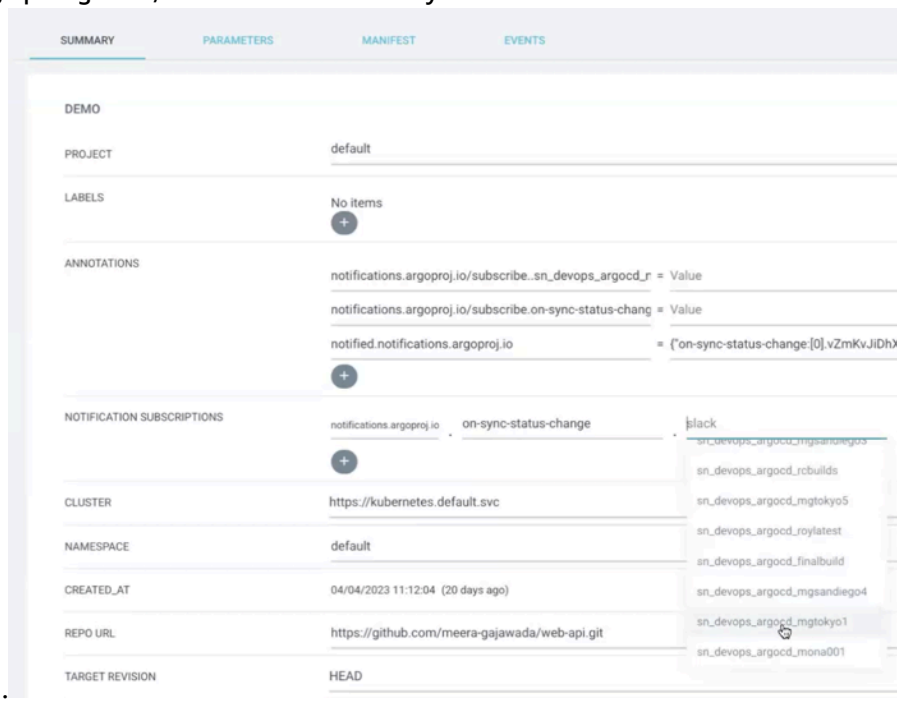
```
    send:
    - app-sync-succeeded
    when: app.status.operationState.phase in ['Succeeded']
subscriptions: |
  - recipients:
    - sn_devops_argocd
    triggers:
    - on-sync-succeeded
    - on-sync-status-unknown
```

2. Open the Argo CD app for which you are configuring webhooks.
3. Navigate to **APP DETAILS > SUMMARY**.
4. Add the **notifications.argoproj.io/subscribe.<trigger>.<service>: <recipient>** annotation with the trigger condition to sync the change status for your instance.
   For example, `notifications.argoproj.io/subscribe.on-sync-succeeded.sn_devops_argocd`.




## Jira integration with DevOps Change Velocity

Connect to your Jira server or cloud instance to discover plans and enable real-time notifications for projects, issues, and releases.

## Jira integration overview

When you connect and configure a Jira instance, all existing work items are imported through plans, and a webhook is established to ensure updates are tracked real-time. You can then associate these planning objects to application for end-to-end traceability.

## Get started

Use one of the following options to onboard Jira. For a guided experience, use the workspace to onboard a tool. Alternatively, you can use the Service Catalog or Classic experience.

### Onboard Jira to DevOps Change Velocity — Workspace

Connect to your Jira Server or Jira Cloud instance from the DevOps Change Workspace to discover available plans and register webhooks to track projects, stories, features, and epics.

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## Before you begin

Complete the tasks specified in the Getting started with DevOps Change Velocity topic.

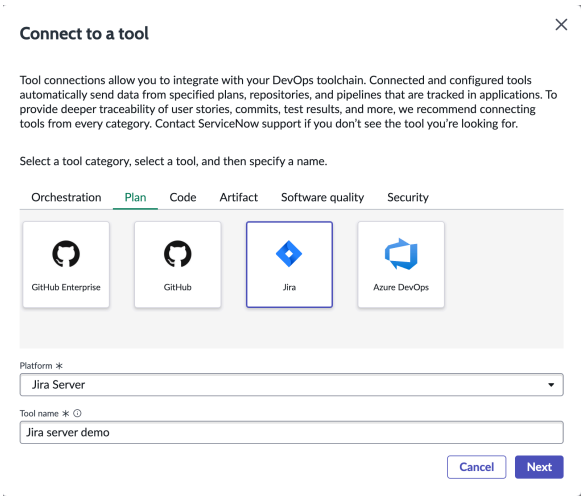
Role required: sn_devops.admin or sn_devops.tool_owner

## Procedure

1. Navigate to **Workspaces** > **DevOps Change Workspace** and use one of the following options to open the Playbook to onboard Jira.

> **Important:**
> If you want to discover and track tool objects like plans while connecting to the tool, you must connect your tool from the Application module.

2. Connect to your Jira Server or Jira Cloud instance.

| | |
|---|---|
| **Jira Server** | **a.** From the **Platform** list, select **Jira Server**.<br>**b.** In the **Tool name** field, enter a name for the tool.<br>This name is used to identify your Jira instance from the list of tools connected to DevOps Change Velocity.<br>  |
| **Jira Cloud** | **a.** From the **Platform** list, select **Jira Cloud**.<br>**b.** In the **Tool name** field, enter a name for the tool.<br>This name is used to identify your Jira instance from the list of tools connected to DevOps Change Velocity. |

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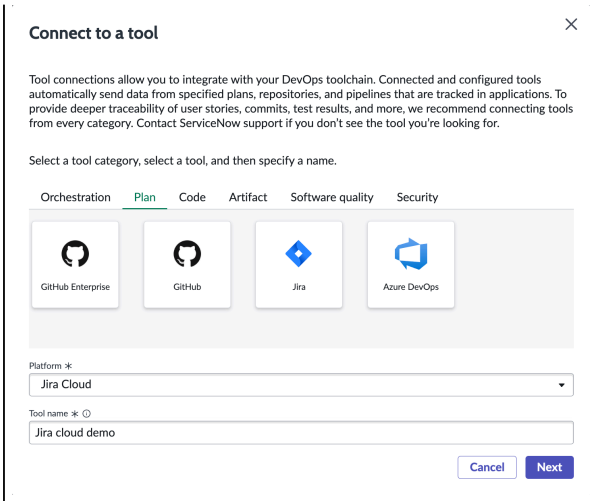
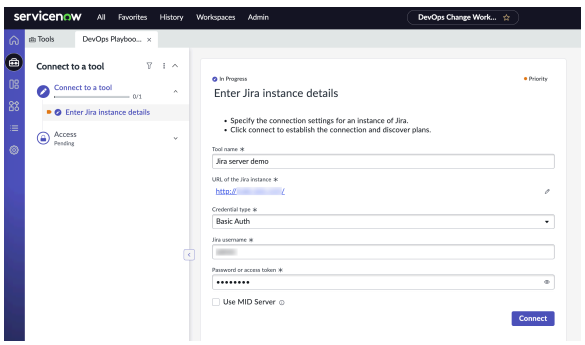



3. Select **Next**.

   The DevOps playbook page opens to help you complete the onboarding tasks.

4. Complete the connection to your Jira tool using the playbook.

   a. Enter the connection details.

| | |
|---|---|
| **Jira Server** | i. Enter your Jira server instance URL.<br>ii. From the **Credential type** list, select the authentication type you want to use to connect with your Jira server.<br>▪ **Basic Auth**<br>1. Enter your Jira server username.<br>**Note:** The Jira user that you use here must have the Jira Administrators permissions.<br>2. Enter the password or access token to access this instance.<br>  <br>▪ **API Key** |



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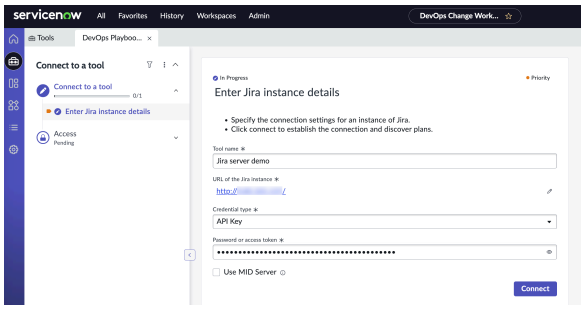
Enter the API token to access the instance.




**iii.** If your Jira instance is attached to a MID Server, select the **MID Server** option and enter its details.

For more information about MID server, see MID Server selection.

---

**Jira Cloud**

**i.** Enter your Jira Cloud instance URL.

> **Note:**
> If you select the credential type as **OAuth 2.0 with 3LO** in the next step, you must enter your Jira instance URL in the following format:
>
> ```
> https://api.atlassian.com/ex/jira/<Cloud-ID>
> ```
>
> For information on obtaining the value of Cloud ID, see Obtain the value of Cloud ID.

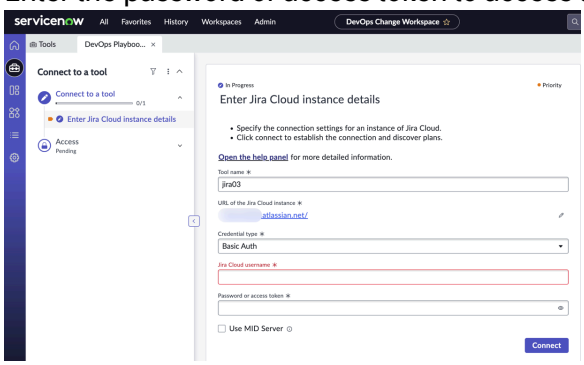
**ii.** Select the credential type as **Basic Auth** or **OAuth 2.0 with 3LO**.

**Basic Auth**

1. Enter your Jira Cloud username.

> **Note:**
> The Jira user that you use here must have the Jira Administrators permissions.

2. Enter the password or access token to access this instance.




**OAuth 2.0 with 3LO**

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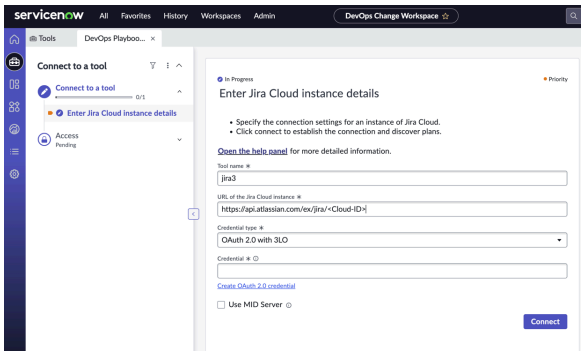
Pre-requisites:

- Create an OAuth 2.0 integration in Jira account
- Create an application registry in ServiceNow instance
- Create a credential record for Jira Cloud

Select an existing OAuth 2.0 credential record in the **Credential** field, or select **Create OAuth 2.0 credential record** to create a new record. For instructions on creating a new credential record, see Create a credential record for Jira Cloud.

**Note:**

- The option to create a new OAuth 2.0 will only be available if you have the connection & OAuth admin role.
- Only records that are not in use and configured for Jira Cloud can be selected as an existing credential record.




iii. If your Jira instance is attached to a MID Server, select the **MID Server** option and enter its details.

For more information about MID server, see MID Server selection

**b.** Select **Connect**.

If the connection is successful, the tool is created in the DevOps Change Velocity and connected to your Jira instance.

**c.** Permission checks are run on the credentials that you entered.
Permissions required and permissions that are available are displayed. If you want to enter credentials with better permissions, select **Re-enter credentials**. For detailed information on all the required permissions, see Jira permissions in Permissions required for DevOps tools.

You can choose to continue with the tool connection even if you don't have all the required permissions.

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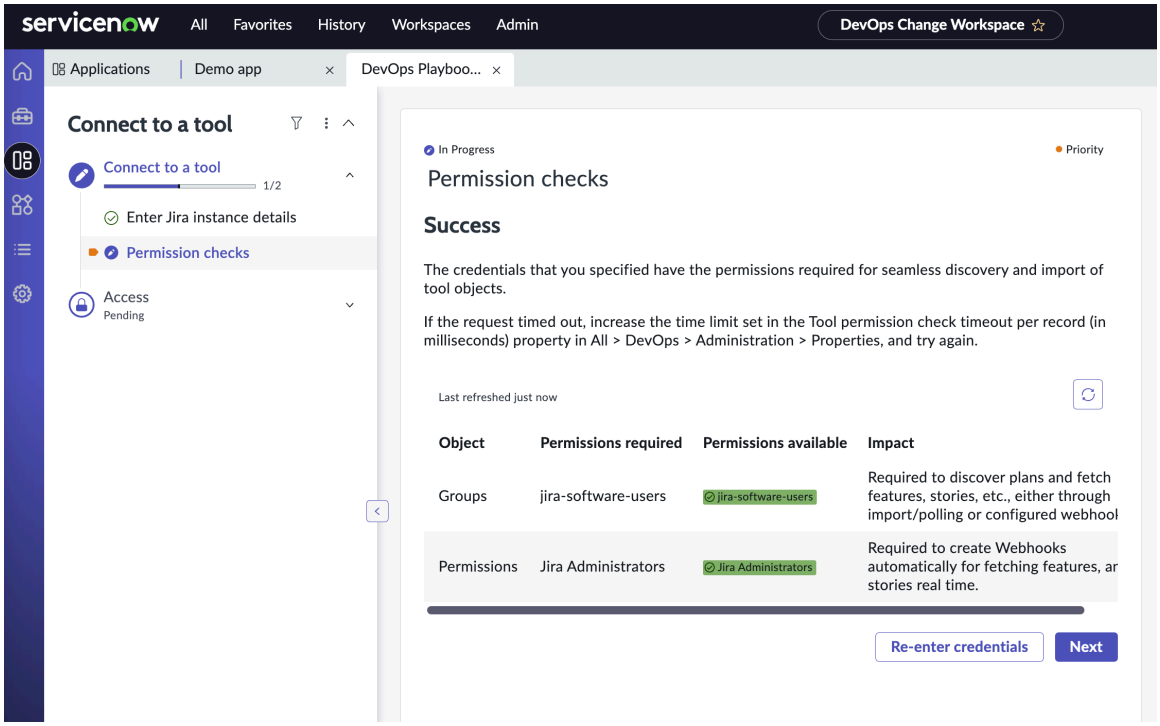


**d.** Select **Next**.

**5.** Specify the access for the tool.

**a.** If you want to control access to the tool, add the groups that must be given access to the tool in the **Maintained by** field.

The tasks these users in the groups can perform depends on the role assigned to them.

- DevOps Tool Owner role: Can view and edit the tool.
- DevOps App Owner role: Can view the tool and can associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects (such as plans, repositories, and pipelines).
- DevOps Administrator role: Can edit all tools.
- Other DevOps roles: Can view the tool.

**Note:**
If you don't select a group and skip this step, all users with the DevOps Tool Owner role will be able to edit the tool.

**b.** If you choose to control access to the tool, the **All App Owners can view and associate tool objects to applications** option becomes available for selection.

This option enables all users having the DevOps App Owner role to access the tool. If selected, they'll be able to view, associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects.

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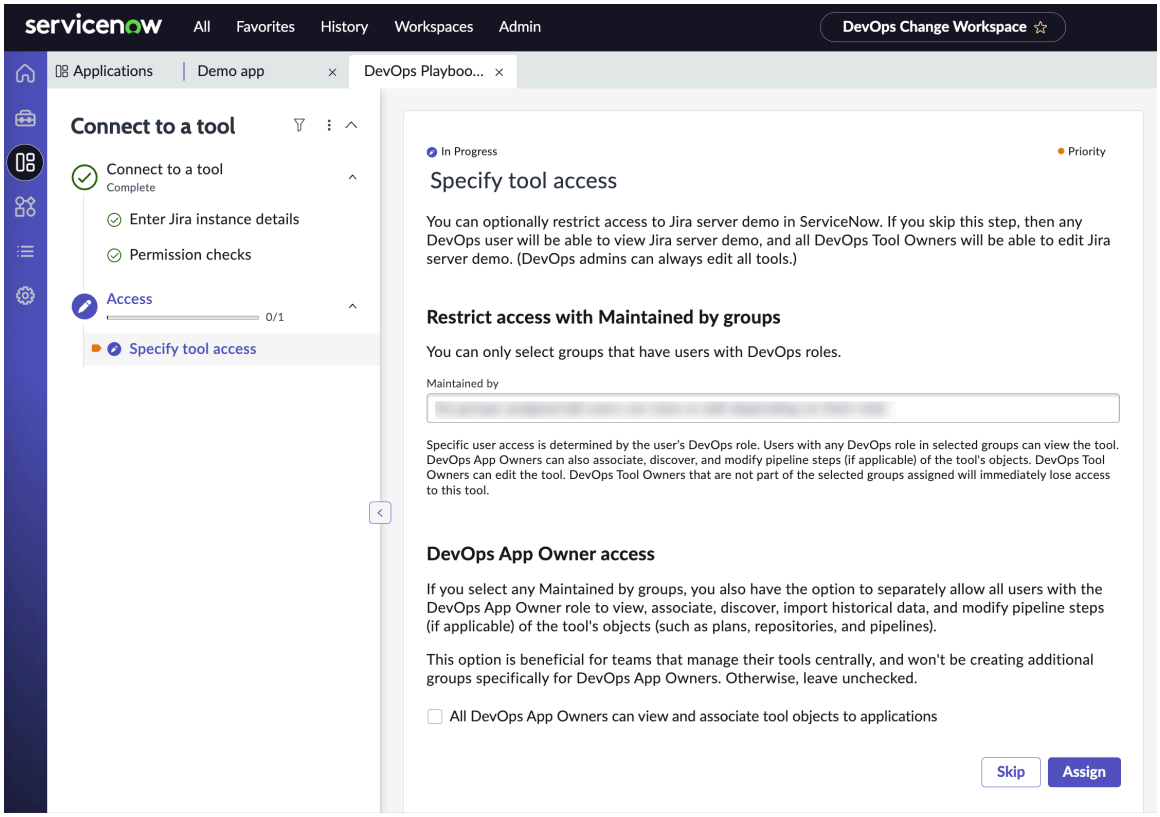
**c.** Select **Assign**.




**6.** To send data in real time between DevOps and your Jira instance, select **Configure**.

This action does the following:

- Registers a webhook between your Jira and ServiceNow instances, and enables real-time data transfer between the two.
- If you have connected your Jira tool using OAuth 2.0 based authentication, the webhooks are created for the OAuth 2.0 integration app in Jira when you configure automatically, whereas if you have connected using basic authentication, the webhooks are created for all your projects in Jira. If you choose to configure the webhooks manually for a Jira tool created using OAuth 2.0 based authentication, a duplicate webhook may get created.

All the discovered Jira projects are listed as Plans.

If you don't choose to configure now, you can enable nightly polling later to fetch data for any tracked plans by setting the *`Enable Polling`* system property to **Yes**.

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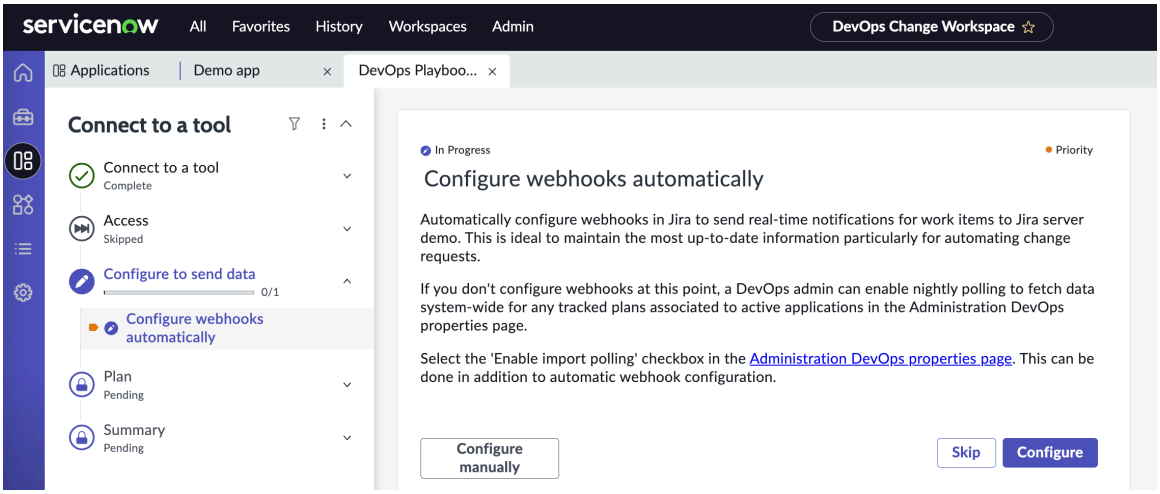



To configure manually, select **Configure manually**. See Configure webhooks in Jira manually for more information.

**Important:**

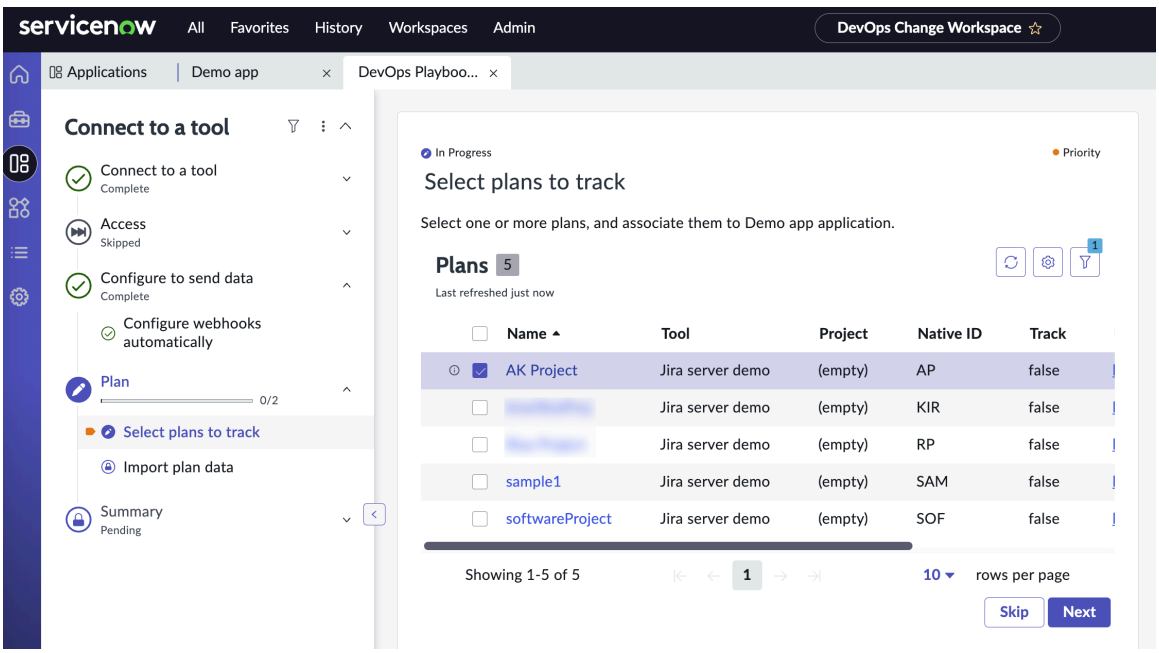
- If you're connecting from the Home page or Tools module, the connection is complete and you're taken to the Summary page.
- If you're connecting from the Applications module, then plans available in your Jira instance are discovered. You can track and import historical data from them.

**7.** Select the plans to track.

**a.** Select the plans for which you want to track updates and associate to the application.

After the tool onboarding is complete, the work items only for these selected plans are automatically imported.

**b.** Select **Next**.

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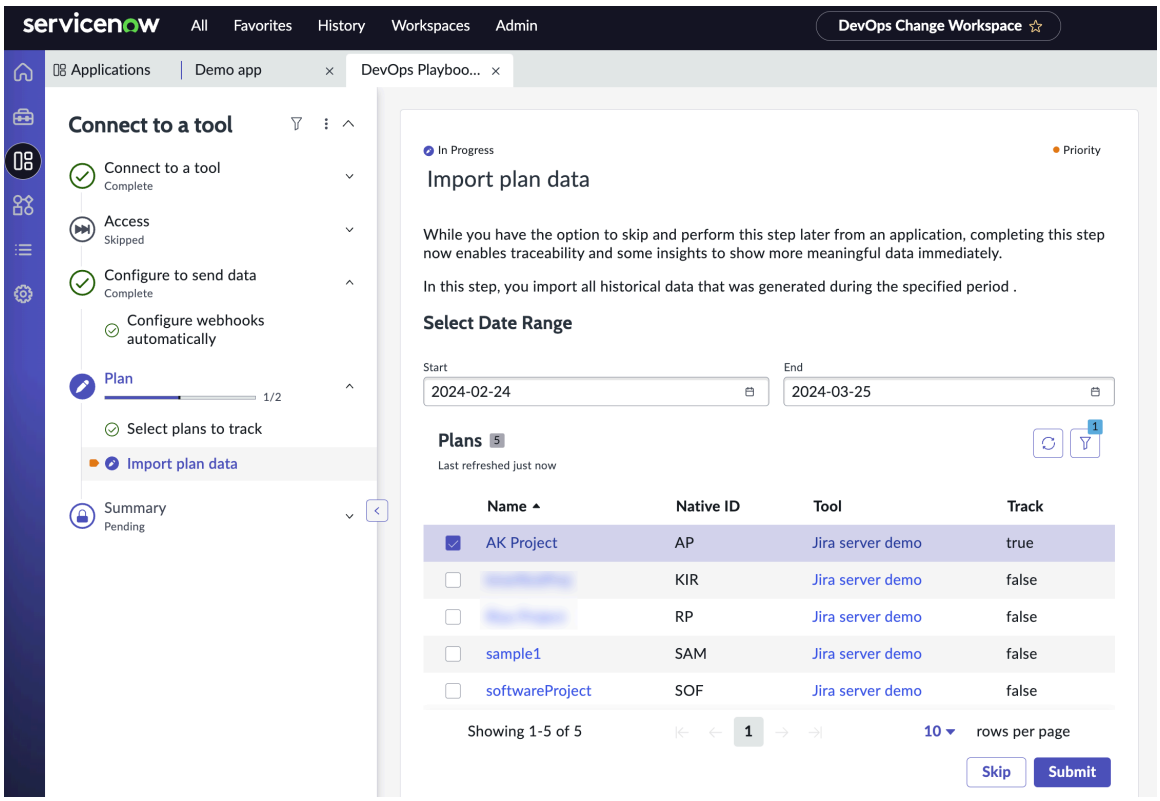
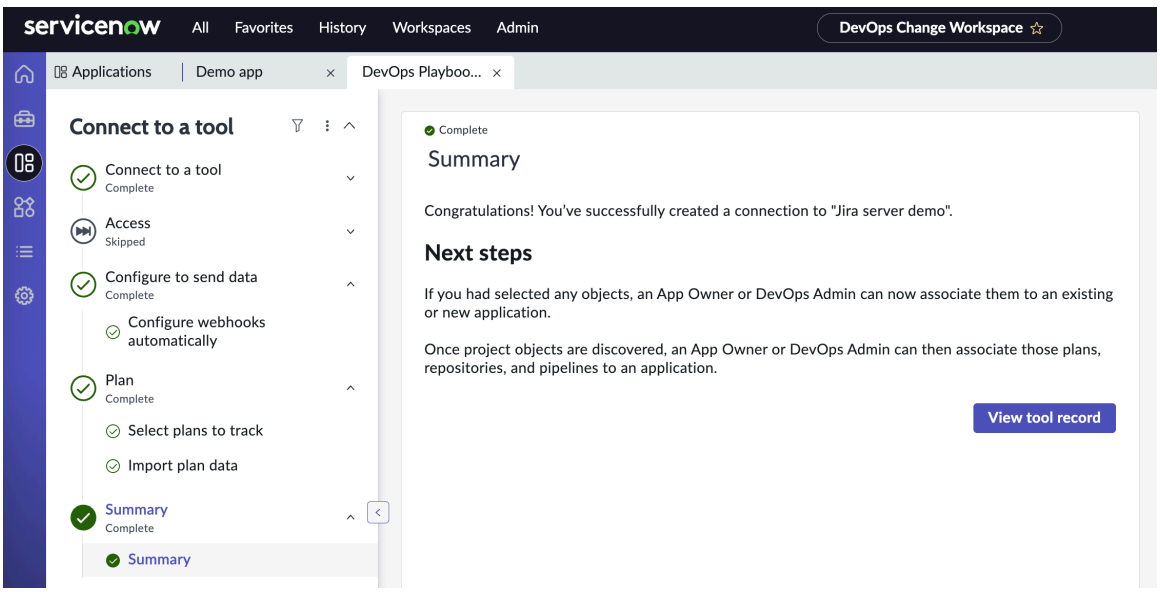
**c.** If you want to import plan data, select the date range and select **Submit**.

You can import up to 90 days of data.




**8.** From the **Summary** page, select **View tool record** to review the details of the connected instance and the plans discovered from it.




## Result

You've successfully onboarded your Jira tool to DevOps Change Velocity.

## What to do next

From the tool record page, you can:

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- See the details and status of the tool.
- **Discover** plans and **Configure** webhooks.

  **Note:**
  - By default, projects are discovered in a set of 50 for Jira Cloud. 50 is the maximum pagination limit supported by Jira. If you want to reduce this value, then you should edit the respective constant in DevOpsCommonConstants script.
  - Project and version data that are discovered aren't updated or tracked in real time.

- Assign groups to control access to the tool using the **Maintained by** field.
- Check credential permissions and update credentials for the tool. For more details, see Check permissions and update credentials for tools — Workspace.
- From the **Plans** tab, select a plan to view its details such as imported work items, features, and others.
- To import historical data from the plans, associate the plans with an application, and import the data. For more information, see Associate tool objects to applications - Workspace.

**Note:**
It is recommended not to update the project key for projects in Jira. If the project key is updated, the updated object names will not reflect in DevOps Change Velocity. Only when the object is updated in Jira, the new name will reflect in DevOps Change Velocity.

**Related topics**

Configure webhooks from the tool record

### Onboard Jira to DevOps Change Velocity — Service Catalog

Create, connect, discover, and configure your Jira Server or Jira Cloud instance using the ServiceNow Service Catalog.

**Before you begin**
Role required: sn_devops.admin or sn_devops.tool_owner

**Procedure**

1. Navigate to **All** > **Service Catalog** > **Catalog Definitions** > **Maintain Items** and search for DevOps.

   **Note:**
   You can also access the service catalog from the Employee Center or Service portal.

2. From the DevOps catalog items, select and activate **DevOps App Onboarding** and **DevOps Tool Onboarding**.
3. After activating, select **DevOps Tool Onboarding** and select **Try it**.
4. In the DevOps Tool Onboarding form, enter the tool details:

| | |
|---|---|
| **Jira Server** | **a.** In the **Tool name** field, enter a name for the tool.<br>**b.** In the **Tool integration** field, search for and select Jira.<br>**c.** Enter your Jira server instance URL. |

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| | |
|---|---|
| | **d.** From the **Credential type** list, select the authentication type you want to use to connect with your Jira server.<br>▪ **Basic Auth**<br>**i.** Enter your Jira server username.<br>**Note:** The Jira user that you use here must have the Jira Administrators permissions.<br>**ii.** Enter the password or access token to access this instance.<br>▪ **API Key**<br>Enter the API token to access the instance.<br>**e.** If you want to configure webhooks for all the projects discovered in your Jira instance, then select the option **Do you wish to configure webhook for the tool?**<br>**f.** Select#**Use MidServer** for an on-premises tool that is attached to a#MID Server. Application is automatically set to#DevOps and capability is set to REST. |
| **Jira Cloud** | **a.** In the **Tool name** field, enter a name for the tool.<br>**b.** In the **Tool integration** field, search for and select Jira Cloud.<br>**c.** in the **Tool URL** field, enter your Jira Cloud instance URL.<br>**d.** In the **Credential type** field, select **Basic Auth** or **OAuth 2.0**.<br>**Basic Auth**<br>**i.** Enter your Jira Cloud username.<br>**Note:** The Jira user that you use here must have the Jira Administrators permissions.<br>**ii.** Enter the password or access token to access this instance.<br>**OAuth 2.0**<br>Pre-requisites:<br>▪ Create an OAuth 2.0 integration in Jira account<br>▪ Obtain the value of Cloud ID<br>▪ Create an application registry in ServiceNow instance<br>▪ Create credential record for Jira Cloud<br>In the **Tool credential** field, select an existing OAuth 2.0 tool credential record. |

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**Note:**
Only records that are not in use and configured for Jira Cloud can be selected as an existing credential record.

**e.** If you want to configure webhooks for all the projects discovered in your Jira instance, then select the option **Do you wish to configure webhook for the tool?**

**Note:**
If you have connected your Jira tool using OAuth 2.0 based authentication, the webhooks are created for the OAuth 2.0 integration app in Jira when you configure automatically, whereas if you have connected using basic authentication, the webhooks are created for all your projects in Jira.

**f.** Select#**Use MidServer** for an on-premises tool that is attached to a#MID Server. Application is automatically set to#DevOps and capability is set to REST.

For a list of all the permissions required on the credentials for connecting to Jira, see Jira permissions in Permissions required for DevOps tools.

5. Select **Order Now**.
   A request is created. When the request is approved, the tool is created, connected, configured, and discovered.
6. From the DevOps catalog items, select **DevOps App Onboarding** and select **Try it**.
7. In the DevOps App Onboarding form, enter the details:

| | |
|---|---|
| Are you creating a new app or adding to an existing one? | Select from the options whether to create a new app or use an existing app. |
| App | Enter the name for the app that you're creating or using. |
| Onboarding pipelines | Leave empty. |
| Onboarding repositories | Leave empty. |
| Onboarding plans | Enter the connected Jira tool name. |
| Plans | Select the plans for which you want to import historical data. |
| Import from and Import to | Select the dates for which you want to import the data. By default, the last 30 days are selected. You can choose to import data for a maximum of 90 days. |

8. Select **Order Now**.
   A request is created. When the request is approved, the plan objects are associated to the app record, which enables real-time tracking. Historical data is also imported for the selected plans. The **Track** field is automatically enabled for imported plans.

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## Onboard Jira to DevOps Change Velocity — Classic

Connect your Jira Server or Jira Cloud instance to discover, configure, and import projects and work items such as stories, epics, and features.

### Before you begin

Complete the tasks in Getting started with DevOps Change Velocity.

Role required: sn_devops.admin or sn_devops.tool_owner

### Procedure

1. Connect to your Jira Server or Jira Cloud instance.

   a. Navigate to **DevOps** > **Tools** > **Create New (legacy)**.

   b. Enter the details for connecting to your Jira instance.

| | |
|---|---|
| **Jira Server** | i. In the **Tool name** field, enter a name for the tool.<br>ii. In the **Tool integration** field, search for and select Jira.<br>iii. Enter your Jira server instance URL.<br>iv. From the **Credential type** list, select the authentication type you want to use to connect with your Jira server.<br>▪ **Basic Auth**<br>1. Enter your Jira server username.<br>**Note:** The Jira user that you use here must have the Jira Administrators permissions.<br>2. Enter the password or access token to access this instance.<br>▪ **API Key**<br>Enter the API token to access the instance. |
| **Jira Cloud** | i. In the **Tool name** field, enter a name for the tool.<br>ii. In the **Tool integration** field, search for and select Jira Cloud.<br>iii. in the **Tool URL** field, enter your Jira Cloud instance URL.<br>iv. In the **Credential type** field, select **Basic Auth** or **OAuth 2.0**.<br>**Basic Auth** |

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1. Enter your Jira Cloud username.

   **Note:**
   The Jira user that you use here must have the Jira Administrators permissions.

2. Enter the password or access token to access this instance.

**OAuth 2.0**

Pre-requisites:

- Create an OAuth 2.0 integration in Jira account
- Obtain the value of Cloud ID
- Create an application registry in ServiceNow instance
- Create credential record for Jira Cloud

In the **Tool credential** field, select an existing OAuth 2.0 tool credential record.

**Note:**
Only records that are not in use and configured for Jira Cloud can be selected as an existing credential record.

For a list of all the permissions required on the credentials for connecting to Jira, see Jira permissions in Permissions required for DevOps tools.

c. **Optional:** If your Jira instance is attached to a MID Server, select the **MID Server** option and enter its details.

(Optional) For more information about MID server, see MID Server selection

d. Select **Submit**.

The tool is automatically connected using a connection alias and HTTP tool connection (Basic Auth credential).

On successful tool creation, you're taken to the tool record page.

2. If you want to control access to the tool, add the groups that must be given access to the tool in the **Maintained by** field on the **Access** tab.

The tasks the users in the groups can perform depends on the roles assigned to them.

| Role | Description |
|---|---|
| DevOps Tool Owner role | Can view and edit the tool. |
| DevOps App Owner role | Can view the tool and can associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects (such as plans, repositories, and pipelines). |
| DevOps Administrator role | Can edit all tools. |
| Other DevOps roles | Can view the tool. |

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**Note:**
Only groups containing users with DevOps roles are available for selection in the **Maintained by** field.

The **All App Owners can view and associate tool objects to applications** option becomes available for selection if you choose to restrict access to the tool. This option enables all users having the DevOps App Owner role to access the tool. If selected, they'll be able to view, associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects.

3. Select **Discover** to discover all existing projects from Jira.

**Note:**
By default, projects are discovered in a set of 50 for Jira Cloud. 50 is the maximum pagination limit supported by Jira. If you want to reduce this value, then you should edit the respective constant in DevOpsCommonConstants script.

4. Select **Configure** to configure webhooks.

This action does the following:

- Registers a webhook between your Jira and ServiceNow instances, and enables real-time data transfer between the two.
- If you have connected your Jira tool using OAuth 2.0 based authentication, the webhooks are created for the OAuth 2.0 integration app in Jira when you configure automatically, whereas if you have connected using basic authentication, the webhooks are created for all your projects in Jira.

All the discovered Jira projects are listed as Plans.

If you don't choose to configure now, you can enable nightly polling later to fetch data for any tracked plans by setting the *Enable Polling* system property to **Yes**.

**Note:**
If you don't have admin privileges for Jira to allow automatic configuration of the webhook URL, request your Jira admin to configure it for you. This action would require creating and configuring the webhook URL manually in your tool instance. After the webhook is configured in the tool, select **Enter Manual Configuration Mode** to connect to Jira manually, then exit the manual configuration mode.

5. Select the **Import** related link to import historical data from Jira projects.

Imported work items are added to the corresponding related lists.

**Note:**
If the project key for a project is updated in Jira, the updated object names will not reflect in DevOps Change Velocity. Only when the object is updated in Jira, the new name will reflect in DevOps Change Velocity.

### Configure webhooks in Jira manually

Configure webhooks in your Jira Server or Jira Cloud instance to send sync notifications to the DevOps Change Velocity application.

**Before you begin**
Role required:

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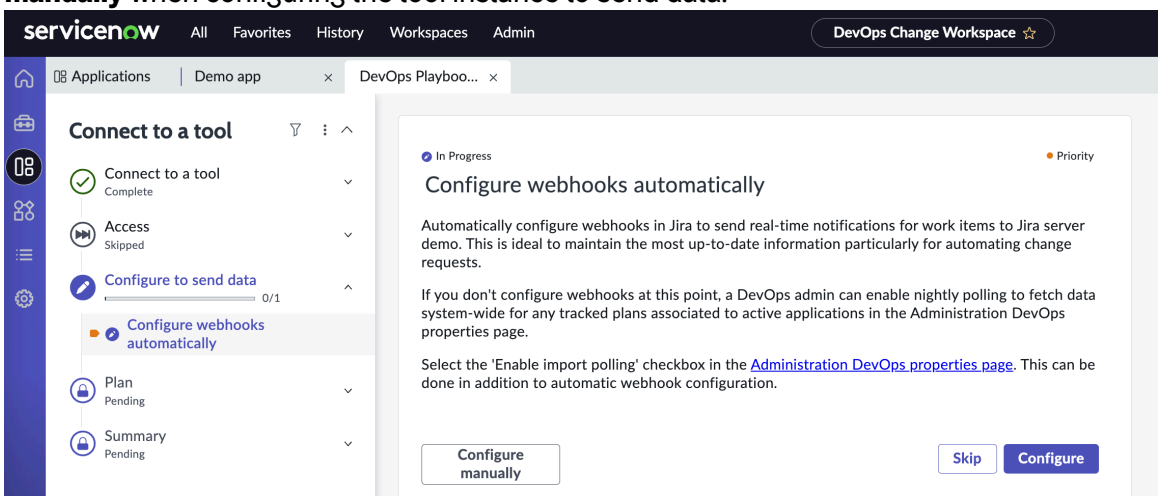
- sn_devops.admin or sn_devops.tool_owner in DevOps Change Velocity.
- Jira admin role in your Jira Server or Jira Cloud instance.

## About this task

If you have connected your Jira tool using OAuth 2.0 based authentication, the webhooks are created for the OAuth 2.0 integration app in Jira when you configure automatically, whereas if you have connected using basic authentication, the webhooks are created for all your projects in Jira. If you choose to configure the webhooks manually for a Jira tool created using OAuth 2.0 based authentication, a duplicate webhook may get created.

## Procedure

1. In DevOps Change Velocity, in the Configure to send data playbook activity, select **Configure manually** when configuring the tool instance to send data.




> **Note:**
> You can also access manual configuration from the Jira tool record in DevOps Change Velocity. From the tool record, select **Configure** > **Configure manually**.

2. Copy the **Webhook URL** field from the ServiceNow instance connection details for Jira.

> **Note:**
> Select **Copy** in the appropriate field to copy the value to your clipboard. The field label changes to **Copied**, but you can copy multiple times.

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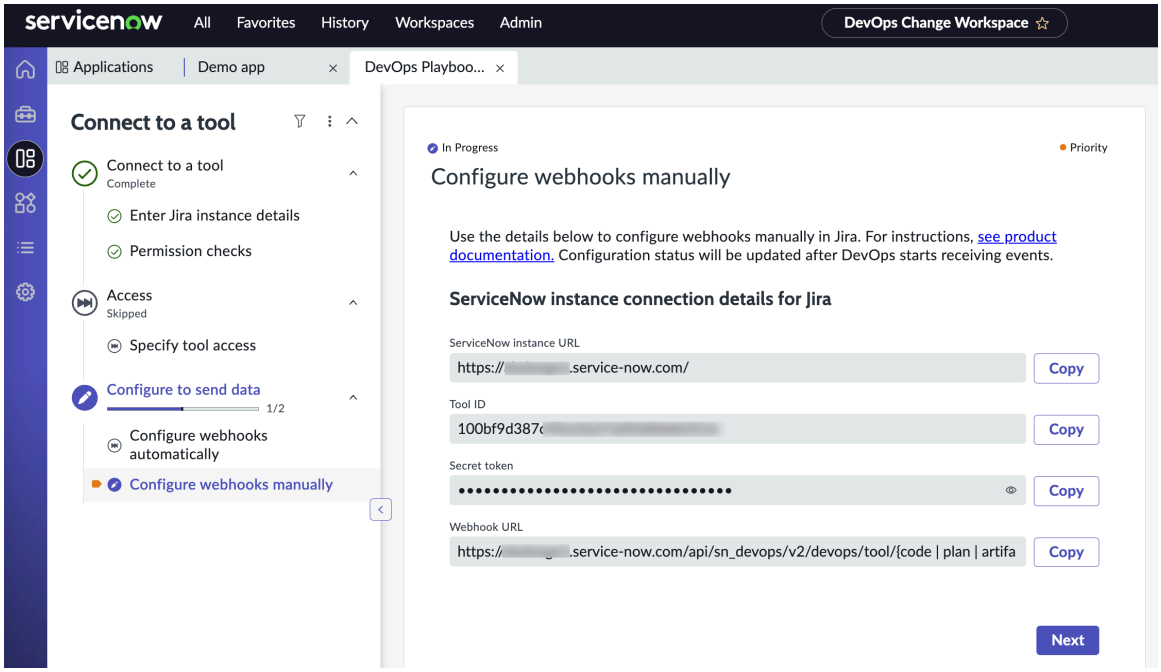


3. Navigate to:
   - For Jira Server navigate to **Administration** > **System** > **WebHooks**.
   - For Jira Cloud instance, navigate to **Settings** > **System** > **WebHooks**.
4. Select **Create a WebHook**.
5. Enter the details for the webhook.

| Field | Description |
|---|---|
| Name | Enter a name for the webhook. |
| Status | Select **Enabled**. |
| URL | Paste the Webhook URL copied from DevOps Change Velocity.<br>○ Modify the copied webhook URL to reflect the code capability. For example, `https://<your_instance>.service-now.com/api/sn_devops/v2/devops/tool/code?toolId=<your_toolID>?ni.nolog.token=<Secure Token>`<br>○ Append the token to the end of the webhook URL. |
| Events | Select the events to be tracked.<br>For example: |

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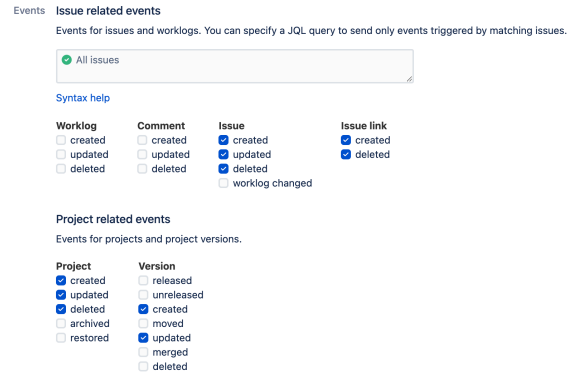
| Field | Description |
| --- | --- |
| |  |

6. Select **Create**.
   If you want to test the webhook, see the section on Jira in Test webhooks manually.

## Rally integration with DevOps Change Velocity

Connect to your Broadcom Rally instance to discover plans and configure real-time notifications to enable change traceability and automation.

## Rally integration overview

With this integration, you can configure and expose data like projects, user stories, and defects from Rally. You can then associate these planning objects to an application for end-to-end traceability.

### Install Rally plugin

You must install the Rally application from ServiceNow Store.

**Note:**

- The default object types configured for Rally are `"ObjectTypes"["HierarchicalRequirement","Defect","Feature"]`.
- The file script include **Rally state mapping helper** is editable. You can override this file with your specific customization as required.
- Scheduledstate in Rally is used when mapping object state to internal ServiceNow work item state.
- For tool mappings, see Tool mappings.

## Get started

Use one of the following options to onboard Rally. For a guided experience, use the workspace to onboard a tool. Alternatively, you can use the Service Catalog or Classic experience.

### Onboard Rally to DevOps Change Velocity — Workspace

Connect to your Rally instance using the DevOps Change Workspace playbook to configure webhooks and discover plans.

#### Before you begin

Complete the tasks specified in the Getting started with DevOps Change Velocity topic.

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Role required: sn_devops.admin or sn_devops.tool_owner

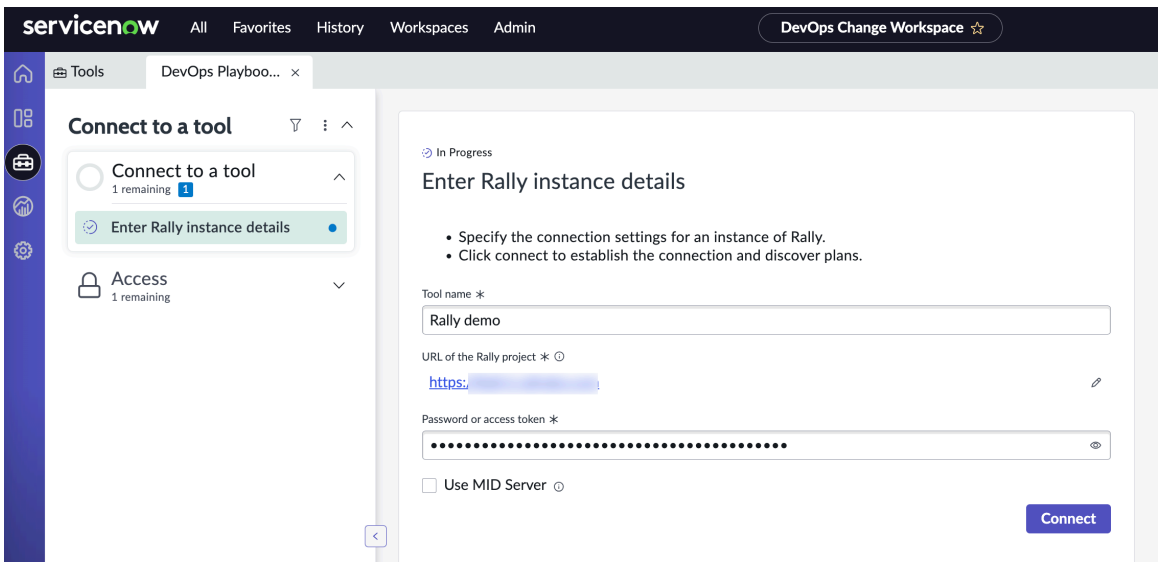
### Procedure

1. Navigate to **Workspaces** > **DevOps Change Workspace** and use one of the following options to open the Playbook to onboard Rally.

   **Important:**
   If you want to discover and track tool objects like plans while connecting to the tool, you must connect your tool from the Application module.

2. Enter a tool name to identify your tool and select **Next**.
3. On the Enter Rally instance details playbook activity, enter the following details:
   a. In the **URL of the Rally project** field, enter your Rally project URL.
   b. In the **Password or access token** field, enter the API token for your Rally instance.
   c. (Optional) If your Rally instance is attached to a MID Server, select the **Use MID Server** option and enter its details.

      A MID server is required if your tool instance is hosted on-prem. For more information about MID server, see MID Server selection.
4. Select **Connect**.
   On successful connection, the tool is created in ServiceNow and connected to your Rally instance.




5. Specify the access for the tool.

   a. If you want to control access to the tool, add the groups that must be given access to the tool in the **Maintained by** field.

      The tasks these users in the groups can perform depends on the role assigned to them.

      - DevOps Tool Owner role: Can view and edit the tool.
      - DevOps App Owner role: Can view the tool and can associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects (such as plans, repositories, and pipelines).

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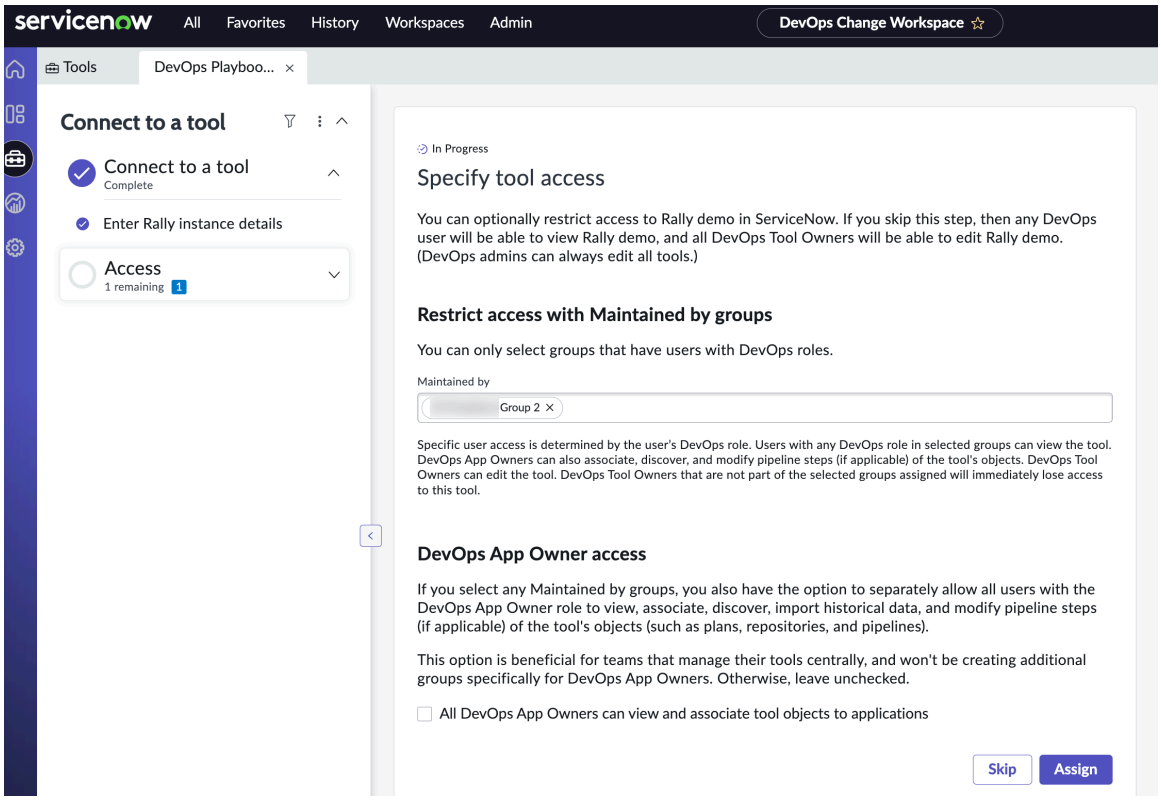
- DevOps Administrator role: Can edit all tools.
- Other DevOps roles: Can view the tool.

**Note:**
If you don't select a group and skip this step, all users with the DevOps Tool Owner role will be able to edit the tool.

**b.** If you choose to control access to the tool, the **All App Owners can view and associate tool objects to applications** option becomes available for selection.
This option enables all users having the DevOps App Owner role to access the tool. If selected, they'll be able to view, associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects.

**c.** Select **Assign**.




**6.** Configure webhooks automatically in Rally to send real-time notifications.

**Note:**
If you prefer not to configure webhooks, you can enable nightly polling to fetch data for all tracked plans by selecting the **Enable import polling** check box in DevOps properties.

**a.** Enter the integration user name and password.

For information about creating the DevOps integration user and password, see Set up integration user account in DevOps Change Velocity.

**b.** Select the plans that you want to track.

**c.** Select **Configure**.

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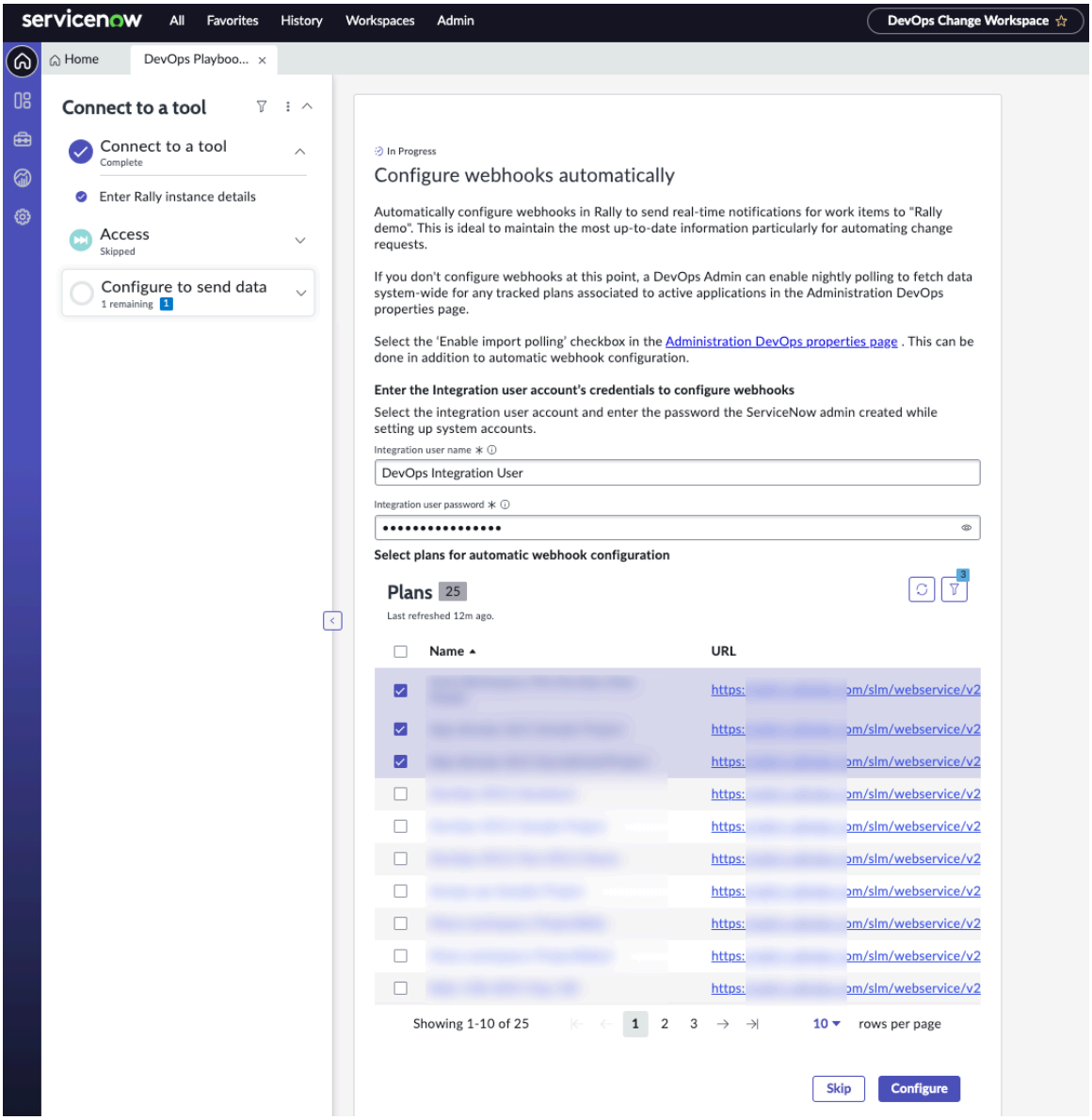


**Important:**

- If you're connecting from the Home page or Tools module, the connection is complete and you're taken to the Summary page.
- If you're connecting from the Applications module, then plans available in your instance are discovered. You can track and import historical data from them.

7. If you want to import plan data, select the date range and select **Submit**.

   You can import up to 90 days of data.

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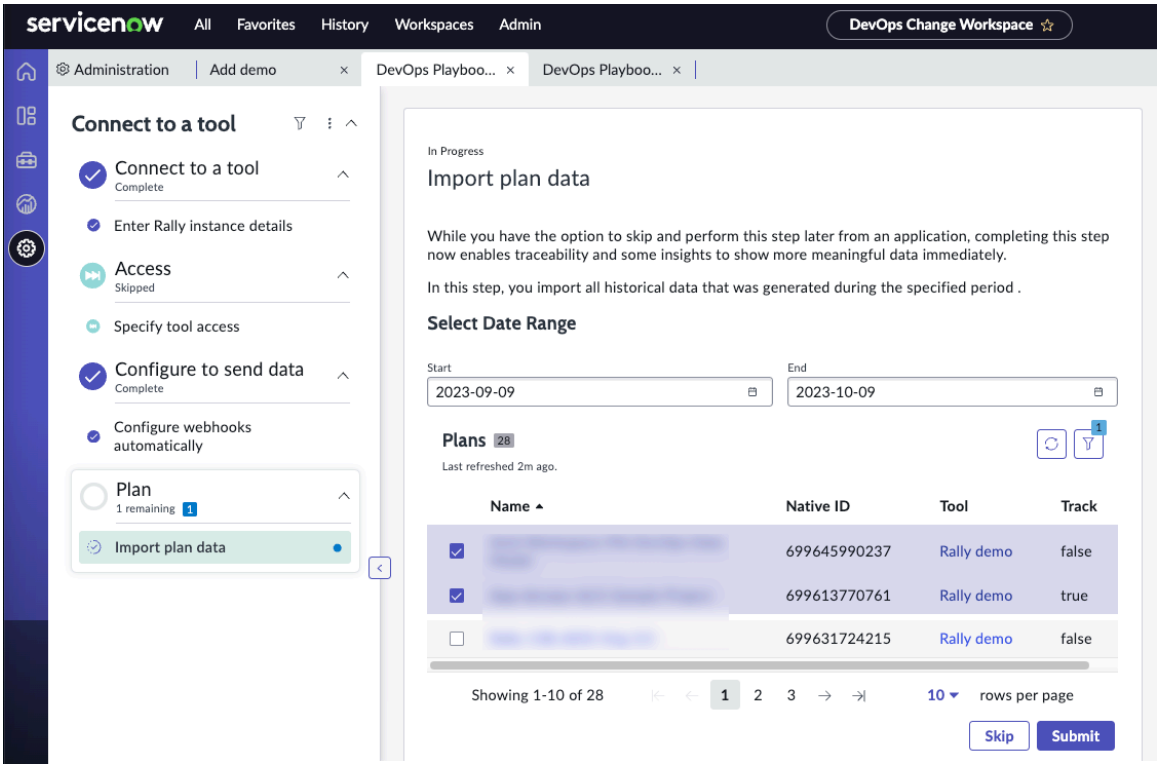
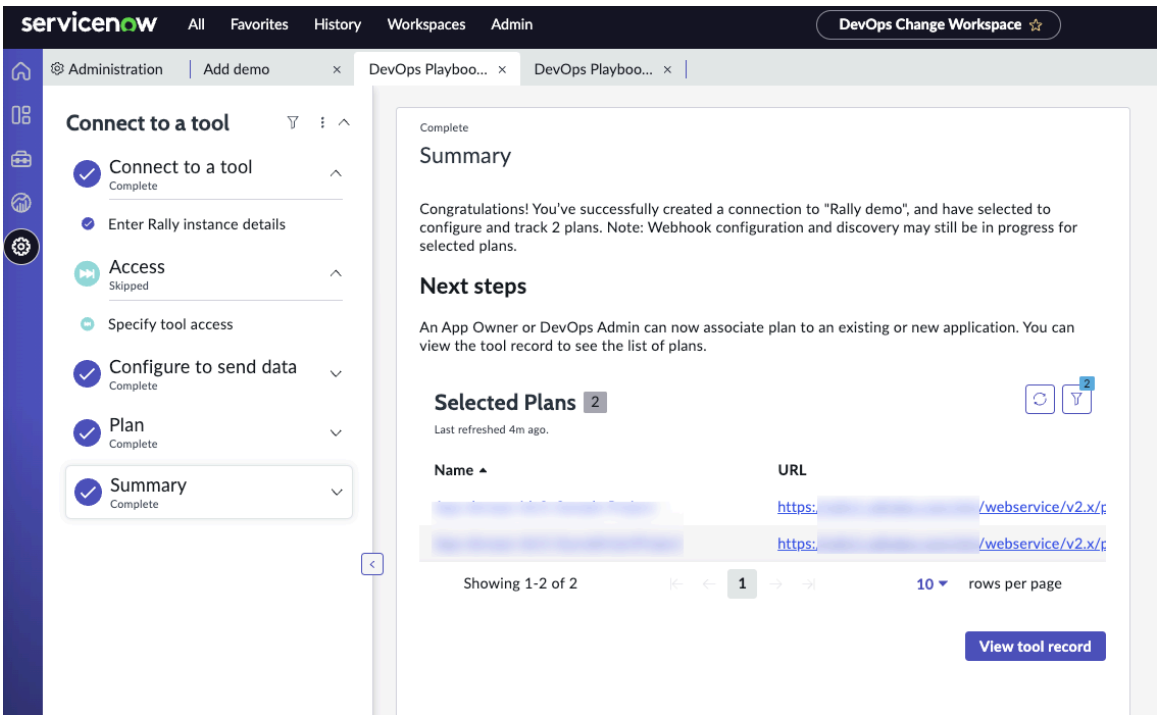



8. From the **Summary** tab, select **View tool record** to review the details of the connected instance and the plans discovered from it.




## Result

You've successfully onboarded your Rally tool to DevOps Change Velocity.

## What to do next

From the tool record page, you can do the following:

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- See the details and status of the tool.
- Discover plans and configure webhooks.
- Assign groups to control access to the tool using the **Maintained by** field.
- From the **Plans** tab, select a plan to view its details such as imported work items, features, and others.
- To import historical data from the plans, associate the plans with an application, and import the data. For more information, see Associate tool objects to applications - Workspace.

**Related topics**

Configure webhooks from the tool record

### Onboard Rally to DevOps Change Velocity — Service Catalog

Create, connect, discover, and configure your Rally instance using the ServiceNow Service Catalog.

## Before you begin

Role required: sn_devops.admin or sn_devops.tool_owner

## Procedure

1. Navigate to **All** > **Service Catalog** > **Catalog Definitions** > **Maintain Items** and search for DevOps.

   **Note:**
   You can also access the service catalog from Employee Center or Service portal.

2. From the DevOps catalog items, select and activate **DevOps App Onboarding** and **DevOps Tool Onboarding**.
3. After activating, select **DevOps Tool Onboarding** and select **Try it**.
4. In the DevOps Tool Onboarding form, enter the tool details:

| Field | Description |
|---|---|
| Tool name | Name for your Rally integration. |
| Tool integration | Select Rally. |
| Tool URL | URL of your Rally instance to integrate. |
| Tool password/ Access token | Enter the API key for Rally. |
| Use MidServer | Optional. Select#MID Server#for an on-premises tool that is attached to a#MID Server. Application is automatically set to #DevOps#and capability is set to REST. |

5. Select **Order Now**.
   A request is created. When the request is approved, the tool is created, connected, discovered, and configured.
6. From the DevOps catalog items, select **DevOps App Onboarding** and select **Try it**.
7. In the DevOps App Onboarding form, enter the details:

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| | |
|---|---|
| Are you creating a new app or adding to an existing one? | Select from the options whether to create a new app or use an existing app. |
| App | Enter the name for the app that you're creating or using. |
| Onboarding pipelines | Leave empty. |
| Onboarding repositories | Leave empty. |
| Onboarding plans | Enter the connected Rally tool name. |
| Plans | Select the plans for which you want to import historical data. |
| Import from and Import to | Select the dates for which you want to import the data. By default, the last 30 days are selected. You can choose to import data for a maximum of 90 days. |

8. Select **Order Now**.
   A request is created. When the request is approved, the plan objects are associated to the app record, which enables real-time tracking. Historical data is also imported for the selected plans. The **Track** field is automatically enabled for imported plans.

### Onboard Rally to DevOps Change Velocity — Classic

With this integration, you can configure and expose data like projects, user stories, and defects from the Rally. You can then associate these planning objects to application for end-to-end traceability.

#### Before you begin

Role required: sn_devops.admin or sn_devops.tool_owner

#### Procedure

1. Navigate to **All** > **DevOps** > **Tools** > **Create New (legacy)**.
2. In the Create DevOps tool form, enter the tool details:

| | |
|---|---|
| Tool name | Name for the tool you're integrating. |
| Tool integration | Tool to integrate. Select Rally. |
| Tool URL | URL of your Rally instance to integrate. |
| Tool password / Access token | Enter the API key for Rally. |
| Use MID Server | MID Server is optional. Select MID Server for an on-premises tool that is attached to a MID Server. The Application value is automatically set to DevOps and the Capability value is set to REST. For more information, see MID Server selection. |

3. Click **Submit** to connect to your Rally instance.

On successful tool creation, you're taken to the tool record page.

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4. If you want to control access to the tool, add the groups that must be given access to the tool in the **Maintained by** field on the **Access** tab.

   The tasks the users in the groups can perform depends on the roles assigned to them.

   - DevOps Tool Owner role: Can view and edit the tool.
   - DevOps App Owner role: Can view the tool and can associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects (such as plans, repositories, and pipelines).
   - DevOps Administrator role: Can edit all tools.
   - Other DevOps roles: Can view the tool.

   **Note:**
   Only groups containing users with DevOps roles are available for selection in the **Maintained by** field.

   The **All App Owners can view and associate tool objects to applications** option becomes available for selection if you choose to restrict access to the tool. This option enables all users having the DevOps App Owner role to access the tool. If selected, they'll be able to view, associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects.

5. Click **Discover** to import existing projects associated with Rally.
   Plan records are added to the **Plans** related links.
6. To configure webhooks for Rally projects:
   a. Click **Configure**.
   b. Select the projects for which you want to configure webhooks and click **Continue**.
   c. Enter your DevOps integration user credentials.
7. **Optional:** To import historical data, select a plan and click **Import**.
   Select the dates to import historical data from the Rally project. You can see the imported data under **Work Items**. Select a work item to see details including commits made.

   **Note:**
   Scheduledstate in Rally is used when mapping object state to internal ServiceNow work item state.

   Formatted id is used for the work item NativeID, for associating work items and commits.

## Agile Development 2.0 integration with DevOps Change Velocity

Connect to your ServiceNow Agile Development 2.0 instance to track your products and the stories, epics, and release versions associated with it.

For more details about Agile Development 2.0, see Agile Development 2.0 .

### Get started

Use one of the following options to onboard Agile Development 2.0. For a guided experience, use the workspace to onboard a tool. Alternatively, you can use the Service Catalog or Classic experience.

#### Onboard Agile Development 2.0 to DevOps Change Velocity — Workspace

Connect to your Agile Development 2.0 instance using the DevOps Change Workspace playbook to enable tracking of stories and epics.

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### Before you begin

Complete the tasks specified in the Getting started with DevOps Change Velocity topic.

Activate the Agile Development 2.0 plugin. For more information, see Activate Agile Development 2.0.

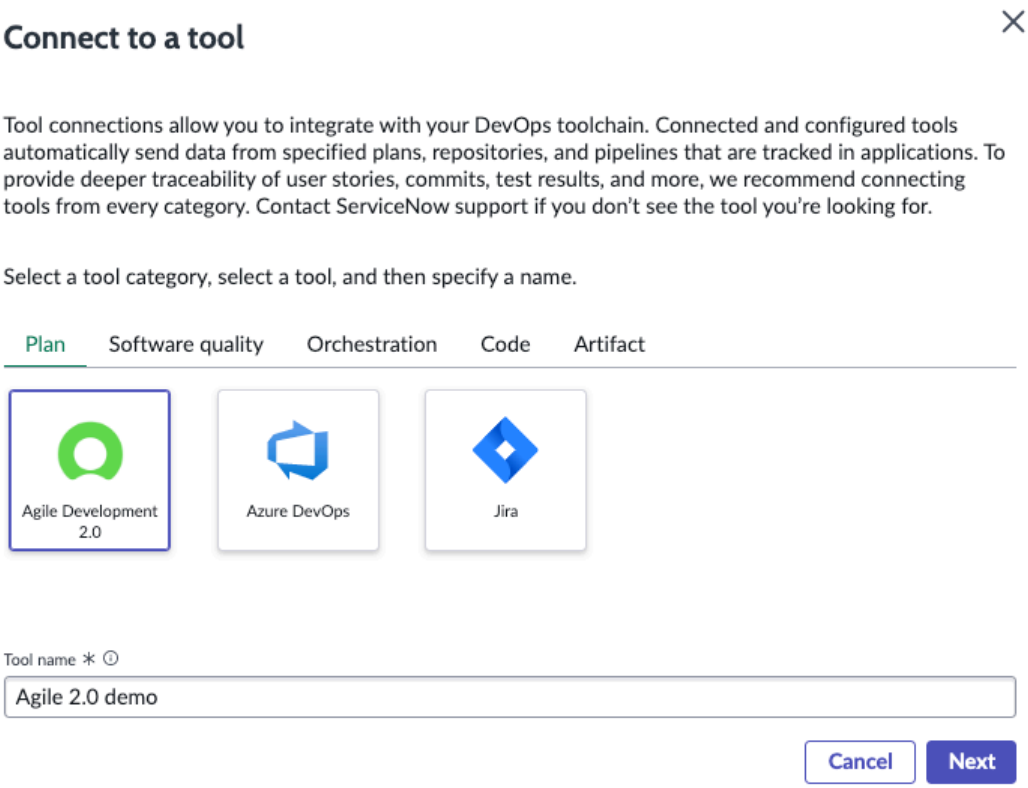
Role required: sn_devops.admin or sn_devops.tool_owner

### Procedure

1. Navigate to **Workspaces** > **DevOps Change Workspace** and use one of the following options to open the Playbook to onboard Agile Development 2.0.

   **Important:**
   If you want to discover and track tool objects like plans while connecting to the tool, you must connect your tool from the Application module.

2. In the **Tool name** field, enter a name for the tool.




3. Select **Next**.

   The DevOps playbook opens to help you complete the onboarding tasks.

4. Select **Connect**.

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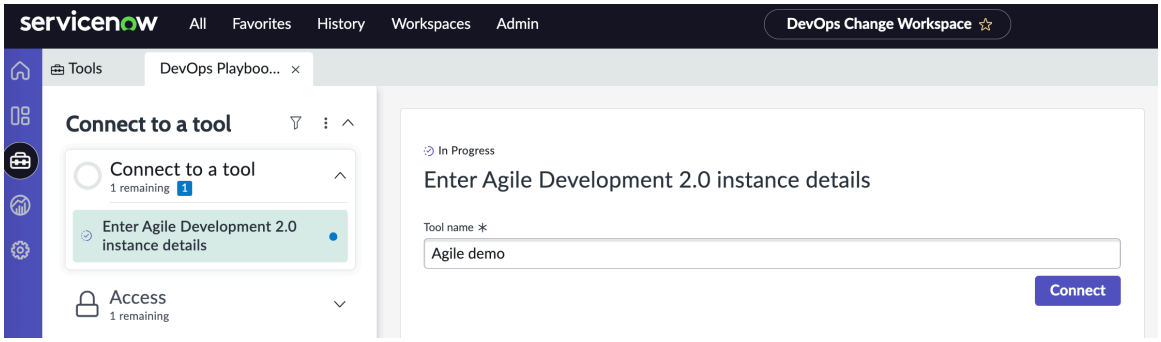


5. Specify the access for the tool.
   a. If you want to control access to the tool, add the groups that must be given access to the tool in the **Maintained by** field.

      The tasks these users in the groups can perform depends on the role assigned to them.

      - DevOps Tool Owner role: Can view and edit the tool.
      - DevOps App Owner role: Can view the tool and can associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects (such as plans, repositories, and pipelines).
      - DevOps Administrator role: Can edit all tools.
      - Other DevOps roles: Can view the tool.

      **Note:**
      If you don't select a group and skip this step, all users with the DevOps Tool Owner role will be able to edit the tool.

   b. If you choose to control access to the tool, the **All App Owners can view and associate tool objects to applications** option becomes available for selection.

      This option enables all users having the DevOps App Owner role to access the tool. If selected, they'll be able to view, associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects.

   c. Select **Assign**.

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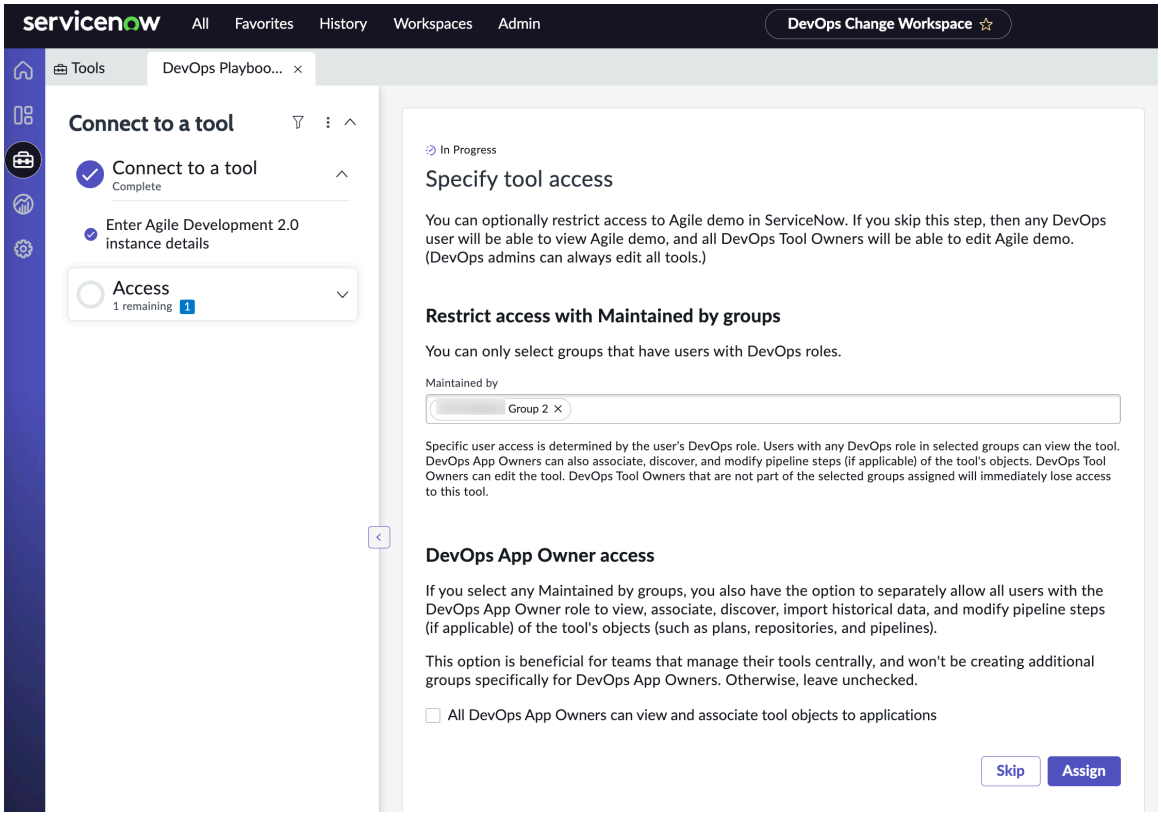


**Important:**

- If you're connecting from the Home page or Tools module, the connection is complete and you're taken to the Summary page.
- If you're connecting from the Applications module, then plans available in your project are discovered. You can track and import historical data from them.

6. Select the plans for which you want to track updates and associate to the application, and select **Next**.

   If you don’t choose to select plans now, you can enable nightly polling later to fetch the data for any tracked plans by setting the *`Enable Polling`* system property to **Yes**.

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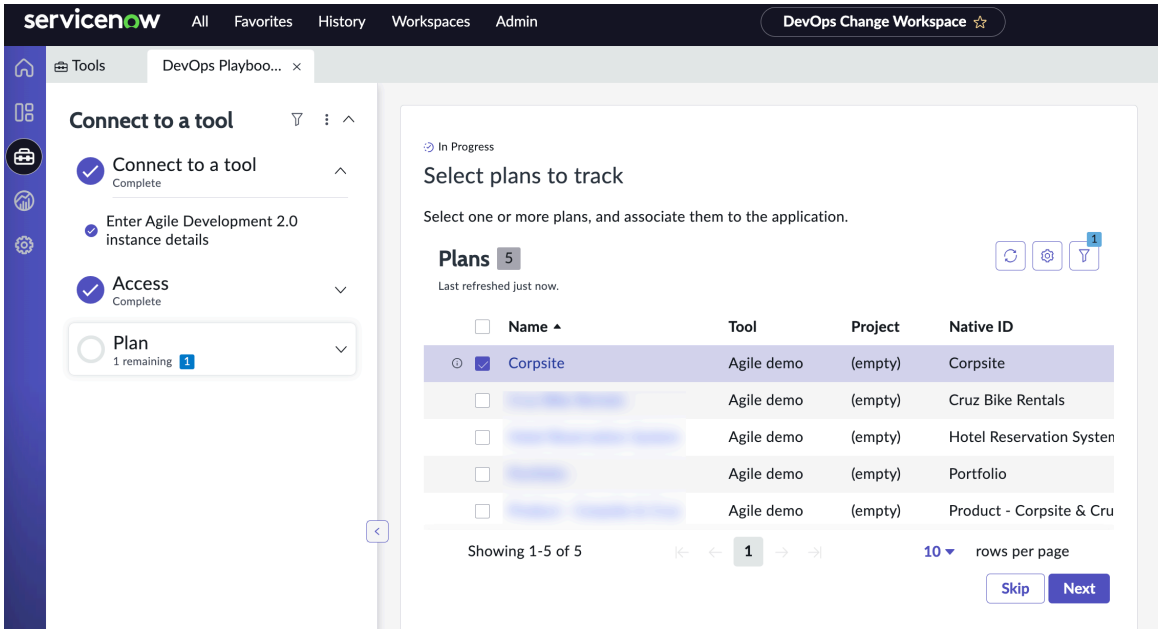
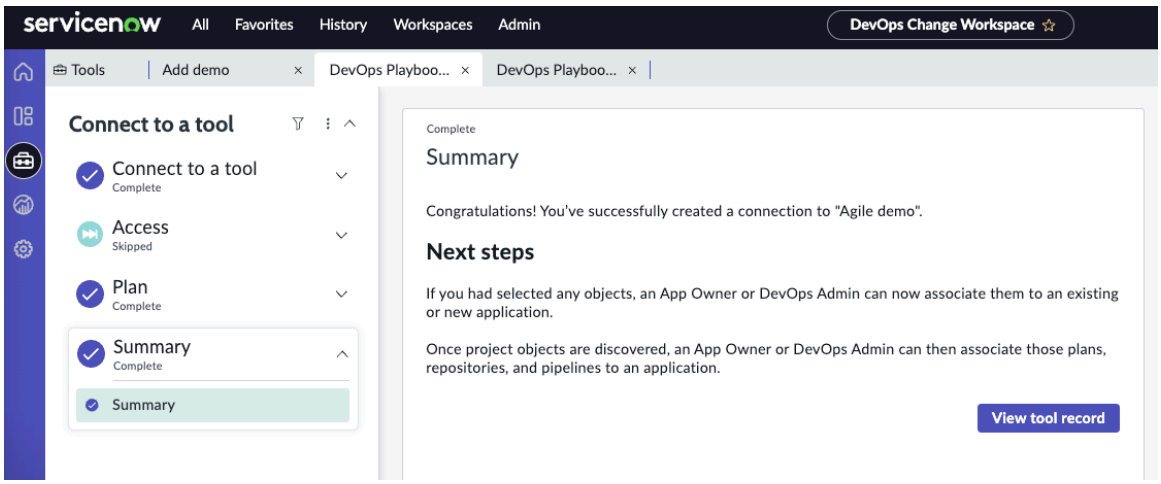



7. If you want to import plan data, select the date range and select **Submit**.

   You can import up to 90 days of data.

8. From the **Summary** page, select **View tool record** to review the details of the connected instance and the plans discovered from it.




## Result

You've successfully onboarded your Agile Development 2.0 tool to DevOps Change Velocity.

### Onboard Agile Development 2.0 to DevOps Change Velocity — Service Catalog

Create, connect, discover, and configure your Agile Development 2.0 instance using the ServiceNow Service Catalog.

## Before you begin

Role required: sn_devops.admin or sn_devops.tool_owner

Jira cloud version is not supported.

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### Procedure

1. Navigate to **All** > **Service Catalog** > **Catalog Definitions** > **Maintain Items** and search for DevOps.

   **Note:**
   You can also access the service catalog from the Employee Center or Service portal.

2. From the DevOps catalog items, select and activate **DevOps App Onboarding** and **DevOps Tool Onboarding**.
3. After activating, select **DevOps Tool Onboarding** and select **Try it**.
4. In the DevOps Tool Onboarding form, enter the tool details:

| Field | Description |
|---|---|
| Tool name | Name for your Agile Development 2.0 integration. |
| Tool integration | Select Agile Development 2.0. |

5. Select **Order Now**.
   A request is created. When the request is approved, the tool is created, connected, configured, and discovered.
6. From the DevOps catalog items, select **DevOps App Onboarding** and select **Try it**.
7. In the DevOps App Onboarding form, enter the details:

| | |
|---|---|
| Are you creating a new app or adding to an existing one? | Select from the options whether to create a new app or use an existing app. |
| App | Enter the name for the app that you're creating or using. |
| Onboarding pipelines | Leave empty. |
| Onboarding repositories | Leave empty. |
| Onboarding plans | Enter the connected Agile Development 2.0 tool name. |
| Plans | Select the plans for which you want to import historical data. |
| Import from and Import to | Select the dates for which you want to import the data. By default, the last 30 days are selected. You can choose to import data for a maximum of 90 days. |

8. Select **Order Now**.
   A request is created. When the request is approved, the plan objects are associated to the app record, which enables real-time tracking. Historical data is also imported for the selected plans. The **Track** field is automatically enabled for imported plans.

## Onboard Agile Development 2.0 to DevOps Change Velocity — Classic

Connect to Agile Development 2.0 and discover plans from it.

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### Before you begin

Role required: sn_devops.admin or sn_devops.tool_owner

### Procedure

1. Create a tool record in DevOps to automatically connect to Agile Development 2.0 and get the webhook URL.

   a. Navigate to **DevOps** > **Tools** > **Create New (legacy)**.

   b. On the form, fill in the fields.

| | |
|---|---|
| Tool name | Name of your choice to identify the tool. |
| Tool Integration | Select **Agile Development 2.0** |

   c. Click **Submit**.

   On successful tool creation, you're taken to the tool record page.

2. If you want to control access to the tool, add the groups that must be given access to the tool in the **Maintained by** field on the **Access** tab.

   The tasks the users in the groups can perform depends on the roles assigned to them.

   - DevOps Tool Owner role: Can view and edit the tool.
   - DevOps App Owner role: Can view the tool and can associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects (such as plans, repositories, and pipelines).
   - DevOps Administrator role: Can edit all tools.
   - Other DevOps roles: Can view the tool.

   **Note:**
   Only groups containing users with DevOps roles are available for selection in the **Maintained by** field.

   The **All App Owners can view and associate tool objects to applications** option becomes available for selection if you choose to restrict access to the tool. This option enables all users having the DevOps App Owner role to access the tool. If selected, they'll be able to view, associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects.

3. Click **Discover** to discover Products from Agile Development 2.0.

   Discovered records are added to the Plans related list.

4. Import data for the discovered plans by clicking the **Import** related link from a plan's record. Epics, stories, and release versions associated to this plan are listed in the respective related lists.

   - Work items related list shows stories and defects.

     **Native State** and **Native Type** fields of the work item contain the original state and type values from the source tool.

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- Plan Versions related list shows releases.
- Features related list shows epics.

## Bitbucket integration with DevOps Change Velocity

Connect to your Bitbucket instance to track Bitbucket repositories.

Use one of the following options to onboard Bitbucket. For a guided experience, use the workspace to onboard a tool. Alternatively, you can use the Service Catalog or Classic experience.

### Onboard Bitbucket to DevOps Change Velocity — Workspace

Connect to your Bitbucket instance using the DevOps Change Workspace playbook to discover repositories.

#### Before you begin

Complete the tasks specified in the Getting started with DevOps Change Velocity topic.

Role required: sn_devops.admin or sn_devops.tool_owner

#### Procedure

1. Navigate to **Workspaces** > **DevOps Change Workspace** and use one of the following options to open the Playbook to onboard Bitbucket.

   **Important:**
   If you want to discover and track tool objects like repositories while connecting to the tool, you must connect your tool from the Application module.

2. Specify a name for the tool in the **Tool name** field, and select **Next**.

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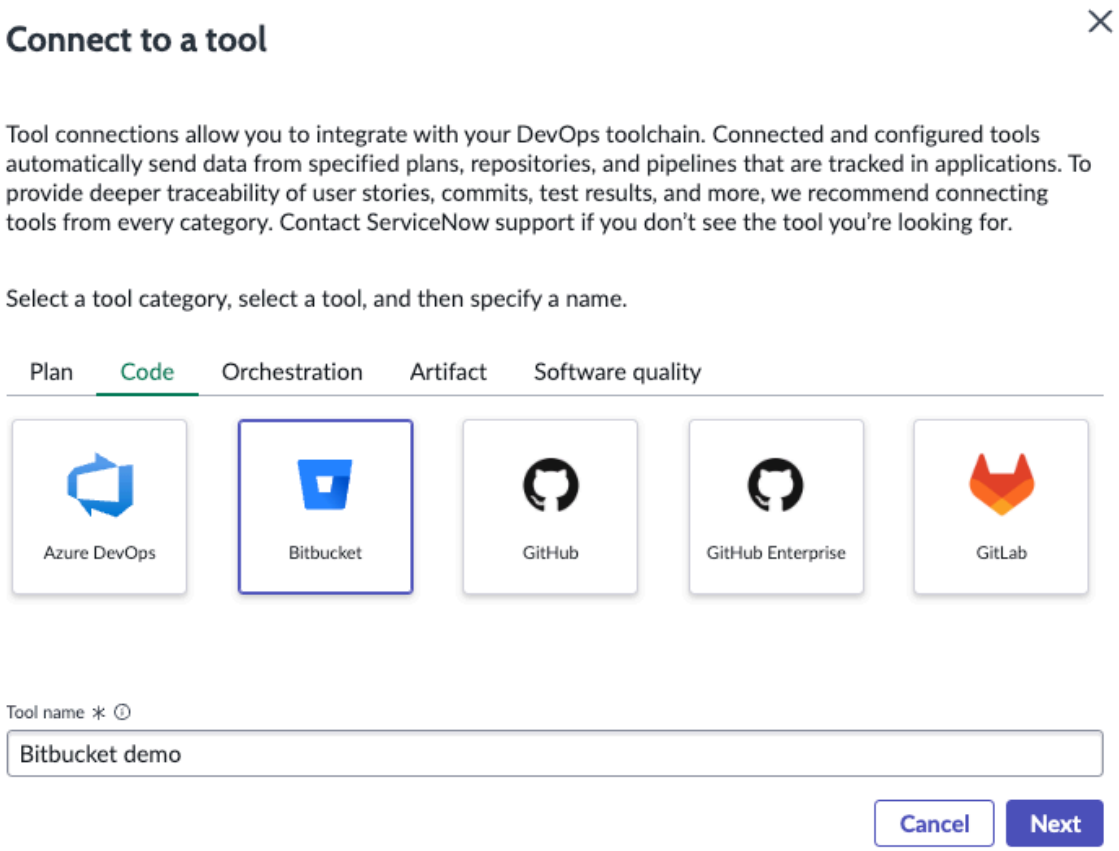
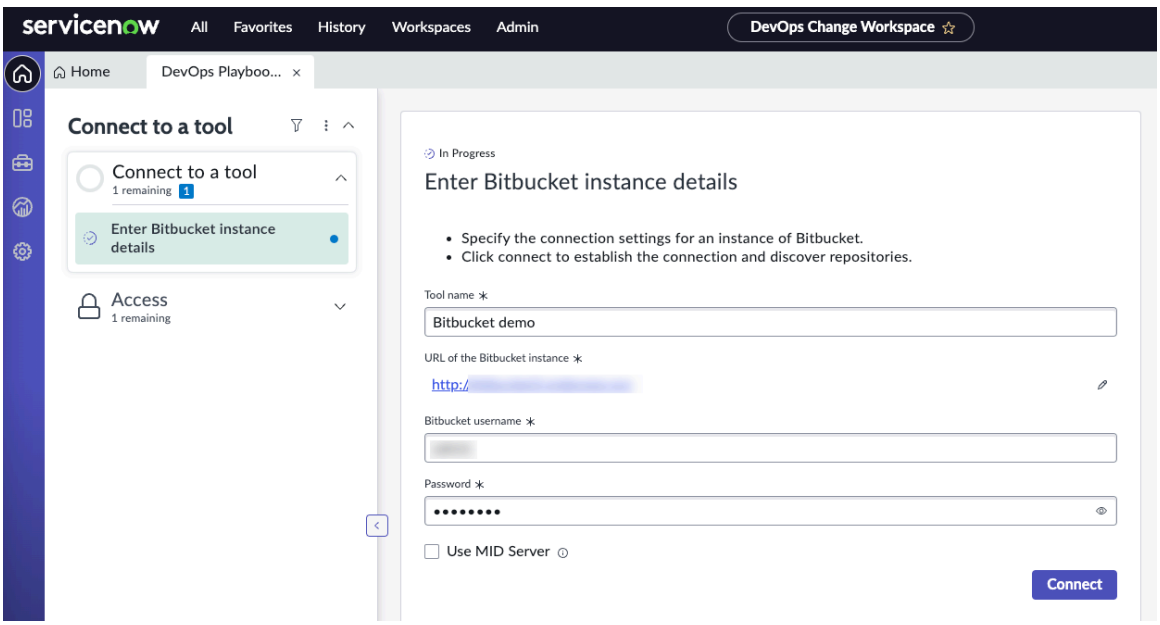



3. On the Bitbucket instance details playbook activity:
   a. Enter the URL of your Bitbucket instance.
   b. Enter the login credentials of the global admin for the Bitbucket instance.
   c. If your Bitbucket instance is attached to a MID Server, select the MID Server option and enter its details. A MID server is required if your tool instance is hosted on-prem. For more information about MID server, see MID Server selection.
4. Select **Connect**.

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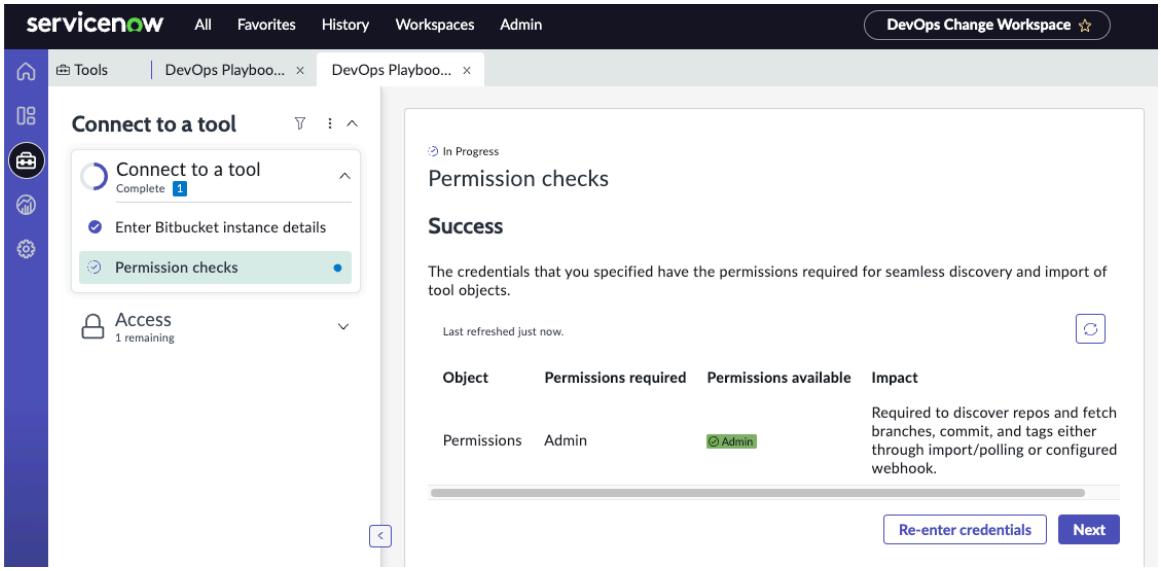
5. Permission checks are run on the credentials that you entered.

   Permissions required and permissions that are available are displayed. If you want to enter credentials with better permissions, select **Re-enter credentials**. For detailed information on all the required permissions, see Bitbucket permissions in Permissions required for DevOps tools.

   You can choose to continue with the tool connection even if you don't have all the required permissions.




6. Select **Next**.
7. Specify the access for the tool.
   a. If you want to control access to the tool, add the groups that must be given access to the tool in the **Maintained by** field.

      The tasks these users in the groups can perform depends on the role assigned to them.

      - DevOps Tool Owner role: Can view and edit the tool.
      - DevOps App Owner role: Can view the tool and can associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects (such as plans, repositories, and pipelines).
      - DevOps Administrator role: Can edit all tools.
      - Other DevOps roles: Can view the tool.

      **Note:**
      If you don't select a group and skip this step, all users with the DevOps Tool Owner role will be able to edit the tool.

   b. If you choose to control access to the tool, the **All App Owners can view and associate tool objects to applications** option becomes available for selection.

      This option enables all users having the DevOps App Owner role to access the tool. If selected, they'll be able to view, associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects.

   c. Select **Assign**.

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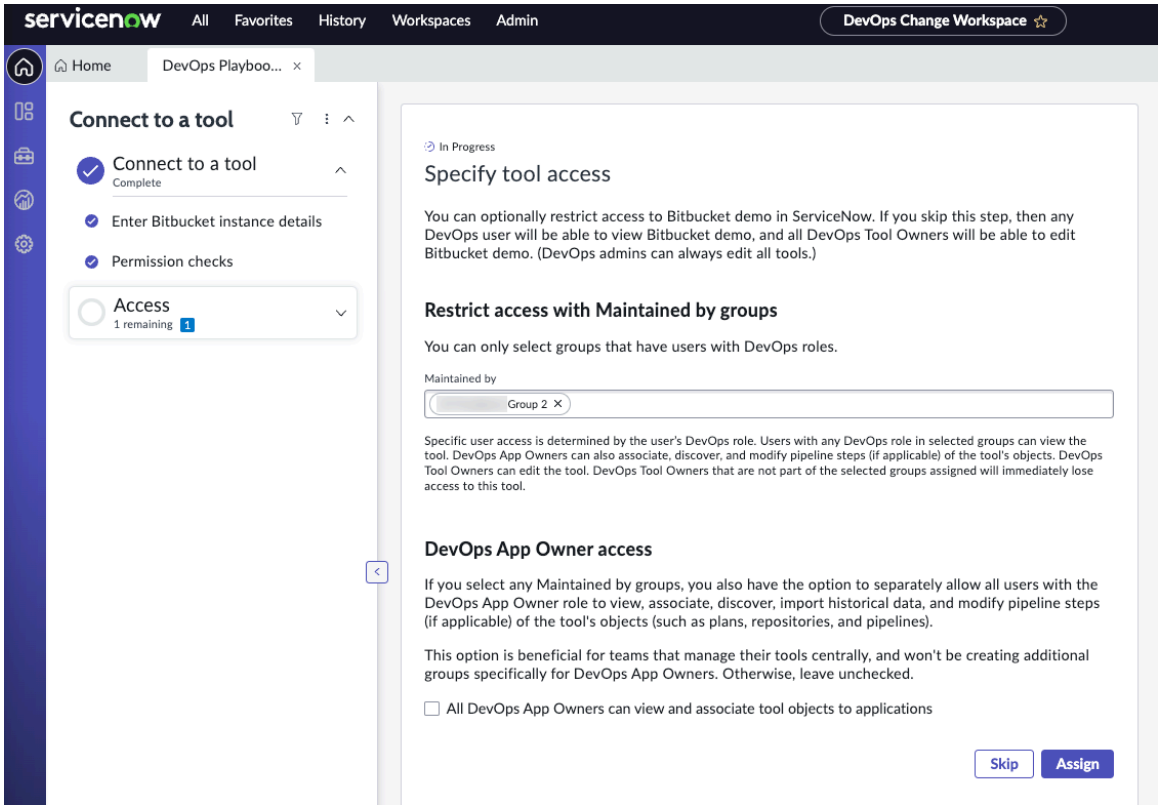
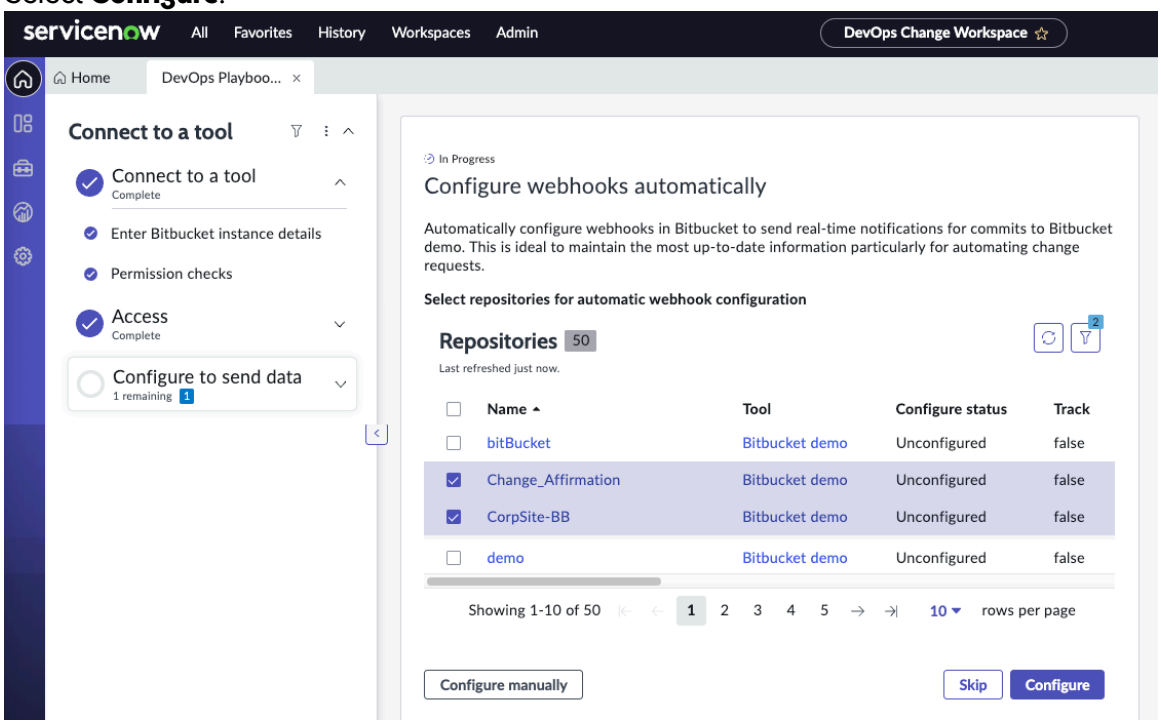



8. Select the repositories for which you want to configure webhooks automatically.

   Real-time notifications are ideal to maintain the most up-to-date information particularly for automating change requests.

   You can also set up webhook by configuring it manually. Alternatively, you can choose to enable nightly polling to fetch data system for any tracked repositories by setting the **Enable Polling** property to **Yes**.

9. Select **Configure**.

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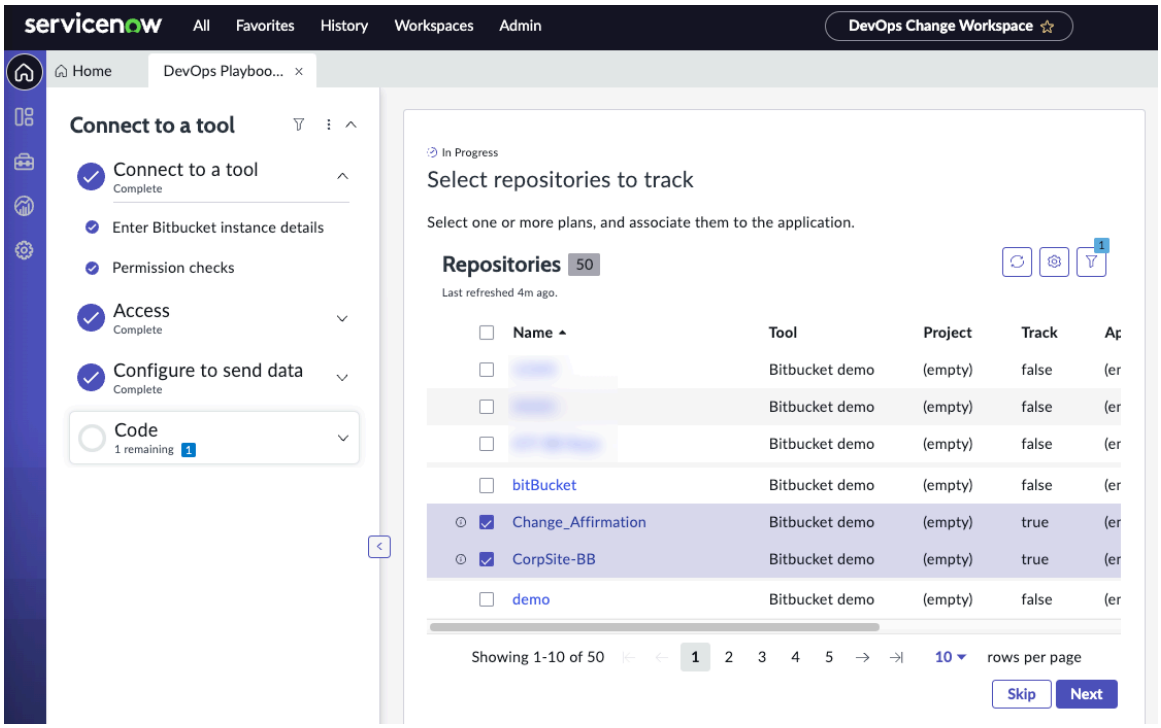
To configure manually, select **Configure manually**. See Configure webhooks in Bitbucket manually for more information.

**Important:**

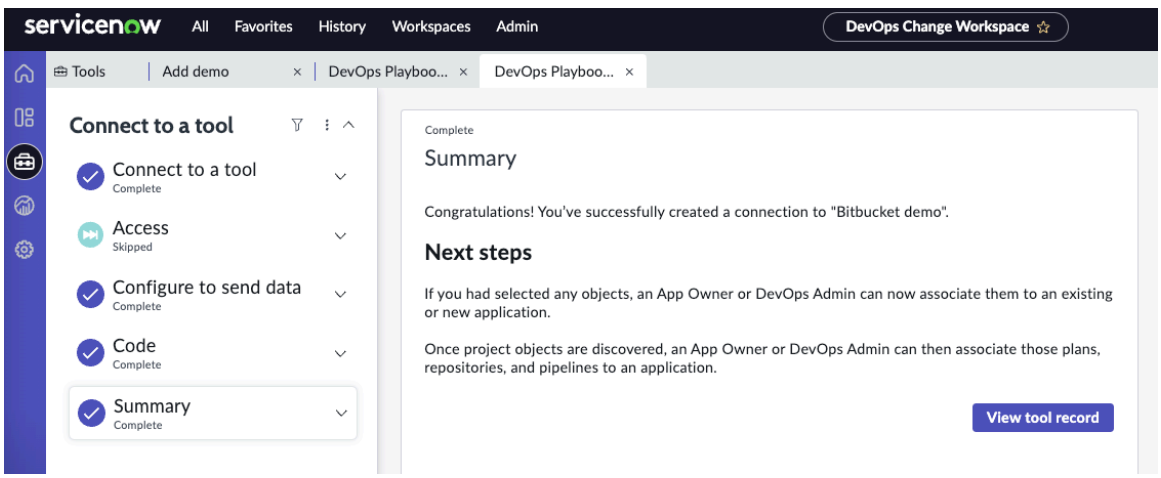
- If you're connecting from the Home page or Tools module, the connection is complete and you're taken to the Summary page.
- If you're connecting from the Applications module, then repositories available in your instance are discovered. You can track and import historical data from them.

10. Select the repositories that you want to track and associate to the application from the **Select repositories to track** playbook activity.




11. Select **Next**.
12. From the **Summary** page, review the details of the successfully connected Bitbucket tool.

    Select **View tool record** to review the details of the connected instance and the repositories discovered from it.

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### Result
You've successfully onboarded your Bitbucket tool to DevOps Change Velocity.

**Note:**
If your tool credential changes, you must also update the credentials in DevOps Change. For more information, see Update third-party tool credentials in DevOps Change Velocity.

### Related topics
Configure webhooks from the tool record

## Onboard Bitbucket to DevOps Change Velocity — Service Catalog
Create, connect, discover, and configure your Bitbucket instance using the ServiceNow Service Catalog.

### Before you begin
Role required: sn_devops.admin or sn_devops.tool_owner

### Procedure
1. Navigate to **All** > **Service Catalog** > **Catalog Definitions** > **Maintain Items** and search for DevOps.

   **Note:**
   You can also access the service catalog from Employee Center or Service portal.

2. From the DevOps catalog items, select and activate **DevOps App Onboarding** and **DevOps Tool Onboarding**.
3. After activating, select **DevOps Tool Onboarding** and select **Try it**.
4. In the DevOps Tool Onboarding form, enter the tool details:

| Field | Description |
|---|---|
| Tool name | Name for your Bitbucket integration. |
| Tool integration | Select Bitbucket. |
| Tool URL | URL of your Bitbucket instance. |
| Tool username | Username for your Bitbucket account. |
| Tool password/ Access token | Bitbucket password or access token. |
| Use MidServer | Optional. Select#MID Server#for an on-premises tool that is attached to a#MID Server. Application is automatically set to #DevOps and capability is set to REST. |

   For a list of all the permissions required on the credentials for connecting to Bitbucket, see Bitbucket permissions in Permissions required for DevOps tools.

5. Select **Order Now**.
   A request is created. When the request is approved, the tool is created, connected, and discovered.
6. From the DevOps catalog items, select **DevOps App Onboarding**.
7. In the DevOps App Onboarding form, enter the details:

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| | |
|---|---|
| Are you creating a new app or adding to an existing one? | Select from the options whether to create a new app or use an existing app. |
| App | Enter the name for the app that you're creating or using. |
| Onboarding pipelines | Leave empty. |
| Onboarding repositories | Enter the connected Bitbucket tool name. |
| Repositories | Select the repositories for which you want to configure webhooks and import historical data. |
| Import from and Import to | Select the dates for which you want to import the data. By default, the last 30 days are selected. You can choose to import data for a maximum of 90 days. |
| Do you wish to configure webhook for the tool? | Select the check box if you want to configure webhooks for the selected repositories. |
| Onboarding plans | Leave empty. |

8. Select **Order Now**.
   A request is created. When the request is approved, the repository objects are associated to the app record and webhooks are configured for real-time tracking. Historical data is imported for the selected repositories. The **Track** field is automatically enabled for imported repositories. For repositories the **Track file changes** is also automatically enabled.

### Onboard Bitbucket to DevOps Change Velocity — Classic

Connect your Bitbucket instance to discover, configure, and import repositories.

#### Before you begin

Role required: sn_devops.admin or sn_devops.tool_owner

Complete the steps specified in the Getting started section before connecting to a tool.

#### About this task

- **Connect** by using your Bitbucket instance details.
- **Discover** repositories.
- **Configure** to create the webhook in the Bitbucket repository automatically.
- **Import** branch and commit records.

#### Procedure

1. Enter the Bitbucket instance details to connect to DevOps Change Velocity by navigating to **All** > **DevOps** > **Tools** > **Create New (legacy)**.
2. Enter a value in the **Tool Name**field and fill in the tool details.

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**Create DevOps Tool form**

| Field | Description |
|---|---|
| Tool integration | Tool to integrate. In this case, select **Bitbucket**. |
| Tool URL | URL of the existing Bitbucket instance to integrate. |
| Tool username, Tool password / Access token | Login credentials of the existing Bitbucket instance. |

For a list of all the permissions required on the credentials for connecting to Bitbucket, see Bitbucket permissions in Permissions required for DevOps tools.

3. Select **MID Server** for an on-premises tool that is attached to a MID Server.
   Application is automatically set to DevOps and capability is set to REST.
4. Select **Submit**.
   The tool is connected successfully.

On successful tool creation, you are taken to the tool record page.

5. If you want to control access to the tool, add the groups that must be given access to the tool in the **Maintained by** field on the **Access** tab.

   The tasks the users in the groups can perform depends on the roles assigned to them.

   - DevOps Tool Owner role: Can view and edit the tool.
   - DevOps App Owner role: Can view the tool and can associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects (such as plans, repositories, and pipelines).
   - DevOps Administrator role: Can edit all tools.
   - Other DevOps roles: Can view the tool.

   **Note:**
   Only groups containing users with DevOps roles are available for selection in the **Maintained by** field.

   The **All App Owners can view and associate tool objects to applications** option becomes available for selection if you choose to restrict access to the tool. This option enables all users having the DevOps App Owner role to access the tool. If selected, they'll be able to view, associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects.

6. Select **Discover** to discover existing repositories for the coding tool.
   Repository records are added to the **Repositories** related list.
7. Automatically configure the webhook URL in a Bitbucket repository to send notifications to the DevOps tool by selecting **Configure**.
   Alternatively, you can choose to enable nightly polling to fetch data system for any tracked repositories by setting the *Enable Polling* property to **Yes**.
8. Select **Import** to import historical data from the repository.

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**Note:**
If your tool credential has changed, you must update the credentials in your ServiceNow instance. For more information, see Update third-party tool credentials in DevOps Change Velocity.

Imported branch records and commit records from the repository are added to the corresponding related lists.

9. In the **App** field, click the lookup list and select an App record to associate with the repository, or click **New** to create one.

### Configure webhooks in Bitbucket manually

Configure webhooks in Bitbucket to send sync notifications to the DevOps Change Velocity application.

## Before you begin

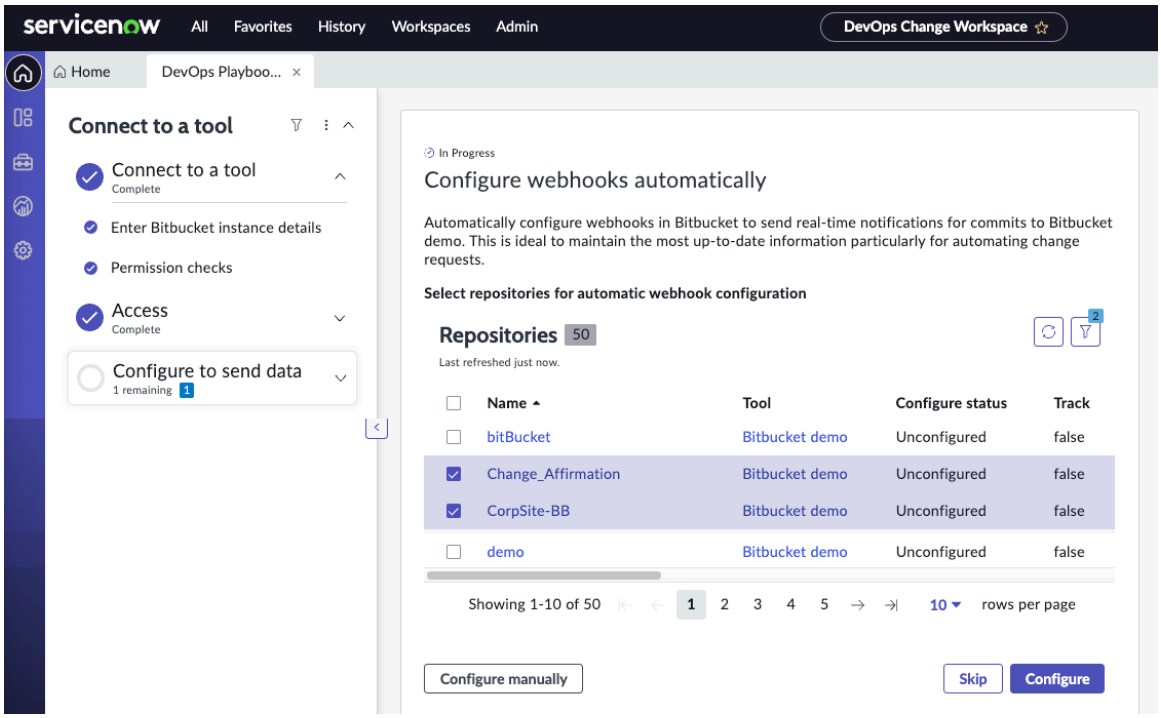
Role required: sn_devops.admin or sn_devops.tool_owner in DevOps Change Velocity, Bitbucket admin

## About this task

You can also access manual configuration from the Bitbucket tool record in DevOps Change Velocity.

## Procedure

1. In Bitbucket, navigate to **Settings** > **Webhooks** for the specified repo, and add a webhook.
2. In DevOps Change Velocity, choose **Configure manually** when configuring the tool instance to send data.




3. In DevOps Change Velocity, copy the **Webhook URL** field from the ServiceNow instance connection details for Bitbucket, and paste the Webhook URL to the **URL** field of the new webhook in Bitbucket.

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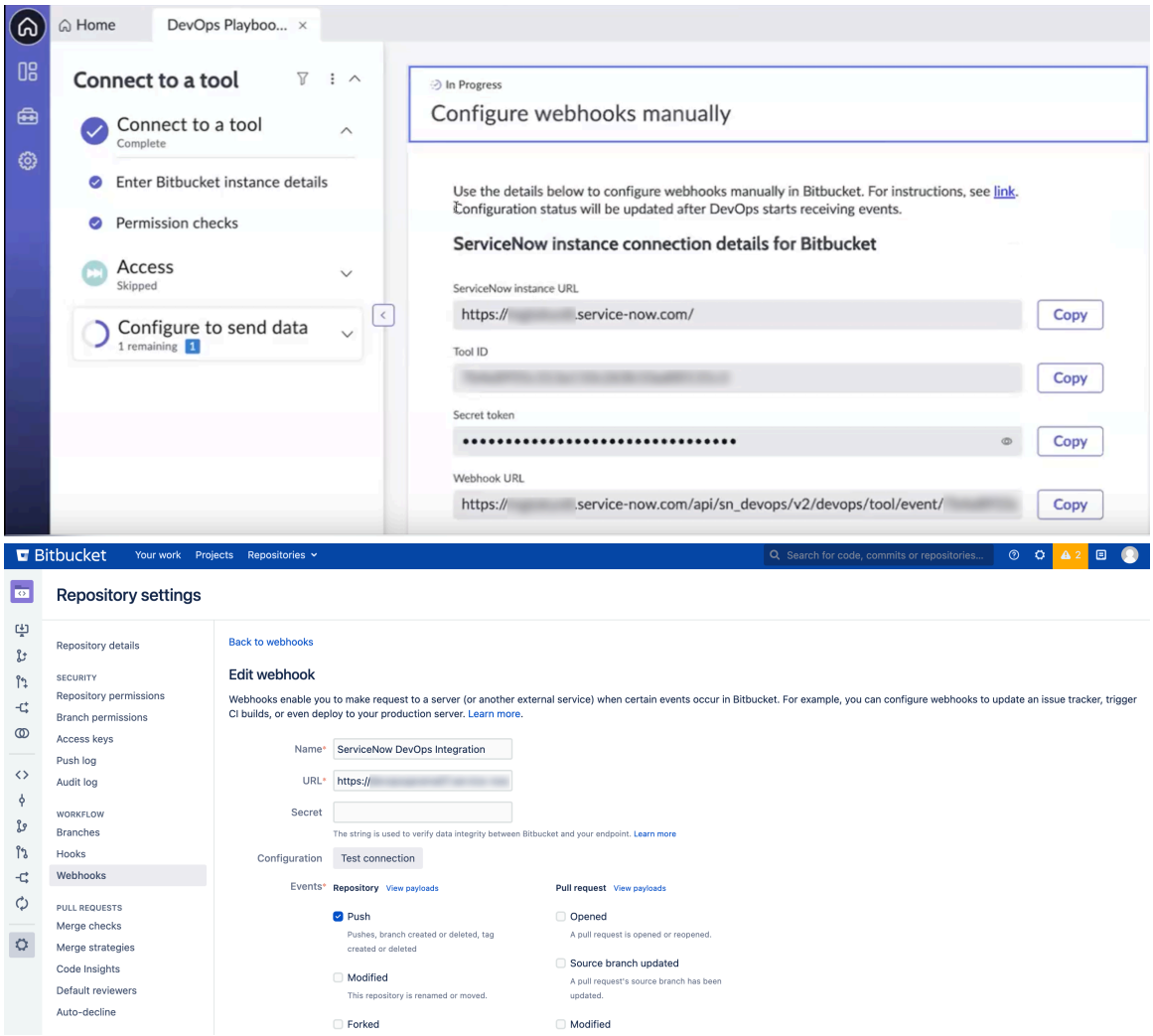
**Note:**
Select **Copy** in the appropriate field to copy the value to your clipboard. The field label changes to **Copied**, but you can copy multiple times.




## JFrog integration with DevOps Change Velocity

Connect to your JFrog instance to track artifacts published to JFrog from pipeline executions in Jenkins, GitHub Actions, Azure DevOps, and GitLab.

For Jenkins, you must activate the Jenkins Artifactory plugin in your Jenkins server to generate the artifacts as part of your pipeline run and publish them in the JFrog artifact repositories.

**Note:**
Historical import of JFrog artifacts is not supported. You can import JFrog artifacts that are built by Jenkins using the Service Catalog import historical data process. For more information, see Importing historical data for DevOps tools. Discover and configure is also not supported for JFrog.

### Get started

Use one of the following options to onboard JFrog. For a guided experience, use the workspace to onboard a tool. Alternatively, you can use the Service Catalog or Classic experience.

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### Onboard JFrog to DevOps Change Velocity — Workspace

Connect to your JFrog instance using the DevOps Change Workspace playbook to track artifact repositories published to JFrog.

## Before you begin

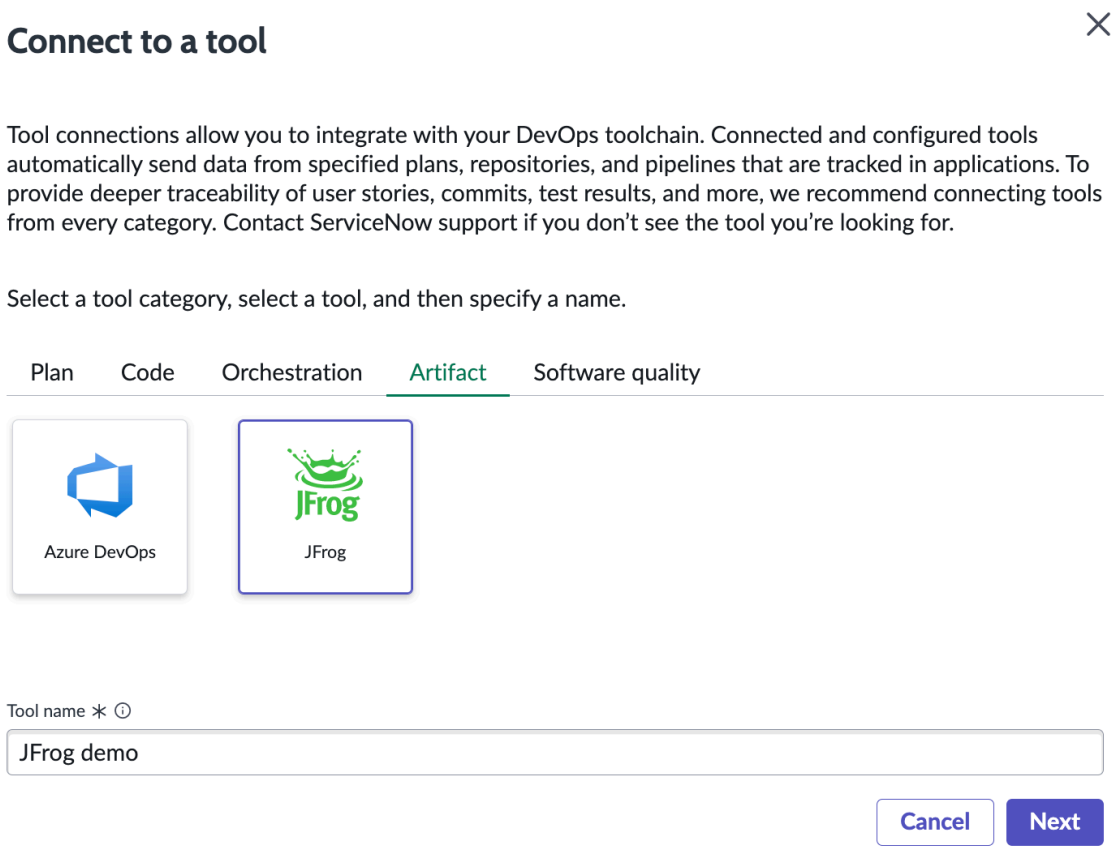
Complete the tasks specified in the Getting started with DevOps Change Velocity topic.

Role required: sn_devops.admin or sn_devops.tool_owner

## Procedure

1. Navigate to **Workspaces** > **DevOps Change Workspace** and use one of the following options to open the Playbook to onboard JFrog.

2. Specify a name for the tool in the **Tool name** field, and select **Next**.




3. On the JFrog instance details playbook activity:

   a. Enter the URL of your JFrog instance.

   b. Enter the login credentials of the global admin for the JFrog instance.

   c. **Optional:** Select the MID Server option and enter its details if your JFrog instance is attached to a MID Server.
   A MID server is required if your tool instance is hosted on-prem. For more information about MID server, see MID Server selection.

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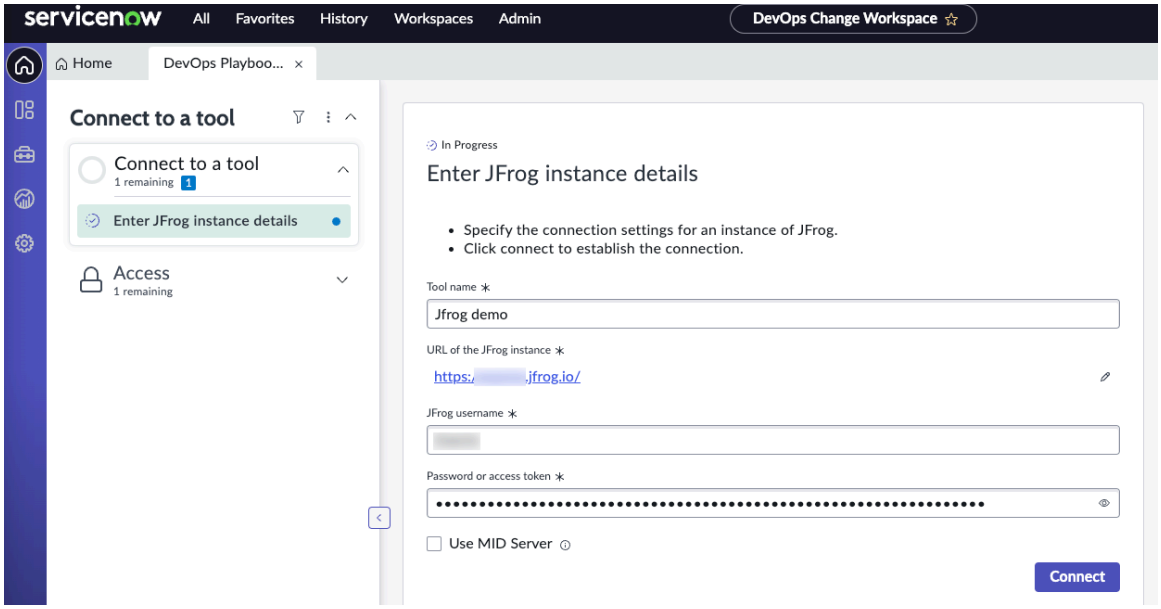
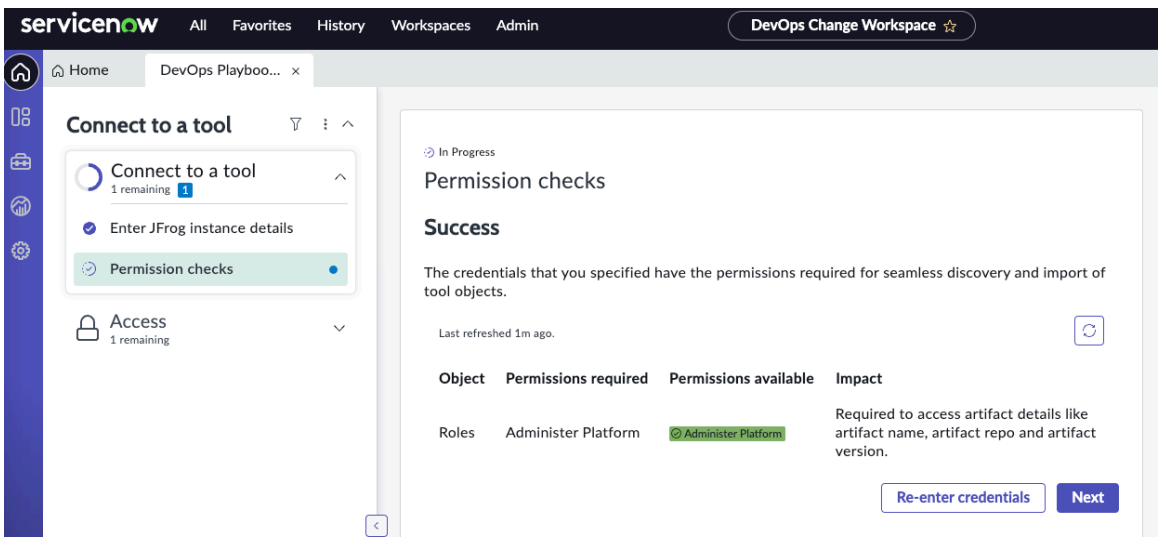



4. Select **Connect**.
5. Permission checks are run on the credentials that you entered.
   Permissions required and permissions that are available are displayed. If you want to enter credentials with better permissions, select **Re-enter credentials**. The credentials that you specified must have the Administer Platform role in JFrog for seamless discovery and import of tool objects. This is a limitation from JFrog. For detailed information on all the required permissions, see Jira permissions in Permissions required for DevOps tools.

   You can choose to continue with the tool connection even if you don't have all the required permissions.

   **Note:**
   If your tool credential has changed, you must update the credentials in your ServiceNow instance. For more information, see Update third-party tool credentials in DevOps Change Velocity.




6. Select **Next**.
7. Specify the access for the tool.

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**a.** If you want to control access to the tool, add the groups that must be given access to the tool in the **Maintained by** field.

The tasks these users in the groups can perform depends on the role assigned to them.

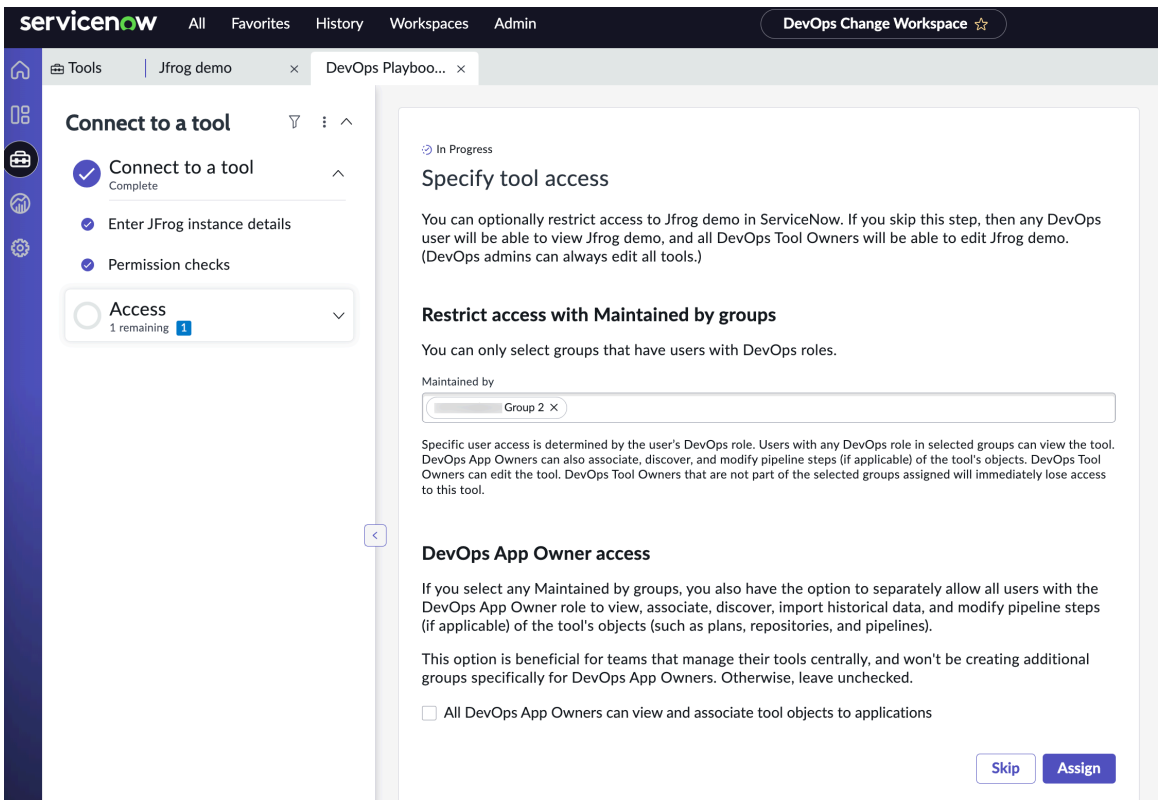
- DevOps Tool Owner role: Can view and edit the tool.
- DevOps App Owner role: Can view the tool and can associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects (such as plans, repositories, and pipelines).
- DevOps Administrator role: Can edit all tools.
- Other DevOps roles: Can view the tool.

> **Note:**
> If you don't select a group and skip this step, all users with the DevOps Tool Owner role will be able to edit the tool.

**b.** If you choose to control access to the tool, the **All App Owners can view and associate tool objects to applications** option becomes available for selection.

This option enables all users having the DevOps App Owner role to access the tool. If selected, they'll be able to view, associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects.

**c.** Select **Assign**.

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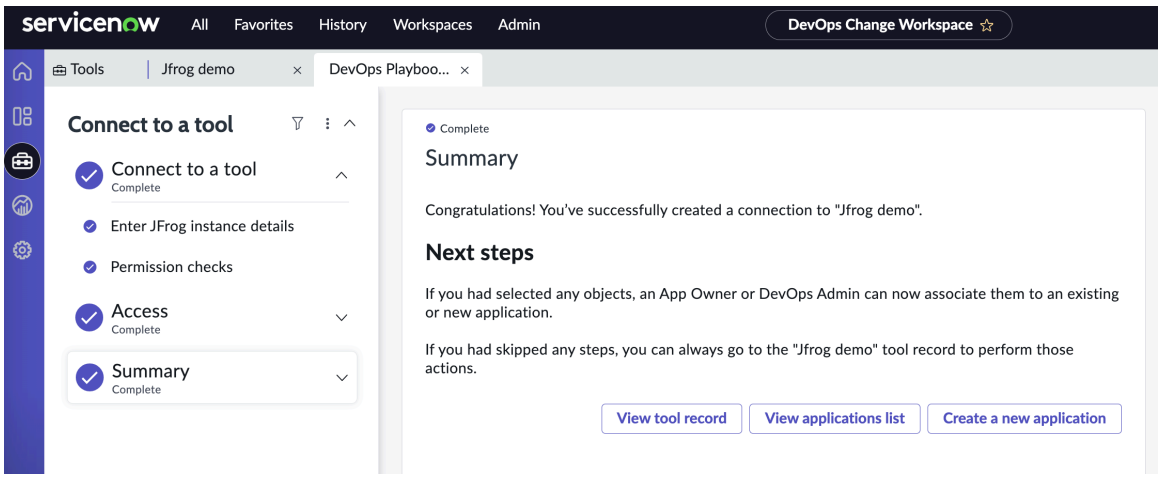
8. From the **Summary** page, select **View tool record** to review the details of the connected instance.




## Result

You've successfully onboarded your JFrog tool to DevOps Change Velocity.

### Onboard JFrog to DevOps Change Velocity — Service Catalog

Connect your JFrog instance using the ServiceNow Service Catalog.

## Before you begin

Role required: sn_devops.admin or sn_devops.tool_owner

## Procedure

1. Navigate to **All** > **Service Catalog** > **Catalog Definitions** > **Maintain Items** and search for DevOps.

   **Note:**
   You can also access the service catalog from Employee Center or Service portal.

2. From the DevOps catalog items, select and activate **DevOps App Onboarding** and **DevOps Tool Onboarding**.
3. After activating, select **DevOps Tool Onboarding** and select **Try it**.
4. In the DevOps Tool Onboarding form, enter the tool details:

| Field | Description |
|---|---|
| Tool name | Name for your JFrog integration. |
| Tool integration | Select JFrog. |
| Tool URL | URL of your JFrog instance. |
| Tool username, password or access token | Login credentials of the global admin for the existing JFrog instance. |
| Use MidServer | Optional. Select#MID Server#for an on-premises tool that is attached to a#MID Server. Application is automatically set to DevOps #and capability is set to REST. |

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For a list of all the permissions required on the credentials for connecting to JFrog, see JFrog permissions in Permissions required for DevOps tools.

5. Select **Order Now**.
   A request is created. When the request is approved, the tool is connected.

### Onboard JFrog to DevOps Change Velocity — Classic

Connect to an instance of the JFrog artifact tool to enable you to track artifacts published to JFrog.

#### Before you begin

Role required: sn_devops.admin or sn_devops.tool_owner

Complete the steps specified in the Getting started section before connecting to a tool.

#### Procedure

1. Enter the JFrog instance details to connect to DevOps Change Velocity by navigating to **All** > **DevOps** > **Tools** > **Create New (legacy)**.
2. Enter a value in the **Tool Name**field and fill in the tool details.

**Create DevOps Tool form**

| Field | Description |
|---|---|
| Tool integration | Tool to integrate. In this case, select **JFrog**. |
| Tool URL | URL of the existing JFrog instance to integrate. |
| Tool username, Tool password / Access token | Login credentials of the global admin for the existing JFrog instance. |

For a list of all the permissions required on the credentials for connecting to JFrog, see JFrog permissions in Permissions required for DevOps tools.

3. Select **MID Server** for an on-premises tool that is attached to a MID Server.
   Application is automatically set to DevOps and capability is set to REST.
4. Click **Submit**.

> **Note:**
> If your tool credential has changed, you must update the credentials in your ServiceNow instance. For more information, see Update third-party tool credentials in DevOps Change Velocity.

If the connection is successful, the tool is created in ServiceNow and connected to your JFrog instance.

On successful tool creation, you're taken to the tool record page.

5. If you want to control access to the tool, add the groups that must be given access to the tool in the **Maintained by** field on the **Access** tab.

   The tasks the users in the groups can perform depends on the roles assigned to them.

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- DevOps Tool Owner role: Can view and edit the tool.
- DevOps App Owner role: Can view the tool and can associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects (such as plans, repositories, and pipelines).
- DevOps Administrator role: Can edit all tools.
- Other DevOps roles: Can view the tool.

**Note:**
Only groups containing users with DevOps roles are available for selection in the **Maintained by** field.

The **All App Owners can view and associate tool objects to applications** option becomes available for selection if you choose to restrict access to the tool. This option enables all users having the DevOps App Owner role to access the tool. If selected, they'll be able to view, associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects.

### Associate steps from GitHub, GitLab, and Azure DevOps with JFrog

JFrog Artifactory support for GitHub Actions, Azure DevOps, and GitLab in DevOps Change Velocity enables you to import the artifact data published to JFrog Artifactory for the corresponding pipeline executions. This can then be linked with all the DevOps data collected in DevOps Change Velocity, like Work Items, Commits, Quality Summary, Test Runs, and so on, which helps to trace and identify the root causes.

**Before you begin**

Role required: sn_devops.admin or sn_devops.tool_owner

Azure DevOps release pipelines are not supported.

Associate steps from GitHub, GitLab, and Azure DevOps to your JFrog tool. Before you can associate steps, you must:

- Connect and configure your GitHub, GitLab, or Azure DevOps tools in DevOps Change Velocity.
- Run the pipelines in the respective GitHub, GitLab, or Azure DevOps instances.
- Discover pipelines and steps in the respective tools in DevOps Change Velocity.
- Connect the JFrog tool in DevOps Change Velocity. The tool must be in the connected state.

**Important:**
- Build info must be published to JFrog along with the artifacts.
- Build info must contain the URL and modules or dependencies information.

## Associate steps from pipelines

1. Open the tool record page of your GitHub, GitLab, or Azure DevOps tool and select the **Pipelines** tab.
2. Select the pipelines that you want to associate with your JFrog tool.
3. Select **Associate artifact tool**.

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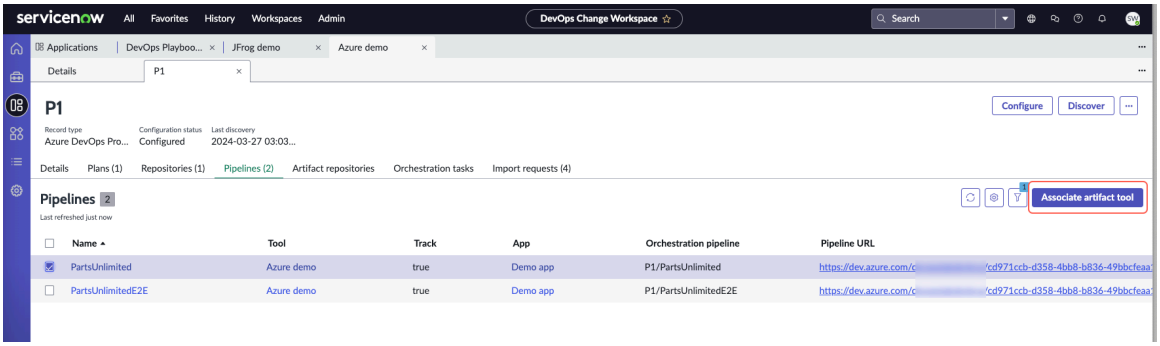
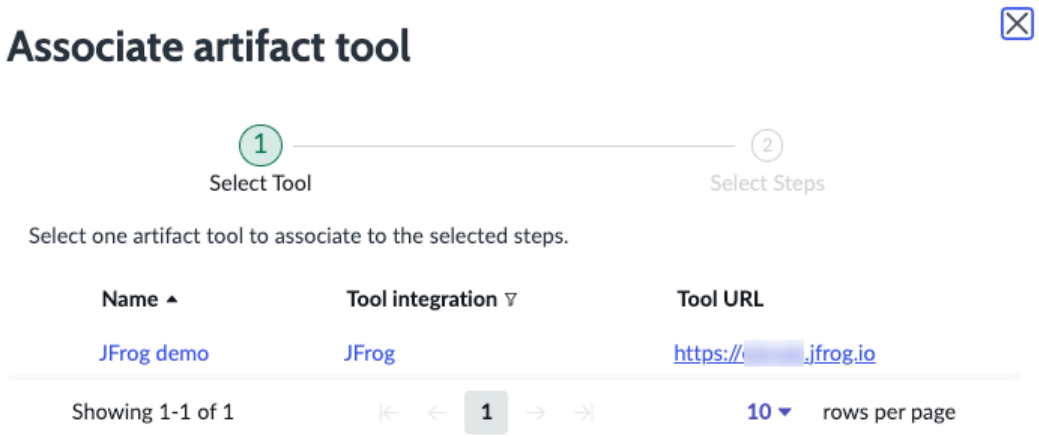



4. Select the JFrog tool to which you want the association.

**Note:**
Only the connected JFrog tools are available for selection.




5. Select the pipeline steps that you want to associate with the selected JFrog tool and select **Associate**.

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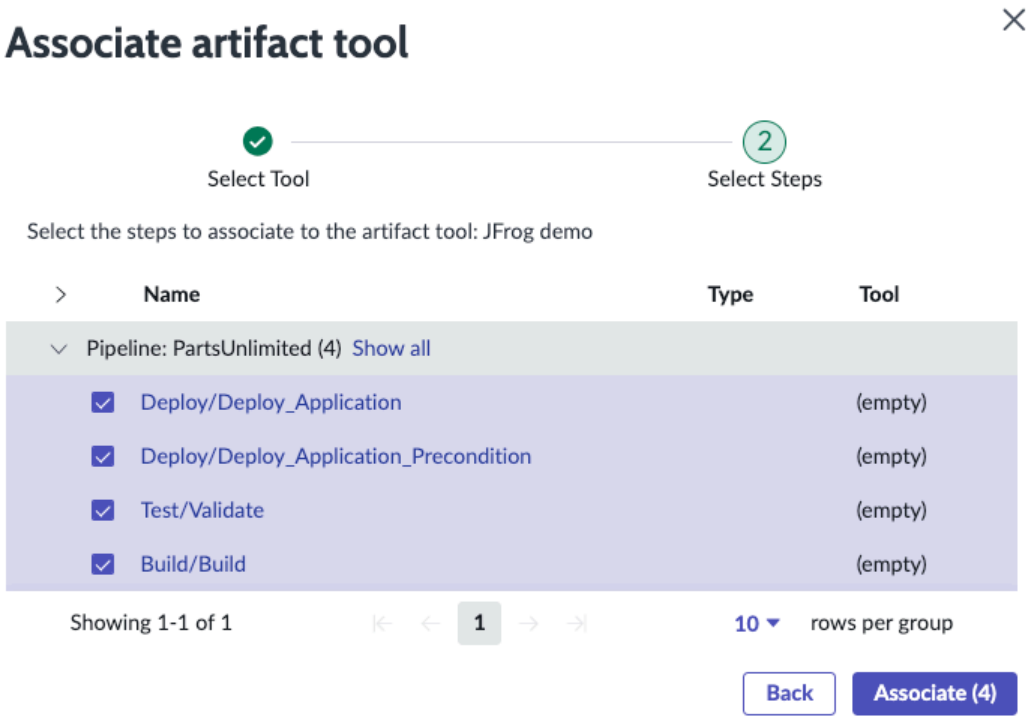
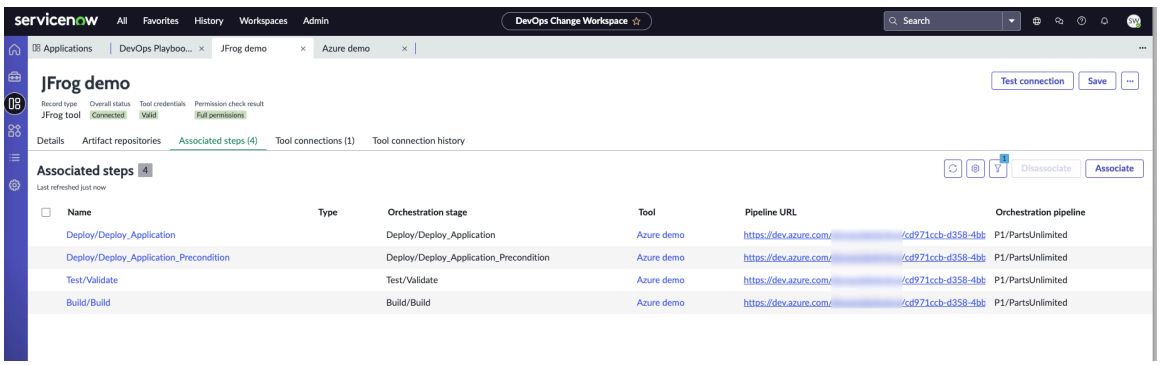
**Note:**
A step can only be associated with one tool.




The steps are associated with the JFrog tool. You can view the associated steps in your JFrog tool record, under the **Associated steps** tab.

To disassociate a step, select it from the **Associated steps** tab in your JFrog tool record and select **Disassociate**.




## Associate steps from the Steps table

1. Open the tool record page of your GitHub, GitLab, or Azure DevOps tool and select the pipeline whose steps you want to associate with your JFrog tool.
2. From the pipeline record, select the **Steps with artifact association** tab and select **Associate**.

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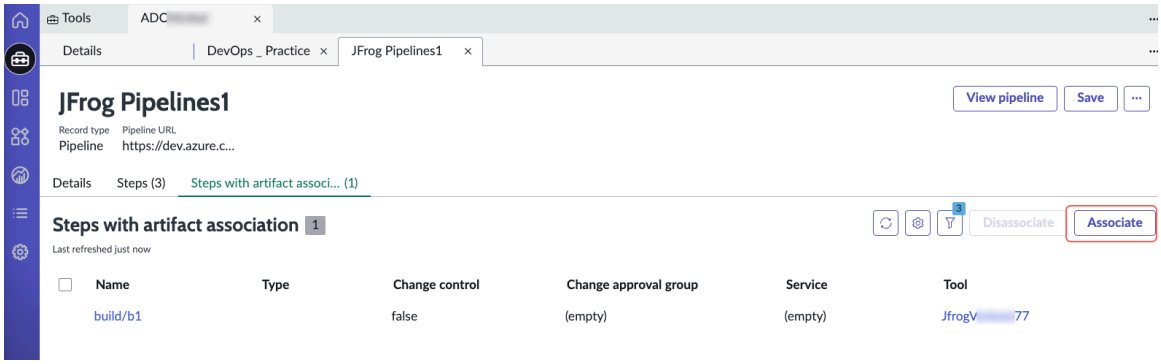
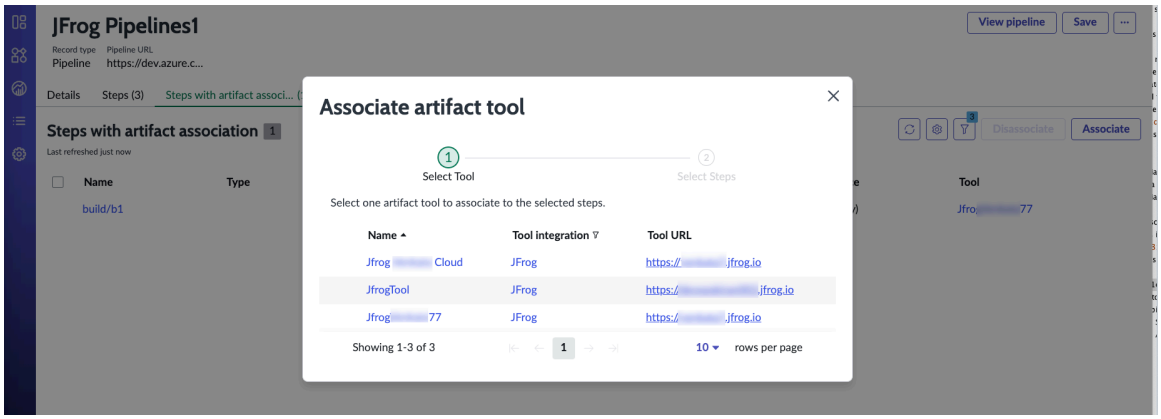


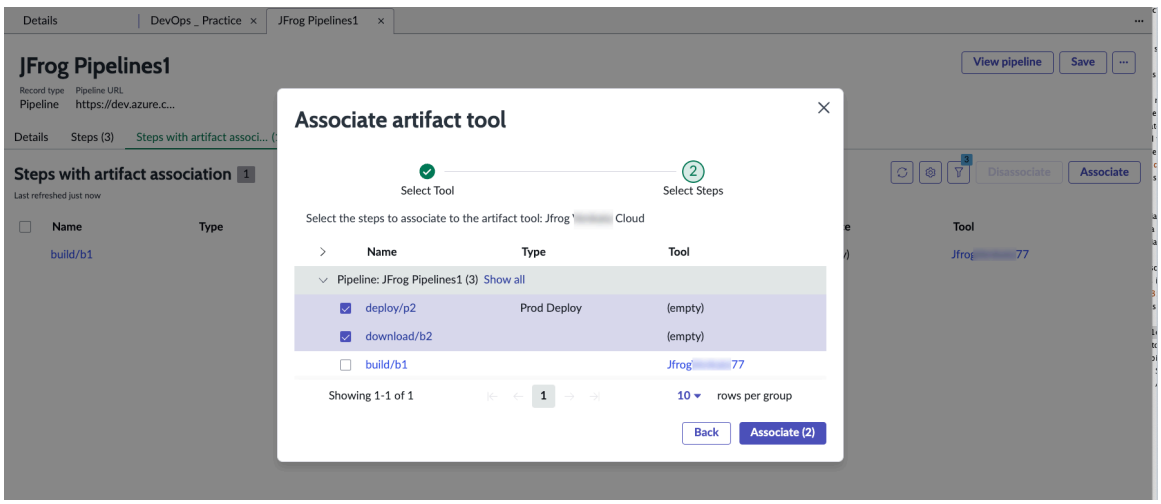

3. From the list of connected JFrog tools, select the tool that you want the steps to be associated with.

**Note:**
Only the connected JFrog tools are available for selection.




4. From the list of steps in the pipeline, select the ones you want to associate with the selected JFrog tool and select **Associate**.

**Note:**
If you select a step, which is already associated with another JFrog tool, it is disassociated from that tool and then associated with the current JFrog tool.




The selected steps are associated with the JFrog tool. To disassociate a step, select it and then select **Disassociate**.

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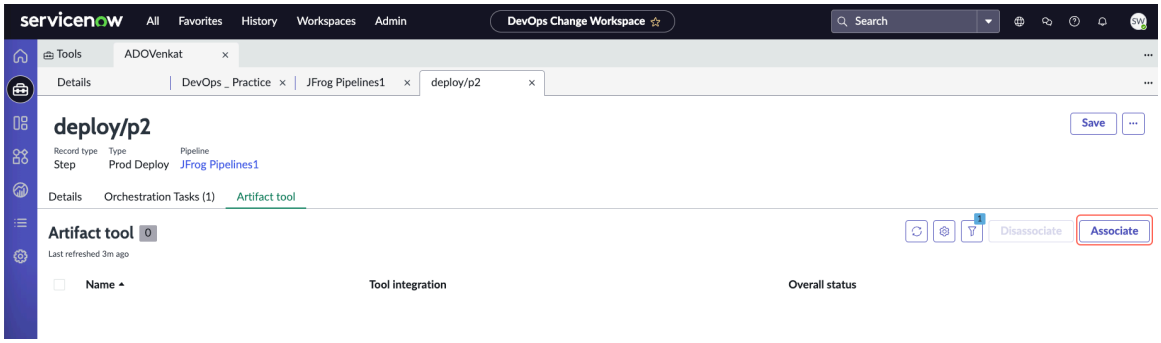
## Associate step from the step record

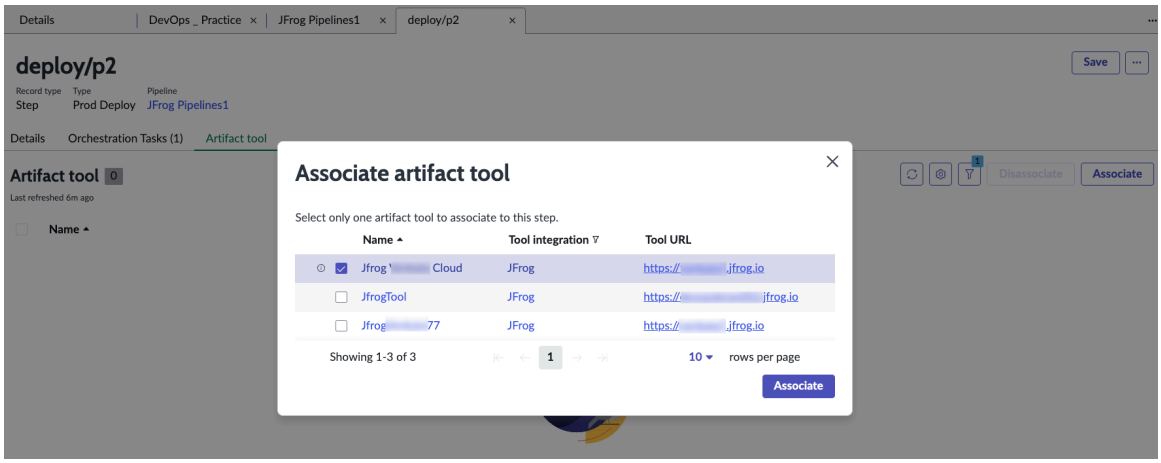
For individual steps, you can associate with a connected JFrog tool directly from the step record.

1. Open the step record page of the step that you want to associate with your JFrog tool.
2. Select the **Artifact tool** tab and select **Associate**.




3. From the list of connected JFrog tools, select the tool that you want the step to be associated with and select **Associate**.

> **Note:**
> Only the connected JFrog tools are available for selection.




The step is associated with the selected JFrog tool. To disassociate the step, select it and then select **Disassociate**.

## Associate steps from the JFrog tool

You can associate steps directly from the JFrog tool.

1. Navigate to the connected JFrog tool.
2. Select the **Associated steps** tab and select **Associate**.

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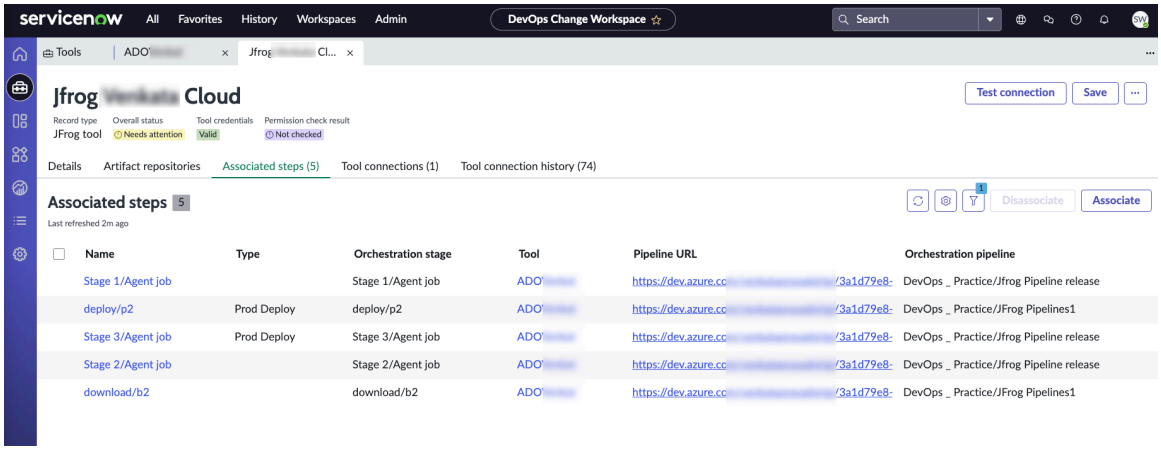
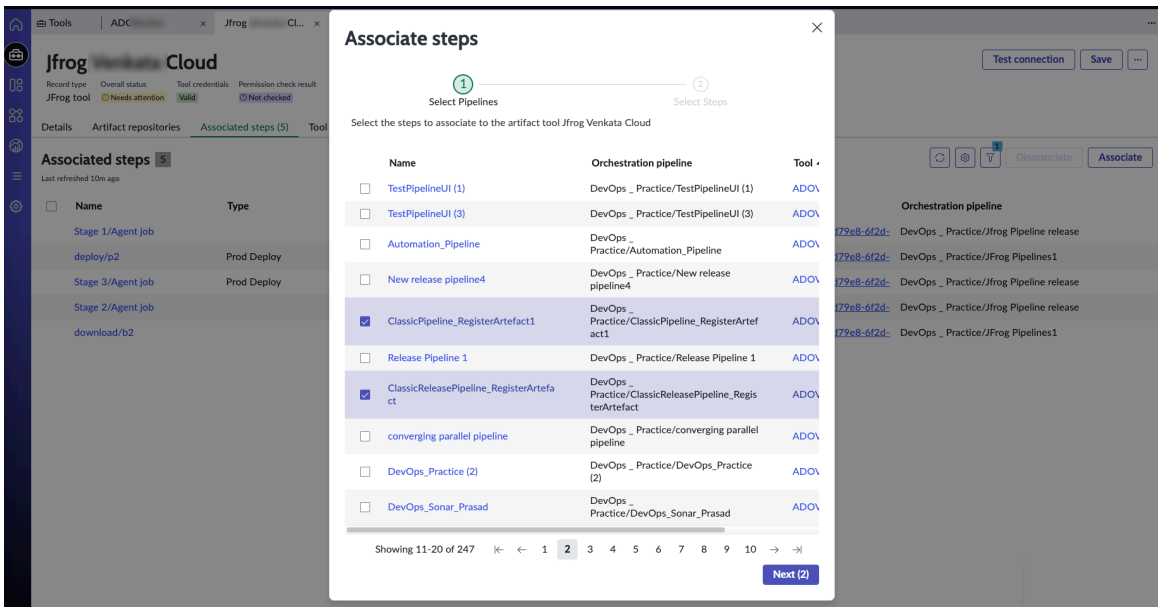



**3.** Select the pipelines whose steps you want to associate with the JFrog tool and select **Next**.




**4.** Select the steps from the pipelines that you want to associate with the JFrog tool and select **Associate**.

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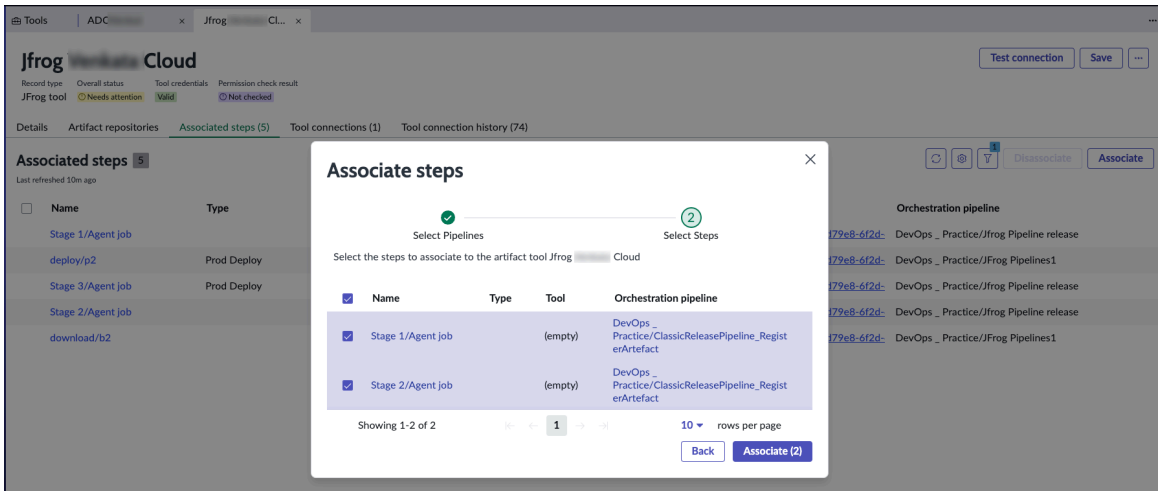
**Note:**
If you select a step, which is already associated with another JFrog tool, it is disassociated from that tool and then associated with the current JFrog tool.




The selected steps are associated with the JFrog tool. To disassociate a step, select it and then select **Disassociate**.

### Configure Azure DevOps for JFrog

Configure your Azure DevOps instance to enable upload and download of JFrog artifacts.

The following settings are required in your Azure DevOps instance:

1. Install the plugin JFrog Artifactory.
2. Select your project and navigate to **Project settings** > **Pipelines** > **Service connections**.
3. Select **New service connection**, search and select the installed **JFrog Artifactory** plugin, and select **Next**.
4. Enter your JFrog instance details and create a service connection for JFrog.

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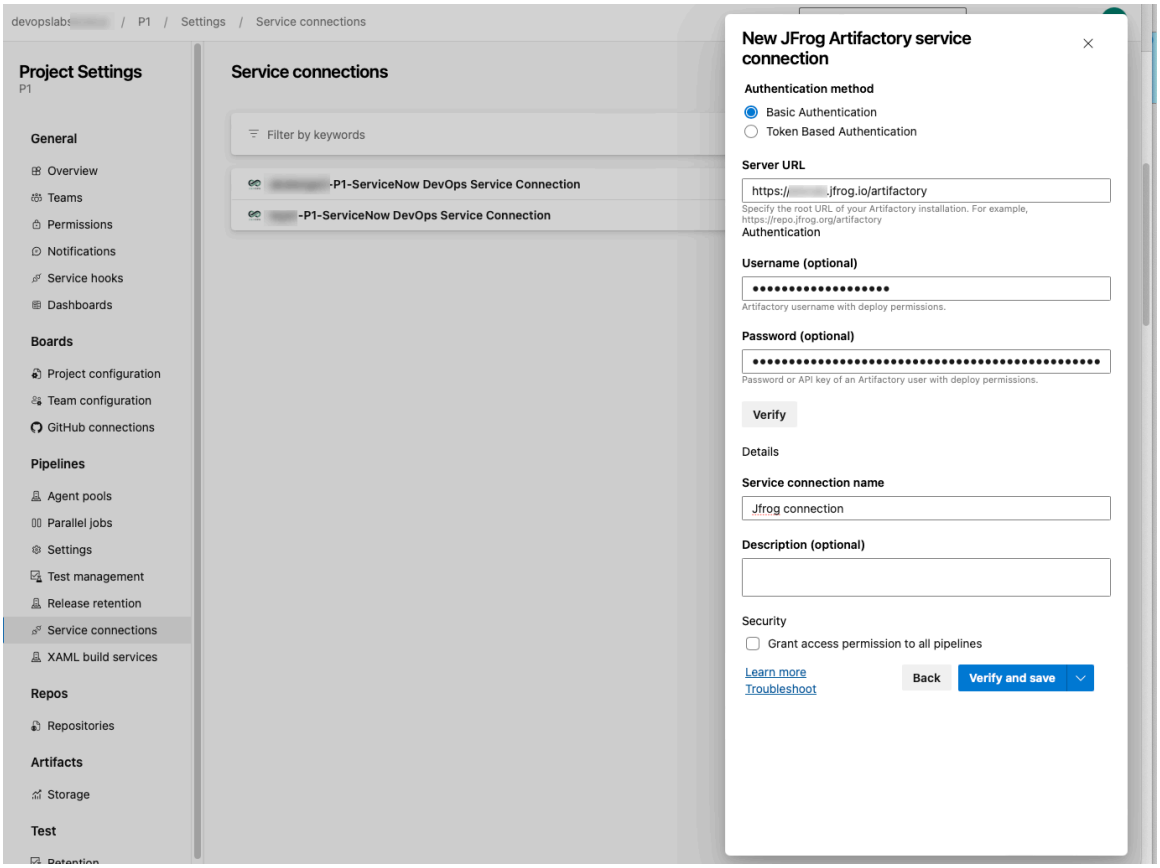


**Note:**
The **Username** and **Password** fields must contain the credentials to your JFrog instance entered in the **Server URL** field.

## Upload artifacts from Azure DevOps to JFrog

To upload artifacts:

1. Navigate to your project pipeline.
2. In your stage for uploading, add the task **Artifactory Generic Upload** for uploading artifacts.
3. For the **Artifactory Generic Upload** task:
   a. Select the service connection you created for JFrog.
   b. In the **Spec** field, entire your file spec.
   c. Select the **Collect build info** check box.
   d. The **Build number** field should contain the *`BuildId`* parameter.
   e. Select **Add**.

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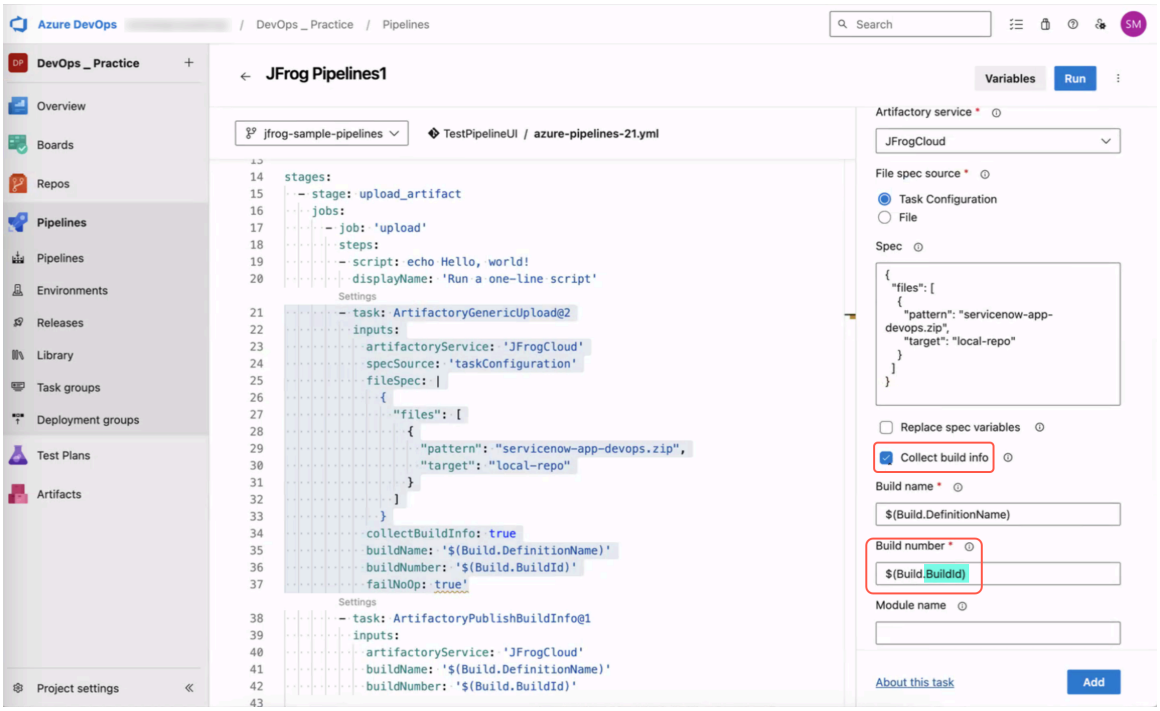
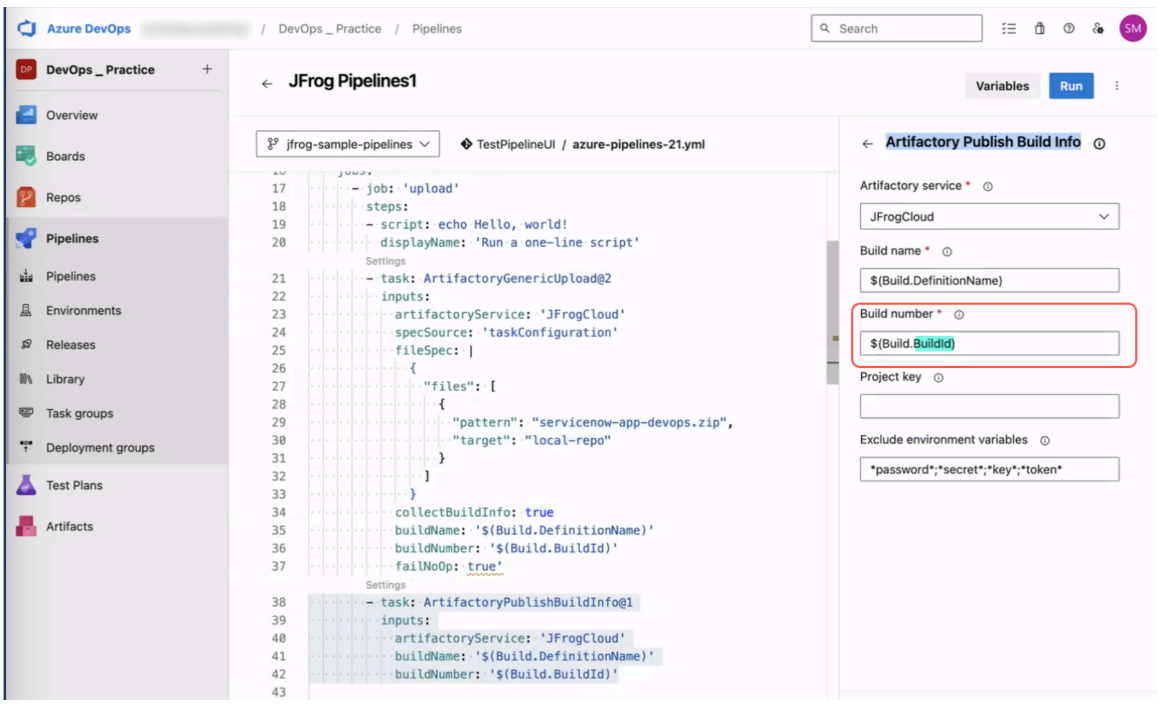



4. Add the task **Artifactory Publish Build Info** for publishing build info.
5. For the **Artifactory Publish Build Info** task:
   a. Select the service connection you created for JFrog.
   b. The **Build number** field should contain the *BuildId* parameter.
   c. Select **Add**.




### Sample pipeline to upload artifacts from Azure DevOps to JFrog

```
trigger:
```

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```
- none
pool:
  vmImage: ubuntu-latest


variables:
- group: Variable Group

stages:
  - stage: upload_artifact
    jobs:
      - job: 'upload'
        steps:
        - script: echo Hello, world!
          displayName: 'Run a one-line script'
        - task: ArtifactoryGenericUpload@2
          inputs:
            artifactoryService: 'JFrogCloud'
            specSource: 'taskConfiguration'
            fileSpec: |
              {
                "files": [
                  {
                    "pattern": "servicenow-app-devops.zip",
                    "target": "local-repo"
                  }
                ]
              }
            collectBuildInfo: true
            buildName: '$(Build.DefinitionName)'
            buildNumber: '$(Build.BuildId)'
            failNoOp: true'
        - task: ArtifactoryPublishBuildInfo@1
          inputs:
            artifactoryService: 'JFrogCloud'
            buildName: '$(Build.DefinitionName)'
            buildNumber: '$(Build.BuildId)'
```

### Download artifacts from JFrog to Azure DevOps

To download artifacts:

1. Navigate to your project pipeline.
2. In your stage for downloading, add the task **Artifactory Generic Download** for downloading artifacts.
3. For the **Artifactory Generic Download** task:
   a. Select the service connection you created for JFrog.
   b. In the **Spec** field, entire your file spec.
   c. Select the **Collect build info** check box.
   d. The **Build number** field should contain the *BuildId* parameter.
   e. Select **Add**.
4. Add the task **Artifactory Publish Build Info** for publishing build info.
5. For the **Artifactory Publish Build Info** task:

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**a.** Select the service connection you created for JFrog.

**b.** The **Build number** field should contain the *BuildId* parameter.

**c.** Select **Add**.

#### Sample pipeline to download artifacts from Azure DevOps to JFrog

```
trigger:
- none
pool:
  vmImage: ubuntu-latest


variables:
- group: Variable Group

stages:
  - stage: download_artifact
    jobs:
      - job: 'download'
        steps:
        - task: ArtifactoryGenericDownload@3
          inputs:
            connection: 'JFrogCloud'
            specSource: 'taskConfiguration'
            fileSpec: |
              {
                "files": [
                  {
                    "pattern":
 "local-repo/servicenow-app-devops.zip",
                    "target": "/tmp/"
                  }
                ]
              }
            collectBuildInfo: true
            buildName: '$(Build.DefinitionName)'
            buildNumber: '$(Build.BuildId)'
            failNoOp: true
        - task: ArtifactoryPublishBuildInfo@1
          inputs:
            artifactoryService: 'JFrogCloud'
            buildName: '$(Build.DefinitionName)'
            buildNumber: '$(Build.BuildId)'
```

### Sample pipeline to upload and download artifacts for GitHub

Pipeline samples for GitHub containing steps to upload and download artifacts for GitHub.

## Upload artifacts from GitHub to JFrog

```
name: JFrogUploadArtifact

on:
  push:
```

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```
    branches:
      - main
jobs:
  upload_to_jfrog:
    runs-on: ubuntu-latest

    defaults:
      run:
        working-directory: "${{ github.workspace }}"

    steps:
      - name: Checkout code
        uses: actions/checkout@v2

      - name: Set up JFrog CLI
        uses: jfrog/setup-jfrog-cli@v3
        with:
          version: latest
        env:
          JF_URL: ${{ secrets.JFROG_URL }}
          JF_USER: ${{ secrets.JFROG_USER }}
          JF_PASSWORD: ${{ secrets.JFROG_PASSWORD }}

      - name: Upload Artifact to Jfrog
        run: |
          export JFROG_CLI_HOME="${{ github.workspace }}"
          #upload artifacts
          jf rt u "servicenow-app-devops.zip" "local_repo"
          # Publish build info
          jf rt bp
```

### Download artifacts from JFrog to GitHub

```
name: JFrogDownloadArtifact

on:
  push:
    branches:
      - main

jobs:
  download_from_jfrog:
    runs-on: ubuntu-latest

    defaults:
      run:
        working-directory: "${{ github.workspace }}"

    steps:
      - name: Checkout code
        uses: actions/checkout@v2

      - name: Set up JFrog CLI
        uses: jfrog/setup-jfrog-cli@v3
        with:
```

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```
          version: latest
        env:
          JF_URL: ${{ secrets.JFROG_URL }}
          JF_USER: ${{ secrets.JFROG_USER }}
          JF_PASSWORD: ${{ secrets.JFROG_PASSWORD }}

      - name: download artifacts from jfrog
        run: |
          export JFROG_CLI_HOME="${{ github.workspace }}"
          # download artifact from jfrog
          jf rt dl "local_repo/servicenow-app-devops.zip" ./
          # Publish build info
          jf rt bp
```

### Sample pipeline to upload and download artifacts for GitLab

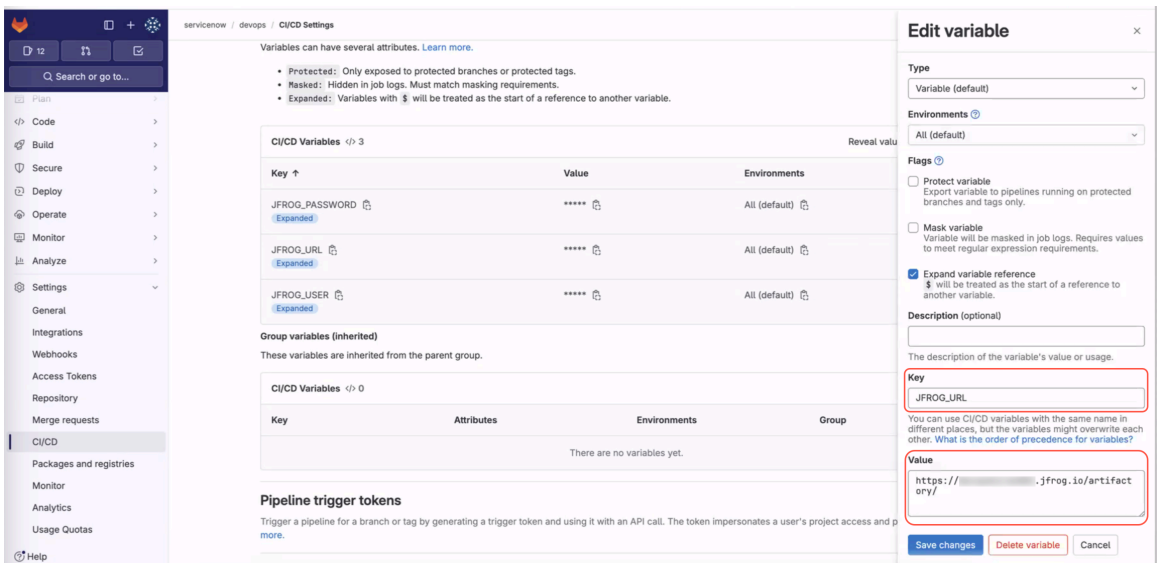
Pipeline samples for GitLab containing steps to upload and download artifacts for GitHub.

To upload and download artifacts from GitLab to JFrog, the parameters *JFROG_URL*, *JFROG_USER*, and *JFROG_PASSWORD* must be set as CI/CD variables in your GitLab instance.

1. Navigate to your project, then go to **Settings** > **CI/CD** > **Variables**.
2. Select **Add variable**.
3. Enter the parameter in the **Key** field and enter the value for the parameter in the **Value** field.
4. Select **Add variable** to save.

Create a CI/CD variable for the following 3 parameters:

- *JFROG_URL*
- *JFROG_USER*
- *JFROG_PASSWORD*




## Sample pipeline to upload artifacts from GitLab to JFrog

```
stages:
  - upload
```

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```
variables:
  JFROG_CLI_HOME: ${CI_PROJECT_DIR}
  JFROG_ARTIFACTORY_URL: ${JFROG_URL}
  JFROG_ARTIFACTORY_REPO: "local_repo/gitlab"
  JFROG_ARTIFACTORY_USERNAME: ${JFROG_USER}
  JFROG_ARTIFACTORY_PASSWORD: ${JFROG_PASSWORD}
  ARTIFACT_PATH: "/"
  ARTIFACT_NAME: "servicenow-app-devops.zip"
  BUILD_NAME: "${CI_PROJECT_NAME}"
  BUILD_NUMBER: "${CI_PIPELINE_ID}"
  JFROG_CLI_BUILD_URL:
 ${CI_SERVER_URL}/$CI_PROJECT_PATH/-/pipelines/$CI_PIPELINE_ID

upload:
  stage: upload
  script:
    - export
 BUILD_URL=${CI_SERVER_URL}/$CI_PROJECT_PATH/pipelines/$CI_PIPEL
INE_ID
    # upload artifact
    - jfrog rt u "servicenow-app-devops.zip"
 "${JFROG_ARTIFACTORY_REPO}" --build-name=$CI_PROJECT_NAME
 --build-number=$CI_PIPELINE_ID
    # publish build-info
    - jfrog rt bp "${CI_PROJECT_NAME}" "${CI_PIPELINE_ID}"
  before_script:
  - mkdir -p ${JFROG_CLI_HOME}
  - export PATH=$PATH:${JFROG_CLI_HOME}
  - curl -fL https://getcli.jfrog.io | sh
  - jfrog config add artifactory-server
 --artifactory-url=${JFROG_ARTIFACTORY_URL}
 --user=${JFROG_ARTIFACTORY_USERNAME}
 --password=${JFROG_ARTIFACTORY_PASSWORD}
```

### Sample pipeline to download artifacts from JFrog to GitLab

```
stages:
  - download

variables:
  JFROG_CLI_HOME: ${CI_PROJECT_DIR}
  JFROG_ARTIFACTORY_URL: ${JFROG_URL}
  JFROG_ARTIFACTORY_REPO: "local_repo/gitlab"
  JFROG_ARTIFACTORY_USERNAME: ${JFROG_USER}
  JFROG_ARTIFACTORY_PASSWORD: ${JFROG_PASSWORD}
  ARTIFACT_PATH: "/"
  ARTIFACT_NAME: "servicenow-app-devops.zip"
  BUILD_NAME: "${CI_PROJECT_NAME}"
  BUILD_NUMBER: "${CI_PIPELINE_ID}"
  JFROG_CLI_BUILD_URL:
 ${CI_SERVER_URL}/$CI_PROJECT_PATH/-/pipelines/$CI_PIPELINE_ID

download:
  stage: download
```

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```
 script:
   # download artifact
    - jfrog rt dl
${JFROG_ARTIFACTORY_REPO}/servicenow-app-devops.zip
--include-dirs --build-name=$CI_PROJECT_NAME
--build-number=$CI_PIPELINE_ID
   # publish build-info
    - jfrog rt bp ${CI_PROJECT_NAME} ${CI_PIPELINE_ID}
 before_script:
 - mkdir -p ${JFROG_CLI_HOME}
 - export PATH=$PATH:${JFROG_CLI_HOME}
 - curl -fL https://getcli.jfrog.io | sh
 - jfrog config add artifactory-server
--artifactory-url=${JFROG_ARTIFACTORY_URL}
--user=${JFROG_ARTIFACTORY_USERNAME}
--password=${JFROG_ARTIFACTORY_PASSWORD}
```

## SonarQube integration with DevOps Change Velocity

Connect to your SonarQube instance that is integrated with your CI/CD pipelines to retrieve code quality and code security results.

## SonarQube integration overview

Sonar scans that are configured on GitHub Actions, Jenkins, and Azure DevOps pipelines are supported in DevOps Change Velocity. Both SonarCloud and SonarQube (on-premises) are supported.

You can view the code quality and code security summary results either in the related list of a Change Request or the Task Execution of the pipeline in your ServiceNow instance. You can also use code quality and code security results in defining change policies and conditions for change automation.

DevOps Change Velocity captures both overall and new code metrics.

## Get started

You can onboard your Sonar instance using an admin or a non-admin Sonar user.

**Pre-requisite configuration for admin user**

In SonarQube: Project-level access to your SonarQube instance to configure scans for all your projects.

**Pre-requisite configuration for non-admin users**

- In SonarQube:
  - The non-admin user must have access to a branch created using Branch Analysis. For more information, see Branch Analysis.
  - The non-admin user must have Browse and Execute Analysis permissions for the projects (both private and public) for which you want to run and view scan results.

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**Note:**
You can set up branch analysis to enable SonarCloud to analyze branches in your projects apart from the main branch. You can't set up or perform branch analysis on SonarQube community edition licenses. Upgrade to SonarQube Developer or Enterprise editions to set up branch analysis on SonarQube on-premises implementations.

- In DevOps Change Velocity
  1. Navigate to **All** > **DevOps** > **Administration** > **Properties**.
  2. Enable the **DevOps Non-Admin Software Quality Summary Flag** property by selecting the **Yes** option.

Sonar custom action and extension are available in the GitHub and Azure DevOps marketplace respectively. For Jenkins, the Sonar scan results are retrieved using ServiceNow Jenkins plugin.

For more information on the scan results captured in ServiceNow, see Software Quality Results.

Use one of the following options to onboard SonarQube. For a guided experience, use the workspace to onboard a tool. Alternatively, you can use the Service Catalog or Classic experience.

### Onboard SonarQube to DevOps Change Velocity — Workspace

Connect to your Sonar instance using the DevOps Change Workspace playbook.

#### Before you begin

Complete the tasks specified in the Getting started with DevOps Change Velocity topic.

Role required: sn_devops.admin or sn_devops.tool_owner

#### Procedure

1. Navigate to **Workspaces** > **DevOps Change Workspace** and use one of the following options to open the Playbook to onboard SonarQube.

2. Enter a name to identify your tool and click **Next**.
3. On the Enter Sonar instance details playbook activity section, enter the following details:
   a. In the **URL of the SonarQube instance** field, enter the SonarQube or SonarCloud instance URL.

      For example, https://sonarcloud.io.

   b. In the **SonarQube username** field, enter the user name for your Sonar account.
   c. In the **Password or access token** field, enter the token generated in Sonar.
   d. If your Sonar instance is attached to a MID Server, select the **Use MID Server** option and enter its details.

      A MID server is required if your tool instance is hosted on-prem. For more information about MID server, see MID Server selection.
4. Click **Connect** and review the details of the successfully connected Sonar instance.

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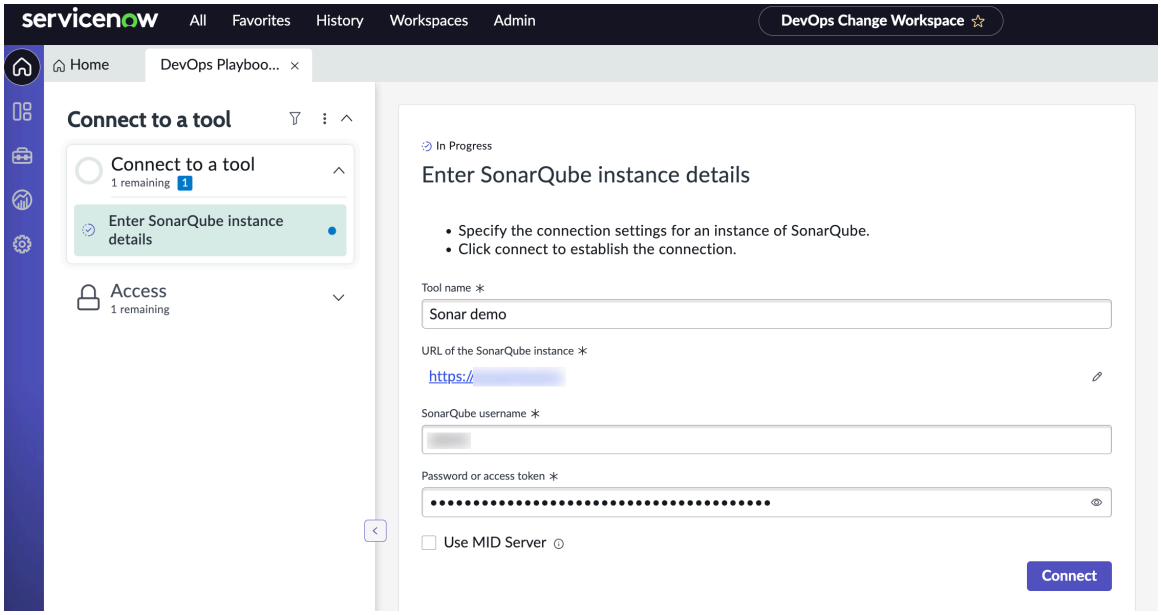


5. Specify the access for the tool.

   a. If you want to control access to the tool, add the groups that must be given access to the tool in the **Maintained by** field.

      The tasks these users in the groups can perform depends on the role assigned to them.

      - DevOps Tool Owner role: Can view and edit the tool.
      - DevOps App Owner role: Can view the tool and can associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects (such as plans, repositories, and pipelines).
      - DevOps Administrator role: Can edit all tools.
      - Other DevOps roles: Can view the tool.

      **Note:**
      If you don't select a group and skip this step, all users with the DevOps Tool Owner role will be able to edit the tool.

   b. If you choose to control access to the tool, the **All App Owners can view and associate tool objects to applications** option becomes available for selection.

      This option enables all users having the DevOps App Owner role to access the tool. If selected, they'll be able to view, associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects.

   c. Select **Assign**.

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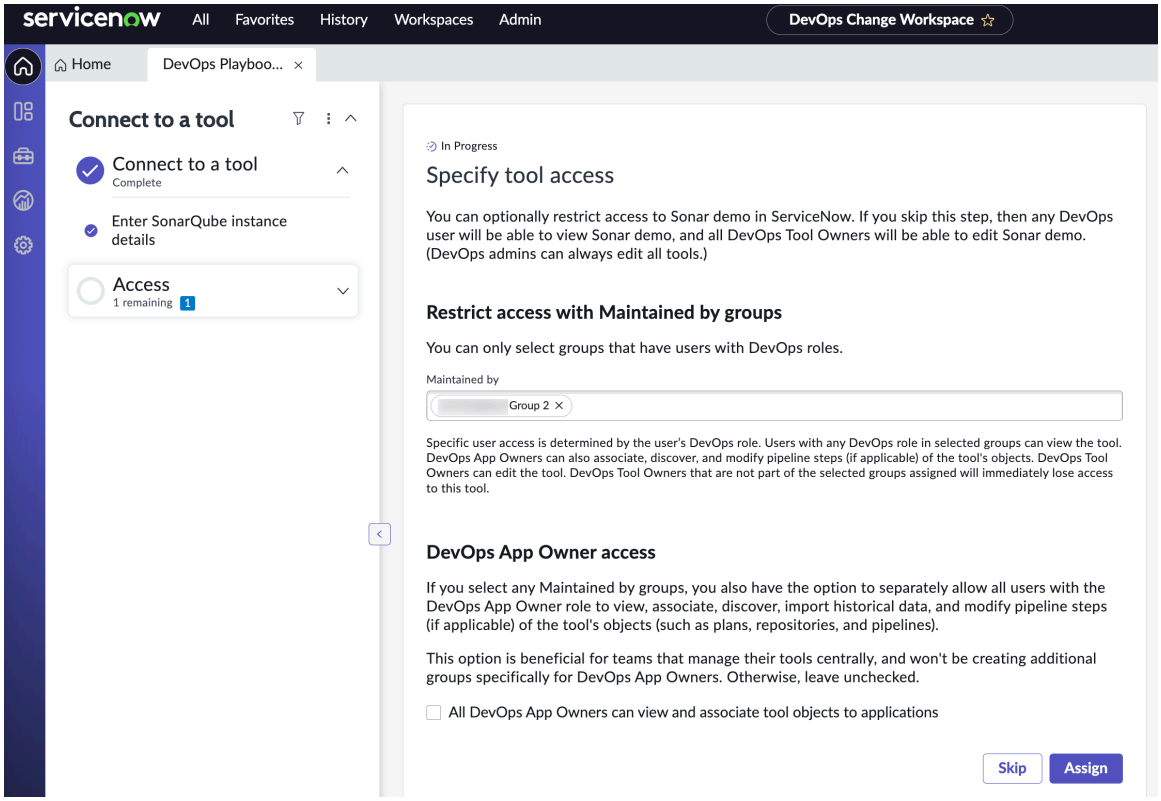
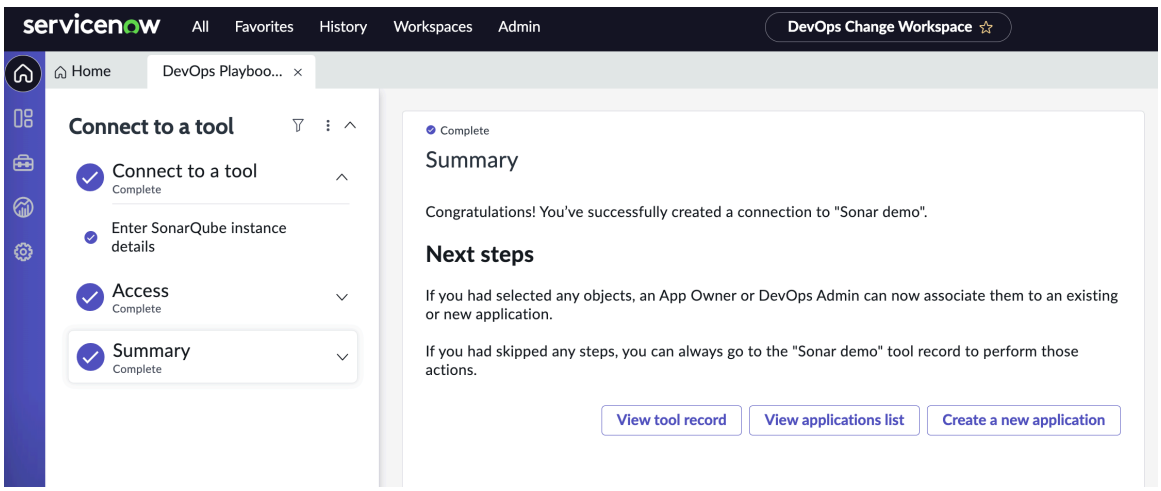



6. From the **Summary** page, select **View tool record** to review the details of the connected instance.




## Result

You've successfully onboarded your SonarQube tool to DevOps Change Velocity.

## Onboard SonarQube to DevOps Change Velocity — Service Catalog

Connect your Sonar instance using the ServiceNow Service Catalog.

## Before you begin

Role required: sn_devops.admin or sn_devops.tool_owner

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### Procedure

1. Navigate to **All** > **Service Catalog** > **Catalog Definitions** > **Maintain Items** and search for DevOps.

   **Note:**
   You can also access the service catalog from Employee Center or Service portal.

2. From the DevOps catalog items, select and activate **DevOps App Onboarding** and **DevOps Tool Onboarding**.
3. After activating, select **DevOps Tool Onboarding** and select **Try it**.
4. In the DevOps Tool Onboarding form, enter the tool details:

| Field | Description |
|---|---|
| Tool name | Name for your Sonar integration. |
| Tool integration | Select SonarQube. |
| Tool URL | SonarQube/SonarCloud instance URL.<br><br>For example,https://sonarcloud.io. |
| Tool password/ Access token | SonarQube user token. |
| Use MidServer | Optional. Select#MID Server#for an on-premises tool that is attached to a#MID Server. Application is automatically set to #DevOps and capability is set to REST. |

5. Select **Order Now**.
   A request is created. When the request is approved, the tool is connected.

#### Onboard SonarQube to DevOps Change Velocity — Classic

Connect to your Sonar instance to retrieve scan results.

### Before you begin

Role required: sn_devops.admin or sn_devops.tool_owner

### Procedure

1. Navigate to **All** > **DevOps** > **Tools** > **Create New (legacy)**.
2. In the Create DevOps tool form, enter the tool details:

| | |
|---|---|
| Tool name | Name for the tool you're integrating. |
| Tool integration | Tool to integrate. Select SonarQube. |
| Tool URL | SonarQube/SonarCloud instance URL.<br><br>For example,https://sonarcloud.io<br><br>**Note:**<br>Don’t enter the slash (/) character at the end of your Sonar tool URL. |

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| | |
|---|---|
| Tool password / Access token | SonarQube user token<br><br>**Note:**<br>Only user tokens generated from **User** > **My Account** > **Security** in your Sonar instance are supported.<br><br>Before generating the token for a SonarQube user, ensure that you grant Browse permission for all your Sonar projects.<br><br>`api: Grants complete read/write access to the API, including all groups and projects, the container registry, and the package registry.` |
| Use MID Server | MID Server is optional. Select MID Server for an on-premises tool that is attached to a MID Server. The Application value is automatically set to DevOps and the Capability value is set to REST. For more information, see MID Server selection. |

3. Click **Submit** to connect to your Sonar instance.

On successful tool creation, you're taken to the tool record page.

4. If you want to control access to the tool, add the groups that must be given access to the tool in the **Maintained by** field on the **Access** tab.

   The tasks the users in the groups can perform depends on the roles assigned to them.

   - DevOps Tool Owner role: Can view and edit the tool.
   - DevOps App Owner role: Can view the tool and can associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects (such as plans, repositories, and pipelines).
   - DevOps Administrator role: Can edit all tools.
   - Other DevOps roles: Can view the tool.

   **Note:**
   Only groups containing users with DevOps roles are available for selection in the **Maintained by** field.

   The **All App Owners can view and associate tool objects to applications** option becomes available for selection if you choose to restrict access to the tool. This option enables all users having the DevOps App Owner role to access the tool. If selected, they'll be able to view, associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects.

### What to do next

- Configure SonarQube scans on Azure DevOps pipelines
- Configure SonarQube scans on Jenkins pipelines

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## Split.io integration with DevOps Change Velocity

Connect to your Split.io instance to manage feature flags requests directly from you ServiceNow instance.

## Split integration overview

Feature flags are used to turn code off and on in your production environment.

This integration extends the ServiceNow platform to manage the CHG approval process for feature flags and segments of Split. This capability enables managing updates to feature flags from DevOps Change Velocity.

- Split.io feature flag tool integration support enables discovery of workspaces, environments, segments, and feature flags.
- Users can set CHG request fields to enable Split.io for CHG control.
- Upon approval/rejection of a CHG request, the callback URL in Split.io for the split or segment is invoked to resume implementation of the update to the split and segment.

### Enable integration with ServiceNow DevOps in Split tool

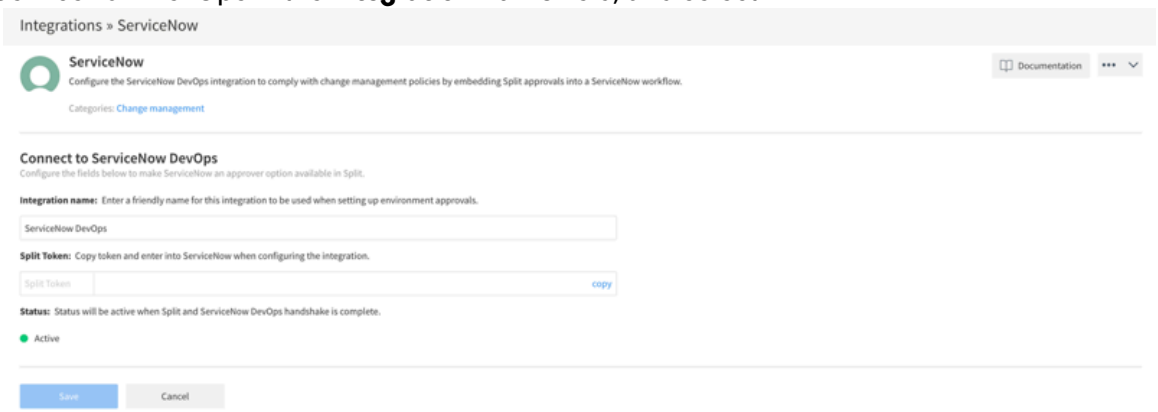
Enable integration with ServiceNow DevOps in Split tool and restrict approvers to only the enabled integration for your environment.

#### Before you begin

Role required: admin in Split organization

#### Procedure

1. In Split tool marketplace, navigate to **Admin Settings > Integrations**.
2. Add ServiceNow DevOps in the **Integration Name** field, and select




**Save**.
A token is generated, which must be used while onboarding the Split.io tool.

3. Navigate to **Admin Settings > Workspaces > Choose the required workspace > Edit the Environment**.

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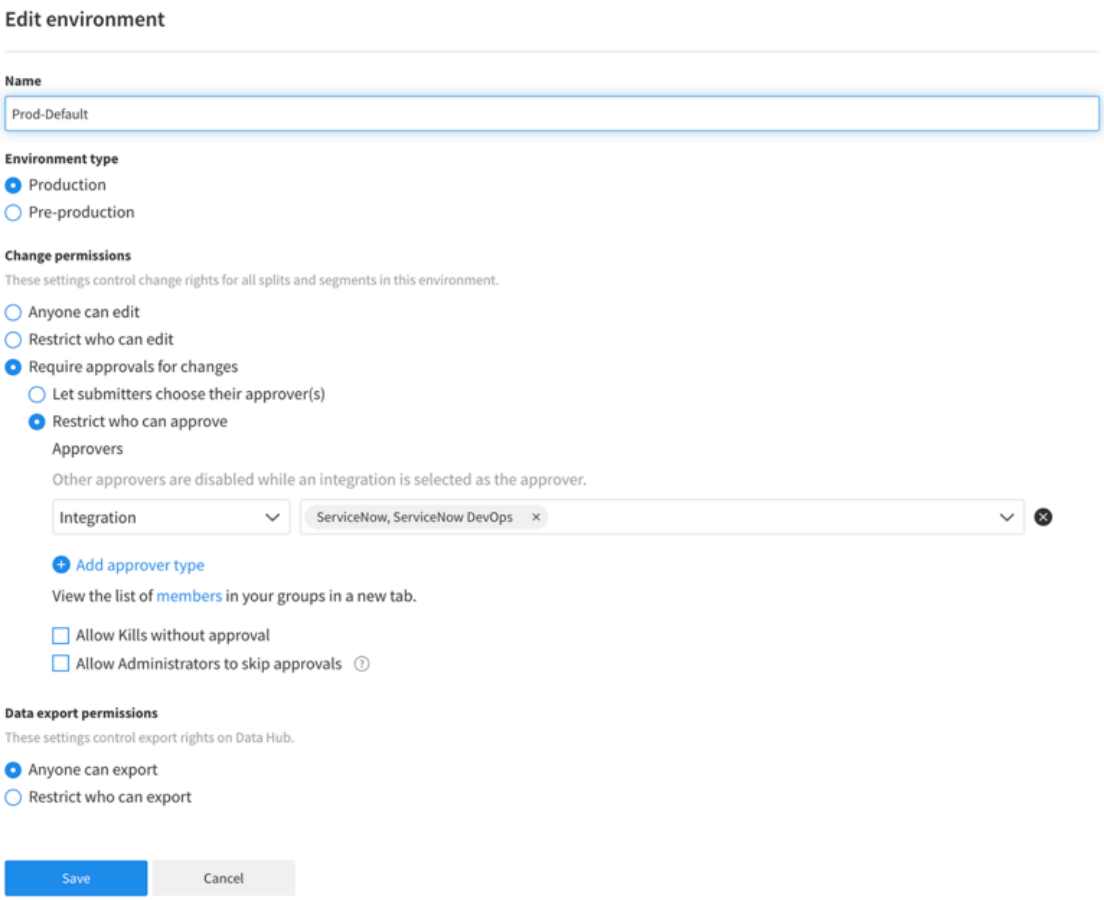
4. In the **Change permissions** field, select **Require approvals for changes > Restrict who can approve**.
5. Select **Integrations** from the drop-down and select the integration configured in step 2 as, and select




**Save**.

[store-future: BEGIN review]

## Onboard Split to DevOps Change Velocity — Workspace

Connect to your Split IO instance using the DevOps Change Workspace playbook.

### Before you begin

Complete the tasks specified in the Getting started with DevOps Change Velocity topic.

Role required: sn_devops.admin or sn_devops.tool_owner

### Procedure

1. Navigate to **Workspaces** > **DevOps Change Workspace** and use one of the following options to open the Playbook to onboard Split IO.

2. Enter a name to identify your tool and click **Next**.
3. In the Enter Split IO instance details playbook activity section, enter the following details:
   a. In the **URL of the Split IO instance** field, enter `https://api.split.io`.
   b. In the **Split IO username** field, enter the user name for your Split IO account.
   c. In the **Password or access token** field, enter the token generated in Split IO.

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**d.** If your Split IO instance is attached to a MID Server, select the **Use MID Server** option and enter its details.

A MID server is required if your tool instance is hosted on-prem. For more information about MID server, see MID Server selection.

4. Click **Connect**.
5. From the **Summary** page, select **View connected Split IO tool** to view the tool details.

### Result
You've successfully onboarded your Split IO tool to DevOps Change Velocity.

[End]

## Onboard Split to DevOps Change Velocity — Classic

Create a Split tool record to connect and discover workspaces, environments, segments, and feature flags from the connected Split tool.

### Before you begin
Role required: sn_devops.admin

### Procedure
1. Create a tool record in DevOps to automatically connect to Split and get the webhook URL.

**a.** Navigate to **DevOps** > **Tools** > **Create New (legacy)** and create a record.

**b.** Enter a **Tool Name** and fill in the tool details.

| | |
|---|---|
| Tool Integration | Split |
| Tool URL | Split tool URL.<br>For example:<br>`https://api.split.io` |
| Tool Username | Split username |
| Tool Password / Access Token | Split password or access token. For information on creating a Split token, see Enable integration with ServiceNow DevOps in Split tool. |

**MID Server** is optional. Select MID Server for an on-premises tool that is attached to a MID Server. Application is automatically set to DevOps and capability is set to REST.

**c.** Select **Submit**.

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The tool is automatically **Connected Successfully** using a connection alias, and HTTP tool connection (basic authentication credential).

> **Note:**
> If you do not have global admin privileges for your tool (to allow automatic configuration of the webhook URL), you may need to have the tool admin user configure it for you (cut and paste the webhook URL into the tool configuration). Once the webhook is configured in the tool, **Enter Manual Configuration Mode** to connect to the tool manually, then exit.

On successful tool creation, you're taken to the tool record page.

2. If you want to control access to the tool, add the groups that must be given access to the tool in the **Maintained by** field on the **Access** tab.

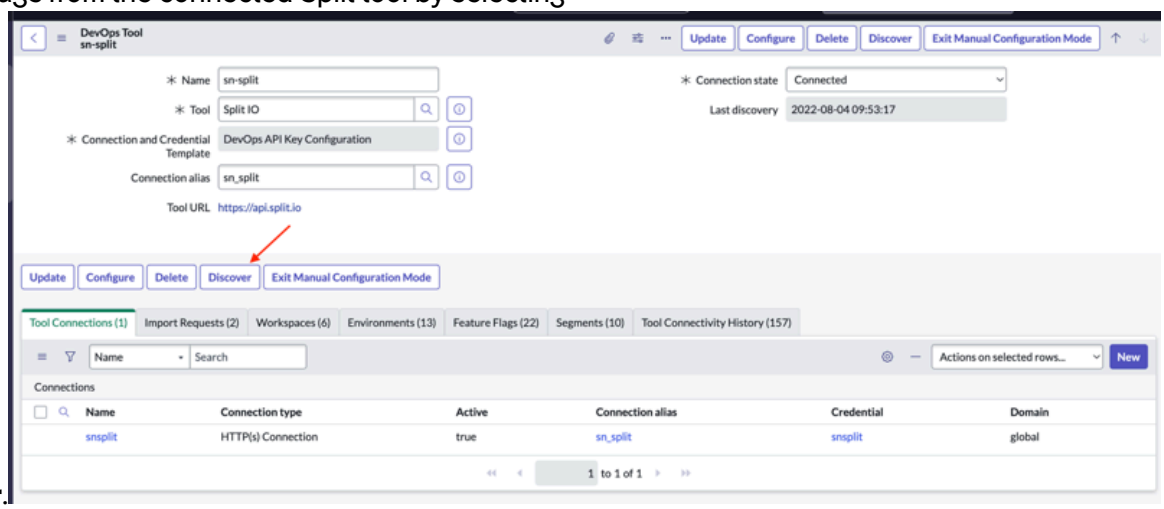
   The tasks the users in the groups can perform depends on the roles assigned to them.

   - DevOps Tool Owner role: Can view and edit the tool.
   - DevOps App Owner role: Can view the tool and can associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects (such as plans, repositories, and pipelines).
   - DevOps Administrator role: Can edit all tools.
   - Other DevOps roles: Can view the tool.

   > **Note:**
   > Only groups containing users with DevOps roles are available for selection in the **Maintained by** field.

   The **All App Owners can view and associate tool objects to applications** option becomes available for selection if you choose to restrict access to the tool. This option enables all users having the DevOps App Owner role to access the tool. If selected, they'll be able to view, associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects.

3. Discover workspaces, environments, segments, and feature flags from the connected Split tool by selecting **Discover**.

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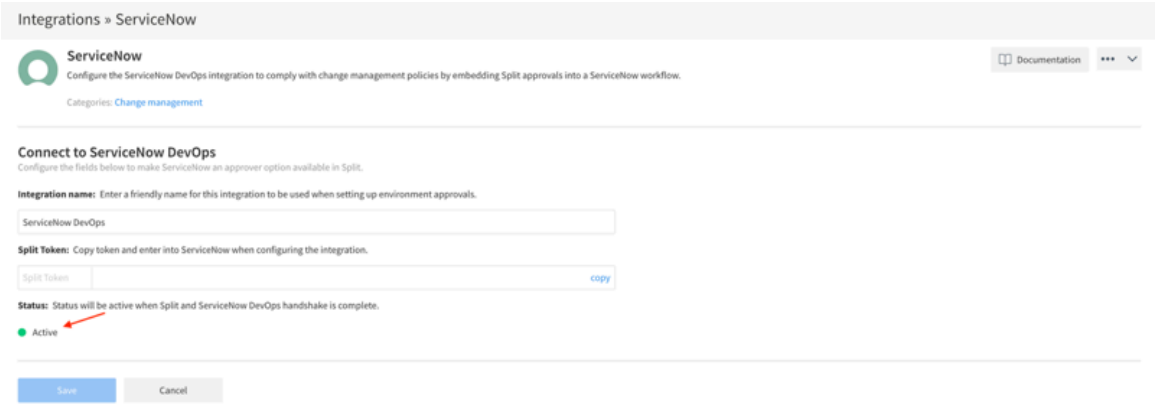
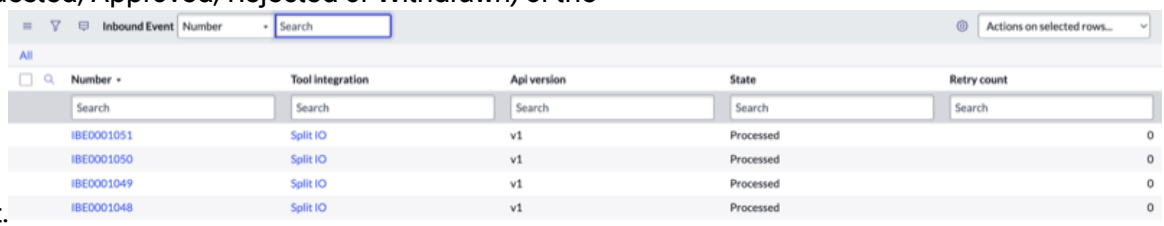
4. Automatically configure the webhook URL in Split tool by selecting **Configure**. ServiceNow Integration will be activated on Split. Webhooks are auto-configured and notifications are sent from Split tool to DevOps.

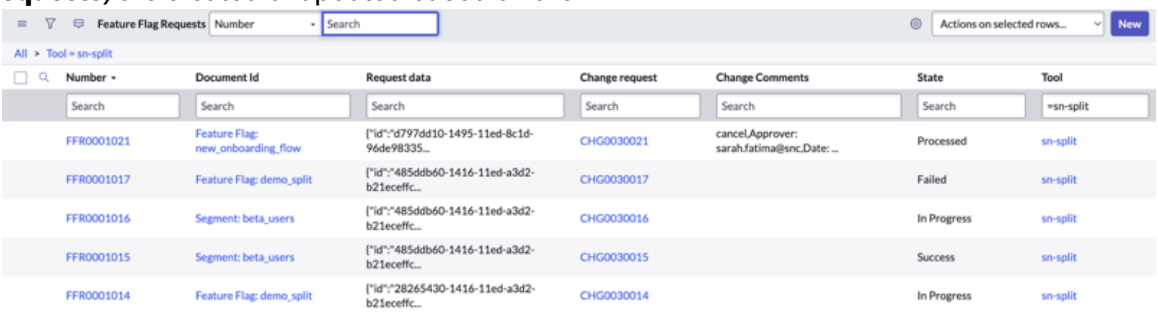



**Example:**
The following example specifies how changes made in the Split tool are notified to ServiceNow DevOps through the webhook.

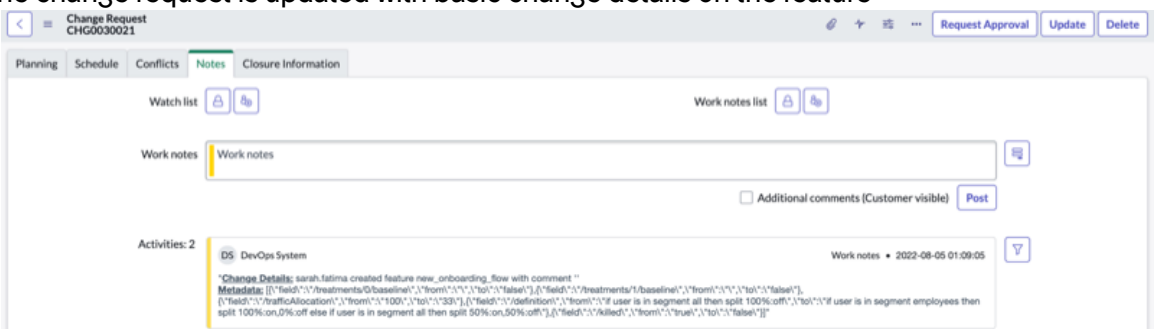
- Inbound events are created in ServiceNow for status (Requested, Approved, Rejected or Withdrawn) of the event.




- Feature Flag requests (**DevOps > Feature Flag > Feature Flag Requests**) are created or updated based on the status.




- A change request is created for every Feature Flag request, and work notes on the change request is updated with basic change details on the feature flag.

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## Veracode integration with DevOps Change Velocity

Connect to your Veracode instance that is integrated with your CI/CD pipelines to retrieve security scan results. This helps you determine how vulnerable your code is.

## Veracode integration overview

Veracode scans that are configured on GitHub Actions, Jenkins, Azure DevOps, GitLab, and Harness pipelines are supported in DevOps Change Velocity.

Ensure that your Veracode credentials have the following API roles.

- Upload and Scan
- Results

For more information, see Veracode documentation.

You can configure Veracode scans on any stage of the pipeline and the scan details are retrieved from the corresponding stage to DevOps Change Velocity. If you're using Azure DevOps or GitHub Actions orchestration tools, then you must add the custom action code in your pipeline always. If you're using Jenkins, and your pipeline already has a Veracode security scan step, you don't have to add the custom action code in your pipeline. Ensure that your Veracode security scan step has waitForScan: true. This is required for the system to retrieve the scan information.

If you want to configure Veracode for the GitLab tool, you can either use the generic Docker container image to add the Veracode security step or perform the steps specified in the Integrate security tools with GitLab topic.

For Harness pipelines, you can configure Veracode scans only through the generic Docker Container Image. For more information, see Implement custom actions for pipelines using generic Docker container image.

You can view the security scan results either in the related list of a Change Request, or the Task Execution of the pipeline, or in the Pipeline UI in your ServiceNow instance. You can also use security results in defining change policies and conditions for change automation.

## Get started

You must install the DevOps Vulnerability Integrations (sn_devops_vul_ints) and Vulnerability Response Integration with Veracode (sn_vul_veracode) plugins before connecting your Veracode instance to ServiceNow. For more information on activating a plugin, see Install a ServiceNow Store application.

For more information on the scan results captured in ServiceNow, see Security scan results.

Use one of the following options to onboard Veracode. For a guided experience, use the workspace to onboard a tool. Alternatively, you can use the Service Catalog or Classic experience.

### Onboard Veracode to DevOps Change Velocity - Workspace

Connect to your Veracode instance using the DevOps Change Workspace playbook.

#### Before you begin

Complete the tasks specified in the Getting started with DevOps Change Velocity topic.

Role required: sn_devops.admin or sn_devops.tool_owner

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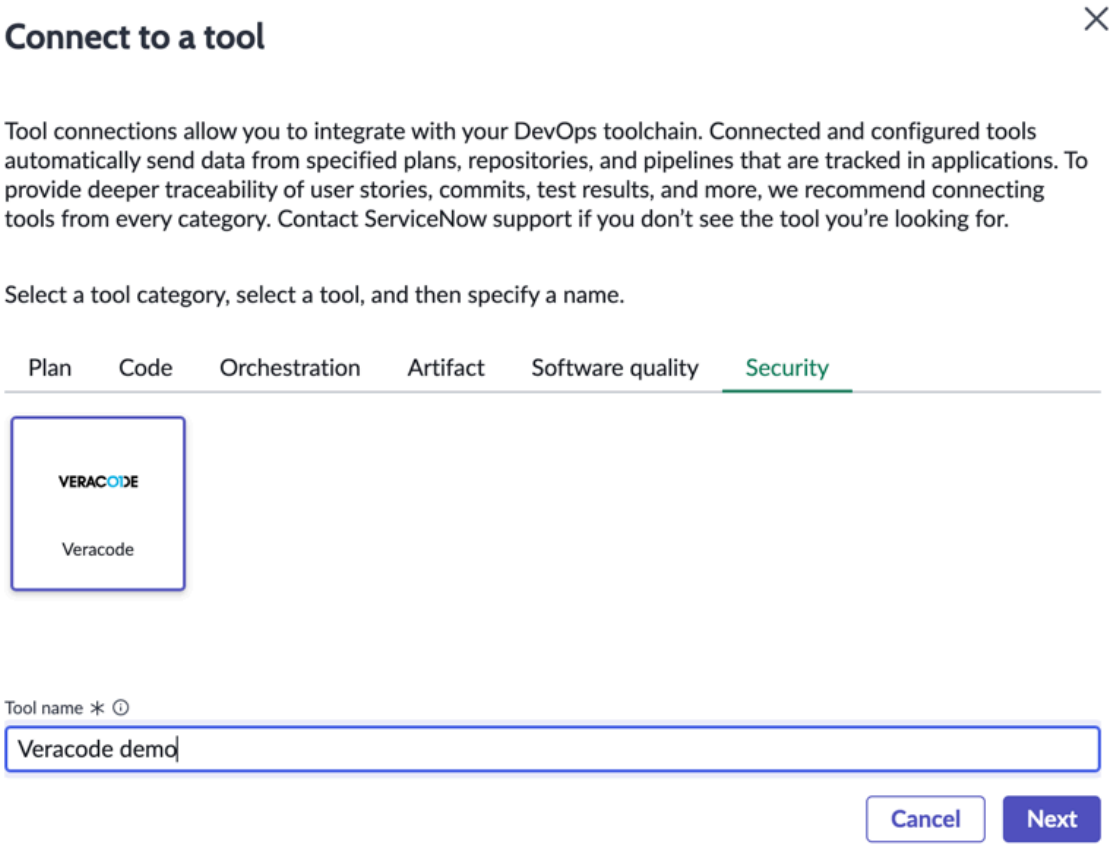
### Procedure

1. Navigate to **Workspaces** > **DevOps Change Workspace** and use one of the following options to open the Playbook to onboard Veracode.

2. Enter a name to identify your tool and select




**Next**.

3. On the Enter Veracode instance details playbook activity section, enter the following credentials:
   a. In the **API id** field, enter the API ID of your Veracode instance.
   b. In the **API key** field, enter the API key of your Veracode instance.

> **Note:**
> Ensure that your Veracode credentials have the following API roles.
> - Upload and Scan
> - Results
>
> For more information, see https://docs.veracode.com/r/c_API_roles_details.

4. Select **Connect** and review the details of the successfully connected Veracode instance.

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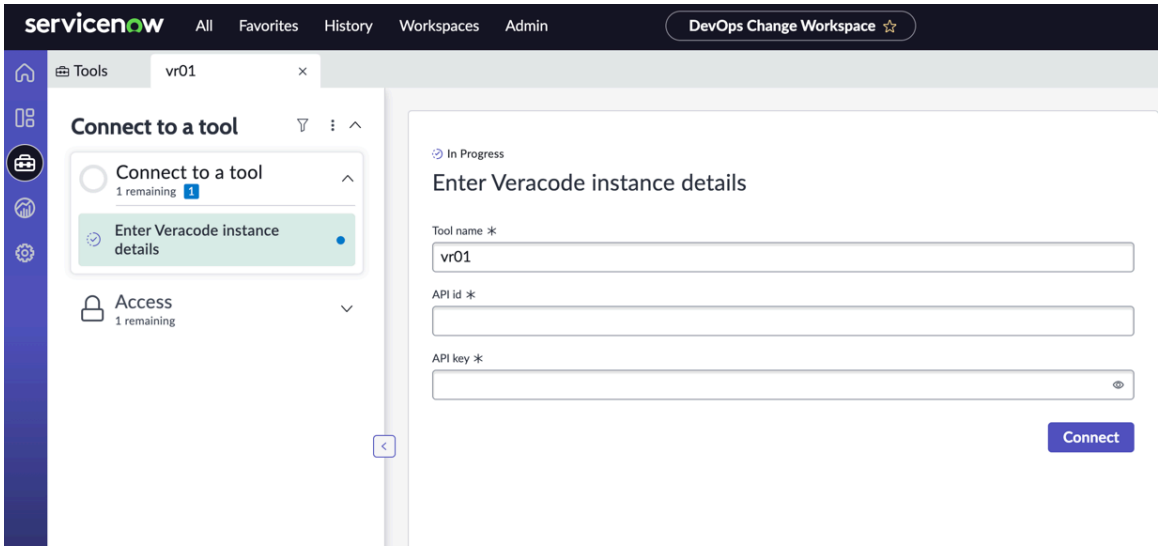


5. Specify the access for the tool.
   a. If you want to control access to the tool, add the groups that must be given access to the tool in the **Maintained by** field.

      The tasks these users in the groups can perform depends on the role assigned to them.

      - DevOps Tool Owner role: Can view and edit the tool.
      - DevOps App Owner role: Can view the tool and can associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects (such as plans, repositories, and pipelines).
      - DevOps Administrator role: Can edit all tools.
      - Other DevOps roles: Can view the tool.

      **Note:**
      If you don't select a group and skip this step, all users with the DevOps Tool Owner role will be able to edit the tool.

   b. If you choose to control access to the tool, the **All App Owners can view and associate tool objects to applications** option becomes available for selection.

      This option enables all users having the DevOps App Owner role to access the tool. If selected, they'll be able to view, associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects.

   c. Select **Assign**.

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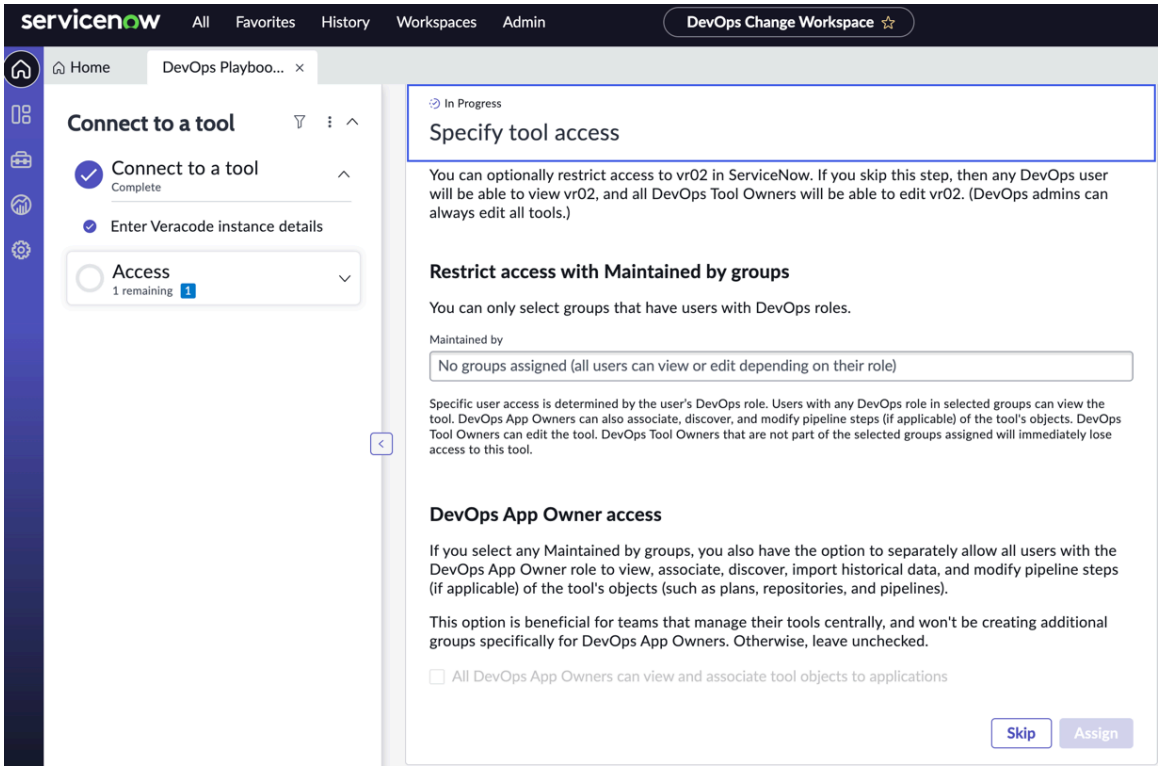


6. If this isn't the first instance of the security tool you're onboarding, select the orchestration tool to associate with your security tool instance from the Associate orchestration tool instances playbook activity.

   This activity isn't displayed if this is the first security tool instance you're onboarding.

   **Note:**
   This playbook activity is required only if you're onboarding more than one security tool instances. When multiple security tool instances are onboarded in ServiceNow, you must associate only one of the security tool instances to the same orchestration tool or pipeline record.

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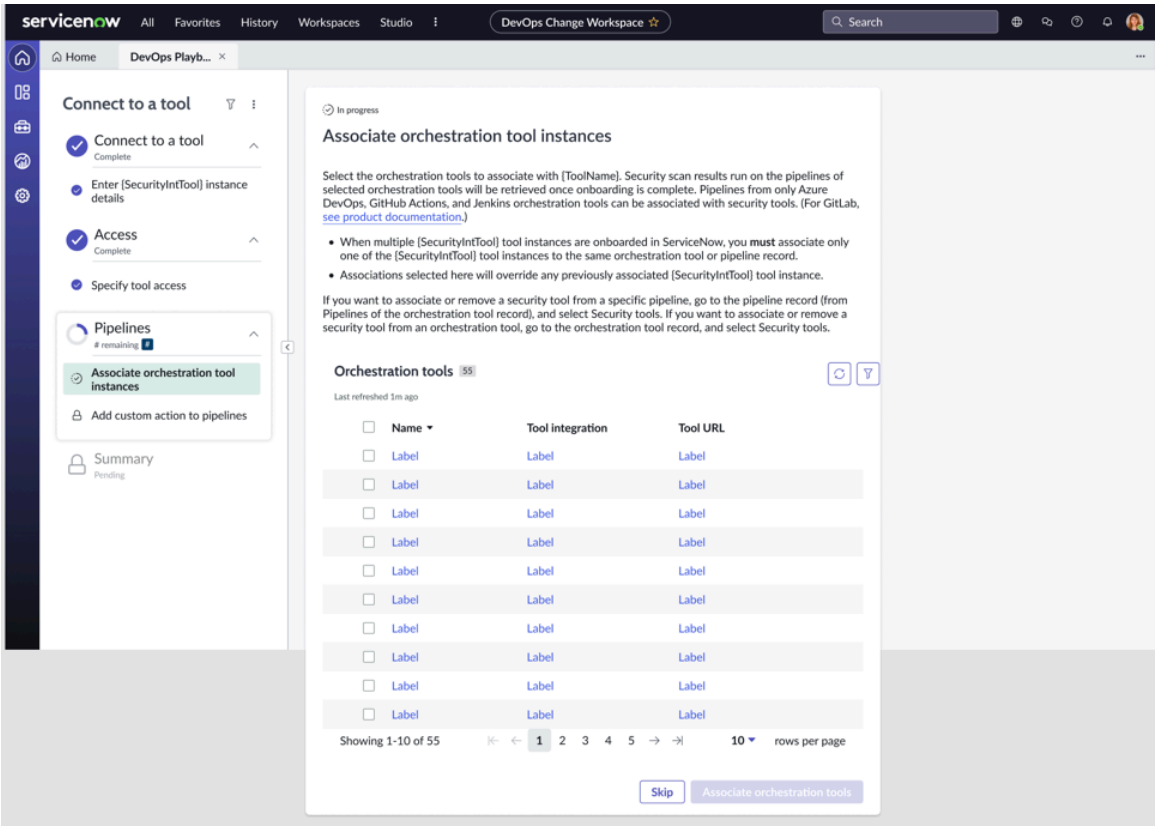


7. From the Add custom action to pipelines playbook activity section, copy the required custom action code and add it as a step in your pipeline.
   - If only one security instance is onboarded in ServiceNow, the pipelines will be automatically associated with Veracode when the pipeline is run.
   - If this is the first security tool instance you're onboarding, the custom action codes for the orchestration tool that you've onboarded in ServiceNow will be available to copy.
     - If you are using Azure DevOps or GitHub Actions orchestration tools, then you must add the custom action code in your pipeline always.
     - If you're using Jenkins, and your pipeline already has a Veracode security scan step, you don't have to add the custom action code in your pipeline. Ensure that your Veracode security scan step has **waitForScan: true**. This is required for the system to retrieve the scan information.
   - If this is the not the first security tool instance you're onboarding, the respective custom action codes for orchestration tools that you've selected in step 6 will be available to copy. If you're using Jenkins, and your pipeline already has a Veracode security scan step, you don't have to add the custom action code in your pipeline. Ensure that your Veracode security scan step has **waitForScan: true**. This is mandatory for the system to retrieve the scan information.
   - If you want to configure Veracode for the GitLab tool, you can either use the generic Docker container image to add the Veracode security step or perform the steps specified in the Integrate security tools with GitLab topic.
   - For Harness pipelines, you can configure Veracode scans only through the generic Docker Container Image. For more information, see Implement custom actions for pipelines using generic Docker container image.
   - Alternatively, you can associate pipeline with security tool instance by adding security tool ID to the custom action code. This will override any previously associated security tool instance.

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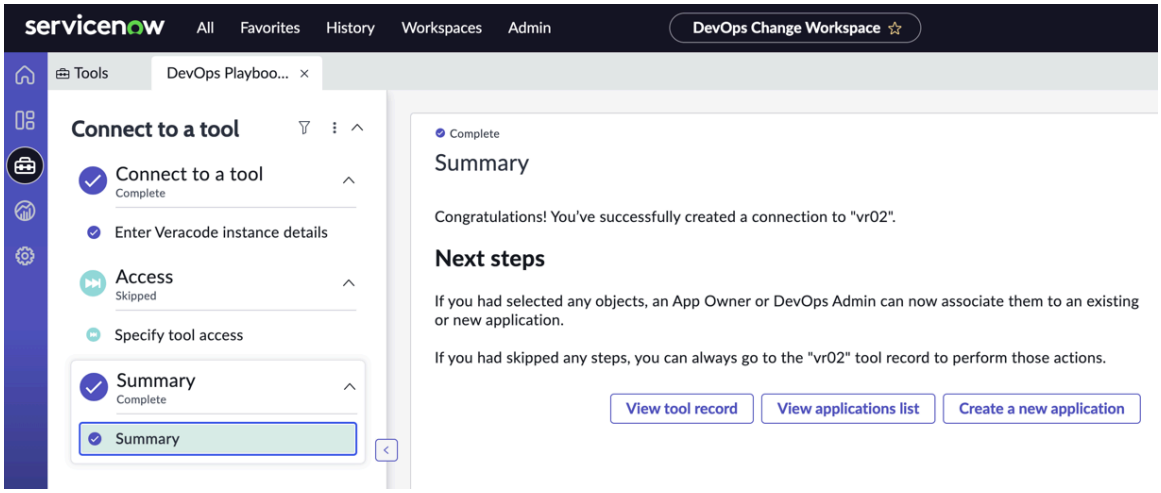
For information on configuring the Veracode scans on your pipeline, see Configure Veracode scans on your pipeline

8. Mark the activity as complete.
9. From the **Summary** page, select **View tool record** to review the details of the connected instance.




## What to do next

Configure Veracode scans on your pipeline

### Onboard Veracode to DevOps Change Velocity - Service Catalog

Connect your Veracode instance using the ServiceNow Service Catalog.

## Before you begin

Role required: sn_devops.admin or sn_devops.tool_owner

## Procedure

1. Navigate to **All** > **Service Catalog** > **Catalog Definitions** > **Maintain Items** and search for DevOps.

> **Note:**
> You can also access the service catalog from Employee Center or Service portal.

2. From the DevOps catalog items, select and activate **DevOps Tool Onboarding**.
3. After activating, select **DevOps Tool Onboarding** and select **Try it**.
4. In the DevOps Tool Onboarding form, enter the tool details:

| Field | Description |
|---|---|
| Tool name | Name for your Veracode integration. |
| Tool integration | Select Veracode. |
| Tool username/ API ID | API ID of your Veracode instance. |
| Tool password/ Access token / API Key | API key of your Veracode instance. |

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**Note:**
You must have the Results and Upload and scan API roles for your Veracode credentials. For more information, see https://docs.veracode.com/r/c_API_roles_details

5. Select **Order Now**.
   A request is created. When the request is approved, the tool is connected.

### What to do next
Configure Veracode scans on your pipeline

### Onboard Veracode to DevOps Change Velocity - Classic

Connect to your Veracode instance to retrieve scan results.

### Before you begin
Role required: sn_devops.admin or sn_devops.tool_owner

### Procedure
1. Navigate to **All** > **DevOps** > **Tools** > **Create New (legacy)**.
2. In the Create DevOps tool form, enter the tool details:

| Field | Description |
|---|---|
| Tool name | Name for your Veracode integration. |
| Tool integration | Select Veracode. |
| Tool username/ API ID | API ID of your Veracode instance. |
| Tool password/ Access token / API Key | API key of your Veracode instance. |

**Note:**
You must have the Results and Upload and scan API roles for your Veracode credentials. For more information, see https://docs.veracode.com/r/c_API_roles_details

3. Click **Submit** to connect to your Veracode instance.

On successful tool creation, you're taken to the tool record page.

4. If you want to control access to the tool, add the groups that must be given access to the tool in the **Maintained by** field on the **Access** tab.

   The tasks the users in the groups can perform depends on the roles assigned to them.

   - DevOps Tool Owner role: Can view and edit the tool.
   - DevOps App Owner role: Can view the tool and can associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects (such as plans, repositories, and pipelines).
   - DevOps Administrator role: Can edit all tools.
   - Other DevOps roles: Can view the tool.

**Note:**
Only groups containing users with DevOps roles are available for selection in the **Maintained by** field.

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The **All App Owners can view and associate tool objects to applications** option becomes available for selection if you choose to restrict access to the tool. This option enables all users having the DevOps App Owner role to access the tool. If selected, they'll be able to view, associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects.

### What to do next

Configure Veracode scans on your pipeline

### Configure Veracode scans on your pipeline

Configure Veracode scans on your Azure DevOps, Jenkins, GitHub, GitLab, or Harness pipelines.

You can configure Veracode scans on any stage of the pipeline and the scan details are retrieved from the corresponding stage to DevOps Change Velocity. If you are using Azure DevOps or GitHub Actions orchestration tools then you need to add the custom action code in your pipeline always. If you are using Jenkins, and your pipeline already has a Veracode security scan step, you do not have to add the custom action code in your pipeline. Ensure that your Veracode security scan step has waitForScan: true. This is required for the system to retrieve the scan information.

If you want to configure Veracode for the GitLab tool, you can either use the generic Docker container image to add the Veracode security step or perform the steps specified in the Integrate security tools with GitLab topic.

For Harness pipelines, you can configure Veracode scans only through the generic Docker Container Image. For more information, see Implement custom actions for pipelines using generic Docker container image.

1. Navigate to the step in your pipeline and add the custom action.

| | |
|---|---|
| Azure DevOps | **a.** Navigate to your pipeline .yml file.<br>**b.** In the **Tasks** section on the right side, search for the **ServiceNow DevOps Security Results** extension task.<br>**c.** Enter the ServiceNow endpoint.<br>**d.** Enter the Security results attributes as the following.<br>`{ "scanner": "Veracode", "applicationName": "", "buildVersion": "", "securityToolId": "" }`<br>// scanner: Scanning tool and is required e.g. Veracode.<br>// applicationName: Name of your Veracode application and is required. This attribute is applicable only for Veracode. |

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| | |
|---|---|
| | // buildVersion: Veracode Scan name / build version and is optional. This attribute is applicable only for Veracode.<br><br>// securityToolId: Security tool onboarded in ServiceNow (sys_id of the onboarded security tool) and is optional.<br><br>**e.** Select **Add** to add the custom action code to your pipeline. |
| Jenkins | **a.** Navigate to the Pipeline Syntax from a configured pipeline.<br><br>**b.** Select the **snDevOpsSecurityResult** step from the **Sample Step** list, and update the values for the security scan attributes in the step.<br><br>**c.** Select **Generate Pipeline Script** to create a snippet. You can copy and paste the snippet into the pipeline.<br><br>`snDevOpsSecurityResult { securityResultAttributes:{"scanner":"Veracode", "applicationName": "", "buildVersion": "", "securityToolId": ""}}`<br><br>// scanner: Scanning tool and is required e.g. Veracode.<br><br>// applicationName: Name of your Veracode application and is required. This attribute is applicable only for Veracode.<br><br>// buildVersion: Veracode Scan name / build version and is optional. This attribute is applicable only for Veracode.<br><br>// securityToolId: Security tool onboarded in ServiceNow (sys_id of the onboarded security tool) and is optional. |
| GitHub Actions | **a.** Navigate to your workflow .yml file.<br><br>**b.** In the **Marketplace** section on the right side, search for the **ServiceNow DevOps Security Results** custom action.<br><br>**c.** Add the following snippet into your .yml file.<br><br>`SecurityScanResults: needs: build runs-on: ubuntu-latest name: Servicenow Security Scan Results` |

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```
    steps:
      - name: ServiceNow
 DevOps Security Results
        uses:
 ServiceNow/servicenow-devop
s-security-result@v1.39.0
        with:

 devops-integration-user-na
me:
 ${{ secrets.SN_DEVOPS_USE
R }}

 devops-integration-user-pas
sword:
 ${{ secrets.SN_DEVOPS_PASSW
ORD }}
            instance-url:
 ${{ secrets.SN_INSTANCE_UR
L }}
            tool-id:
 ${{ secrets.SN_ORCHESTRATIO
N_TOOL_ID }}
            context-github:
 ${{ toJSON(github) }}
            job-name:
 'Servicenow Security Scan
 Results'

 security-result-attributes:
 '{ "scanner": "Veracode",
 "applicationName": "",
 "buildVersion": "",
 "securityToolId": ""}
```

// scanner: Scanning tool and is required e.g. Veracode.

// applicationName: Name of your Veracode application and is required. This attribute is applicable only for Veracode.

// buildVersion: Veracode Scan name / build version and is optional. This attribute is applicable only for Veracode.

// securityToolId: Security tool onboarded in ServiceNow (sys_id of the onboarded security tool) and is optional.

For more information, see GitHub marketplace.

| | |
|---|---|
| Harness | Run the generic Docker Container Image to use the following script. For more information, see Implement custom actions for pipelines using generic Docker container image. |

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```
- stage:
    name: ServiceNow DevOps
 Security Result
    identifier: Security
    description: ""
    type: Custom
    spec:
      execution:
        steps:
          - stepGroup:
              name: Security
              identifier:
 Security
              steps:
                - step:
                    type: Run
                    name:
 ServiceNow DevOps Security
 Result

     identifier:
 ServiceNow_DevOps_Security_R
esult
                    spec:

     connectorRef:
 docker_hub_connector_for_har
ness
                      image:
 servicenowdocker/sndevops:5.
0.0
                      shell:
 Sh

 command: |-

   sndevopscli create
 securityScan -p


 "{"pipelineInfo":{

 "buildNumber":"<+stage.nodeE
xecutionId>",

 "taskExecutionUrl":"<+pipeli
ne.executionUrl>?stage=<+stag
e.nodeExecutionId>",

 "orchestrationPipeline":"<+o
rg.identifier>/<
+project.identifier>/<
+pipeline.name>"
                          },

 "securityResultAttributes":{
```

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```
    "scanner":"Veracode",
    "applicationName":"",
    "buildVersion":"",
    "securityToolId":""
                          }
                        }"

envVariables:

       SNOW_URL:
<+variable.SNOW_URL>

     SNOW_TOOLID:
<+variable.SNOW_TOOLID>

      SNOW_TOKEN:
<+variable.SNOW_TOKEN>
             stepGroupInfra:
               type:
KubernetesDirect
               spec:

  connectorRef:
kubernates_connector
                 namespace:
harness-delegate-ng
   tags: {}
```

2. Run the pipeline to retrieve the security scan results.

### Associate orchestration tool from Veracode tool record and vice-versa

You can associate orchestration tool from the Veracode tool record and associate the Veracode tool record from the orchestration or pipeline record.

#### Before you begin

Role required: sn_devops.admin or sn_devops.tool_owner

#### Procedure

1. Navigate to **Workspaces >DevOps Change Workspace > Tools > Security tools**.
2. From the Security tools list, select the tool with which you want to associate an orchestration tool.
3. In the Security tool record, navigate to the Orchestration tools tab.
4. Select **Associate orchestration tools**.

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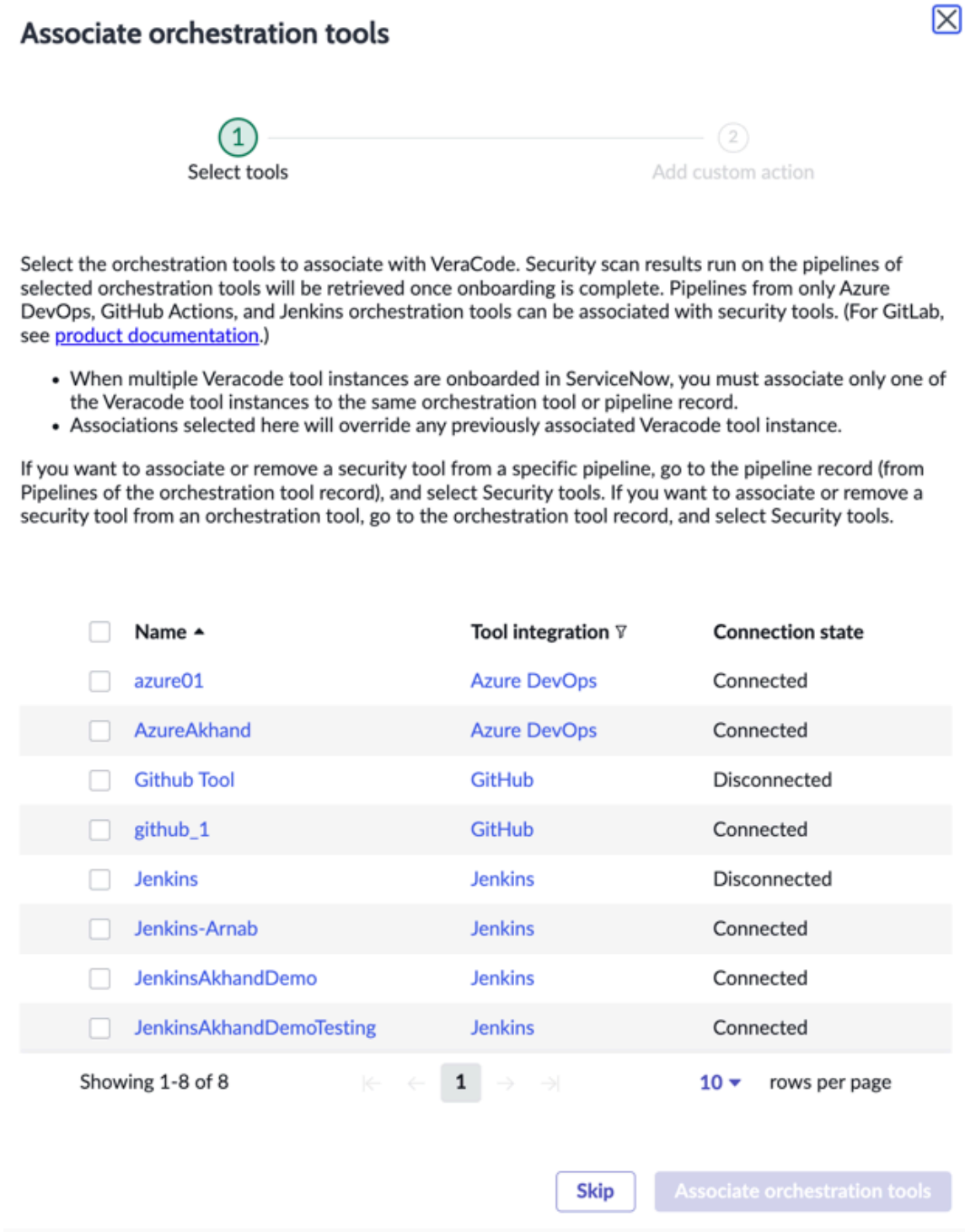
5. In the Select tool dialog box, select the orchestration tools you want to associate with your security tool, and select **Associate orchestration tools**.

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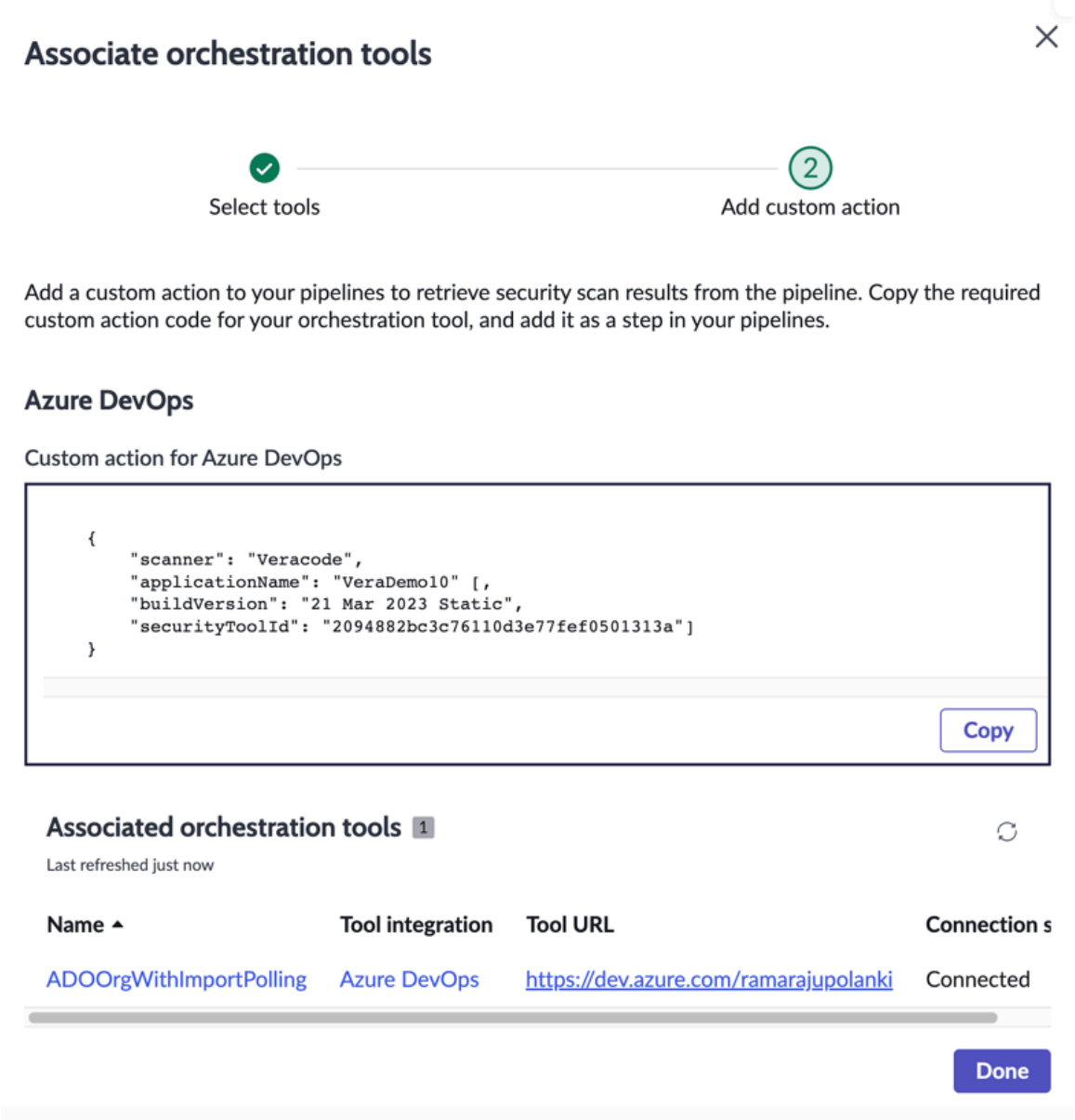
6. In the Add custom action dialog box, copy the required custom action code for your orchestration tool, and add it as a step in your pipelines.




7. Select **Done**.

> **Note:**
> In a similar way, you can associate a security tool instance with an orchestration tool or pipeline record. You can navigate to the orchestration tool or pipeline record, and from the Security tools tab, you can select **Associate security tool**. In the dialog boxes that are displayed, you can select the security tool instances to associate and then copy the custom action to add it in the corresponding pipeline step.

### Additional info - Veracode

Additional information on Veracode such as association of orchestration tool from security tool, security scan results, and change policies based on security summary tables.

### Security scan results

Security scan results display scan details from security scans configured on your GitHub Actions, Jenkins, Azure DevOps, GitLab, or Harness pipelines.

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You can configure security scans in your GitHub Actions, Jenkins, Azure DevOps, GitLab, and Harness pipelines to retrieve the scan results in DevOps Change Velocity. Security inbound events will be created in ServiceNow from the corresponding pipeline run that are then processed to store the scan results. You can view the scan results for each scan that was part of your build or release pipeline executions.

**Note:**
If you want to configure Veracode for the GitLab tool, you can either use the generic Docker container image to add the Veracode security step or perform the steps specified in the Integrate security tools with GitLab topic.

The retrieved scan summaries are stored in the following tables:

**Application Vulnerability Scan Summary (sn_vul_app_vul_scan_summary)**

| Column name | Description |
|---|---|
| Source | Source application vulnerability scanner for this application record. |
| Detected Flaw Count | Total number of new detected flaws in the scan. |
| Last scan date | Date of the most recent scan. |
| Last scan rating | Rating assigned by the scanner based on the detected items of the most recent scans. |
| Last static scan date | Date of the most recent static scan. |
| Last static scan rating | Rating assigned by the scanner based on the detected items of the most recent static scan. |
| Last dynamic scan date | Date of the most recent dynamic scan. |
| Last dynamic scan rating | Rating assigned by the scanner based on the detected items of the most recent dynamic scan. |
| Last interactive scan date | Date of the most recent interactive scan. |
| Last interactive scan rating | Rating assigned by the scanner based on the detected items of the most recent interactive scan. |

**Application Vulnerability Scan Summary Details (sn_vul_app_vul_scan_summary_details)**

| Column name | Description |
|---|---|
| Category name | Name of the vulnerability category. |
| Severity | Severity of the flaws in the scan report. |
| Count | Number of flaws in the category for a severity. |

### Change policies based on security summary tables

You can use the security conditions that are available in the base system or customize them based on your requirement.

The vulnerability severity conditions are present in the **Fetch Risk Sonar Security and Incident data** action in the **DevOps Gather Change**

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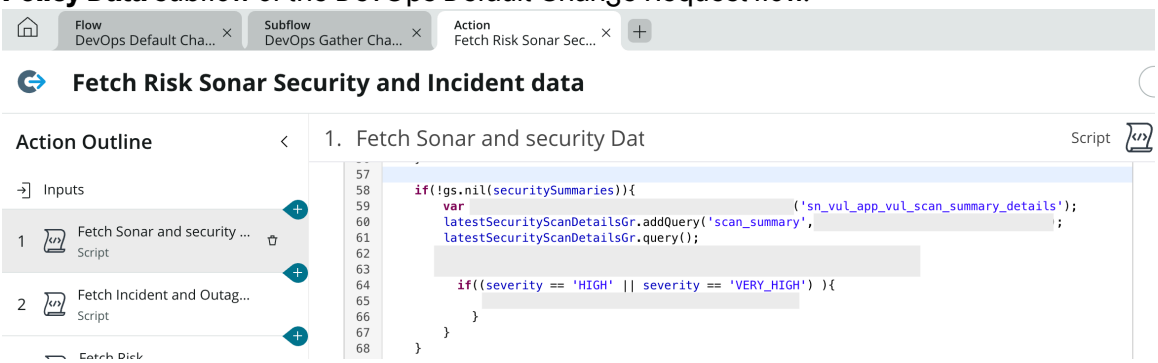
**Policy Data** subflow of the DevOps Default Change Request flow.




If the severity condition is classified as **HIGH** or **VERY HIGH** from Veracode or Checkmarx, then the change request is automatically rejected.

If you are an upgrading customer and you want to customize the conditions with any additional security data or change the existing conditions, you must update the script in the **Fetch Risk Sonar Security and Incident data** action in the change flow. Ensure that you are referring to the *Application Vulnerability Scan Summary Details (sn_vul_app_vul_scan_summary_details)* table in the script when you customize. For more information, see Security scan results.

## Checkmarx integration with DevOps Change Velocity

Connect to your Checkmarx instance that is integrated with your CI/CD pipelines to retrieve security scan results. This helps you determine how vulnerable your code is.

## Checkmarx integration overview

Checkmarx scans that are configured on GitHub Actions, Jenkins, Azure DevOps, GitLab, and Harness pipelines are supported in DevOps Change Velocity.

Two Checkmarx tools can be integrated with DevOps Change Velocity, which are Checkmarx One and Checkmarx SAST. For more information, see Checkmarx One and Checkmarx SAST documentation.

Ensure that your Checkmarx SAST user has a role that has permissions to read **Project** and **Scan Results** to get summary details. For more information, see Checkmarx documentation. Ensure that your Checkmarx One user has the **create-scan** and **manage-project** roles to access Scan summary details. For more information, see Checkmarx documentation.

**Note:**
If you are integrating with Checkmarx One, you can retrieve only Static Application Security Testing (SAST) scans but not Software Composition Analysis (SCA) scans.

You can configure Checkmarx scans on any stage of the pipeline and the scan details are retrieved from the corresponding stage to DevOps Change Velocity. If you're using Azure DevOps or GitHub Actions orchestration tools, then you must add the custom action code in your pipeline always. If you're using Jenkins, and your pipeline already has a Checkmarx One security scan (checkmarxASTScanner) step, you don't have to add the custom action code in your pipeline. For Checkmarx SAST, the custom action code must be added in your pipeline even if it has the security scan step (checkmarxASTScanner).

If you want to configure Checkmarx for the GitLab tool, you can either use the generic Docker container image to add the Checkmarx security step or perform the steps specified in the Integrate security tools with GitLab topic.

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For Harness pipelines, you can configure Checkmarx scans only through the generic Docker Container Image. For more information, see Implement custom actions for pipelines using generic Docker container image.

You can view the security scan results either in the related list of a Change Request, or the Task Execution of the pipeline, or in the Pipeline UI in your ServiceNow instance. You can also use security results in defining change policies and conditions for change automation.

## Get started

You must install the DevOps Vulnerability Integrations (sn_devops_vul_ints) and Checkmarx One Vulnerability Integration (x_chec3_chexone) or Checkmarx CxSAST Vulnerability Integration (x_chec3_cxsast) plugins before connecting your Checkmarx instance to ServiceNow. For more information on activating a plugin, see Opt in to the ServiceNow Store products.

For more information on the scan results captured in ServiceNow, see Security scan results.

Use one of the following options to onboard Checkmarx. For a guided experience, use the workspace to onboard a tool. Alternatively, you can use the Service Catalog or Classic experience.

### Onboard Checkmarx to DevOps Change Velocity - Workspace

Connect to your Checkmarx instance using the DevOps Change Workspace playbook.

#### Before you begin

Complete the tasks specified in the Getting started with DevOps Change Velocity topic.

Role required: sn_devops.admin or sn_devops.tool_owner

#### About this task

Checkmarx has two types of tools - Checkmarx SAST and Checkmarx One.

#### Procedure

1. Navigate to **Workspaces** > **DevOps Change Workspace** and use one of the following options to open the Playbook to onboard Checkmarx.

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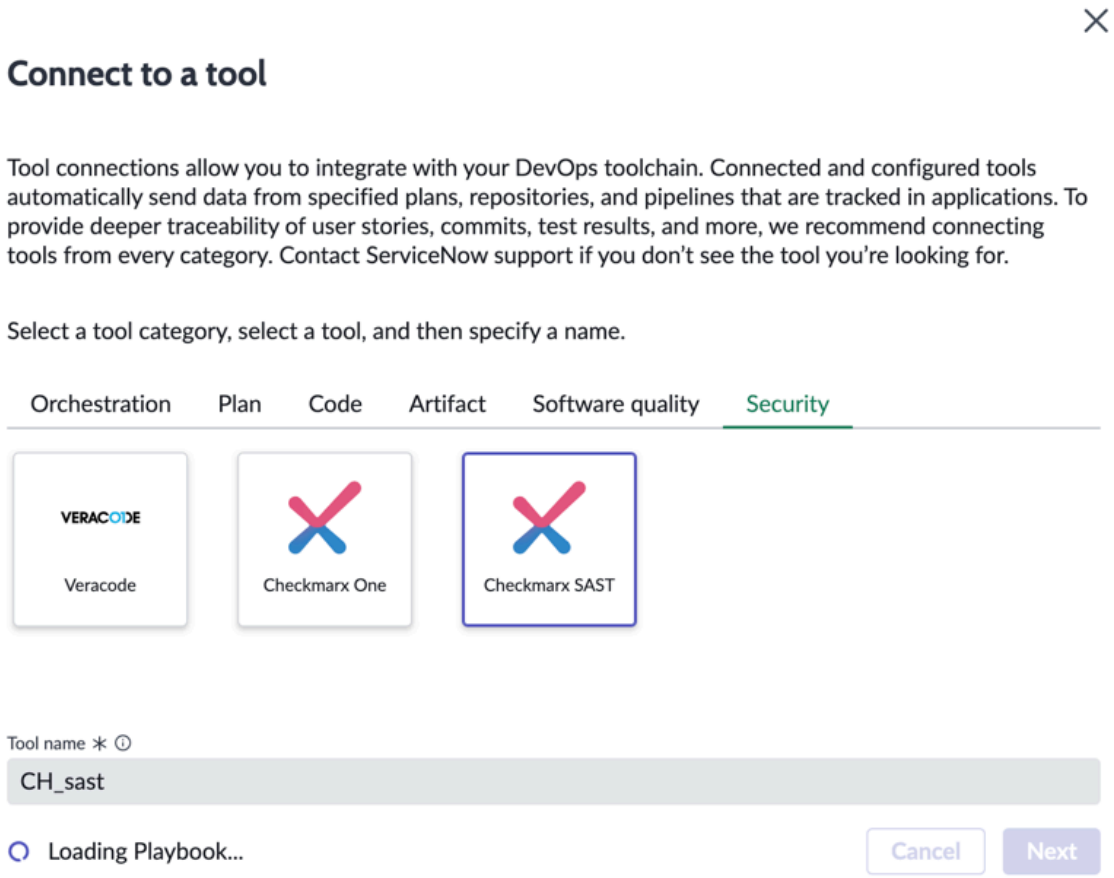
2. Enter a name to identify your tool and select **Next**.




3. On the instance details playbook activity section, enter the following credentials based on whether you are connecting to Checkmarx One or Checkmarx SAST.

   Ensure that your Checkmarx SAST user has a role that has permissions to read **Project** and **Scan Results** to get summary details. For more information, see Checkmarx documentation. Ensure that your Checkmarx One user has the **create-scan** and **manage-project** roles to access Scan summary details. For more information, see Checkmarx documentation.

4. Select **Connect** and review the details of the successfully connected Checkmarx instance.
5. Specify the access for the tool.
   a. If you want to control access to the tool, add the groups that must be given access to the tool in the **Maintained by** field.

      The tasks these users in the groups can perform depends on the role assigned to them.

      - DevOps Tool Owner role: Can view and edit the tool.
      - DevOps App Owner role: Can view the tool and can associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects (such as plans, repositories, and pipelines).
      - DevOps Administrator role: Can edit all tools.
      - Other DevOps roles: Can view the tool.

      **Note:**
      If you don't select a group and skip this step, all users with the DevOps Tool Owner role will be able to edit the tool.

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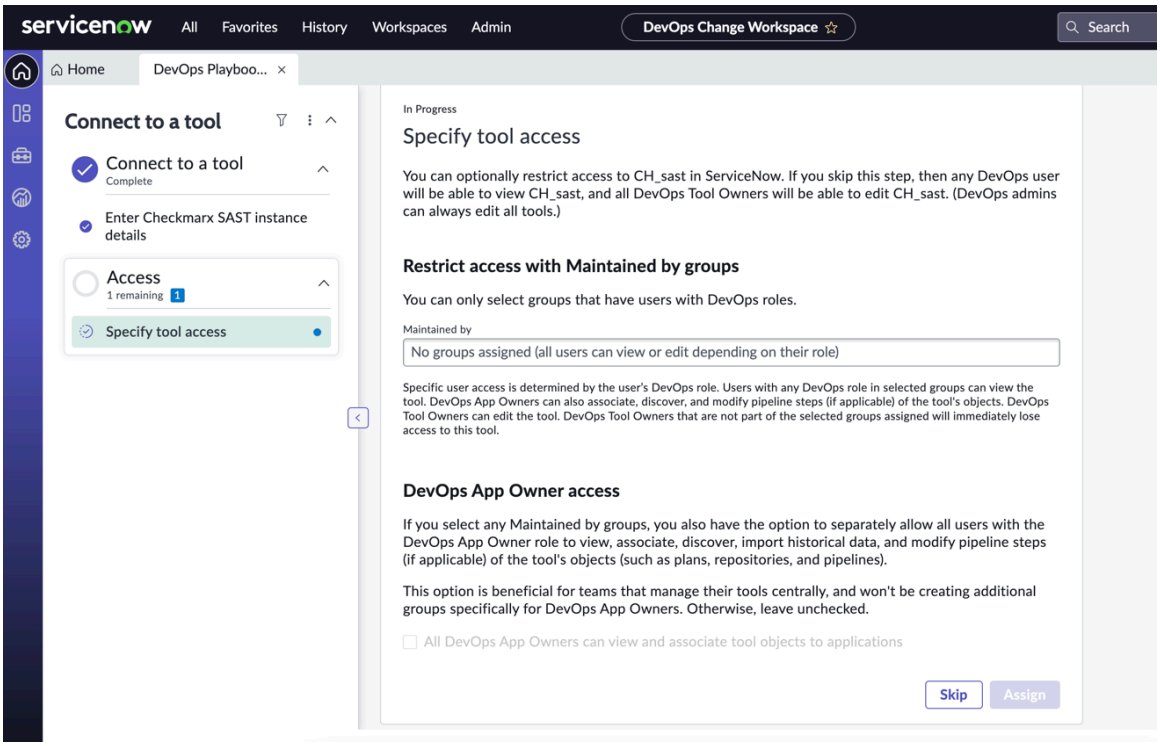
**b.** If you choose to control access to the tool, the **All App Owners can view and associate tool objects to applications** option becomes available for selection.

This option enables all users having the DevOps App Owner role to access the tool. If selected, they'll be able to view, associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects.

**c.** Select **Assign**.




**6.** If this isn't the first instance of the security tool you're onboarding, select the orchestration tool to associate with your security tool instance from the Associate orchestration tool instances playbook activity.

This activity isn't displayed if this is the first security tool instance you're onboarding.

> **Note:**
> This playbook activity is required only if you're onboarding more than one security tool instances. When multiple security tool instances are onboarded in ServiceNow, you must associate only one of the security tool instances to the same orchestration tool or pipeline record.

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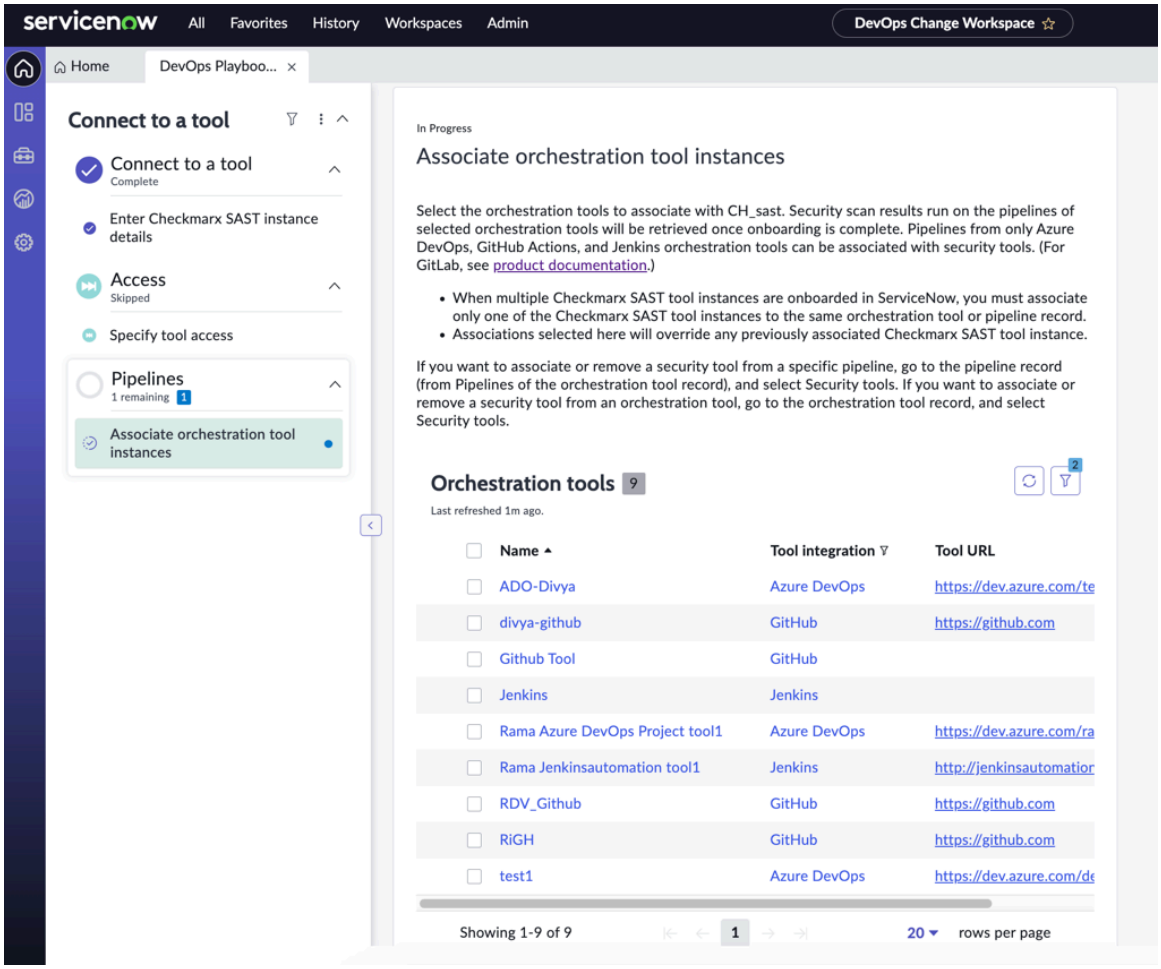


7. From the Add custom action to pipelines playbook activity section, copy the required custom action code and add it as a step in your pipeline.
   - If only one security instance is onboarded in ServiceNow, the pipelines will be automatically associated with Checkmarx when the pipeline is run.
   - If this is the first security tool instance you're onboarding, the custom action codes for the orchestration tool that you've onboarded in ServiceNow will be available to copy.
     - If you are using Azure DevOps or GitHub Actions orchestration tools, then you must add the custom action code in your pipeline always.
     - You can configure Checkmarx scans on any stage of the pipeline and the scan details are retrieved from the corresponding stage to DevOps Change Velocity. If you're using Azure DevOps or GitHub Actions orchestration tools, then you must add the custom action code in your pipeline always. If you're using Jenkins, and your pipeline already has a Checkmarx One security scan (checkmarxASTScanner) step, you don't have to add the custom action code in your pipeline. For Checkmarx SAST, the custom action code must be added in your pipeline even if it has the security scan step (checkmarxASTScanner).
   - If this is the not the first security tool instance you're onboarding, the respective custom action codes for orchestration tools that you've selected in step 6 will be available to copy. If you're using Jenkins, and your pipeline already has a Checkmarx One security scan (checkmarxASTScanner) step, you don't have to add the custom action code in your pipeline.
   - If you want to configure Checkmarx for the GitLab tool, you can either use the generic Docker container image to add the Checkmarx security step or perform the steps specified in the Integrate security tools with GitLab topic.

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- For Harness pipelines, you can configure Checkmarx scans only through the generic Docker Container Image. For more information, see Implement custom actions for pipelines using generic Docker container image
- Alternatively, you can associate pipeline with security tool instance by adding security tool ID to the custom action code. This will override any previously associated security tool instance.

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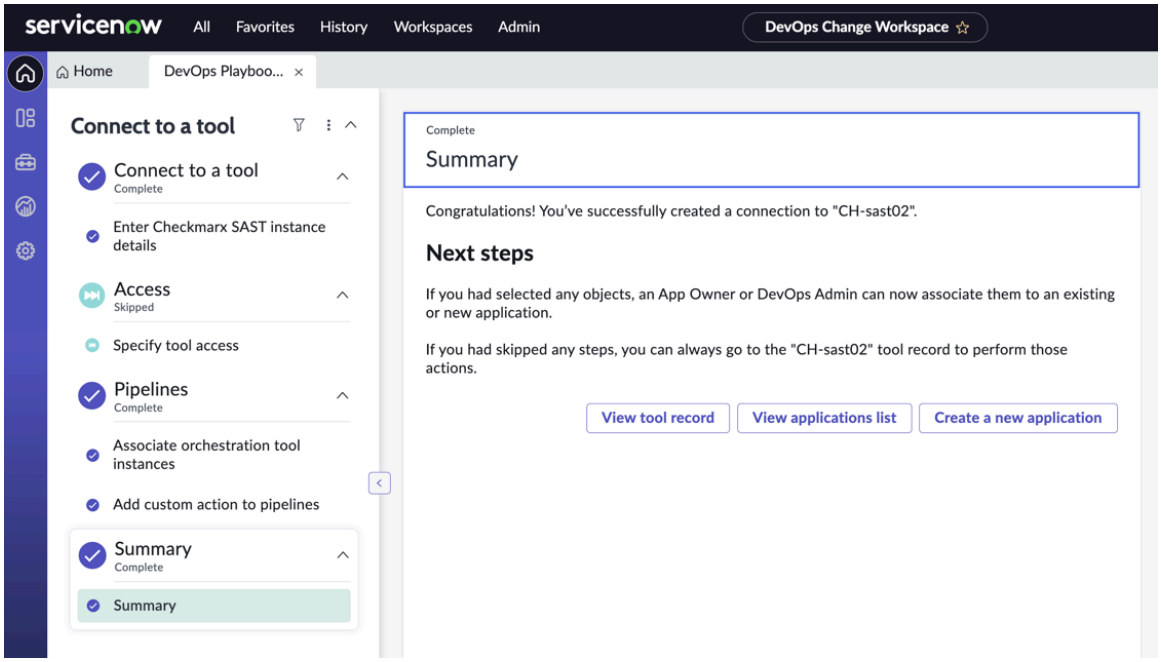
8. Mark the activity as complete.
9. From the **Summary** page, select **View tool record** to review the details of the connected instance.




## What to do next

Configure Checkmarx scans on your pipeline

### Onboard Checkmarx to DevOps Change Velocity - Service Catalog

Connect your Checkmarx instance using the ServiceNow Service Catalog.

## Before you begin

Role required: sn_devops.admin or sn_devops.tool_owner

## Procedure

1. Navigate to **All** > **Service Catalog** > **Catalog Definitions** > **Maintain Items** and search for DevOps.

> **Note:**
> You can also access the service catalog from Employee Center or Service portal.

2. From the DevOps catalog items, select and activate **DevOps Tool Onboarding**.
3. After activating, select **DevOps Tool Onboarding** and select **Try it**.
4. In the DevOps Tool Onboarding form, enter the tool details based on whether you are onboarding Checkmarx SAST or Checkmarx One.

### Checkmarx SAST

| Field | Description |
|---|---|
| Tool name | Name for your Checkmarx integration. |
| Tool integration | Checkmarx SAST. |
| Server URL | Base URL of your Checkmarx One intance. |

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| Field | Description |
|---|---|
| Tool username/ API ID | API ID of your Checkmarx instance. |
| Tool password/ Access token / API Key | API key of your Checkmarx instance. |
| MID server | MID server associated with the Checkmarx One instance. |

#### Checkmarx One

| Field | Description |
|---|---|
| Tool name | Name for your Checkmarx integration. |
| Tool integration | Checkmarx One. |
| CheckmarxOne Access Control Base URL | Access Control Base URL of your Checkmarx One instance. |
| CheckmarxOne API Base URL. | API Base URL of your Checkmarx One instance. |
| Tenant | Name of your Checkmarx One tenant account. |
| Client Id | Name you used to store your Checkmarx Client ID in your repository. |
| Client Secret | Name you used to store your Checkmarx Secret in your repository. |

Ensure that your Checkmarx SAST user has a role that has permissions to read **Project** and **Scan Results** to get summary details. For more information, see Checkmarx documentation. Ensure that your Checkmarx One user has the **create-scan** and **manage-project** roles to access Scan summary details. For more information, see Checkmarx documentation.

5. Select **Order Now**.
   A request is created. When the request is approved, the tool is connected.

### What to do next
Configure Checkmarx scans on your pipeline

## Onboard Checkmarx to DevOps Change Velocity - Classic

Connect to your Checkmarx instance to retrieve scan results.

### Before you begin
Role required: sn_devops.admin or sn_devops.tool_owner

### Procedure

1. Navigate to **All** > **DevOps** > **Tools** > **Create New (legacy)**.
2. In the Create DevOps tool form, enter the tool details based on whether you are onboarding Checkmarx SAST or Checkmarx One.

#### Checkmarx SAST

| Field | Description |
|---|---|
| Tool name | Name for your Checkmarx integration. |

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| Field | Description |
|---|---|
| Tool integration | Checkmarx SAST. |
| Server URL | Base URL of your Checkmarx One intance. |
| Tool username/ API ID | API ID of your Checkmarx instance. |
| Tool password/ Access token / API Key | API key of your Checkmarx instance. |
| MID server | MID server associated with the Checkmarx One instance. |

### Checkmarx One

| Field | Description |
|---|---|
| Tool name | Name for your Checkmarx integration. |
| Tool integration | Checkmarx One. |
| CheckmarxOne Access Control Base URL | Access Control Base URL of your Checkmarx One instance. |
| CheckmarxOne API Base URL. | API Base URL of your Checkmarx One instance. |
| Tenant | Name of your Checkmarx One tenant account. |
| Client Id | Name you used to store your Checkmarx Client ID in your repository. |
| Client Secret | Name you used to store your Checkmarx Secret in your repository. |

Ensure that your Checkmarx SAST user has a role that has permissions to read **Project** and **Scan Results** to get summary details. For more information, see Checkmarx documentation. Ensure that your Checkmarx One user has the **create-scan** and **manage-project** roles to access Scan summary details. For more information, see Checkmarx documentation.

3. Click **Submit** to connect to your Checkmarx instance.

On successful tool creation, you're taken to the tool record page.

4. If you want to control access to the tool, add the groups that must be given access to the tool in the **Maintained by** field on the **Access** tab.

   The tasks the users in the groups can perform depends on the roles assigned to them.

   - DevOps Tool Owner role: Can view and edit the tool.
   - DevOps App Owner role: Can view the tool and can associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects (such as plans, repositories, and pipelines).
   - DevOps Administrator role: Can edit all tools.
   - Other DevOps roles: Can view the tool.

   **Note:**
   Only groups containing users with DevOps roles are available for selection in the **Maintained by** field.

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The **All App Owners can view and associate tool objects to applications** option becomes available for selection if you choose to restrict access to the tool. This option enables all users having the DevOps App Owner role to access the tool. If selected, they'll be able to view, associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects.

## What to do next

Configure Checkmarx scans on your pipeline

### Configure Checkmarx scans on your pipeline

Configure Checkmarx scans on your Azure DevOps, Jenkins, GitHub, GitLab, or Harness pipelines.

You can configure Checkmarx scans on any stage of the pipeline and the scan details are retrieved from the corresponding stage to DevOps Change Velocity. If you're using Azure DevOps or GitHub Actions orchestration tools, then you must add the custom action code in your pipeline always. If you're using Jenkins, and your pipeline already has a Checkmarx One security scan (checkmarxASTScanner) step, you don't have to add the custom action code in your pipeline. For Checkmarx SAST, the custom action code must be added in your pipeline even if it has the security scan step (checkmarxASTScanner).

If you want to configure Checkmarx for the GitLab tool, you can either use the generic Docker container image to add the Checkmarx security step or perform the steps specified in the Integrate security tools with GitLab topic.

For Harness pipelines, you can configure Checkmarx scans only through the generic Docker Container Image. For more information, see Implement custom actions for pipelines using generic Docker container image.

1. Navigate to the step in your pipeline and add the custom action.

| | |
|---|---|
| Azure DevOps | **a.** Navigate to your pipeline .yml file.<br>**b.** In the **Tasks** section on the right side, search for the **ServiceNow DevOps Security Results** extension task.<br>**c.** Enter the ServiceNow endpoint.<br>**d.** Enter the Security results attributes as the following.<br>▪ Checkmarx SAST<br>`- task: ServiceNow-DevOps-Build-Security-Results@1`<br>`inputs:`<br>`connectedServiceName: "" # ServiceNow DevOps Change Velocity Service Connection`<br>`securityResultAttributes: \|` |

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```
        {"scanner":
"Checkmarx SAST",
 "projectId": "",
"securityToolId": ""}
     # scanner: Scanning
tool and is required e.g.
Checkmarx SAST.
     # projectId:
Id of your Checkmarx
SAST project and is
required. This attribute
is applicable only for
Checkmarx SAST.
     # securityToolId:
Security tool onboarded
in ServiceNow (sys_id of
the onboarded security
tool) and is optional.
```

- Checkmarx One

```
- task:
 ServiceNow-DevOps-Build-S
ecurity-Results@1
    inputs:

 connectedServiceName:
 "" # ServiceNow DevOps
 Change Velocity Service
 Connection

 securityResultAttributes:
 |
        {"scanner":
 "Checkmarx One",
 "projectName":
 "", "projectId":
 "", "scanId": "",
 "securityToolId": ""}
     # scanner: Scanning
 tool and is required e.g.
 Checkmarx One.
     # projectName:
 Name of your Checkmarx
 One project and is
 required. This attribute
 is applicable only for
 Checkmarx One.
     # projectId: Id
 of your Checkmarx One
 project and can be used
 instead of projectName
 field. This attribute
 is applicable only for
 Checkmarx One.
     # scanId: Checkmarx
 One scan id and is
```

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```
optional. This attribute
is applicable only for
Checkmarx One.
     # securityToolId:
Security tool onboarded
in ServiceNow (sys_id of
the onboarded security
tool) and is optional.
```

**e.** Select **Add** to add the custom action code to your pipeline.

Jenkins

**a.** Navigate to the Pipeline Syntax from a configured pipeline.

**b.** Select the **snDevOpsSecurityResult** step from the **Sample Step** list, and update the values for the security scan attributes in the step.

**c.** Select **Generate Pipeline Script** to create a snippet. You can copy and paste the snippet into the pipeline.

- Checkmarx SAST

```
snDevOpsSecurityResult
 securityResultAttributes:
 '{"scanner": "Checkmarx
 SAST", "projectId": "",
 "securityToolId": ""}'
// scanner: Scanning tool
 and is required e.g.
 Checkmarx SAST.
// projectId: Id of your
 Checkmarx SAST project
 and is required. This
 attribute is applicable
 only for Checkmarx SAST.
// securityToolId:
 Security tool onboarded
 in ServiceNow (sys_id of
 the onboarded security
 tool) and is optional.
```

- Checkmarx One

```
snDevOpsSecurityResult
 securityResultAttributes:
 '{"scanner": "Checkmarx
 One", "projectName":
 "", "projectId":
 "", "scanId": "",
 "securityToolId": ""}'
// scanner: Scanning tool
 and is required e.g.
 Checkmarx One.
// projectName/projectId:
 Name/Id of your Checkmarx
```

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```
 One project and is
 required. This attribute
 is applicable only for
 Checkmarx One.
// scanId: Checkmarx
 One scan id and is
 optional. This attribute
 is applicable only for
 Checkmarx One.
// securityToolId:
 Security tool onboarded
 in ServiceNow (sys_id of
 the onboarded security
 tool) and is optional.
```

GitHub Actions

**a.** Navigate to your workflow .yml file.

**b.** In the **Marketplace** section on the right side, search for the **ServiceNow DevOps Security Results** custom action.

**c.** Add the following snippet into your .yml file.

- Checkmarx SAST

```
ServiceNowSecurityScanResu
lts:
    # jobs that must
 complete successfully
 before this job will run
    needs: build
    # type of machine to
 run the job on
    runs-on: ubuntu-latest
    name: ServiceNow
 Security Scan Results
    steps:
      - name: ServiceNow
 DevOps Security Results
        uses:
 ServiceNow/servicenow-dev
ops-security-result@v3.0.0
        with:
            # Devops
 Integration User Name

 devops-integration-user-n
ame:
 ${{ secrets.SN_DEVOPS_USE
R }}
            # Devops
 Integration User Password

 devops-integration-user-p
assword:
 ${{ secrets.SN_DEVOPS_PAS
SWORD }}
            # ServiceNow
 Instance URL
```

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```
            instance-url:
 ${{ secrets.SN_INSTANCE_U
RL }}
            #
 Orchestration Tool Id
            tool-id:
 ${{ secrets.SN_ORCHESTRAT
ION_TOOL_ID }}
            # GitHub
 Context

 context-github:
 ${{ toJSON(github) }}
            # Display Name
 of the Job
            job-name:
 'ServiceNow Security Scan
 Results'

 security-result-attribut
es: '{"scanner":
 "Checkmarx SAST",
 "projectId": "",
 "securityToolId": ""}'
            # scanner:
 Scanning tool and is
 required e.g. Checkmarx
 SAST.
            # projectId:
 Id of your Checkmarx
 SAST project and is
 required. This attribute
 is applicable only for
 Checkmarx SAST.
            #
 securityToolId: Security
 tool onboarded in
 ServiceNow (sys_id of the
 onboarded security tool)
 and is optional.
```

- Checkmarx One

```
ServiceNowSecurityScanResu
lts:
    # jobs that must
 complete successfully
 before this job will run
    needs: build
    # type of machine to
 run the job on
    runs-on: ubuntu-latest
    name: ServiceNow
 Security Scan Results
    steps:
      - name: ServiceNow
 DevOps Security Results
```

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```
        uses:
 ServiceNow/servicenow-dev
ops-security-result@v3.0.0
        with:
            # Devops
 Integration User Name

 devops-integration-user-n
ame:
 ${{ secrets.SN_DEVOPS_USE
R }}
            # Devops
 Integration User Password

 devops-integration-user-p
assword:
 ${{ secrets.SN_DEVOPS_PAS
SWORD }}
            # ServiceNow
 Instance URL
            instance-url:
 ${{ secrets.SN_INSTANCE_U
RL }}
            #
 Orchestration Tool Id
            tool-id:
 ${{ secrets.SN_ORCHESTRAT
ION_TOOL_ID }}
            # GitHub
 Context

 context-github:
 ${{ toJSON(github) }}
            # Display Name
 of the Job
            job-name:
 'ServiceNow Security Scan
 Results'

 security-result-attribut
es: '{"scanner":
 "Checkmarx One",
 "projectName":
 "", "projectId":
 "", "scanId": "",
 "securityToolId": ""}'
            # scanner:
 Scanning tool and is
 required e.g. Checkmarx
 One.
            #
 projectName/projectId:
 Name/Id of your Checkmarx
 One project and is
 required. This attribute
 is applicable only for
 Checkmarx One.
```

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```
            # scanId:
Checkmarx One scan id
and is optional. This
attribute is applicable
only for Checkmarx One.
            #
securityToolId: Security
tool onboarded in
ServiceNow (sys_id of the
onboarded security tool)
and is optional.
```

For more information, see GitHub marketplace.

| | |
|---|---|
| Harness | Run the generic Docker Container Image to use the following script. For more information, see Implement custom actions for pipelines using generic Docker container image. |

```
- stage:
    name: ServiceNow DevOps
 Security Result
    identifier: Security
    description: ""
    type: Custom
    spec:
      execution:
        steps:
          - stepGroup:
              name: Security
              identifier:
 Security
              steps:
                - step:
                    type: Run
                    name:
 ServiceNow DevOps Security
 Result

     identifier:
 ServiceNow_DevOps_Security_R
esult
                    spec:

     connectorRef:
 docker_hub_connector_for_har
ness
                      image:
 servicenowdocker/sndevops:5.
0.0
                      shell:
 Sh

 command: |-

   sndevopscli create
 securityScan -p
```

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```
 "{"pipelineInfo":{

 "buildNumber":"<+stage.nodeE
xecutionId>",

 "taskExecutionUrl":"<+pipeli
ne.executionUrl>?stage=<+stag
e.nodeExecutionId>",

 "orchestrationPipeline":"<+o
rg.identifier>/<
+project.identifier>/<
+pipeline.name>"
                          },

 "securityResultAttributes":{
    "scanner":"Veracode",
    "applicationName":"",
    "buildVersion":"",
    "securityToolId":""
                           }
                         }"

 envVariables:

        SNOW_URL:
 <+variable.SNOW_URL>

      SNOW_TOOLID:
 <+variable.SNOW_TOOLID>

       SNOW_TOKEN:
 <+variable.SNOW_TOKEN>
              stepGroupInfra:
                type:
 KubernetesDirect
                spec:

   connectorRef:
 kubernates_connector
                  namespace:
 harness-delegate-ng
    tags: {}
```

2. Run the pipeline to retrieve the security scan results.

### Associate orchestration tool from Checkmarx tool record and vice-versa

You can associate orchestration tool from the Checkmarx tool record and associate the Checkmarx tool record from the orchestration or pipeline record.

**Before you begin**
Role required: sn_devops.admin or sn_devops.tool_owner

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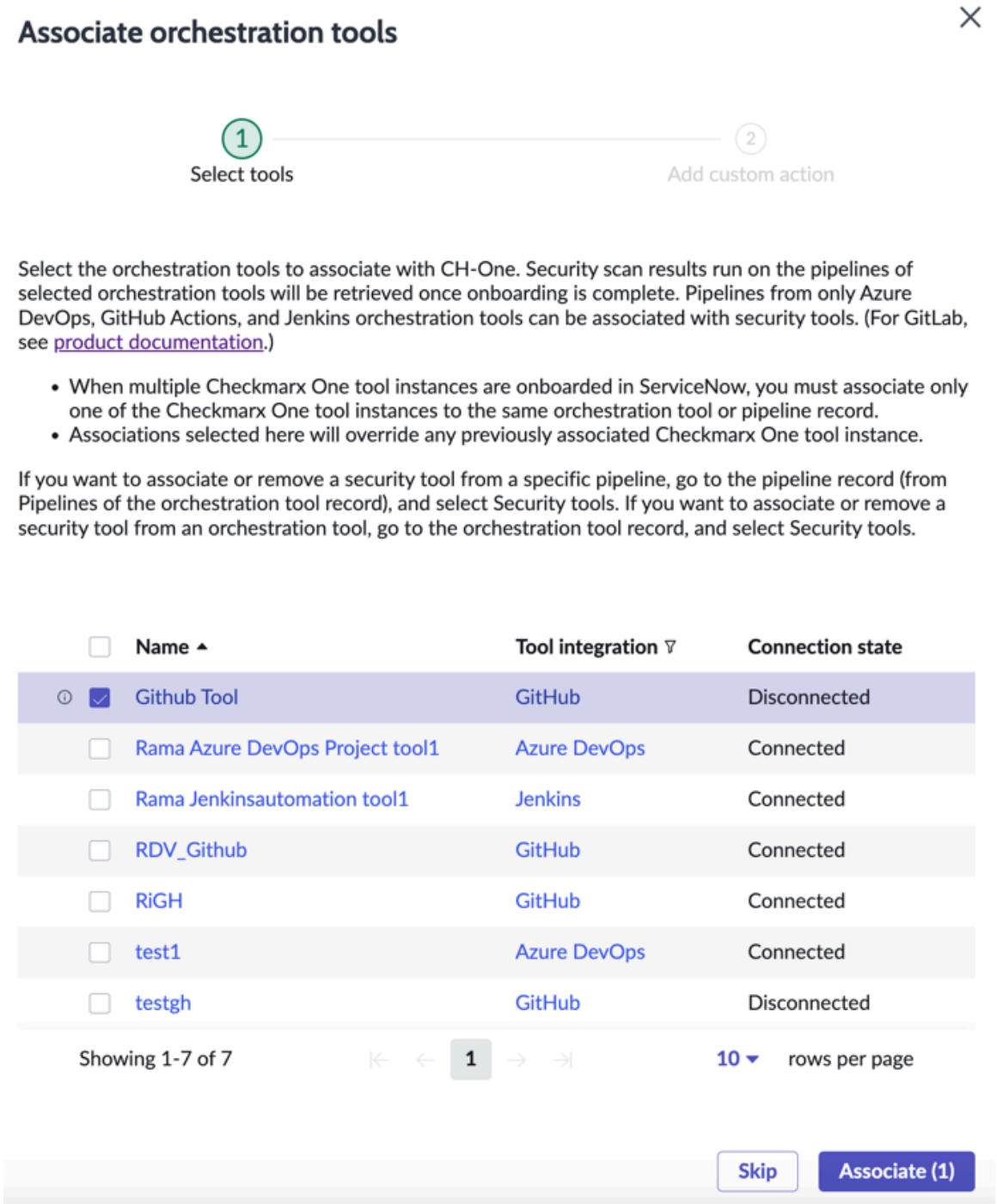
## Procedure

1. Navigate to **Workspaces >DevOps Change Workspace > Tools > Security tools**.
2. From the Security tools list, select the tool with which you want to associate an orchestration tool.
3. In the Security tool record, navigate to the Orchestration tools tab.
4. Select **Associate**.
5. In the Select tool dialog box, select the orchestration tools you want to associate with your security tool, and select **Associate**.

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6. In the Add custom action dialog box, copy the required custom action code for your orchestration tool, and add it as a step in your pipelines.




7. Select **Done**.

> **Note:**
> In a similar way, you can associate a security tool instance with an orchestration tool or pipeline record. You can navigate to the orchestration tool or pipeline record, and from the Security tools tab, you can select **Associate**. In the dialog boxes that are displayed, you can select the security tool instances to associate and then copy the custom action to add it in the corresponding pipeline step.

## Harness integration with DevOps Change Velocity

Connect to your Harness instance to discover pipeline definitions and configure real-time notifications or polling to enable change traceability and automation.

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## Get started

Use the workspace to onboard the Harness tool. Configure webhooks manually in Harness to send pipeline notifications to DevOps Change Velocity.

### Onboard Harness to DevOps Change Velocity - Workspace

Connect to your Harness instance using the DevOps Change Workspace playbook to discover pipelines.

### Before you begin

Complete the tasks specified in the Getting started with DevOps Change Velocity topic.

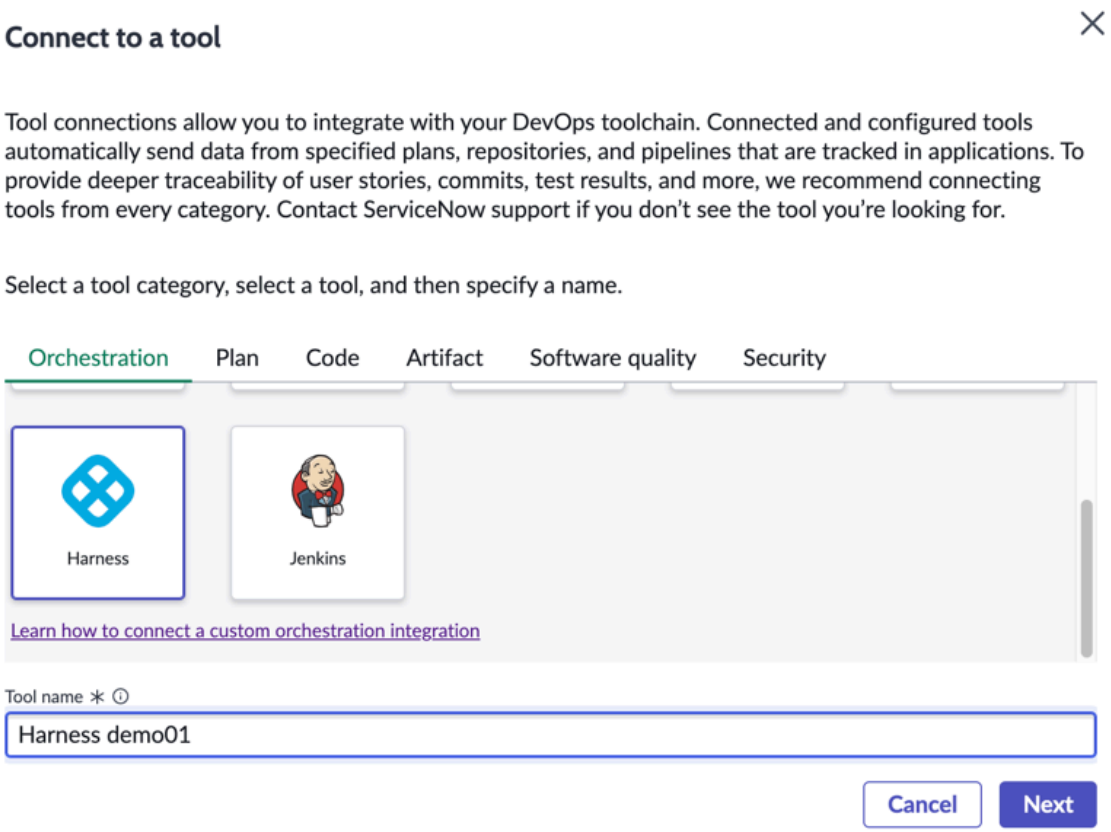
Role required: sn_devops.admin or sn_devops.tool_owner

### Procedure

1. Navigate to **Workspaces** > **DevOps Change Workspace** and use one of the following options to open the Playbook to onboard Harness.

   **Important:**
   If you want to discover and track tool objects like pipelines while connecting to the tool, you must connect your tool from the Application module. The steps for associating tool objects in this procedure are only applicable when you connect your tool from the Application module.

2. In the **Tool name** field, enter a name for the tool.




3. Select **Next**.

   The DevOps playbook opens to help you complete the onboarding tasks.

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4. Enter your Harness instance details.

   a. Enter your password or access token for Harness.

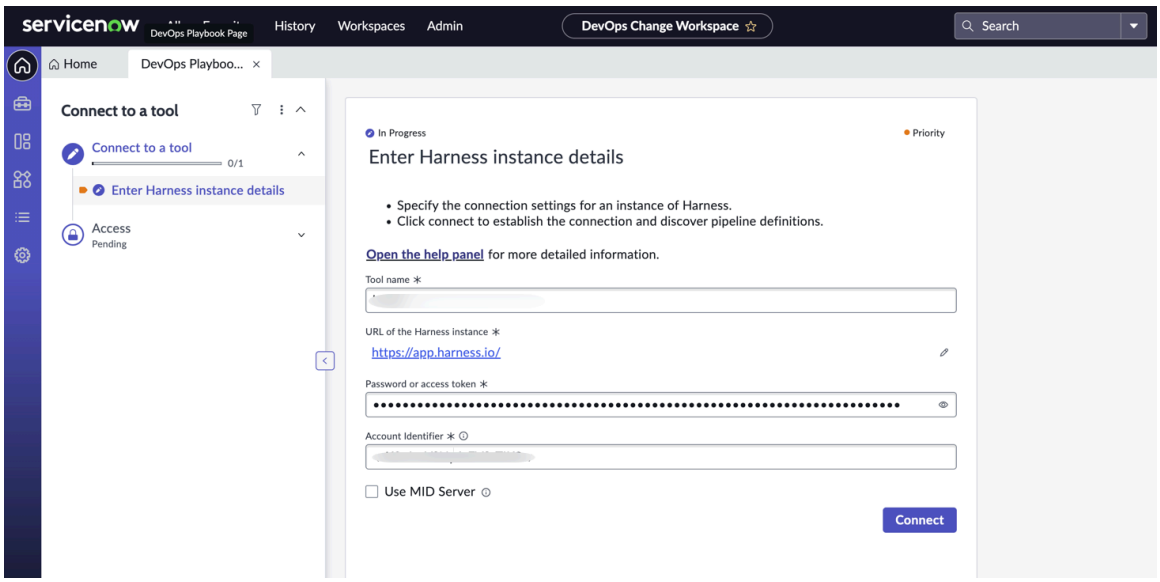
   b. Enter a value in the **Account Identifier** field.

   > **Note:**
   > Account Identifier is the unique identifier for your account in the Harness platform. Copy it from Account Settings of your Harness account.

   c. If your Harness instance is attached to a MID Server, select the **MID Server** option and enter its details.

   For more information about MID server, see MID Server selection

   d. Select **Connect**.




5. Specify the access for the tool.

   a. If you want to control access to the tool, add the groups that must be given access to the tool in the **Maintained by** field.

   The tasks these users in the groups can perform depends on the role assigned to them.

   - DevOps Tool Owner role: Can view and edit the tool.
   - DevOps App Owner role: Can view the tool and can associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects (such as plans, repositories, and pipelines).
   - DevOps Administrator role: Can edit all tools.
   - Other DevOps roles: Can view the tool.

   > **Note:**
   > If you don't select a group and skip this step, all users with the DevOps Tool Owner role will be able to edit the tool.

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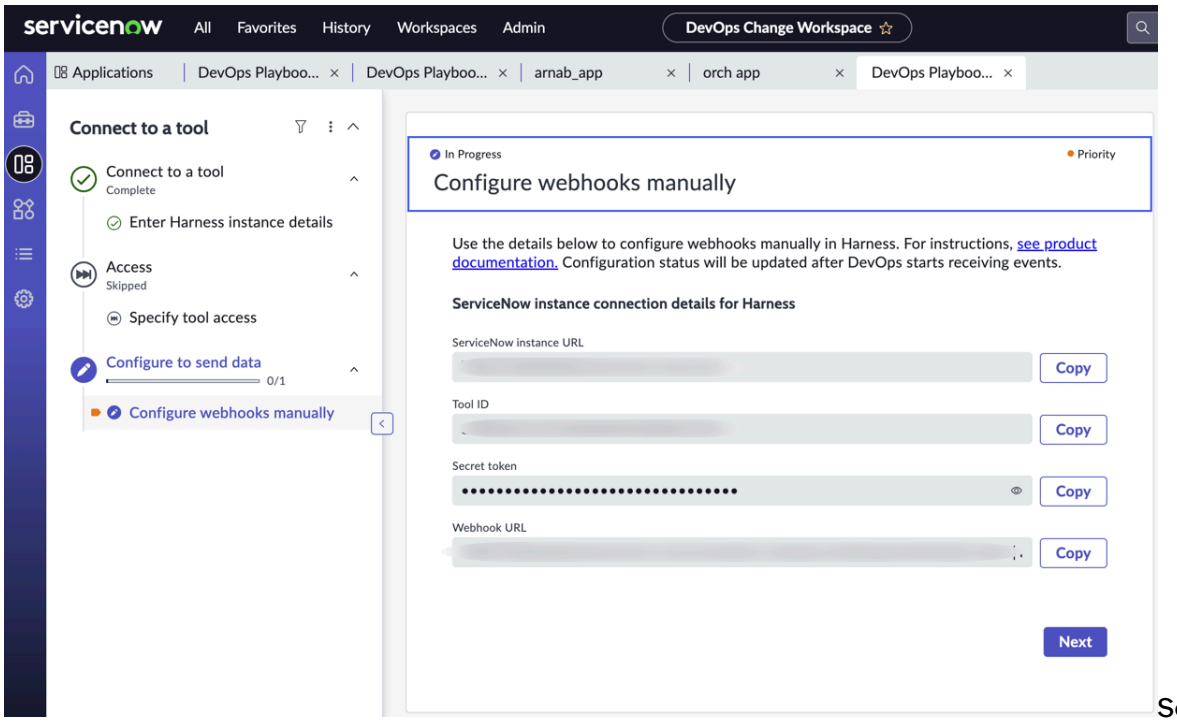
b. If you choose to control access to the tool, the **All App Owners can view and associate tool objects to applications** option becomes available for selection.

   This option enables all users having the DevOps App Owner role to access the tool. If selected, they'll be able to view, associate, discover, import historical data, and modify pipeline steps (if applicable) of the tool's objects.

c. Select **Assign**.

6. In the Configure webhooks manually screen, copy the ServiceNow instance connection details for Harness.




See Configure webhooks in Harness manually for more information.

7. Select the pipelines that you want to track and associate to the application, and select **Associate pipelines**.

   For each selected pipeline, all steps are imported for the last successful execution.

8. **Optional:** In the Assign services to pipeline steps activity, specify **Step type** and **Service** for each pipeline step.

   (Optional) Completing this step as part of tool onboarding enables the DevOps Insights dashboards to show more meaningful data immediately.

9. In the Import historical data step, select the date range in the **Start date** and **End date** fields and select **Import data**.

   **Note:**
   You can import up to 90 days of data.

10. Select **Next**.

11. From the **Summary** page, review the details of the successfully connected Harness tool.

    Select **View tool record** to review the details of the connected instance.

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### Result
You've successfully onboarded your Harness tool to DevOps Change Velocity.

**Note:**
If your tool credential changes, you must also update the credentials in DevOps Change. For more information, see Update third-party tool credentials in DevOps Change Velocity.

## Configure webhooks in Harness manually

Configure webhooks manually in Harness to send pipeline notifications to DevOps Change Velocity.

### Before you begin
Role required:

- sn_devops.admin or sn_devops.tool_owner in DevOps Change Velocity
- Harness admin

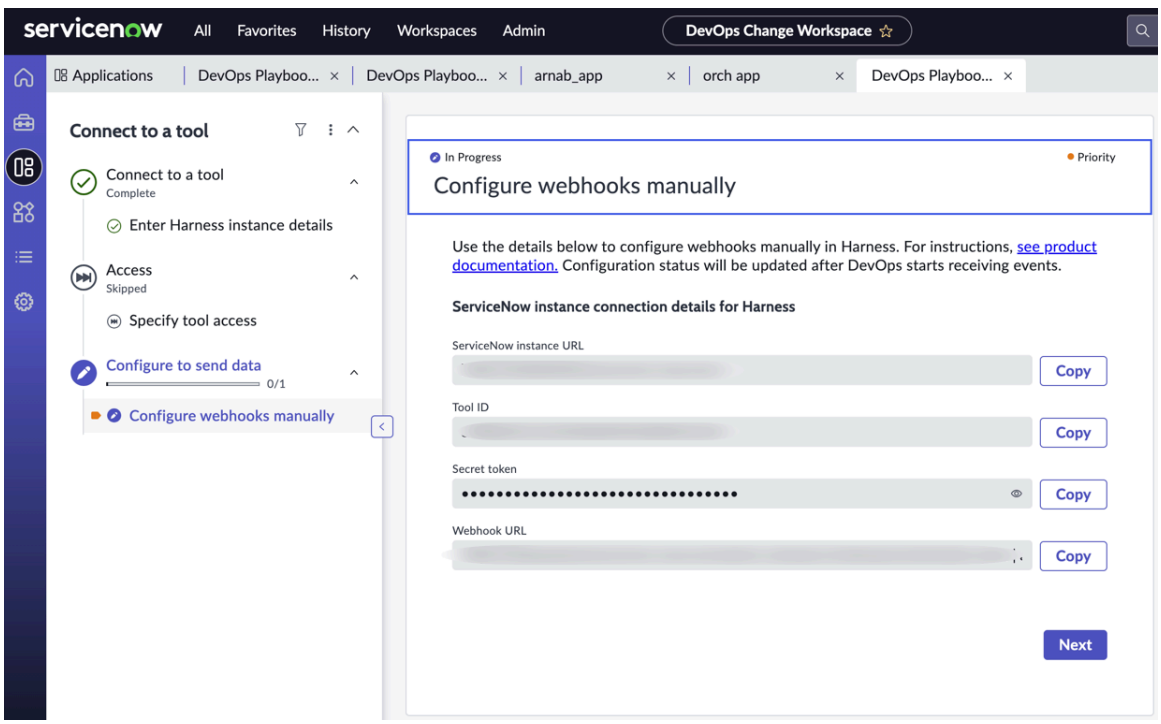
### Procedure

1. In DevOps Change Velocity, choose **Configure manually** when configuring the tool instance to send data.

   **Note:**
   You can also access manual configuration from the Harness tool record in DevOps Change Velocity. From the tool record, select **Configure manually**.

2. Copy the **Webhook URL** and the other field values from DevOps Change Velocity connection details for Harness.

   **Note:**
   Select **Copy** in the appropriate field to copy the value to your clipboard. The field label changes to **Copied**, but you can copy multiple times.




3. Modify the copied Webhook URL to reflect your tool details.

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```
https://<your instance>.service-now.com/api/sn_devops/
v2/devops/tool/{code | plan | artifact | orchestration | test |
softwarequality }?toolId=<your ToolId>
```

**a.** In <your instance>, enter the copied ServiceNow instance URL.

**b.** Select one of the tool capabilities `{code | plan | artifact | orchestration | test | softwarequality }` to match your tool.
For example:

```
https://demoinstance.service-now.com/api/sn_devops/v2/devops/
tool/orchestration?toolId=<your ToolId>
```

**c.** In <your ToolId>, enter the copied tool ID.
For example:

```
https://demoinstance.service-now.com/api/sn_devops/v2/devops/
tool/orchestration?toolId=ac0cif1a1b7696107940a864gjhgbcb58
```

**d.** Add the "&ni.nolog.token=<copied secret token>" parameter in the URL to pass the secret token.
For example:

```
https://demoinstance.service-now.com/api/
sn_devops/v2/devops/tool/orchestration?
toolId=ac0cdf1a1b7696107940a864gjhgbcb58&ni.nolog.token=brl1jhab63nn56
```

**e.** Add "&projectId=<project_sys_id>" in the URL to add the account identifier.

> **Note:**
> Project Id or Account Id is the unique identifier for your account in the Harness platform. Copy it from Account Settings of your Harness account.

For example:

```
https://demoinstance.service-now.com/api/
sn_devops/v2/devops/tool/orchestration?
toolId=ac0cdf1a1b7696107940a864gjhgbcb58&ni.nolog.token=brl1jhab63nn56&pro
```

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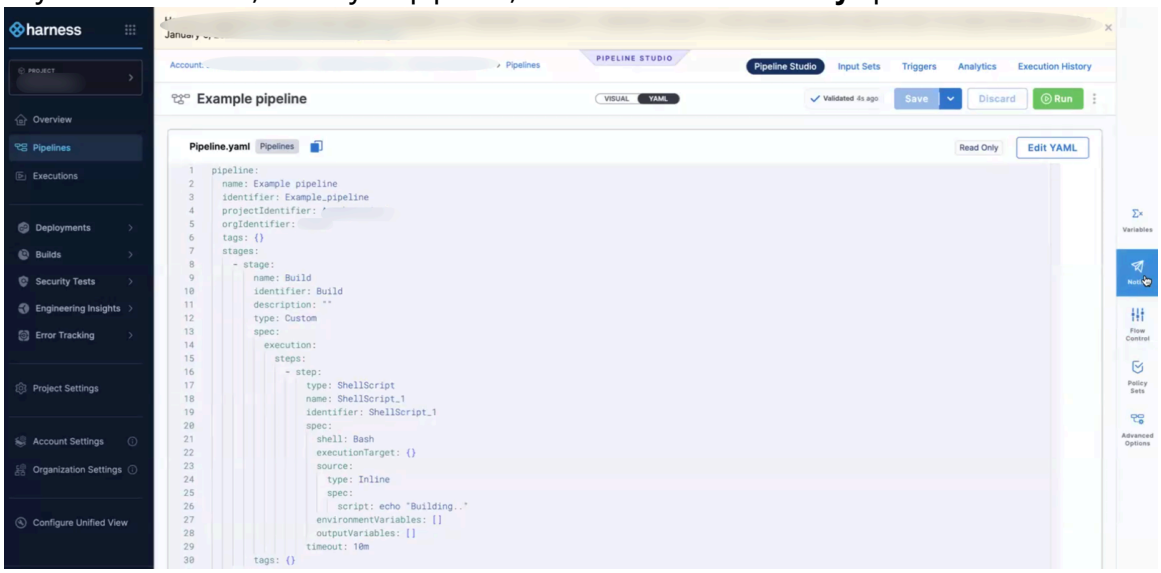
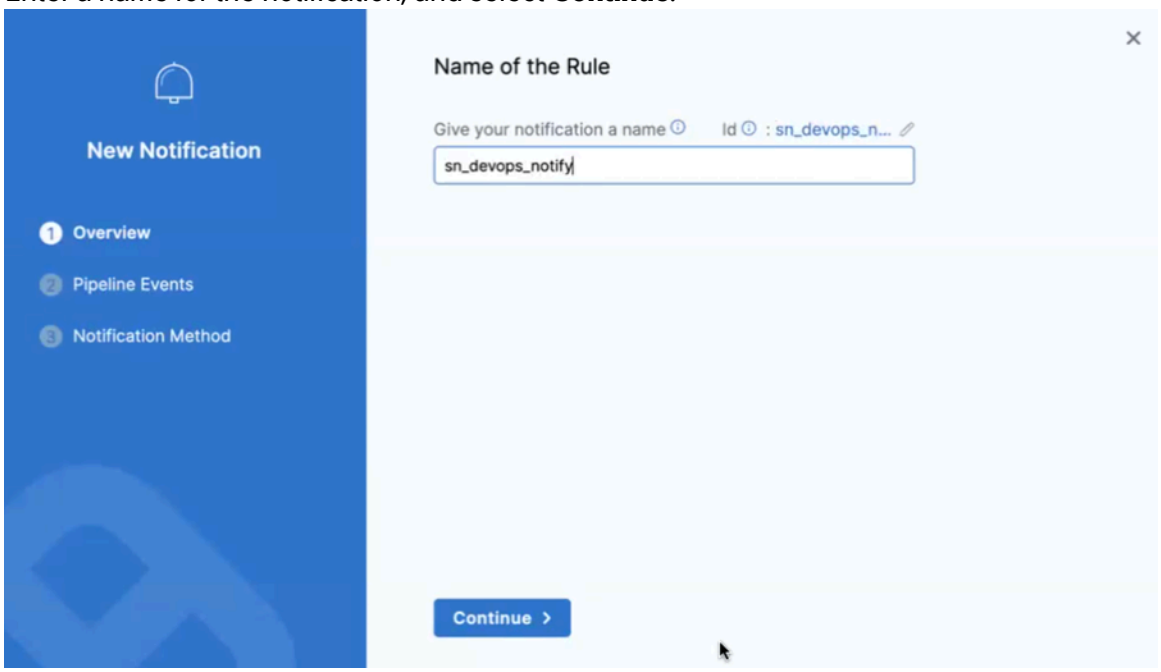
4. In your Harness tool, select your pipeline, and then select the **Notify** option.




5. Select **+Notifications** to create a new notification record.
6. Enter a name for the notification, and select **Continue**.

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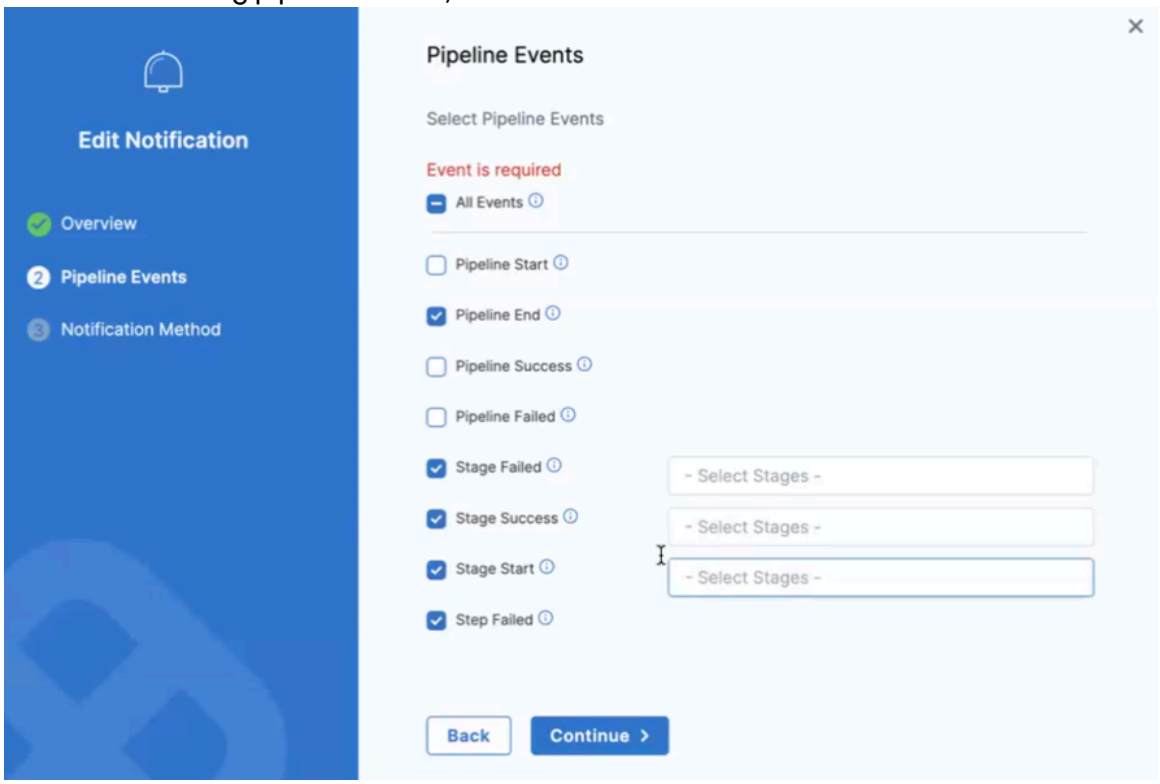
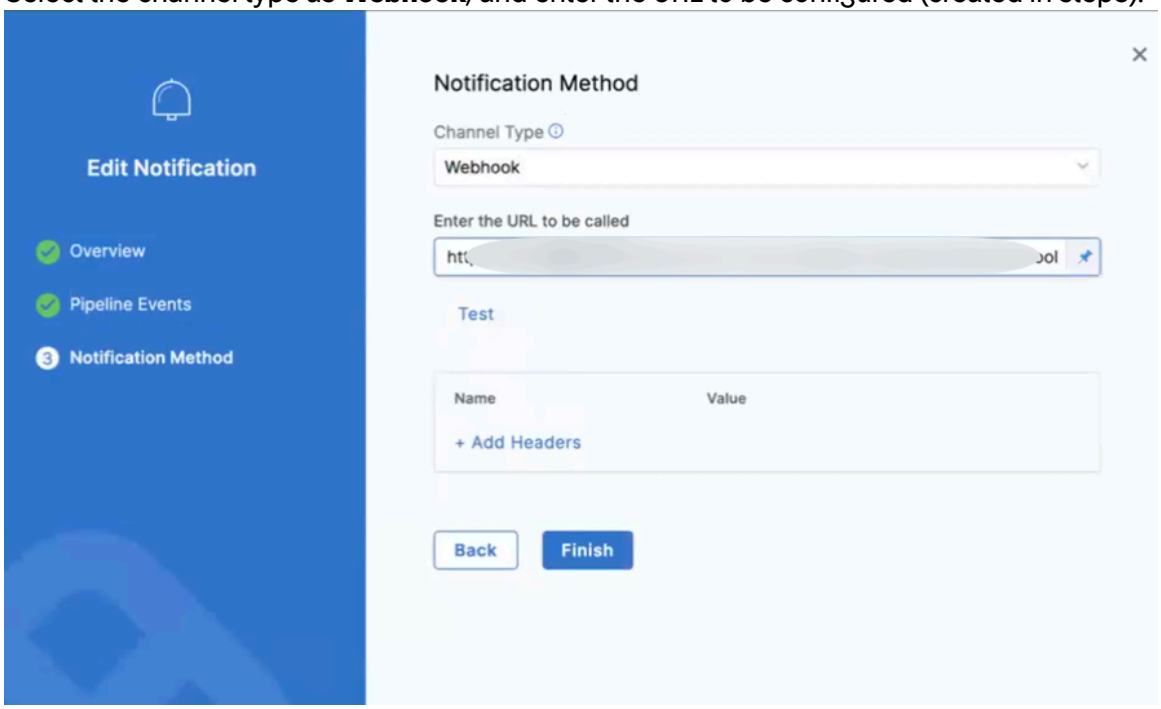
7. Select the following pipeline events, and then select **Continue**.




- Pipeline End
- Stage Failed
- Stage Success
- Stage Start
- Step Failed

8. Select the channel type as **Webhook**, and enter the URL to be configured (created in step3).




9. Select **Finish**.

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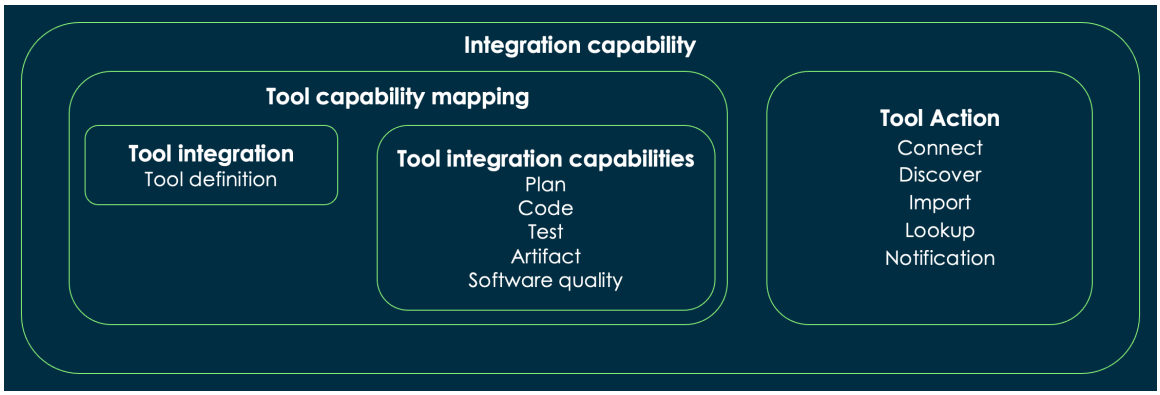
## User-created integrations in DevOps Change Velocity

User-created integrations are for integrating additional planning, coding, and test tools that are not available by default in the DevOps Change Velocity application.

The DevOps Change Velocity application includes tool definitions for integrating some common planning, coding, and DevOps test tool integration, but you can also set up user-created integrations for additional tools in your DevOps environment.

## Integration objects

DevOps tool integration consists of these objects.




## Tool capability actions

- **Connect** action:

  When connecting, the subflow for the specific tool is called and the connection state is updated. The connection status message is shown on the form.

  See Connect capability subflow for more details.

- **Discover** action:

  When discovering, an import request record is created and the subflow for the specific tool is called (as defined in the Integration Capability record). **Detail** and **Status** fields in the Import Request record are updated with the number of items discovered, updated, and failed.

  The transformed payload consists of an array of objects as a JSON string. Elements vary depending on the tool type.

  See Discover capability subflow for more details.

- **Import** action:

  Import action does not support historical import functionality.

- **Lookup** action:

  The Lookup main flow is provided to support artifact tool type in a subflow created by your integration developer.

- **Notification** (webhook) action:

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The source tool is configured manually (by your integration developer) to send raw data to the ServiceNow instance. The raw payload is then transformed into a standard JSON object using a subflow.

See the Notification capability subflow and the DevOps - POST /devops/tool/{capability} endpoint of the DevOps API for more details.

**Note:**
If a subflow is not specified, default handling of notifications occurs (*`original payload`* is automatically copied to *`transformed payload`*).

This behavior is useful when the transactional data of the tool is supported by ServiceNow DevOps as is.

See the expected standard payloads in the Notification capability subflow for more details.

## DevOps integration configuration overview

Tool integration configuration can be completed by your integration developer and your DevOps admin.

**Integration developer**

- Create a tool integration record in DevOps to define the tool you are integrating (source tool).
- Create a Flow Designer subflow to collect and transform data from the tool you are integrating (source tool).
- Create a tool capability mapping record in DevOps to map the tool integration record to the tool type capability.

  **Note:**
  Notifications (webhook) capability is supported. Connect and discover capabilities are also supported.

- Create an integration capability record in DevOps to specify the action for the tool type capability.

**DevOps admin**

- Create a (planning, coding, or test) tool record in DevOps to connect to the tool you are integrating (source tool).

  **Note:**
  The tool integration record must be specified in the **Tool** field of the tool record.

- Configure the source tool with the webhook and credentials.

## Inbound events

An inbound event serves as a staging area for the notifications flow that supports reprocessing of failed payloads. Meaning, a record in an error state from a failed integration or transformation can be retried.

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If an Inbound Event record is in the **Error** state, the flow was not able to insert the record successfully into the core DevOps tables.

Common errors can be resolved with these actions.

**Inbound event error states**

| Error | Action |
|---|---|
| Missing required fields | The transformed payload does not match the standard payload.<br><br>Refer to the standard and JSON payloads provided. |
| Repository not marked for tracking | The commit cannot be inserted.<br><br>The DevOps admin needs to track the repository. |
| [Subflow] has not been published within application scope [app_scope] | The subflow is created but not published yet. |
| Timeout exception | The subflow takes more time than the value set in the property: *com.glide.hub.flow_api.default_execution_ti*<br><br>See FlowAPI - executeSubflowQuick(String name, Map inputs, Number timeout) for more details.<br><br>**Note:** The execution of the subflow exceeds the value set in the **Timeout** field in the Integration Capability record. |
| Did not find a matching subflow for notification capability and [tool_integration_sys_id] tool integration | The flow was not able to find the matching subflow.<br><br>Verify the integration setup procedure. |
| Payload does not match the expected capability. | The **Original payload** (payload being sent) is a different **Capability** type than the tool type capability configured in your tool capability mapping.<br><br>The payload type must match the tool type capability configured in your tool integration. |

**Note:**
An inbound event record is not created when any of the following conditions occur:

- Source tool has not passed the tool ID as a query parameter.
- Source tool has passed on a tool ID, but there is no matching tool ID in the instance.

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## Tool mappings

A tool can be mapped to multiple capabilities.

| Tool Integration | Tool Type Capability | Tool Capability Mapping |
|---|---|---|
| • Agile Development 2.0<br>• Azure DevOps<br>• Bitbucket<br>• GitHub<br>• GitHub Enterprise<br>• GitLab<br>• Jenkins<br>• Jira<br>• Rally | • Plan<br>• Code<br>• Orchestration<br>• Artifact<br>• Test | Plan<br>• Agile Development 2.0 - Plan<br>• Azure DevOps - Plan<br>• Jira - Plan<br>• Rally - Plan<br>Code<br>• Azure DevOps - Code<br>• Bitbucket - Code<br>• GitHub - Code<br>• GitHub Enterprise - Code<br>• GitLab - Code<br>Orchestration<br>• Azure DevOps - Orchestration<br>• Jenkins - Orchestration<br>• GitLab - Orchestration<br>Test<br>• Azure DevOps - Test<br>• Jenkins - Test |

A tool capability mapping can be mapped to multiple actions.

| Tool Capability Mapping | Tool Action | Integration Capability |
|---|---|---|
| • Agile Development 2.0 - Plan<br>• Azure DevOps - Plan<br>• Azure DevOps - Code<br>• Azure DevOps - Orchestration<br>• Bitbucket - Code<br>• GitHub - Code<br>• GitHub Enterprise - Code | • Connect<br>• Discover<br>• Import<br>• Lookup<br>• Notification | Agile Development 2.0<br>• Agile Development 2.0 - Plan - Connect<br>• Agile Development 2.0 - Plan - Discover<br>• Agile Development 2.0 - Plan - Import<br>• Agile Development 2.0 - Plan - Notification<br>Azure DevOps<br>• Azure DevOps - Plan - Connect<br>• Azure DevOps - Plan - Discover<br>• Azure DevOps - Plan - Notification<br>• Azure DevOps - Code - Discover |

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| Tool Capability Mapping | Tool Action | Integration Capability |
|---|---|---|
| • GitLab - Code<br>• GitLab - Orchestration<br>• Jenkins - Orchestration<br>• Jira - Plan<br>• Rally - Plan | | • Azure DevOps - Code - Notification<br>• Azure DevOps - Orchestration - Discover<br>• Azure DevOps - Orchestration - Notification<br><br>Bitbucket<br>• Bitbucket - Code - Connect<br>• Bitbucket - Code - Discover<br>• Bitbucket - Code - Import<br>• Bitbucket - Code - Notification<br><br>GitHub<br>• GitHub - Code - Connect<br>• GitHub - Code - Discover<br>• GitHub - Code - Import<br>• GitHub - Code - Notification<br><br>GitHub Enterprise<br>• GitHub - Code - Connect<br>• GitHub - Code - Discover<br>• GitHub - Code - Import<br>• GitHub - Code - Notification<br><br>GitLab<br>• GitLab - Code - Connect<br>• GitLab - Code - Discover<br>• GitLab - Code - Notification<br>• GitLab - Orchestration - Notification<br><br>Jenkins<br>• Jenkins - Orchestration - Connect<br>• Jenkins - Orchestration - Discover<br>• Jenkins - Orchestration - Import<br>• Jenkins - Orchestration - Notification<br><br>Jira<br>• Jira - Plan - Connect<br>• Jira - Plan - Discover<br>• Jira - Plan - Import<br>• Jira - Plan - Notification<br><br>Rally |

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| Tool Capability Mapping | Tool Action | Integration Capability |
|---|---|---|
| | | • Rally - Plan - Discover<br>• Rally - Plan - Import<br>• Rally - Plan - Notification<br>• Rally - Plan - Connect<br>• Rally - Plan - Validate |

Multiple test types can be mapped to each tool integration.

| Test Type | Tool Integration | Test Type Mapping |
|---|---|---|
| Unit: JUnit, XUnit, NUnit, Unit test<br>Functional:<br>• Integration<br>• Regression<br>• Smoke<br>• System<br>• User Acceptance<br>Performance: Load | • Azure DevOps<br>• Jenkins<br>• GitLab<br>• GitHub<br>• GitHub Enterprise | Azure DevOps<br>• Azure DevOps - JUnit<br>• Azure DevOps Nunit<br>• Azure DevOps Xunit<br>• Azure DevOps Unit test<br>• Azure DevOps - Integration<br>• Azure DevOps - Regression<br>• Azure DevOps - Smoke<br>• Azure DevOps - System<br>• Azure DevOps - User Acceptance<br>• Azure DevOps - Load<br>Jenkins<br>• Jenkins - JUnit<br>• Jenkins - Integration<br>• Jenkins - Regression<br>• Jenkins - Smoke<br>• Jenkins - System<br>• Jenkins - User Acceptance<br>• Jenkins - Load<br>GitLab<br>• GitLab - JUnit<br>• GitLab - Integration<br>• GitLab - Regression<br>• GitLab - Smoke<br>• GitLab - System<br>• GitLab - User Acceptance<br>• GitLab - Load |

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| Test Type | Tool Integration | Test Type Mapping |
|---|---|---|
| | | GitHub and GitHub Enterprise<br>• GitHub - JUnit<br>• GitHub Nunit<br>• GitHub Xunit<br>• GitHub Unit test<br>• GitHub - Integration<br>• GitHub - Regression<br>• GitHub - Smoke<br>• GitHub - System<br>• GitHub - User Acceptance<br>• GitHub - Load |

### DevOps test tool integration

Test tool integration lets you view test results in DevOps for Jenkins, Azure DevOps, GitHub, GitHub Enterprise, and GitLab unit, functional, and performance tests.

For GitLab and Jenkins, only JUnit test type integration is supported.

**Note:**
For other test types, use the DevOps - POST /devops/tool/{capability} endpoint of the DevOps API.

- Selenium tests run and published using TestNG are reported by the Jenkins plugin for ServiceNow DevOps.
- Test type categorization is supported.
- Additional tests results reported by tools, such as Apache JMeter, can be processed in DevOps using custom Flow Designer subflows (no pipeline changes required).

| Category | Test type |
|---|---|
| Unit | JUnit (default)<br>NUnit<br>XUnit<br>Unit test<br>**Note:**<br>• For GitLab and Jenkins, only the JUnit test type integration is supported.<br>• For ADO, GitHub, and GitHub Enterprise, the JUnit, NUnit, XUnit, and Unit test type integrations are supported. |

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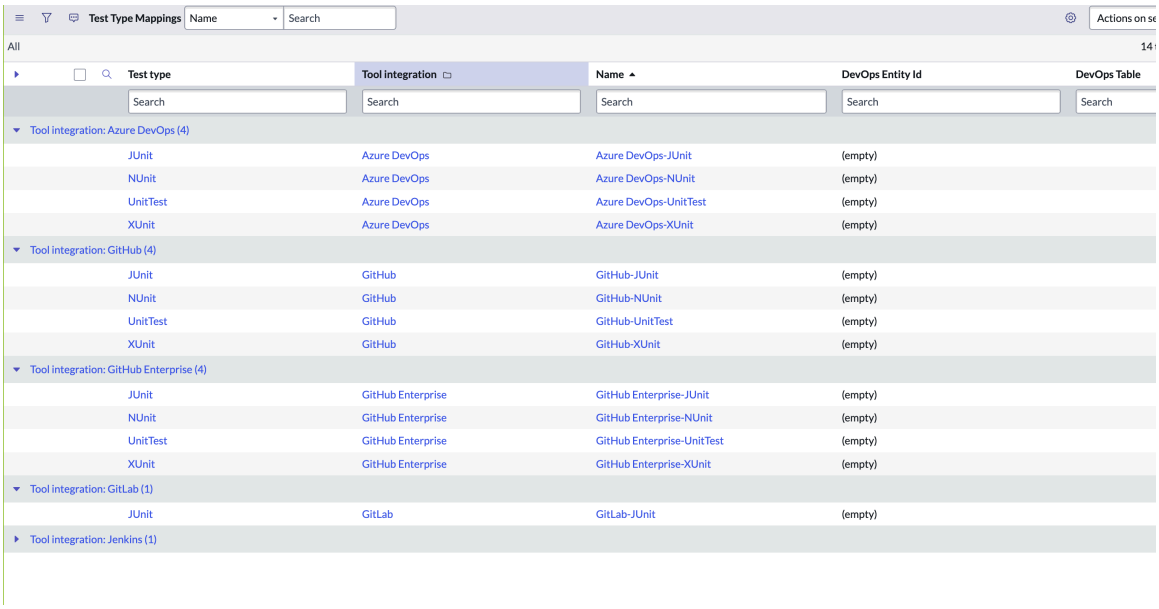
| Category | Test type |
| --- | --- |
| | You can change the default test type by modifying the *[sn_devops.default_test_type]* DevOps property. |
| Functional | • Integration<br>• Regression<br>• Smoke<br>• System<br>• User Acceptance |
| Performance | Load |

## Test type mapping

The test type mapping connects the test type and entity being tested with the DevOps tool (**DevOps** > **Integrations** > **Test Type Mappings** module.)




An accurate test type mapping ensures that the test type always appears as intended in the test summary results.

| Field | Description |
| --- | --- |
| Test type | • JUnit<br>• Nunit<br>• Xunit<br>• Unit test |

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| Field | | Description |
|---|---|---|
| | | **Note:**<br>○ For GitLab and Jenkins, only the JUnit test type integration is supported.<br>○ For ADO, GitHub, and GitHub Enterprise, the JUnit, NUnit, XUnit, and Unit test type integrations are supported.<br>• Integration<br>• Regression<br>• Smoke<br>• System<br>• User Acceptance<br>• Load |
| DevOps Entity Id | Table name | DevOps table name that contains the entity linked to the test results (in the test report payload).<br>• Step [sn_devops_step]<br>• Pipeline [sn_devops_pipeline]<br>**Note:** Only DevOps Step and Pipeline tables are supported. |
| | Document | Name of the entity specified in the selected table.<br>For example, the name of the step, pipeline, artifact, or package. |
| Test File Paths<br>(Jenkins tests only) | | Path to the generated test result file on the Jenkins server.<br>This is useful so test reports with attributes that don't conform to JUnit or TestNG |

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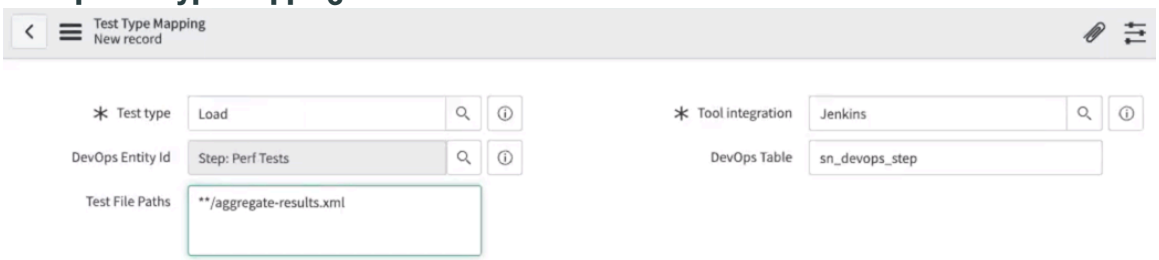
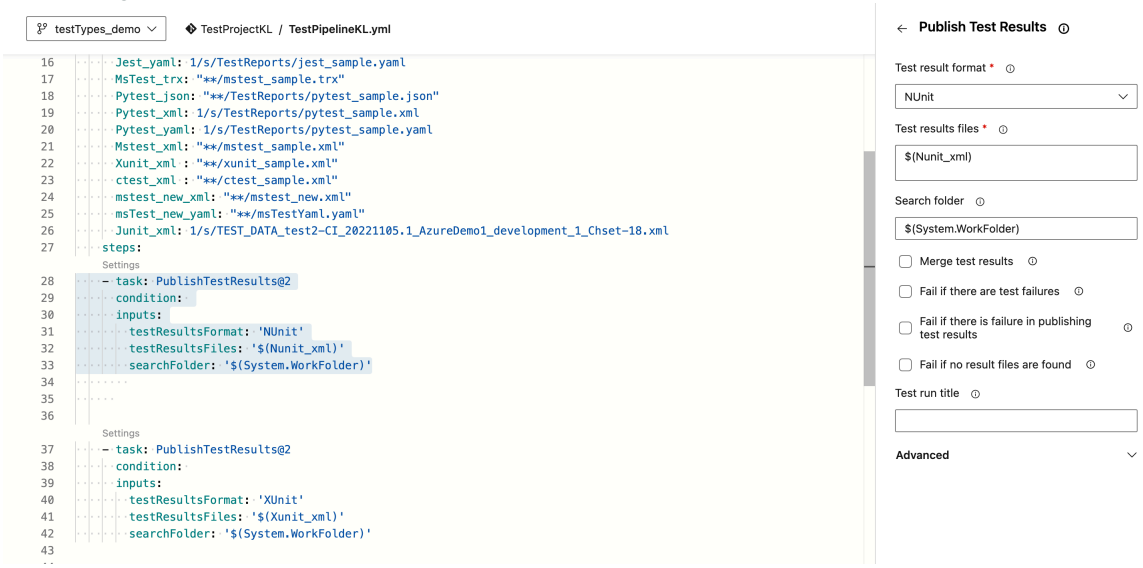
| Field | Description |
| --- | --- |
| | implementation, such as JMeter for example, can still be leveraged by DevOps.<br><br>Separate multiple files by a comma.<br><br>**Note:** You must use a Flow Designer subflow to transform a raw test payload. |
| Tool integration | Tool that's running the test. |
| DevOps Table | DevOps table that corresponds to the table name in the **DevOps Entity Id** setting. |

### DevOps test type mapping




### Example yaml file of ADO unit test

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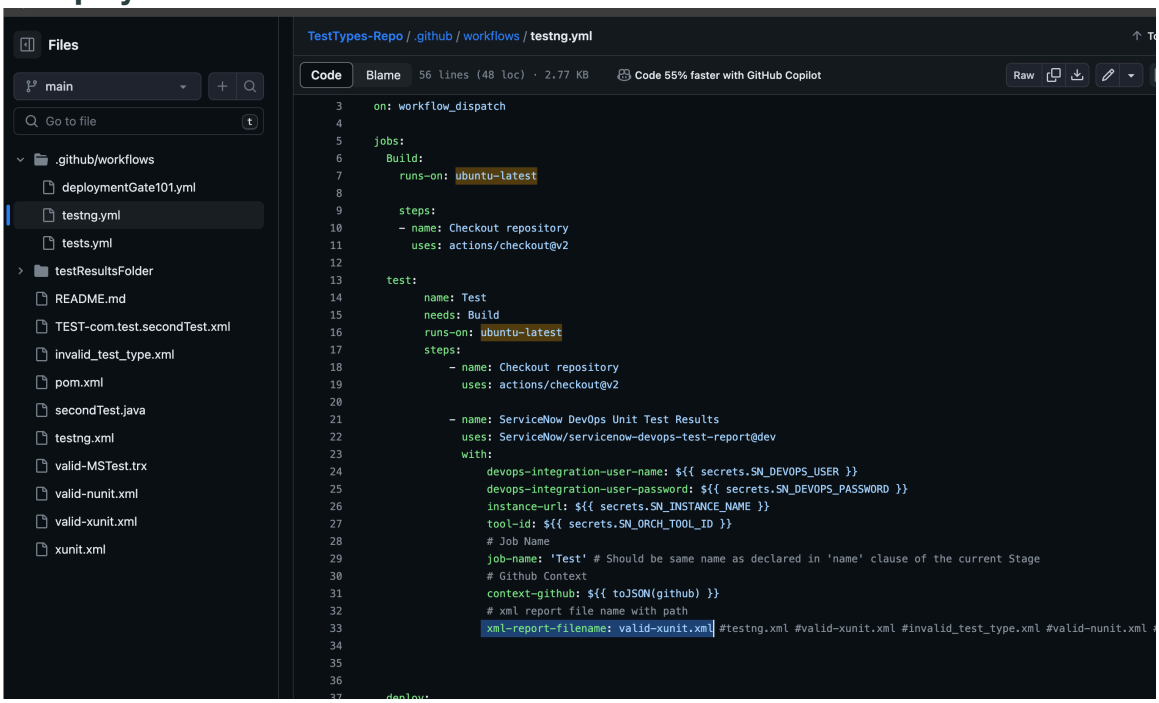
### Example yaml file of GitHub unit test



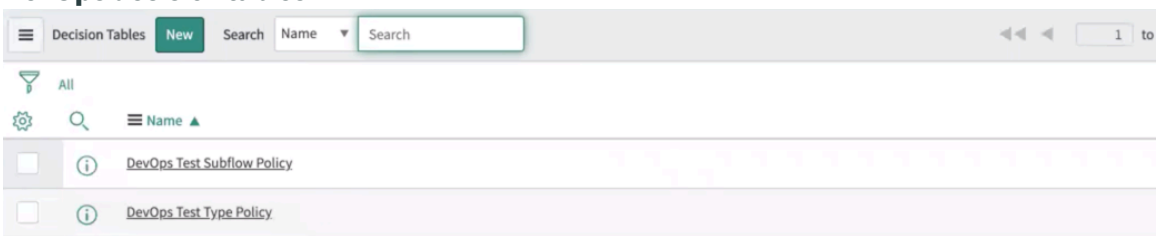

## Transforming a raw test payload

You can transform a raw test report (a report containing attributes that do not conform to JUnit or TestNG implementation), such as JMeter for example, by configuring the **DevOps Test Subflow Policy** decision table to call a custom subflow (**Decision Tables** > **Decision Tables** module).

**Note:**
You must create the custom Flow Designer subflow that transforms the raw test payload.

If there is more than one test type in a performance stage, you can use the **DevOps Test Type Policy** decision table to configure the test type for each test so the test result payloads are transformed correctly.

### DevOps decision tables




### DevOps decision tables

| Decision table | Purpose | Configuration |
|---|---|---|
| DevOps Test Subflow Policy | To automatically call a custom subflow that transforms the raw payload received by the tool.<br><br>Decision inputs: | Create a decision that specifies the custom subflow to call when the raw payload is received. |

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### DevOps decision tables (continued)

| Decision table | Purpose | Configuration |
|---|---|---|
| | • Test Result Payload<br>• Test Type | Set the conditions to contain fields that would be included in the raw payload.<br><br>For example, to call Jenkins BZ Performance Test custom subflow:<br><br>Conditions:<br>• `Test Type is Load`<br><br>(Load is the test type configured for performance tests)<br><br>• `Test Result Payload contains throughput`<br>• `Test Result Payload contains concurrency`<br><br>Answer: FLow: Jenkins BZ Performance Test |
| DevOps Test Type Policy | To automatically set test types when more than one type of test is configured in a performance test stage.<br><br>This is necessary so the results for the second test type get transformed correctly.<br><br>For example, when both a Load performance test and a JUnit performance test are mapped in the same DevOps step, the JUnit test results won't get formatted correctly unless a decision is created.<br><br>Decision inputs:<br>• Step<br>• Test Result Payload<br>• Tool Integration<br>• Pipeline | Create a decision for each type of test in the performance test stage to set the test type.<br><br>Load test:<br>• Conditions:<br>◦ `Step is Perf Tests`<br>◦ `Test Result Payload contains throughput`<br>◦ `Test Result Payload contains concurrency`<br>• Answer: `TestType: Load`<br><br>JUnit test: |

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## DevOps decision tables (continued)

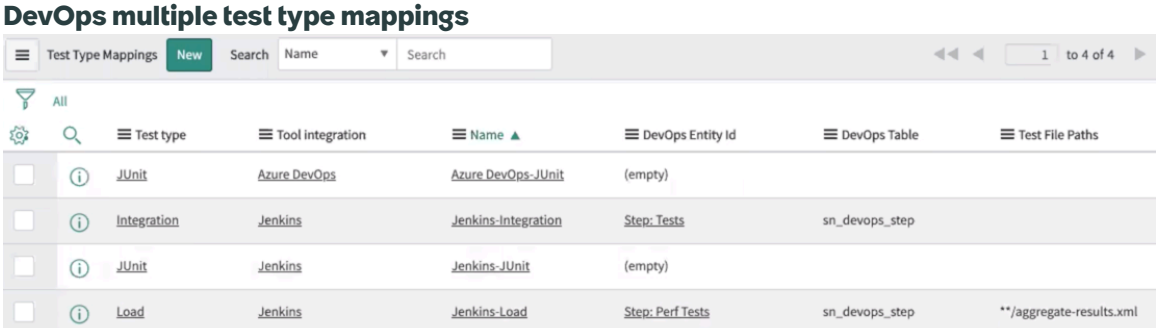
| Decision table | Purpose | Configuration |
|---|---|---|
| | | • Conditions:<br>○ `Step is Perf Tests`<br>○ `Test Result Payload does not contain throughput`<br>○ `Test Result Payload does not contain concurrency`<br>• Answer: `TestType : JUnit` |

## DevOps multiple performance test types

```
stage('Checkout') {
    snDevOpsStep()
    snDevOpsChange()
    node {
        echo 'Checking out..'
        checkout scm
    }
}
stage('Tests'){
  snDevOpsStep()
  node {
    sh 'mvn clean test'
    step([$class: 'Publisher', reportFilenamePattern: '**/testng-results.xml'])
  }
}
stage('Perf Tests'){
  snDevOpsStep()
  node {
    bzt "load_test1.yml"
    junit '**/xunit.xml'
  }
}

```

## DevOps multiple test type mappings

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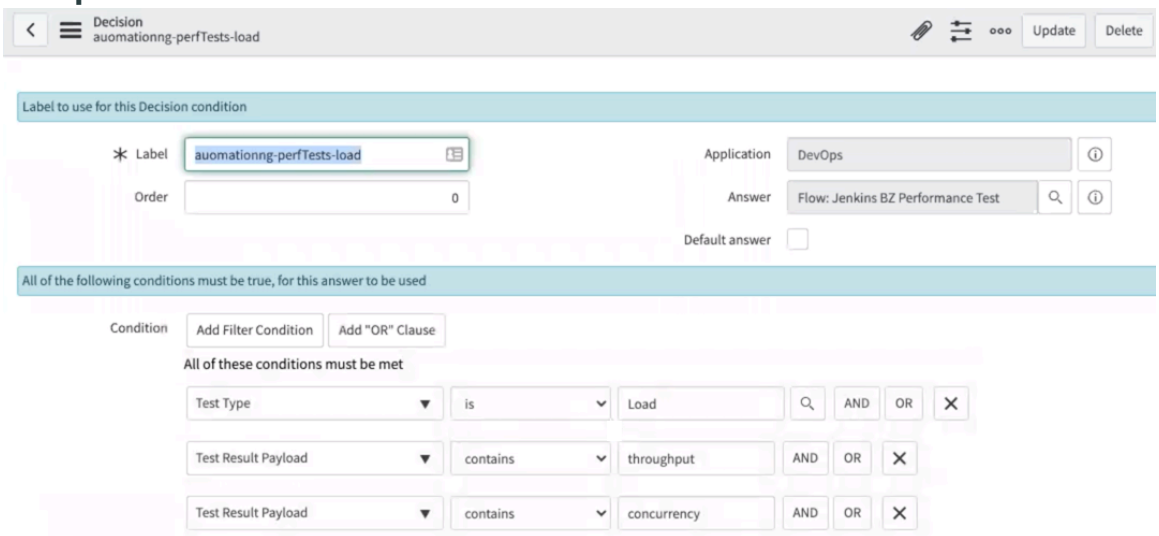
### DevOps decision table decision

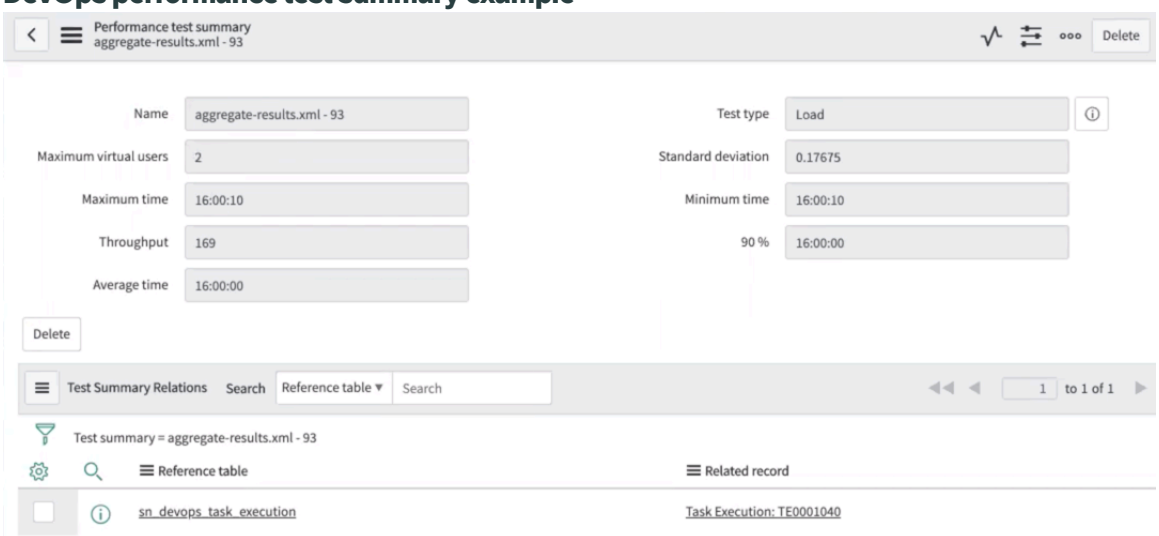



## Test summary results

You can view test summary results these ways.

- **DevOps** > **Test Results** module (Test Summaries and Performance Test Summaries).
- DevOps change request - Test Results related list.
- DevOps Pipeline UI - Quality tile.

### DevOps performance test summary example




## Expected standard JSON Notification capability payload - Test tool

Functional:

```
{
"name": "CorpSite-selenium#55",
"duration": 78.802,
"passedTests": 4,
"failedTests": 0,
"skippedTests": 0,
"blockedTests": 0,
"totalTests": 4,
```

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```
"startTime": "2020-06-30T18:12:31Z",
"finishTime": "2020-06-30T18:12:31Z",
"passingPercent": 100,


// Use Artifact OR Package OR Build + Stage + PipelineName
 Attributes

Send only one Attribute combination. For example, send
 Attributes of either  Artifact or Package, or the combination
 of Build + Stage + PipelineName.

If you send more than one Attribute, priority is given in
 the following order and the low priory one is ignored. For
 example, if you send attribute for both packages and artifacts,
 then attribute of package is considered and the attribute of
 artifacts is ignored.

1.packages
2.artifcats
3.buildNumber + stageName + pipelineName

"packages": [{"name": "CorpSite-pkg1"}],
"artifacts": [{"name": "CorpSite-artifact", "version":
 "1.0.0"}],
"buildNumber": "55",
"stageName": "test",
"pipelineName": "CorpSite-selenium",
}

Notes:
- The pipelineName attribute value must be same as the value in
 the Orchestration pipeline field of the Pipeline [sn_devops_pipeline]
 table.
- The stageName attribute value must be same as the value in
 the Orchestration stage field of the Step [sn_devops_step] table.
```

Performance:

```
{
"name": "Performance Tests",
"url": "http://abc.com",
"startTime": "2020-06-30T18:12:31Z",
"finishTime": "2020-06-30T18:12:31Z",
"duration": 78.802,
"maximumVirtualUsers": "",
"throughput": "",
"maximumTime": "",
"minimumTime": "",
"averageTime": "",
"ninetyPercent": "",
"standardDeviation": "",

// Use Artifact OR Package OR Build + Stage + PipelineName
 Attributes
```

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```
Send only one Attribute combination. For example, send
 Attributes of either  Artifact or Package, or the combination
 of Build + Stage + PipelineName.

If you send more than one Attribute, priority is given in
 the following order and the low priory one is ignored. For
 example, if you send attribute for both packages and artifacts,
 then attribute of package is considered and the attribute of
 artifacts is ignored.

1.packages
2.artifcats
3.buildNumber + stageName + pipelineName

"packages": [{"name": "CorpSite-pkg1"}],
"artifacts": [{"name": "CorpSite-artifact", "version":
 "1.0.0"}],
"buildNumber": "55",
"stageName": "test",
"pipelineName": "CorpSite-Performance",
}

Notes:
- The pipelineName attribute value must be same as the value in
 the Orchestration pipeline field of the Pipeline [sn_devops_pipeline]
 table.
- The stageName attribute value must be same as the value in
 the Orchestration stage field of the Step [sn_devops_step] table.
```

### Configure a test tool in DevOps

Configure a test tool in DevOps to view unit, functional, and performance test results.

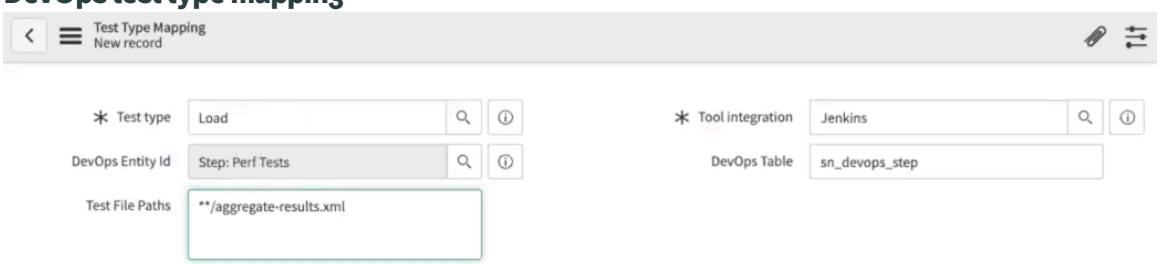
#### Before you begin

Role required: sn_devops.admin

#### Procedure

1. Navigate to **All** > **DevOps** > **Integrations** > **Test Type Mappings** and create a record to map the test type to the integration tool.
2. In the Test Type Mapping record, use the search icon ( ) to select **Test type** and **Tool integration** field values.

**DevOps test type mapping**




3. Click the search icon ( ) in the **DevOps Entity Id** field, and fill in the test details.

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| | |
|---|---|
| Table name | DevOps table name that contains the entity linked to the test results. |
| Document | Name of the entity specified in the selected table. |

**DevOps test mapping entity ID**




See the Test type mapping section for more details.

4. **Optional:** To capture the raw test payload of non-JUnit or -TestNG tests, enter an .xml filename and path (comma separate multiple files).

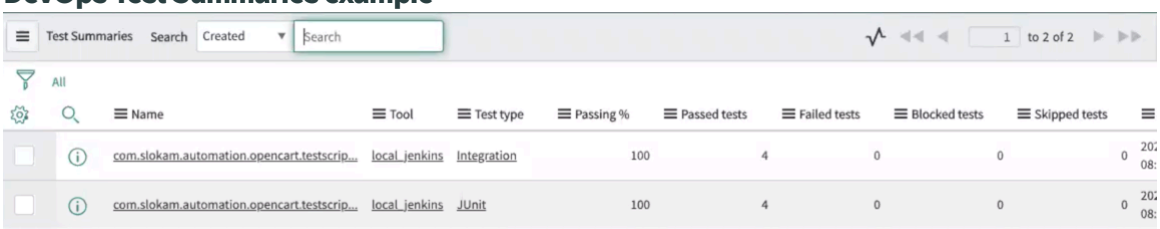
   (Optional) You can transform a raw payload using decision tables and a custom Flow Designer subflow.

   **Note:**
   You must create the custom subflow that transforms the raw payload.

   See the Transforming a raw test payload section for more details on configuring decision tables.

5. Run the test and view test results by navigating to **DevOps** > **Test Results** (Test Summaries and Performance Test Summaries).

**DevOps Test Summaries example**

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**Example:**

### Scripted pipeline example with test configuration

```
stage('Checkout') {
    snDevOpsStep()
    snDevOpsChange()
    node {
        echo 'Checking out..'
        checkout scm
    }
}
stage('Tests'){
  snDevOpsStep()
  node {
    sh 'mvn clean test'
    step([$class: 'Publisher', reportFilenamePattern: '**/testng-results.xml'])
  }
}
stage('Perf Tests'){
  snDevOpsStep()
  node {
    bzt "load_test1.yml"
    //junit '**/xunit.xml'
  }
}

```

### Add test results to change requests using test API

Add test results to DevOps change requests using the test capability of the DevOps - POST /devops/tool/{capability} API. The API is available for all test types for various tools connected to DevOps Change Velocity.

For more information about the API, see DevOps - POST /devops/tool/{capability}. To use the API in Azure DevOps, GitHub, and Jenkins, you must use the format mentioned in the respective sections below.

**Prerequisites**

Role required: sn_devops.admin

You must make sure that the test type you want to use in the API is available as a test type in DevOps Change Velocity and that it is mapped with the respective orchestration tool.

1. Navigate to **DevOps Change Workspace** > **Administration** > **Integrations** > **Test types**.

   You can also use the classic UI navigation **DevOps** > **Integrations** > **Test Types**.

2. Verify if the test type is available in the Test types table.

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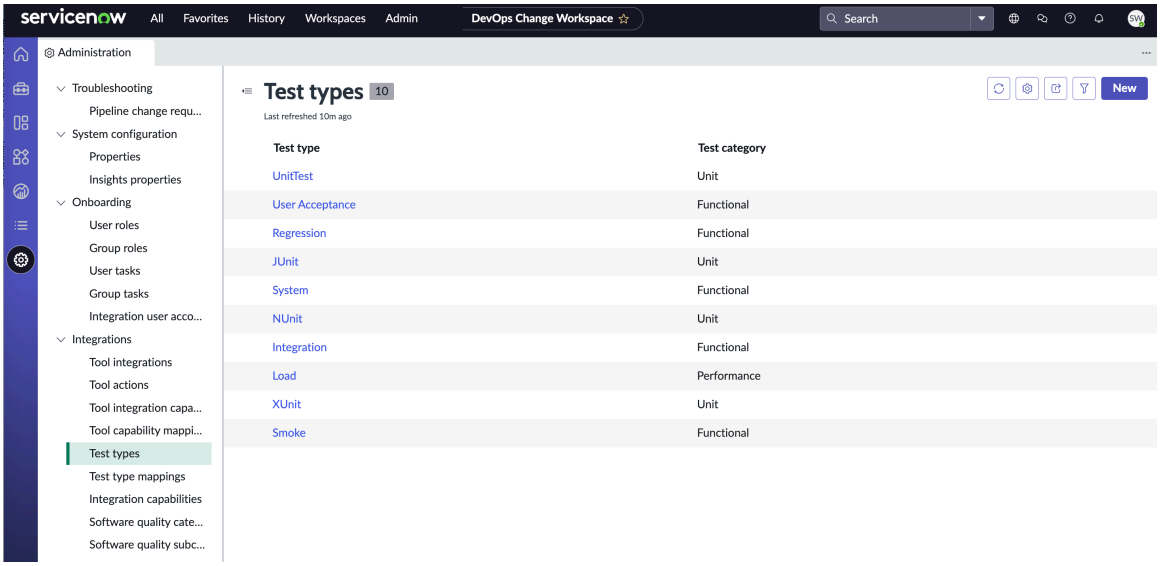



3. For custom test types, select **New** and add the test type to the list.

   a. In the **Test type** field, enter a name for your test type.

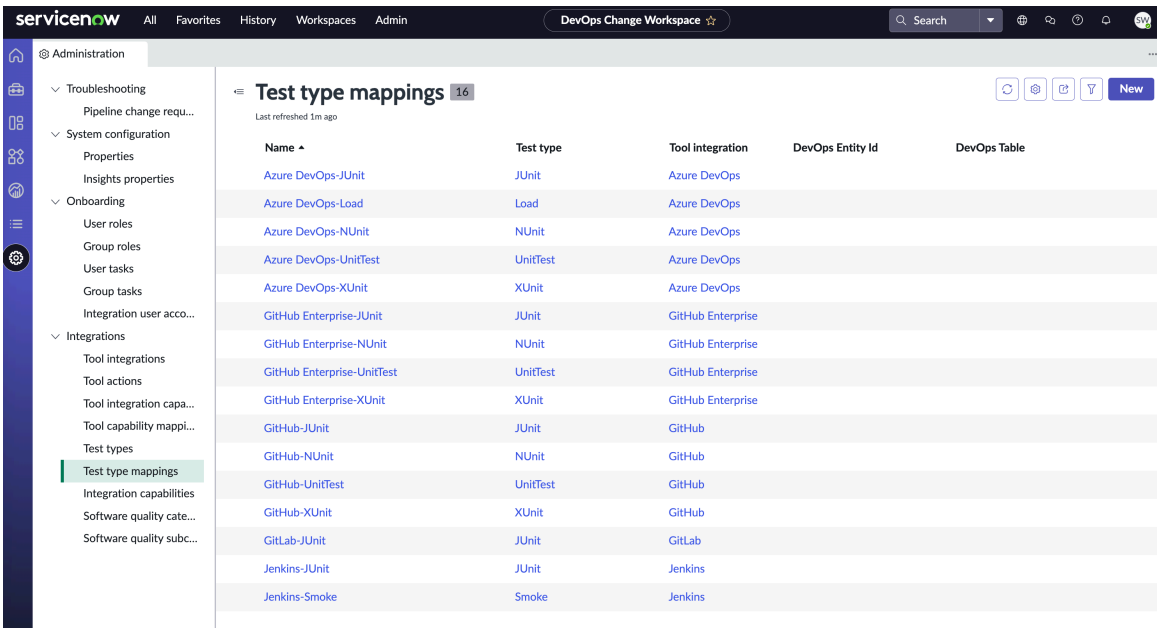
   b. From the **Test category** list, select the category of your test type.

   c. Select **Save**.

4. Navigate to **DevOps Change Workspace** > **Administration** > **Integrations** > **Test type mappings**.

   You can also use the classic UI navigation **DevOps** > **Integrations** > **Test Type Mappings**.

5. Verify if the test type is mapped to your orchestration tool.




6. If the mapping is not available, then select **New** and create the mapping.

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a. From the **Test type** list, select the test type that you want to map.

b. From the **Tool integration** list, select your orchestration tool.

c. Select **Save**.

## Azure DevOps

For Azure DevOps pipelines, use the format given here to add test results to change requests for various test types.

Format for URL suffix and parameters:

```
/api/sn_devops/v1/devops/tool/test?toolId=<devops_ToolID>&testType=<test_type>
```

- The parameter *toolId* must be a valid Tool Id from a connected and configured tool in DevOps Change Velocity.
- The parameter *testType* should have a test type mapping in DevOps Change Velocity.

Within the *Body*, you must pass the parameters based on the test type.

**Note:**
For the generic connection, use the following:

- username: devops.integration.user
- password: <devops.integration.user password>

### Pipeline configuration for performance tests

Sample parameters for the body:

```
{
  "name": "Perf. tests DEMO5",
  "duration": 0,
  "maximumVirtualUsers": 10,
  "throughput": "5/min",
  "maximumTime": 10000,
  "minimumTime": 5000,
  "averageTime": 7000,
  "ninetyPercent": 8000,
  "standardDeviation": 2,
"startTime": "2023-12-14T23:31:31z",
  "finishTime": "2023-12-14T23:40:32z",
  "buildNumber": $(Build.BuildNumber),
  "stageName": "Test API Job",
  "pipelineName": "TEST-CI-PIPELINE"
}
```

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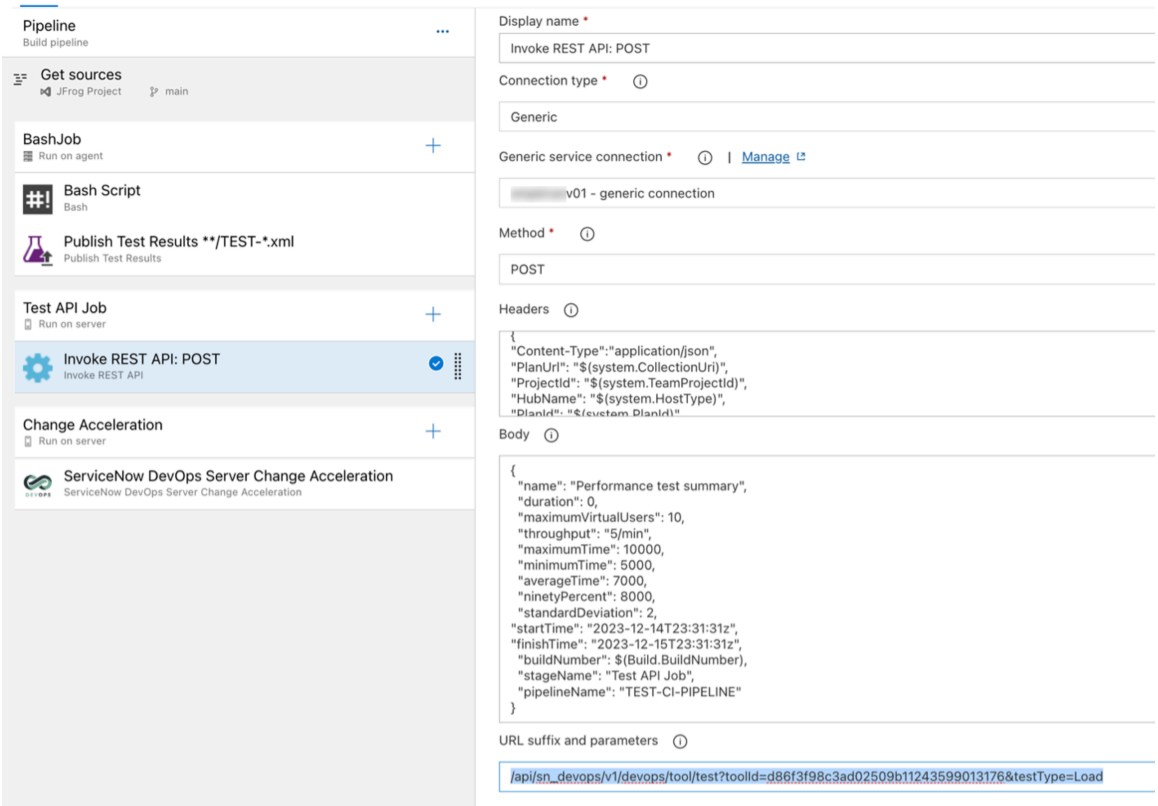
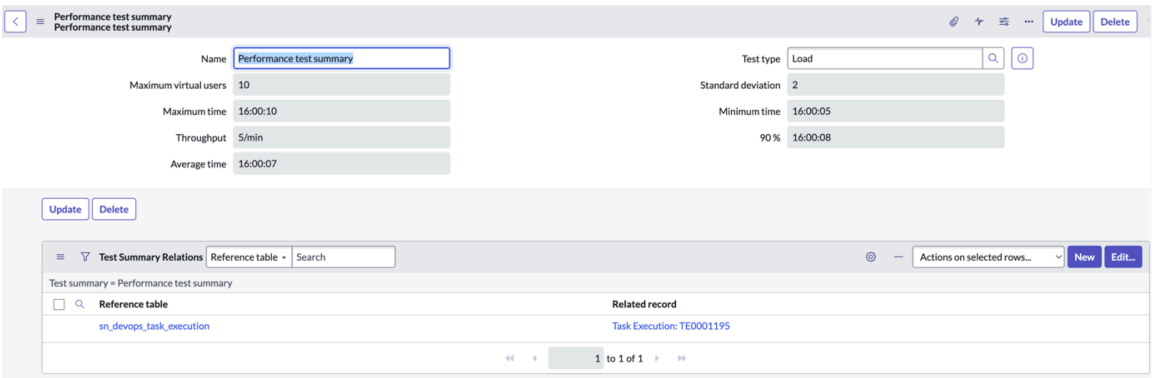



**Performance test summary in your Now instance**:




**Test summary attached to your DevOps change request**:

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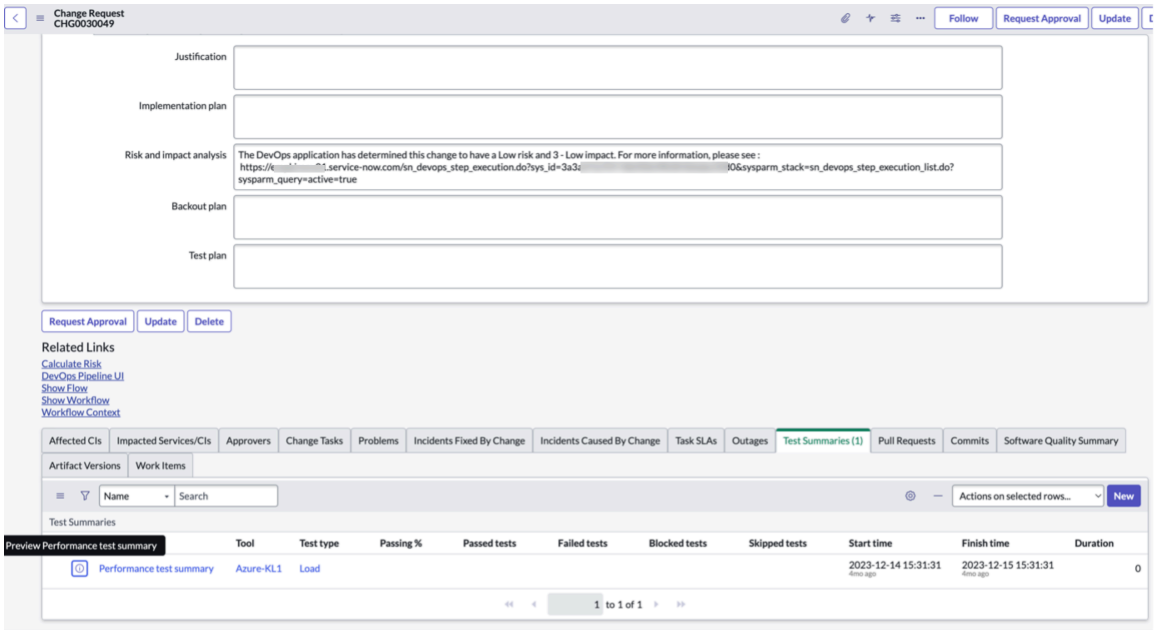


## Pipeline configuration for other functional and unit tests

Sample parameters for the body:

```
{
  "name":" Smoke Test summary",
   "duration":0.0,
   "passedTests":1,
   "failed Tests":1,
   "skipped Tests":1,
   "blockedTests":1,
   "total Tests":4,
  "startTime": "2023-12-14T23:31:31z",
  "finishTime": "2023-12-15T23:31:31z",
  "buildNumber": $(Build. BuildNumber),
 "stageName": "Test API Job",
  "pipelineName": "TEST-CI-PIPELINE"
}
```

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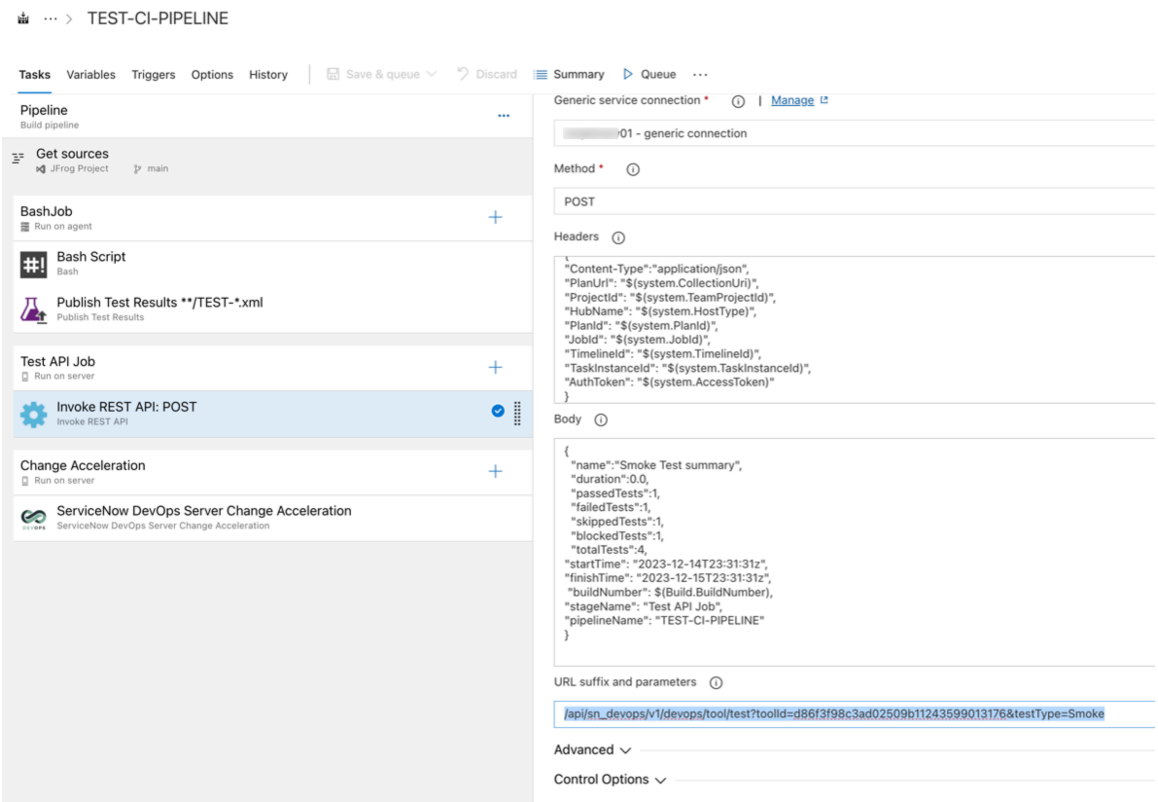
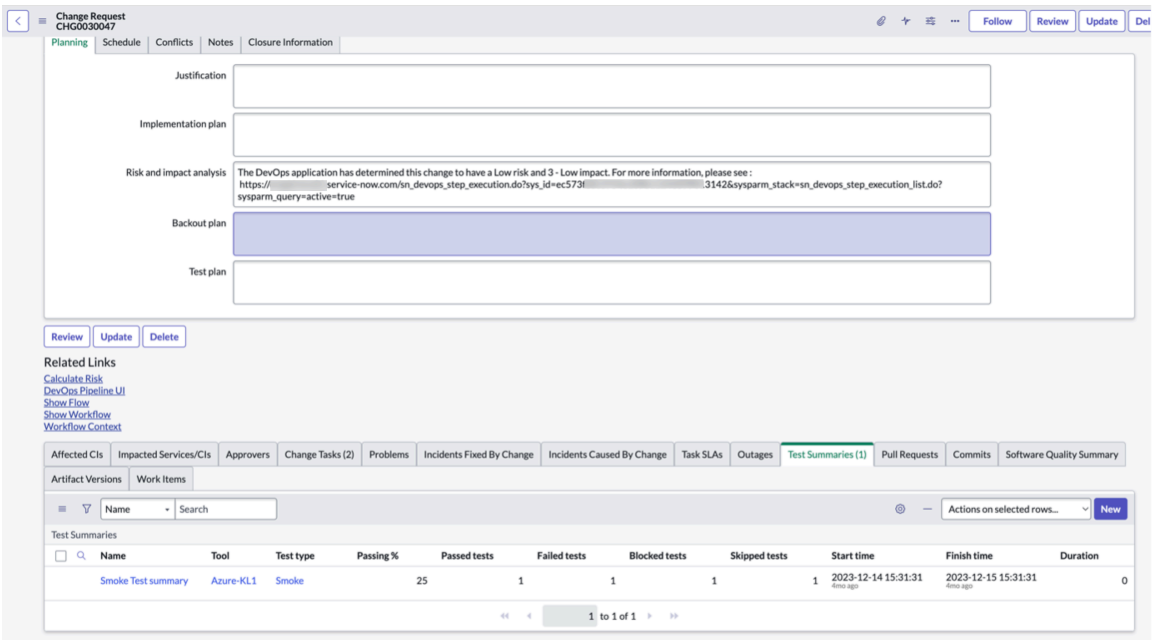



**Test summary attached to your DevOps change request**:




## Azure DevOps YAML pipeline

Sample pipeline:

```
stages:
  - stage: BashScript
    jobs:
      - job: 'bash'
        steps:
```

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```
        - script: echo Hello, world!
          displayName: 'BashScript'


  - stage: TestAPI
    dependsOn: BashScript
    jobs:
      - job: 'RESTTestAPI'
        # dependsOn: BashScript
        pool: server
        steps:
        - task: InvokeRESTAPI@1
          displayName: 'Invoke REST API: POST'
          inputs:
            connectionType: 'connectedServiceName'
            serviceConnection: 'v01 - generic connection'
            method: 'POST'
            body: |
              {
                            "name": "Performance test summary
 kl2",
                            "duration": 0,
                            "maximumVirtualUsers": 10,
                            "throughput": "5/min",
                            "maximumTime": 10000,
                            "minimumTime": 5000,
                            "averageTime": 7000,
                            "ninetyPercent": 8000,
                            "standardDeviation": 2,
                            "startTime": "2023-12-14T23:31:31z",
                            "finishTime":
 "2023-12-14T23:40:32z",
                            "buildNumber": $(Build.BuildId),
                            "stageName": "TestAPI/RestTestAPI",
                            "pipelineName": "TESTYMLPipeline"
                          }
            urlSuffix:
 '/api/sn_devops/v1/devops/tool/test?toolId=<devops_ToolID>&test
Type=<test_type>'
            waitForCompletion: 'false'
```

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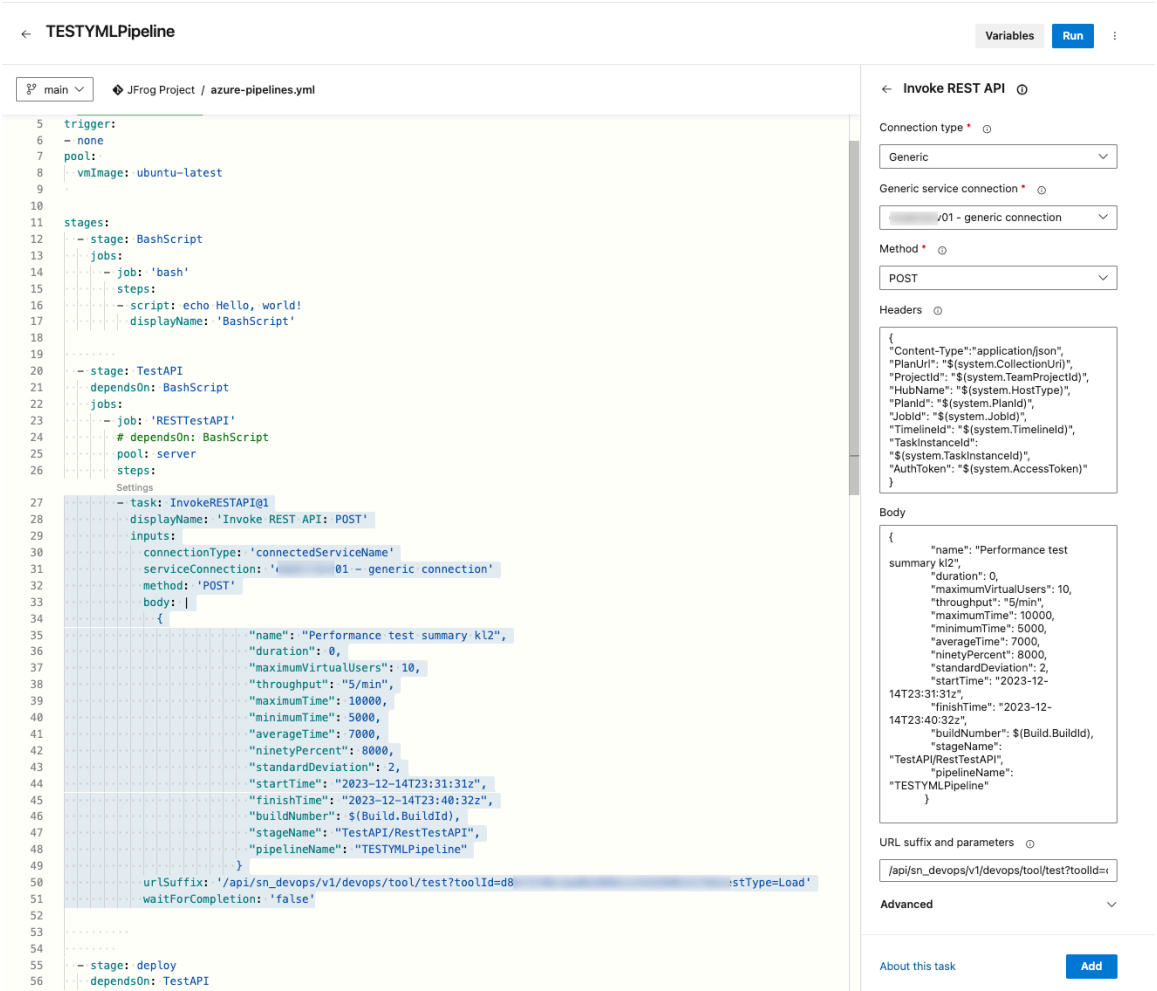


## Release pipeline

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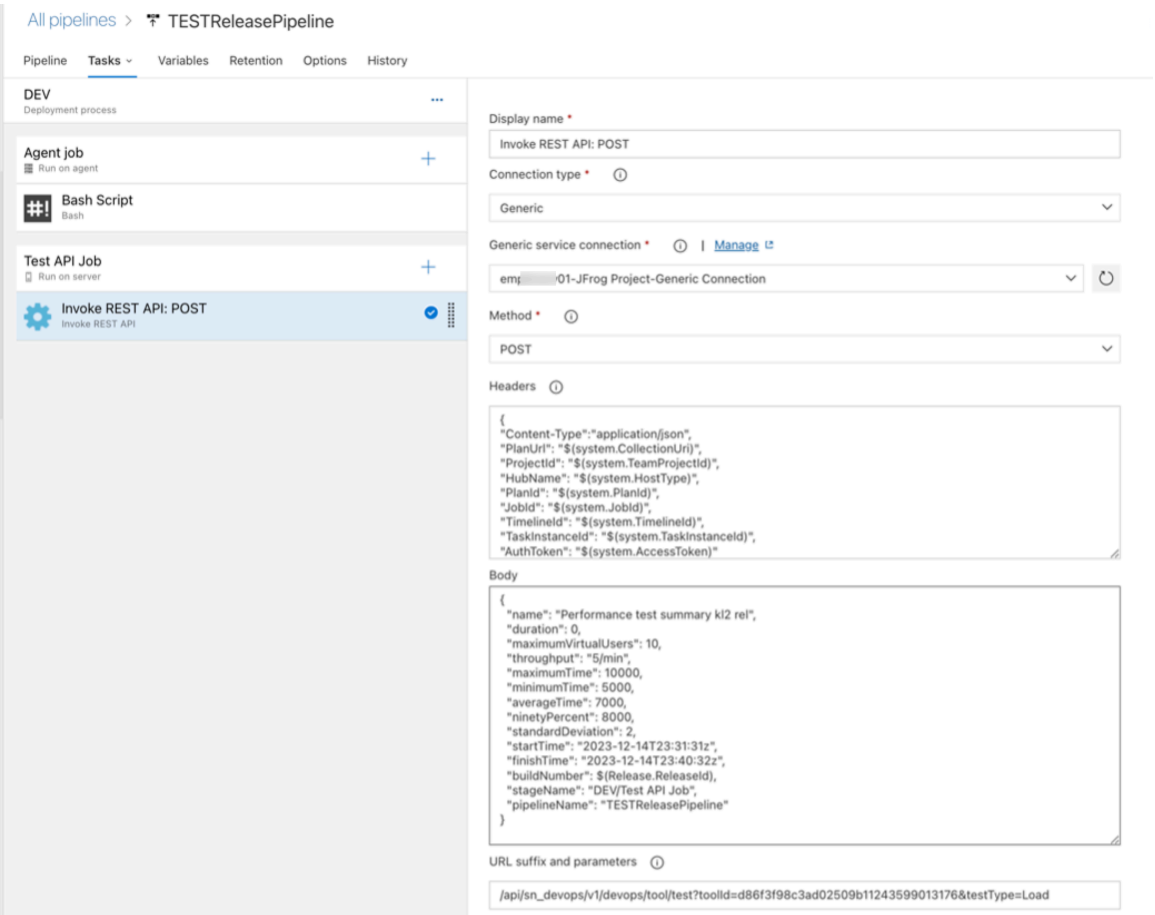


## GitHub

For GitHub pipelines, use the format given here to add test results to change requests for various test types.

### Pipeline configuration for performance tests

Sample pipeline:

```
name: Test API Call Perf

on:
  workflow_dispatch:

jobs:
  post_api_call_perf:
    runs-on: ubuntu-latest

    steps:
    - name: Checkout Repository
      uses: actions/checkout@v2

    - name: post_api_call_perf
      run: |

 apiUrl="https://
<your_instance>.service-now.com/api/sn_devops/v1/devops/tool/te
st?toolId=<devops_ToolId>&testType=<performance_test_type>"
```

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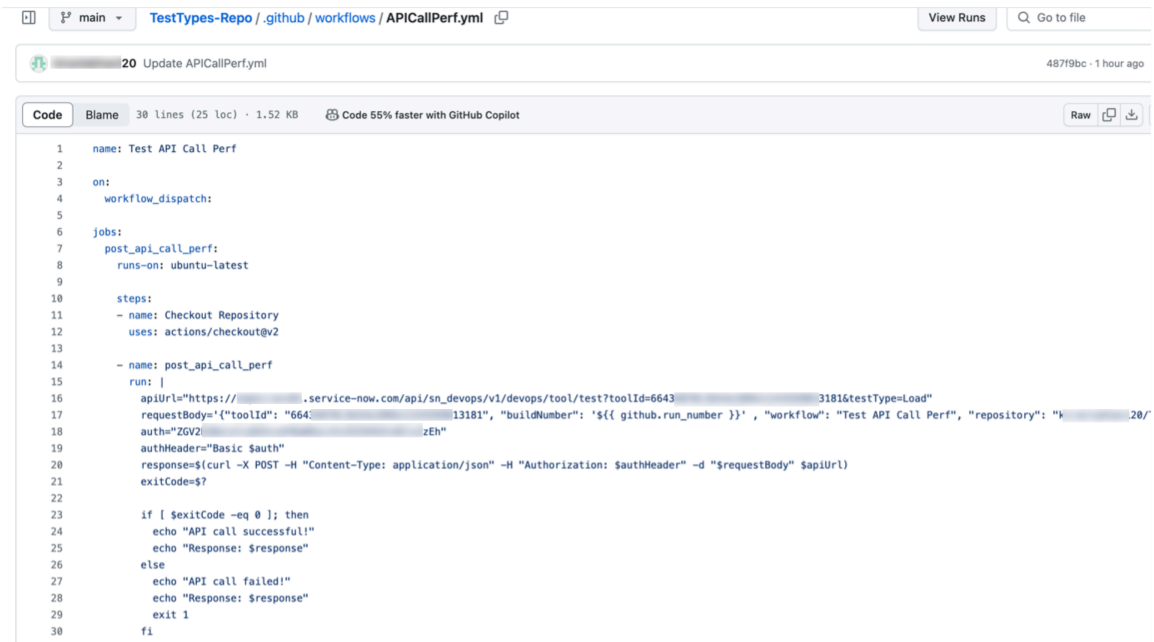
```
        requestBody='{"toolId": "<devops_ToolId>",
"buildNumber": '${{ github.run_number }}' , "workflow": "Test
API Call Perf", "repository": "<your_GitHub_repository>",
"stageName":"post_api_call_perf","pipelineName":"Test
API Call Perf", "testType": "Load", "buildNumber":
'${{ github.run_number }}', "buildId": '${{ github.run_id }}' ,
"attemptNumber" : '${{ github.run_attempt }}', "name":
"GitHub Test Summary - Performance 1.0","duration":
0.0,"maximumVirtualUsers": 10,"throughput":
"5/min","maximumTime": 1000,"minimumTime": 5000,"averageTime":
7000,"startTime": "2023-12-14T23:31:31z","finishTime":
"2023-12-14T23:31:31z","ninetyPercent": 8000,
"standardDeviation": 2.0 }'
        auth="devops.integration.user:<password> in base64
encoded"
        authHeader="Basic $auth"
        response=$(curl -X POST -H "Content-Type:
application/json" -H "Authorization: $authHeader" -d
"$requestBody" $apiUrl)
        exitCode=$?

        if [ $exitCode -eq 0 ]; then
          echo "API call successful!"
          echo "Response: $response"
        else
          echo "API call failed!"
          echo "Response: $response"
          exit 1
        fi
```




### Pipeline configuration for other functional and unit tests

Sample pipeline:

```
name: Test API Call

on:
```

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```
  workflow_dispatch:

jobs:
  post_api_call:
    runs-on: ubuntu-latest

    steps:
    - name: Checkout Repository
      uses: actions/checkout@v2

    - name: post_api_call
      run: |

 apiUrl="https://
<your_instance>.service-now.com/api/sn_devops/v1/devops/tool/te
st?toolId=<devops_ToolID>&testType=<test_type>"
        requestBody='{"toolId": "<devops_ToolID>",
 "buildNumber": '${{ github.run_number }}' , "workflow":
 "Test API Call", "repository": "<your_GitHub_repository>",
 "stageName":"post_api_call","pipelineName":"TestAPICall",
 "testType": "Smoke", "buildNumber":
 '${{ github.run_number }}', "buildId": '${{ github.run_id }}' ,
 "attemptNumber" : '${{ github.run_attempt }}',
 "testSummaries": [{"name": "GitHub Test Summary -
 smoke","passedTests": 1,"failedTests": 1,"skippedTests":
 1,"ignoredTests": 0,"blockedTests": 1,"totalTests":
 4,"startTime": "2023-12-14T23:31:31z","endTime":
 "2023-12-14T23:31:31z","duration": 0.0,"testType": "Smoke",
 "suites": []}] }'
        auth="devops.integration.user:<password> in base64
 encoded"

        authHeader="Basic $auth"
        response=$(curl -X POST -H "Content-Type:
 application/json" -H "Authorization: $authHeader" -d
 "$requestBody" $apiUrl)
        exitCode=$?

        if [ $exitCode -eq 0 ]; then
          echo "API call successful!"
          echo "Response: $response"
        else
          echo "API call failed!"
          echo "Response: $response"
          exit 1
        fi
```

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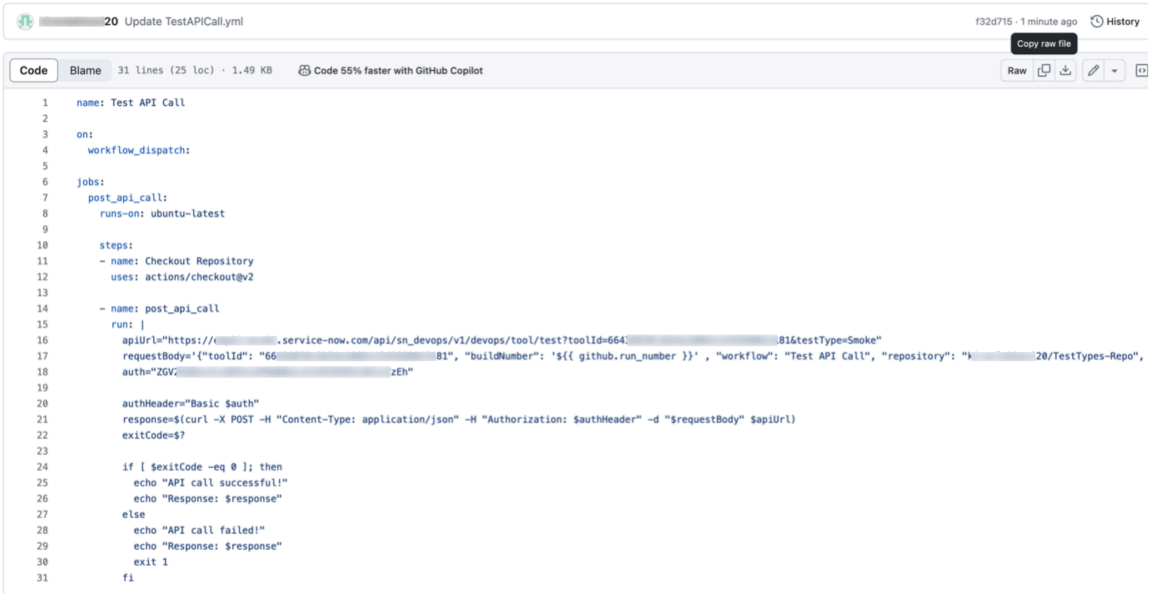


## Jenkins

For Jenkins pipelines, use the format given here to add test results to change requests for various test types.

### Pipeline configuration for performance tests

Sample pipeline:

```
pipeline {
    agent any
    stages {
        stage('POST API Call') {
            steps {
                script {
                    def apiUrl =
 'https://<your_instance>.service-now.com/api/sn_devops/v1/devo
ps/tool/test?toolId=<devops_ToolID>&testType=<performance_test_t
ype>'
                    def requestBody = [
                        name: "Performance Load tests jenkins",
                        duration: 0.0,
                        maximumVirtualUsers: 10,
                        throughput: "6/min",
                        maximumTime: 1000,
                        minimumTime: 300,
                        averageTime: 700,
                        ninetyPercent: 600,
                        standardDeviation: 2.0,
                        startTime: "2023-12-14T23:31:31z",
                        finishTime: "2023-12-14T23:40:32z",
                        buildNumber: env.BUILD_NUMBER,
                        stageName: "POST API Call",
                        pipelineName:
 "KLPerformanceTestPipeline"
                    ]
                    def auth = "<password>" //
 devops.integration.user:<password> in base64 encoded.
```

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```
                    def authHeader = "Basic " + auth
                    def response = httpRequest(
                        contentType: 'APPLICATION_JSON',
                        httpMode: 'POST',
                        requestBody:
groovy.json.JsonOutput.toJson(requestBody),
                        url: apiUrl,
                        customHeaders: [[name: 'Authorization',
value: authHeader]]
                    )

                    if (response.status == 200 ||
response.status == 201) {
                        echo "API call successful!"
                        echo "Response: ${response.content}"
                    } else {
                        error "API call failed with status
${response.status}"
                    }
                }
            }
        }
    }
}
```

**Pipeline**

Definition

Pipeline script

Script

```
pipeline {
    agent any

    stages {
        stage('POST API Call') {
            steps {
                script {
                    def apiUrl = 'https://          .service-now.com/api/sn_devops/v1/devops/tool/test?toolId=67091                    :9013152&testType=Load'
                    def requestBody = [
                        name: "Test summary Load Perf",
                        duration: 0.0,
                        maximumVirtualUsers: 10,
                        startTime: "2023-12-14T23:31:31z",
                        finishTime: "2023-12-15T23:31:31z",
                        throughput: "5/min",
                        maximumTime: 10000,
                        minimumTime: 5000,
                        averageTime: 7000,
                        ninetyPercent: 8000,
                        standardDeviation: 2.0,
                        buildNumber: env.BUILD_NUMBER,
                        stageName: "POST API Call",
                        pipelineName: "TestPipelineKL"
                    ]

                    def auth = "ZGV2b3                                    Eh" // devops.integration.user:<password> in base64 encoded.
                    def authHeader = "Basic " + auth

                    def response = httpRequest(
                        contentType: 'APPLICATION_JSON',
                        httpMode: 'POST',
                        requestBody: groovy.json.JsonOutput.toJson(requestBody),
                        url: apiUrl,
                        customHeaders: [[name: 'Authorization', value: authHeader]]
                    )

                    if (response.status == 200 || response.status == 201) {
                        echo "API call successful!"
                        echo "Response: ${response.content}"
                    } else {
                        error "API call failed with status ${response.status}"
                    }
                }
            }
        }
        stage('UAT deploy') {
            //stages {
              //  stage('UAT pre-prod deploy') {
                    steps {
                        snDevOpsChange()
                    }
              //  }
            // }
        }
    }
}
```

### Pipeline configuration for other functional and unit tests

Sample pipeline:

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```
pipeline {
    agent any

    stages {
        stage('POST API Call') {
            steps {
                script {
                    def apiUrl =
 'https://<your_instance>.service-now.com/api/sn_devops/v1/devo
ps/tool/test?toolId=<devops_ToolID>&testType=<test_type>'
                    def requestBody = [
                        name: "Smoke tests",
                        duration: 0.0,
                        passedTests: 1,
                        failedTests: 1,
                        skippedTests: 1,
                        blockedTests: 1,
                        totalTests: 4,
                        startTime: "2023-12-14T23:31:31z",
                     finishTime: "2023-12-15T23:31:31z",
                        buildNumber: env.BUILD_NUMBER,
                        stageName: "POST API Call",
                        pipelineName: "TestPipelineKL"
                    ]

                    def auth = "<password>" //
 devops.integration.user:<password> in base64 encoded.
                    def authHeader = "Basic " + auth

                    def response = httpRequest(
                        contentType: 'APPLICATION_JSON',
                        httpMode: 'POST',
                        requestBody:
 groovy.json.JsonOutput.toJson(requestBody),
                        url: apiUrl,
                        customHeaders: [[name: 'Authorization',
 value: authHeader]]
                    )

                    if (response.status == 200 ||
 response.status == 201) {
                        echo "API call successful!"
                        echo "Response: ${response.content}"
                    } else {
                        error "API call failed with status
 ${response.status}"
                    }
                }
            }
        }
    }
}
```

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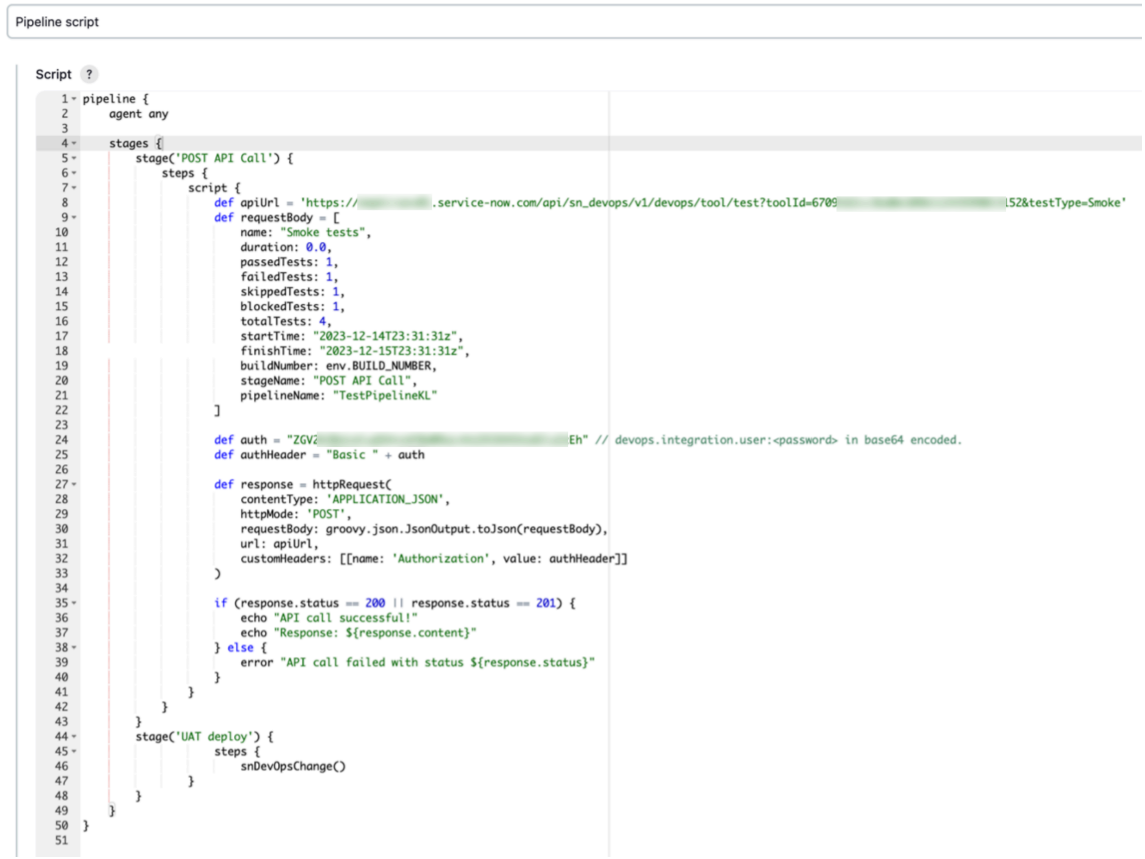


## Limitations of the test API

- Waiting logic will not be taken care of.
- Re-run scenarios cannot be handled.

### Add attachments to change requests using attachment API

Add test report xmls as attachments to DevOps change requests using the attachment API.

For more information about the API, see Attachment - POST /now/attachment/file.

The attachment API URL is:

`https://<your_instance>.service-now.com/api/now/attachment/file?table_name=change_request&table_sys_id=$(getServerChange.sys_id)&file_name=<attached_filename.xml>`, where

- table_name = 'change_request'
- table_sys_id = <chg record sys_id>
- file_name = Any name for the attachment

## Azure DevOps

### Prerequisites

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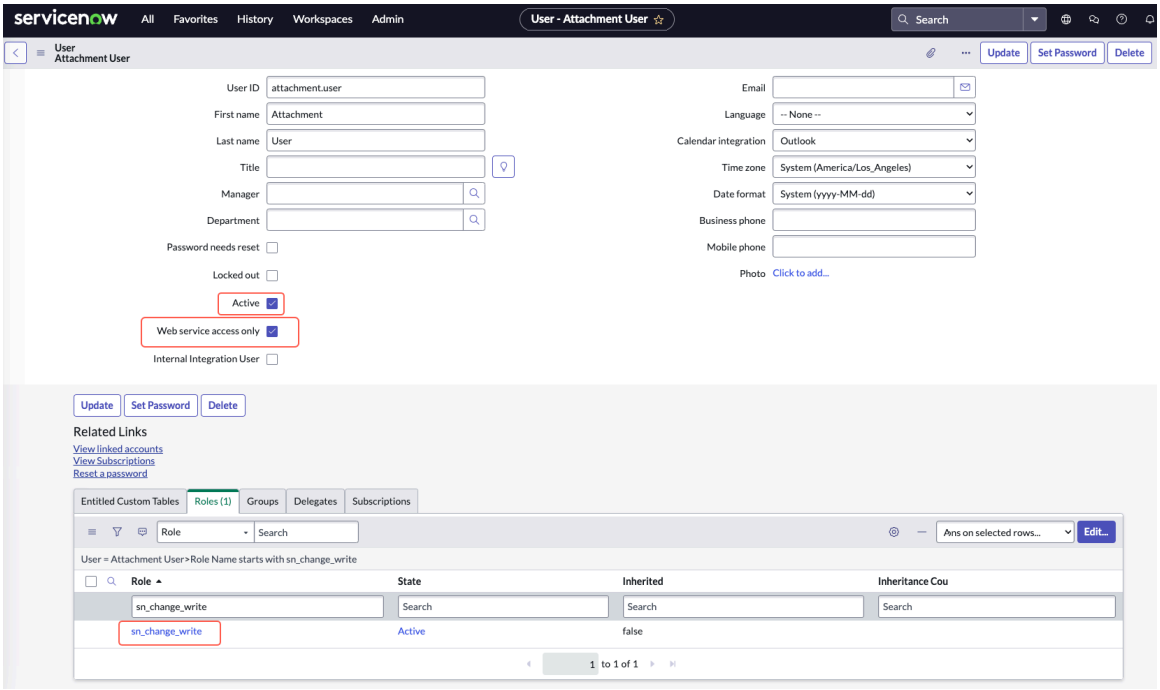
- Create an active user with the option **Web service access only** selected. For information on how to create a user, see Create a user.
- Assign the role **sn_change_write** to the user. For information on how to assign the role, see Assign a role to a user.




- The system property **sn_devops.enable_ado_generic_connection** must be enabled.
- While configuring your Azure DevOps project, to upload to chg. table, the generic connection used should have a user having the role **sn_change_write**.

For Azure DevOps pipelines, use the format given here to add attachments to change requests.

Sample pipeline:

```
stage: PostDeploy
    jobs:
      - job: 'pd1'
        pool: server
        steps:
            - task: ServiceNow-DevOps-Server-Get-Change@1
              inputs:
                connectedServiceName: 'v01-Software Quality
 Scans-ServiceNow DevOps Service Connection'
                projectName: '$(system.teamProject)'
                pipelineName: '$(build.definitionName)'
                stageName: 'Deploy'
                jobName: 'd1'
                buildNumber: '$(build.buildId)'
                branchName: '$(Build.SourceBranchName)'
              name: getServerChange
            - task: InvokeRESTAPI@1
              inputs:
                connectionType: 'connectedServiceName'
                serviceConnection: 'v01 - new'
```

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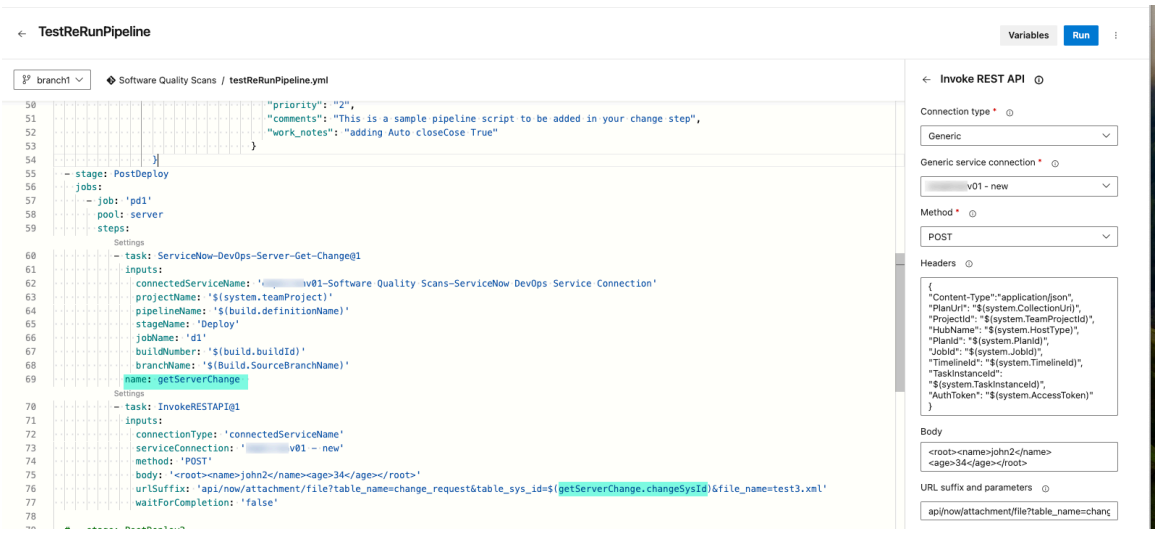
```
                method: 'POST'
                body:
 '<root><name>john2</name><age>34</age></root>'
                urlSuffix:
 'api/now/attachment/file?table_name=change_request&table_sys_
id=$(getServerChange.changeSysId)&file_name=test3.xml'
                waitForCompletion: 'false'
```




## GitHub

For GitHub pipelines, use the format given here to add attachments to change requests.

Sample pipeline:



```
change:
  needs: post_api_call
  runs-on: ubuntu-latest
  name: 'ServiceNow DevOps Change Automation'
  steps:
    - name: ServiceNow Change
      id: create_change
      uses: ServiceNow/servicenow-devops-change@dev
      with:
        # Devops Integration Token
        devops-integration-token: ${{ secrets.SN_DEVOPS_TOKEN }}
        # ServiceNow Instance URL
        instance-url: ${{ secrets.SN_INSTANCE_URL }}
        # Orchestration Tool Id
        tool-id: ${{ secrets.SN_ORCHESTRATION_TOOL_ID }}
        # GitHub Context
        context-github: ${{ toJSON(github) }}
        # Display Name of the Job
        job-name: 'ServiceNow DevOps Change Automation'
        change-request: '{"attributes":{"chg_model":{"name":"DevOps"}, "requested_by":{"name": "DevOps System"},"assignment_group":{"name": "Change management"},"priority": "2","comments": "This is a sample pipeline script to be added in
        # change-request: '{"attributes":{"chg_model":{"name":"DevOp"}}}'
        # You can specify the requested_by attribute either with name or sys_id. Example: "requested_by":{"name": "Test User"} or "requested_by": "62826bf03710200044e0bfc8bcbe5df1"
        # You can specify the assignment_group attribute either with name or sys_id. Example: "assignment_group":{"name": "Change Approval Team"} or "assignment_group": "5f721d93c0a8010e015533746de18bf9"
        # start_date: Enter the planned start date
        # end_date: Enter the planned end date
        abortOnChangeCreationFailure: false

    - name: Output of ServiceNow DevOps Change Automation
      run: |
        # echo 'Output of ServiceNow DevOps Change Automation is change-request-number = ${{ steps.create_change.outputs.change-request-number }}' >> $GITHUB_OUTPUT
        echo 'Output of ServiceNow DevOps Change Automation is change-request-sys-id = ${{ steps.create_change.outputs.change-request-sys-id }}' >> $GITHUB_OUTPUT
        curl -X POST \
          -H "Authorization: Basic ZG[redacted]SE=" \
          -H "Content-Type: application/xml" \
          -d '<root><name>john2</name><age>34</age></root>' \
          "https://[redacted].service-now.com/api/now/attachment/file?table_name=change_request&table_sys_id=${{ steps.create_change.outputs.change-request-sys-id }}&file_name=test113.xml"
```

**Attachment in the Change Request form in Now instance**:

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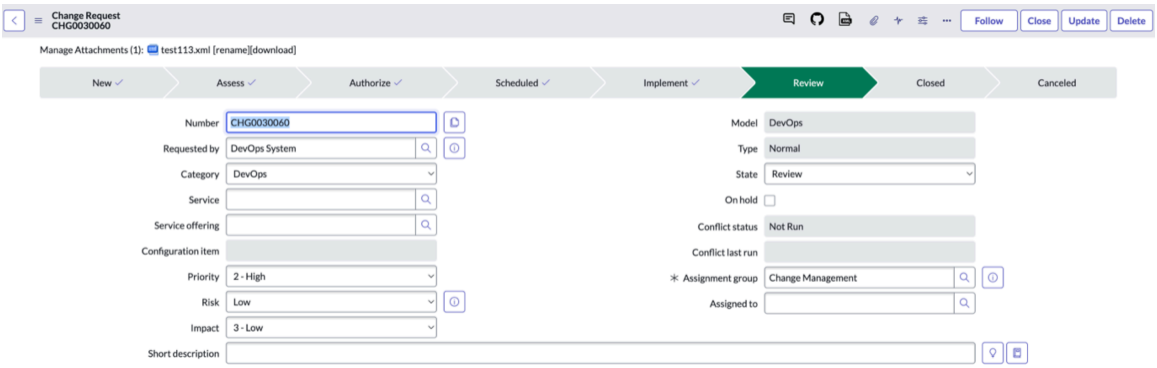


## Jenkins

For Jenkins pipelines, use the format given here to add attachments to change requests.

Sample pipeline:

```
pipeline {
    agent any

    stages {
        stage('POST API Call') {
            steps {
                script {
                    def apiUrl =
 'https://<your_instance>.service-now.com/api/sn_devops/v1/devo
ps/tool/test?toolId=<devops_ToolId>&testType=Smoke'
                    def requestBody = [
                        name: "Smoke tests",
                        duration: 0.0,
                        passedTests: 1,
                        failedTests: 1,
                        skippedTests: 1,
                        blockedTests: 1,
                        totalTests: 4,
                        startTime: "2023-12-14T23:31:31z",
                     finishTime: "2023-12-15T23:31:31z",
                        buildNumber: env.BUILD_NUMBER,
                        stageName: "POST API Call",
                        pipelineName: "TestPipelineKL"
                    ]

                    def auth = "<password>" //
 devops.integration.user:<password> in base64 encoded.
                    def authHeader = "Basic " + auth

                    def response = httpRequest(
                        contentType: 'APPLICATION_JSON',
                        httpMode: 'POST',
                        requestBody:
 groovy.json.JsonOutput.toJson(requestBody),
                        url: apiUrl,
                        customHeaders: [[name: 'Authorization',
 value: authHeader]]
                    )
```

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```
                    if (response.status == 200 ||
 response.status == 201) {
                        echo "API call successful!"
                        echo "Response: ${response.content}"
                    } else {
                        error "API call failed with status
 ${response.status}"
                    }
                }
            }
        }
        stage('UAT deploy') {
                    steps {
                        script {
                            def chg_output = snDevOpsChange()
                            def changeRequestNumber
 = snDevOpsGetChangeNumber(changeDetails:
 """{"build_number":"${env.BUILD_NUMBER}", "pipeline_name":
 "TestPipelineKL", "stage_name": "UAT deploy"}""")
                            echo "${changeRequestNumber}"
                            echo "Output of snDevOpsChange():
 ${chg_output}"
                    }
                }
        }
        stage('Example') {
            steps {
                script {
                    def API_URL =
 'https://<your_instance>.service-now.com/api/sn_devops/devops/o
rchestration/changeInfo?pipelineName=TestPipelineKL&toolId=<devo
ps_ToolId>&buildNumber=' + env.BUILD_NUMBER +
 '&stageName=UAT%20deploy'
                    def AUTH = 'Basic <password>'
                    // Call the API
                    def response = sh(script: "curl -X GET -H
 'Authorization: ${AUTH}' -H 'Content-Type: application/json'
 '${API_URL}'", returnStdout: true).trim()
                    echo "Response: ${response}"

                    // Store the JSON response into a variable
                    def slurper = new groovy.json.JsonSlurper()
                    def jsonResponse =
 slurper.parseText(response)
                    echo "Stored JSON Response: ${jsonResponse}"

                    // Store the specific field value from JSON
 response into a variable
                    def changeId = jsonResponse.result.sys_id
                    echo "Change ID: ${changeId}"

                    // Call the second API to post attachment
                    def xmlData =
 '<root><name>john2</name><age>34</age></root>'
                    def AUTH2 = 'Basic <password>='
                    def postResponse = sh(script:
 "curl -X POST -H 'Authorization: ${AUTH2}' -H
```

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```
 'Content-Type: application/xml' -d '${xmlData}'
 'https://<your_instance>.service-now.com/api/now/attachment/fi
le?table_name=change_request&table_sys_id=${changeId}&file_name=
test10111.xml'", returnStdout: true).trim()
                    }
                }
            }
        }
}
```



## Limitations of the attachment API

- The attachment xml file's text size should be acceptable to the orchestration tool.
- For Azure DevOps, *sn_change_write* role is needed for authentication of attachment API, to upload the file to the change record.

### DevOps user-created security tool integration

You can integrate additional security tools that are not supported in the base system in DevOps Change Velocity.

### Configure user-created security tool

Connect your custom security tool that is integrated with your CI/CD pipelines to DevOps Change Velocity to retrieve security scan results.

### Before you begin

You must create the application vulnerability integration by following the step-by-step instructions in the Configure DevOps with Application Vulnerability Response for better visibility into CI/CD pipeline [KB1441741] enablement guide. This is a required pre-requisite setup to onboard your custom security tool from DevOps Change Velocity.

Role required:

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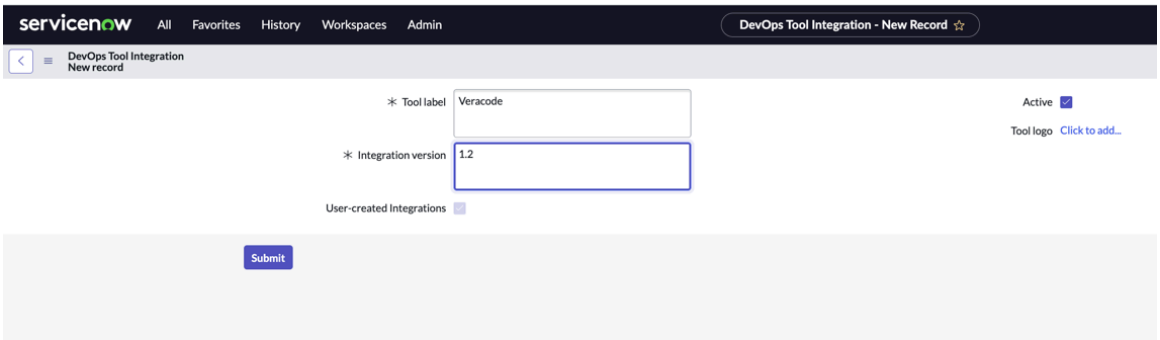
- Developer role for the scoped app
- DevOps admin role

**Note:**
When creating an integration as a scoped app, the system admin must assign these roles to the integration developer, so the integration developer is able to create tool integration and integration capability records for the specific scope.

### Procedure

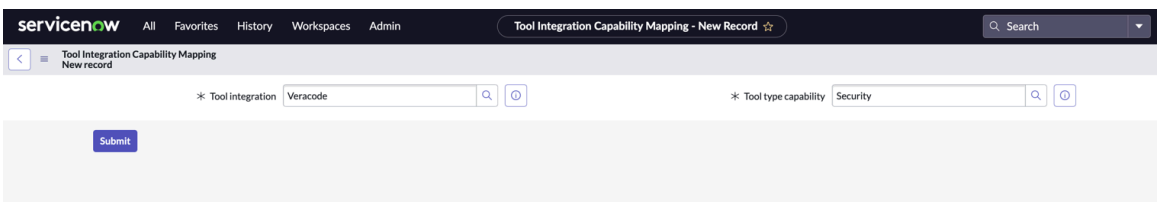
1. Navigate to **DevOps > Integrations > Tool Integrations** and create a record to define the tool you are integrating.
2. Select **New**, and enter the following values in the form fields.

| Field | Value |
|---|---|
| Tool label | Name of the tool integration. |
| Integration version | Version of the tool integration. |




3. Select **Submit**.
4. Open the newly created tool integration and navigate to the Tool Integration Capability Mappings related list.
5. Select **New**, and enter the following values in the form fields.

| Field | Value |
|---|---|
| Tool integration | Sample tool |
| Tool type capability | Security |




6. Select **Submit**.
7. Navigate to the Integration Capabilities related list, and select **New**.
8. Create the **Connect** and **Validate** records by entering the following values in the form fields.

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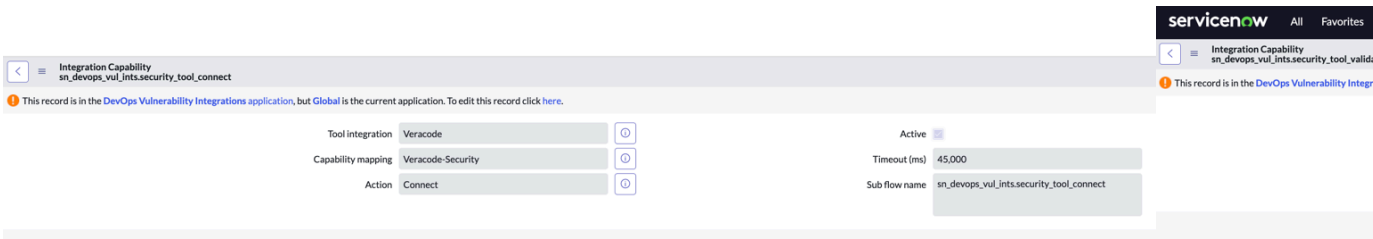
| Field | Value |
|---|---|
| Tool integration | Sample Code Tool |
| Capability mapping | Capability mapping record created in step 6. |
| Action | Connect<br>**Note:**<br>Do not edit tool action records. |
| Active | Selected |
| Timeout (ms) | Timeout for the corresponding subflow. If execution of the subflow exceeds this value, a timeout exception occurs. Value is in milliseconds (ms). Default is 45,000 (45 seconds). |
| Subflow name | ○ For Connect: sn_devops_vul_ints.security_tool_connect<br>○ For Validate: sn_devops_vul_ints.security_tool_validate |
| Domain | global |




9. Open the newly created tool integration record and add the **SecOps source integration** and **Integration handler** name fields to the form by navigating to **Configure > Form layout**. In the tool integration form, enter the following values for these fields.
   - SecOps source integration: Select the source integration that is created in the Third Party Integrations (sn_sec_int_integration) table as described in the **Configuration page > Steps to create a configuration** section in the Configure DevOps with Application Vulnerability Response for better visibility into CI/CD pipeline [KB1441741] enablement guide.
   - Integration handler name: sn_devops_vul_ints.DevOpsSecurityToolIntegrationHandler
10. Ensure that "Tool Integration name" DevOps Integration (example: Veracode DevOps Integration) is created in the Application Vulnerability Integration (sn_vul_app_integration) table and mapped to the source integration that is created in the Third Party Integrations (sn_sec_int_integration) table as described in the **Configuration page > Steps to create a configuration** section in the Configure DevOps with Application Vulnerability Response for better visibility into CI/CD pipeline [KB1441741] enablement guide.

### What to do next

By default, when you onboard your tool from workspace, you have to enter the mandatory fields as defined in the Configuration Page section in the Configure DevOps with Application Vulnerability Response for better visibility into CI/CD pipeline [KB1441741] enablement guide. Not all the mandatory fields are credential fields. In the base system, all the mandatory fields are displayed while updating credentials. If you want to update the credentials for this tool when the

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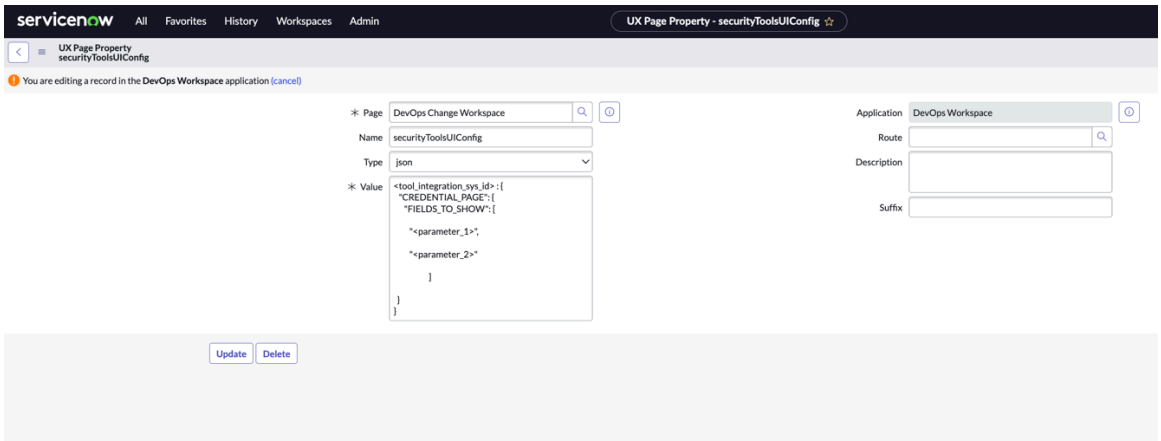
credentials have expired, you may not want to enter all the mandatory fields. To configure the mandatory fields that you want to show in the Update credentials page, perform the following steps.

1. Navigate to **Now Experience Framework > Experiences**.
2. Select **DevOps Change Workspace**.
3. On the UX Page Properties related list, select **securityToolsUIConfig**.
4. Add the following entry to the JSON.

```
<tool_integration_sys_id> : {
   "CREDENTIAL_PAGE": {
      "FIELDS_TO_SHOW": [
          "<parameter_1>",
          "<parameter_2>"
                    ]
  }
}
```




## Integrate security tools with GitLab

Configure security tool for GitLab which is not supported in the base system.

### Before you begin

Role required: sn_devops.admin

### Procedure

1. Navigate to **DevOps > Integrations > Tool Integrations** and open the GitLab orchestration tool integration record.
2. Navigate to the Tool Integration Capability Mappings related list.
3. Select **New**, and enter the following values in the form fields.

| Field | Value |
|---|---|
| Tool integration | GitLab |
| Tool type capability | Security |

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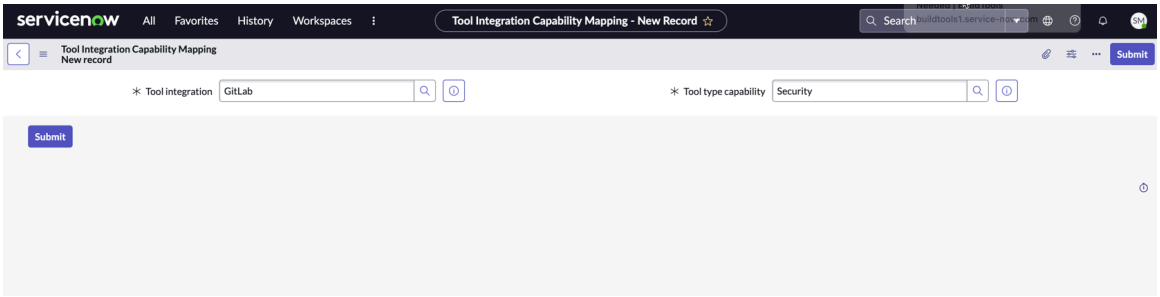
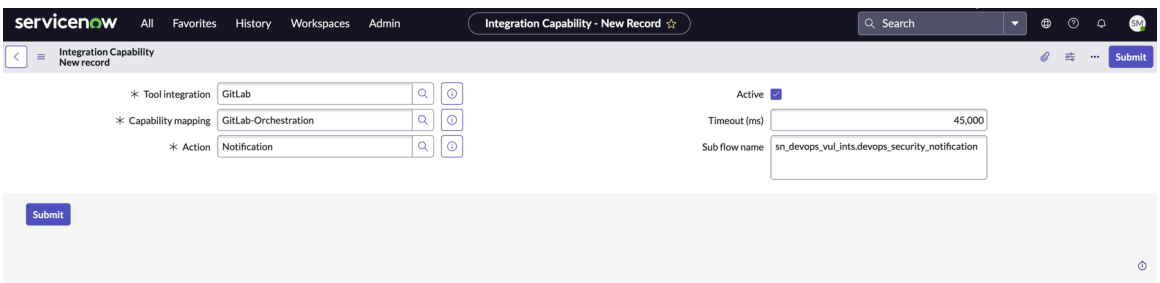



4. Select **Submit**.
5. Navigate to the Integration Capabilities related list, and select **New**.
6. Enter the following values in the form fields.

| Field | Value |
|---|---|
| Tool integration | GitLab |
| Capability mapping | Capability mapping record created in step 4. |
| Action | Notification<br>**Note:**<br>Do not edit tool action records. |
| Active | Selected |
| Timeout (ms) | Timeout for the corresponding subflow. If execution of the subflow exceeds this value, a timeout exception occurs. Value is in milliseconds (ms). Default is 45,000 (45 seconds). |
| Subflow name | sn_devops_vul_ints.devops_security_notification |
| Domain | global |




**Note:**
Deactivate the *BR Seeded tool integrations not editable* business rule to integrate security tools with GitLab.

7. Modify the *sn_devops_ints.DevOpsGitLabIntegrationHandler* script include by navigating to **System definitions > Script include**, and searching for the *DevOpsGitLabIntegrationHandler* script.
   a. Modify the handleEvent method to process the security scan results from the GitLab pipeline. Ensure that your security stage name in your GitLab pipeline is same as the name you update in the VERACODE_STAGE_NAME, CMARX_ONE_STAGE_NAME, or

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CMARX_SAST_STAGE_NAME variable in the handleEvent method. Replace the handleEvent method code with the following code snippet.

```
handleEvent: function(eventGr) {
   try {
       var renameHandler = new
sn_devops.DevOpsPipelineRenameHandler(this.refTable,
this.appContext, this.relatedRecord);
       renameHandler.handlePipelineRename(eventGr);
       var payload =
JSON.parse(eventGr.getValue("original_payload"));
       this._logger.debug("typeof payload >>" + typeof
payload);
       if (!gs.nil(payload) && typeof payload === 'object')
{
           var status =
this.getTaskExecutionStatus(payload);
           this._logger.debug("Task Execution status -> " +
status);
           if (gs.nil(status))
               this.updateInboundEvent(eventGr, {
                   processing_details: gs.getMessage('Task
execution status [{0}] is not handled',
payload.build_status),
                   state:
sn_devops.DevOpsCommonConstants.INBOUND_EVENT_STATE_IGNORED
               });
           else {
               // create fake start event for cancelled job
               if (status == 'cancelled') {
                   this.createFakeEvent(eventGr, payload,
'running');
               }
               var normalizedObject = {};
               normalizedObject.taskExecution =
this.getTaskExecutionObject(eventGr, payload, status);
               normalizedObject.orchestrationTask =
this.getOrchestrationTaskObject(normalizedObject.taskExecuti
on, payload);
               normalizedObject.callback =
this.getCallbackObject(normalizedObject.taskExecution,
payload);
               var devopsUtil = new
sn_devops.DevOpsUtil(this.refTable, this.appContext,
this.relatedRecord);
               normalizedObject =
devopsUtil.schemaValidationForTransformedPayload(normalizedO
bject);
               var VERACODE_STAGE_NAME = 'SN_VERACODE';
               var CMARX_ONE_STAGE_NAME =
'SN_CMARX_ONE_STAGE_NAME';
               var CMARX_SAST_STAGE_NAME =
'SN_CMARX_SAST_STAGE_NAME';
               if (!gs.nil(payload.build_stage) &&
                   (
                       payload.build_stage ==
VERACODE_STAGE_NAME ||
```

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```
                        payload.build_stage ==
 CMARX_ONE_STAGE_NAME ||
                        payload.build_stage ==
 CMARX_SAST_STAGE_NAME
                    )
                    &&
 this.isCompleted(normalizedObject.taskExecution)) {
                    var queryParams =
 sn_devops.DevOpsQueryParamsHelper.convertToSingular(JSON.par
se(eventGr.getValue('query_params')));
                    if
 (gs.nil(normalizedObject.taskExecution.securityScan)) {

 normalizedObject.taskExecution.securityScan = {
                            securityScanSummaryCount: 0
                        };
                    }

 normalizedObject.taskExecution.securityScan.securityScanSumm
aryCount += 1;
                }
                this._logger.debug("Normalized Object: " +
 JSON.stringify(normalizedObject));
                return JSON.stringify(normalizedObject);
            }
        } else
            this.updateInboundEvent(eventGr, {
                processing_details: gs.getMessage('Payload is
 missing or invalid'),
                state:
 sn_devops.DevOpsCommonConstants.INBOUND_EVENT_STATE_ERROR
            });
    } catch (error) {
        throw
 sn_devops.DevOpsErrorHelper.createDevOpsScriptIncludeError(e
rror,
 sn_devops_ints.DevOpsIntegrationsCommonMessages.GITLAB_INBOU
ND_EVENT_PROCESS_ISSUE,
 "DevOpsGitLabIntegrationHandler.handleEvent",
 "handleEvent");
    }
},
```

In the following examples the GitLab pipeline shows that the security stage name is same as the VERACODE_STAGE_NAME, CMARX_ONE_STAGE_NAME, or CMARX_SAST_STAGE_NAME variables respectively in the handleEvent method.

VERACODE_STAGE_NAME is for Veracode.

```
image: maven:latest
stages:
  - build
  - SN_VERACODE
  - Deploy

build_1:
  stage: build
```

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```
  tags:
    - local-runner1
  script:
    - echo "build"

security_test:
  stage: SN_VERACODE
  tags:
    - local-runner1
  script:
    - |
      curl
 "https://<instance>.service-now.com/api/sn_devops/v1/devo
ps/tool/security?toolId=<gitlab_tool_sys_id> " \
        --request POST \
        --header "Accept:application/json" \
        --header "Content-Type:application/json" \
        --data "{
              \"pipelineInfo\": {
                \"buildNumber\": \"${CI_JOB_ID}\",
                \"taskExecutionUrl\": \"${CI_JOB_URL}/\"
              },
              \"securityResultAttributes\": {
                \"scanner\": \"Veracode\",
                \"applicationName\": \"Application\"
              }
            }" \
        --user 'devops.system':’password’
```

CMARX_ONE_STAGE_NAME is for Checkmarx One.

```
image: maven:latest
stages:
  - build
  - SN_CMARX_ONE_STAGE_NAME
  - Deploy

build_1:
  stage: build
  tags:
    - local-runner1
  script:
    - echo "build"

security_test:
  stage: SN_CMARX_ONE_STAGE_NAME
  tags:
    - local-runner1
  script:
    - |
      curl
 "https://<instance>.service-now.com/api/sn_devops/v1/devo
ps/tool/security?toolId=<gitlab_tool_sys_id> " \
        --request POST \
        --header "Accept:application/json" \
        --header "Content-Type:application/json" \
```

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```
        --data "{
              \"pipelineInfo\": {
                \"buildNumber\": \"${CI_JOB_ID}\",
                \"taskExecutionUrl\": \"${CI_JOB_URL}/\"
              },
              \"securityResultAttributes\": {
                \"scanner\": \"Checkmarx One\",
                \"projectId\": \"projectId\",
                \"scanId\": \"scanId\",
              }
            }" \
        --user 'devops.system':'password'
```

CMARX_SAST_STAGE_NAME is for Checkmarx SAST.

```
image: maven:latest
stages:
  - build
  - SN_CMARX_SAST_STAGE_NAME
  - Deploy

build_1:
  stage: build
  tags:
    - local-runner1
  script:
    - echo "build"

security_test:
  stage: SN_CMARX_SAST_STAGE_NAME
  tags:
    - local-runner1
  script:
    - |
      curl
 "https://<instance>.service-now.com/api/sn_devops/v1/devo
ps/tool/security?toolId=<gitlab_tool_sys_id> " \
        --request POST \
        --header "Accept:application/json" \
        --header "Content-Type:application/json" \
        --data "{
              \"pipelineInfo\": {
                \"buildNumber\": \"${CI_JOB_ID}\",
                \"taskExecutionUrl\": \"${CI_JOB_URL}/\"
              },
              \"securityResultAttributes\": {
                \"scanner\": \"Checkmarx\",
                \"projectId\": \"projectId\"
              }
            }" \
        --user 'devops.system':'password'
```

**b.** Add the getPipelineWithSecurityEventPayload method to the DevOpsGitLabIntegrationHandler script.

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```
getPipelineWithSecurityEventPayload: function(payload) {
        var gr = new
 GlideRecordSecure('sn_devops_task_execution');
        gr.addEncodedQuery("execution_url=" +
 payload.pipelineInfo.taskExecutionUrl);
        gr.query();
        var task = null;
        if (gr.next()) {
            task = gr;
        }
        if (gs.nil(task) || gs.nil(task.orchestration_task)
 || gs.nil(task.orchestration_task.step)) {
            throw "Pipeline Info not found";
        }
        var step =
 task.orchestration_task.step.getRefRecord();
        var pipelineDAO = new sn_devops.DevOpsPipelineDAO();
        var query = 'sys_id=' + step.pipeline;
        var pipeline =
 pipelineDAO.getLimitedRecordsByEncodedQuery(query);
        return pipeline;
    },
```

### DevOps user-created orchestration tool integration

Integrate DevOps Change Velocity with any orchestration tool that is not supported in the base system.

If the orchestration tool your organization uses isn't provided in the base system, you can create an orchestration tool integration on your own. There are two ways in which you can create the integration.

- Using transform scripts. See the Now Support Knowledge Base [KB1794252] article for more information.
- Using subflows and actions. See the Now Support Knowledge Base [KB1638410] article for more information.

### Create a DevOps tool integration

To create a DevOps tool integration, your integration developer configures DevOps tool integration settings, and a Flow Designer subflow to collect and transform data from the source tool. Then your DevOps admin configures your DevOps tool connections.

#### Before you begin

**Note:**
When creating an integration as a scoped app, the system admin must assign these roles to the integration developer so the integration developer is able to create tool integration and integration capability records for the specific scope.

- Developer role for the scoped app
- DevOps admin role

Role required: sn_devops.admin

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### About this task

Creating a DevOps tool integration procedure involves configuration by both your integration developer and your DevOps admin.

- Your integration developer creates a tool integration record in DevOps, a Flow Designer subflow, a tool capability mapping, and an integration capability record in DevOps to map the capabilities and actions together.

  **Note:**
  Notification, connect, and discover capabilities are supported.

- Your DevOps admin sets up DevOps connections (planning or coding tool), and configures the source tool with the webhook and credentials.

This procedure provides detailed steps to create your DevOps tool integration.

### Procedure

1. Integration developer:
   Configure the source tool integration capabilities and actions, and a subflow.

   a. Navigate to **DevOps** > **Integrations** > **Tool Integrations** and create a record to define the tool you are integrating (source tool).

   **Note:**
   Do not edit the tool integration records provided with the DevOps application.

   **DevOps tool integration**

   | | |
   |---|---|
   | Tool label | Sample Code Tool |
   | Table | Code Tool [sn_devops_tool] |
   | Use packageable integrations | Selected |
   | Integration version | 1.0 |
   | Active | Selected |

   b. Navigate to **Flow Designer** > **Designer** and create a subflow to collect and transform data from the tool you are integrating (source tool).

   **Note:**
   The **Run As** field must be set to System User, and the **Inputs** label must be set to current variable.

   **Notification subflow properties**

   | | |
   |---|---|
   | Name | Code Tool Notification |
   | Application | Sample Integration App |
   | Accessible From | All application scopes |
   | Description | Code tool for integration app |
   | Run As | System User |

   The subflow must contain Get More Data via API calls, and/or transform the original payload. Copy the transformed payload into the inbound events record.

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**Note:**
Do not edit the DevOps main flow.

**c.** Navigate to **DevOps** > **Integrations** > **Tool Capability Mappings** and create a record to map the tool integration record to the tool type capability.

**DevOps tool capability mapping**

| | |
|---|---|
| Tool integration | Sample tool |
| Tool type capability | Code |

**d.** Navigate to **DevOps** > **Integrations** > **Integration Capabilities** and create a record to specify the action for the tool capability mapping.

**Note:**
Do not edit the integration capability records provided with the DevOps application.

**DevOps integration capability**

| | |
|---|---|
| Tool integration | Sample Code Tool |
| Capability mapping | Sample Code Tool-Code<br>**Note:** Do not edit tool type capability records. |
| Action | Notification<br>**Note:** Do not edit tool action records. |
| Active | Selected |
| Timeout (ms) | Timeout for the corresponding subflow. If execution of the subflow exceeds this value, a timeout exception occurs.<br>Value is in milliseconds (ms). Default is 45,000 (45 seconds). |
| Subflow name | x_snc_sample_integ.code_tool_notification<br>The name is prefixed by the scope name and a dot (.) before the actual subflow name.<br>For example, given:<br>▪ `connect_code_tool` subflow<br>▪ `my_app_scope` scope<br>The value for this field is `my_app_scope.connect_code_tool`. |

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| | |
|---|---|
| | **Note:** If the **Subflow name** field is left blank for a Notification capability, default handling of notifications occurs.<br><br>See Notification tool capability action. |
| Domain | global |

2. DevOps admin:

   Configure the connection from DevOps to the source tool.

   a. The tool record must contain:
      - Reference to the tool integration record created by the integration developer (in the **Tool** field)
      - Tool label
      - Connection alias (connection and credential)

   b. Copy the notification (webhook) created on the DevOps planning tool to the source tool service hook of the notification endpoint and set the credentials to devops.integration.user.

   You can view the state of integration events in the Inbound Event list (**DevOps** > **Administration** > **Inbound Events**).

   The inbound event record state is set to **Processed** once the object has been inserted into the DevOps Core table. Event states include New, In Progress, Processed, Unmatched, and Error.

3. If the tool integration record and the subflow are created in a different scope, the DevOps admin must create two new Cross scope privileges records to allow the app to access the inbound events table.
   Navigate to **System Applications** > **Application Cross-Scope Access** and create read and write cross scope privileges records to allow your app to access the inbound events table.

| Field | Read | Write |
|---|---|---|
| Source Scope | Auto populated based on the current application | |
| Target Scope | DevOps | |
| Target Name | sn_devops_inbound_event | |
| Target Type | Table | |
| Operation | Read | Write |
| Status | Allowed | |

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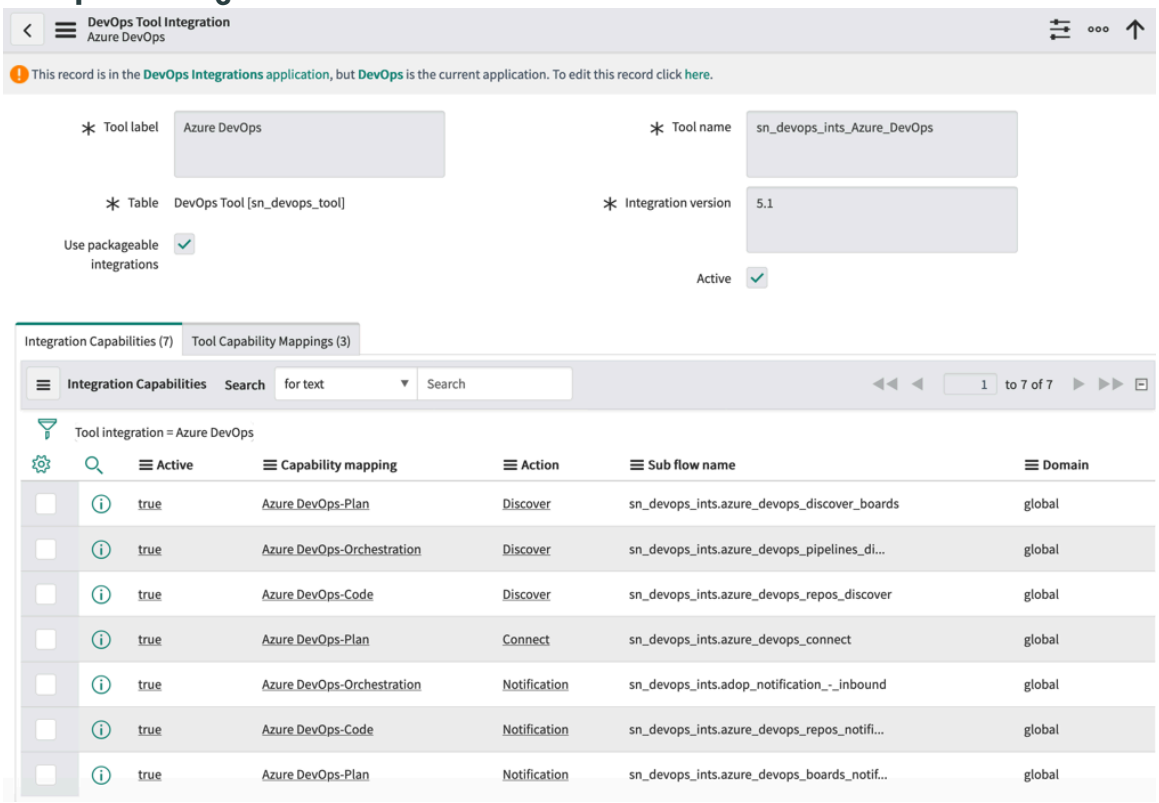
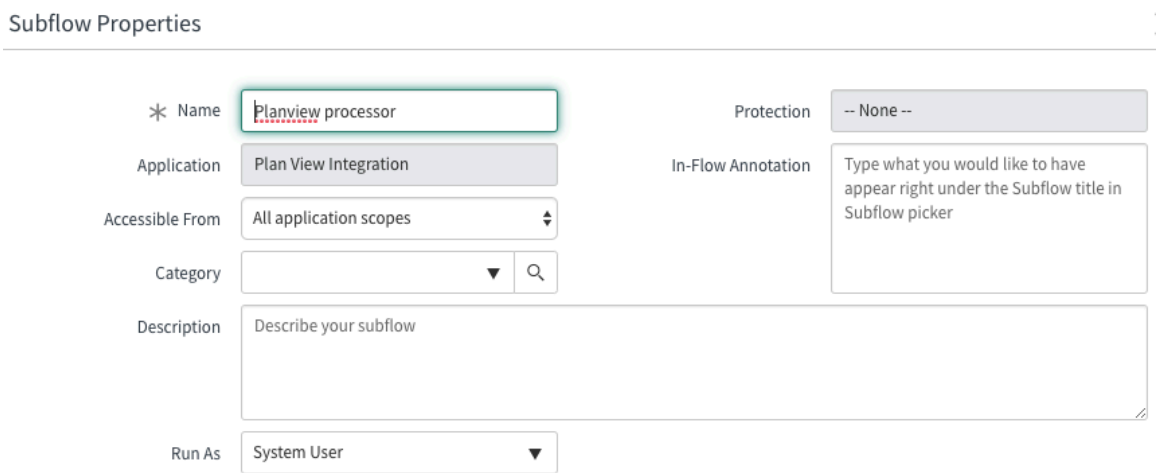
## Example:

### DevOps tool integration




### Flow Designer subflow properties

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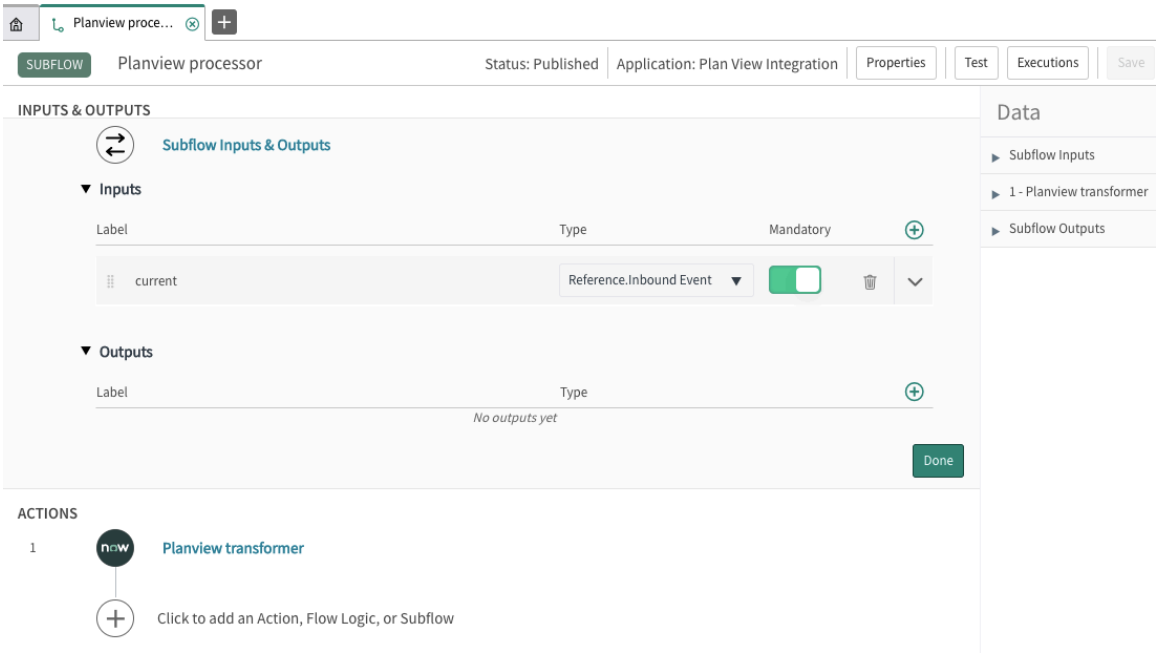
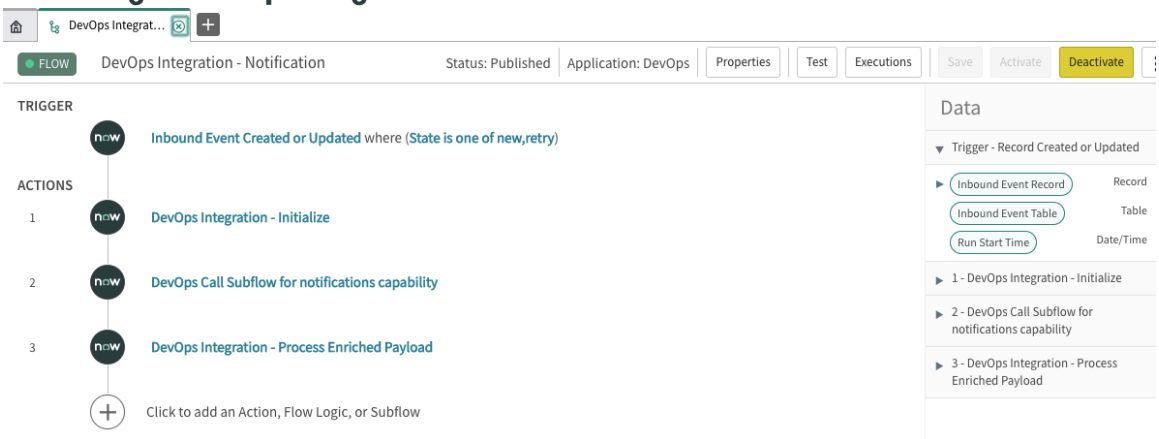
## Flow Designer subflow




## Flow Designer DevOps Integration - Notification flow

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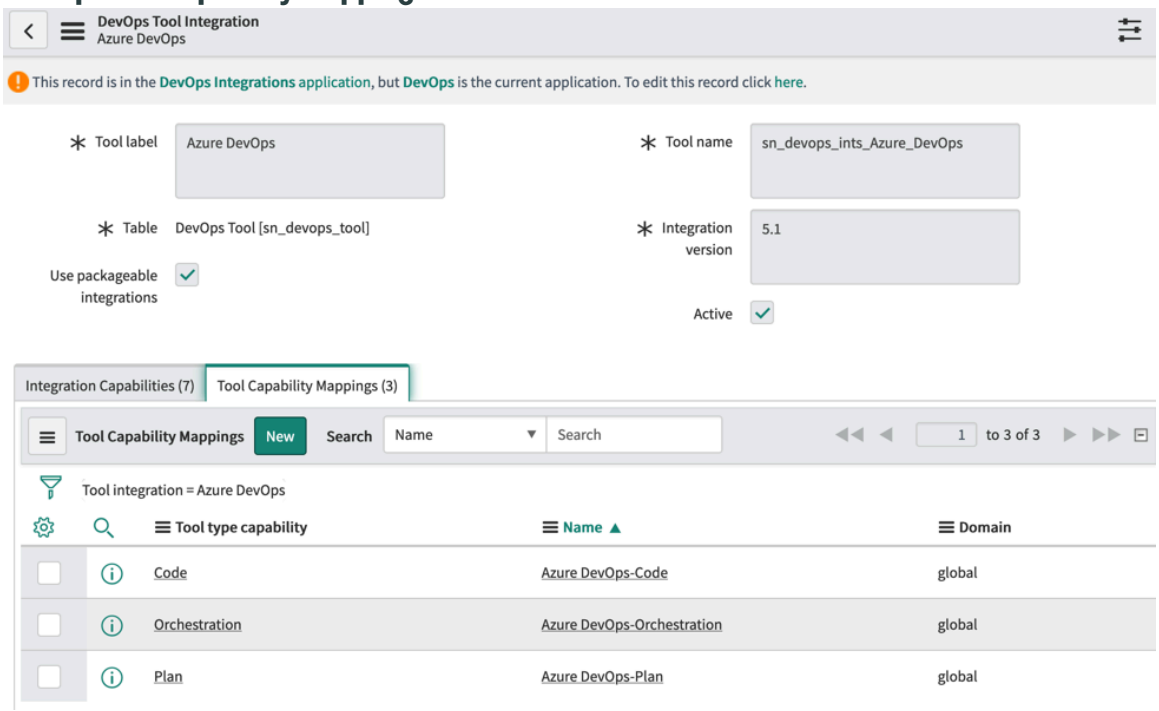
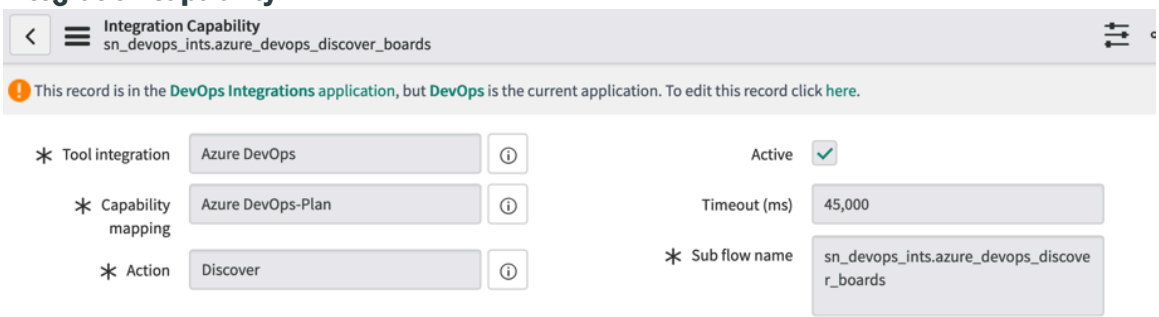
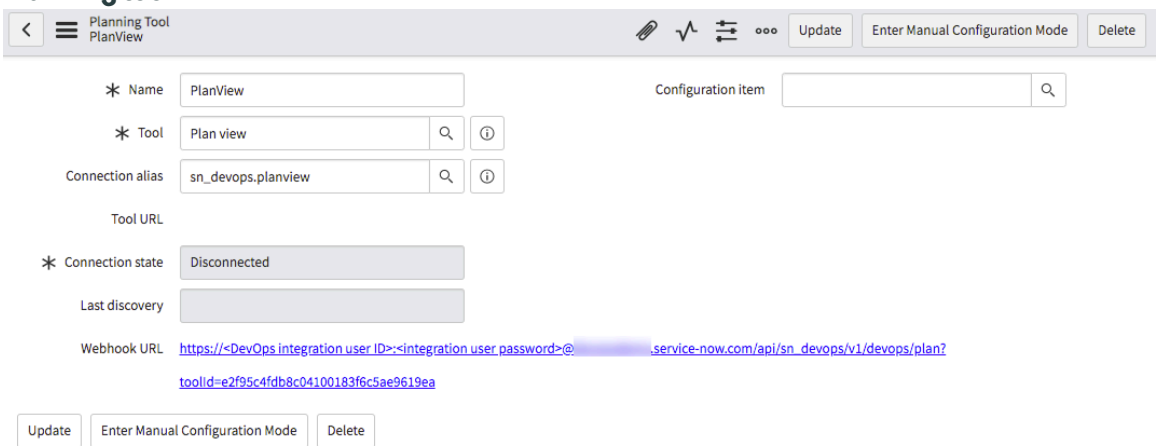
## DevOps tool capability mapping




## Integration capability




## Planning tool

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**Cross scope access records (read and write)**




### Creating DevOps subflows

For user-created integrations, create a DevOps Flow Designer subflow to collect and transform data from the tool you are integrating.

ServiceNow Flow Designer is a ServiceNow AI Platform feature your integration developer can use to automate processes using a sequence of actions. Trigger conditions start the flow, and variables pass information between actions.

See Flow Designer Subflows for information on how to create a subflow.

## Notification capability subflow

| Item | Expected value |
|---|---|
| Inputs | Label: current<br>Type: Reference.Inbound Event |
| Outputs | N/A |

Transform the original payload, and save the final payload in the **transformed_payload** field.

**Expected standard JSON Notification capability payload - Planning tool**

**Note:**
The version attribute in the JSON payload is optional. Even if you do not provide the version attribute, the payload is processed successfully.

```
{
  "id": "STR1234",
  "type": "Story",
  "shortDescription": "Planning API Spec",
  "state": "In-progress",
  "createdDateTime": "1970-01-01T08:15:30-05:00",
  "assignedTo": {
    "name": "Leo Neo",
    "userName": "lenn",
    "id": "3fa85f64-5717-4562-b3fc-2c963f66afa6",
    "email": "lenn@smithworksinc.com"
  },
// The Version attribute is optional
  "version": {
      "id": "REL1234",
      "shortDescription": "APIs Release",
      "createdDateTime": "1970-01-01T08:15:30-05:00",
```

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```
      "app": {
          "id": "PRODUCT1234",
          "shortDescription": "Mobile UI",
          "createdDateTime":
 "1970-01-01T08:15:30-05:00",
          "url":
 "https://jira.com/mycompany/browse/PRODUCT-125"
        },
      "url":
 "https://jira.com/mycompany/browse/REL-125"
    },
  "app": {
      "id": "PRODUCT1234",
      "shortDescription": "Mobile UI",
      "createdDateTime": "1970-01-01T08:15:30-05:00",
      "url":
 "https://jira.com/mycompany/browse/PRODUCT-125"
    },
  "url": "https://jira.com/mycompany/browse/HALOKEY-25"
}
```


**Expected standard JSON Notification capability payload - Coding tool**


```
{
  "id": "3fa85f64-5717-4562-b3fc-2c963f66afa6",
  "url":
 "https://github.com/mycompany/mobileplatform/commit/3f
a85f6457174562b3fc2c963f66afa6",
  "committedDate": "1970-01-01T08:15:30-05:00",
  "repository": {
    "name": "Platform-Mobile",
    "url":
 "https://github.com/mycompany/mobileplatform"
  },
 "branch": {
    "name": "master",
    "path": "refs/heads/master"
  },
  "committer": {
    "email": "lenn@smithworksinc.com"
  },
  "details": [
    {
      "additions": 0,
      "deletions": 0,
      "totalChanges": 0,
      "file":
 "src/test/java/com/mycompany/app/App.java",
      "action": "modified",
      "changes":
 "%40%40%20-30%2C6%20%2B30%2C18%20%40%40%20public%20v
oid%20testAppConstructor%28%29%20%7B%0A
%20%20%20%20%20%20%20%20%20%20%7D%0A%20%20%20%20%20%7D%0A
%20%0A%2B%20%20%20%20%40Test%0A%2B
%20%20%20%20public%20void%20testDatabase%28%29%0A%2B
%20%20%20%20%7B%0A%2B
%09%2F%2FThis%20is%20a%20test%20function%0A%2B
```


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```
%20%20%20%20%20%20%20%20App.main%28null%29%3B%0A%2B
%20%20%20%20%20%20%20%20try%20%7B%0A%2B
%20%20%20%20%20%20%20%20%20%20%20%20assertEquals%28%22H
ello%20World%21%22%20%2B%20System.getProperty%28%22line
.separator%22%29%2C%20outContent.toString%28%29%29
%3B%0A%2B
%20%20%20%20%20%20%20%20%7D%20catch%20%28AssertionEr
ror%20e%29%20%7B%0A%2B
%20%20%20%20%20%20%20%20%20%20%20%20fail%28%22%22mess
age%22%20is%20not%20%22Hello%20World%21%22%22%29%3B%0A
%2B%20%20%20%20%20%20%20%20%7D%0A%2B%20%20%20%20%7D%0A
%2B%0A%20%20%20%20%20%40Test%0A
%20%20%20%20%20public%20void%20testAppMain%28%29%0A%20%
20%20%20%20%7B"
    }
  ]
}
```

**Expected standard JSON Notification capability payload - Orchestration tool**

```
{
  "toolId": "bc1d9454dbdb0810ae77f3c61d9619d1",
  "buildNumber": "100",
  "nativeId": "HILR/Prod #100",
  "name": "HILR/Prod",
  "id": "HILR/Prod #100",
  "url":
 "https://dev.azure.com/lenn/CorpSite-ADO/_build/resul
ts?buildId=100#Prod/",
  "isMultiBranch": "false",
  "orchestrationTaskUrl":
 "https://dev.azure.com/lenn/CorpSite-ADO/_build?name=H
ILR#Prod",
  "orchestrationTaskName": "CorpSite-ADO/HILR#Prod",
  "upstreamTaskUrl":
 "https://dev.azure.com/lenn/CorpSite-ADO/_build/resul
ts?buildId=100#UAT/",
  "upstreamId": "CorpSite-ADO/HILR#UAT",
  "result": "building",
  "startDateTime": "2020-03-20 22:59:27"
}
```

**Expected standard JSON Notification capability payload - Test tool**

Functional:

```
{
"name": "CorpSite-selenium#55",
"duration": 78.802,
"passedTests": 4,
"failedTests": 0,
"skippedTests": 0,
"blockedTests": 0,
"totalTests": 4,
"startTime": "2020-06-30T18:12:31Z",
"finishTime": "2020-06-30T18:12:31Z",
"passingPercent": 100,
```

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```
// Use Artifact OR Package OR Build + Stage +
 PipelineName Attributes
"packages": [{"name": "CorpSite-pkg1"}],
"artifacts": [{"name": "CorpSite-artifact", "version":
 "1.0.0"}],
"buildNumber": "55",
"stageName": "test",
"pipelineName": "CorpSite-selenium",
}
```

Performance:

```
{
"name": "Performance Tests",
"url": "http://abc.com",
"startTime": "2020-06-30T18:12:31Z",
"finishTime": "2020-06-30T18:12:31Z",
"duration": 78.802,
"maximumVirtualUsers": "",
"throughput": "",
"maximumTime": "",
"minimumTime": "",
"averageTime": "",
"ninetyPercent": "",
"standardDeviation": "",

// Use Artifact OR Package OR Build + Stage +
 PipelineName Attributes
"packages": [{"name": "CorpSite-pkg1"}],
"artifacts": [{"name": "CorpSite-artifact", "version":
 "1.0.0"}],
"buildNumber": "55",
"stageName": "test",
"pipelineName": "CorpSite-Performance",
}
```

**Expected standard JSON Notification capability payload - Artifact tool**

Pipelines:

```
{
  "artifacts": [
    {
      "name": "acm.jar",
      "version": "1.82",
      "semanticVersion": "1.82.0",
      "repositoryName": "acm-repo"
    }
  ],
  "pipelineName": "testMultiBranch/master",
  "taskExecutionNumber": "82",
  "stageName": "buildmbmaster",
  "branchName": "master"
}
```

Jenkins Freestyle/Maven Project:

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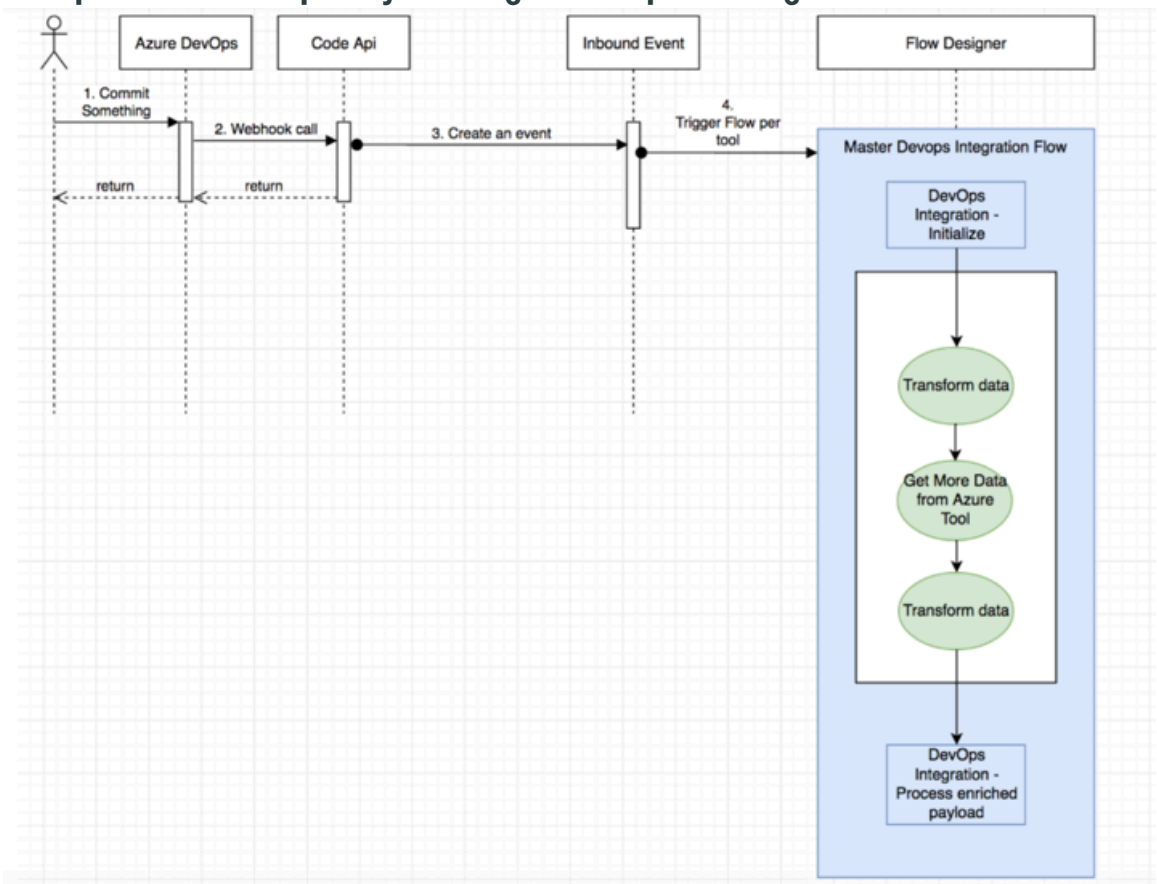
```
{
  "artifacts": [
    {
      "name": "mav1.jar",
      "version": "1.11",
      "semanticVersion": "1.11.0",
      "repositoryName": "mav-repo"
    }
  ],
  "projectName": "maven-test-proj",
  "taskExecutionNumber": "11"
}
```

### DevOps Notification capability flow diagram example - Coding tool




## Connect capability subflow

The Connect capability is supported.

| Item | Expected value |
|---|---|
| Inputs | Label: current<br><br>Type: Reference.DevOps Tool<br><br>Tool record for which the **Connect** button action is clicked. |

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| Item | Expected value |
| --- | --- |
| Outputs<br><br>See subflow outputs. | • Label: connected<br><br>Flag indicating the success or failure of the connection made to the target tool (true/false).<br><br>• Label: errormessage<br><br>String message displayed on the form for connection failure. The variable is an empty string if the connection is successful. |

Connect errors shown on the DevOps tool form:

**Connection failed**

Subflow was executed successfully but the connection could not be made.

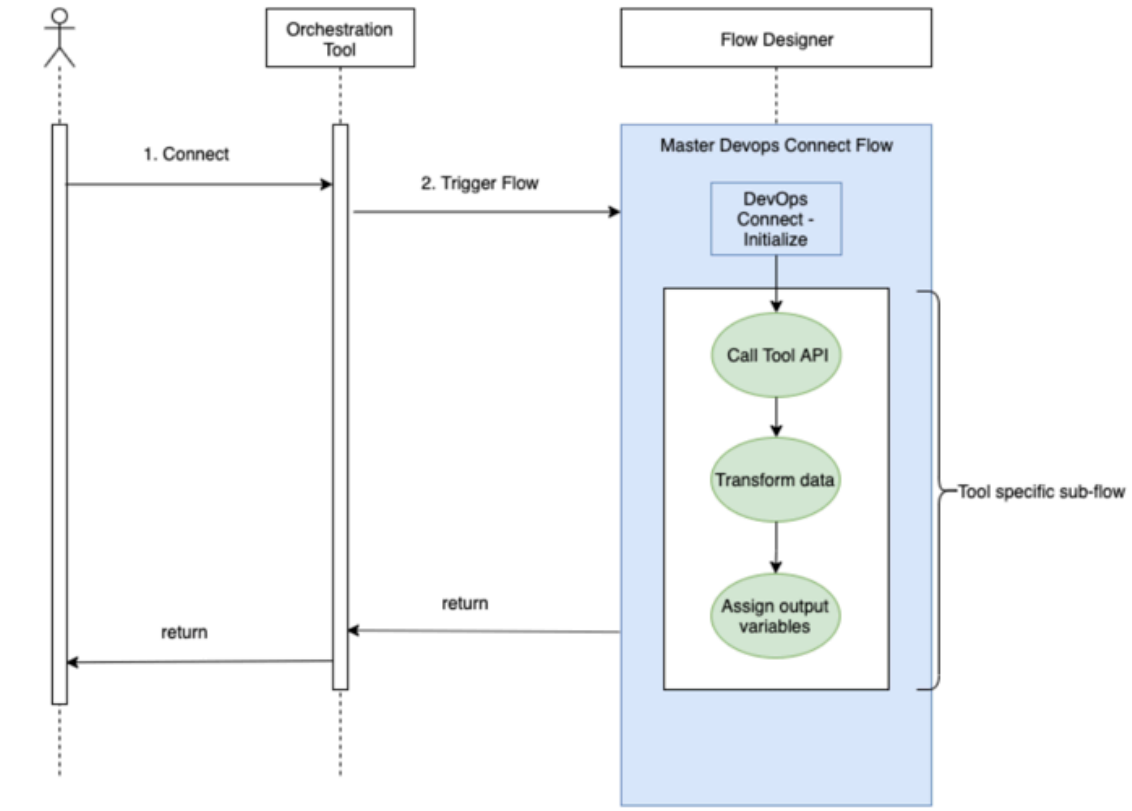
**Error: Failed to get failure details from the tool specific connect flow**

Subflow execution failed for an unknown reason.

**Error updating the tool connect status**

The connection_state attribute could not be updated for an unknown reason.

### DevOps Connect capability flow diagram example - Orchestration tool




## Discover capability subflow

The Discover capability is supported.

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| Item | Expected value |
| --- | --- |
| Inputs | Label: current<br>Type: Reference.DevOps Tool |
| Outputs<br>See subflow outputs. | Without pagination:<br>Label: discoverpayload<br>Type: Array of objects as JSON string.<br>`(JSON.stringify([{},{}]))`<br>Planning tool without pagination:<br>`[ { "id":"REL1234567", "name": "REL NUMBERS", "url":"https://jira.com/vult/browse/REL1234567", "nativeId": "1790e6cc-085b-4529-9cb8-47f393182226" }, { "id":"TOR67", "name": "TOR 67", "url":"https://jira.com/welp/browse/TOR67", "nativeId": "482ce864-085b-4529-9cb8-47f393767eb2" } ]`<br>Coding tool without pagination:<br>`[ { "name": "nvm_repo", "url": "https://github.com/nvm_repo/" }, { "name": "golang_util", "url": "https://github.com/golang_util/" } ];` |

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| Item | Expected value |
| --- | --- |
| | Orchestration tool without pagination:<br>{<br>"orchestrationTasks": [<br>{<br>"name": "Build_APC_1",<br>"url":<br>"https://jenkins.wsf.xyz/job/Build_APC_1",<br>"projectName":<br>"Build_APC_1"<br>},<br>{<br>"name": "CI_CD_Jenkins",<br>"url":<br>"https://pt1.jenkins.com/job/CI_CD_Jenkins",<br>"projectName":<br>"CI_CD_Jenkins"<br>},<br>{<br>"name": "CI_deploy",<br>"url":<br>"https://pt2.jenkins.com/job/CI_deploy",<br>"projectName":<br>"CI_deploy"<br>}<br>],<br>"pipelines": [<br>{<br>"name": "Build_APC_1",<br>"url":<br>"https://jenkins.wsf.xyz/job/Build_APC_1",<br>"projectName":<br>"Build_APC_1"<br>},<br>{<br>"name": "CI_CD_Jenkins",<br>"url":<br>"https://pt1.jenkins.com/job/CI_CD_Jenkins",<br>"projectName":<br>"CI_CD_Jenkins"<br>},<br>{<br>"name": "CI_deploy",<br>"url":<br>"https://pt2.jenkins.com/job/CI_deploy",<br>"projectName":<br>"CI_deploy"<br>} |

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| Item | Expected value |
| --- | --- |
| | <pre>  ]<br>}</pre><br>With pagination:<br>Label: discoverpayload<br>Type: Array of objects as JSON string.<br>`(JSON.stringify([{},{}]))`<br>Sample JSON format:<br><pre>"pageInfo" : {<br>    "isLastPage" : true,<br>    "discoverPayload" : {},<br>    “pageDetails” : {}<br>}</pre><br>Planning tool with pagination:<br><pre>{<br>    "pageInfo": {<br>        "isLastPage": false,<br>        "discoverPayload": [<br>            {<br><br> "id":"REL1234567",<br>                "name": "REL<br> NUMBERS",<br><br> "url":"https://<br>jira.com/vult/browse/REL123456<br>7",<br>                "nativeId":<br> "1790e6cc-085b-4529-9cb8-47f3<br>93182226"<br>            },<br>            {<br>                "id":"TOR67",<br>                "name": "TOR<br> 67",<br><br> "url":"https://<br>jira.com/welp/browse/TOR67",<br>                "nativeId":<br> "482ce864-085b-4529-9cb8-47f3<br>93767eb2"<br>            }<br>            ],<br>        "pageDetails": {<br>            "curPage" : 1,<br>            "nextPage": 2<br>        }<br>    }<br>}</pre> |

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| Item | Expected value |
| --- | --- |
| | Coding tool with pagination:<br>{<br>"pageInfo": {<br>"isLastPage": false,<br>"discoverPayload": [<br>{<br>"name": "nvm_repo",<br>"url": "https://github.com/nvm_repo/"<br>},<br>{<br>"name": "golang_util",<br>"url": "https://github.com/golang_util/"<br>}<br>],<br>"pageDetails": {<br>"curPage" : 1,<br>"nextPage": 2<br>}<br>}<br>}<br>Orchestration tool with pagination:<br>{<br>"pageInfo": {<br>"isLastPage": false,<br>"discoverPayload": {<br>"orchestrationTasks": [<br>{<br>"name": "Build_APC_1",<br>"url": "https://jenkins.wsf.xyz/job/Build_APC_1",<br>"projectName": "Build_APC_1"<br>},<br>{<br>"name": "CI_CD_Jenkins",<br>"url": "https://pt1.jenkins.com/job/CI_CD_Jenkins",<br>"projectName": "CI_CD_Jenkins"<br>}<br>],<br>"pipelines": [ |

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| Item | Expected value |
| --- | --- |
| | {<br>"name":<br>"Build_APC_1",<br>"url":<br>"https://jenkins.wsf.xyz/job/Build_APC_1",<br>"projectName":<br>"Build_APC_1"<br>}<br>]<br>},<br>"pageDetails": {<br>"curPage" : 1,<br>"nextPage": 2<br>}<br>}<br>} |

The Discover main flow is triggered during import request record creation. An import request has these states and messages.

| State | Message |
| --- | --- |
| Requested | -- |
| Processing | -- |
| Completed | Updated <number> object(s)<br>Found <number> objects with invalid toolId<br>Found <number> objects failed validation |
| Error | • Unable to parse payload string from Subflow<br>• discoverpayload is expected to be an array of objects<br>• ImportRequest record does not have reference to tool table |
| Paused | -- |
| Canceled | -- |
| Unmatched | -- |

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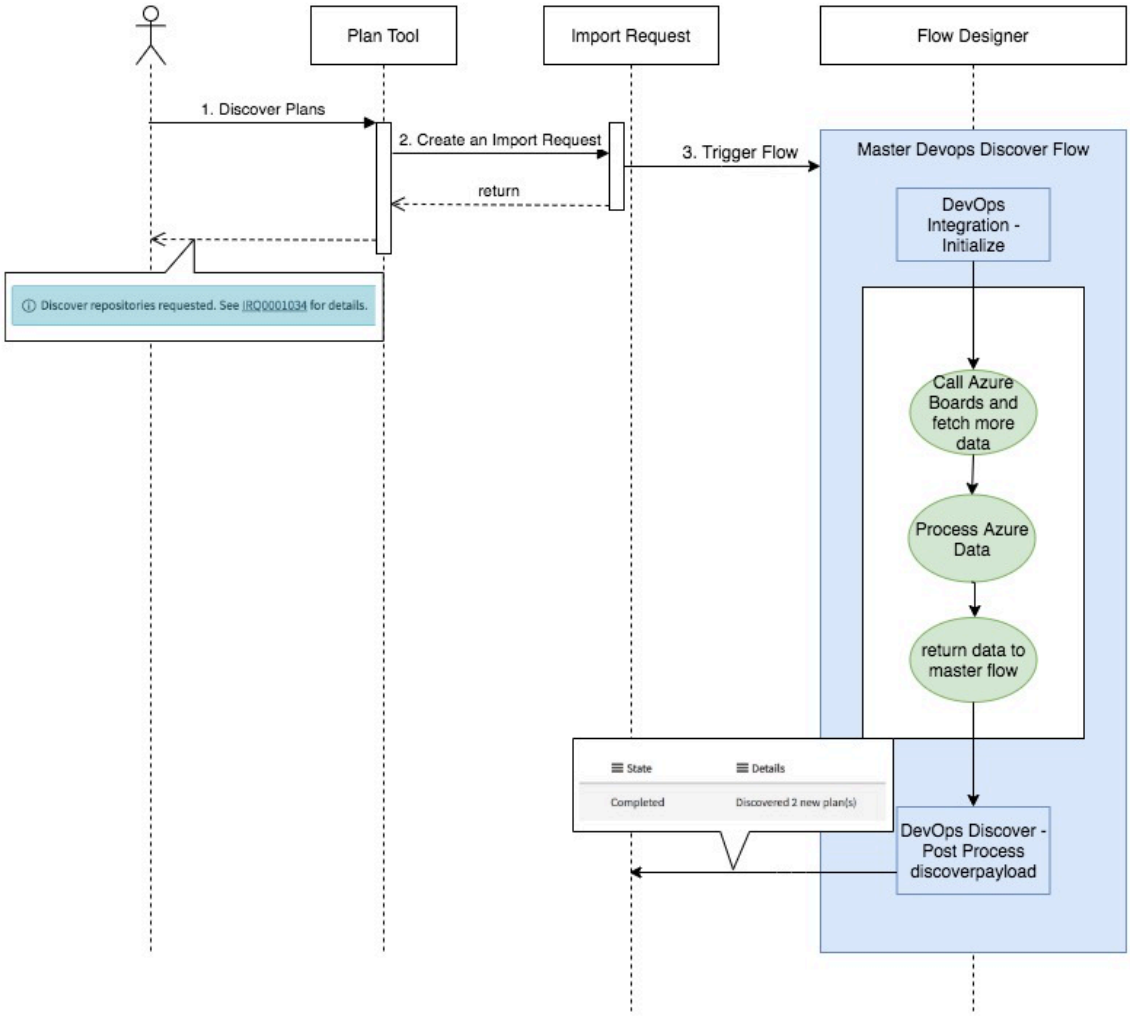
## DevOps Discover capability flow diagram example - Planning tool

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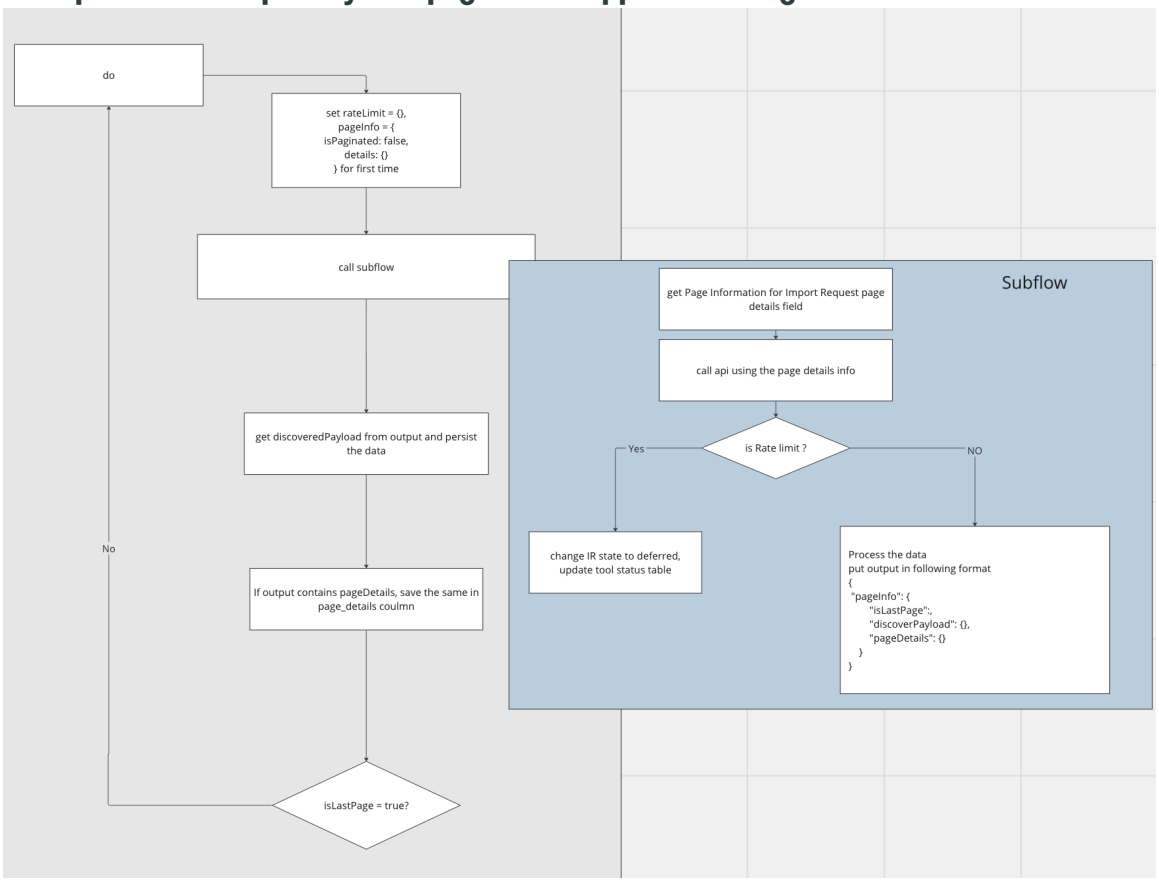
### DevOps Discover capability with pagination support flow diagram




## Update Import Request Flow Designer action

You can use the Update Import Request action in your Discover subflow to modify the Import Request record state, if desired.

| Input label | Type |
|---|---|
| current | Reference.Import Request |
| state | (String)<br>• requested<br>• processing<br>**Note:** Flow execution is stopped (once the return is received from the subflow) when the state is set to processing.<br>• completed<br>• error<br>• paused<br>• canceled<br>• unmatched |

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| Input label | Type |
| --- | --- |
| details | (String) |

### Add custom fields for a planning tool integration

Add custom fields into your planning tool integration to improve configurability and access business-specific information, which facilitates more informed decision-making.

## Before you begin

Role required: sn_devops.admin

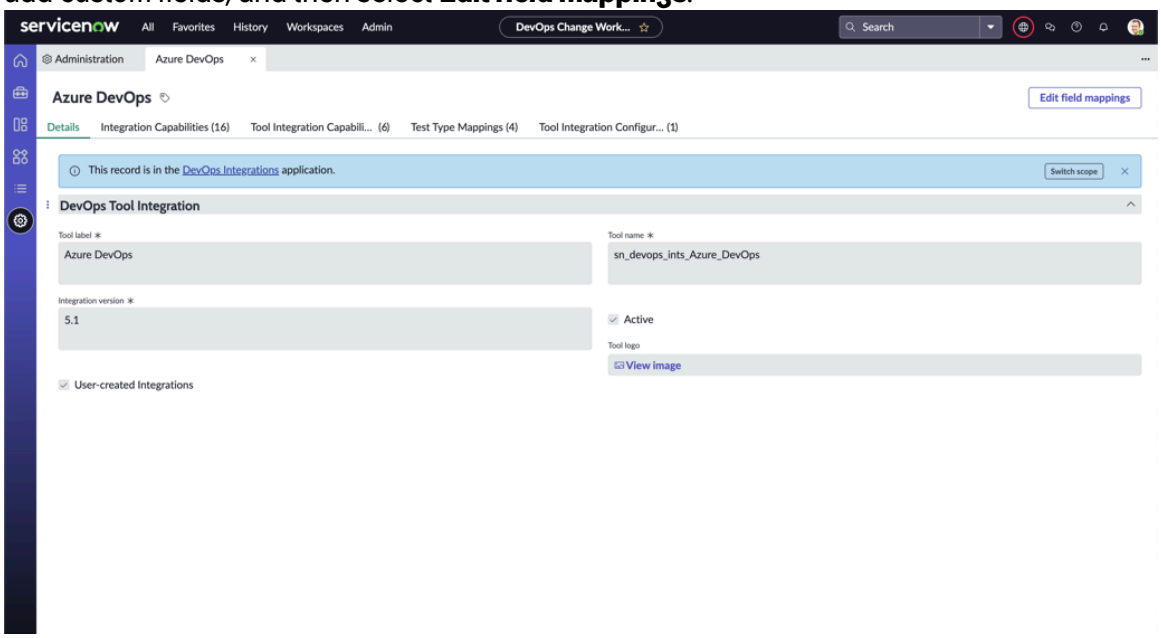
## About this task

You can add custom fields to a planning tool integration by using record transformers. Create record transformers for each tool action, and add record transformer rules to map fields in your tool to fields in the DevOps data model. For example, consider a scenario where the Azure DevOps work item Id is defined as "adoid" during the import process. If you want to align it with the ServiceNow work item Id, you can achieve this by creating a record transformer for the import action. Within this transformer, you must establish rules to map the "adoid" field to the corresponding ServiceNow work item Id field. After the field mapping is created, every time an inbound event is received from Azure DevOps to bring in work items, the data will be processed through the configured transformer into the transformed payload.

**Note:**
This feature is available only for the base system plan type tool integrations except for ServiceNow Agile Development 2.0.

## Procedure

1. Navigate to **Workspaces** > **DevOps Change Workspace** > **Administration**.
2. Select **Integrations > Tool integrations** from the Lists tab.
3. Select the planning tool integration for which you want to add custom fields, and then select **Edit field mappings**.




**Note:**
Verify that the application scope is selected as DevOps Integrations.

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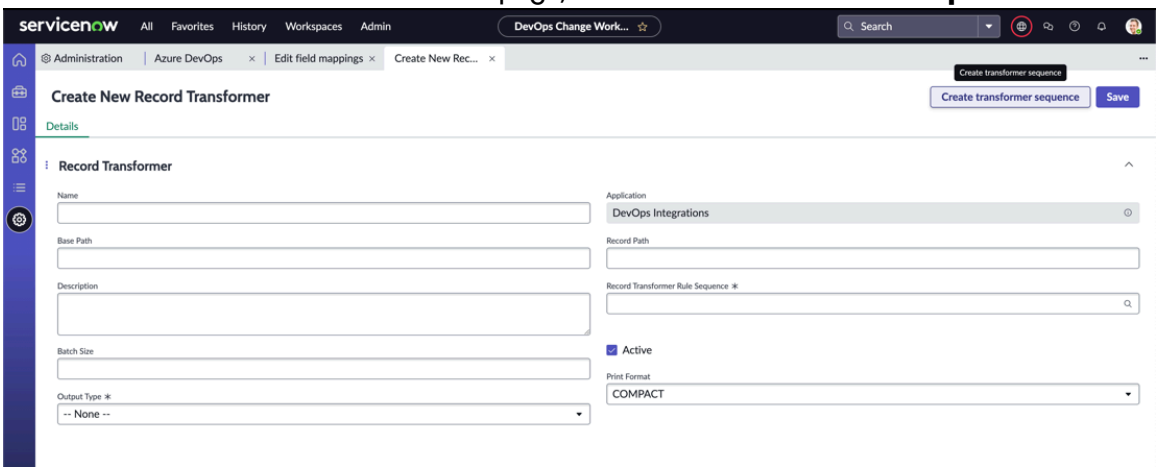
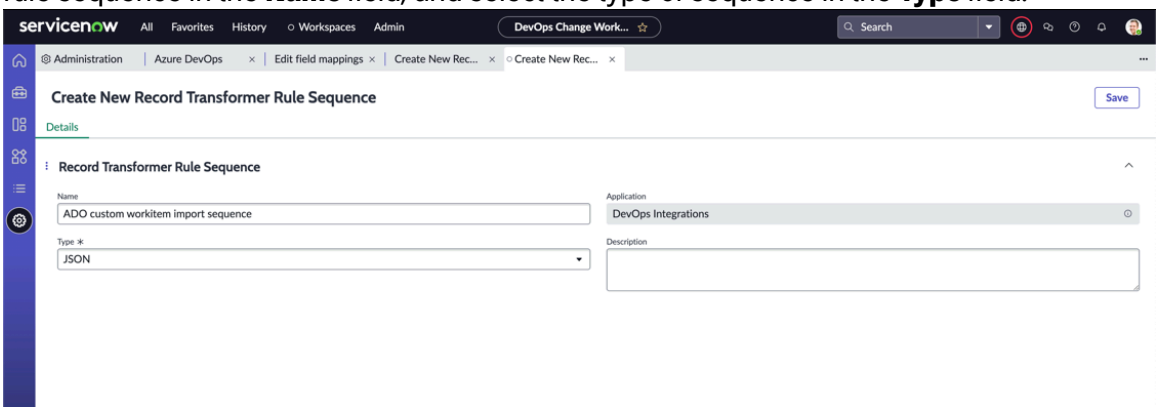
4. In the Edit field mappings page, select the **Create a record transformer** button in the Planning capability transformation section.

> **Note:**
> You must create a record transformer for each tool action. In this procedure, a record transformer is created for the Import action.

a. On the Create New Record Transformer page, select **Create transformer sequence**.




b. In the Create New Record Transformer Rule Sequence page, enter the name of the rule sequence in the **Name** field, and select the type of sequence in the **Type** field.




c. Select **Save**.

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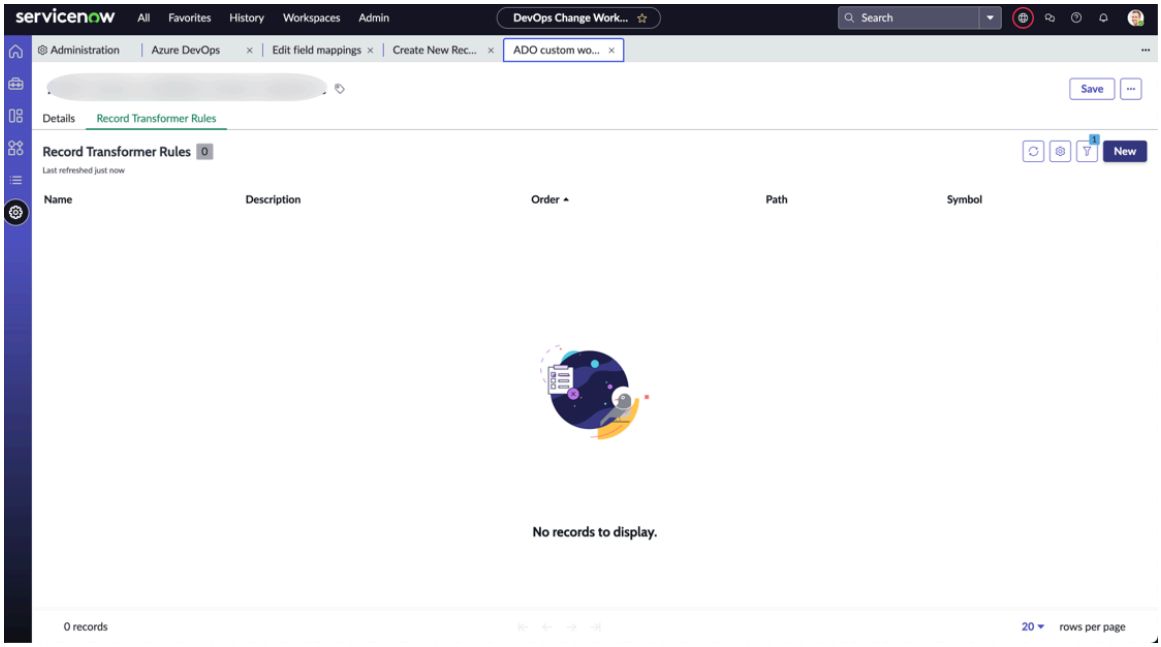
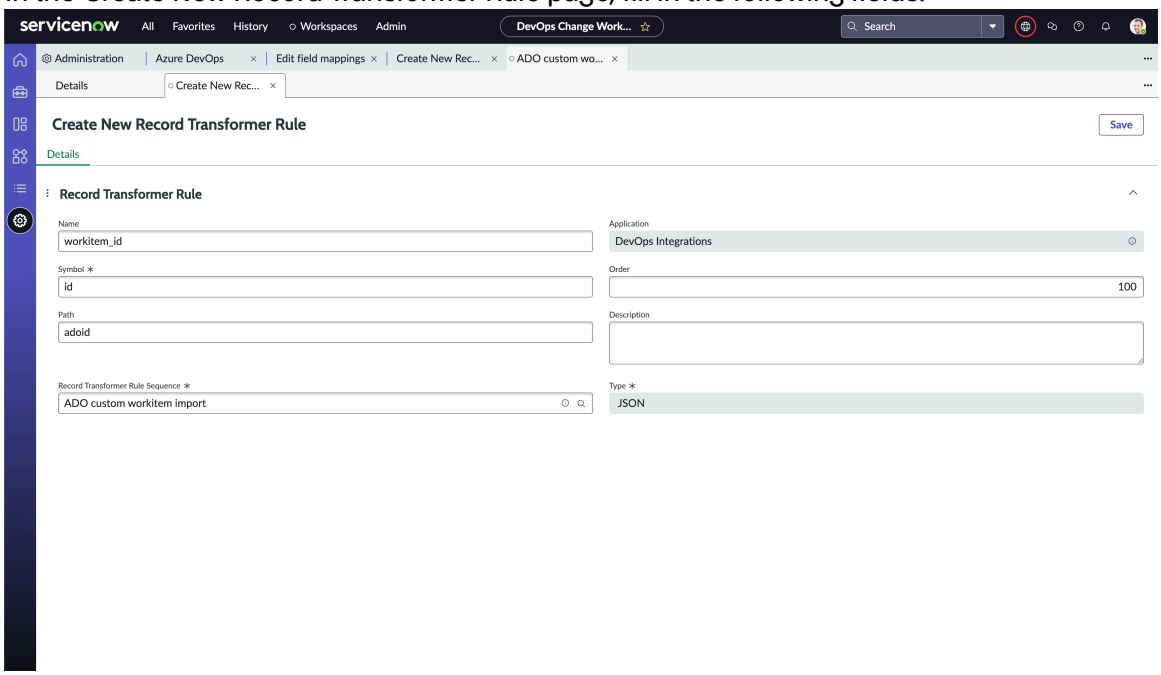
5. Navigate to the transformer record page, and select the **Record Transformer Rules** tab, and then select **New**.




6. In the Create New Record Transformer Rule page, fill in the following fields.




### Create New Record Transformer Rule

| Field | Description |
|---|---|
| Name | Name of the rule in the sequence. |
| Symbol | Name of the field in the transformed payload to where the custom field value is extracted to. |
| Path | Payload path from where the custom field value is retrieved. |

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| Field | Description |
|---|---|
| Order | Order in which the rule must be run in the sequence. |
| Description | Text explaining the rule. |

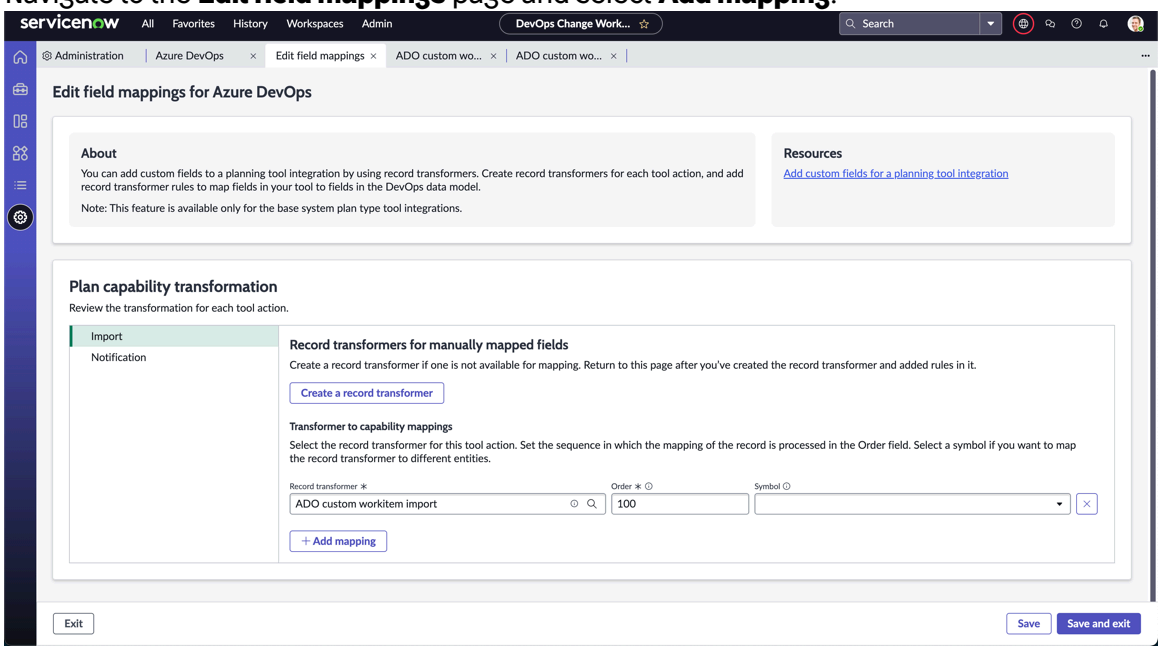
**Note:**
Multiple rules can also be added to a custom column from the JSON payload and more fields can be mapped. All the transformations added are considered in the transformed payload.

7. Select **Save**.
8. Navigate to the Details section of the transformer record, and fill in the following fields.

### Record Transformer

| Field | Description |
|---|---|
| Name | Name of the record transformer. |
| Base Path | Path to read from for the incoming payload. |
| Description | Text explaining the record transformer. |
| Record Path | Path to write to for the transformed payload. |
| Record Transformer Rule Sequence | Rule sequence that you want to associate with this record transformer. |
| Active | Option to make the record transformer active. |

9. Select **Save**.
10. Navigate to the **Edit field mappings** page and select **Add mapping**.




a. Select the record transformer for the tool action.
b. Set the sequence in which the mapping of the record is processed in the **Order** field.
c. Select a symbol if you want to map the record transformer to different entities.

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**Note:**
The Symbol field here is different from the Symbol field in the Create New Record Transformer Rule form in step 6.

**d.** Select **Save**.

**Note:**
You can add multiple field mappings for an action as per your requirement.

**Related topics**

Transformer - Scoped, Global

## Update third-party tool credentials in DevOps Change Velocity

If your tool credential has changed, you must update the credentials in your ServiceNow instance to avoid getting disconnected.

### Before you begin

Role required: sn_devops.admin

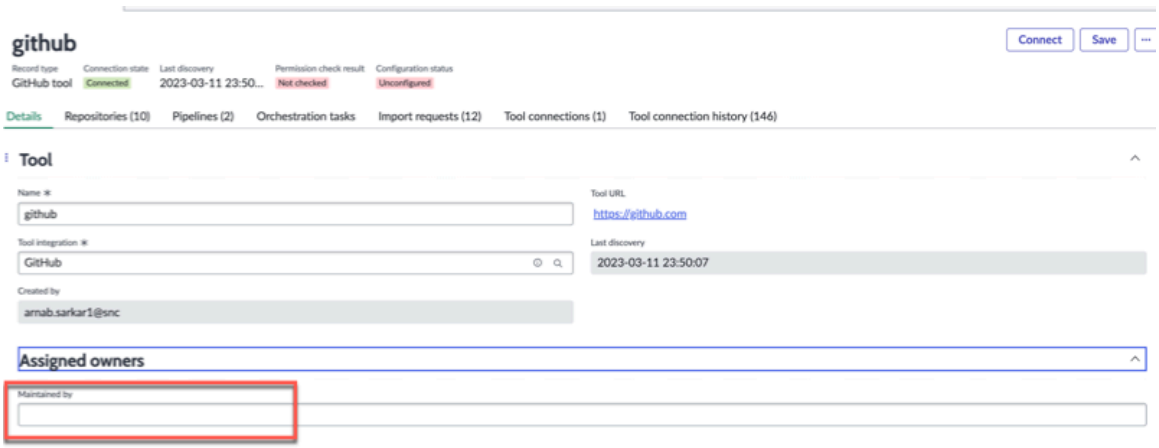
### Procedure

Update your tool credentials using one of the following methods.

#### Notifications on tool credential expiration

Notifications are sent to tool users on expiration of tool credentials to alert them. Notifications are also sent proactively before the expiration of tool credentials for GitHub tools created with basic authentication. This enables tool users with the sn_devops.tool_owner or sn_devops.admin roles to update the tool credentials and prevent any loss of data.

A universal task is created and assigned to users with the sn_devops.tool_owner role who are part of any user group specified in the **Maintained by** field, and any user with the sn_devops.admin role. They will be notified of the universal task through notification (in the bell icon), email, and an open task in the workspace home page.




Notifications are also displayed in the tool record in the form of a banner message to any user with access to the tool when the tool credentials expire. But the credentials can be updated only by users with the sn_devops.tool_owner or sn_devops.admin role.

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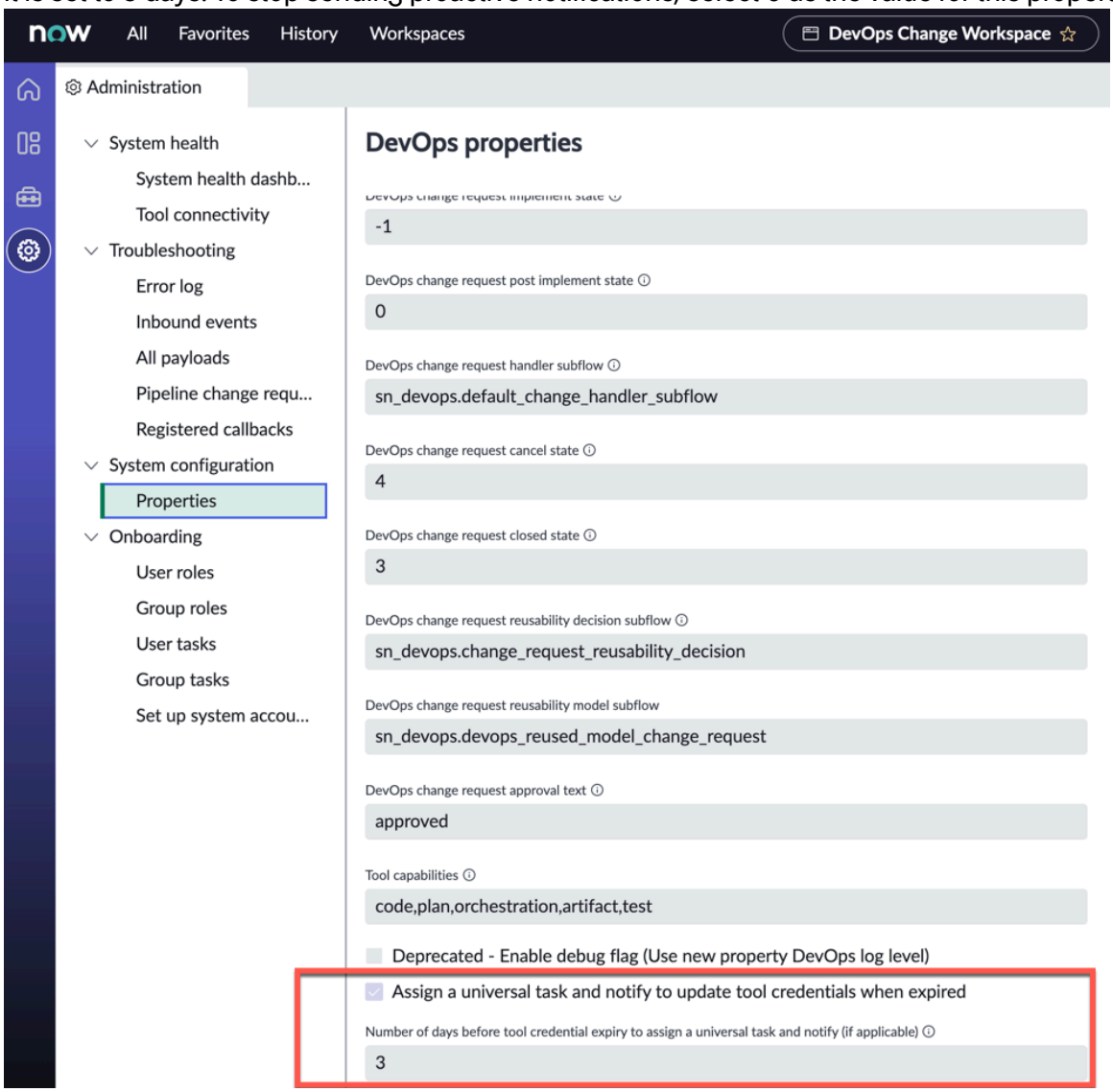
The credentials expiration check happens in the system every one hour. If your tool credentials have expired, it might take a maximum of one hour for the system to send notifications.

For GitHub tools created with basic auth, notifications are also sent proactively before the expiration of tool credentials. Apart from the universal task and banner notification, a field message is also displayed in the case of proactive expiration notifications. You can set the number of days before which expiration notifications must be sent in the **Number of days before tool credential expiry to assign a universal task and notify (if applicable)** property. By default, it is set to 3 days. To stop sending proactive notifications, select 0 as the value for this property.




If you want to stop sending notifications for expired credentials after expiry, disable the *`Assign a universal task and notify to update tool credentials when expired`* property. For more information, see DevOps Change Velocity properties.

The following types of notifications are sent:

**Universal task**

A universal task is created and notifications are sent to users with the sn_devops.tool_owner role who are part of any user group specified in the **Maintained by** field, and any user with the sn_devops.admin role.

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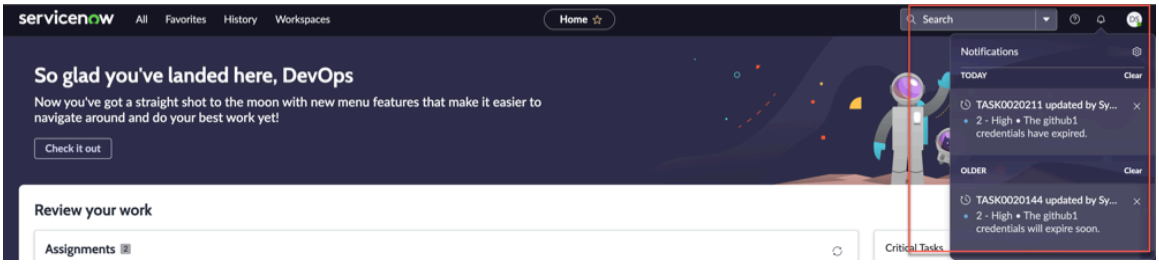


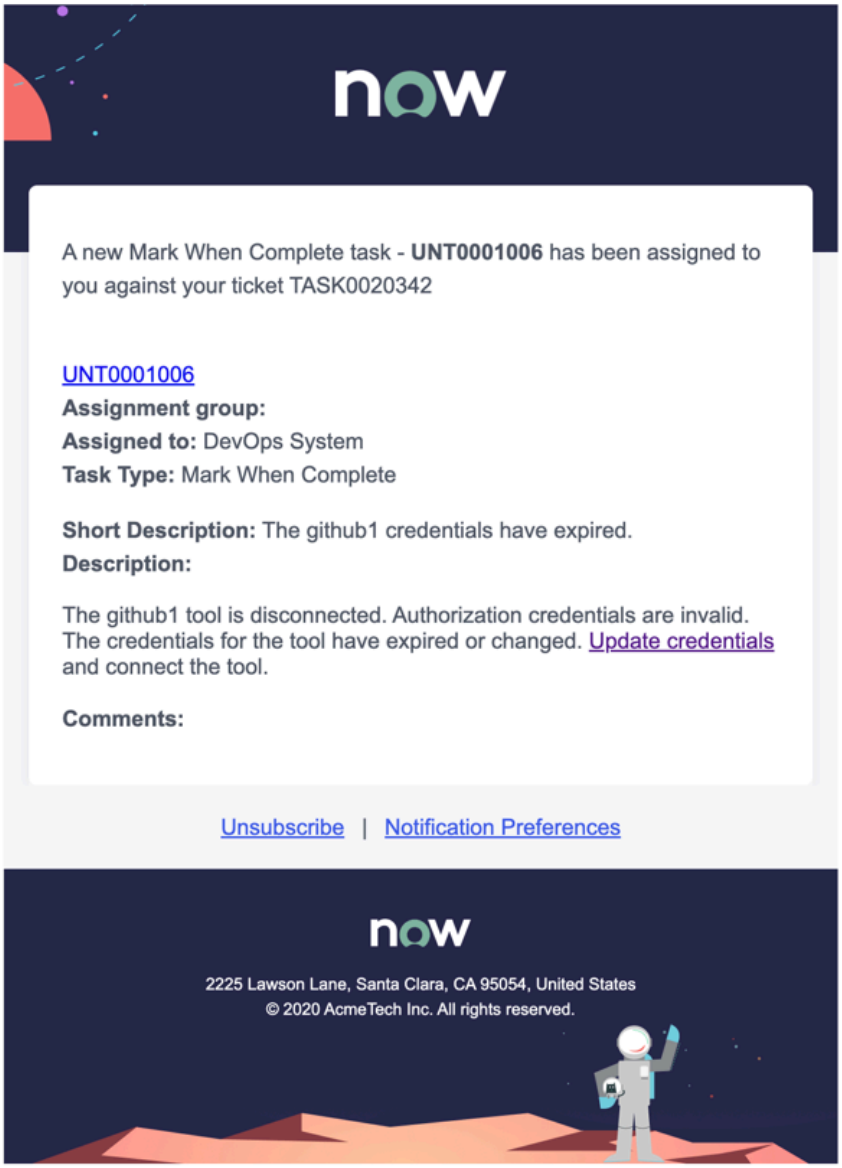


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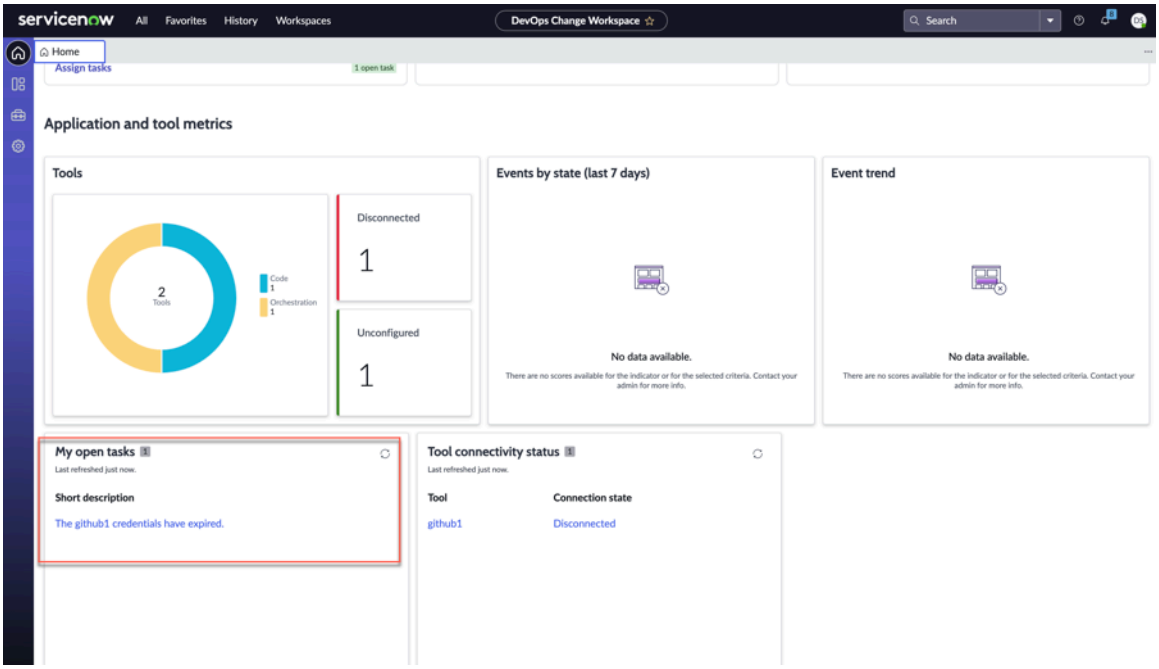
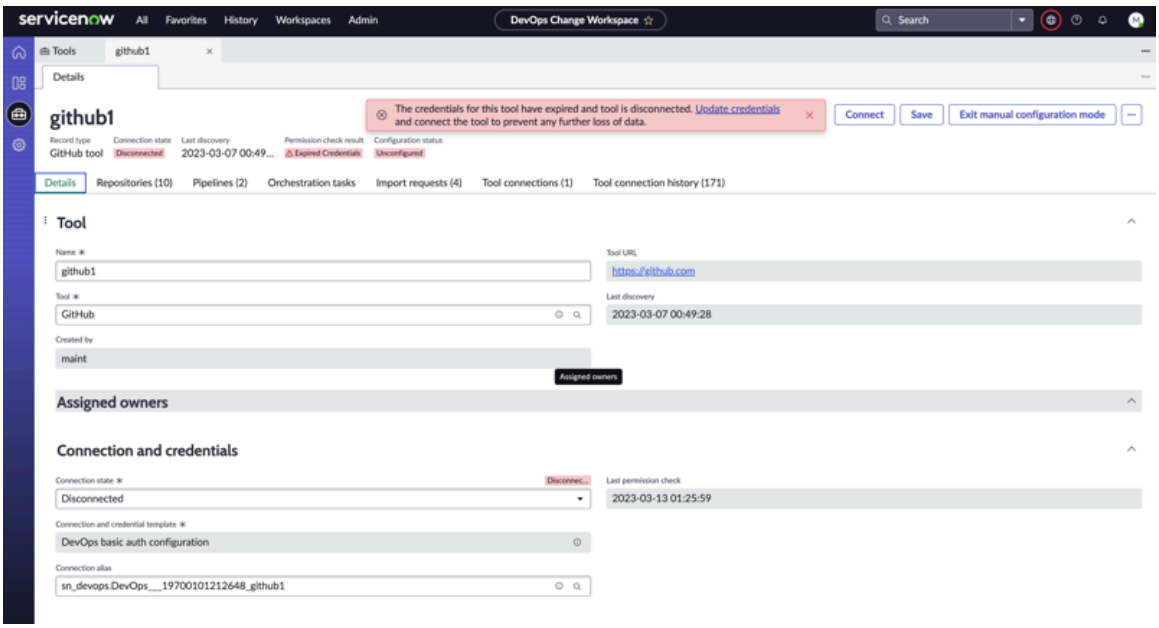



## Banner message

A banner message is displayed on the tool record to all users with access to the tool record.




## Field message

A field message is displayed on the **Credentials expiration** field in the tool record for a GitHub tool created with basic auth.

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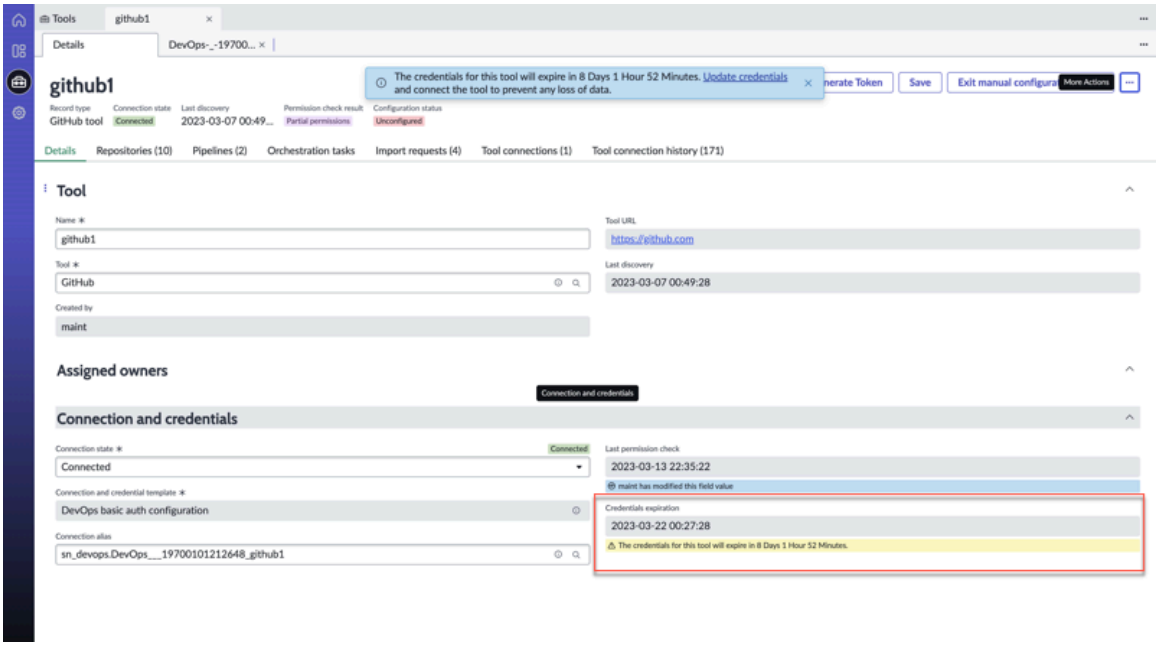


When the credentials of your tool expire, the tool gets disconnected. You can select the **Update credentials** link in the notifications, and update your tool credentials. After the credentials are updated, connect to the tool again to start receiving data. For information on updating tool credentials, see Update third-party tool credentials in DevOps Change Velocity.

## Applications in DevOps Change Velocity

In DevOps Change Velocity, an application collects all the up-to-date data that connected tools send about plans, repositories, and pipelines.

An application is needed to group plans, repositories, and pipelines together which enable tracking automatically and provide associations for DevOps data such as commits linked to work items. You can link the application with other ServiceNow products, including DevOps Config.

You must create an application to enable traceability for user stories, commits, test results, and more. Associating plans, repositories, and pipelines to an application also enables pipeline modeling, change governance, and metric reporting. In the DevOps Change, this procedure generates a single DevOps application record (sn_devops_app) that is used by both DevOps and DevOps Config (if installed).

When DevOps Config is installed, the DevOps application record is also linked to a CDM application record (sn_cdm_application). The CSDM application model (name, owner, manufacturer) functions as the link between ServiceNow DevOps products.

### Create an application - Workspace

Create applications using the DevOps Change Workspace and associate pipelines, plans, and repositories to it.

#### Before you begin

Role required: sn_devops.admin or sn_devops.app_owner

#### Procedure

1. Navigate to **Workspaces** > **DevOps Change Workspace**.
2. You can create an application using any of the following options:

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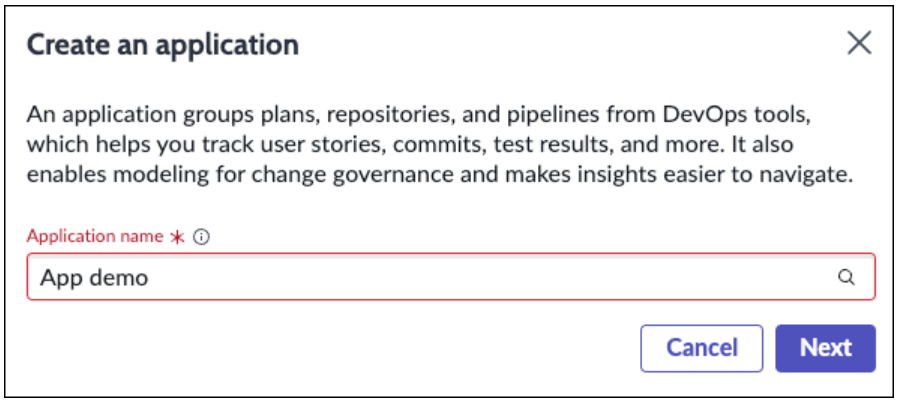
- Select **Create an application** from the Home page.
- Select the **Applications** ( ) module and select **New**.

3. In the Create an application modal, in the **Application name** field, enter the name for your application.




You can either create a new application, which will create a new application model with the same name, or select an existing application model, which will create an application with the same name as the model.

| Type | Result |
|---|---|
| New application | ○ The system generates a new DevOps application, a new application model, and a new SDLC component (SDLC-C) in the CMDB.<br>○ The SDLC-C is assigned the same name as the new application.<br>○ If the DevOps Config application is installed, then DevOps associates the application to the CDM application. |
| Existing application model | The system generates a new DevOps application from that application model.<br>○ The application is given the same name as the application model.<br>○ If an SDLC component exists for the application model, then DevOps associates the SDLC-C to the new application.<br>○ If an SDLC component doesn't exist for the application model, then DevOps generates a new SDLC-C with the same name as the application model.<br>○ If DevOps Config is installed, then DevOps creates a CDM application and associates the SDLC-C to the application. |

The Create an Application playbook activity opens.

4. In the Enter application details playbook activity:

   a. Select the **Business app** in CMDB that you want linked to your application.

   b. (Optional) Add user groups to the **Maintained by** field to control access to the application.

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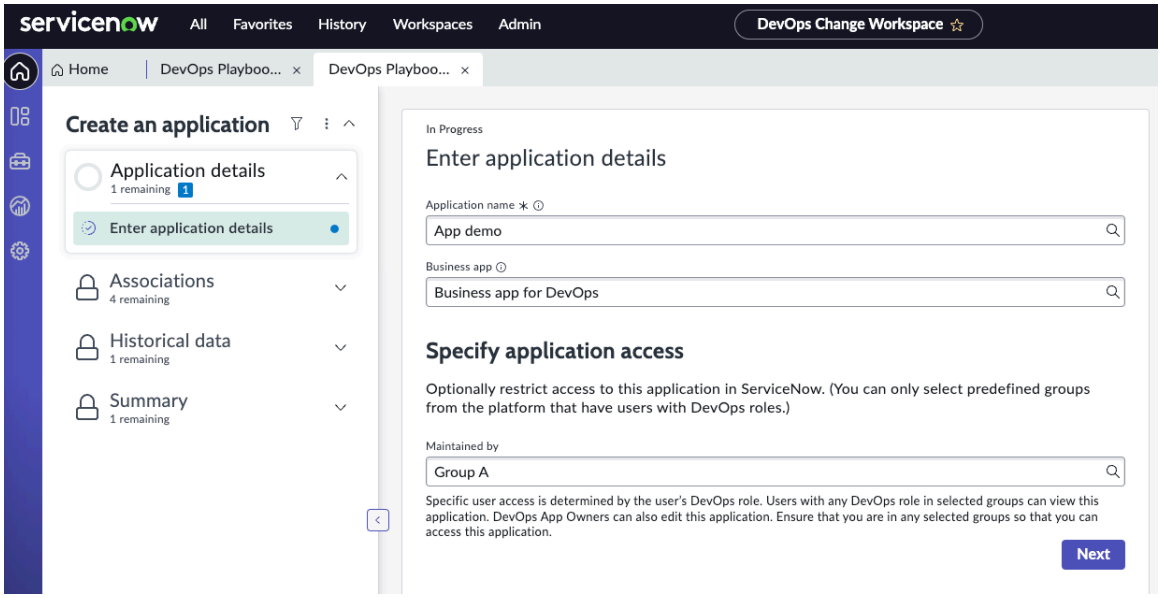
You can select any group that has at least one user with DevOps roles. When user groups are added:

- Users with DevOps App Owner role or DevOps Administrator role can edit the application.
- Users having other DevOps roles can view the application.
- Users having DevOps roles, but aren't part of the groups added can't view the application.

**c.** Select **Next**.




**5.** In the Associate pipelines playbook activity:

**a.** Add the orchestration tools whose pipelines you want to associate with the app to the **Tools** field.

> **Note:**
> You can skip this step if you haven't connected to an orchestration tool, or if you don't want to associate pipelines.

**b.** Select the pipelines that you want to associate with the app.

**c.** Select **Associate pipelines**.

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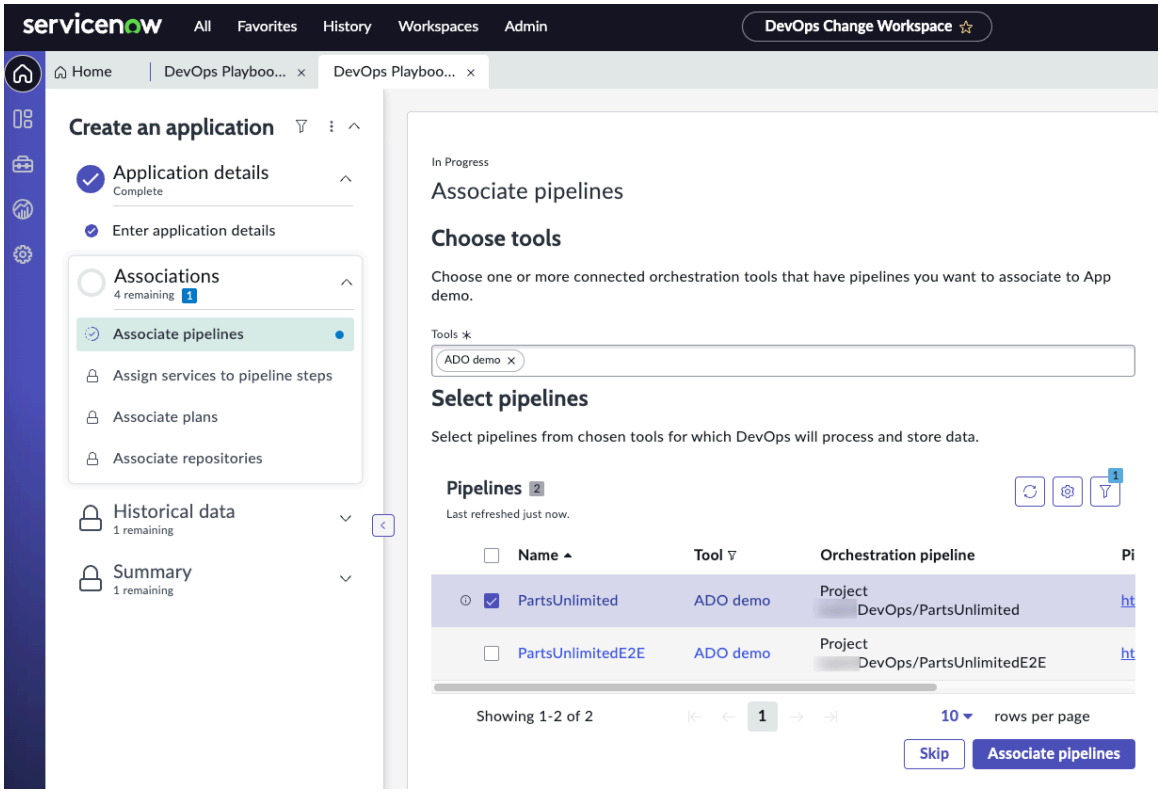


6. In the Assign services to pipeline steps playbook activity:

   a. For each selected pipeline, all steps or stages are imported for the last successful execution. You can select the following for each pipeline step:

      i. **Pipeline step type**: Select a step type for which you want to assign a service.

      **Tip:**
      Specify at least the *`Prod deploy`* step type for steps that represents the production deployment to enable DevOps to identify successful pipeline executions as production deployments.

      ii. **Service**: Select the CMDB application service that the pipeline step maps to.

      Application service maps approximately to the environment. If you use the same pipeline step to deploy to different environments, leave the field empty. Service information enables DevOps to identify and report on operational metrics such as incidents, outages, and so on.

   b. Select **Assign services**.

   **Note:**
   You can skip this step if your pipeline doesn't have any steps or if you haven't associated pipelines.

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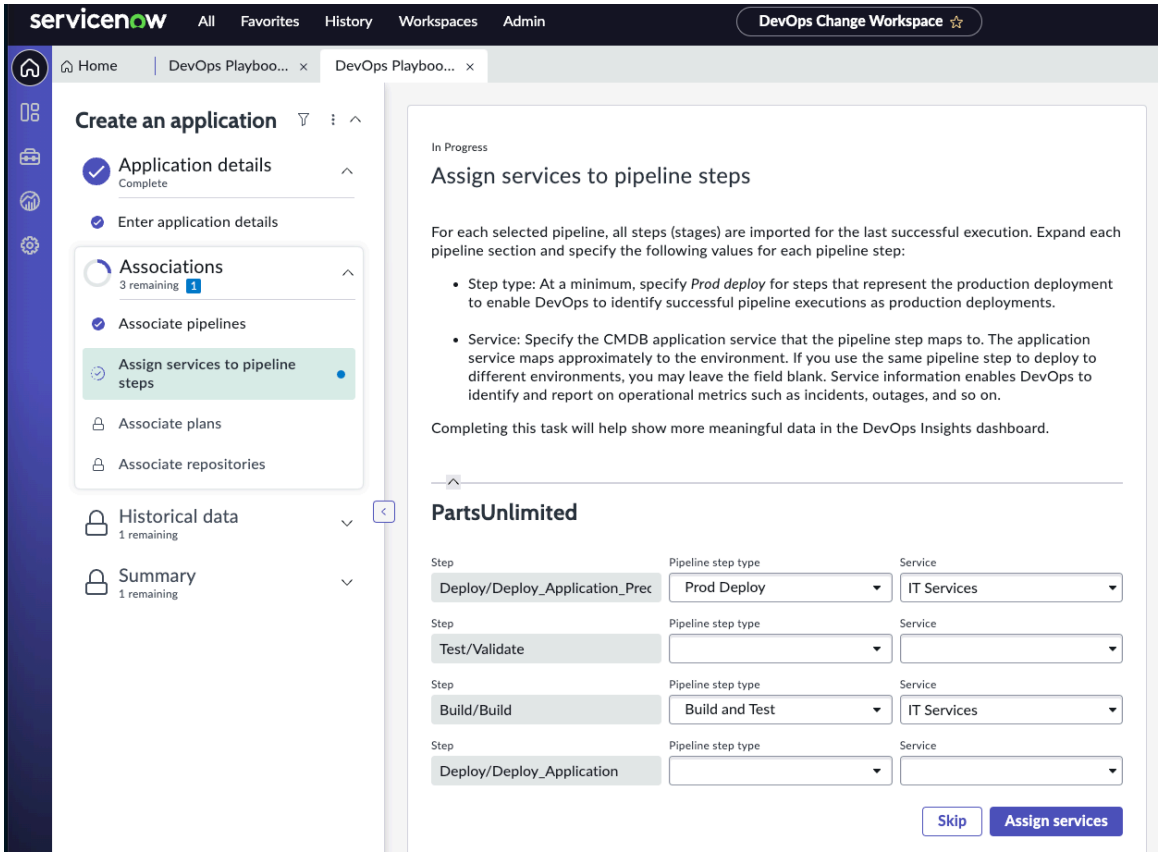


**7.** In the Associate plans playbook activity:

**a.** Add the planning tools whose plans you want to associate with the app to the **Tools** field.

> **Note:**
> You can skip this step if you haven't connected to a planning tool, or if you don't want to associate plans.

**b.** Select the plans that you want to associate with the app.

**c.** Select **Associate plans**.

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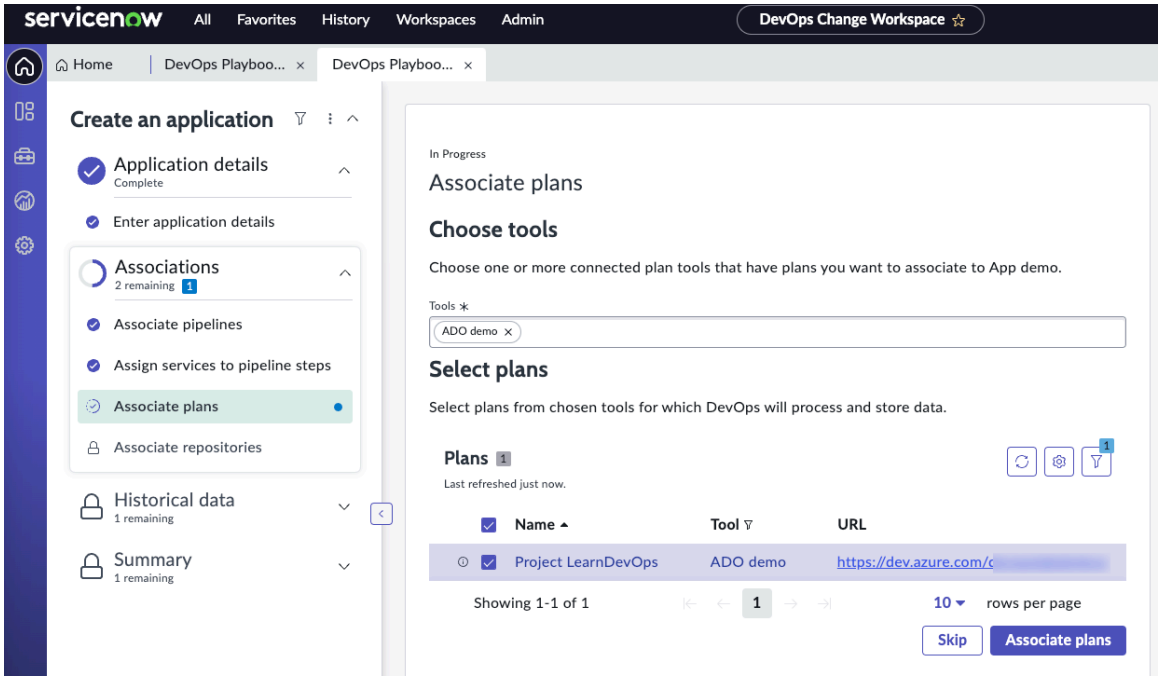


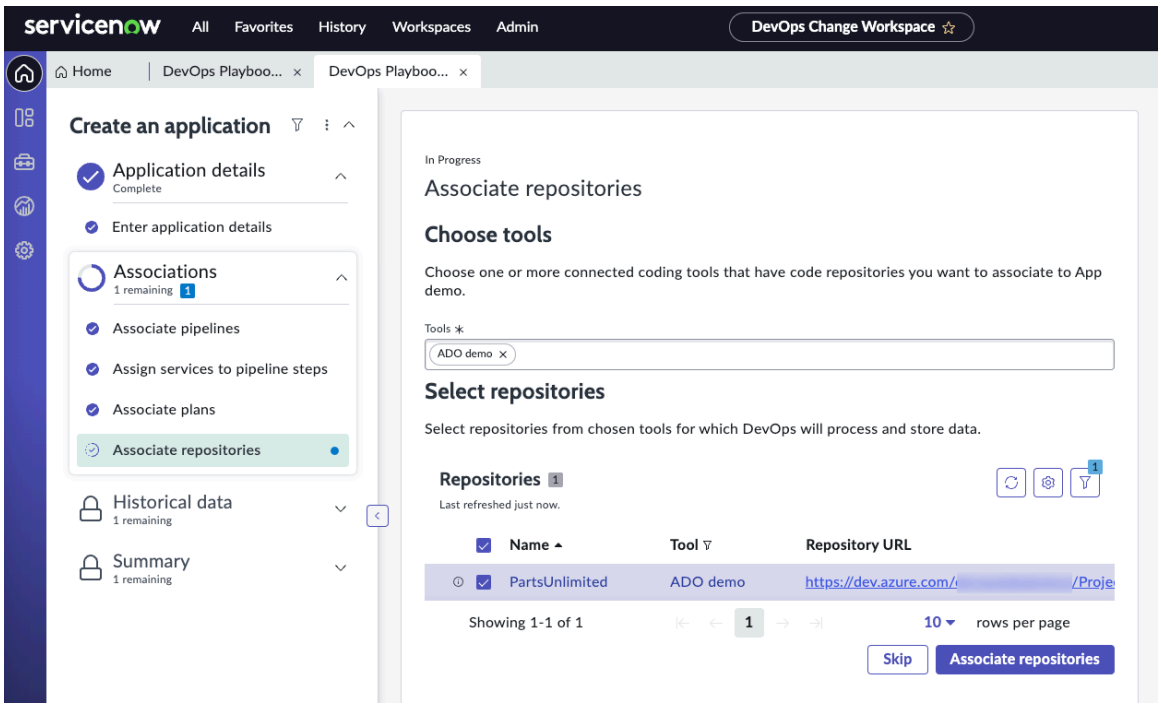

8. In the Associate repositories playbook activity:

   a. Add the coding tools whose repositories you want to associate with the app to the **Tools** field.

   > **Note:**
   > You can skip this step if you haven't connected to a coding tool, or if you don't want to associate repositories.

   b. Select the repositories that you want to associate with the app.

   c. Select **Associate repositories**.

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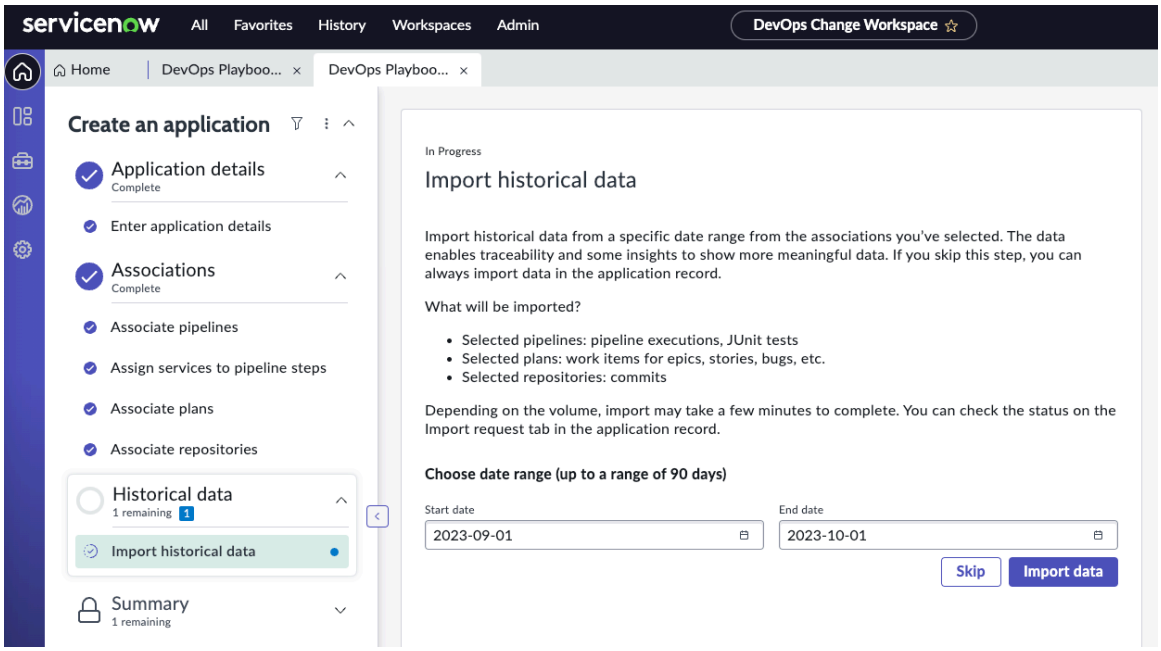
**9.** In the Import historical data playbook activity:

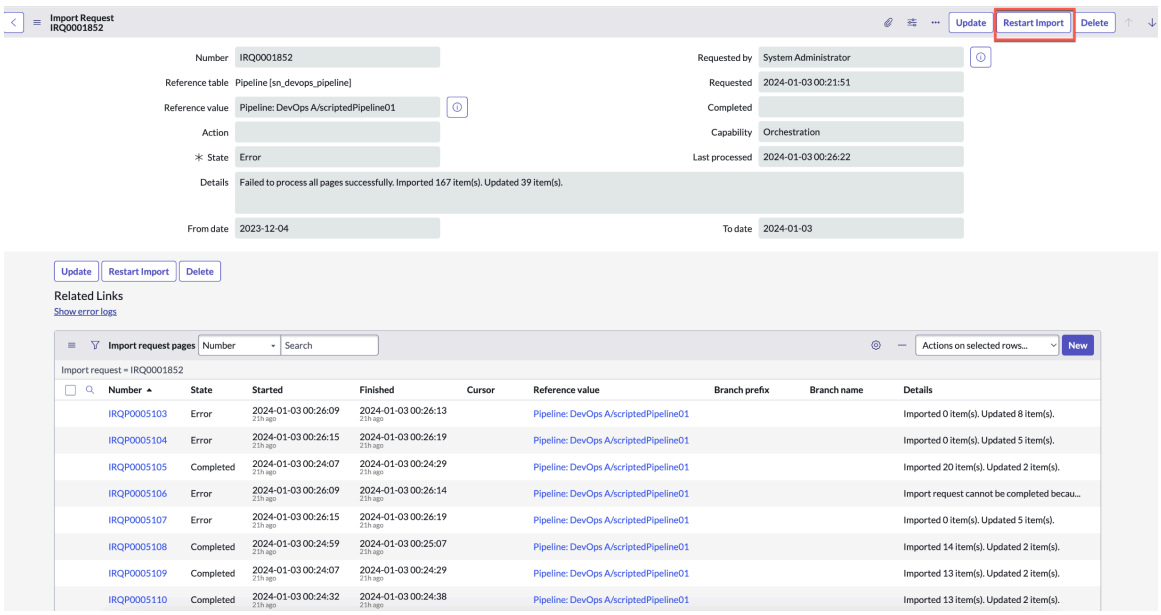
**a.** Select the start and end dates for import. You can import up to 90 days of data.

> **Note:**
> You can skip this step if you don't want to import any data from the select pipelines, plans, and repositories.

**b.** Select **Import data**.




> **Note:**
> If your import request could not be completed due to an error, you can select **Restart Import** in the corresponding **Import Request** record to retry the import.




**10.** From the **Summary** page, select **View application** to review the details of the created application.

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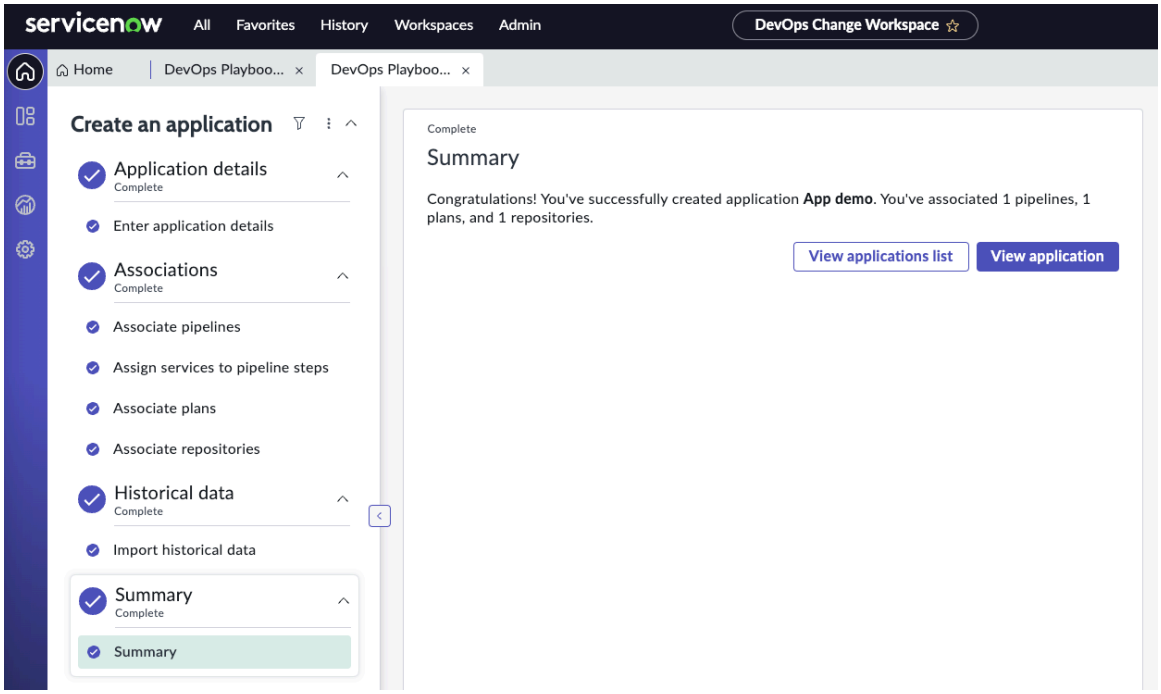


If you skipped associating objects to the application or if you want to associate other objects, see Associate tool objects to applications - Workspace.

## Associate tool objects to applications - Workspace

After creating an application, you can associate plans, repositories, and pipelines with it. Applications group plans, repositories, and pipelines from DevOps tools, which provides traceability to user stories, commits, test results, and so on.

### Before you begin

Role required: sn_devops.admin or sn_devops.app_owner

### Procedure

1. Navigate to **Workspaces** > **DevOps Change Workspace** > **Applications**.
2. Select the application.
3. From the application record page, select the tab for the object type that you want to associate.
4. Select **Save**.

## Create an application - Classic

Create applications using the Classic UI or the Service Catalog.

### Before you begin

Role required: sn_devops.admin or sn_devops.app_owner

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### Procedure

1. You can create applications using the Classic UI, or the Service Catalog.
   - Classic UI: Navigate to **All** > **DevOps** > **Apps & Pipelines** > **Create App (legacy)**.
   - Service Catalog: Navigate to **All** > **Service Catalog** > **Catalog Definitions** > **Maintatin Items** > **Create DevOps Application** > **Try It**.
2. On the Create DevOps Application form, choose whether to create a new application and new application model or to base the application on an existing application model.
3. Select **Submit**.

### What to do next

You can view the list of all the applications from the Apps page in the Classic UI. Navigate to **All** > **DevOps** > **Apps & Pipelines** > **Apps** and select your application.

For each application, you can:

- Update details such as#**Business app**, **State (Active)**, and#**Log Level**. Applications marked as **Active** are polled daily for updates to associated plans, repositories, and pipelines.
- Control access to the application by adding user groups to the **Maintained by** field. You can select any group that has at least one user with DevOps roles.

  When user groups are added:
  - Users with DevOps App Owner role or DevOps Administrator role can edit and associate objects with the application.
  - Users having other DevOps roles can view the application.
  - Users having DevOps roles, but aren’t part of the groups added can't view the application.

  **Note:**
  DevOps admins can always see and edit everything in DevOps.

- View and associate plans, repositories, pipelines, and artifact repositories. Associate the appropriate tool objects to the application to ensure that all the DevOps data is grouped and tracked. For more information, see Associate tool objects to applications – Classic.
- Delete the application record.

## Associate tool objects to applications – Classic

After creating an application, you can associate plans, repositories, pipelines, and artifacts with it.

### Before you begin

Role required: sn_devops.admin or sn_devops.app_owner

### Procedure

1. Navigate to **All** > **DevOps** > **Apps & Pipelines** > **Apps**.
2. Select the application.
3. From the application record page, select the related list for the object type that you want to associate.

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# Accelerating your DevOps change process

Enable the change acceleration feature of DevOps Change Velocity for automatic change request creation in your pipeline, and use change approval flows and policies to automate approval under certain conditions.

**Note:**
ServiceNow Change Management must be installed for change acceleration.

Enable and set up change control when you model your pipeline in DevOps:

- Model an Azure pipeline in DevOps
- Model a GitLab basic CI pipeline in DevOps
- Model a Jenkins pipeline in DevOps

You can view details for active change requests by navigating to **DevOps** > **Orchestrate** > **Pipeline Change Requests**.

## Change control process

When change control is enabled for a job in your DevOps development pipeline, a change request is automatically created and set to Assess state to request approval for the execution of the current stage or job if an assignment group is added for the change request. Change requests can be approved automatically by configuring conditions in a change approval policy.

Pipeline steps can be configured to enable change receipts, which do not pause the pipeline. Change requests created with change receipts enabled include all pipeline data, but do not require approval to proceed in the pipeline and the change request will be in post implement states. For change requests created without enabling change receipt, the pipeline will be paused until the change request is approved, and upon approval, the pipeline will be resumed.

If you want to stop the automatic transition of the change request states even when change receipt is turned on, you must disable the sn_devops.enable_change_receipt_state_transition property. For more information, see DevOps Change Velocity properties.

Once approved, either automatically or manually, change requests move to Implement state and the job is run. Once the job is run, the change request is moved to the closed state with Close code as successful on a successful job run or Unsuccessful on error in the job run. For information on customizing your change request states, see Custom change request process.

If a change request is not approved and moved to the canceled or closed state, the associated Jenkins, GitHub, or ADO job is marked as failed and a console message is shown:

For Jenkins: `[ServiceNow DevOps] Job was not approved for execution`

For GitHub: `Error: **** Change has been created but the change is either rejected or cancelled`

For ADO: `"changeState":"Closed"`

## Automatic approval of change requests using flows and policies

You can automate the change approval process for all your DevOps change requests. DevOps Change Velocity uses flows and DevOps data (such as work items, commits, code coverage, code security, risk, and test results) to update the state of a change request and automatically approve it based on change approval policies. Three flows are available in the base system that you can clone, customize, and activate (in Flow Designer). By default, the DevOps Change

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Request Manual Approval Flow is activated. DevOps flows are applicable to only automatically created change requests or change requests that have change receipt turned off.

## Flows

A flow is an automated process consisting of a trigger (which specifies when to run the flow) and a sequence of reusable actions (where the actions perform a sequence of operations on your data). Flows are built in Flow Designer, a ServiceNow AI Platform feature that enables process automation. For more information, see Flow Designer.

You can use one of the DevOps flows available in the base system as a template; clone the flow and customize it to your business requirements. Ensure that only one DevOps flow is in the active state at any time to avoid conflicts and errors. A DevOps flow is applicable to change requests that have the DevOps category or if the devops_change property is set to true. (An automatically created DevOps change request sets the category to DevOps by default).

By default, the flows are configured to update the state of the step execution based on the change request state, and any additional default behavior. Based on the step execution state, a callback is made to the pipeline:

- If the DevOps change request is approved, the flow will update the step execution state to approved, and the change request state is updated to implement. After that the pipeline will be resumed.
- If the DevOps change request is rejected, the flow will update the step execution state to rejected, and the change request state is updated to new. After that the pipeline will be terminated.
- If the DevOps change request is canceled, the flow will update the step execution state to canceled by user, and the change request is updated to canceled. After that the pipeline will be canceled.

If a business rule or data policy causes an error while updating a change in the DevOps Change Request Manual Approval Flow, DevOps Change Request Minimal Automation Approval Flow, or DevOps Change Request Advanced Automation Approval Flow, the corresponding error will be displayed in the worknotes of the change request and logged in the console logs of the pipeline tool.

| DevOps flow | Default behavior |
| --- | --- |
| DevOps Change Request Manual Approval Flow | This flow is activated by default. With this flow, DevOps change requests must go through a manual approval process, where the flow waits for the change request to reach an eligible state (rejected, implemented, or specific implementation state). When reached, this flow will update the state of the step execution based on the state of the change request.<br><br>If the change request is type-based, the flow will wait for the change to get rejected, implemented, or canceled. If the change request is model-based, the flow will wait for the change to get rejected, get canceled, or reach one of the implementation states defined in the model or the implement state specified in the DevOps property. |

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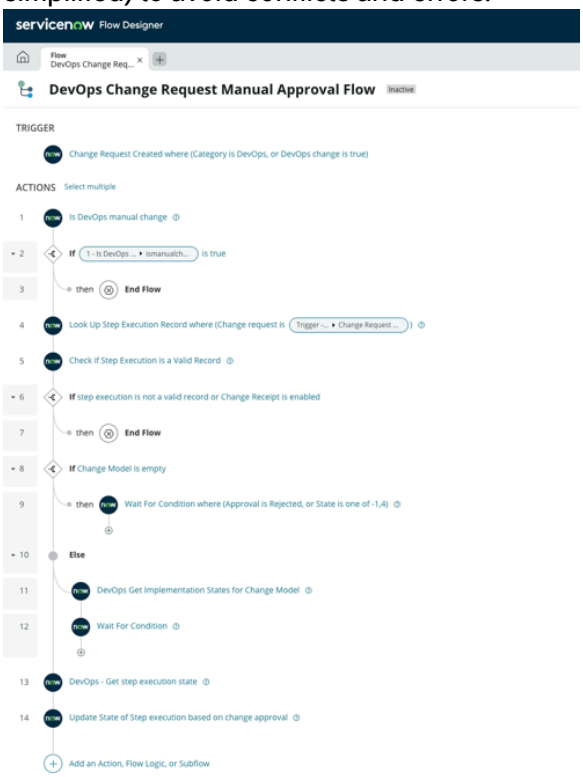
| DevOps flow | Default behavior |
| --- | --- |
| | This flow won't trigger for DevOps change requests whose model is a base system DevOps change model (DevOps or DevOps simplified) to avoid conflicts and errors.<br>  <br><br>You can clone this flow and customize it to make changes. Ensure that the other DevOps flows are deactivated. |
| DevOps Change Request Minimal Automation Approval Flow | This flow gathers DevOps data and runs the DevOps Change Request Minimal Automation Policy, which determines if the change should be auto-rejected, auto-approved, or sent for manual approval. This flow is triggered for DevOps change requests whose type or model is set to normal. |

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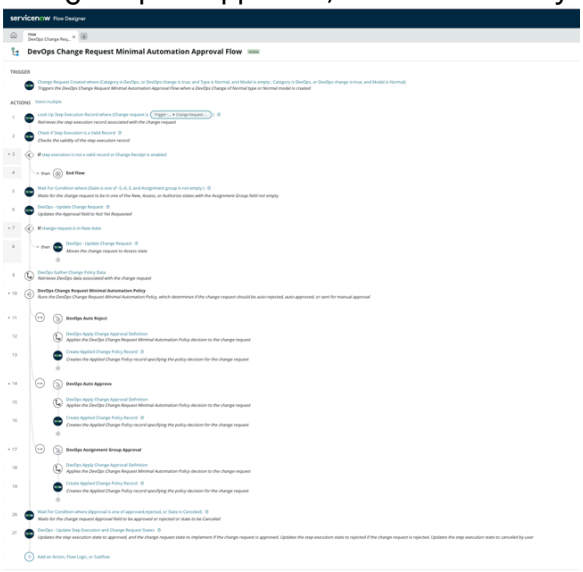
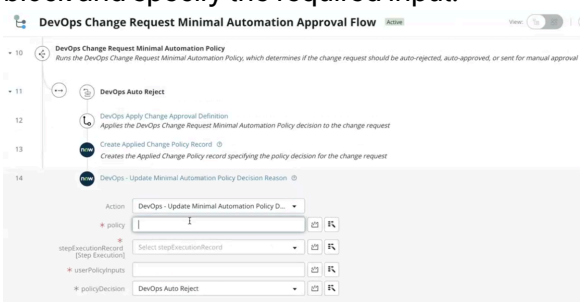
| DevOps flow | Default behavior |
| --- | --- |
| | Activate this flow if you want to automate change request approvals, but start minimally.<br>  <br>You can clone this flow and customize it to make changes. Ensure that the other DevOps flows are deactivated.<br><br>You can also add the DevOps - Update Minimal Automation Policy Decision Reason action to this flow to update the policy decisions to the step execution change comment and the change request worknotes to know the reasons for the decision. You can add this action inside every decision block and specify the required input.<br>  <br> |
| DevOps Change Request Advanced Automation Approval Flow | This flow gathers DevOps data and runs the DevOps Change Request Advanced Automation Policy, which determines if the change should be auto-rejected, auto-approved, or sent for manual approval. This flow is triggered for DevOps change requests whose type or model is set to normal.<br><br>If the DevOps change request is approved, the flow will update the change request to the scheduled state, and the planned start date will be used to set the change request start date. On the change request |

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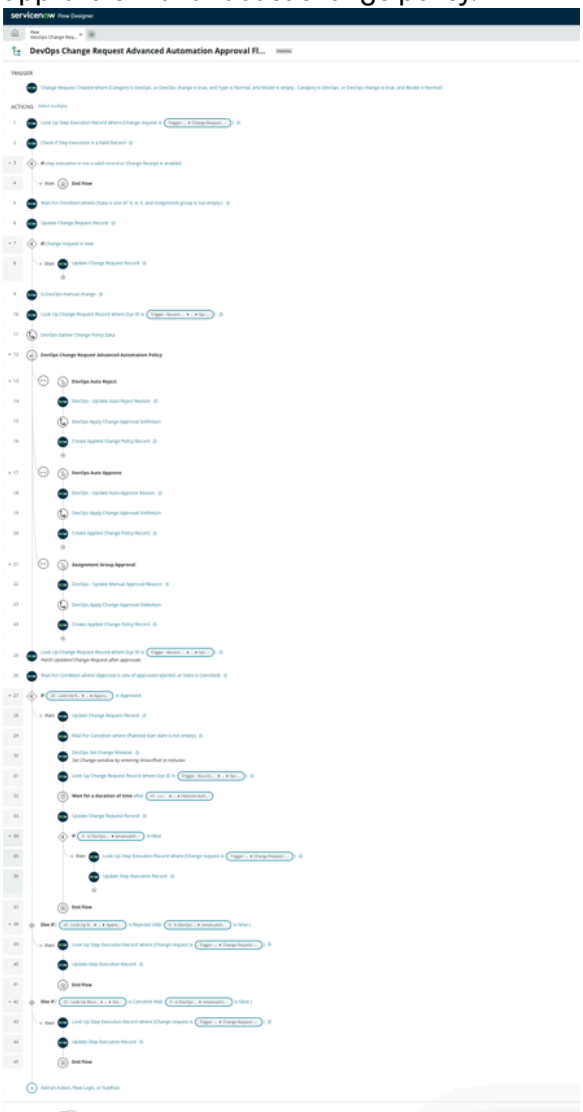
| DevOps flow | Default behavior |
| --- | --- |
| | start date, the flow will update the change request state to implement. After that the pipeline will be resumed. Activate this flow if you want to automate change request approvals with a robust change policy.<br>  <br>You can clone this flow and customize it to make changes. Ensure that the other DevOps flows are deactivated. |
| DevOps#Demo#Change Automation flow | When demo data is installed, the #DevOps #Demo#Change Automation flow#s available where#normal type of change request or normal model change request can be auto-approved based on the decision policies. #As a part of demo data, the decision policies available are: |

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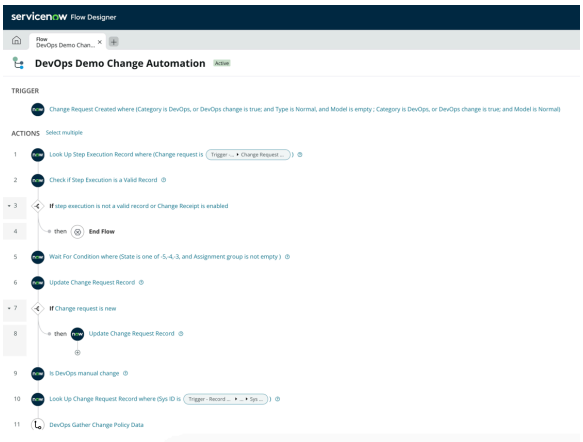
| DevOps flow | Default behavior |
| --- | --- |
| | • DevOps Low Risk Auto Approval policy, where the failed test count is zero##.<br>• DevOps High risk manual approval policy, where the failed test count is greater than zero#.<br>  <br>You can clone this flow and customize it to make changes. Ensure that the other DevOps flows are deactivated. |

To read guidelines on how to use flows, subflows, and actions more effectively, see Design considerations for Flow Designer.

## Change approval policies

A change approval policy is a course of action that can be applied to a change request. It consists of the following:

- Policy input: Variable sources evaluated within a condition.
- Decisions: Determines whether the change approval definition must be applied based on conditions.
- Approval definitions: Defines the type of approval that can be applied.

The DevOps Change Request Minimal Automation Policy and DevOps Change Request Advanced Automation Policy are available by default. The three normal change policies available are:

- DevOps Model Change Policy
- DevOps Change Request Minimal Automation Policy
- DevOps Change Request Advanced Automation Policy

For more information on change approval policies, see Change approval policies.

The DevOps automated approval flows use change approval policies and DevOps data (such as work items, commits, pull requests, test summaries, security summaries, and quality summaries) to automatically update the change record state and step execution state to approved, rejected, or canceled. You can view and edit these policies based on your business requirements, or create your own in the decision table. See the following decision tables.

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The DevOps Change Request Minimal Automation Policy has the following conditions and criteria by default:

| Condition | Criteria | Description |
|---|---|---|
| Commit linked to work items | Not Empty | Each code commit must have an agile story to adhere to your agile development practices. Each commit comment must have the Story ID linked to it. |
| Unit Test Coverage % | >70% | Unit Test coverage must be greater than 70% for change auto approval. This applies to integration test tools that are used with any orchestration tool, such as Jenkins, Gitlab, Azure DevOps, or Github Actions. |
| Code security | >0 blocker or critical 0 | >0 blocker or critical 0Code security scans must have 0 vulnerabilities, with blocker, critical, and major vulnerabilities. |

The DevOps Change Request Advanced Automation Policy has the following conditions and criteria by default:

| Condition | Criteria | Description |
|---|---|---|
| Commit linked to work items | Not Empty | Each code commit must have an agile story to adhere to your agile development practices. Each commit comment must have the Story ID linked to it. |
| Regression tests failed | 0 | All regression tests must pass for change auto approval. This applies to integration test tools that are used with any orchestration tool, such as Jenkins, Gitlab, Azure DevOps, or Github Actions. |
| Integration tests failed | 0 | All integration tests must pass for change auto approval. This applies to integration test tools that are used with any orchestration tool, such as Jenkins, Gitlab, Azure DevOps, or Github Actions. |
| Commits -> Total Changes | >50 | Commits greater than 50 require manual change approval |
| Load Tests Failed | 0 | All load tests must pass for change auto approval. This applies to integration test tools that are used with any orchestration tool, such as Jenkins, Gitlab, Azure DevOps, or Github Actions. |
| Unit Test Coverage % | >70% | Unit Test coverage must be greater than 70% for change auto approval. This applies to integration test tools that are used with any orchestration tool, such as Jenkins, Gitlab, Azure DevOps, or Github Actions. |
| Code Coverage % | >70% | >70%Code quality scans coverage must be greater than 70% for change auto approval. This applies to SonarQube tool integration with orchestration tool such as Jenkins, or Azure DevOps or Github Actions. |
| Code security | >0 blocker or critical 0 | >0 blocker or critical 0Code security scans must have 0 vulnerabilities, with blocker, critical, and major vulnerabilities. |
| Number of outages in 7 days | >70% | Zero outages in 7 days. |
| Number of current outages | 0 | No new current outages. |
| Number of open incidents | 0 | No new or open current incidents. |

The three outcomes for the DevOps Change Request Minimal Automation and DevOps Change Request Advanced Automation policies (depending on the conditions that you specify) are:

- Auto approval: If the conditions specified in the policy are met, the change request is automatically approved.
- Auto reject: If one or more of the conditions specified in the policy are not met, the change request is automatically rejected.
- Manual approval: If one or more conditions need manual approval by a user or group, that is specified in the policy. Notifications are sent by the policy to the relevant users or groups to expedite the manual approval and progress the change request.

## Change approval work notes

When a change request is updated based on a flow and change approval policy, the work notes associated with the change request are updated to one of the following hard-coded messages:

- Change Approval Policy not found. Change Request has been rejected (%s).
- %s is inactive. Change Request has been rejected (%s).
- No Decisions matched. %s has been skipped (%s).
- No approvals were generated from matched Decisions. %s has been skipped (%s).
- Change Request has been rejected by %s (%s).
- Change Request has been approved by %s (%s).

The work notes are updated based on a logic which uses the combination of one of the hard-coded messages + the policy name + action label used in the flow associated with the change request. In this combination, you can change only the value of policy name and the action label but not the hard-coded message. For example,

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```
if (APPROVED.equals(state))
38 message = String.format(APPROVED_MSG, policyName,
 actionLabel);
```

## Custom change request templates

When you enable change control in the ServiceNow DevOps step , you can select a custom template to populate fields automatically while creating the change request. The change request **Category** field is automatically set to DevOps.

> **Note:**
> Do not configure the **Category** and **changeType** fields from the custom template.

The type of change request corresponds to the change request table in global scope.

## Automatic change request related lists

For a change request automatically created by DevOps, the **Category** field is automatically set to DevOps, and these related lists are added:

**Commits**

Commits associated with the change request.

**Work Items**

Work items associated with the change request.

**Artifact Versions**

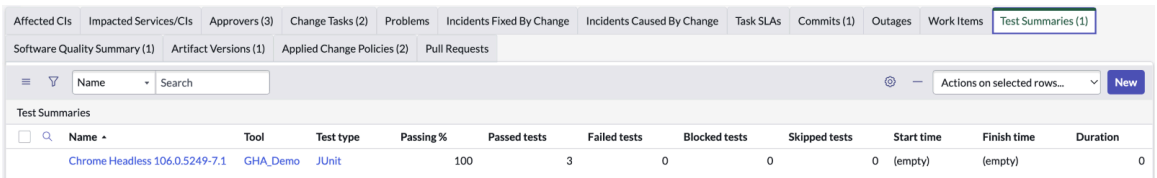
List of artifact versions associated to the package linked to pipeline execution for packages created before the change request is approved.

If no package is linked to the pipeline execution, then the list is empty.

**Test Summaries (replaces Test Results related list)**

List of test summaries for a pipeline execution associated with an artifact, package, or task execution before the change request.

See Test Results for more details.




> **Note:**
> Implementation details from the orchestration tool are automatically added to the **Work notes** field on the change request form. Detail added to the work notes is limited to 5 KB of the task execution log for the step.

## Custom change request process

These DevOps change properties are available to customize your change request flow.

- DevOps change request implement state
- DevOps change request post implement state

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- DevOps change request cancel state
- DevOps change request approval text

To customize your change request flow, you must first create a **System Definition** > **Choice List**. For example, `DevOps_Implement (value - 10)`.

Then, add the choice list to **System Definition** > **Script Include** > **ChangeRequestStateHandlerSNC**.

Once you have created the choice list and added it to the script include, you can update DevOps change properties with the new choice list values. For example, *`DevOps change request implement state`*`-10`.

## DevOps Risk Condition

You can use the DevOps risk and impact calculation based on committer risk score.

This condition is inactive by default.

## Test Results related list

Lists the tests that were run in a pipeline after a package was created. If no package was created, then the list includes the tests that were run after an artifact version was created.

Scenarios:

**A package is created in the pipeline, but no artifact versions are registered.**

- If the change request is created in the package creation stage:

  No test results are displayed because a package is not yet linked to the pipeline execution.

- If the change request is created in a stage after the package creation stage:

  Build test summaries include those associated with stages after the package creation stage, up to the change-controlled stage.

**Artifact versions are registered, but no package is created.**

- If the change request is created in the artifact version stage:

  No test results will be displayed, because no tests are associated until the task execution is completed.

- If the change request is created in a stage after the artifact version stage:

  Build test summaries include those in the artifact version stage, as well as the stages afterward, up to the change-controlled stage.

**Both artifact versions and package are created in the pipeline.**

- If the change request is part of the stage after artifact version and package creation stages:

  Build test summaries include those associated with the package creation stage, as well as the stages afterward, up to the change-controlled stage.

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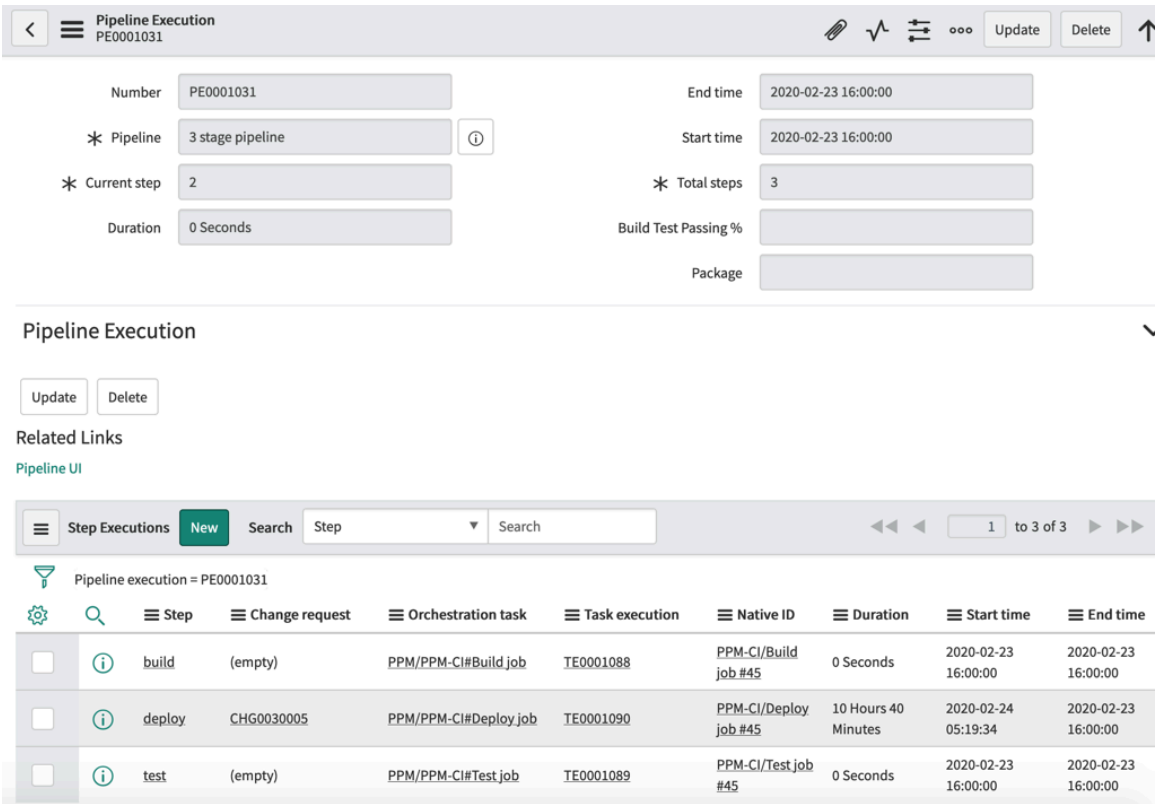
- If the change request is part of the package creation stage, and artifact versions are created as part of an earlier stage;
  - or the change request is created in a stage (not package creation) after the artifact version stage, but before package creation stage;
  - or the change request is part of the package creation stage and artifact versions are created as part of an earlier stage:

  Build test summaries include those associated with the artifact version stage, as well as stages afterward, up to the change-controlled stage.

## Pipeline executions view

You can view pipeline activity by navigating to **DevOps** > **Orchestrate** > **Pipeline Executions**.




## Automate DevOps change request creation

Modify your pipeline to automatically create a DevOps change request.

### About this task

The step 5 in this topic requires you to specify the attributes for the change request. Change attributes can be specified in multiple areas. They can be specified in the pipeline step of DevOps Change Velocity, in the Default Change Handler subflow, in an approval flow, in a template, or passed in the pipeline. If a change model is used, they can also be specified in model presets. For more information, see DevOps change request attributes.

If you have used business rules, then you must set the *sn_devops.change_request.apply_attributes_on_creation* property to true, so that the change attributes passed in the pipeline are set when the change request is created instead of the attributes being passed after the change request is created. For more information, see DevOps Change Velocity properties.

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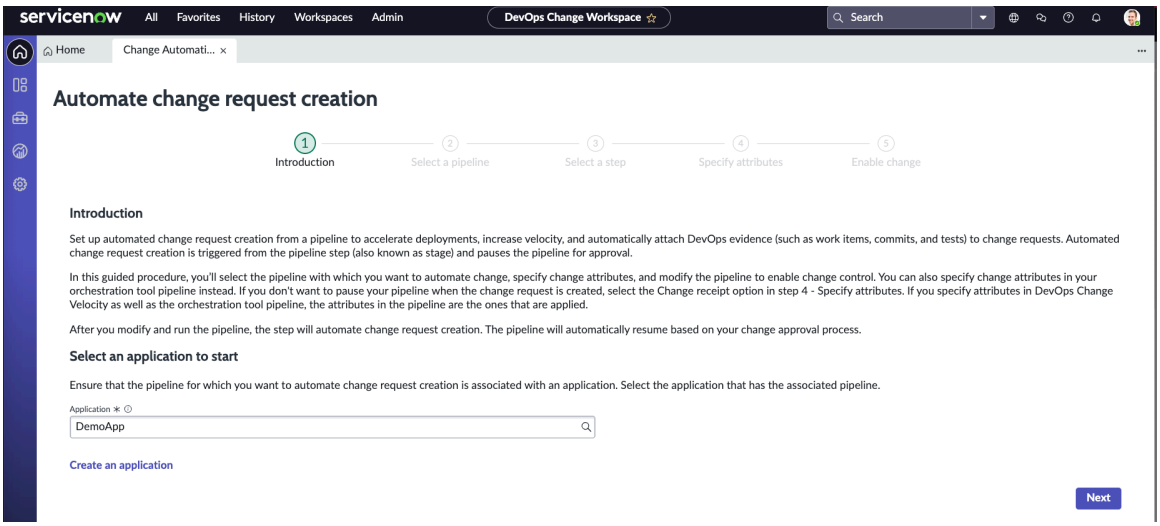
## Before you begin

Role required: sn_devops.admin, sn_devops.tool_owner, or sn_devops.app_owner

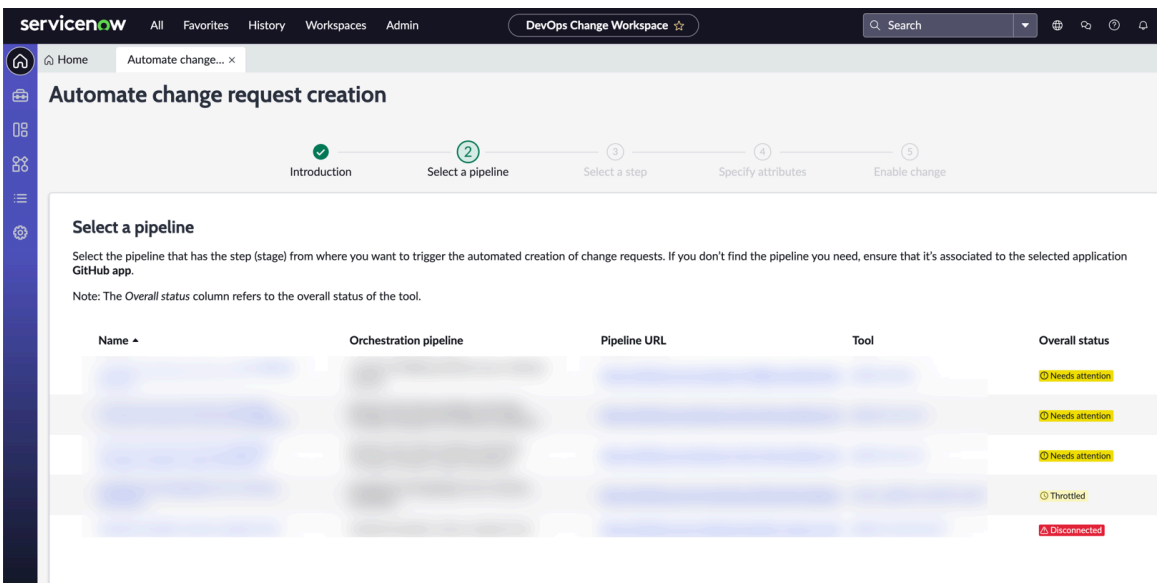
## Procedure

1. From the DevOps Change Workspace, select **Automate change creation**.
2. In the **Application** field, select the application that you want to associate with the pipeline for which you want to automate change request creation, and select **Next**.




3. Select the pipeline that has the step (stage) from where you want to trigger the automated creation of change requests.

> **Note:**
> If you don't see the pipeline, make sure that it's associated to the application selected in the previous step.




You can see the connection state of the tool associated with the pipeline in the **Overall status** column. An alert will also be displayed based on the connection state of the tool before proceeding to the next step.

4. Select the step in the pipeline from where you want to trigger the automated creation of a change request.

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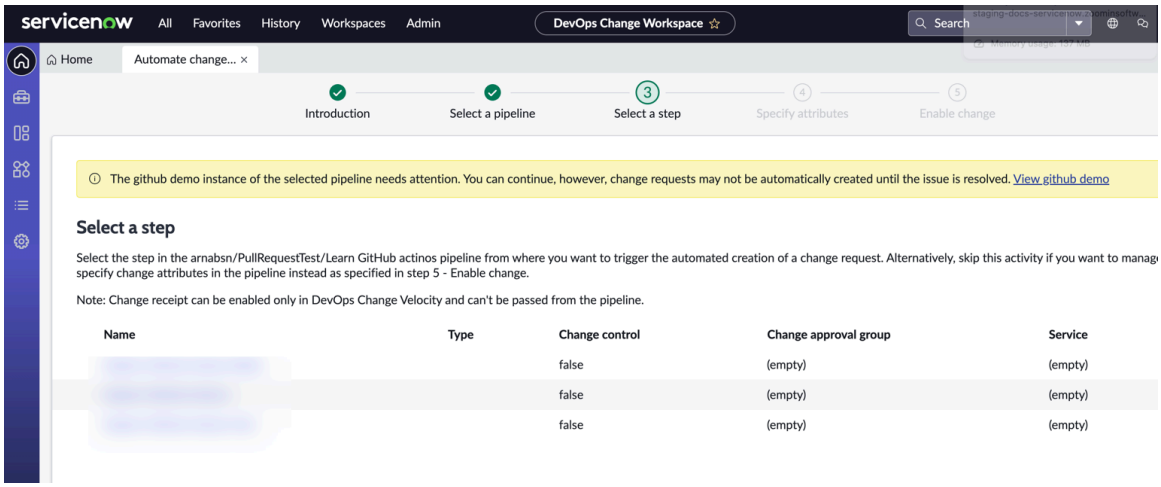
**Note:**
You can skip this activity if you want to manage and specify change attributes in the pipeline instead as specified in the **Enable change** step.

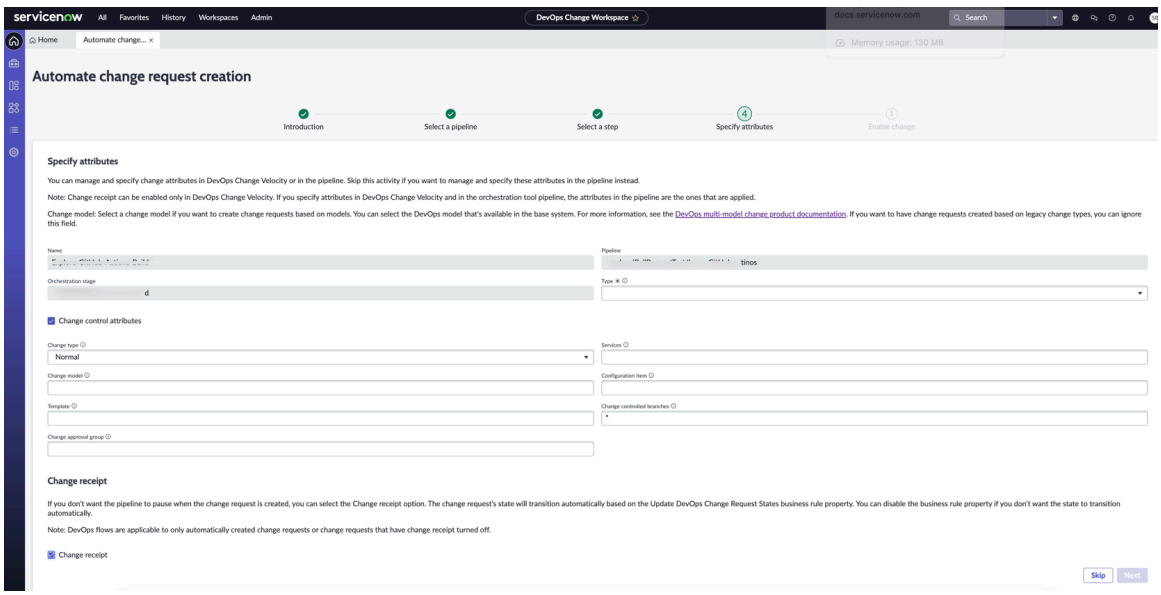



5. Specify the change attributes in the change fields and enable change receipt by selecting the Change receipt option.

**Note:**
You can skip the activity of specifying change attributes if you want to manage and specify these attributes in the pipeline instead. However, change receipt can be enabled only from ServiceNow DevOps Change Velocity.

For more information on configuring change settings, see Create a Change.

You must enable change receipt if you don't want the pipeline to pause when the change request is created. You can disable the sn_devops.enable_change_receipt_state_transition property if you don't want the state to transition automatically.




6. Modify your pipeline and use the corresponding code snippet to enable change control and specify change attributes.
Depending on your orchestration tool, the steps to enable change control are displayed. Follow the instructions given on the page and modify your pipeline accordingly.

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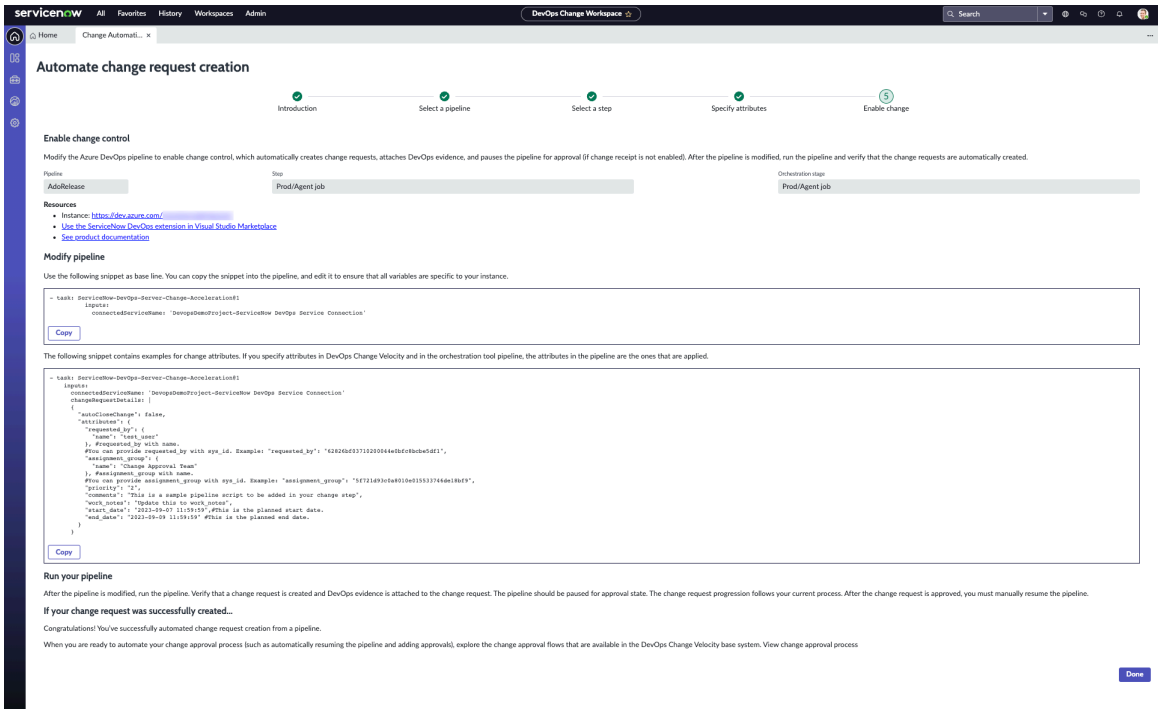
The following image displays the steps for Azure DevOps.




7. Select **Done**.

## Create a DevOps Change request and associate existing DevOps data — Workspace

Create a DevOps change request and associate existing DevOps data through the Workspace UI.

### Before you begin

Role required: sn_devops.admin

### About this task

For more information on using Change features, see Create a Change.

> **Important:**
> You can update the associated data after you create a request, but you cannot edit a change request if it is in one of the following states:
>
> - Implement
> - Post-Implement
> - Cancelled

### Procedure

1. Navigate to **Workspaces** > **DevOps Change** > **Applications** ( ).
2. Select an application from **Applications** list.
3. In the Recommended actions panel, select **Create manual change**.
4. In the **Category** list, select *DevOps* and then select **Save**.
5. Select **Add DevOps data** to add supporting data to the change request.

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6. Complete the Add DevOps data pages.

   a. Specify the following values on the **Select data type and associations** page:

   **Select data type and associations**

| Field | Description |
|---|---|
| Data type | The type of data to associate with the change request.<br>▪ Artifact version<br>▪ Release version<br>▪ Build number |
| Data associations | The specific data to associate with the change request. You can select multiple artifact versions and build numbers.<br>If you select *Build number* as the **Data type**, then you must also specify the application name and corresponding pipelines and build numbers. |

   b. Select **Next** to open the Verify data associations page.

   c. Navigate the tabs to verify that the associated data is mapped accurately. Update settings as needed.
      - Work Items
      - Commits
      - Pull Requests
      - Test Summaries
      - Artifact Versions
      - Software Quality Summaries
      - Security Scan Summaries

   d. Select **Submit**.

   The Change request form is updated.

7. Configure other settings as needed.
   For example, specify the schedule.

   **Note:**
   For more information on configuring settings, see Create a Change.

8. Select **Save**.

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### What to do next
To modify the data that is associated to the change request, select **Edit DevOps data**. Verify the associated data that you added or removed in the **Additions**/**Removal** tabs in the **Add DevOps Data** modal.

## Create a DevOps Change request and associate existing DevOps data — Classic

Create a DevOps change request and associate existing DevOps data through the Classic UI.

### Before you begin
Role required: sn_devops.admin or sn_devops.app_owner

### About this task
Create a DevOps change request and associate existing DevOps data. You can modify the associated details after you have created a DevOps change and associated data with it.

**Important:**
If the Change request is in one of the following states, the **Edit DevOps Data** button is inactive:

- Implement
- Post-Implement
- Cancelled

### Procedure
1. Navigate to **All** > **Change** > **Create New** > **Create Normal Change**.

   **Note:**
   For more information on using the Change module, see Create a Change.

2. From the **Category** list, select *DevOps* or *Other*.
3. **Optional:** Select the **DevOps Change** option, if you have selected *Other* in the **Category** field.
4. Click the **Add DevOps Data** button on the form header.

   **Note:**
   The **Add DevOps Data** button appears only if you have selected *DevOps* as the category, or *Other* as the category and selected the **DevOps Change** option.

   The **Add DevOps Data** modal displays.
5. In the **Select data type and associations** section, select the data type and the related data associations.

   a. Select any of the following options from the **Data Type** list.

   - Artifact Version
   - Release Version
   - Build Number

   **Note:**
   You can select multiple Artifact versions and Build Numbers.

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b. Select the data you want to associate with the change from the **Artifact Version**, **Release Version** or **Build Number** field.

> **Important:**
> If you select *Build Number* as the **Data Type**, you must also specify the application name, and corresponding pipelines and build numbers.

6. Click **Next**.
7. Verify that the associated data for the following fields is mapped accurately.
   - Work Items
   - Commits
   - Pull Requests
   - Test Summaries
   - Artifact Versions
   - Software Quality Summaries
   - Security Scan Summaries
8. Click **Submit**.
   The Change Request form displays.
9. Select the **Assignment group** to which this change request is assigned.
10. Configure the change window for the change request from the Schedule tab.

> **Note:**
> For more information on configuring the schedule, see Create a Change.

11. Click **Submit**.

### What to do next

To modify the associated DevOps data to the change request, click the **Edit DevOps Data** button. Verify the associated data that you added or removed in the **Additions**/**Removal** tabs in the **Add DevOps Data** modal.

## DevOps change request without mandating category as DevOps

Enable categorizing DevOps change request from DevOps properties. Change requests that are created as part of pipeline execution steps can be created with a category other than DevOps.

### Before you begin

Role required: sn_devops.admin

### About this task

Change requests created in the DevOps application aren't created with **Category** as DevOps.

Use related templates for specific categories, such as *`Hardware, Software, Database`* and so on, to create DevOps change requests. You can categorize DevOps change requests from the DevOps properties.

New change requests that are created in the DevOps application after you enable the property can continue to use custom change policies and approval workflows, in addition to the base system's DevOps Demo Change Automation flow, and the DevOps Model Change Request flow. If you don't enable this property, change requests continue to be created and processed with the category attribute set to DevOps.

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### Procedure

1. From the DevOps Change Workspace, navigate to **Administration** > **System configuration** > **Properties**.
   You can also navigate from **All** > **DevOps** > **Administration** > **Properties**.
2. Enable the **Categorize DevOps changes requests on "DevOps change" field** property.
   Select the check box to enable categorizing any change request created from the DevOps application, as a DevOps change request.

   By default, the property check box is cleared. To make changes, set the application scope to DevOps Data Model.

> **Important:**
> DevOps Insights capabilities are disabled when this property is selected.

### Result

Any new change request that is created from the DevOps application is considered as a DevOps change irrespective of the category attribute and processed accordingly. DevOps change request creation and processing no longer depend only on the category attribute being set to DevOps.

## Change request creation with DevOps data retrieval errors

Create change requests even with errors in DevOps data retrieval.

## Change request creation overview

> **Note:**
> Change request creation with DevOps data retrieval errors is supported only for Azure DevOps, GitHub Actions, GitLab, and Jenkins pipelines.

You can create a change request with or without errors in DevOps data retrieval. This functionality can be controlled by the **Enable change request creation even with errors in DevOps data retrieval** property. When the **Enable change request creation even with errors in DevOps data retrieval** property is enabled, and an error occurs in retrieving DevOps data like work items, commits, test summaries, or security summaries, the corresponding change request is still created. The data that can be retrieved will still be associated with the change request. For the data that can't be retrieved, the reason for the error will be notified to the user in the third-party console, and the same information will also be added in the **Change Comments** field in the Step Execution record and the change **Worknotes**.

If the **Enable change request creation even with errors in DevOps data retrieval** property isn't enabled, a change request is created only when there's no error in any step of a pipeline run. When an error occurs, the pipeline is aborted and the reason for the error is added in the inbound event's **Processing details** field, and the same is notified to the user in the third-party console.

For more information, see DevOps Change Velocity properties.

## Approval for change requests with DevOps data retrieval errors

For change requests created with DevOps data retrieval errors, the *`is_change_with_partial_data`* policy input is set to **True** for all the change approval policies. Only a manual change approval decision is applied to such changes so that you can approve or reject the change after manually verifying the DevOps data in it. In the DevOps Gather Change Policy Data subflow, the *`Is change with partial data`* action determines whether a change is created with DevOps data retrieval errors or not.

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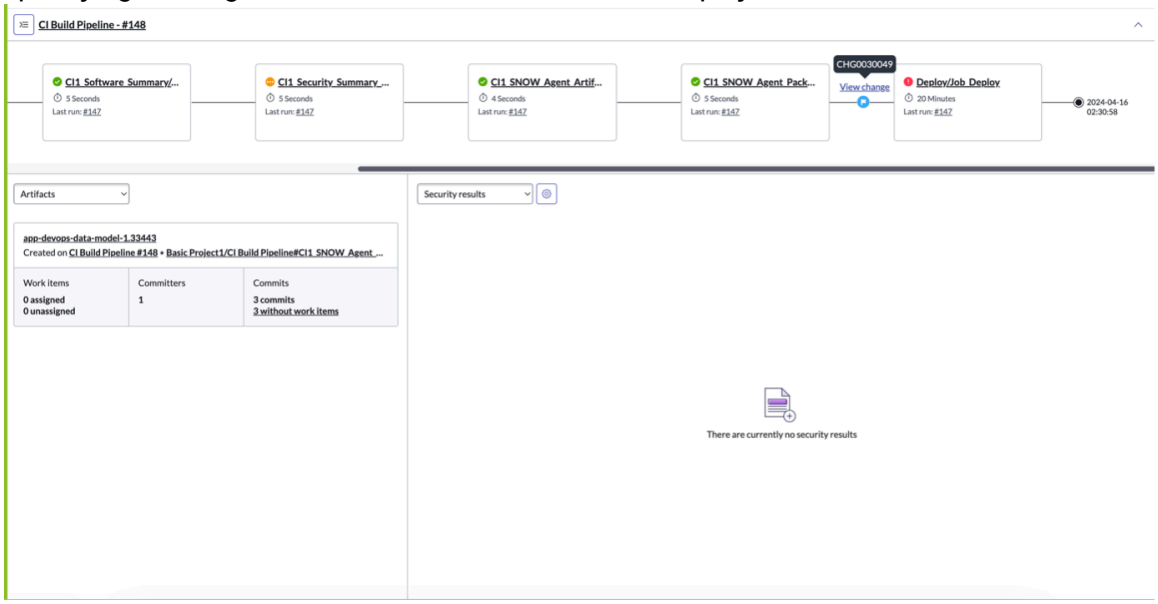
## Pipeline UI for change requests with DevOps data retrieval errors

When a change request gets created with DevOps data retrieval errors, the card specifying the stage where the error occurred will be displayed in the Yellow color.




**Note:**
If your build pipeline (CI) is set up to trigger a release (CD) pipeline and a change is created in the release pipeline, the data is collected from the build pipeline and associated with the change request. There may be a situation where ServiceNow DevOps Change Velocity will receive and process the release pipeline events before build pipeline events. In this case, the change will be created with DevOps data from the build pipeline even though there's an error in retrieving some of the data. You can observe this behavior even though the **Enable change request creation even with errors in the DevOps data retrieval** property is enabled. Also, the *is_change_with_partial_data* policy input will be false in this case, and the approval process will be applied in the way it's defined in the approval flows unlike always manual in case of change requests with DevOps data retrieval errors.

## Callback timeout

If an inbound event goes into the waiting state during a pipeline run, the system tries to process the change until the timeout value in the *sn_devops.change_request_callback_timeout* property is exceeded, after that the pipeline is aborted. The reason for the error is displayed in your third-party tool's console logs. When a pipeline is canceled because of callback timeout, the same information is added in the callback record of the corresponding step execution. You can contact your DevOps admin to increase the timeout value in the *sn_devops.change_request_callback_timeout* property. The default value of this property is 120 minutes, and the minimum value is 60 minutes. For more information, see DevOps Change Velocity properties.

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**Note:**
If you are using GitHub change automation custom action or GitLab Docker change automation custom action in your corresponding pipeline to create change requests, you need to provide the **interval** in the custom action, which enables GitHub or GitLab to poll ServiceNow DevOps for the change status. When the change reaches an appropriate state in ServiceNow within the specified interval, the appropriate status depending on the outcome of the change will be sent to GitHub or GitLab pipeline, which will resume or abort the pipeline. See ServiceNow DevOps custom actions from GitHub marketplace and Implement custom actions for pipelines using generic Docker container image for more details. So, when your pipeline with the change custom action is run, and if any of the step notification from GitHub or GitLab did not reach ServiceNow DevOps, then the association of callback, step execution, and task execution will not happen in ServiceNow DevOps. As the association is not available, the change will not be created and ServiceNow DevOps will wait until the association is in place. At the same time, GitHub or GitLab will poll ServiceNow for the change status until the time specified in the interval is reached. If the interval is passed and also the timeout specified in the *sn_devops.change_request_callback_timeout* property is reached, ServiceNow DevOps will not terminate your pipeline as it should but will leave it for the default timeout set in the GitHub or GitLab step that will eventually terminate the pipeline. The important information in this scenario is that ServiceNow DevOps will not be able to notify the user that the step events did not reach ServiceNow DevOps in the GitHub or GitLab console logs.

## Upgrade

After you upgrade, the property will be set to false by default. Your current change process will function as is, but the only difference you'll see is that, when an error occurs in retrieving DevOps data the pipeline is aborted (instead of waiting indefinitely) and the reason for the error is added in the inbound event **Processing details** field, and the same is notified to the user in the third-party console. If you want to create change requests with errors in retrieving DevOps data and also not fail your pipeline, you can enable the **Enable change request creation even with errors in DevOps data retrieval** property. This provides value to your change approvers and AppDev teams by getting the changes created automatically with DevOps evidence that is gathered and appropriately notified in the change request work notes and third-party console logs with errors or data that may be missing.

## Limitation

If the **Enable change request creation even with errors in DevOps data retrieval** property is enabled, and the ADO artifact package step in your pipeline results in error, the change will be created without ADO artifacts associated with it, but the corresponding error will not be notified in Worknotes, or Step Execution change comments, or in the ADO console log.

## Artifacts and packages

Artifacts and packages enable DevOps Change Velocity to track development and testing activities across a wide range of deployment and release models. This feature ensures that pipeline activity stored in the DevOps data model can be retrieved and applied when artifacts are created and released at different times or in different pipelines.

### Artifacts

When an artifact version is registered, related activities like commits, tests, and code scans are tracked so that regardless of when the artifact version is deployed, those details can be retrieved. It can be in the current pipeline execution, a later execution of the same pipeline, a pipeline that is triggered by the current one, or a separate pipeline that is triggered independently.

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When you associate commits with an artifact version (CI pipeline), and define an artifact package (CD pipeline), all artifact versions generated since the last time the app was deployed to production are included in the list of commits for the change. Consolidation of these items is helpful, especially when there are multiple CI builds before the deployment.

DevOps change request attributes:

- **Category** DevOps or the **Categorize DevOps change requests on "DevOps Change" field** check box is selected in DevOps properties. For more information, see DevOps change request without mandating category as DevOps.
- Commits and Work Items related lists

#### Packages

A package tracks when one or more artifact versions are being used in a deployment pipeline. This provides two important benefits:

1. Retrieval of activities for all artifact versions declared in the package. For example, for use in an automated change approval policy.
2. Recording when a specified artifact version was successfully released, ensuring that information tied to them is no longer considered. For example, for later change requests.

## Artifact setup

1. Create an artifact tool record in DevOps.

   **Note:**
   An artifact tool isn't necessary unless a webhook or user-created integration subflow configuration is required to look up artifact versions.

2. Register artifacts in the CI pipeline.
3. Create a package in the CD pipeline.

   **Note:**
   The package creation step must be before the Prod Deploy step.

## Artifact registration

Configure artifact registration in a scripted pipeline or freestyle job using the DevOps API / `artifact/registration` endpoint. Multiple artifact versions are supported.

For Jenkins pipeline:

- Scripted and declarative pipeline (*`snDevOpsArtifact`* Jenkinsfile command)

  For example:

```
snDevOpsArtifact(artifactsPayload: """{"artifacts":
 [{"name": "sa-web.jar", "version": "1.9","semanticVersion":
 "1.9.0","repositoryName": "services-1031"}], "branchName":
 "master"}""")
```

- Freestyle job (**Register Artifact** build step)

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For example:

```
{"artifacts":[{"name":"sentiment-analysis-web2","version":"1.9"
,"semanticVersion":"1.9.0","repositoryName":"maven-releases"}]}
```

## Artifact package creation

**Important:**
You must add the package creation step before the change step in your pipeline, and package creation must be added in a stage which is previous to the change step, so that packages are linked to the pipeline execution for a change request.

Configure artifact package creation in a scripted pipeline or freestyle job using the DevOps API `/package/registration` endpoint.

**Note:**
Package name must be specified.

For Jenkins pipeline:

- Freestyle job (**Create Package** build step)

  For example:

  ```
  {"artifacts":[{"name":"sentiment-analysis-web2","version":"1.9"
  ,"repositoryName":"maven-releases"}]}
  ```

- Declarative and scripted pipeline (*snDevOpsPackage* Jenkinsfile command)

  Package with more than one artifact (from different repos) in the payload, for example:

  ```
  snDevOpsPackage(name: "sentimentpackage", artifactsPayload:
   """{"artifacts":[{"name": "sa-web.jar", "version": "1.9",
   "repositoryName": "services-1031"}, "{"name": "sa-db.jar",
  ```

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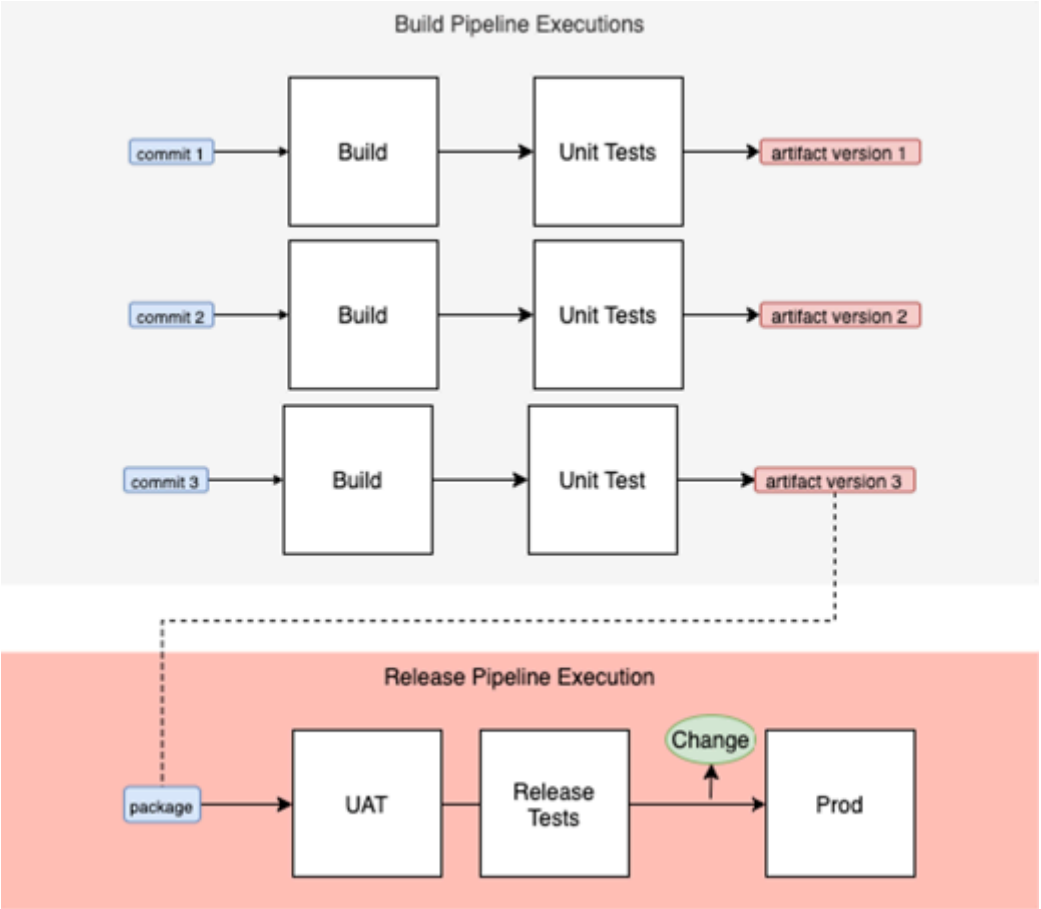
```
"version": "1.3.2", "repositoryName": "services-1032"}],
"branchName": "master"}""")
```




**Note:**
When an artifact version isn't available during the build, build details (pipelineName or projectName, taskExecutionNumber, stageName, branchName) are used to look up the artifact version in the task execution.

Jenkins plugin step `includeBuildInfo` can be used to include build details in the API call.

## Artifact workflow and objects

The orchestration tool job publishes the new artifact (consisting of versions) to the artifact repository. Each artifact version is associated with a task execution (consisting of the related code commits). A package is created for the release (consisting of specific artifact versions flagged for deployment) and, after the deployment stage completes, the package is marked as deployed to production.

These objects are part of the artifact structure.

- **Artifact tool**

  Used to support artifact repository managers such as JFrog Artifactory.

  **Note:**
  An artifact tool isn't necessary unless a webhook or user-created integration subflow configuration is required to look up artifact versions.

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- **Artifact repository**

  Target for artifacts generated in a build, and also a source of artifacts required by a build. Can be created manually, or through the RegisterArtifact API as new artifacts are published under new repositories in a tool.

- **Artifact**

  Artifact name for which different builds (artifact versions) are generated. Can be created manually, or through the RegisterArtifact API. Artifacts (versions) are associated with a task execution and published to an artifact repository.

- **Artifact version**

  Specific version of the artifact. Deployable component of an application generated by a CI build. When provided, semantic version is used.

  Can be created through discovery, or through the RegisterArtifact API. Artifacts (versions) are associated with a task execution and published to a tracked artifact repository.

- **Semantic version**

  Optional attribute of an artifact version that, when provided, is used to determine commits for a change. Semantic version format is (MAJOR.MINOR.PATCH).

- **Package**

  Collection of artifact versions used as input to a CD pipeline, or for associating test results.

  Package creation is triggered by the CreatePackage API call from the orchestration tool and contains the name, version, and repository name of all the artifact versions included in the package. A check box indicates whether the package has been deployed to production.

DevOps change acceleration for releases:

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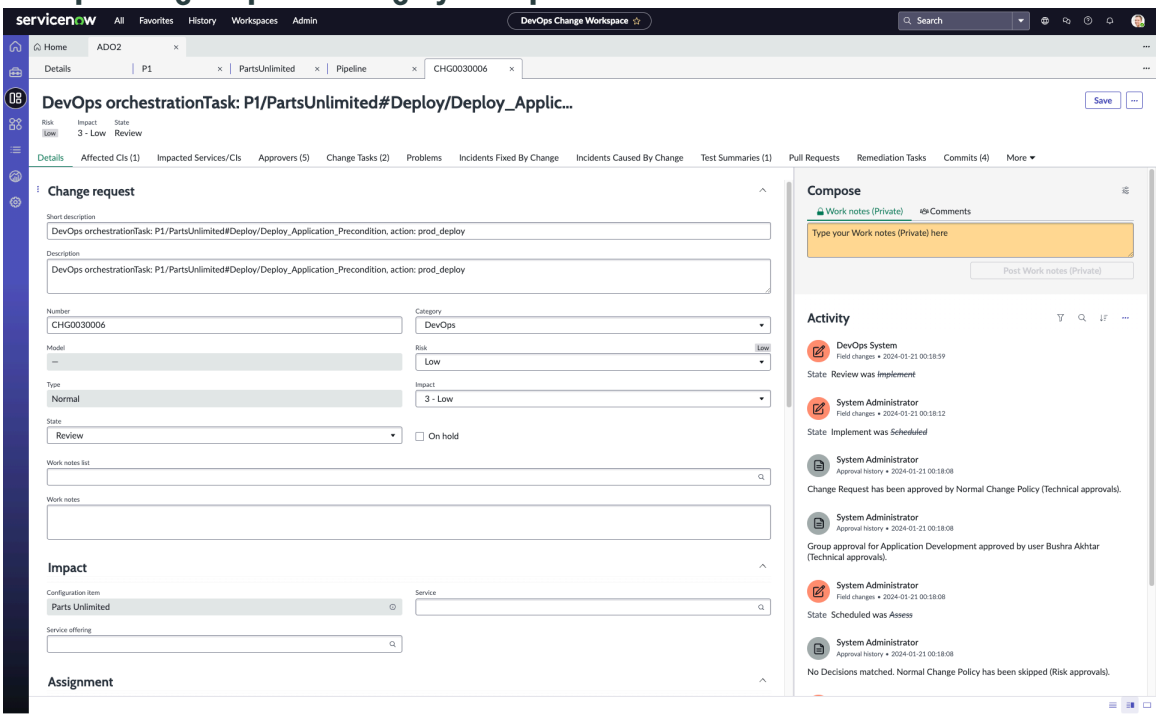
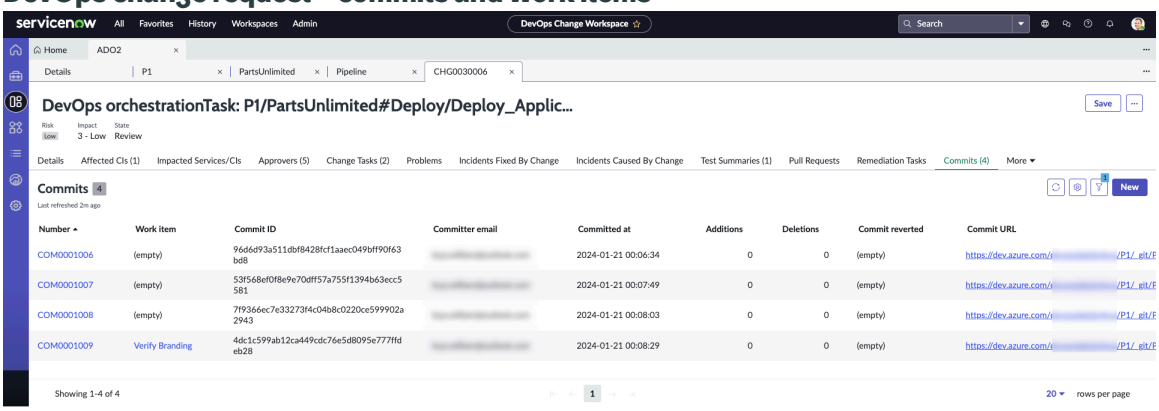
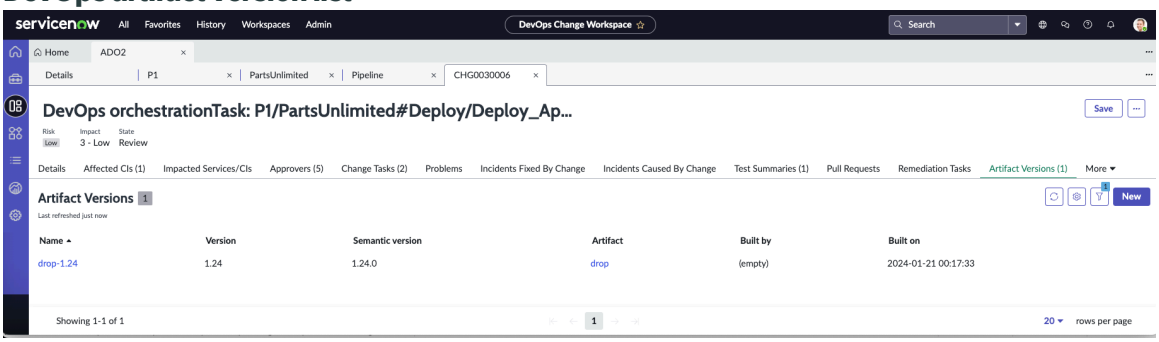
## DevOps change request – category DevOps




## DevOps change request – commits and work items




## DevOps artifact version list

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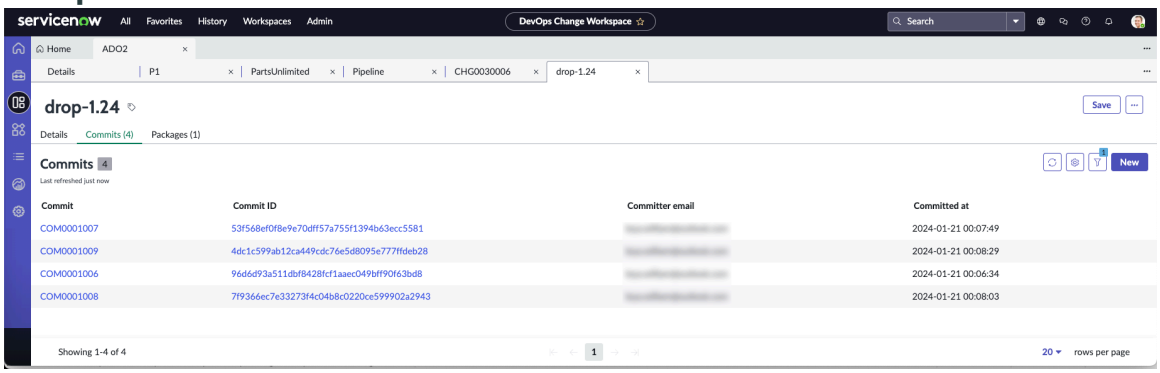
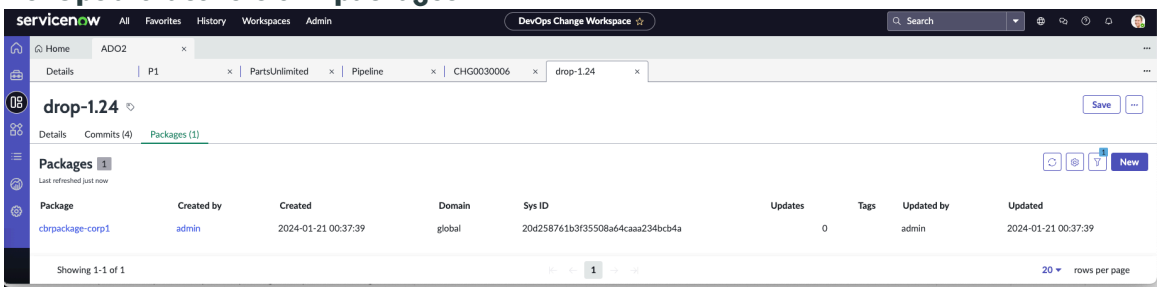
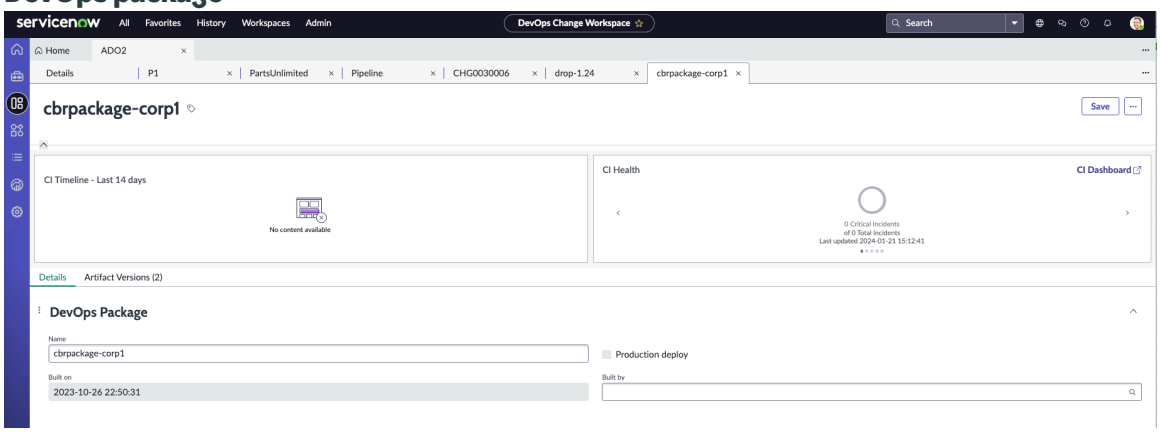
## DevOps artifact version – commits




## DevOps artifact version – packages




## DevOps package




You can also see all existing pipeline change requests directly from the **Changes** module in the application navigator.

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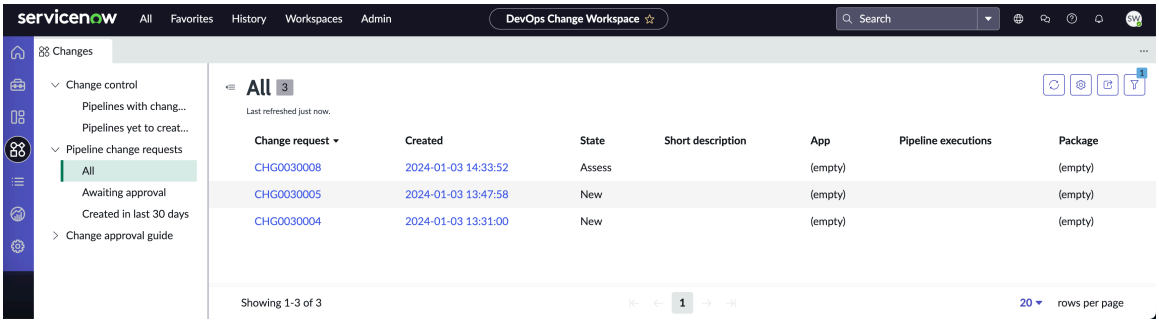
### Changes module

You can see all existing change control and pipeline change requests directly using the **Changes** module in the application navigator.

Navigate to **DevOps Change Workspace** > **Changes** > **Pipeline change requests** > **All** for all change-related information.

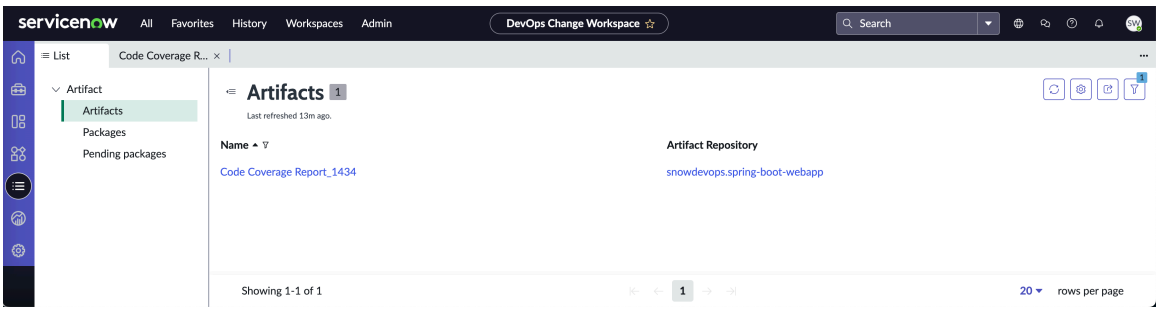
#### Pipeline change requests




### List module

You can see all the existing artifacts and packages directly using the **List** module in the application navigator.

Navigate to **DevOps Change Workspace** > **Lists** > **Artifact** for all artifact-related information.




## Artifacts and packages monitoring

When artifacts and packages are registered from a source tool into ServiceNow, they are often staged in the *sn_devops_artifact_staging* table, while the remaining necessary data for creation and linkage of these objects is either received from inbound events, or fetched by DevOps flows.

Most of the times, these staging records are processed within a few seconds. But there may be cases where the necessary data is never received, so these records may be left idle. The **Description** field on the table below contains a summary of the details missing in such cases to help in easier monitoring.

> **Note:**
> It is recommended to have unique artifact names for release builds, that is, different artifact names for builds running on different branch builds.

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| Staging type | Staging code | When can this occur | Final state? | Description |
|---|---|---|---|---|
| create_package_registration | WAITING_FOR_OTHER_STAGED_REQUESTS | During a package registration call, when the task execution where the call originated from is found in the system and post processed, but not all artifact versions passed in the artifacts payload have been found in the system. | No | Your package registration request is pending for the following reason:<br><br>Task execution found for association (TE00012345) and post processing flag is set to true, but not all artifact versions were found.<br><br>Total artifact count: 2 |
| create_package_registration | TASK_EXECUTION_POST_PROCESSING_PENDING | During a package registration call, when the task execution where the call originated from is found in the system but hasn't yet been post processed. That is, the Completed webhook event for this task execution hasn't yet been processed. | No | Your package registration request is pending for the following reason:<br><br>Task execution found for association (TE00012345), but post processing complete flag is not set to true.<br><br>Total artifact count: 2 |
| create_package_registration | NO_TASK_EXECUTION_FOUND | During a package registration call, when the task execution where the call originated from isn't yet found in the system. | No | Your package registration request is pending for the following reason:<br><br>Task execution not found for association (pipelineName=TestPipeline, stageName=Package, taskExecutionNumber=18).<br><br>Total artifact count: 2 |
| create_package_registration | VERSION_NOT_FOUND | During a package registration call, when the artifact version passed in the artifacts payload hasn't yet been found in the system. | No | Your package registration request is pending for the following reason:<br><br>Artifact version not found (name=TestArtifact, version=2.5, repositoryName=TestRepo, pipelineName=TestPipeline, stageName=Package, taskExecutionNumber=18).<br><br>Artifact count: 1 out of 2 |

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| Staging type | Staging code | When can this occur | Final state? | Description |
|---|---|---|---|---|
| create_package | VERSION_NOT_FOUND | During a package registration call, when the artifact version isn't passed in the artifacts payload, but it contains either a taskExecutionSysId or (pipelineName, stageName, taskExecutionNumber) that can be used to lookup the task execution record, which in this case is found and post processed, but doesn't have any artifact version record associated. | No | Your package registration request is pending for the following reason:<br><br>Artifact version not available in payload and not found using task execution details (name=TestArtifact, version=2.5, repositoryName=TestRepo, pipelineName=TestPipeline, stageName=Package, taskExecutionNumber=18) (TE00012345).<br><br>Artifact count: 1 out of 2 |
| create_package | TASK_EXECUTION_POST_PROCESSING_PENDING | During a package registration call, when the artifact version isn't passed in the artifacts payload, but it contains either a taskExecutionSysId or (pipelineName, stageName, taskExecutionNumber) that can be used to lookup the task execution record, which in this case is found but not yet post processed. | No | Your package registration request is pending for the following reason:<br><br>Artifact version not available in payload, and task execution found for association but post processing complete flag is not set to true (name=TestArtifact, version=2.5, repositoryName=TestRepo, pipelineName=TestPipeline, stageName=Package, taskExecutionNumber=18) (TE00012345).<br><br>Artifact count: 1 out of 2 |
| create_package | NO_TASK_EXECUTION_FOUND | During a package registration call, when the artifact version isn't passed in the artifacts payload, but it contains either a taskExecutionSysId or (pipelineName, stageName, taskExecutionNumber) that can be used to lookup the task execution record, which in this case isn't found. | No | Your package registration request is pending for the following reason:<br><br>Artifact version not available in payload, and task execution also not found for association (name=TestArtifact, version=2.5, repositoryName=TestRepo, pipelineName=TestPipeline, stageName=Package, taskExecutionNumber=18). |

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| Staging type | Staging code | When can this occur | Final state? | Description |
|---|---|---|---|---|
| | | | | Artifact count: 1 out of 2 |
| create_package | WAITING_FOR_OTHER_STAGED_REQUESTS | During a package registration call, when the artifact version passed in the artifacts payload has been found in the system, but must wait for the other related staging records to be processed (including both create_package or create_package_association records). | No | Your package registration request is pending for the following reason:<br><br>Artifact version found, but need to wait for the remaining package registration staging records.<br><br>Artifact count: 1 out of 2 |
| register_artifact | TASK_EXECUTION_POST_PROCESSING_PENDING | During an artifact registration call, when the task execution where the call originated from is found in the system but hasn't been post processed yet. That is the 'Completed' webhook event for this task execution hasn't yet been processed. | No | Your artifact registration request is pending for the following reason:<br><br>Artifact version created and task execution found for association for association (TE00012345), but post processing complete flag is not set to true. |
| register_artifact | NO_TASK_EXECUTION_FOUND | During an artifact registration call, when the task execution where the call originated from isn't yet found in the system. | No | Your artifact registration request is pending for the following reason:<br><br>Artifact version created, but task execution not found for association (pipelineName=TestPipeline, stageName=Package, taskExecutionNumber=18). |
| register_artifact | VERSION_ALREADY_REGISTERED | During an artifact registration call, when the artifact version provided in the artifacts payload for a given artifact and repository, already exists in the system. | Yes (Ignored) | Your artifact registration request was ignored for the following reason:<br><br>Artifact version has already been registered. |
| register_artifact | NO_SUBFLOW_CONFIGURED | During an artifact registration call, when the artifact version isn't provided in the artifacts payload, and both webhook and look-up subflow aren't to find the artifact version record. | Yes (Ignored) | Your artifact registration request was ignored for the following reason:<br><br>Artifact version not available in payload. Webhook and look-up subflow are not available. |

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| Staging type | Staging code | When can this occur | Final state? | Description |
|---|---|---|---|---|
| register_artifact | NO_TASK_EXECUTION_FOUND | During artifact registration call, when the artifact version isn't provided in the artifacts payload, but webhook is supported and the artifact version record can be found, but the task execution where the call originated from isn't yet found in the system. | No | Your artifact registration request is pending for the following reason:<br><br>Artifact version found via webhook, but task execution not found for association (pipelineName=TestPipeline, stageName=Package, taskExecutionNumber=18). |
| register_artifact | TASK_EXECUTION_POST_PROCESSING_PENDING | During artifact registration call, when the artifact version isn't provided in the artifacts payload, but webhook is supported and the artifact version record can be found, and the task execution where the call originated from is found in the system but hasn't been post processed yet. That is, the Completed webhook event for this task execution hasn't yet been processed. | No | Your artifact registration request is pending for the following reason:<br><br>Artifact version found via webhook and task execution found for association (TE00012345), but post processing complete flag is not set to true. |
| register_artifact | NO_TASK_EXECUTION_FOUND | During artifact registration call, when the artifact version isn't provided in the artifacts payload, but look-up subflow is supported and the artifact version record can be found, but the task execution where the call originated from isn't yet found in the system. | No | Your artifact registration request is pending for the following reason:<br><br>Artifact version found via lookup, but task execution not found for association (pipelineName=TestPipeline, stageName=Package, taskExecutionNumber=18). |
| register_artifact | TASK_EXECUTION_POST_PROCESSING_PENDING | During artifact registration call, when the artifact version isn't provided in the artifacts payload, but look-up subflow is supported and the artifact version record can be found, and the task execution where the call originated from is found in the system but hasn't been post processed yet. That is, the Completed webhook event for this task execution hasn't yet been processed. | No | Your artifact registration request is pending for the following reason:<br><br>Artifact version found via lookup and task execution found for association (TE00012345), but post processing complete flag is not set to true. |

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| Staging type | Staging code | When can this occur | Final state? | Description |
|---|---|---|---|---|
| register_artifact | ERROR_CALLING_SUBFLOW | During artifact registration call, when the artifact version isn't provided in the artifacts payload, and look-up subflow is supported but the artifact version couldn't be found. | Yes (Ignored) | Your artifact registration request was ignored for the following reason:<br><br>Artifact version not found by the look-up subflow. |
| register_artifact | ERROR_CALLING_SUBFLOW | During artifact registration call, when the artifact version isn't provided in the artifacts payload, and look-up subflow is supported but could not find the artifact version due to an error in the subflow. | Yes (Ignored) | Your artifact registration request was ignored for the following reason:<br><br>Artifact version not found by the look-up subflow due to an error (refer to DevOps logs for additional details). |
| register_artifact | ERROR_CALLING_SUBFLOW | During artifact registration call, when the artifact version isn't provided in the artifacts payload, and look-up subflow is supported but wasn't executed because the parent artifact record could not be found in the system. | Yes (Ignored) | Your artifact registration request was ignored for the following reason:<br><br>Artifact not found. |

### Commits included in DevOps change request

The DevOps artifact package and its associated artifact versions are used to determine which commits are included in a DevOps change.

Commits are included in a change based on the change type.

| Change type | Commits included |
|---|---|
| Manual | Commits from the artifact versions of the package in the change. In addition, the commits from task executions of all the pipeline executions in the change reference record when the data_type column is plan or pipeline execution are included. |
| Automated | • Without package: All commits from the artifact versions are included. The artifact versions are the ones that are linked to the pipeline execution and the task executions for that pipeline execution.<br>• With package: If any of the upstream task executions of the change has the prod deploy step, then commits from the last successful prod deploy pipeline execution are included. Commits that appear in multiple pipeline executions will be listed only once. If the prod deploy step is not present in the upstream task executions, the commits from all the artifact versions of the package are included. |

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| Change type | Commits included |
| --- | --- |
| | • Run commits: If there are no commits from either of the with or without package flow as specified previously, then the run commits from the upstream task executions of the change request are associated. |

All commits for artifact versions in the package that were generated after the last deployment date (up to the version currently being deployed) are included in the change request. Previous major versions are not included.

**Note:**
Patch and hot fix versions are excluded.

When provided, semantic version is used to determine commits for a change. Format is (MAJOR.MINOR.PATCH). For example, semantic version 2.0.1 is read as follows:

- Major version 2
- Minor version 0
- Patch/hotfix version 1

Failed task executions between the previous and current artifact versions that did not build an artifact but have associated commits are also associated to the created artifact version.

## Types of commits

- Normal commits: Commits on the tracked repository are associated to the change request.
- Revert commits: Commits that have the revert field value as true. A revert commit results in a reverted commit and revert commit in the source tree. Both the commits are not associated to the change request.
- Merge commits: Commits that have the merge field value as true.
  - Merge commit: The source tree tracks the commit to a branch over time and allows for a special merge commit to be made. This merge commit combines the parent commits located directly after the most recent common commit on both the current branch and the branch to be merged. Merge commit adds a new commit on the main branch.
  - Squash and merge: Squashing during a merge generates the working tree and index state to match a merge without creating a merge commit. Squash and merge keeps the changes but removes the individual commits from history. It has a single commit with the merge value as true.

## Example: Commits and packages

This example consists of:

- Three build pipelines (A, B, and C)
- A release pipeline (ABC) under change control, with four packages:
  1. Build pipeline A (major version 1)
  2. Build pipelines A and B (major version 1)
  3. Build pipelines B and C (major version 1)
  4. Build pipelines A, B, and C (major version 1)

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### Package 1 (A 1.1.0)

| Commit | Build pipeline | Semantic version | Included in package |
|---|---|---|---|
| 1 | A | 1.0.0 | X |
| 2 | A | 1.0.1 | -- |
| 3 | A | 1.1.0 | X |

**Note:**
Commit 2 (build A, semantic version 1.0.1) is not included in the package because the semantic version syntax indicates a patch or hot fix.

### Package 2 (A 1.2.0, B 1.1.0)

| Commit | Build pipeline | Semantic version | Included in package |
|---|---|---|---|
| 4 | A | 1.1.1 | -- |
| 5 | A | 1.2.0 | X |
| 6 | A | 1.2.0 | X |
| 7 | B | 1.0.0 | X |
| 8 | B | 1.0.0 | X |
| 9 | B | 1.1.0 | X |
| 10 | B | 1.1.0 | X |

**Note:**
Commit 4 (build A, semantic version 1.1.1) is not included because the semantic version syntax indicates a patch or hot fix.

### Package 3 (B 1.2.0, C 1.0.0)

| Commit | Build pipeline | Semantic version | Included in package |
|---|---|---|---|
| 11 | A | 1.3.0 | -- |
| 12 | B | 1.2.0 | X |
| 13 | B | 1.2.0 | X |
| 14 | C | 1.0.0 | X |
| 15 | C | 1.0.0 | X |
| 16 | C | 1.0.0 | X |

**Note:**
Commit 11 (build A, semantic version 1.3.0) is not included because the package does not specify build A.

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**Package 4 (A 1.4.0, B 1.3.0, C 1.2.0)**

| Commit | Build pipeline | Semantic version | Included in package |
|---|---|---|---|
| 17 | A | 1.4.0 | X |
| 18 | A | 1.4.0 | X |
| 19 | B | 1.3.0 | X |
| 20 | B | 1.3.0 | X |
| 21 | C | 1.1.0 | X |
| 22 | C | 1.1.0 | X |
| 23 | C | 1.2.0 | X |
| 24 | C | 1.2.0 | X |

**Note:**
Commit 11 is also included in this package because it is part of the changes in major version 1 of build A since the last package (including major version 1 of build A), package #2, was deployed to production.

## Example: Commit calculation logic

Use case with the logic for calculating commits that get associated to artifact versions. The branch information is included whenever the commits are defined.

For example, consider two pipelines, one on the main branch, one on the test branch. Run scenario:

- Create a commit C0 on main, run CI build, but don’t create Artifact Version.
- Create a commit C1 on test, run CI build, but don’t create Artifact Version.
- Create a commit C2 on main, run CI build and the build fails.
- Create 2 commits C3,C4 on main, run a CI build and create an Artifact Version (v1.0).

Expected result: Artifact Version (v1.0) is associated to C0, C2, C3, C4. Commit C1 is excluded as it's on a different branch.

Continuing with the use case:

- Create 1 commit C5 on main, run CI build, but don’t create Artifact Version.
- Create 1 commit C6 on main, run CI build and create an Artifact Version (v2.0).

Expected result: The new artifact version (v2.0) created is associated to C5, C6.

**Summary**:

- All commits from pipeline executions (success & failed) in the same branch, between last Artifact Version for a given Artifact and current Artifact Version, are associated.
- If no previous Artifact Version for the given Artifact is found, then all commits from pipeline executions in the same branch are associated.

Continuing with the use case:

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Create a release with Artifact Version from the previous step, have a CD pipeline with Step type = Prod Deploy.

Expected result:

- Release is associated with the same Artifact Version (v2.0).
- Change Request created shows Artifact Version (v2.0) and Commits C0, C2, C3, C4, C5, C6.

**Summary**:

- Commits from both Artifact Versions (v1.0, v2.0) built on main branch (no previous package was deployed to Prod) are shown in the change request, but not the commit from execution on test branch.
- The number of commits shown in the change request will be the same as the number in the tool.

Continuing with the use case:

- Create 2 commits C7, C8 on test branch, run CI build and create an Artifact Version.

  Expected result: Artifact Version (v3.0) is associated to C1, C7, C8.

- Create 2 commits C9, C10 on main branch, run CI build and create an Artifact Version.

  Expected result: Artifact Version (v4.0) is associated to C9, C10.

- Create a release with Artifact Version from previous step (v4.0), have a CD pipeline with Step type = Prod Deploy.

  Expected result:

  - Release is associated with Artifact Version (v4.0).
  - Change Request created shows Artifact Version (v4.0) and commits C9, C10.

**Summary**:

- The change request shows commits just from the latest Artifact Version built on main branch, as commits from previous Artifact Versions built on main had been deployed to Prod on the previous package.
- No commits from Artifact Version built on test are shown.
- The number of commits shown in the change request will be the same as the number in the tool.

## DevOps Pipeline UI

Use the Pipeline UI to visualize interactions and results across a pipeline execution. This graphical view shows pipeline step progression and other details for each pipeline.

From DevOps, get a quick view of how everything is connected to see exactly what is happening with the pipeline and when. From the ServiceNow Change Management application, you can access the Pipeline UI and quickly see the commits, the committers, and other details for the change request in one place.

The Pipeline UI displays parallel stages as modeled in Azure DevOps release pipelines. The pipeline UI displays the real-time state of the pipeline as it appears in Azure DevOps. The associated artifact details sourced from the build pipeline, Test Results, Software Quality Summary Results also display on the pipeline UI. For more information, see Parallel stages in Azure DevOps release pipelines.

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The Pipeline UI shows all attempts of any stage or job that has been rerun or restarted. For more information, see Restarting failed build or release pipeline jobs and stages.

The Pipeline UI shows the pipeline steps that ran instead of the steps configured in DevOps.

You can access the Pipeline UI using the related link from within certain DevOps forms, and also from a DevOps change request form:

- DevOps Pipeline form
- DevOps Pipeline Execution form
- Change Request form created by DevOps

**Note:**
You must reload the view to update the status buttons in the pipeline execution History.

| Step run states (task execution status) | |
|---|---|
| Green | Successful.<br><br>All step executions associated to the pipeline execution passed. |
| Grey | Not yet run. |
| Yellow | Waiting (pending, building, validating).<br><br>At least one step execution is waiting. |
| Red | Failed.<br><br>At least one step execution failed.<br><br>Task execution end date is populated even when the change is rejected.<br><br>**Note:**<br>To enable the canceling of the change request associated with the step when the step fails, you must set the *sn_devops.cancel_change_on_pipeline_canc* property to Yes. For more information, see Properties installed with DevOps. |

**Note:**
The order the cards appear in the Pipeline UI is determined by the **Order** field in each pipeline step when you modeled your pipeline in DevOps. Skipped stages are not shown.

The order the cards appear in the Pipeline UI by task execution.

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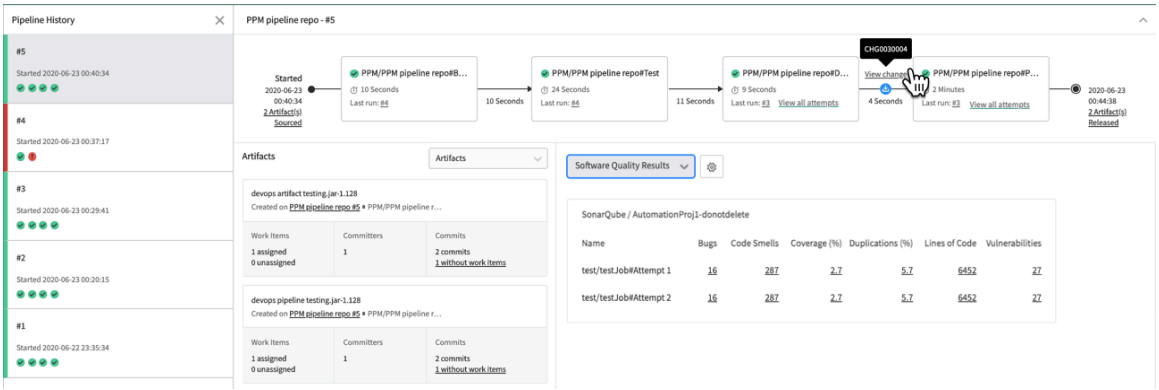


| UI feature | Description |
|---|---|
| Pipeline steps | Timing.<br>• Start<br>• Last run<br>• Duration for each step<br>When the downstream task execution starts immediately after the upstream task execution, the duration is 0 seconds.<br>• Wait times in between task executions.<br>Wait time is calculated as:<br>Start time of the task execution minus the end time of the upstream task execution. |
| View change request | Change request record.<br>Click directly into the change request of the step that was created by DevOps to view details of the change and take action.<br>**Note:**<br>• The change request record for the associated with the latest task execution displays.<br>• Commits reverted in the same pipeline execution are not shown in the commit list. |
| Pipeline history | Pipeline Execution.<br>Click a history tile to view the previous step details for a pipeline execution.<br>**Note:**<br>Pipeline history is displayed for only the most recent 20 pipeline executions. |

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| UI feature | Description |
| --- | --- |
| View all attempts | All attempts that the job has run in a step.<br><br>Click the link in the relevant step to view all attempt details. |
| Artifacts | • Artifact versions<br>  ○ Work items<br>  ○ Commits<br>  ○ Packages<br>• Commits<br>• Work items<br><br>**Note:**<br>Commits reverted in the same pipeline execution are not shown in the commit list. |
| Test Results | View the build test results to see what tests passed or failed.<br><br>The quality card contains test summaries:<br>• Test type and test category in the format:<br>`test type/test category`<br>• Native ID of the step<br>• Test pass percentage (unit and functional tests only)<br>• Throughput (performance tests only)<br>• Step name |
| Software Quality Results | View all the software quality (SonarQube scan) results grouped by project name that were fetched as part of the selected pipeline. You can view the scan results for all categories in a pipeline execution step.<br><br>You can customize the results that are displayed in the Pipeline UI by configuring the columns in the **Software quality categories shown by default in the Pipeline UI view** (**DevOps** > **Administration** > **Properties** > **DevOps Properties Category** > ) property in a comma separated format. |

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| UI feature | Description |
| --- | --- |
| | • Click the gear icon to modify the column view in the pipeline UI.<br>• Click the step execution record to view the corresponding Software Quality Scan Summary record.<br>• Click the Vulnerabilities count record to view the Software Quality Scan Detail record and the corresponding sub category details. |
| Security Results | View all the security results that were retrieved as part of the selected pipeline. You can view the scan results for all categories in a pipeline execution step.<br>You can customize the results that are displayed in the Pipeline UI.<br>• Click the gear icon to modify the view in the pipeline UI.<br>• Click the step execution record to view the corresponding Security scan summary record.<br>• Click the Detected flaws count record to view the Security scan details. |

**Note:**
When you reattempt running a stage or a pipeline job in Azure DevOps, which contains a test or a software quality scan, the results get appended with the attempt number.

Click directly into DevOps change requests, step executions, artifacts, artifact versions, work items, test summaries, and reattempts in flyout windows.

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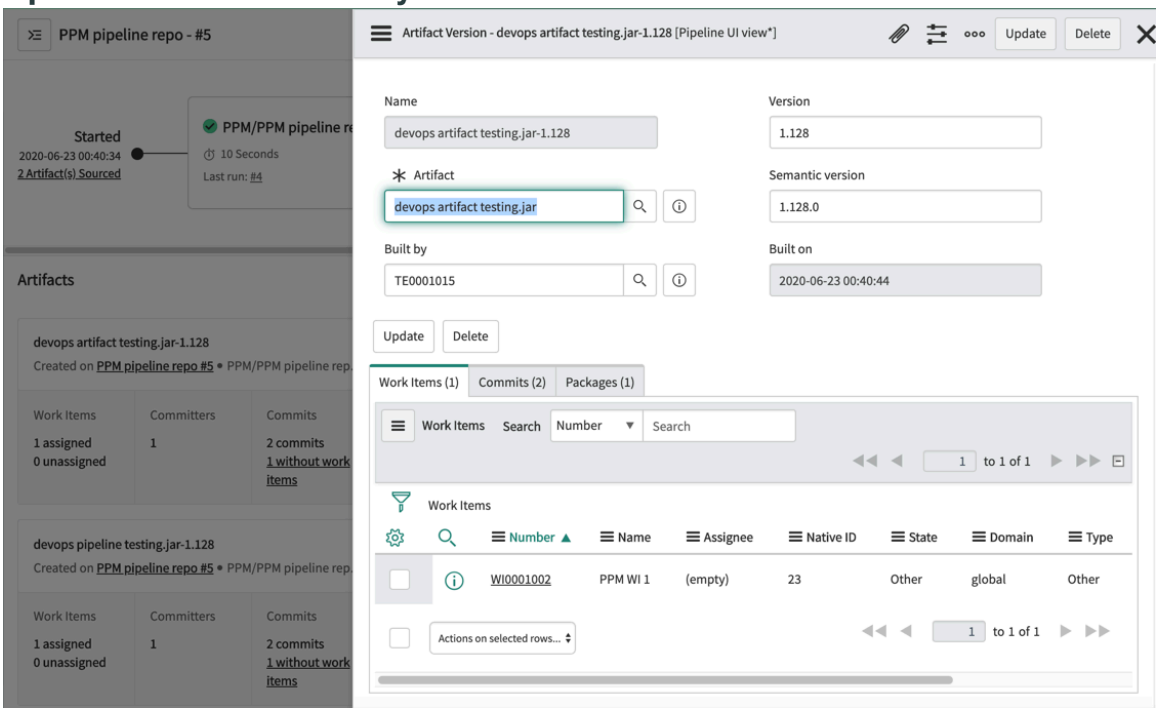
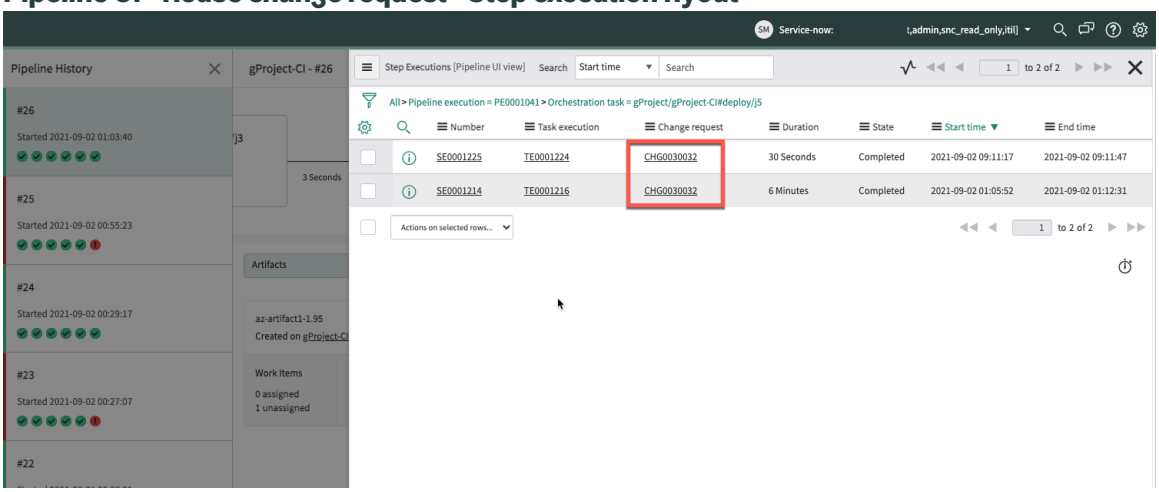
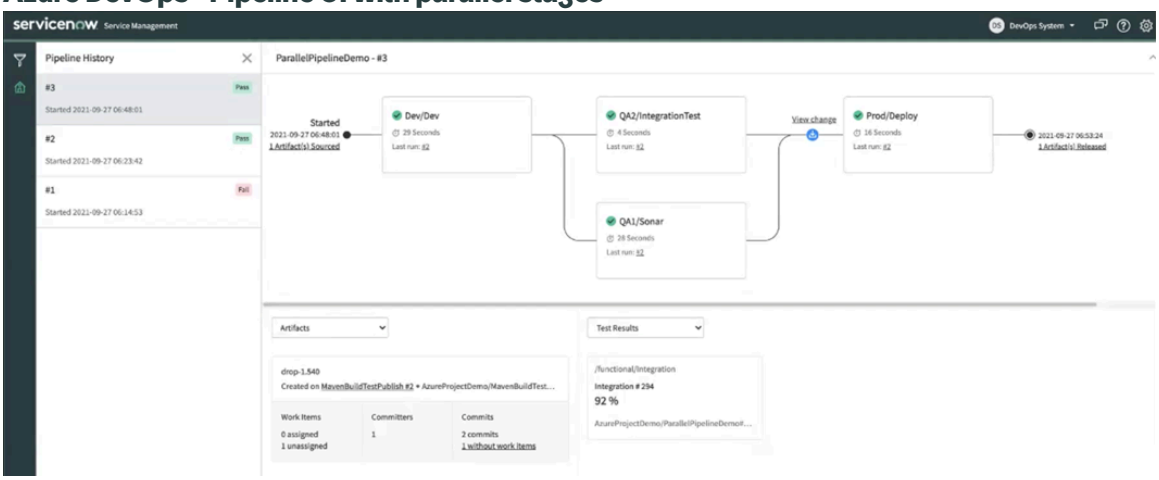
## Pipeline UI — Artifact version flyout




## Pipeline UI - Reuse change request - Step execution flyout




## Azure DevOps - Pipeline UI with parallel stages

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## Configuring DevOps change request details within the pipeline

Configure how the closure information, change state, and change request fields are updated from within a pipeline in the change step of the pipeline.

**Note:**
Configuring change request details from within a GitLab pipeline isn't supported.

The system variable, by default, points to the Default subflow to auto close a change in the base system. The **DevOps auto close change on pipeline completion subflow** (*sn_devops.auto_close_change*) determines how the closure information, change state, and change request fields are updated when a pipeline is completed. If you want to specify a custom subflow that must be activated when a pipeline is completed, you can clone this subflow and customize it according to your requirements.

Closure information and change request attributes are contained with the *changeRequestDetails* object.

### Auto close change

Set the *autoCloseChange* parameter to `true/false` in the changeRequestDetails object when creating a change from a pipeline to update the **Close code** and **Close notes** fields and close the change request when a pipeline is completed. The **Actual start date** and **Actual end date** field values are also updated when the pipeline is completed. The date values are based on the pipeline's start time or the pipeline's first stage's start time, and the pipeline's end time or the pipeline's last stage's end time. The close notes will be suffixed with text specifying that the closure information has been updated based on the Auto close change feature.

If set to true, the **Close code** and **Close notes** fields will be updated and the system will try to close the change request when the pipeline is completed.

If set to false, the **Close code** and **Close notes** fields will be updated when a pipeline is completed but the change request won't be closed.

You can also set the **Auto close change** field value for a pipeline in the ServiceNow application. If you select **Update Change Only**, the **Close code** and **Close notes** fields will be updated when a pipeline is completed, and if you select **Update and Close Change**, the change request will also be closed along with updating the closure information.

Based on whether the auto close change is specified in the pipeline or column, the final state considered will be as follows:

| autoCloseChange flag in change request attributes | Auto Close Change column value (sn_devops_pipeline) | Final state |
|---|---|---|
| True | Update Change Only | Updates change and moves state to close |
| False | Update and Close Change | Only updates the change |
| - | Update Change Only | Only updates the change |
| - | Update and Close Change | Updates change and moves state to close |

**Note:**
The value specified for the autoCloseChange attribute in the pipeline takes precedence over the value specified in the Auto Close Change column in ServiceNow.

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**Note:**

- The auto close change feature is only applicable for basic pipelines with a single change created on it. If there are multiple changes, the latest change will be considered for auto close.
- The auto close change feature isn't supported for Jenkins freestyle pipelines and change requests where the change receipt feature is enabled.
- For an Azure release pipeline, the pipeline completion state is derived by consolidating the state of each stage in the pipeline. If even one stage fails, the pipeline will be considered unsuccessful. If even one stage is partially successful, the pipeline will be considered successful with issues.

### Upgrade information

If you're upgrading, you must re-configure your orchestration tool before setting the autoCloseChange parameter for GitHub and Azure build pipelines.

### Set Close Code

Set the *setCloseCode:* parameter to `true/false` based on the desired behavior. Default is true.

If set to true, the **Close code** and **Close notes** fields are updated as specified in the change step attributes and the change request is moved to post-implement when a stage is completed. You can override this behavior by enabling the **Auto close code** feature. The setCloseCode feature will get disabled when autoCloseChange is enabled and set to true or false. For more information, see Auto Close Change. Use the autoCloseChange feature for more accurate change request details.

If set to false, when the job or pipeline has completed, the change request isn't updated and remains in the Implement state.

- Closure Information in the change request isn't set (**Close code** and **Close notes** fields are left empty).
- A link to the step execution is added to the **Work notes**.

### Change request fields

Set change request field values within the pipeline for the change request template specified.

- Use the *attributes:* parameter to set field values.
- Use the DevOps - POST /devops/orchestration/changeControl endpoint of the DevOps API.

**Note:**

- If a specified field has a dependent field that is required, you must set that attribute as well.
- If the attribute for the dependent required field isn't set, change request and related step execution are canceled, and work notes are updated.

Field values within the *attributes:* parameter are key-value pairs. Meaning, the key is the field name within the template and the value is the information to populate in the field.

You can use the *changeControl* API to specify fields such as *type*, *cmdb_ci*, *template*, *assignment_group* *business_service*, *standard_change_template*, *chg_model* and create a change request.

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When attributes are passed for change, the order of priority is as follows:

1. Change request fields or changeControl API.
2. Values in the Step record.
3. Values provided in the Change Request template.

**Note:**
When configuring change requests from within the pipeline, change type and template fields are always taken from one source. You can't use a combination of attributes from the API request and the change request form.

All fields in the Change Request [change_request] table are supported except where specified.

**Change request fields supported**

| | |
|---|---|
| Unsupported fields | • risk<br>• impact<br>• number<br>• sys_id<br>• risk_impact_analysis |
| Supported fields | All remaining fields in the Change Request [change_request] table. |

**Note:**
The attribute name must match the change request field name, and the value specified must be valid.

## Sample JSON payload

```
{

 "callbackURL":"http://192.168.0.4:3000/jenkins/sn-devops/pipeli
ne_839b7605-b98d-4831-bc87-96829de7da37",

 "orchestrationTaskURL":"http://192.168.0.4:3000/jenkins/job/jav
a_sample_tests#deploy/",
   "isMultiBranch":"false",
   "orchestrationTaskName":"java_sample_tests#deploy",
   "orchestrationTaskDetails":{
      "triggerType":"upstream",

 "upstreamTaskExecutionURL":"http://192.168.0.4:3000/jenkins/j
ob/java_sample_tests/129/execution/node/35/wfapi/describe",

 "taskExecutionURL":"http://192.168.0.4:3000/jenkins/job/java_sa
mple_tests/129/execution/node/50/wfapi/describe"
   },
   "changeRequestDetails":{
      "setCloseCode":false,
      "attributes":{
```

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```
        "sys_created_by":"1832fbe1d701120035ae23c7ce610369",
        "sys_updated_by":"56826bf03710200044e0bfc8bcbe5dca",
        "requested_by":{
           "name":"Abel Tuter"
        },
        "watch_list":[
           {
              "name":"Abel Tuter"
           },
           {
              "name":"Aileen Mottern"
           },
           {
              "name":"Alejandra Prenatt"
           },
           "56826bf03710200044e0bfc8bcbe5dca"
        ],
        "work_notes_list":[
           "56826bf03710200044e0bfc8bcbe5dca",
           "46c6f9efa9fe198101ddf5eed9adf6e7",
           "d8f57f140b20220050192f15d6673a98"
        ],
        "assigned_to":"1832fbe1d701120035ae23c7ce610369",
        "category":"Service",
        "sys_created_on":"2021-02-09 18:58:41",
        "priority":"2",
     }
  }
}
```


## Pipeline examples

### Change request details - Azure pipeline

```
- stage: Deploy
  dependsOn: Build
  jobs:
    - job: 'now_change'
      pool: server
      steps:
```

Settings

```
      - task: ServiceNow-DevOps-Server-Change-Acceleration@1
        inputs:
          connectedServiceName: '$(ServiceNowConnection)'
          changeRequestDetails: |
            {
              "autoCloseChange" : true,
              "attributes": {
                "comments" : "This update for work notes is from ADO Job",
                "work_notes" : "Update this to work_notes",
                "category" : "Service",
                "priority" : "2"
              }
            }
```

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### Job-level settings — Jenkins




### Change request details - Jenkins

```
stage('Change-Step') {
      steps {
          echo 'Change Step'
          snDevOpsChange changeRequestDetails: '{ "autoCloseChange": true, attributes:{"close_notes":"sample close notes"} }'
      }
}
```

### Change request details - GitHub

```
deploy:
  name: Deploy
  needs: registerpackage
  runs-on: ubuntu-latest
  steps:
    - name: Custom Change
      uses: ServiceNow/servicenow-devops-change@master
      with:
        devops-integration-user-name: ${{ secrets.SN_DEVOPS_USER }}
        devops-integration-user-password: ${{ secrets.SN_DEVOPS_PASSWORD }}
        instance-url: ${{ secrets.SN_INSTANCE_URL }}
        tool-id: ${{ secrets.SN_ORCHESTRATION_TOOL_ID }}
        context-github: ${{ toJSON(github) }}
        job-name: 'Deploy'
        change-request: '{"autoCloseChange":true,"attributes":{"close_notes":"Automated Software Deployment for close_Notes"}}'
        interval: '100'
        timeout: '3600'
```

## Using DevOps Change Request Manual Approval flow

Customize or recreate the DevOps Change Request Manual Approval flow based on your requirements using a flow or a script.

In the DevOps Change Request Manual Approval flow, the state of step execution is changed based on the change approval. However, you can customize or recreate this flow based on your requirements.

After the change request state is moved to approved, canceled, or rejected (either manually or by using a change policy), call the **Update state of step execution based on change approval** Flow Designer action to update the **State** field of step execution record.

You can use either a flow or a script to call the action.

## Calling the Flow Designer action using a flow

Calling the **Update state of step execution based on change approval** Flow Designer action is required to update the state of the step execution record according to the approval field in the change request record.

This action serves as a trigger for the **Change Control Callback** flow, which is used to notify the change decision to the orchestration tool.

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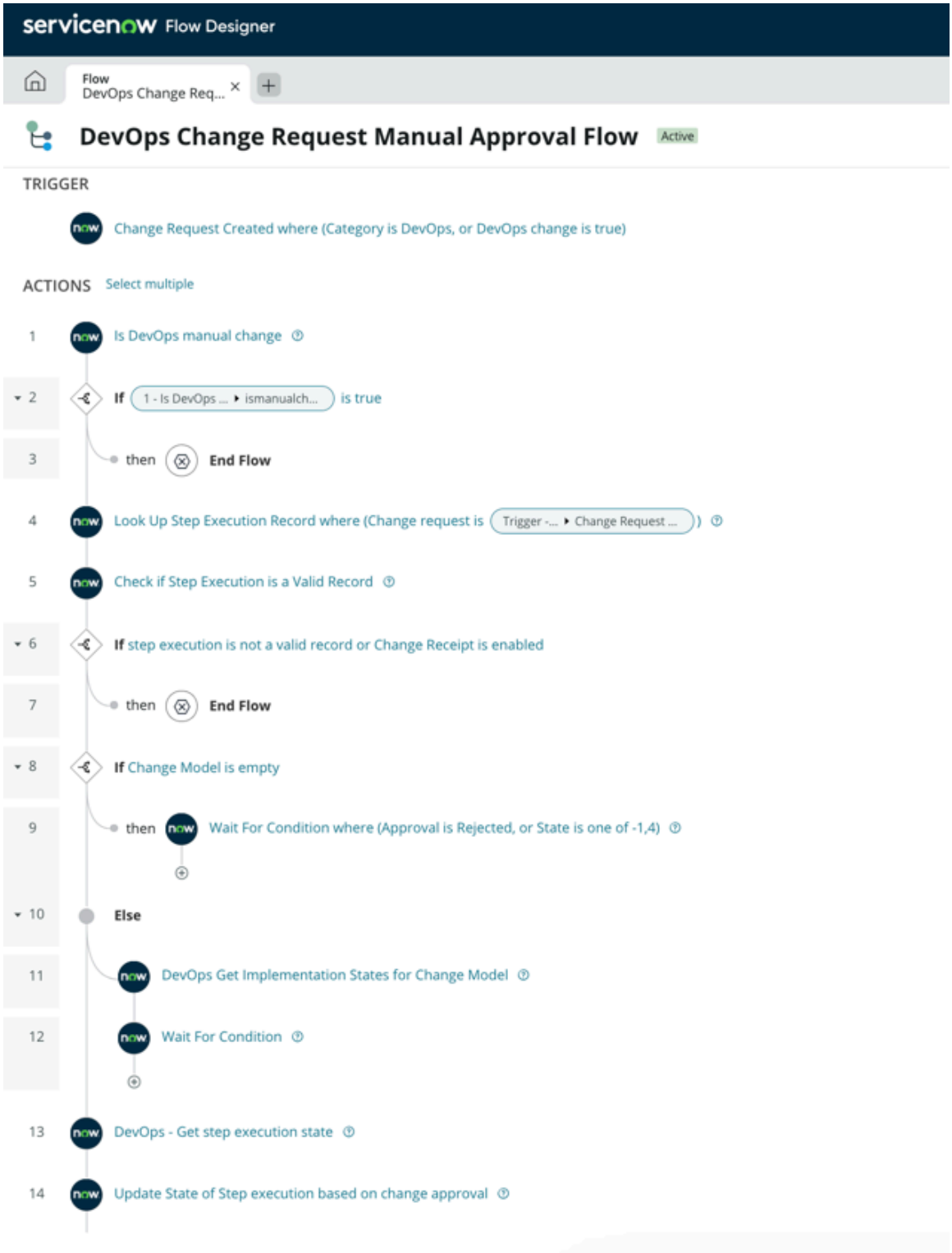


## Calling the Flow Designer action using a script

Method to call the Flow Designer action from a script:

```
sn_fd.FlowAPI.executeAction('sn_devops.name_of_FD_action',
 inputs);
```

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```
function() {

  try {
      var inputs = {};
      inputs['stepexecutiongr'] = ; // GlideRecord of table: sn_devops_step_execution
      inputs['state'] = ; // Choice

      // Start Asynchronously: Uncomment to run in background. Code snippet will not have access to outputs.
      // sn_fd.FlowAPI.startAction('sn_devops.update_state_of_step_execution_based_on_change_approval', inputs);

      // Execute Synchronously: Run in foreground. Code snippet has access to outputs.
      var outputs = sn_fd.FlowAPI.executeAction('sn_devops.update_state_of_step_execution_based_on_change_approval', inputs);

      // Current action has no outputs defined.
  } catch (ex) {
      var message = ex.getMessage();
      gs.error(message);
  }

})();
```

## Default Change Handler subflow

Use the Default Change Handler subflow to populate these change request fields with default values.

- Requested by
- Justification
- Implementation Plan
- Backout plan
- Test Plan
- Short Description
- Description
- Start Date
- End Date
- Risk Impact Analysis

The Default Change Handler subflow overrides the field values that were populated using a template while creating the change request record.

If desired, you can write a custom subflow in place of this flow by modifying the *[sn_devops.change_request_handler_subflow]* DevOps property.

## DevOps Demo Change Automation flow

When demo data is installed, Flow Designer **DevOps Demo Change Automation** flow is available where normal type of change request or normal model change request can be auto-approved based on the decision policies.

As a part of demo data, the decision policies available are:

- DevOps Low Risk Auto Approval policy, where the failed test count is zero.
- DevOps High risk manual approval policy, where the failed test count is greater than zero.

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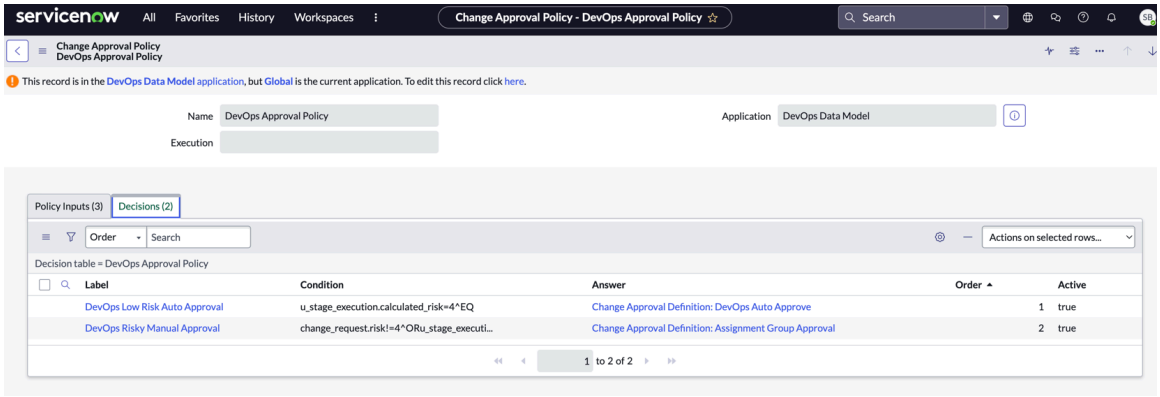



As a part of the demo flow, Flow Designer actions available are:

- DevOps Set Change Window

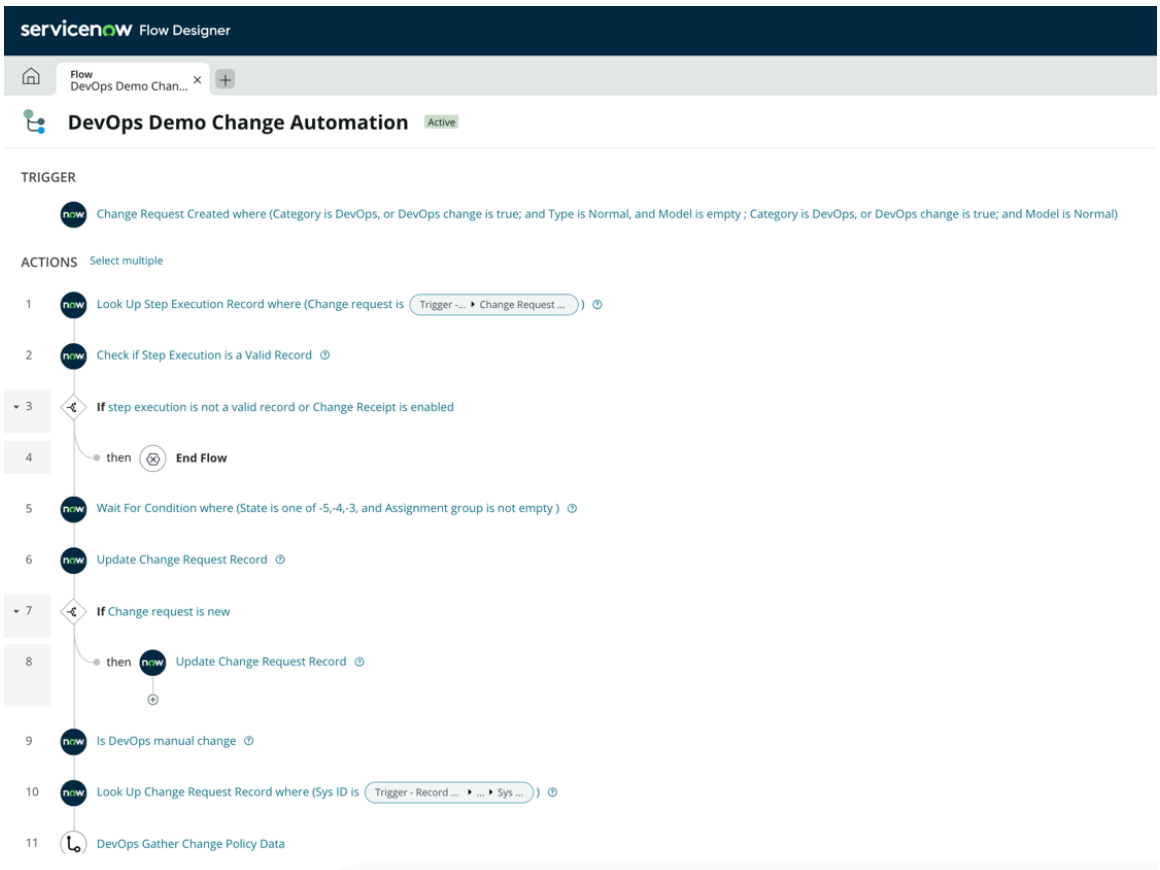
  Action used to set the change request start date.

- Get Change Policy User/Group

  Action used to fetch the user/group based on the change request approval policy.

- DevOps Create Auto Approval Record

  Action used by the user to create Auto-Approve/Auto-Reject approval records.




## Related topics

Accelerating your DevOps change process

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## DevOps change models

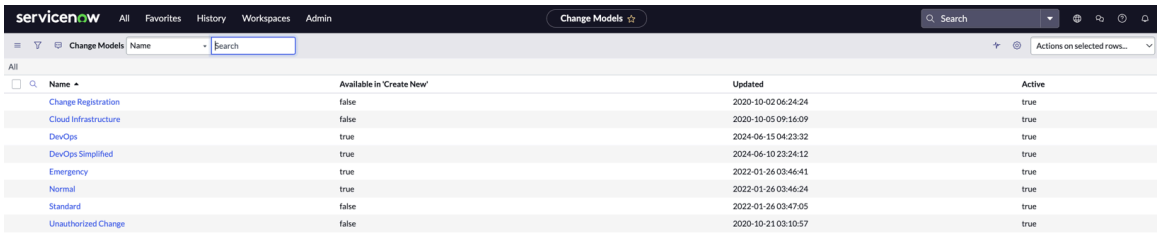
DevOps Change Velocity enables you to use fit-for-purpose change models that allow better flexibility in defining change models or processes to reflect modern development practices.

## DevOps Change model overview

**Important:**
For DevOps change requests, use the Change Management - Change Models feature, which provides greater flexibility to enable the change process flow in a way that is optimized for specific use cases. For more information, see Change models. The legacy Change Management - State Model is also supported. For more information, see State model and transitions.

**Important:**
The DevOps and DevOps Simplified change models are not supported for Argo CD and Split tool change requests.

Use fit-for-purpose change models with a suite of succinct flows and flow actions built in Flow Designer for specific use cases. Instead of using the legacy ITIL-based change processes that are predefined in change workflows (Normal, Standard, and Emergency), you can selectively transition to a wide range of models that are optimized for specific use cases. Change models can be created with states and rules that determine the transitions between the states. For information on change models, see Change models.




| Name | Available in 'Create New' | Updated | Active |
|---|---|---|---|
| Change Registration | false | 2020-10-02 06:24:24 | true |
| Cloud Infrastructure | false | 2020-10-05 09:16:09 | true |
| DevOps | true | 2024-06-15 04:23:32 | true |
| DevOps Simplified | true | 2024-06-10 23:24:12 | true |
| Emergency | true | 2022-01-26 03:46:41 | true |
| Normal | true | 2022-01-26 03:46:24 | true |
| Standard | false | 2022-01-26 03:47:05 | true |
| Unauthorized Change | false | 2020-10-21 03:10:57 | true |

You can use any of the base system change models including the DevOps or DevOps Simplified change models. To create a change request based on models, you can either configure the **Model** field in the Step form in ServiceNow, or pass the model sys_id or name in the change step from your orchestration pipeline.

## Base system DevOps change models

Two change models, called DevOps and DevOps Simplified are included in the base system and are active by default for you to create a model based change request.

### Type compatibility flag

The type compatibility *com.snc.change_management.change_model.type_compatibility* property is used to determine what kind of change requests (type- or model-based) will be created. Navigate to **System Properties > All Properties** to set the value for this property. The default value of this property is False. This property enables change type compatibility for change models. When set to true, the change request can be created either as a type-based workflow or change models. When set to false, change request will be created only using change model.

The change request will be created based on the configuration combination as defined in the following tables when the property is set to true or false.

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### When the type compatibility property is set to True

| Change attribute configured in the pipeline step in ServiceNow | Change attribute passed in the pipeline | Change attribute considered in change request creation |
|---|---|---|
| Change model: <any selected change model> | Neither model nor change type is passed. | Model-based change request will be created |
| Change model: <any selected change model> | Type is passed. For example, Normal<br>`{ "attributes": { "type": "normal" } }` | Type-based change request will be created |
| Change model: <any selected change model> for example, Model 1. | Different model is passed. For example, Model 2.<br>`{ "attributes": { "chg_model": { "name": "Model 2" } } }` | Change will be created based on Model 2 |
| Change model: Not specified<br><br>Change type: <any selected change type> | Neither model nor change type is passed | Type-based change request will be created |
| Change type: <any selected change type> | Model is passed.<br>`{ "attributes": { "chg_model": { "name": "DevOps" } } }` | Model-based change request will be created |
| Change type: <any selected change type>. For example, Normal | Different type is passed. For example, Emergency. | Change request will be created based on Emergency type. |

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### When the type compatibility property is set to True (continued)

| Change attribute configured in the pipeline step in ServiceNow | Change attribute passed in the pipeline | Change attribute considered in change request creation |
|---|---|---|
| | <pre>{<br>"attributes": {<br>"type":<br>"emergency"<br>}<br>}</pre> | |

### When the type compatibility property is set to False

| Change attribute configured in the pipeline step in ServiceNow | Change attribute passed in the pipeline | Change attribute considered in change request creation |
|---|---|---|
| Change model: <any selected change model> | Neither model nor change type is passed | Model-based change request will be created |
| Change model: <any selected change model> | Type is passed. For example, Normal<br><pre>{<br>"attributes": {<br>"type":<br>"normal"<br>}<br>}</pre> | Error<br><br>Change request can't be created because the type compatibility flag is disabled. Enable the type compatibility flag in system properties or configure the change model in the step record in ServiceNow or enter the appropriate change model sys id or name in the pipeline.<br><br>For information on resolving this error, see Common errors in DevOps Change Velocity. |
| Change model: <any selected change model> for example, Model 1. | Different model is passed. For example, Model 2.<br><pre>{<br>"attributes": {<br>"chg_model": {<br>"name":<br>"Model 2"<br>}<br>}<br>}</pre> | Change will be created based on Model 2 |

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**When the type compatibility property is set to False (continued)**

| Change attribute configured in the pipeline step in ServiceNow | Change attribute passed in the pipeline | Change attribute considered in change request creation |
|---|---|---|
| Change model: Not specified<br><br>Change type: <any selected change type> | Neither model nor change type is passed. | Error<br><br>Change request can't be created because either the change type or change model isn't configured for the pipeline.<br><br>For information on resolving this error, see Common errors in DevOps Change Velocity. |
| Change type: <any selected change type> | Model is passed.<br>`{ "attributes": { "chg_model": { "name": "DevOps" } } }` | Model-based change request will be created |
| Change type: <any selected change type>. For example, Normal | Different type is passed. For example, Emergency.<br>`{ "attributes": { "type": "emergency" } }` | Error<br><br>Change request cannot be created because the type compatibility flag is disabled. Enable the type compatibility flag in system properties or configure the change model in the step record in ServiceNow or enter the appropriate change model sys id or name in the pipeline.<br><br>For information on resolving this error, see Common errors in DevOps Change Velocity. |

### Configuration of DevOps models

The base system change models have the **Implementation states** field value as Implement, and the **Record preset** field is selected as **Type=Normal** by default. The

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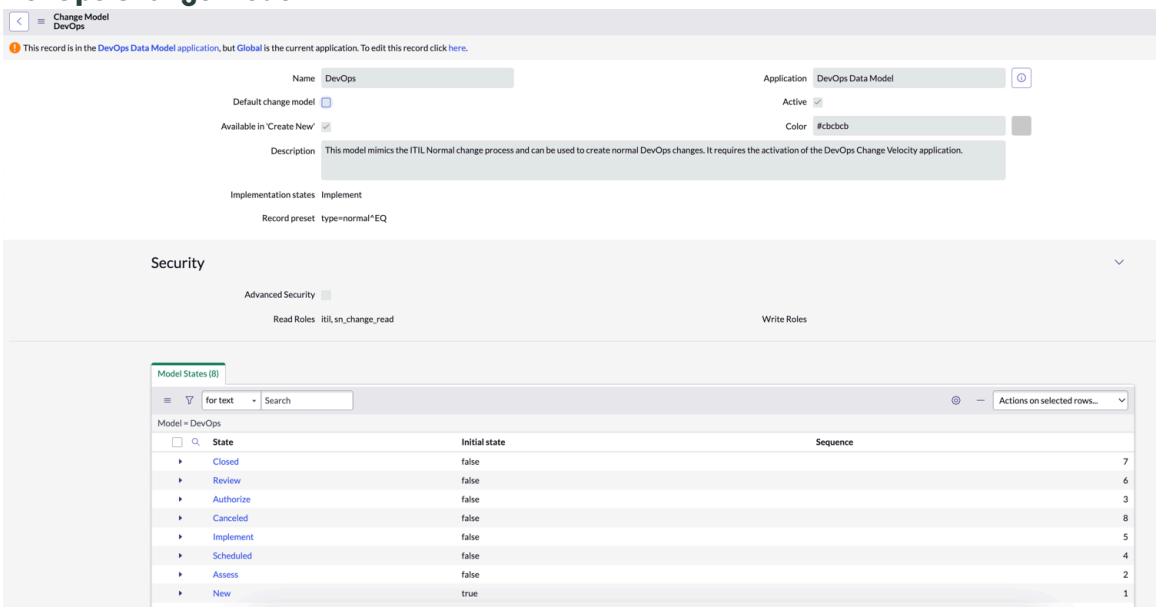
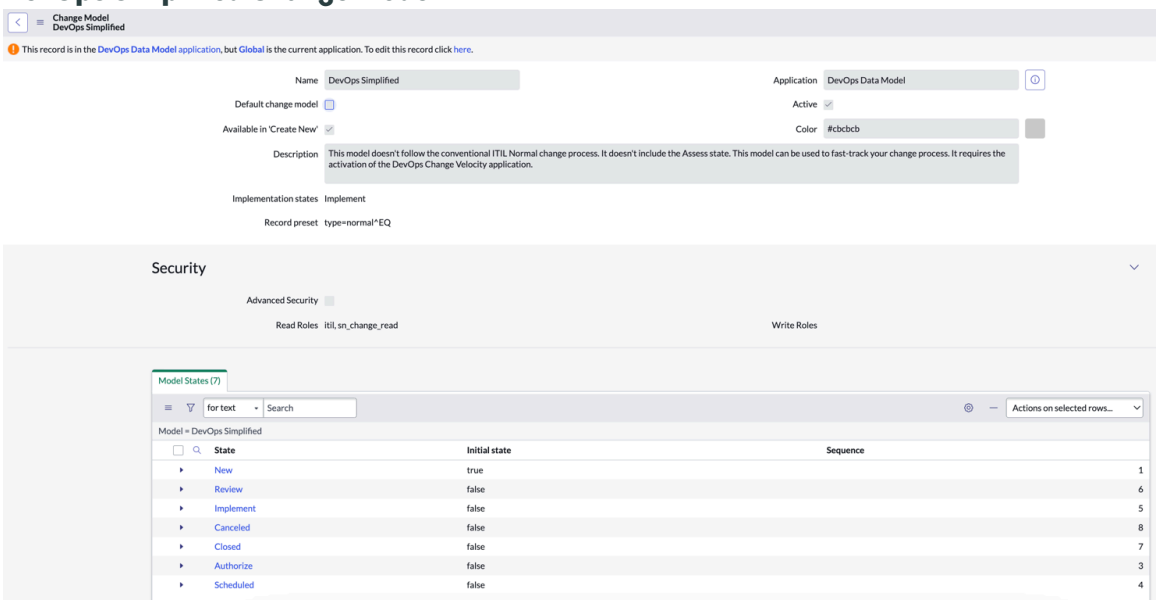
model states available for the DevOps change model are New, Assess, Authorize, Scheduled, Implement, Review, Closed, and Canceled. And the model states available for the DevOps Simplified change model are New, Authorize, Scheduled, Implement, Review, Closed, and Canceled. Depending on your requirements, you can modify the change models and configure the states and transitions for your specific use case.

### DevOps Change Model




### DevOps Simplified Change Model




If you want to create your own model instead of using the base system DevOps models, see the instructions in the Create a Change model section.

You can use record presets to configure change details for your change model. Whenever a change is created, these values will be automatically set on the change. You can set a record preset for any change field that exists in the change request.

The following logic is considered for pre-filing the change details when creating a change request.

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- If you have configured change details in the record preset, then you can't override this value by passing change details from the pipeline.
- If change details aren't configured in the record preset, then the values passed from the pipeline is considered for pre-filing the details in the change request.
- If change details are neither configured in the record preset nor passed from the pipeline, then the values configured in the Step form in ServiceNow are considered.

| Change details configured in record preset in ServiceNow | Change details configured in Step form in ServiceNow | Change details passed in the pipeline | Change details pre-filled when change is created |
|---|---|---|---|
| Assignment group: DevOps Report | Assignment group: Not specified | Assignment group: Not specified | Assignment group will be pre-filled from the record preset in the change request |
| Assignment group: Not configured | Assignment group: Not specified | Assignment group: DevOps Report | Assignment group will be pre-filled from the pipeline in the change request |
| Assignment group: Not configured | Assignment group: DevOps Report | Assignment group: Not specified | Assignment group will be pre-filled from the Step form in the change request |

## DevOps Change model

The DevOps change model contains flows in the base system for state transition and change approvals. Each state in the DevOps model has its own flows and each flow will get triggered when the required conditions are met. Change approval (auto or manual) is based on the DevOps Model Change Policy. By default, the base system DevOps Model Change Policy only has the manual approval decision activated. When you are ready for more approval automation, you can modify the policy. The following flows explain the state transition and change approval behavior.

- Change - DevOps - New: When the change request is created in the New state, this flow gets triggered. If it has an Assignment Group, then this flow updates the change state to Assess.
- Change - DevOps - Assess: When the change request is in the Assess state, this flow gets triggered. There are two key actions in this flow - DevOps Gather Change Policy Data and Apply Change Approval Policy, which are used to retrieve the DevOps data associated with the change request and check whether the change request must be auto approved, auto rejected, or sent for manual approval. The change approval (auto or manual) happens as part of this flow in the Apply Change Approval Policy action based on the DevOps Model Change Policy. If the change is approved (auto or manual), it moves to the Authorize state. If the change is rejected, an email notification is sent to

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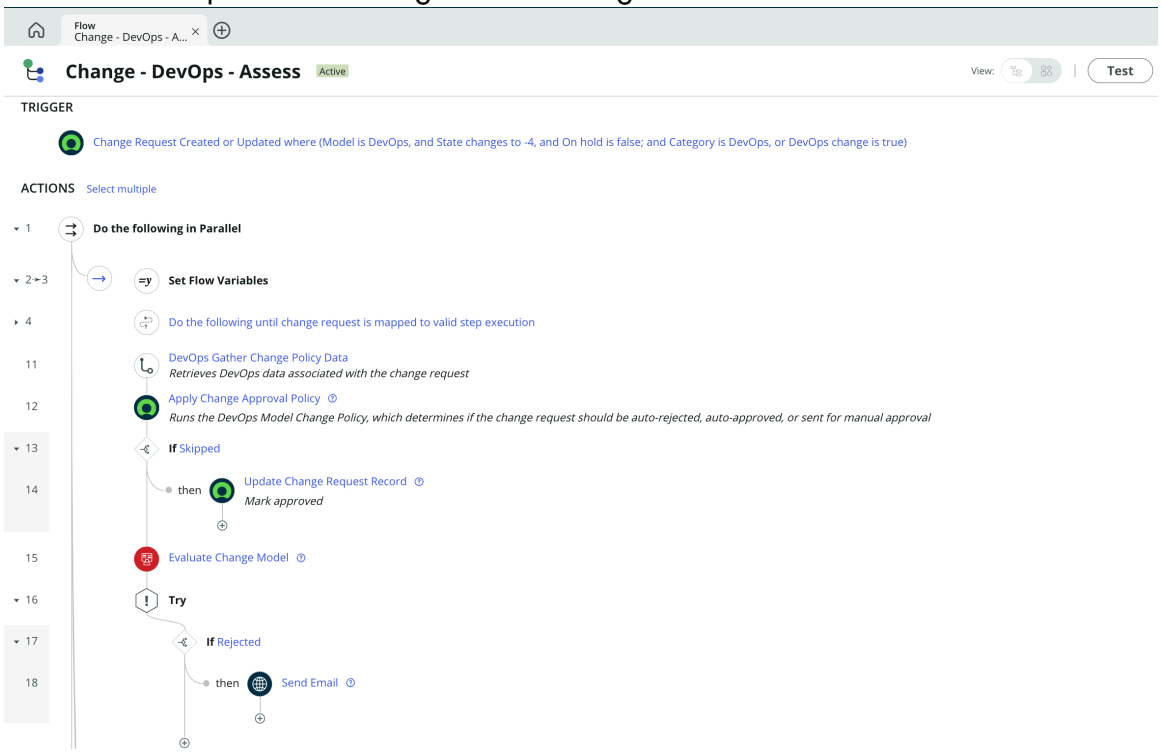
the user who requested the change and the change is moved back to the New state.




- Change - DevOps - Authorize: When the change request is in the Authorize state, this flow gets triggered. In the base system, you will notice that there are two key actions - DevOps Gather Change Policy Data and Apply Change Approval Policy, which are used to retrieve the DevOps data associated with the change request and check whether the change request must be auto approved, auto rejected, or sent for manual approval. The conditions in the DevOps Model Change Policy in the Apply Change Approval Policy action won't be met. So the change approval (auto or manual) in this flow will be skipped. This flow will only move the change request state to Scheduled that triggers the Change - DevOps - Schedule flow.

  **Note:**
  If your change process requires another approval, you can refer to this flow and customize the DevOps Model Change Policy according to your requirements.

- Change - DevOps - Schedule: When the change request is in the Scheduled state, this flow gets triggered. When the planned start date is reached, the change is moved to the Implement state.
- Change - DevOps - Implement: When the change request is in the Implement state, this flow gets triggered.

The DevOps Model Change Policy contains the following policy inputs:

- is_change_with_partial_data
- regression_tests_failed
- code_security
- code_coverage
- total_num_of_commits
- tests_passing_percent
- load_tests_failed
- num_of_open_incidents

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- num_of_outages_in_last_7_days
- num_of_current_outages
- integration_tests_failed
- commits_without_work_item
- change_request
- risk

The three outcomes for the DevOps Model Change Policy (depending on the conditions that you specify) are:

- Auto approval: If the conditions specified in the policy are met, the change request is automatically approved.
- Auto reject: If one or more of the conditions specified in the policy are not met, the change request is automatically rejected.
- Manual approval: If one or more conditions need manual approval by a user or group, that is specified in the policy. Notifications are sent by the policy to the relevant users or groups to expedite the manual approval and progress the change request.

**Note:**
By default, the base system DevOps Model Change Policy only has the manual approval decision activated.

**Important:**
When you use the base system DevOps model as is, the change approval is automated by default. If you do not want automated change approval, you can modify the DevOps Model Change Policy in a way it suits your current change process.

### DevOps Simplified model

The DevOps Simplified change model contains flows in the base system for state transition and change approvals. Each state in the DevOps Simplified model has its own flows and each flow will get triggered when the required conditions are met. Change approval (auto or manual) is based on the DevOps Simplified Model Change Policy. The following flows explains the state transition and change approval behavior.

- Change - DevOps Simplified - New: When the change request is created in the New state, this flow gets triggered. If it has an Assignment Group, then this flow updates the change state to Assess.
- Change - DevOps Simplified - Authorize: When the change request is in the Authorize state, this flow gets triggered. There are two key actions in this flow - DevOps Gather Change Policy Data and Apply Change Approval Policy, which are used to retrieve the DevOps data associated with the change request and check whether the change request must be auto approved, auto rejected, or sent for manual approval. The change approval (auto or manual) happens as part of this flow in the Apply Change Approval Policy action based on the DevOps Simplified Model Change Policy. If the change is approved (auto or manual), it moves to the Schedule state. If the change is rejected, an email notification is sent to the user who requested the change and the change is moved back to the New state.

**Note:**
If your change process requires another approval, you can refer to this flow and customize the DevOps Simplified Model Change Policy according to your requirements.

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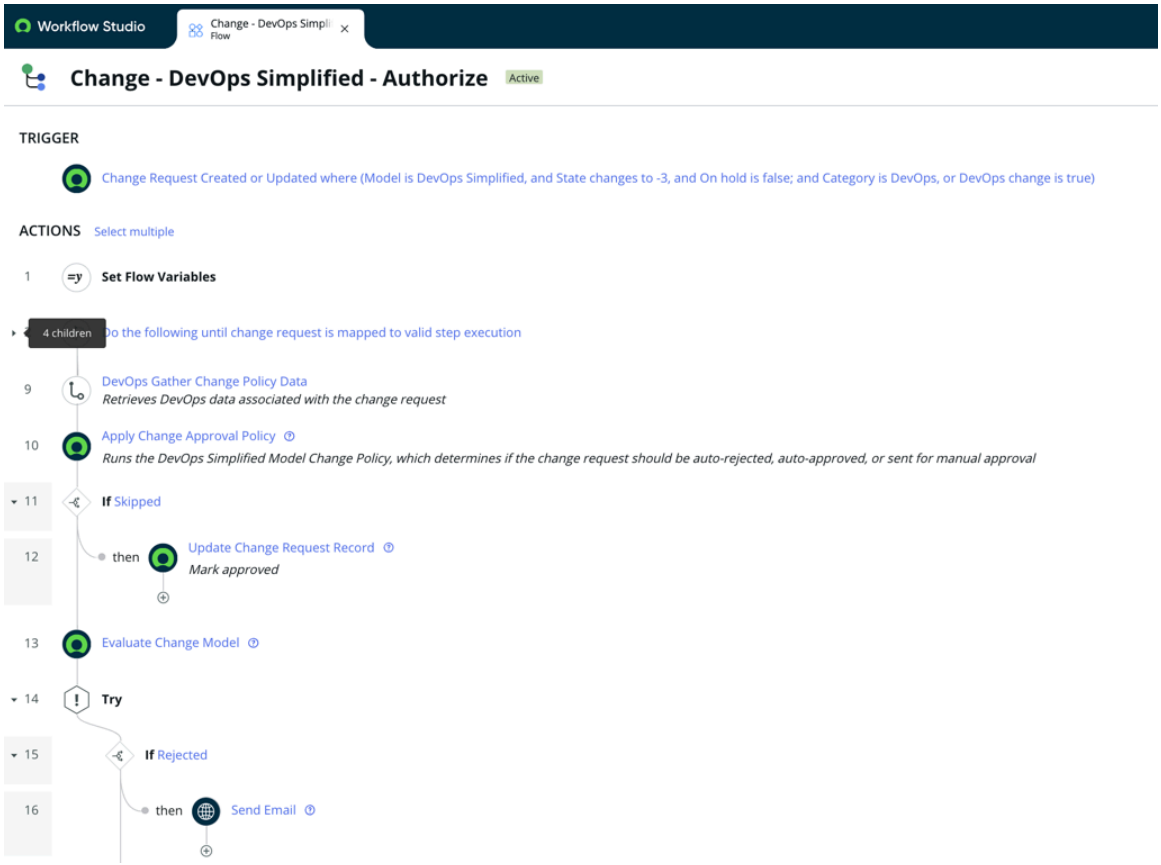


- Change - DevOps Simplified- Schedule: When the change request is in the Scheduled state, this flow gets triggered. When the planned start date is reached, the change is moved to the Implement state.
- Change - DevOps Simplified - Implement: When the change request is in the Implement state, this flow gets triggered.

The DevOps Simplified Model Change Policy contains the following policy inputs:

- is_change_with_partial_data
- regression_tests_failed
- code_security
- code_coverage
- total_num_of_commits
- tests_passing_percent
- load_tests_failed
- num_of_open_incidents
- num_of_outages_in_last_7_days
- num_of_current_outages
- integration_tests_failed
- commits_without_work_item
- change_request
- risk

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The three outcomes for the DevOps Simplified Model Change Policy (depending on the conditions that you specify) are:

- Auto approval: If the conditions specified in the policy are met, the change request is automatically approved.
- Auto reject: If one or more of the conditions specified in the policy are not met, the change request is automatically rejected.
- Manual approval: If one or more conditions need manual approval by a user or group, that is specified in the policy. Notifications are sent by the policy to the relevant users or groups to expedite the manual approval and progress the change request.

**Note:**
By default, the base system DevOps Simplified Model Change Policy only has the manual approval decision activated.

## Callback to resume the pipeline

In DevOps Change Velocity, the following considerations are made to send a callback request.

- The implementation states is used to send a callback to the third-party orchestration tool. If only one implementation state is present in the change model, then an absolute comparison is made. When the change created by a change model reaches the implementation state that is set, a call back is sent to the third-party orchestration tool.

**Note:**
In change models, the Implementation states field can have one or more states. You can define the implementation states for each change model. For more information, see State model and transitions.

- If multiple implementation states are present in the change model, a call back is sent to the third-party orchestration tool in the state where implementation state is reached first.
- If there's no implementation state set on the change model, then the model states are checked for the **Implement** state. If the Implement state is present, then that is considered for call back to the third-party orchestration tool. If there's no implement state in the model states as well, then the value present in the **sn_devops.change_request.implement_state** property is considered. The value of the system property is -1 by default, which is the implement state.

**Note:**
The Change – DevOps – Update execution state flow is used to send a callback to the third-party orchestration tool. This approval flow waits until the change request is in the Implement state. Once the change request reaches Implement state, this flow updates the Step Execution record to the appropriate (approved, rejected, canceled) state. The moment the Step Execution record is updated, the Change Control Callback flow is triggered to send the callback to the third-party tool.

## After upgrade

- The **Change model** field will be displayed in the Step form. This won't impact your existing type-based change creation process as the type compatibility property (*com.snc.change_management.change_model.type_compatibility*) is true.
- If you want to have a model-based change request, set the type compatibility property to false. The **Change model** field in the Step form will be required. For information on configuration combination based on the property, see the table When the type compatibility property is set to False.

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**Note:**
If you're an existing customer and zbooted your instance, or a new customer, you can create model-based change requests by default. However, you can create type-based change requests by setting the type compatibility property to true.

The following table explains how the change model feature works for new and upgrading customers.

**Change model behavior based on upgrade**

| New or upgrade instance | Type compatibility flag | Model or Type | State transition flows | Auto change approval flows | Callback to 3rd party |
|---|---|---|---|---|---|
| zboot (new or existing zbooted) | false | DevOps model | • Change request - DevOps - New<br>• Change request - DevOps - Assess<br>• Change request - DevOps - Authorize<br>• Change request - DevOps - Schedule<br>• Change request - DevOps - Implement | In the base system, change approval (auto or manual) happens through the Change request - DevOps - Assess flow. If you want another level of approval, you can refer to the Change request - DevOps - Authorize flow and customize the DevOps Model Change Policy accordingly. | See the Note in the Callback section. |
| Upgrade | false | DevOps model | • Change request - DevOps - New<br>• Change request - DevOps - Assess<br>• Change request - DevOps - Authorize<br>• Change request - | In the base system, change approval (auto or manual) happens through the Change request - DevOps - Assess flow. If you want another level of approval, you can refer to the Change request - | See the Note in the Callback section. |

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**Change model behavior based on upgrade (continued)**

| New or upgrade instance | Type compatibility flag | Model or Type | State transition flows | Auto change approval flows | Callback to 3rd party |
|---|---|---|---|---|---|
| | | | DevOps - Schedule<br>• Change request - DevOps - Implement | DevOps - Authorize flow and customize the DevOps Model Change Policy accordingly. | |
| zboot (new or existing zbooted) | false | DevOps Simplified model | • Change request - DevOps - New<br>• Change request - DevOps - Authorize<br>• Change request - DevOps - Schedule<br>• Change request - DevOps - Implement | In the base system, change approval (auto or manual) happens through the Change request - DevOps - Authorize flow. If you want another level of approval, you can customize the DevOps Simplified Model Change Policy accordingly. | See the Note in the Callback section. |
| Upgrade | false | DevOps Simplified model | • Change request - DevOps - New<br>• Change request - DevOps - Assess<br>• Change request - DevOps - Authorize<br>• Change request - DevOps - Schedule | In the base system, change approval (auto or manual) happens through the Change request - DevOps - Authorize flow. If you want another level of approval, you can customize the DevOps Simplified Model | See the Note in the Callback section. |

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**Change model behavior based on upgrade (continued)**

| New or upgrade instance | Type compatibility flag | Model or Type | State transition flows | Auto change approval flows | Callback to 3rd party |
|---|---|---|---|---|---|
| | | | • Change request - DevOps - Implement | Change Policy accordingly. | |
| Upgrade | true | Type | Current behavior is continued | DevOps Change Request Manual Approval, or DevOps Change Request Minimal Automation Approval, or DevOps Change Request Advanced Automation Approval flows (whichever flow is active) | Change Control Callback flows |

### Update change model in pipeline

Update the change model in your existing pipeline steps using the DevOps Pipeline Migration to Change Models catalog item.

## Before you begin

Role required:

- sn_change_read role to read the change model from the chg_model table.
- sn_devops.viewer role to read the pipelines from the sn_devops_pipeline table.

## About this task

If you're an upgrading user, and you want to migrate your existing pipelines steps to change models, you must perform this procedure.

The DevOps Pipeline Migration to Change Models catalog item enables you to update the change model in each step record in your pipeline at once. For example if you have set the type compatibility`com.snc.change_management.change_model.type_compatibility` #property to false and change model input is required in multiple pipeline steps, you can use this catalog item to update the change model for all pipeline steps in one go.

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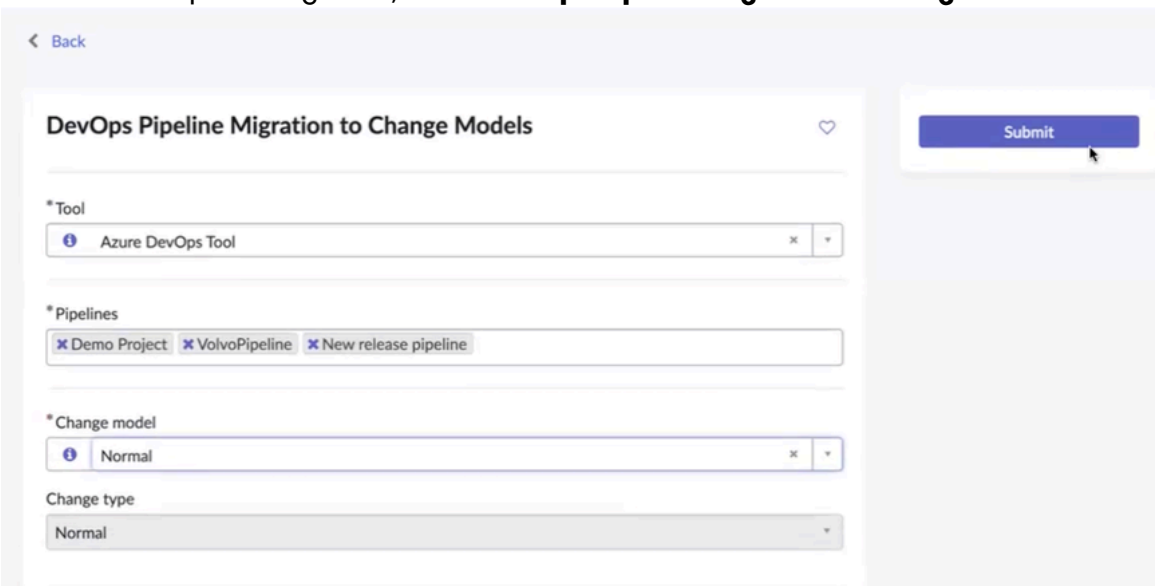
## Procedure

1. Navigate to **All > Service Catalog > Catalog Definitions > Maintain Items > DevOps Pipeline Migration to Change Models**, and set the **Active** state to **True** to activate the **DevOps Pipeline Migration to Change Models** maintain item.
   By default the catalog item is turned off.
2. In the Available For related list of the catalog item, add the users to whom the catalog must be available.
3. In the Approve By related list of the catalog item, add the users who can approve the catalog item.
   Alternatively, navigate to **All > Flow Designer > Flows**, and activate the **Request for pipeline migration** catalog flow. You can update the rule set in the **Ask For Approval** action of the flow to add a user or a group of users who can approve the catalog item.
4. To add the catalog item in the Service Catalog categories in Service Portal, set the category of these items to **DevOps** and add the **Service Catalog** catalog.
   If the DevOps category isn't available, you must create a new category called **DevOps** from the catalog item record itself and assign the **DevOps Onboarding** catalog to it.
5. To add catalog item in Employee Service Center, add a new topic in the Assigned Topics related list with taxonomy as **Employee** in the **IT > IT for IT** section.
   The Assigned Topics related list isn't available in the Default view of the **Catalog Item** form.
   To add it, select **Additional icons > Configure > Related Lists** and move the **Connected Content → Catalog item** field to the selected section.
6. Navigate to **All > Service Catalog > Catalog Definitions > Maintain Items** and search for **DevOps**.

   **Note:**
   You can also access the service catalog from the Employee Center or Service portal.

7. From the DevOps catalog items, select **DevOps Pipeline Migration to Change Models**.




8. In the form, fill in the following fields.

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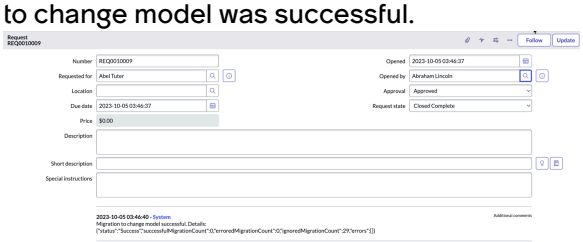
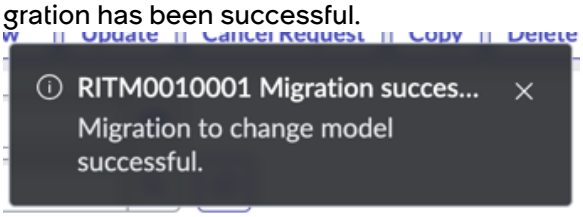
### DevOps Pipeline Migration to Change Models form

| Field | Description |
|---|---|
| Tool | Orchestration tool that contains the required pipelines. |
| Pipeline | Pipelines for which you want to update the change model. |
| Change model | Change model to which the existing models are being updated. |

9. Select **Submit**.

A request is created. Based on whether the request is approved or rejected, notifications are send to the requester.

**Note:**
If any of the pipelines you selected in step 8 has any data policy, which doesn't allow the pipeline steps to be updated, the same is updated as an error in the worknotes of the corresponding request.

| Option | Description |
|---|---|
| **Approved and successful** | ○ A comment is added in the request record specifying that migration to change model was successful.<br>  <br>○ A bell notification is sent to the requester specifying that the mi gration has been successful.<br>  |

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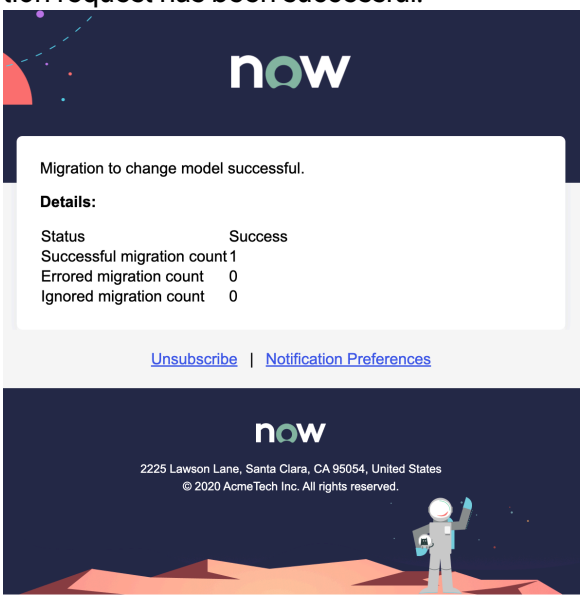
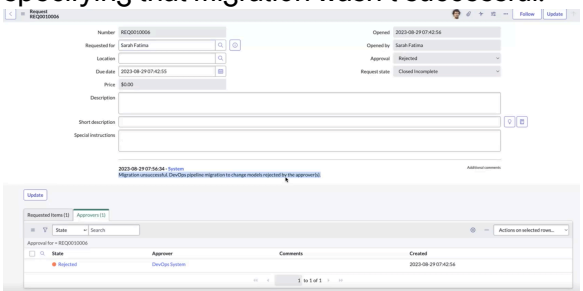
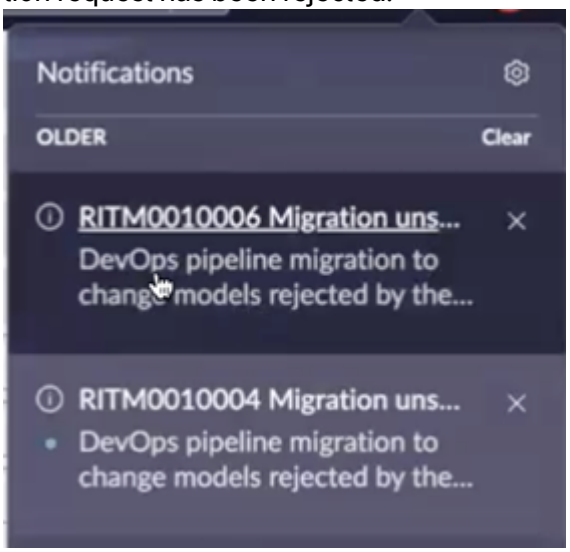
| Option | Description |
| --- | --- |
| | ○ An email notification is sent to the requester specifying that the migration request has been successful.<br>  |
| **Rejected and unsuccessful** | ○ A comment is added in the request record specifying that migration wasn't successful.<br>  <br>○ A bell notification is sent to the requester specifying that the migration request has been rejected.<br>  |

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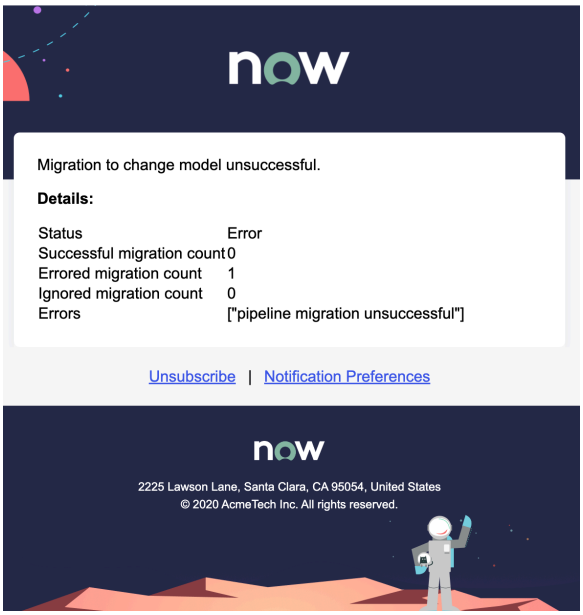
| Option | Description |
| --- | --- |
| | ○ An email notification is sent to the requester specifying that the mi gration request has been rejected.   |

## Retrieve change request data using DevOpsChangeRelationshipHelper script

Retrieve data associated with a change request based on the specified relation type using the DevOpsChangeRelationshipHelper script include.

### Before you begin

Role required: sn_devops.viewer

### About this task

Use Script Includes to store JavaScript functions and classes for use by server scripts. You can call the Script Include from a Business Rule, UI Action, workflow script, Scripted REST API, and so on.

This method retrieves data related to a change request based on the specified relation type.

The supported relation types are:

- DevOpsCommonConstants.COMMIT_TABLE
- DevOpsCommonConstants.DEVOPS_WORK_ITEM
- DevOpsCommonConstants.DEVOPS_TEST_SUMMARY_TABLE
- DevOpsCommonConstants.DEVOPS_SECURITY_SCAN_SUMMARY_TABLE
- DevOpsCommonConstants.DEVOPS_ARTIFACT_VERSION_TABLE
- DevOpsCommonConstants.DEVOPS_SOFTWARE_QUALITY_SUMMARY_TABLE
- DevOpsCommonConstants.DEVOPS_PULL_REQUEST_TABLE

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### Procedure

1. Navigate to **All** > **System Definition** > **Script Includes**.
2. Search for the DevOpsChangeRelationshipHelper script.
   You can call this Script Include from a Business Rule, UI Action, workflow script, Scripted REST API, and so on.

### Example:

Assume you have an instance of the object containing the changeRelationHelperObj method.

```
var changeRelationHelperObj = new
 sn_devops.DevOpsChangeRelationshipHelper();
```

Assume you have a GlideRecord object representing a change request.

```
var changeRequest = new GlideRecord('change_request');
changeRequest.addQuery('number', 'CHG123456');
changeRequest.query();
changeRequest.next();
```

The retrieved data may include additional details depending on the relation type. If data is found, an array containing the related sys IDs information is returned. If data is not found, a debug message is displayed and an empty array is returned. If there is an issue during data retrieval, an error message is displayed with details.

Example 1: Retrieving commit data for a change request.

```
try {
    var commitsData =
 changeRelationHelperObj.getChangeRelationData(changeRequest,
 sn_devops.DevOpsCommonConstants.COMMIT_TABLE);
    if (commitsData && commitsData.length > 0) {
        gs.log('Commits Data:', commitsData);
    } else {
        gs.log('No commits found for Change Request:',
 changeRequest.getDisplayValue());
    }
} catch (error) {
    gs.error('Error fetching commits data:',
 error.getMessage());
}
```

Example 2: Retrieving work items for a change request.

```
try {
    var workItemsData =
 changeRelationHelperObj.getChangeRelationData(changeRequest,
 sn_devops.DevOpsCommonConstants.DEVOPS_WORK_ITEM);
    if (workItemsData && workItemsData.length > 0) {
        gs.log('Work Items Data:', workItemsData);
    } else {
        gs.log('No work items found for Change Request:',
 changeRequest.getDisplayValue());
    }
} catch (error) {
    gs.error('Error fetching work items data:',
 error.getMessage());
}
```

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# Manage Pull Requests (PR) or Merge Requests in DevOps Change Velocity

Manage Jenkins and Azure DevOps (ADO) pipeline's pull requests for GitHub, Bitbucket, and ADO coding sources from ServiceNow DevOps. You can enable the change approval process on your pull request to control pull request merge approvals from ServiceNow DevOps and monitor pull request details associated with the change request.

## Before you begin

Ensure that the following prerequisites are met before approving pull requests:

- Your admin has created a pull request branch in GitHub or Bitbucket using a Multi-branch project pipeline. For more information, see GitHub branch source and Bitbucket branch source.
- Your admin has enabled pull request creation in the ADO repository.
  For more information, see https://marketplace.visualstudio.com/items?itemName=ShaykiAbramczyk.CreatePullRequest.
- Your admin has configured Jenkins integration with DevOps. For more information, see Jenkins integration with DevOps.
- Your admin has configured GitHub integration with DevOps. For more information, see GitHub integration with DevOps.
- Your admin has configured Bitbucket integration with DevOps. For more information, see Bitbucket integration with DevOps.
- Your admin has configured ADO integration with DevOps. For more information, see Azure DevOps integration with DevOps Change Velocity.
- Your admin has enabled the Change Acceleration feature of DevOps for automatic change request creation in your pipeline. For more information, see Accelerating DevOps change.

Role required: sn_devops.admin

## About this task

For Jenkins pipelines, pull requests can be managed for GitHub and Bitbucket coding sources.

For ADO pipelines, pull requests can be managed for ADO coding source.

## Procedure

1. Create a pull request in GitHub or Bitbucket or ADO.
   For more information, see Creating a pull request or Create a pull request to merge your change.
2. Perform the following steps based on your orchestration tool.

3. Run the pull request pipeline in Jenkins or ADO.
   A build is initiated and a change request notification is sent to the approver associated with the pipeline.
4. Navigate to **DevOps > Orchestrate > Pipeline Change Requests**.
5. Select the change record associated with the pull request.
6. Approve the change request associated with the pull request by selecting **Approved** in the **State** field.
   Merge is enabled in GitHub or Bitbucket or ADO for the pull request. Merge the pull request in the corresponding tool.
7. Select the Pull Requests related list associated with the change record.

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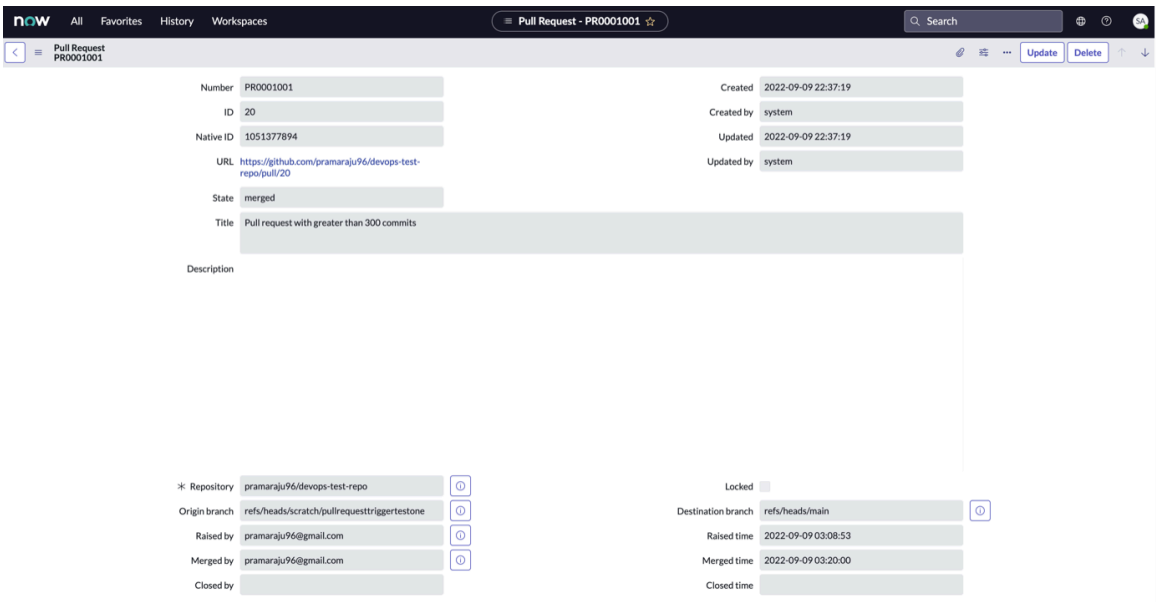
8. View the pull request details by clicking the pull request number corresponding to the **Number** field.




All the pull request details (including the details after the request is merged) associated with the change record are displayed. Details such as Pull request ID, Commits, Origin branch, Destination branch, Raised by, Approver, Comments, PR raised time, PR approved time, PR merged/closed time are displayed. Commits from pull requests are shown in the **Commits** related list.

**Limitation**

Details of pull requests that are created in a BitBucket coding source and associated with a Jenkins pipeline are not displayed for a change request.

## DevOps change request attributes

Add or update DevOps change request attributes using the changeInfo REST API, the Default Change Handler subflow, by passing attributes through the pipeline, Update function, or automated flows.

## Specifying attributes

Use one of the following methods to specify change request attributes:

- DevOps - PUT /devops/orchestration/changeInfo/{changeInfo} to update fields within a specified change request.

  **Note:**

  - The changeInfo API won't function when the pipeline is in the paused state.
  - An API call can't be executed while the pipeline is waiting.
  - The API approach must be considered after thorough testing.

- Default Change Handler subflow to populate change request fields with default values. For more information, see Default Change Handler subflow.
- Passing the change attributes through the orchestration pipeline. For more information, see Configuring DevOps change request details within the pipeline.

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- Passing the change attributes through the Update function in the orchestration pipeline function. For more information, see the following:
  - Get and update change request details in Azure DevOps pipeline
  - Update change request details in Jenkins pipeline
  - ServiceNow DevOps custom actions from GitHub marketplace
  - Implement custom actions for pipelines using generic Docker container image
- Automated flows: DevOps approval flows to make changes in a change request. For more information, see Flows.

## Precedence of consideration

When the change attributes are specified through multiple methods, the precedence in which the attribute values are considered will vary. In ServiceNow, attributes can be specified in the pipeline step of DevOps Change Velocity, in the Default Change Handler subflow, or in an approval flow. In the orchestration tool pipeline, attributes can be passed in the pipeline step, or using the REST APIs. If a change model is used, they can also be specified in model presets.

See the following tables and examples to understand the precedence in which the values will be considered.

**Precedence of change attributes for type-based changes**

| Change request | Precedence |
|---|---|
| Standard | **1.** Change attributes passed through pipeline<br>**2.** Step record fields in ServiceNow<br>**3.** Template passed in change attributes through pipeline<br>**4.** Template in Step fields in ServiceNow |
| Non-standard | **1.** Change attributes passed through pipeline<br>**2.** Default Change Handler subflow & approval flows<br>**Important:** Setting attribute values in both the Default Change Handler subflow and approval flows can cause conflicts because they might run simultaneously. Set the attribute values in only one source to avoid issues.<br>**3.** Step record fields in ServiceNow<br>**4.** Template passed in change attributes through pipeline<br>**5.** Template in Step fields in ServiceNow |

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**Precedence of change attributes for model-based changes**

| Change request | Precedence |
|---|---|
| Standard | **1.** Model Presets<br>**2.** Change attributes passed through pipeline<br>**3.** Step record fields in ServiceNow<br>**4.** Template passed in change attributes through pipeline<br>**5.** Template in Step fields in ServiceNow |
| Non-standard | **1.** Model Presets<br>**2.** Change attributes passed through pipeline<br>**3.** Default Change Handler subflow & approval flows<br>**Important:** Setting attribute values in both the Default Change Handler subflow and approval flows can cause conflicts because they might run simultaneously. Set the attribute values in only one source to avoid issues.<br>**4.** Step record fields in ServiceNow<br>**5.** Template passed in change attributes through pipeline<br>**6.** Template in Step fields in ServiceNow |

**Note:**
If you have used business rules in your change operations, then you must set the *sn_devops.change_request.apply_attributes_on_creation* property to true, so that the change attributes passed in the pipeline are set when the change request is created instead of the attributes being passed after the change request is created. For more information, see DevOps Change Velocity properties.

## Example: Scenario 1

Consider a scenario where the attributes are specified in the Default change handler subflow in ServiceNow and in the Update function in the orchestration pipeline. Assume that the assignment_group attribute is specified as “change mgmt” in the Default change handler subflow, and as “CAB” in the Update function in the pipeline. In this scenario, when the change is created, the value from the Default change handler subflow will be considered, and “change mgmt” will be the value considered for assignment_group. Once the change is approved, and the pipeline is resumed, the value specified in the Update function will be considered, i.e. “CAB”.

## Example: Scenario 2

Consider a scenario where the attributes are specified in the Default change handler subflow in ServiceNow and in the change step in the orchestration pipeline. Assume that the

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assignment_group attribute is specified as “change mgmt” in the Default change handler subflow, and as “chg mgmt1” in the change step of the pipeline. In this scenario, when the change is created, the value from change step (chg mgmt1) will be considered, and then once the Default change handler subflow is triggered, the value considered will be “change mgmt”.

### Example: Scenario 3

Consider a scenario where the attributes are specified through the template passed in change attributes and in the template of the step record. Assume that the assignment_group attribute is specified as “change mgmt” in the template passed in change attributes, and as “chg mgmt1” in the template of the pipeline step record. In this scenario, when the change is created, the value from the template passed in change attribute (chg mgmt) will be considered.

### Example: Scenario 4

Consider a scenario where the attributes are specified in the change attributes and the model preset for a model-based change. Assume that the assignment_group attribute is specified as “change mgmt” in change attributes and as “chg mgmt1” in the model preset. In this scenario, when the change is created, the value from model preset (chg mgmt1) will be considered.

## DevOps Insights reports

To help you plan and implement updates to your DevOps processes, DevOps Insights displays a variety of configurable reports that are grouped by type of metric. From the DevOps Change Workspace, select the DevOps Insights icon ( ) to view the reports.

### DevOps Insights

Analyze operational and business reports and to determine the overall efficiency#and growth of your#development processes.

- Monitor activities, KPIs, and metrics in a central dashboard.
- Track performance over time.
- View summary data broken out by bug, epic, feature, "other", story, or task.

### Mining and analyzing the metrics

Each report provides both a summary of an important business metric and access to more detailed information about the metric.

- By default, many reports display data for the last 30 days. Select the **Date** icon ( ) to configure a custom date range.
- Point to a specific data point in a chart to view detailed data.
- Select a specific data point to view the key performance indicator (KPI) details for the report in a separate tab. You can then use the powerful data-management tools in the Performance Analytics application to drill deeply into the data.
- To apply any filter other than the date filter, select the filter icon and then move filter categories from the **Available** list to the **Applied** list.
- Filters appear at the top of the tab. For each report, the Applied filter icon ( ) displays the number of filters that are currently applied to a report. Select the icon to view and configure the filters that are applied to a widget.

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## Schedule of data collection

You must enable the daily data collection job to populate the dashboards with new DevOps data coming in from the connected third-party tools.

1. Navigate to **All** > **Performance Analytics** > **Data Collector** > **Jobs**.
2. Configure the *[DevOps] Daily Data Collection* job to run as system admin.

**Note:**
*[DevOps] Daily Data Collection* job is active by default and configured to run as admin user.

Run the *Load Change Request Repo Detail* scheduler script and *[DevOps] Historical Data Collection* job for historical data:

1. Navigate to **All** > **System Definition** > **Scheduled Jobs**.
2. Execute the *Load Change Request Repo Detail* scheduler script.

   This job populates the Change Request Repo Detail table [sn_devops_insights_change_request_repo_detail] if you import demo data after installing the DevOps Insights application.

   If you're installing demo data along with the DevOps Insights application, then there's no need to run this job. You can directly run the *[DevOps] Historical Data Collection* performance analytics job to see scores.
3. Navigate to **All** > **Performance Analytics** > **Data Collector** > **Jobs**.
4. Execute the *[DevOps] Historical Data Collection* job to run as system admin.

   The execution time depends on the volume of data. This is a one-time task to collect historical DevOps data, and not meant to be on a schedule.

**Tip:**

Based on the time taken to complete this job, plan on running it during a period of low usage.

## DevOps Insights dashboard - Workspace

The DevOps Insights dashboard provides a flexible graphical view of operational and business reports. Use the dashboard to evaluate the results of your overall DevOps process.

### Summary dashboard

The DevOps Insights Summary dashboard enables an overview of key metrics across various categories from accelerate to quality metrics along with a quick glance of the most active applications.

#### Summary reports

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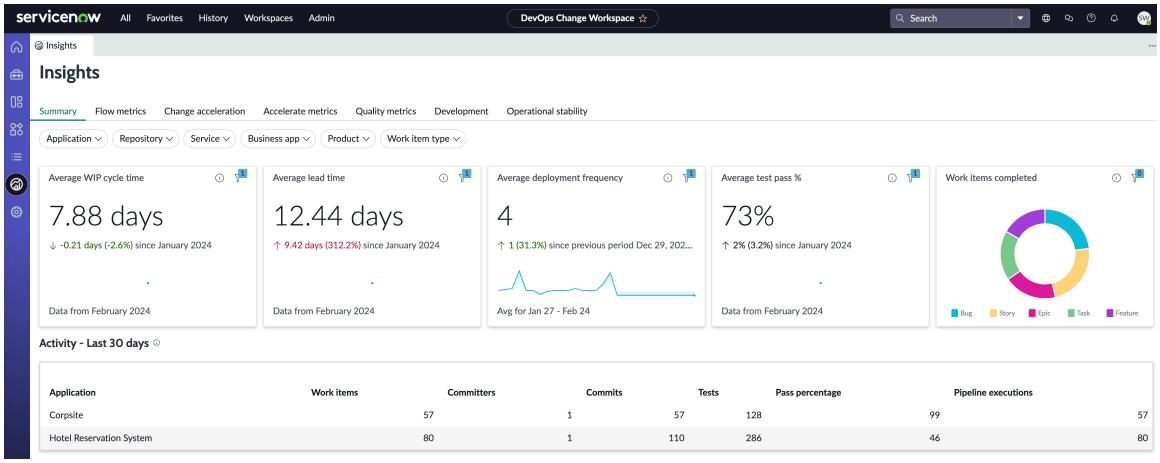


| Report | Description | Source |
|---|---|---|
| Average WIP cycle time | Average time in days that a work item is in the WIP state before completion. | Calculation: Time to complete WIP items divided by the number of completed work items |
| Average lead time | Daily average lead time for prod deploy pipeline executions. | Calculation: Sum of successful prod deploy lead times divided by the number of successful production pipeline executions. |
| Average deployment frequency | Average number of successful production deployments.<br><br>Applies to pipeline steps of type **Prod Deploy** that are in the completed state. | Step execution |
| Average test pass % | Daily average test pass percentage for pipeline executions. | Database view joined by test summary, test summary relations, step execution, change request repository detail, step, pipeline, app, and application product detail. |
| Work items completed | Work items, grouped by work item type, that were set to the complete state during the last 30 days. | Database view joined by work item, metric instance, commit work item, commit, commit execution, step execution, step, pipeline, app, and application product detail. |
| Activity — last 30 days | For each application, the summary of activity during the last 30 days. | Database view joined by commit, commit work item, repository, commit execution, |

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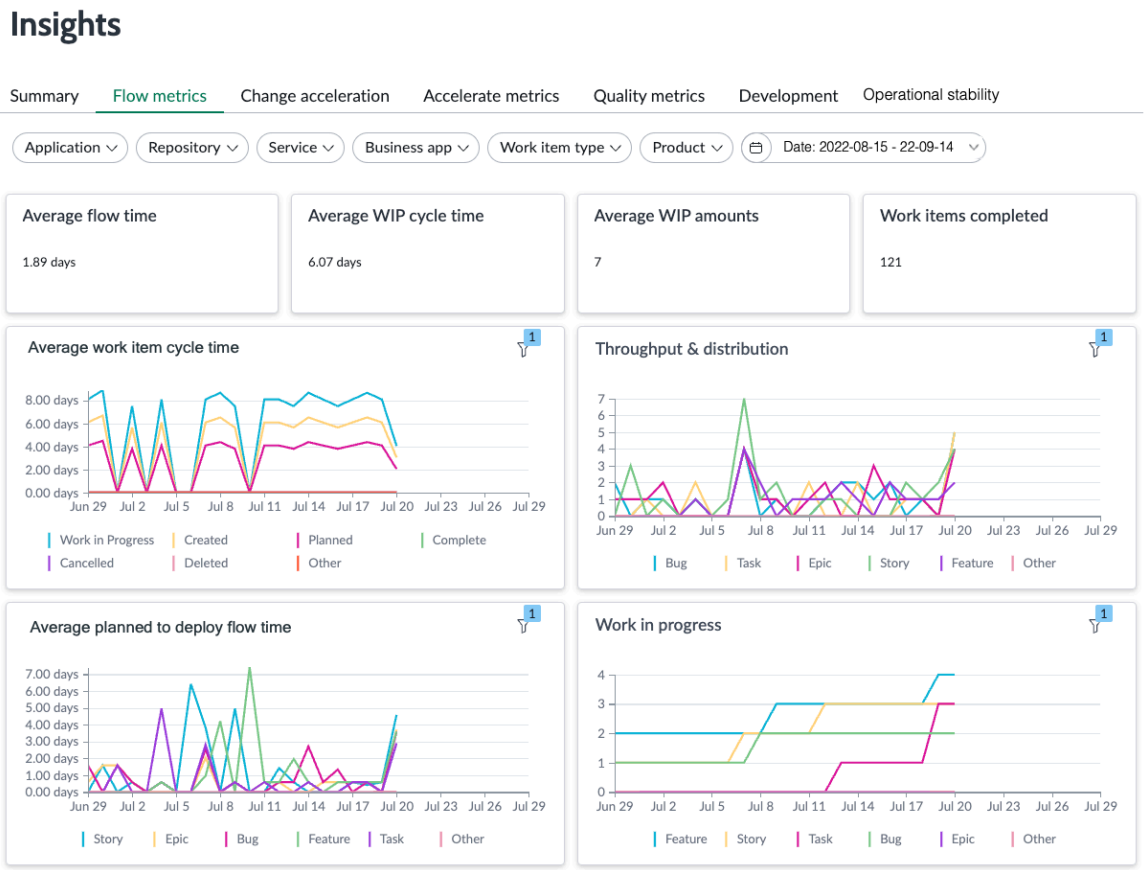
| Report | Description | Source |
|---|---|---|
| | | app, test summary relations, step execution, test summary. |

### Flow metrics dashboard

The DevOps Insights Flow metrics reports help you visualize how work is moving through your development process. Uncover bottlenecks by determining which kinds of work (such as stories or bugs) are taking the longest.

### Flow metrics reports




### Flow metrics reports

| Report | Description | Source |
|---|---|---|
| Average flow time | Average time, in days, that a work item spent from the created state to step execution end time of a successful prod pipeline deployment. | Database view joined by work item, metric instance, commit work item, commit, commit execution, step execution, step, pipeline, app, and application product detail. |
| Average WIP cycle time | Average time in days that a work item is in a specific state. | Database view joined by Work Item, Metric Instance, Commit, Step Execution, Commit execution, and Commit work item lists. |

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**Flow metrics reports (continued)**

| Report | Description | Source |
|---|---|---|
| Average WIP count | Average number of work items that are WIP during the last 30 days. | Average count of Work Items with State set to Work In Progress. |
| Work items completed | Number of work items in the complete state that are associated to commits through a successful production pipeline deploy in the last 30 days.<br>**Note:** Filters don't apply for this chart. | Average count of Work Items associated to Step Execution type set to Prod deploy. This requires commit to work item association as only work items deployed through a pipeline are in production. |
| Average work item cycle time | Average time in days that a work item is in a specific state. | Database view joined by Work Item, Metric Instance, Commit, Step Execution, Commit execution, and Commit work item lists. |
| Throughput and distribution | Number of work items, by type, that are associated to commits through a successful production pipeline deploy. | Database view joined by Work Item, Metric Instance, Commit, Step Execution, Commit execution, and Commit work item lists. |
| Average planned to deploy flow time | Average duration from the time that a work item associated to a commit was created to the time that the item was successfully deployed to production through pipelines. | Database view joined by Work Item, Metric Instance, Commit, Step Execution, Commit execution, and Commit work item lists. |
| Work in progress | Number of work items that are currently in the work in progress state. | Database view joined by Work Item, Metric Instance, Commit, Step Execution, Commit execution, and Commit work item lists. |

## Change acceleration dashboard

The DevOps Insights Change acceleration tab displays change acceleration metrics that focus on your path to automation, comparing automated changes to manual changes, change policy decisions, and ROI. You can use this information to verify that automated change requests are being resolved more quickly than manually approved change requests.

### Change acceleration reports

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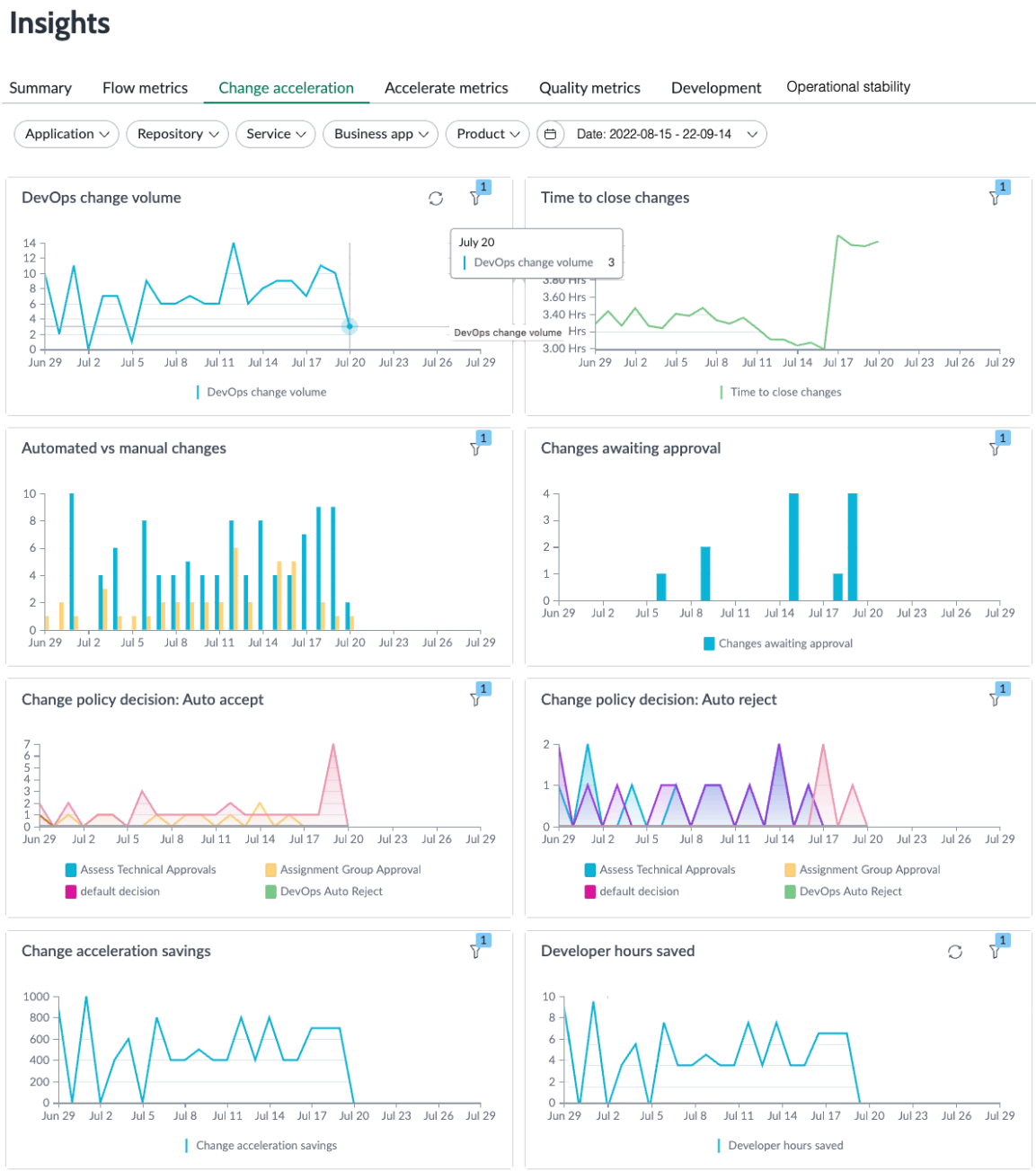


Change requests that are part of step executions qualify as DevOps change requests.

### Change acceleration reports

| Report | Description | Source |
|---|---|---|
| DevOps change volume | Number of DevOps change requests created. | Database view joined by Step Execution, Change request, and change request repository. |
| Time to close changes | Average time in hours to close DevOps changes by application.<br><br>For each month, this is the average for (Time that change | Database view joined by Step Execution, Change request, and change request repository. |

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### Change acceleration reports (continued)

| Report | Description | Source |
|---|---|---|
| | request was closed) minus (Time that change request was opened). | |
| Automated vs manual changes | Comparison between the numbers of DevOps change requests using change approval policies and DevOps change requests requiring manual approval.<br>• A change request is considered automated when a change policy performs the approve/reject action.<br>• A manual change is any change request that is assigned to a user or group for the approve/reject action and isn't acted on by a change policy. | Database view joined by Step Execution, Change request, and change request repository. |
| Changes awaiting approval | Number of DevOps changes that are pending approval by date range.<br>By default, change requests in the New or Assess state are considered awaiting approval.<br>To specify the states that are considered awaiting approval, update the *Change Request Awaiting States* property setting. For details, see DevOps Insights properties. | Database view joined by Step Execution, Change request, System properties, and change request repository detail lists. |
| Change policy decision: auto-accept | The number of change policy decisions by decision type that automatically accept change requests.<br>Point to a value on the chart to view the list of policy decisions that were used for auto-approval and the number of times that a decision was used for auto-approval. | Database view joined by Step Execution, Change request, System properties, and change request repository detail lists. |

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**Change acceleration reports (continued)**

| Report | Description | Source |
|---|---|---|
| Change policy decision: auto-reject | The number of change policy decisions by decision type that automatically reject change requests.<br><br>Point to a value on the chart to view the list of policy decisions that were used for auto-rejection and the number of times that a decision was used for auto-rejection. | Database view joined by Step Execution, Change request, Policy applied, Auto approval rejection action, Change approval definition, and change request repository detail lists. |
| Change acceleration savings | Net amount saved per month by automating DevOps changes.<br><br>When a change is automated, a developer doesn't have to manually fill out the change request and associate each work item, code commits, test results and other evidence and artifacts to the change. After this activity is automated, hours that would have been spent on filling out the change, searching, tracking down and attaching items from other tools to a change, will now be saved. More work items require a relatively increasing number of hours to associate them manually. Therefore, higher numbers of work items should result in more hours saved after the change is automated. Change acceleration savings are calculated by multiplying the hours saved by the average hourly developer cost.<br><br>To change the default value of the average hourly developer cost, update the *`Average Hourly developer Cost`* property setting. For details, see DevOps Insights properties. | Calculation: Average hourly developer cost multiplied by developer hours saved. |

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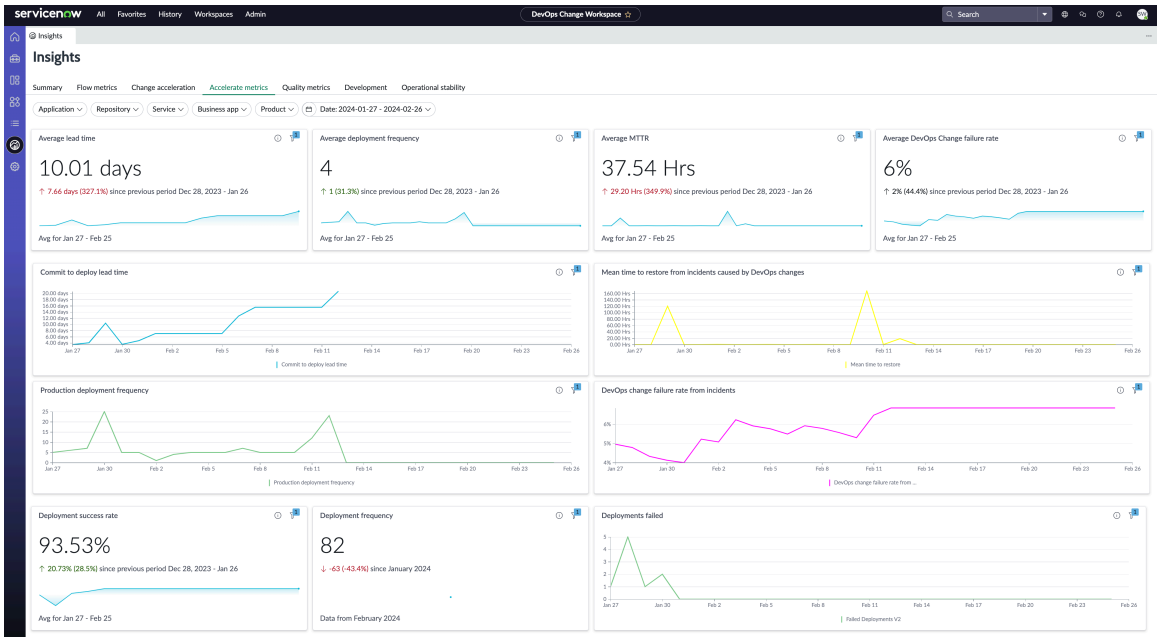
### Change acceleration reports (continued)

| Report | Description | Source |
|---|---|---|
| Developer hours saved | Number of developer hours saved per month by automating DevOps changes.<br><br>To change the default value of 1 (one) hour per developer, update the *`X hours per Developer time`* property setting. For details, see DevOps Insights properties. | Calculation: Number of work items in a change request multiplied by 1 hour per developer. |

## Accelerate metrics dashboard

The DevOps Insights Accelerate metrics are four key DevOps metrics that measure software delivery performance. Deployment frequency and lead time measure DevOps speed, while change failure rate and mean time to recovery are used to measure stability.

### Accelerate metrics reports




### Accelerate metrics reports

| Report | Description | Source |
|---|---|---|
| Average lead time | Average of:<br><br>([Time the code is successfully pushed to production] minus [Earliest commit time])<br><br>Applies to pipeline steps of type **Prod Deploy** that are in the completed state. | Pipeline execution |

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### Accelerate metrics reports (continued)

| Report | Description | Source |
|---|---|---|
| | **Note:** This widget uses average aggregation and doesn't support multi-element selection. | |
| Average deployment frequency | Average number of successful production deployments.<br><br>Applies to pipeline steps of type **Prod Deploy** that are in the completed state. | Step execution |
| Average MTTR | Average resolve time for an incident caused by a DevOps change.<br><br>**Note:** This widget uses average aggregation and doesn't support multi-element selection. | Database view joined by Incident, Change Request, Step Execution, Step, Pipeline, and App lists. |
| Average DevOps change failure rate | Daily average ratio of DevOps change requests that are associated to an incident divided by all DevOps change requests.<br><br>**Note:** This widget uses formula and doesn't support multi-element selection. | Change request |
| Commit to deploy lead time | Duration from the earliest commit time to production deployment for a successful pipeline execution.<br><br>The value includes only steps of type **Prod deploy** that are in the completed state.<br><br>You might investigate high lead times by identifying the slowest pipeline steps. For example, a manual change approval process could increase lead time. | Calculation: Sum of successful prod deploy Lead times divided by the number of successful production pipeline executions.<br><br>Needs 'Commits to Task Execution' association. Both Repository and Pipeline must be tracked and associated to the same App.<br><br>Needs Step type to be Prod Deploy.<br><br>Needs Task Execution result to be Successful. |

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### Accelerate metrics reports (continued)

| Report | Description | Source |
|---|---|---|
| Mean time to restore from incidents caused by DevOps changes | Daily average time to resolve an incident that was caused by a DevOps change. | Database view joined by step execution, change request, change request repository detail, and incident lists.<br><br>Calculated only for DevOps incidents by considering incident opened and closed time. |
| Production deployment frequency | Number of successful production deployments.<br><br>The value includes only pipeline steps of type **Prod deploy** that are in the completed state.<br><br>To change the default value of 30 days, update the **Date range** setting. | Database view joined by Change Request, Step Execution, change request repository detail.<br><br>Needs Step Execution state to be Completed.<br><br>Needs Step type to be Prod Deploy. |
| DevOps change failure rate from incidents | Percentage of DevOps changes that caused incidents divided by all DevOps changes deployed to production.<br><br>If a change request caused multiple incidents, then only the change that caused or triggered the incident is considered. The number of incidents that the change caused isn't considered. | Needs DevOps Change Request (Change associated to a Step Execution).<br><br>Needs Step Execution state to be Completed.<br><br>Needs Step type to be Prod Deploy.<br><br>Needs Incident caused by to be DevOps Change Request. |
| Deployment Success Rate | Deployments success rate over the last 30 days.<br><br>Deployment Success Rate = (Number of Successful Deployments in the last 30 days / Total Number of Deployments in the last 30 days) * 100<br><br>Applies to steps of type **Prod Deploy** in completed state. | Step Execution |

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**Accelerate metrics reports (continued)**

| Report | Description | Source |
|---|---|---|
| | **Note:** This widget uses formula and does not support multi-element selection. | |
| Deployment Frequency | Number of successful production deployments in the last 30 days.<br><br>Applies to steps of type **Prod Deploy** that are in completed state. | Step Execution |
| Deployments failed | Number of failed production deployments in the last 30 days.<br><br>Applies to steps of type **Prod Deploy** that are in failed or user-canceled state. | Step Execution |

## Quality metrics dashboard

The DevOps Insights Quality metrics dashboard enables a quick glance at data from tools such as SonarQube for code coverage, test pass percentage from your orchestration tools, vulnerabilities from security tools, and even overall bug counts.

### Quality metrics reports

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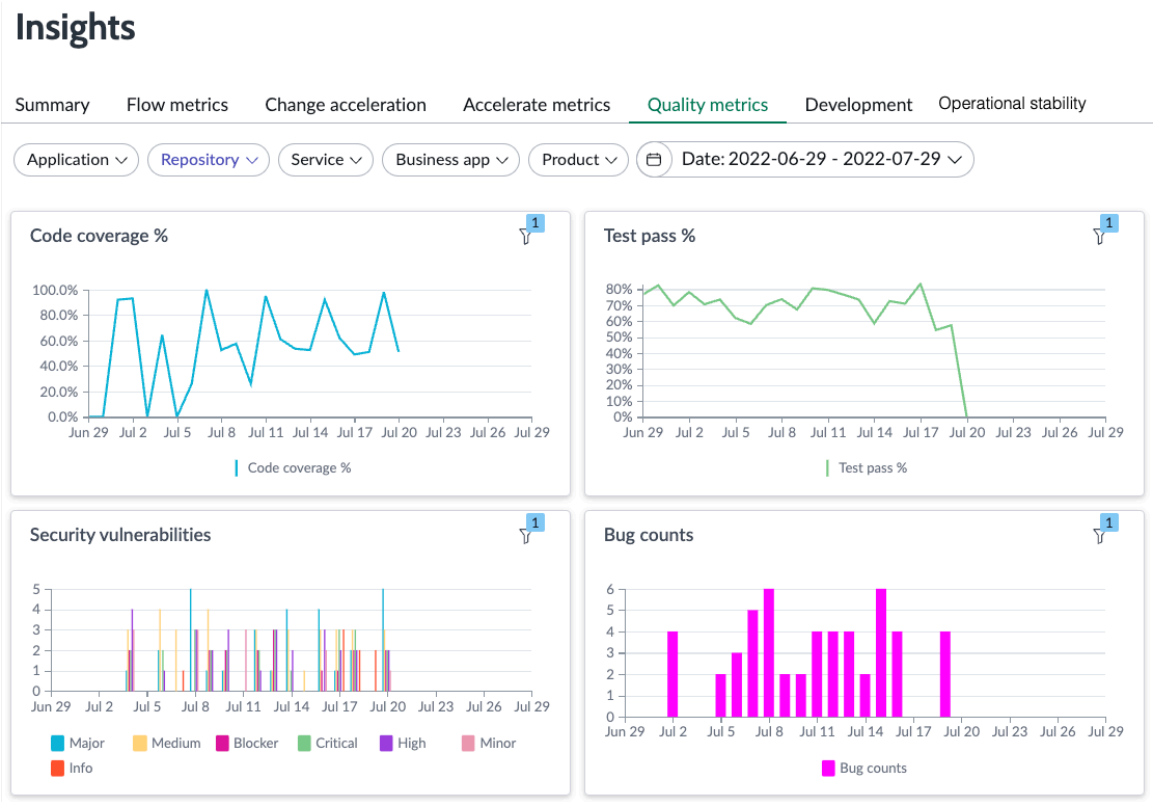


## Quality metrics reports

| Report | Description | Source |
|---|---|---|
| Code coverage % | Percentage of code that is covered by testing. | Needs Software Quality Scan Detail with Category = Coverage (%)<br><br>Needs Software Quality Scan Summary Relations related to Task Execution |
| Test pass % | Test pass percentage. | Needs Test Summary related to Task Execution |
| Security vulnerabilities | Count of security vulnerabilities over time. | Needs Software Quality Scan Detail with Category = Vulnerabilities<br><br>Needs Software Quality Scan Summary Relations related to Task Execution. |
| Bug counts | Number of work items of type bug. | Needs *Commits to Work Items* association. Both Repository and Plan must be tracked and associated to the same app. |

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**Quality metrics reports (continued)**

| Report | Description | Source |
|---|---|---|
| | | Needs *Commits to Task Execution* association. Both Repository and Pipeline must be tracked and associated to the same App<br><br>Needs Work Item to be of type Bug. |

### DevOps Insights Development dashboard

Development metrics focus on commit data that provides insights into how active and agile your teams are. With this information, you can reach full traceability of work by ensuring that commits are being tagged with the appropriate work items.

#### Development reports

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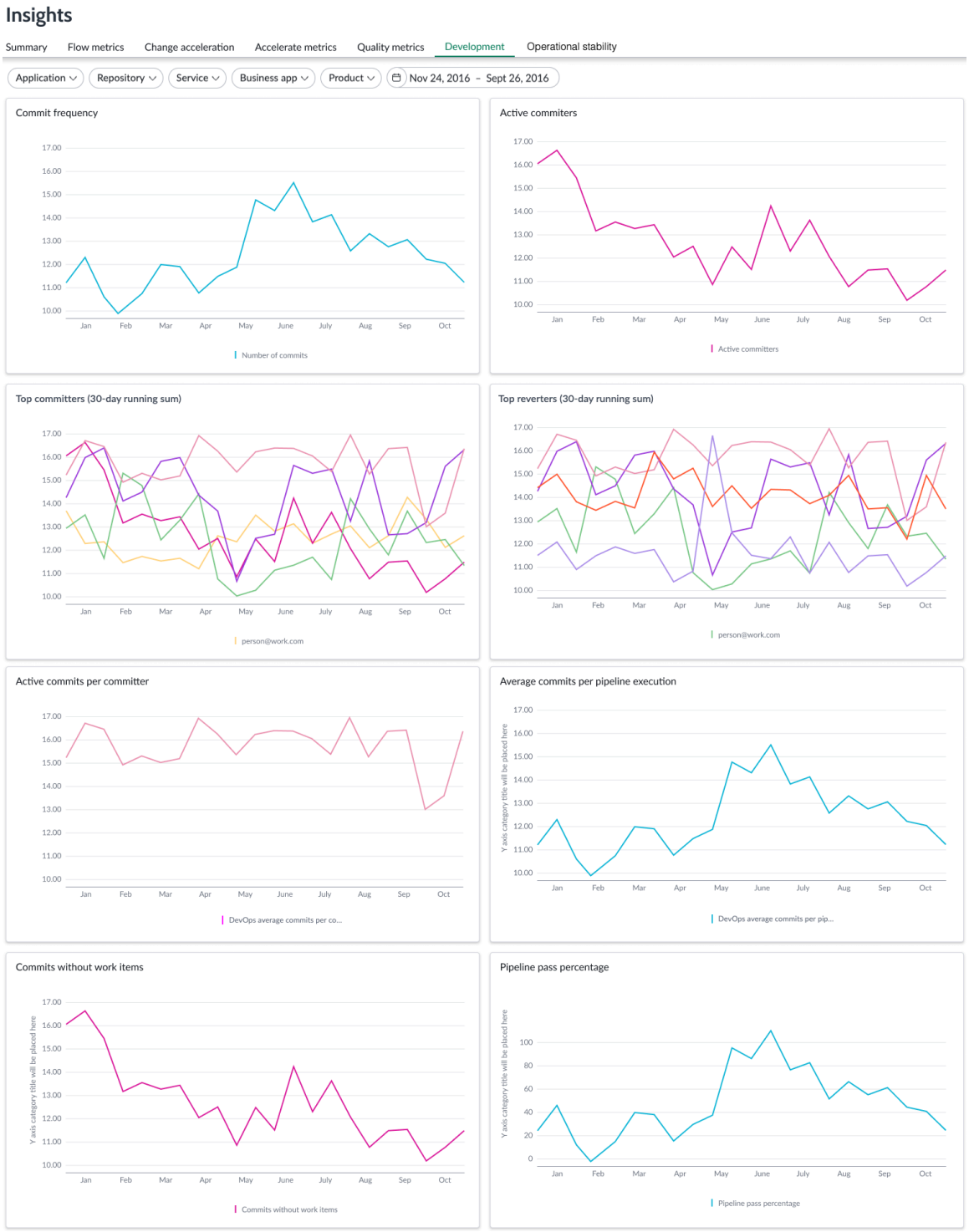


## Development reports

| Report | Description |
|---|---|
| Commit frequency | Number of commits associated to pipeline executions.<br><br>Smaller, more frequent commits are preferred over larger less frequent commits. |
| Active committers | Number of committers that submitted commits. |

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**Development reports (continued)**

| Report | Description |
|---|---|
| | Because this report uses metric aggregation, it doesn't support multi-element selection. |
| Top committers (30-day running sum) | Committers with the highest number of commits. |
| Top reverters (30-day running sum) | Committers with the highest number of reverts. |
| Average commits per committer | Average calculated as: `(total number of commits)/(active committers)`. A higher value is more favorable.<br><br>Because this report uses metric aggregation, it doesn't support multi-element selection. |
| Average commits per pipeline execution | Average commits per pipeline, calculated as (Total number of commits)/(Number of pipeline executions).<br><br>A low number is preferable, which indicates a concentrated effort, versus switching from task to task without completion.<br><br>Because this report uses metric aggregation, it doesn't support multi-element selection. |
| Commits without work items | Commits made that aren't associated to a work item, grouped by committer.<br><br>This report is useful for investigating and resolving why a commit isn't tied to a work item, because all commits should be tied to a work item. |
| Pipeline pass percentage | Ratio of successful pipeline executions divided by total number of pipeline executions. |

## DevOps Insights Operational stability dashboard

Operational metrics reflect on the stability of your applications to enable you to ensure that your teams are moving fast without compromising release quality.

### Operational stability reports

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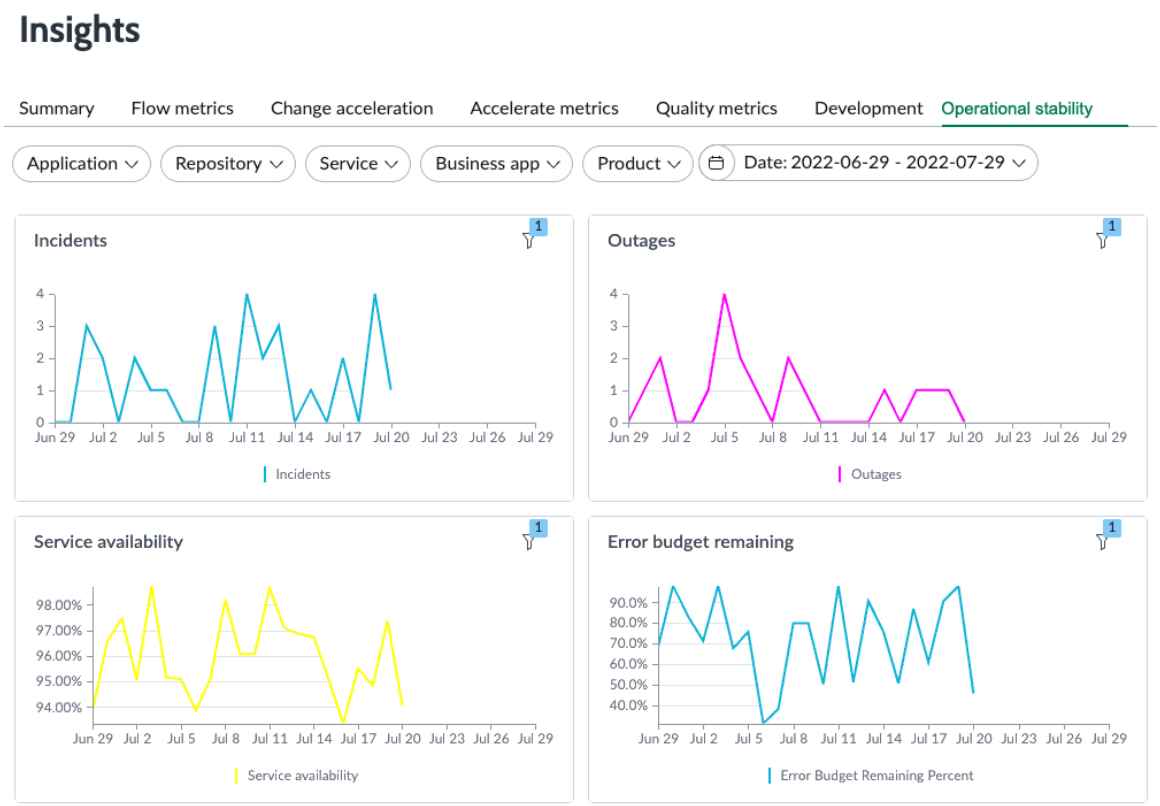


## Operations stability reports

| Report | Description | Source |
|---|---|---|
| Incidents | Number of incidents for pipeline steps of type Prod deploy that are linked to a service in the CMDB. | Needs Step type to be Prod Deploy.<br><br>Needs Incident associated to a Service that matches the one in the prod deploy Step. |
| Outages | Number of outages for pipeline steps of type Prod deploy that are linked to a service in the CMDB. | Needs Step type to be Prod Deploy.<br><br>Needs Outage (cmdb_ci_outage) associated to a Service that matches the one in the prod deploy Step. |
| Service availability | Average service availability for pipeline steps of type Prod deploy that are linked to a service in the CMDB. | Needs Step type to be Prod Deploy.<br><br>Needs parent Service Offering associated to a Service that matches the one in the prod deploy Step. |
| Error budget remaining | Percentage of error budget left to spend in a month, for | Needs Step type to be Prod Deploy. |

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**Operations stability reports (continued)**

| Report | Description | Source |
|---|---|---|
| | pipeline steps of type Prod deploy that are linked to a service in the CMDB. This data is from the Site Reliability operations application.<br><br>An error budget is the amount of Service Level Objective (SLO) that you can spend over a specified time. It can be used to manage release velocity. It's typically based on availability, latency, and so on. | Needs parent Service Offering associated to a Service that matches the one in the prod deploy Step.<br><br>Needs SRO application. |

## Group DevOps applications into a product

Products that use an application model in the CSDM support hierarchies of applications. You can customize hierarchies to simplify tracking of "rolled-up" data on DevOps Insights reports. This is used for the Product filter in insights.

### Before you begin

Role required: application owner, sn_devops.admin

### About this task

For example, you can include multiple DevOps microservice applications into a product, include multiple such products into a portfolio, and then include ("roll up") the portfolio in an organization. Another example structure might be **application > team > product > portfolio or business unit**.

- A DevOps application can belong to one or multiple products.
- A product or multiple products can belong to one or multiple other products.
- Multiple applications and products can belong to a product.

For every product, the system creates a corresponding entry in the application model and SDL component tables.

**Important:**
To add an application to a product, the application must hold execution data. For a newly added application, therefore, you must wait until the data import job has run.

### Procedure

1. Create applications as described in Create an application - Workspace.
2. Open the application models table: `<instanceName>/cmdb_application_product_model_list.do` and then follow this procedure to configure each application that will be included in a product.
   a. In the Application models list, select the application model to open the record.
   b. On the Application model form, in the **Model categories** field, select the appropriate category.
   c. Save the record.

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3. Follow this procedure to create a product that will act as a parent.
   a. In the Application models list, select **New**.
   b. On the Application model form, in the **Name** field, enter the name of the product.
   c. In the **Model categories** field, select **Bundle**.
   d. **Optional:** Enter a short description.
   e. Save the record.
4. Open the Model category of component table (`<instanceName>/cmdb_m2m_model_component_list.do`) to specify the category of each application (the application is the component in this case).
5. For each application, select **New**, specify the following settings, and then submit the record.

**Model component form**

| Field | Description |
|---|---|
| Model category of component | The **Model categories** value that you specified for the application on the Application model form. |
| Component | The application. |
| Bundle | The product that will act as a parent of the application. |

The application is now a member of the specified product.

### Result

The DevOps Insights tabs provides filters for the reports.

- The scheduled "Data collection" job processes your changes. When the job finishes, you can view reports for the added products. If you are running the job manually, execute the "Update Repo Details and Work Item State Detail" job before executing the Data collection job.
- The **Application** filter lists all applications.
- The **Product** filter lists all applications plus all products.
- To view the members of a product, view the list in the Model category of component table (`<instanceName>/cmdb_m2m_model_component_list.do`). Applications are listed in the **Component** column and products are listed in the **Bundle** column.

## DevOps Insights properties

DevOps Insights properties configure how DevOps Insights workspace data is displayed in reports.

Role required: sn_devops.admin

You can view the Insights properties from the DevOps Change Workspace by navigating to **Workspaces** > **DevOps Change Workspace** > **System configuration** > **Insights properties**.

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### Properties installed with DevOps Insights

| Property | Description | Default |
|---|---|---|
| X hours per Developer time | The time taken per developer to work on a single work item in hours.<br><br>This value is used to calculate the Developer hours saved report.<br><br>For example, for every work item associated to a change request, a developer saved X hours in having to associate the work items, commits, test results, and other related DevOps data for their work. | 1 |
| Change Request Awaiting States | The states that are reported as awaiting a change request in the Changes awaiting approval report.<br><br>Use the following values for the other states:<br>• New: -5<br>• Assess: -4<br>• Authorize: -3<br>• Schedule: -2<br>• Implement -1<br>• Review: 0<br>• Closed: 3<br>• Canceled: 4 | -5, -4 |
| Average Hourly Developer Cost | The average hourly cost of a developer working on DevOps changes in the selected currency.<br><br>This value is used to calculate the Change acceleration savings report, where we multiply the Developer hours saved by this developer cost to estimate an ROI. | 100 |

## DevOps Change Velocity reference

Reference information to provide additional details about DevOps Change Velocity such as tables, users, roles, properties, errors, limitations, and others.

### Components installed with DevOps Change Velocity

Several types of components are installed with DevOps Change Velocity, including tables, users, roles, and scheduled jobs.

Demo data is available for this application.

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**Note:**
The Application Files table lists the components that are installed with this application. For instructions on how to access this table, see Find components installed with an application.

## Users installed

| User | Description |
|---|---|
| devops.integration.user | DevOps Integration User<br>**Note:** You must configure the password before the DevOps Integration User can configure a tool. |
| devops.system | DevOps System user |

## Roles installed

| Role title [name] | Description | Contains roles |
|---|---|---|
| DevOps Administrator<br>[sn_devops.admin] | Sets up and configures the DevOps application.<br>Only the DevOps Administrator has access to the Administration module.<br>**Note:** To ensure that the devops.system user has correct access, add the sn_devops.admin role to the field-level ACL (sys_connection.*) if a field-level ACL exists on the sys_connection table or include the connection_admin role in the sn_devops.admin role. | • sn_devops.app_owner<br>• sn_devops.integration<br>• sn_devops.tool_owner<br>• action_designer<br>If the DevOps Change Health Scan Content Pack application is installed, the following roles are also added to DevOps Administrator to access the health scan feature.<br>• sn_cicd.sys_ci_automation<br>• scan_user |
| DevOps Integration<br>[sn_devops.integration] | Has inbound access to the tools in your environment to allow integration with the DevOps application. | • flow_operator<br>• cmdb_read |
| DevOps App Owner<br>[sn_devops.app_owner] | Oversees the operation of the DevOps application and monitors performance in your DevOps environment.<br>The app owner can: | • sn_devops.viewer<br>• cmdb_read |

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| Role title [name] | Description | Contains roles |
|---|---|---|
| | • Create, update, and delete applications only.<br>• Associate or dissociate objects to applications (pipelines, repos, plans, artifact repository)<br>• Perform change automation and modify pipeline steps.<br>• Access to see all the tools but not modify them.<br>• Can click discover from tool records to find new plans, repos, or pipelines from already connected tools.<br>• Has the viewer role. | |
| DevOps Tool Owner<br><br>[sn_devops.tool_owner] | The tool owners can:<br>• Create new tools.<br>• Perform the following actions on the tool:<br>  ○ Discover (classic UI and workspace)<br>  ○ Enter Manual Configuration Mode (classic UI and workspace)<br>  ○ Configure (classic UI and workspace)<br>  ○ Configure Guidance (Jenkins only, workspace)<br>  ○ Update Credentials (workspace)<br>  ○ Check Permissions (workspace)<br>  ○ Delete tool (classic UI and workspace)<br>• View System health and Troubleshooting sections of the Administration module and view Insights dashboards.<br>• On the tool record page, the Related Links tabs will show Tool connections and Tool connectivity history.<br>• If users have both Tool Owner and App Owner roles, they can also create apps and change request automations. | sn_devops.viewer |

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| Role title [name] | Description | Contains roles |
|---|---|---|
| | Tool owners can update credentials only for tools in which they are a member of the access groups, or for tools without access restrictions. | |
| DevOps Viewer<br><br>[sn_devops.viewer] | Has access to the DevOps application to use in their environment. | • sn_devops_ws.workspace_user<br>• cmdb_read<br>• sn_devops.report_viewer<br><br>**Note:** The sn_devops.report_viewer role enables users to view reports that are created for DevOps tables. Users cannot view DevOps reports without this role. |

**Warning:** When you uninstall DevOps Config, there could be empty rows in the **Contains Roles** related list (table: sys_user_role_contains) for the roles installed with DevOps Change Velocity. You must delete these empty rows before discovering tool objects.

## Scheduled jobs installed

| Scheduled job | Description |
|---|---|
| [DevOps] Historical Data Collection | Collects data from DevOps tools on demand.<br><br>**Note:** You must run this scheduled job to see historical DevOps data after installation of the DevOps Insights application. |
| [DevOps] Daily Data Collection | Collects data from DevOps tools daily. |
| DevOps auto discover tool associations | Automatically discovers new pipelines, plans, and repositories for all the tools that are in connected state and for all the capabilities. This job is scheduled to run once daily.<br><br>You can deactivate or change the frequency of the schedule:<br>**1.** Navigate to **System Definition** > **Scheduled Jobs** and select **DevOps auto discover tool associations**.<br>**2.** To deactivate the job, deselect the **Active** check box.<br>**3.** To change the frequency, update the **Repeat Interval**. |
| Tool connectivity history | For each tool, the scheduled job does the following: |

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| Scheduled job | Description |
|---|---|
| | • Checks the connectivity of the tool and updates the **Connection state** field in the tool record page.<br>• Checks the inbound events received in the given interval and updates the **Last webhook activity** field in the tool record page with the latest date and time.<br><br>This job is scheduled to run every hour. You can update the frequency if required.<br>**1.** Navigate to **System Definition** > **Scheduled Jobs**.<br>**2.** Search for and select **Tool connectivity history**.<br>**3.** Update the **Repeat Interval** fields based on your requirement. |

## Tables installed

| Name | Table |
|---|---|
| API Schema Definition | [sn_devops_api_schema_definition] |
| App | [sn_devops_app] |
| Artifact | [sn_devops_artifact] |
| Artifact Repository | [sn_devops_artifact_repository] |
| Artifact Staged Request | [sn_devops_artifact_staging] |
| Artifact Version | [sn_devops_artifact_version] |
| Base Planning Item | [sn_devops_base_planning_item] |
| Branch | [sn_devops_branch] |
| Build Test Result | [sn_devops_build_test_result] |
| Build Test Summary | [sn_devops_build_test_summary] |
| Callback | [sn_devops_callback] |
| Commit | [sn_devops_commit] |
| Committer | [sn_devops_committer] |

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| Name | Table |
| --- | --- |
| Commit Details | [sn_devops_commit_details] |
| Contributor Score Change Factor | [sn_devops_contributor_score_chg_factor] |
| Environment | [sn_devops_environment] |
| Event | [sn_devops_event] |
| Event Processor | [sn_devops_event_processor] |
| Import Filter | [sn_devops_import_filter] |
| Import Request | [sn_devops_import_request] |
| Import Request Page | [sn_devops_import_request_page] |
| Inbound Event | [sn_devops_inbound_event] |
| Integration Capability | [sn_devops_integration_capability]<br>Extends table Application File. |
| App to Plan | [sn_devops_m2m_app_plan] |
| Deployed Artifact to TaskExecution | [sn_devops_m2m_artifact_execution] |
| Artifact Version to Commit | [sb_devops_m2m_artifact_version_commit] |
| Artifact Version to Package | [sn_devops_m2m_artifact_version_package] |
| Branch To Commit | [sn_devops_m2m_branch_commit] |
| Run Commit | [sn_devops_m2m_commit_execution] |
| Work Item To Plan Version | [sn_devops_m2m_work_item_plan_version] |
| Orchestration Task | [sn_devops_orchestration_task] |
| Orchestration Task Definition | [sn_devops_orchestration_task_definition] |

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| Name | Table |
| --- | --- |
| Package | [sn_devops_package]<br>Extends table Configuration Item. |
| Participant | [sn_devops_participant] |
| Pipeline | [sn_devops_pipeline] |
| Pipeline Execution | [sn_devops_pipeline_execution] |
| Plan | [sn_devops_plan]<br>Extends table Base Planning Item. |
| Plan Version | [sn_devops_plan_version]<br>Extends table Base Planning Item. |
| Repository | [sn_devops_repository] |
| Step | [sn_devops_step] |
| Step Execution | [sn_devops_step_execution] |
| Tag | [sn_devops_tag] |
| Task Execution | [sn_devops_task_execution] |
| Test Execution | [sn_devops_test_execution] |
| Test Result | [sn_devops_test_result] |
| Test Type | [sn_devops_test_type] |
| DevOps Tool | [sn_devops_tool] |
| Tool Action | [sn_devops_tool_action] |
| Tool Capability Mapping | [sn_devops_tool_capability_mapping] |
| DevOps Tool Integration | [sn_devops_tool_integration] |

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| Name | Table |
|---|---|
| | Extends table Application File. |
| Tool Type Capability | [sn_devops_tool_type_capability] |
| Work Item | [sn_devops_work_item]<br>Extends table Base Planning Item. |

## DevOps Change Velocity properties

Use these properties to configure settings in the DevOps Change Velocity application.

Role required: sn_devops.admin

You can view the properties from the DevOps Change workspace by navigating to **System configuration** > **Properties**.

To view the properties from the Classic UI, navigate to **All** > **DevOps** > **Administration** > **Properties**.

| Property | Description | Default | Name |
|---|---|---|---|
| Maximum retries for errored inbound events | Maximum number of retries for errored inbound events. | 3 | [sn_devops.max_retry_count_inbound_ |
| Tool capabilities | The tool capabilities supported, entered as comma-separated values. | code,plan,orchestration,artifact,test | [sn_devops.tool_capabilities] |
| DevOps change request approval text | The DevOps change request approval text to be used for change management customizations. | Approved | [sn_devops.change_request.approved_ |
| DevOps change request - Apply attributes on change creation | If enabled, change attributes are applied when a change is created. If there are any data policies applied on the change attributes, they are enforced when the change is created. If this property is not enabled, change attributes are applied after the change is created, which may cause change creation failure if any data policies | False (disabled) | [sn_devops.change_request.apply_attri |

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| Property | Description | Default | Name |
|---|---|---|---|
| | are present on the change attributes. | | |
| Duration of DevOps system health report (in days) | Defaults to the last 7 days, to show system health metrics like inbound events. | 7 | [sn_devops.health_duration_report] |
| Enable automatic association of repos to apps on pipeline execution | If enabled, automatically associates repositories to apps and enables track when a pipeline identifies commits of a repository that is not yet associated. Also associates pipelines that are not yet associated to the corresponding app when the repository is already assigned to the app. | Yes (enabled) | [sn_devops.enable_automatic_associat |
| Maximum number of pages to process at a time for an import request | The maximum number of pages that must be processed at a time for an import request. | 10 | [sn_devops.import.max.pages.processi |
| DevOps change request reusability decision subflow | The subflow that can be called to check if a previously created change can be reused, instead of creating a new one. | sn_devops.change_request_reusability_subflow | [sn_devops.change_request_reusabilit |
| GitHub URL | For GitHub, this field is used to get the API URL (for REST calls). | https://github.com | [sn_devops.github.url] |
| DevOps change request cancel state | DevOps change request cancel state to be used for change management customizations. | 4 (Canceled) | [sn_devops.change_request.cancel_sta |
| Maximum orchestration tool executions while importing | Maximum orchestration tool executions while importing Jenkins freestyle jobs. | 1000 | [sn_devops.import.orchestration_tool.e |
| To save payloads as attachments on the Import Request Page record, set the "Value" field to "true". Anything | If true, the fetched JSON payload is saved as an attachment in the Import Request page. | False (disabled) | [sn_devops.import.save.payloads.as.att |

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| Property | Description | Default | Name |
|---|---|---|---|
| else is considered as false. | To save payloads as attachments on the Import Request Page record, set the **Value** field to true. Anything else is considered false. | | |
| DevOps non-admin software quality summary flag | Enable to view and monitor SonarQube scans configured on your GitHub Actions, Jenkins, or Azure DevOps pipelines as a non-admin SonarQube user. | False (disabled) | [sn_devops.non_admin_software_quali |
| Default test type | Default test type from orchestration pipelines. | JUnit | [sn_devops.default_test_type] |
| Coding tool branches per page | Number of coding tool branches per page. | 19 | [sn_devops.import.coding_tool.branche |
| Planning tool issues per page | Number of planning tool issues displayed per page. | 100 | [sn_devops.import.planning_tool.issues |
| sn_devops role to be automatically added to active DevOps users | The sn_devops role entered in the value field is automatically added to users who are active DevOps users (for example, making a commit).<br><br>If a role that is not in the sn_devops scope is provided, it is not added.<br><br>Leave empty if no role should be automatically provided. | sn_devops.viewer | [sn_devops.discovered.user.auto.assign |
| Software quality categories shown by default in the Pipeline UI view | The software quality categories shown by default in the Pipeline UI view, entered as comma-separated values. | coverage,lines_of_code,bugs,code_smells,duplications,reference | [sn_devops.sq_ui_duplications_reference |
| Errors or exceptions (comma separated) for which errorred | Errors or exceptions for which the errored inbound events are set to Retry. Entered | TimeOutException,FlowObjectAPIException | [sn_devops.inbound_events_retry_erro |

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| Property | Description | Default | Name |
|---|---|---|---|
| inbound events are set to Retry | as comma-separated values. | | |
| DevOps log level | The DevOps log level.<br><br>Select the appropriate level from the following:<br>• Error<br>• Warning<br>• Information<br>• Debug<br>• Trace | Warning | sn_devops.devops_log_level |
| Categorize DevOps change requests on **DevOps Change** field | .<br><br>Select this option to categorize change requests with category field set to DevOps as a DevOps change.<br><br>Clear to disable. | False (disabled) | [sn_devops.custom_change_categoriza |
| Orchestration tool executions per page | Number of orchestration tool executions per page. | 50 | [sn_devops.import.orchestration_tool.e |
| Enable import polling | Option to enable polling of import requests. Clear to disable polling. | False (disabled) | [sn_devops.enable_import_polling] |
| GitHub API version path | The GitHub API version path. | /api/v3 | [sn_devops.github.api_version_path] |
| Tool permission check timeout per record (in milliseconds) | During the tool connection process, the system performs permission validations in the foreground, and restricts the tool connection page. For every permission validation, a REST API call is made to external tools to evaluate the availability of the permission. The REST API response time may vary based on your network settings. To avoid delays, you | 10000 | [sn_devops.permission_check_timeout |

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| Property | Description | Default | Name |
|---|---|---|---|
| | can specify how long the system should wait to get a response from an external tool before marking the permission as an error through this property. | | |
| DevOps change request reusability model subflow | The DevOps change request reusability model subflow. | sn_devops.devops_reusable_change_request_model_subflow | [sn_devops.devops_reusable_change_request_model_cha |
| Time elapsed (in minutes) | The time elapsed in minutes. The retry job checks for errored inbound events from the time/value specified. | 1440 (7 days) | [sn_devops.inbound_events_error_retry |
| Cancel the change request when the associated stage in the pipeline fails or is canceled | When this property is enabled and the orchestration task mapped to a certain step in your DevOps pipeline fails or is canceled, the change request associated with that step is also canceled. A change request can be canceled only if it has not already been rejected or is not in the implement or review state at the time of cancellation. | False (disabled) | [sn_devops.cancel_change_on_pipelin |
| Cascade delete threshold (recommended foreground limit 1000) | Cascade delete threshold. | 1000 | [sn_devops.cascade_delete_threshold] |
| Maximum retries per page while importing | Maximum retries allowed per page while importing data from tools. | 3 | [sn_devops.import.max.retries.per_pag |
| DevOps change request post implement state | DevOps change request post implement state to be used for change management customizations. | 0 (Review) | [sn_devops.change_request.post_impl |
| DevOps change request implement state | DevOps change request implement state to be used for | -1 (Implement) | [sn_devops.change_request.implemen |

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| Property | Description | Default | Name |
|---|---|---|---|
| | change management customizations. | | |
| Default committer score | The default committer score. | 50 | [sn_devops.committer.score.default] |
| Enable to track GitLab pull (merge) requests. If not enabled, then pull (merge) requests and related events will be ignored. | When this property is enabled, GitLab pull (merge) requests are tracked in DevOps Change Velocity. If disabled, then all merge request events are ignored. | Yes (enabled) | sn_devops.track.gitlab.pullrequests |
| Default throttle reset time in minutes from current time | If a tool doesn't support a throttle reset time, the throttle reset time will be considered as the current time plus the value given for this property. | 15 minutes | [sn_devops.throttle.reset.time.default] |
| Multiply factor for committer score | The multiplication factor to be used for committer score. | 1 | [sn_devops.committer.score.multiply.fa |
| Auto archive (in months) | The duration after which the table data is to be auto-archived. | 9 | [sn_devops.table_auto_archive_duratio |
| Deprecated - Enable debug flag (Use new property DevOps log level) | DevOps Debug Logger.<br>**Note:** This property is deprecated, use the *sn_devops.devops_log_level* (DevOps log level) property instead. | Yes (enabled) | [sn_devops.enable_debug] |
| Maximum processing time per page while importing (in seconds) | Maximum processing time in seconds, that should be allowed per page while importing data from tools. | 300 | [sn_devops.import.max.processing.time |
| Supported webhook capabilities | Webhook capabilities supported by DevOps Change Velocity. | code,plan,orchestration,artifact,test | [sn_devops.supported_webhook_capa |
| DevOps change request closed state | DevOps change request closed state to be used for | 3 | [sn_devops.change_request.closed_sta |

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| Property | Description | Default | Name |
|---|---|---|---|
| | change management customizations. | | |
| Bulk flow timeout (in milliseconds) | Bulk flow timeout in milliseconds. | 60000 | [sn_devops.bulk_flow_timeout] |
| GitHub/Bitbucket coding tool commits per page | Number of coding tool commits per page for GitHub and Bitbucket. | 100 | [sn_devops.import.coding_tool.commits |
| Folder depth | Retrieves only those orchestration tasks and pipelines which are in folders whose nesting level is less than or equal to the number specified here. Folder Depth is the level of nesting done on folders in Jenkins, which contains the orchestration task and pipelines that you want to discover. For example, if you want to discover orchestration tasks and pipelines for a folder structure that is nested 2 times in your Jenkins environment, you must enter 2 as the value for this property. | 3 | [sn_devops.discover.jenkins.folder.dep |
| DevOps change request handler subflow | If you are using a custom subflow instead of the Default Change Handler subflow in Flow Designer (which is used to populate the change request fields with default values), then you must update this property value to the new subflow. You can copy the Default Change Handler subflow in Flow Designer and update it according to your organization's needs. For information on the Default Change | sn_devops.default_change_handler_subflow | [sn_devops.change_request_handler_s |

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| Property | Description | Default | Name |
|---|---|---|---|
| | Handler subflow, see Using DevOps Change Request Manual Approval flow.<br><br>For information on copying a subflow, see Copy a subflow. | | |
| Coding tool repositories per page | The number of repositories that must be displayed per page when you import repositories after connecting to a tool. The total number of repositories imported is not dependent on this property, but the number of repositories that must be displayed per page from the total number of repositories imported can be specified using this property. For example, if your tool contains 1000 repositories and you specify 100 as the property value, 1000 repositories will be imported of which 100 will be displayed per page in the Import Requests page.<br><br>When you discover repositories, the number of repositories that must be retrieved per API call in the backend is also dependent on this property value. For a large number of repositories, set a relatively smaller value in this property so that lesser number of repositories are retrieved per call and | 100 | [sn_devops.import.coding_tool.repos.p |

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| Property | Description | Default | Name |
|---|---|---|---|
| | the system does not time out. | | |
| GitHub API URL | GitHub API URL. | https://api.github.com | [sn_devops.github.api_url] |
| ITBM Agile planning tool issues import max limit | Strategic Portfolio Management (SPM) Agile planning tool issues import max limit. | 1000 | [sn_devops.import.planning_tool.itbm.is |
| Assign a universal task and notify to update tool credentials when expired | Admins and tool owners will be notified (through universal task, email, banner, and field message) on expiry of tool credentials after the credentials have expired. As an admin or tool owner, you can update your tool credentials and connect the tool to prevent any further loss of data. For information on updating tool credentials, see Update third-party tool credentials in DevOps Change Velocity. | Yes (enabled) | [sn_devops.credential_expiration.notify |
| Number of days before tool credential expiry to assign a universal task and notify (if applicable) | Set the number of days before tool credentials expiry to send notifications (through universal task, email, banner, and field message) to admins for GitHub tools created with basic authentication. To stop sending proactive notifications, select 0 as the value for this property. For information on updating tool credentials, see Update third-party tool credentials in DevOps Change Velocity. | 3 | [sn_devops.credential_expiration.notify |

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| Property | Description | Default | Name |
|---|---|---|---|
| Number of days to display warning alerts when events were not being received | Set the number of days to display warning alerts in the **Last event received** field in the tool record when events were not being received. This only applies for tools which sends data to ServiceNow. The **Last event received** field in the tool record header and inside the tool record will be highlighted in yellow for warning alerts when the events were not being received. | 2 | [sn_devops.last_event_received.warnin |
| Number of days to display critical alerts when events were not being received | Set the number of days to display critical alerts in the Last event received field in the tool record when events were not being received. This only applies for tools which sends data to ServiceNow. The **Last event received** field in the tool record header and inside the tool record will be highlighted in red for critical alerts when the events were not being received. | 7 | [sn_devops.last_event_received.critica |
| Enable whether Azure DevOps Run Commits must be determined from the last successful pipeline build | If enabled, DevOps Change will pick up the last commits, upto a maximum of 2000, created after the last successful pipeline build from Azure DevOps as part of Run Commits.<br><br>If disabled, only the last 200 commits will be considered for Run Commits. | No | [sn_devops.enable_ado_bulk_run_com |

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| Property | Description | Default | Name |
|---|---|---|---|
| Enable whether GitHub Run Commits must be determined from the last successful workflow run | If enabled, DevOps Change will pick up the first 2000 commits after the last successful workflow run in GitHub as part of Run Commits.<br>**Note:** Skipped commits are not considered.<br>If disabled, only the last commit will be picked up for Run Commits. | No | [sn_devops.enable_github_run_commit |
| This property decides whether to create a Generic Connection on configure operation for Azure DevOps | The step to enter the integration user name and password is required to configure webhooks when this property is enabled. | No | [sn_devops.enable_ado_generic_conne |
| Maximum limit for the number of pipelines that can be discovered for an Azure DevOps project | Set the maximum number of pipelines that can be discovered in an import request for an ADO project. If your project has more than 15000 pipelines, then you can try setting this property value to that number and see if the pipelines get discovered. If not, you can reduce the value to a lower number and try to discover. | 15000 | [sn_devops.discover.max.pipelines.ado |
| Update DevOps Change Request States Automatically when Change Receipt is Enabled | Updates the DevOps change request states automatically when change receipt is enabled. If you want to stop the automatic transition of the change request states even when change receipt is turned on, you must disable this property. | Selected (enabled) | [sn_devops.enable_change_receipt_sta |

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| Property | Description | Default | Name |
|---|---|---|---|
| Switch to this user after token based authentication is successful | If the devops.system user is not available in your ServiceNow instance, use this property to set any other user that has the sn_devops.integration role, which is needed to complete the token authentication. | devops.system | [sn_devops.token_auth.user] |
| Maximum limit for the number of times the discover action that exceeds the rate limit will be retried. | Determines the maximum number of times the discover action will be automatically retried after it reaches the rate limit. For example, if the rate interval in Azure DevOps is 5 mins, and you enter a value of 4 here, then after every 5min, the discover action will be retried for 4 times. | 10 | [sn_devops.max_retry_count_discover] |
| Enable change request creation even with errors in DevOps data retrieval | If enabled, when an error occurs in retrieving DevOps data like work items, commits, test summaries, security summaries, etc, the corresponding change request is still created. The data that can be retrieved will still be associated with the change request. For the data that cannot be retrieved, the reason for the error will be notified to the user in the third-party console, and the same information will also be added in the **Change Comments** field in the Step Execution record and the change **Worknotes**. | No (disabled) | [sn_devops.enable_change_creation_w |

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| Property | Description | Default | Name |
|---|---|---|---|
| Enable state transition from New to Assess when DevOps Change Request Manual Approval Flow is active | If enabled, updates the change request state from New to Assess directly when the DevOps Change Request Manual Approval Flow is active. If you want to stop the automatic transition of the change request state to Assess when the DevOps Change Request Manual Approval Flow is active, you must disable this property. | Yes (enabled) | [sn_devops.enable_change_request_st |
| Change request callback timeout (in minutes) | Set the timeout value in minutes until which the system will try to process a change when an inbound event goes into the waiting state during a pipeline run. After that the pipeline will be aborted. The reason for the error is displayed in your third-party tool's console logs. When a pipeline is cancelled because of callback timeout, the same information is added in the callback record of the corresponding step execution. | 120 minutes | [sn_devops.change_request_callback_ |
| Client ID specifier for GitHub App | If you are connecting to GitHub through a GitHub App using OAuth 2.0, you must enter the Client ID prefix (first 3 or more characters of the ID) of your GitHub App as the value of this property. This is to ensure that the right permission checks are run for the GitHub tool connection. | lv1,lv2 | [sn_devops.github_oauth_client_id_spe |

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| Property | Description | Default | Name |
|---|---|---|---|
| Default Bitbucket branch used for import request | Specify the default Bitbucket branch name that must be used to create an import request. | master | [sn_devops.bitbucket_default_branch] |

## DevOps System Health dashboard

The System Health dashboard lets the DevOps administrator view the overall health of integrations, connectivity status, as well as view trends of inbound event processing data.

Role required: sn_devops.admin

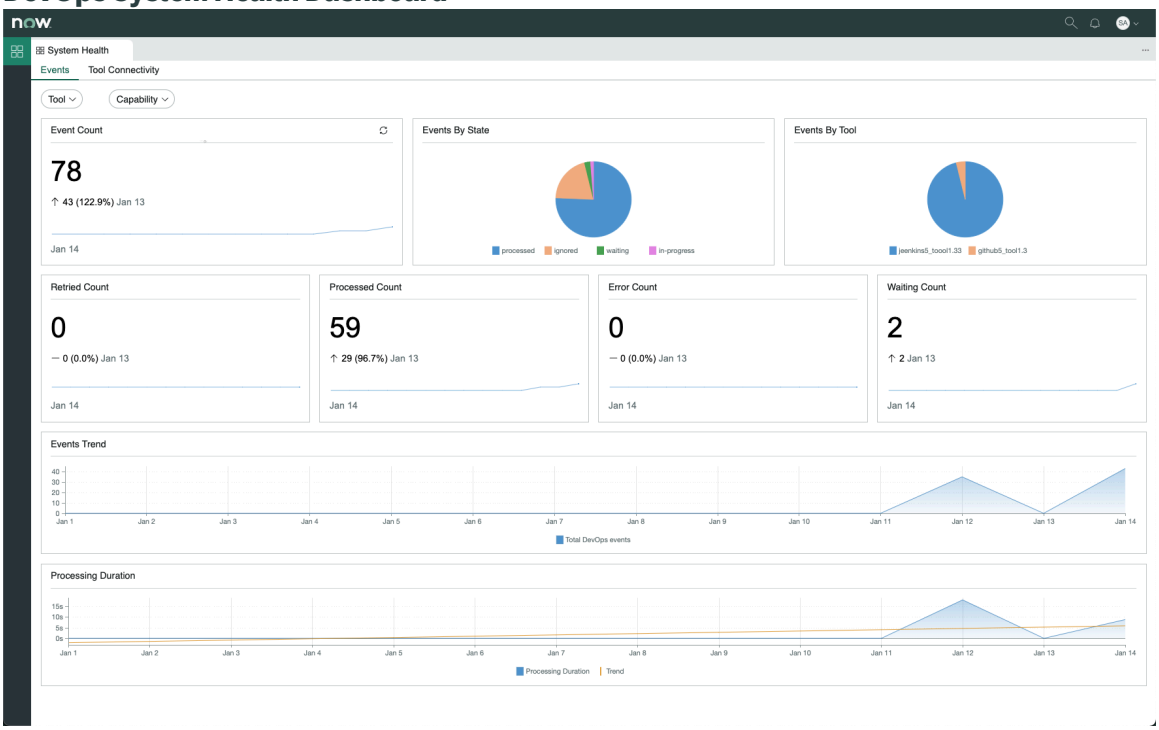
**Note:**
The DevOps System Health dashboard is available only in DevOps data model 1.33 and later versions.

Use the System Health dashboard to track the health, event status, and connectivity status of your DevOps environment. Interactive charts enable you to view and analyze the system health and inbound event processing details.

**Note:**

- Scores aren't real-time. For example, if the chart displays that two events are in the waiting state, the events could have already moved to the completed state.
- Because the scores are fetched from formula indicators, you can't drill down to the records in the KPI page.

### DevOps System Health Dashboard




## Events

From the DevOps Change Workspace, navigate to **Administration** > **System health** > **System health dashboard**.

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| Report | Type | Description |
|---|---|---|
| Event count | Count trend | Daily trending total count of DevOps events.<br><br>The report displays the percentage and count, which is the last 7 running sum.<br><br>Total count includes events from [sn_devops_inbound_event], [sn_devops_event], and the [sn_devops_processed_event] tables. |
| Events by state | Pie chart | Total count DevOps events distributed by current state. |
| Events by tool | Pie chart | Total count of DevOps events, distributed by tool. |
| Retry count | Count trend | Daily trend of the count of total retried DevOps.<br><br>The report displays the percentage and count variance in the last 24 hours. |
| Processed count | Count trend | Daily trend of the total count of processed DevOps events.<br><br>The report displays the percentage and count variance in the last 24 hours. |
| Error count | Count trend | Daily trend of the total count of DevOps events in error state.<br><br>The report displays the percentage and count variance in the last 24 hours. |
| Waiting count | Count trend | Daily trend of the total count of DevOps events in waiting state.<br><br>The report displays the percentage and count variance in the last 24 hours. |
| Event trend | Line trend | Total trending count of DevOps events.<br><br>The report displays the percentage and count variance in the last 24 hours. |
| Processing duration | Line trend | Processing duration of events (in seconds) measured daily. |

## Tool connectivity

The Tool connectivity status report displays the connectivity status with details of all the integrated tools. The tool connectivity table displays the connection status for each connected tool. A background job tries to connect to the tools every hour and maintains the connection history. You can view the historical details under a new related list on the tools page.

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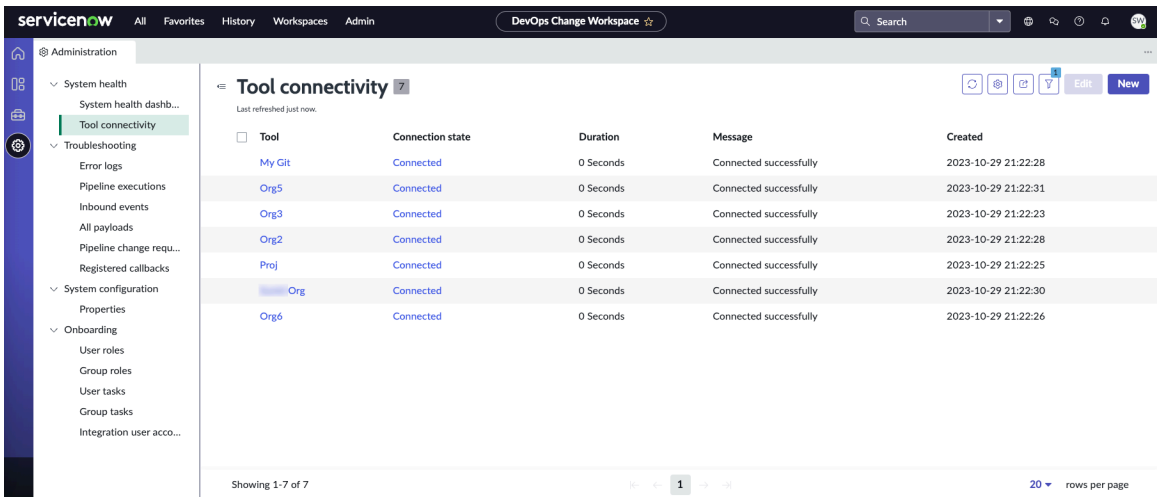
To see the report, from the DevOps Change Workspace, navigate to **Administration** > **System health** > **Tool connectivity**.




## System health email notifications

A base system DevOps Report group is added by default. An email notification summarizing the weekly System Health report is sent to the users in this DevOps Report user group that is specified in the **Who will receive** related list of the **System Notifications > Email Notifications** form, as configured in the base system DevOps Health Report notification. For more information, see Email notifications.

### Note:

- Add users with DevOps Admin (sn_devops.admin) role to the DevOps Report user group.
- You need to remove a user from the group to unsubscribe the user from receiving notifications.

The base-system email notification contains and displays a comparative digest of key system health performance indicators as compared to their performance in the previous weekly report. The comparative data is sourced from relevant tables and calculated based on required indicators using the date range specified in weekly report. The comparative data and indicators always display with respect to the same tables and indicators vis-a-vis, the data collected against the relevant reports and indicator data for the previous week.

To configure the frequency in which the base system email notification is sent out. Navigate to **System Scheduler** > **Scheduled Jobs** > **Trigger DevOps Health Check Email Notification** and select the **Configure Job Notification** related link, and make the schedule changes.

If you want to modify the users who receive the email notification, modify the user group specified in the **Groups** field of the **Who will receive** section. Navigate to **System Notification** > **Email** > **Notification** > **DevOps Health Script**. For more information, see Add a user to a group.

Use the **Preview Notification** option to check your notification.

For example, you can see which users will or will not receive the notification, along with what instance details and period for which the notification is sent.

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servicenow

Your DevOps System Health for Jan 16 - Jan 23

Hello DevOps Admins,
Your DevOps system health report for the past 7 days.

**Instance Name:** devopsr( ;1

**DevOps product status:** Stable

**Date Range:** 2022-01-16 to 2022-01-23

| | Current | Change: |
|---|---|---|
| **Pipeline Executions** | | |
| Total Pipeline Runs | 0 | ▼ -100.0% |
| Average Pipeline Duration | 0.0 secs | ▲ 100.0% |
| **Change Requests** | | |
| Total Change Requests | 0 | ▼ -100.0% |
| Failed | 0(0.0 %) | ▼ 0.0% |
| **Inbound Events** | | |
| Total Events | 0 | ▼ -100.0% |
| Average Processing Duration | 0.0 secs | ▲ 100.0% |
| **github5_tool1.3** | | |
| Events | 0 | ▼ -100.0% |
| Average Processing Duration | 0.0 secs | ▼ 0.0% |
| **jeenkins5_toool1.33** | | |
| Events | 0 | ▼ -100.0% |
| Average Processing Duration | 0.0 secs | ▼ -100.0% |

View Dashboard

Unsubscribe

servicenow

2225 Lawson Lane, Santa Clara, CA 95054, United States

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## DevOps log levels

DevOps log levels allow you to filter logs by level as well by a particular tool or application. Log levels in the DevOps application let you decide the extent of log detail you need for debugging.

The flexibility to set log levels allows you to select the right log level information that is appropriate for your organizational needs. You can select custom log levels based on the log levels or categories that you need and as an application or tool currently supports. In previous versions of DevOps, the default log level was set to debug, and the [sn_devops.enable_debug] property that you could either enable or disable. You can select any of the following log levels for the DevOps application using the DevOps sn_devops.devops_log_level property:

- Error
- Warning
- Information
- Debug
- Trace

**Note:**

- The base system log level is set to Warning. You must modify the base system value from DevOps properties.
- By default, if you have different log levels for connected apps and for the DevOps application, the log level with more information is printed. For example, if you set up the log level for an app at Error, and for the DevOps application at Trace, the log levels are printed with the most information (Trace).

Multiple flows for in the DevOps application now use the new logging framework to collect log data during the flow execution. The following flows currently support the new log levels:

- Artifact & Package registration flows
- Self Service Onboarding
- Self-Service Catalog — App Onboarding
- Change Traceability flow
- Notification flow for plan, code, and orchestration capabilities

## Common errors in DevOps Change Velocity

Identify the root cause of errors that occur in DevOps Change Velocity, and see the corresponding steps that might resolve them.

### Tool connection

This table lists the steps required to resolve the errors that might occur when you select the **Submit** or **Connect** button after entering the tool details in the tool connection process:

| Message | Action |
| --- | --- |
| Tool cannot be created because the tool name has not been entered. Enter the tool name, and try again. | Re-enter the tool name. |

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| Message | Action |
| --- | --- |
| Tool cannot be created because the tool integration has not been selected. Select the correct tool integration value, and try again. | Select the correct tool integration value. |
| Tool cannot be created because the tool URL is invalid or incorrect. Re-enter the tool URL, and try again. | Re-enter the tool URL. |
| Tool cannot be created because the platform version cannot be determined. Create the glide.buildtag.last sys property, and try again. | 1. Navigate to **DevOps > Administration > Properties**.<br>2. Verify if the *`glide.buildtag.last sys`* property exists.<br>3. If not, create the *`glide.buildtag.last sys`* property. |
| Tool cannot be created because the associated CreateDevOps tool connection is invalid. Create a valid connection alias, and try again. | 1. Navigate to **All > Connections & Credentials > Connection & Credential Aliases** and open the **CreateDevOpsTool** record.<br>2. In the Connections related list, create a record and enter a name for the connection.<br>3. On the Connection form, select the **Credential** field lookup list, and then select **New** to create an admin credential.<br>4. Select **Basic Auth Credentials** and enter a name.<br>5. Enter admin username and password (required to access the tools in your DevOps environment).<br>A user with connection_admin role can configure an HTTP connection.<br>6. On the Connection form, enter **https://<instance name>.service-now.com/** for the Connection URL. |
| Tool cannot be created because the CreateDevOpsTool alias credentials are incorrect. Update the credential record, and try again. | 1. Select the **credential record** link in the message. If you are connecting to the tool from the workspace UI, right-click on the credentials record link, and select **Open in a new tab**.<br>2. In the credentials record page, enter the correct credentials in the **Username** and **Password** fields.<br>3. Save the changes, and retry connecting to the tool. |

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| Message | Action |
| --- | --- |
| Tool cannot be created because the connection URL of the CreateDevOpsTool alias is incorrect. Use the following URL: https://<instancename>.service-now.com,and try again. | 1. Navigate to **All > Connections & Credentials > Connection & Credential Aliases** and open the **CreateDevOpsTool** record.<br>2. On the Connection form, enter **https://<instance name>.service-now.com/** for the Connection URL. |
| To create a connection alias, you need the connection_admin role. Contact your system administrator. | This error occurs if the connection alias field is empty for a tool record. To create the tool connection, you need a connection alias. Only a user having the *connection_admin* role can create a connection alias. You must reach out to a user having this role, like an administrator, and get the connection alias created. |
| Tool cannot be created because the <toolname> tool name already exists. Enter a different name, and try again. | Use a different name for the tool. |
| Tool cannot be created because the <toolname> does not have a valid MID server configuration. Configure a valid MID server, and try again. | 1. If you are using the workspace, check if the mid server is running and reachable.<br>2. If you are using the catalog and record producer, check if the mid server is running and reachable with application as DevOps and Capability as REST. |
| Tool cannot be created because there are no connection and credentials aliases available for DevOps Data Model scope. Create a new connection and credential alias, and try again. | This error occurs for OAuth authentication.<br>1. Navigate to **All > Connections & Credentials > Connection & Credential Aliases**.<br>2. Create a new alias with the application as **DevOps Data Model**. |
| Tool cannot be created due to a technical issue while creating the credential record. | 1. Navigate to **All > Process Automation > Flow Designer > Executions**.<br>2. Check for the latest execution of the sn_devops.devops_create_credentials subflow to know the details of the error. |
| Tool cannot be created because credential and domain combination for an active record already exists. | This error occurs for OAuth authentication.<br>1. Use a different credential.<br>2. Check if the existing credential is used by any active connection. |

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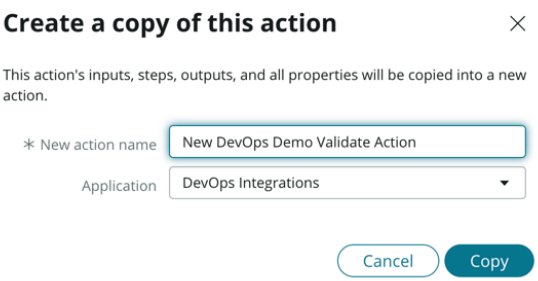
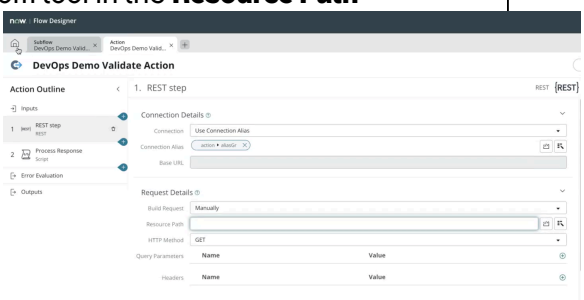
| Message | Action |
| --- | --- |
| Tool cannot be created due to a technical issue while creating the connection record. | 1. Navigate to **All > Process Automation > Flow Designer > Executions**.<br>2. Check for the latest execution of *sn_devops.create_connection_for_tool* action to know the details of the error. |
| Tool cannot be created because of the following reasons:<br>• The validate subflow is not configured, and<br>• An integration capability record with the same subflow name does not exist for the associated tool integration.<br><br>Configure the subflow, and create the integration capability record with the Validate action and a subflow name for the tool integration, and try again. | This error occurs only for custom tool integrations.<br>1. Navigate to **All > Process Automation > Flow Designer**.<br>2. In the Flow Designer page, select the **Subflows** tab.<br>3. Open the **DevOps Demo Validate Subflow** record from the list.<br>4. From the Actions section, open the **DevOps Demo Validate Action** record by selecting the Open action in Action Designer ( ) icon.<br>5. Select **More Actions menu > Copy Action**.<br>  <br>6. Enter a new name for the action and select the application as **DevOps Integrations**, and select **Copy**.<br>7. In the copied action, select **Inputs > REST step**.<br>8. In the Request Details section, enter resource path of your custom tool in the **Resource Path** field.<br>  <br>9. Enter the API version of your custom tool in the **Query Parameters** field. |

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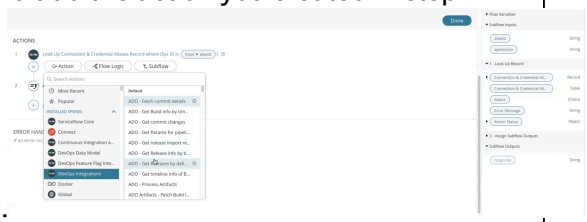
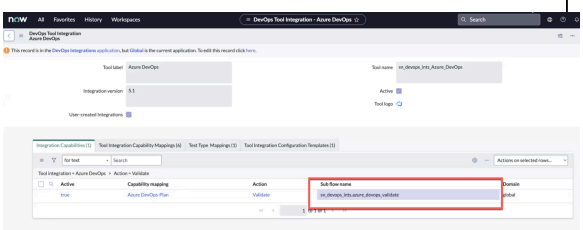
| Message | Action |
| --- | --- |
| | 10. Save the changes.<br>11. Publish the action by selecting **Publish**.<br>12. Navigate back to the **DevOps Demo Validate Subflow** record.<br>13. Select **More Actions menu > Copy Subflow**.<br>14. Enter a new name for the subflow and select the application as **DevOps Integrations**, and select **Copy**.<br>15. In the copied subflow, delete the **DevOps Demo Validate Action** action and add the action you created in step 11.<br>  <br>a. In the **Action** field, select the action you created in step 11.<br>b. In the **aliasGR** field, select the Connection & Credential Alias record from the **Data > Lookup records** section.<br>c. In the **apiversion** field, select the api version from the **Data > Subflow Inputs** section.<br>d. Save the changes.<br>16. Publish the subflow by selecting **Publish**.<br>17. Navigate to **DevOps > Integrations > Integration Capabilities** and create a record with the **Validate** action.<br>For more information, see Create a DevOps tool integration.<br>  <br>18. Associate the subflow you created in step 16 with the integration capability record. |

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| Message | Action |
| --- | --- |
| Tool cannot be created due to a connectivity issue. Check the <validate_subflow_name> subflow for more details, and try again. | 1. Navigate to **All > Process Automation > Flow Designer > Executions**.<br>2. Check for the latest execution of <validate_subflow_name> subflow to know the details of the error. |
| Tool authorization credentials are invalid. Enter valid credentials, and try again. | Re-enter the correct username/password for the tool. |
| Tool cannot be created because there is no response received from the server. Enter a valid tool URL or Check if server is up and running, and try again. | 1. Re-enter the tool URL.<br>2. Check the mid server. |
| The connection URL is incorrect, check the<br><br>URL and try again. | Re-enter the tool URL. |
| Tool cannot be connected because the GitHub app slug name is incorrect. Enter the correct GitHub app slug name and try again. | You can find the GitHub app slug name on the settings page of your GitHub app. The GitHub app slug name is the URL-friendly name of your GitHub app. For example, if you have created a GitHub app with the name **Test App**, the corresponding URL-friendly GitHub app slug name will be **test-app**. In your GitHub url - "https://github.com/settings/apps/test-app", "test-app" is the GitHub app slug name. For more information, see GitHub documentation. |
| Password value is too long and could be truncated after encryption. Please either reduce password length or increase field size. | From 18th January 2023, Jira has extended the length of API tokens for Atlassian accounts. You must increase the maximum password value to more than 255 in the discovery_credentials table to accommodate the extended character length. For more information, see the KB1269878 kb article and Atlassian documentation. |
| Unexpected behaviour from remote host: Circular redirect to 'https://bitbucket.org/account/signin/?next=%2F...%2Frest%2Fapi%2F1.0%2Fusers'. | This error might occur if you try to connect to a BitBucket Cloud instance. BitBucket Cloud is not supported. You must use a BitBucket Server instance to connect to ServiceNow DevOps. Connect to your BitBucket instance via an MID server. A MID server is required if your tool instance is hosted on-prem. For more information about MID server, see MID Server selection |
| `Mismatch in tool URL: Tool URL entered in ServiceNow below: https://<URL of the Jenkins instance you entered>` | This error occurs when the Jenkins URL entered in DevOps is different from the Jenkins URL entered in your Jenkins instance.<br><br>From your Jenkins instance, navigate to **Manage Jenkins** > **System** > **Jenkins** |

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| Message | Action |
| --- | --- |
| `Tool URL entered in Jenkins: https://<Jenkins location URL entered in Jenkins> In Jenkins, under Manage Jenkins > System, check that your configured Jenkins URL is the same as the Tool URL entered here. See the troubleshooting tool on-boarding errors.` | **Location**. The **Jenkins URL** entered here must match the **URL of the Jenkins instance** entered in DevOps. |

## Tool permissions

This section lists the steps required to resolve tool permission errors when you create a DevOps tool using workspace playbooks. Tool permission check guidelines are displayed in a pop-up when you connect to a tool from the workspace.

### Action

If any permission is missing, perform the following steps:

- Update the permissions for the provided credentials in the external DevOps tool. Select **Refresh** in the pop-up to perform the checks again.
- Close the pop-up, use different credentials, and select **Connect** again. The permission check pop-up appears with results of the newly entered credentials.
- Review the impact column, and if the impact does not affect your use-case, select **Continue** anyway.

If all permission checks are successful:

- Select **Continue** to progress to the next step in the playbook.
- If errors show up in the result, try again by selecting **Refresh**.
- If the error persists, update the Tool permission check timeout per record (in milliseconds) property and try again.

### Tool permission check timeout property

During the tool connection process, the system performs permission validations in the foreground, and restricts the tool connection page. For every permission validation, a REST API call is made to external tools to evaluate the availability of the permission. The REST API response time may vary based on your network settings. To avoid delays, you can specify how long the system should wait to get a response from an external tool before marking the permission as an error. You can specify this time using the **Tool permission check timeout per record (in milliseconds)** property *(`sn_devops.permission_check_timeout`)*. If you find that some of the permission checks are resulting in an error, try increasing the timeout value, and select **Refresh** in the Permissions pop-up.

## Tool notification

This table lists the steps required to resolve errors that might occur in scenarios such as retrieving commit details, pipeline execution details, pull request details, test summaries:

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| Reason | Action |
| --- | --- |
| Authorization credentials are either invalid or do not have the minimum required permissions. | • Verify if your third-party tool credentials have the required scopes. If you are using the workspace UI, you can navigate to the tool record, and select **More actions ( ... ) > Check credential permissions** to know about the required permissions.<br>• Verify if you have entered the correct username/password for your third-party tool. If you are using the workspace UI, and you want to update your tool credentials, then navigate to the tool record, and select **More actions ( ... ) > Check credential permissions**. For more information on updating credentials, see Update third-party tool credentials in DevOps Change Velocity. |
| There is no response from the server. Check the server connection status, and try again. | • Verify that the DevOps tool server is reachable and responsive.<br>• If MID server is configured, verify if the server is up and running. |
| Unable to process the request. | Verify if the maximum number of instances associated with a webhook has exceeded. If you encountered this error for GitHub, verify if you have associated more than 20 instances to a webhook. |
| Authorization credentials do not have the minimum required permissions. | Verify if your third-party tool credentials have the required scopes. If you are using the workspace UI, you can navigate to the tool record, and select **More actions ( ... ) > Check credential permissions** to know about the required permissions. |
| MID server configuration is invalid. Configure a valid MID server, and try again. | Check if the mid server is running and reachable. |
| The connection URL is invalid. Enter a valid URL, and try again. | 1. Navigate to **All > Connections & Credentials > Connection & Credential Aliases** and open the required connection & credential record.<br>2. From the Connections related list, open the related **Connection** form.<br>3. On the **Connection** form, verify if the connection URL of the third-party tool is correct. |

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| Reason | Action |
| --- | --- |
| The rate limit has been exceeded. Retry after {0}. | Rate limit is the number of API calls an app or user can make within a given time period. Rate limiting is a technique to limit network traffic to help prevent users from exhausting system resources. If the max rate limit allowed in your third-party tool has exceeded, you might encounter this error. |
| Your credentials does not have the required scopes. | Verify if your third-party tool credentials have the required scopes. If you are using the workspace UI, you can navigate to the tool record, and select **More actions ( ... ) > Check credential permissions** to know about the required permissions. |

## Change request

This table lists the steps required to resolve errors that might occur during change request creation:

| Error | Action |
| --- | --- |
| Change request cannot be created because the type compatibility flag is disabled. Enable the type compatibility flag in system properties or configure the change model in the step record in ServiceNow or enter the appropriate change model sys id in the pipeline. | • Navigate to **All > System Properties**, and enable the *com.snc.change_management.change_model.typ* property, or<br>• Add the change model in the Step form or change attributes of the pipeline. |
| Change request cannot be created because either the change type or change model is not configured for the pipeline. | Add the change model or type in the Step form or change attributes of the pipeline. |

## General errors

This table lists steps required to resolve few general errors that might occur while working with the DevOps Change Velocity application.

| Issue | Action |
| --- | --- |
| Import request not progressing | If an import request remains in the Requested state for too long while performing an import for a tool (such as Jenkins, Jira, or GitHub ), delete the import request and try again.<br>**Note:** Delete the existing request to retry importing the same range. |

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| Issue | Action |
| --- | --- |
| Tool connection fails | Remove the trailing slash ('/') in the **Connection URL** field on the HTTP Connection form. |
| No change request is created for a Jenkins job under change control | Verify that:<br>• The tool integration in your instance is set up properly.<br>• The task has been synced in your instance.<br>• Tasks and app steps have been configured in your instance.<br><br>Change request creation is not supported if the task is under change control:<br>• Is not part of a pipeline (is a standalone task, for example).<br>• Is the first in the pipeline.<br>• Is within the pipeline, but the user manually triggers, or does SCM checkout directly on the task under change control (thus not triggering the pipeline from the beginning). |
| Jenkins does not block the job under change control (does not wait for change request approval) | Verify that the Jenkins location is configured:<br><br>Navigate to **Jenkins** > **Manage Jenkins** > **Configure System** and provide the hostname for the **Jenkins URL** field in the Jenkins Location section.<br><br>**Note:**<br>To avoid caching issues, click **Save** even if the **Jenkins URL** field already contains a value when you first open the form. |
| Events occurring in the payload log with state Not Connected | If any of the following changes for a connection made manually (using manual configuration mode), the connection is automatically disconnected.<br>• Alias associated with the tool<br>• Type of tool<br>• New active HTTP connection for the same domain added to the alias<br>• Existing HTTP connection for the same domain activated<br>• Connection URL of the HTTP connection<br>• Credentials of the HTTP connection<br>• Use MID Server setting in the HTTP connection |

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| Issue | Action |
| --- | --- |
| | Enter manual configuration mode and reconnect. |
| Retry Inbound events that fail or error out due to REST API TimeoutException/ FlowObjectAPIException | Update the *Retry Errored Inbound Events* scheduled job to retry processing inbound events that are in *Error* state.<br>• Update the errors or exceptions list to specify exceptions that you want to retry event processing for.<br>• Modify the default *Maximum Retry* count.<br>For more information, see Retry errored inbound events |
| Pipeline execution in ServiceNow DevOps does not move forward and waits indefinitely as the SonarQube scans do not take place due to the absence of SonarQube tool.<br>The software quality inbound event displays the following error message in the processing details field. "Check if the respective SonarQube tool is created successfully. If not, create the SonarQube tool and retry the inbound event." | For all SonarQube steps in code quality scans, the user must create SonarQube tool in the ServiceNow DevOps instance.<br>For more information, see SonarQube integration with DevOps Change Velocity |
| Pipeline UI displays broken links between stages. | Navigate to **Task Executions** and ensure that the Upstream executions column has the appropriate upstream link references. |

## Retry errored inbound events

Run base system or modified scheduled jobs to retry processing errored inbound events. Specify the exceptions or errors to retry events that are in an *Error* state.

### Before you begin

Role required: sn_devops.admin

### About this task

A scheduled job retries processing inbound events that are in *Error* state. You can choose to use the scheduled job with its base-system properties or customize the properties to suit your needs.

- Run a scheduled job on inbound events that are in error state.
- Update the list of exceptions and errors so that you can retry processing errored inbound events with those exceptions.
- Specify the count for maximum attempts the retry jobs runs on an inbound event.
- Specify the time elapsed since the last retry job. The retry job runs again on the errored inbound events after the duration you specify.

Based on your error or exception, perform any of the following steps to retry processing the inbound events.

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### Procedure

1. Modify the *Retry Errored Inbound Events* scheduled job frequency.

   a. Navigate to **System Definition** > **Scheduled Jobs**.

   b. Search and open the *Retry Errored Inbound Events* job.

      The job checks for errored inbound events.

      **Note:**
      By default, the scheduled job runs repeat every two minutes. You can modify the frequency (in minutes), as required.

   c. Select the frequency to run the job, from the **Run** field, and configure the corresponding fields.

   d. Click **Update**.

   You have modified the frequency of the scheduled job.

2. Modify properties related to retry processing inbound events.

   a. Navigate to **DevOps** > **Administration** > **Properties**.

   b. Modify the **Maximum retries for errored inbound events** property.

      **Note:**
      The default value for this property is 3. You can modify the count as needed.

      Processing inbound events are retried based on the count you specify.

   c. Modify the **Time elapsed (in minutes)** property.

      **Note:**
      The default value for this property is 1440 minutes (24 hours). You can modify the count if required.

      Based on the value in this property field, the system retries processing inbound events. For example, if the last attempt to process the inbound events was on 12 noon on 1 January, by default, the scheduled job retries processing errored events after 1440 minutes or 1 day from the timestamp of the last attempt to process the inbound event.

   d. To update the exceptions list based on which errored events are retried for processing, modify the **Errors or exceptions (comma separated) for which errored inbound events are set to Retry** property.

      **Note:**
      The default value of this property is *TimeOutExceptions, FlowObjectAPIException*. You can update the exceptions you want to retry processing in a comma-separated format.

      The exceptions you enter for the property are checked for the **Processing Details** field in the inbound event's record and retries processing.

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### Result
The scheduled job to retry processing inbound events runs based on either the properties you have configured or the base system properties that are specified by default.

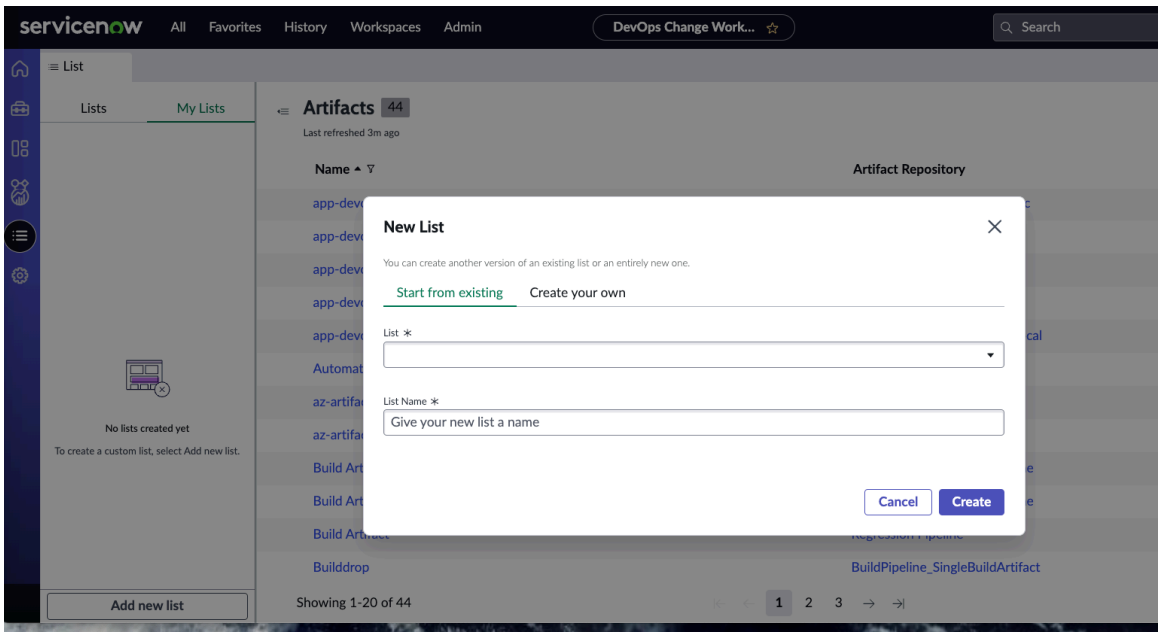
## Customized lists

Create customized lists for your List, Change, Tools, and Administration modules. You can create your own version of an existing list, or a new one.

### Before you begin
Role required: sn_devops.admin, sn_devops.tool_owner, or sn_devops.app_owner

### Procedure
1. Navigate to **Workspaces** > **DevOps Change Workspace**.
2. Select the module where you want the list added (List, Change, Tools, or Administration).
3. Select **My Lists** tab and select **Add new list**.

   You can create a different version of an existing list or a new one.




4. You can create a different version of an existing list or a new one.
   - To create a list from an existing list:
     a. Select the **Start from existing** tab.
     b. From the **List** drop-down, select an existing list.
     c. In the **List Name** field, give a name for your list.
     d. Select the columns from the list that you want in your list.
     e. If required, add filters for the list.
     f. If you want the list sorted by a column, select the column and order in the **Sort by** section.
     g. Select **Create**.

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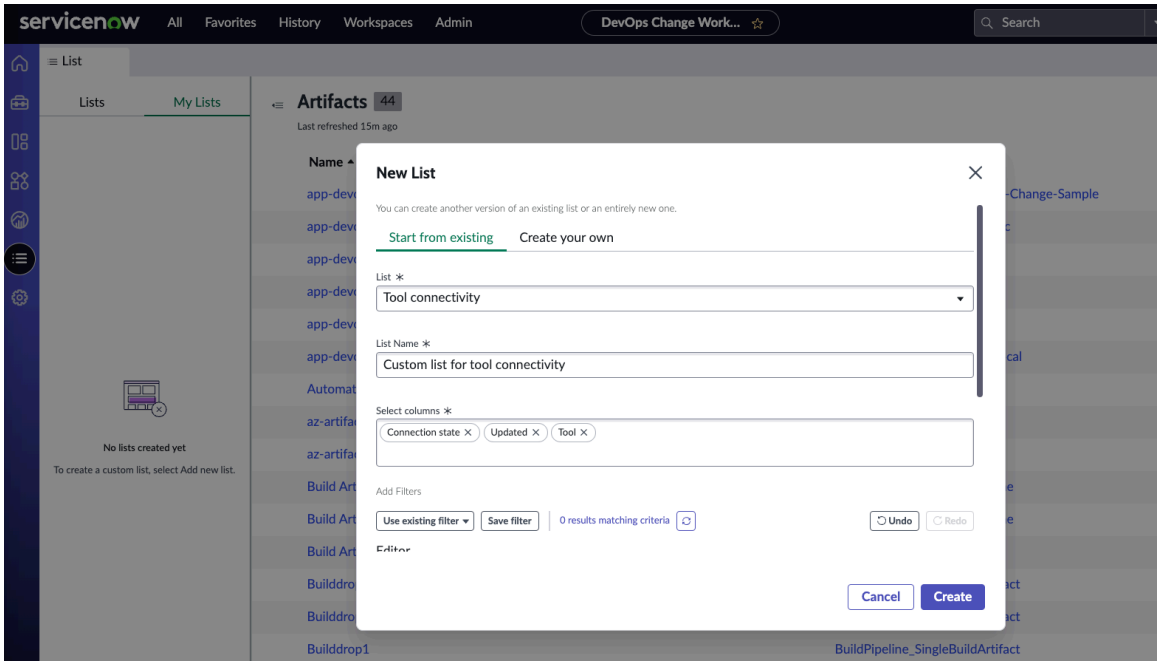
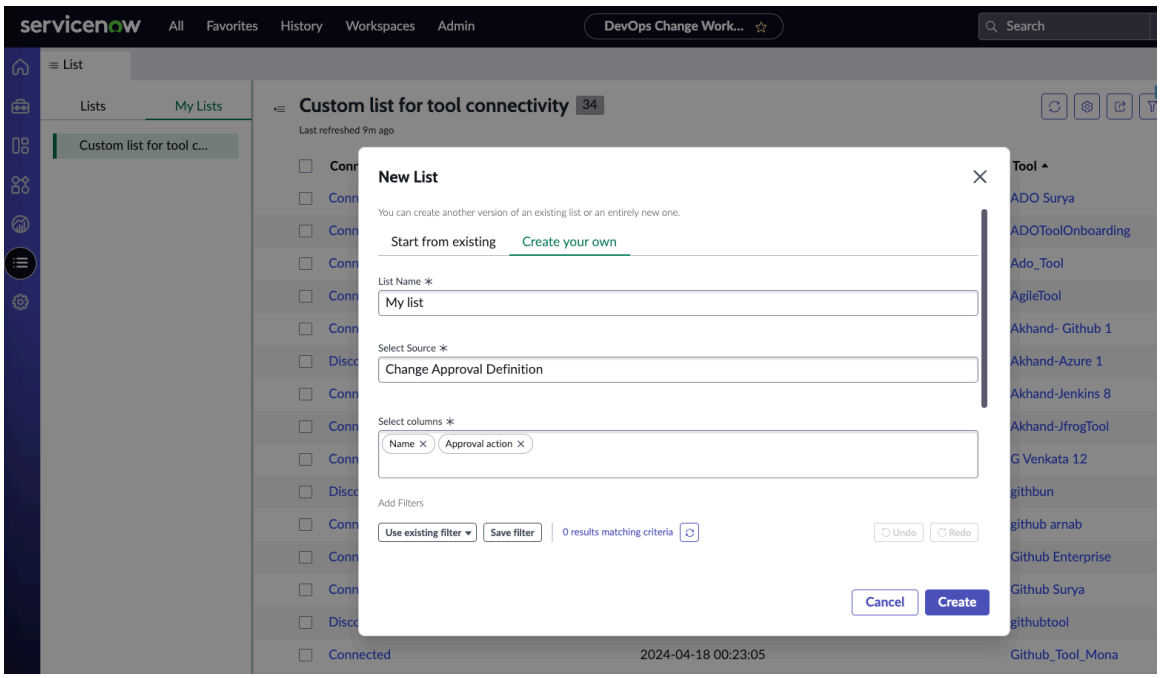



- To create your own list:
  - **a.** Select the **Create your own** tab.
  - **b.** From the **Select Source** list, gselect the table using which you want to create your list.
  - **c.** Select the columns that you want in your list.
  - **d.** If required, add filters for the list.
  - **e.** If you want the list sorted by a column, select the column and order in the **Sort by** section.
  - **f.** Select **Create**.




## Cloning guidelines for DevOps Change Velocity

Clone the DevOps Change Velocity application from one instance to another.

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**Note:**
Valid for Utah and later.

For detailed information for cloning a ServiceNow instance, refer to the following topics.

- System clone
  - Request a clone
  - Clone Target Registration and Authentication
  - Exclude a table from cloning
  - Data preservation on cloning target instances
- New Backup-based Clone Engine [KB0540342]

## Base system table exclusion and preservers on global tables used in DevOps

| Table name | Exclude table entry present? | Data preservers entry present? |
|---|---|---|
| **For DevOps tool** | | |
| sys_alias | No | No |
| http_connection | Yes | Yes |
| discovery_credentials | Yes | Yes |
| oauth_entity_profile | Yes | Yes |
| oauth_entity | Yes | Yes |
| jwt_provider | Yes | Yes |
| jwt_keystore_aliases | Yes | Yes |
| sys_certificate | Yes | Yes |
| token_verification | Yes | Yes |
| sys_user_group | No | No |
| **For DevOps apps** | | |
| cmdb_ci_business_app | No | No |
| cmdb_ci_sdlc_component | No | No |
| cmdb_application_product_model | No | No |

## Tools cloned from source instance

- The tools that are cloned from source instance will have a Connection alias (sys_alias) associated with them.
- The Connection record and the Credential record aren't cloned over from the source instance since those tables are excluded.
- Tool URL will be empty because the tool URL is dynamically calculated using connection record.
- Connect test fails because there's no active connection.
- All the underlying entities like projects, plans, pipelines, repositories, work items, commits, pipeline execution, and so on must be present under the tool.

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- The tool's token isn’t cloned.
- New webhook inbound events won’t automatically start to come to the cloned target instance for these tools. The tools must be reconfigured to receive new inbound events.

**Manual steps on cloned tools**

1. Create Connection and Credential
   - Use the **Create New Connection & Credential** action present under the related links on the tool record or manually create the connection (http_connection) and credential (discovery_credentials) record and associate with the tool's connection alias.
   - Manually run the **Connect** action on the tool and make sure that the tool connection state is **Connected**.
2. Regenerate token and configure
   - For the tools that support token-based webhook configuration, use the **Regenerate token** action from the Related Links on the tool record page.
   - Regenerating the token creates a new token in the token_verification table and creates webhooks for the tool and repos that have Configure status as **Configured**.
   - For the tools that don't support token-based webhooks, click **Configure** and enter the user name and password for the DevOps integration user.

## Apps cloned from source instance

- Apps that are cloned from the source instance will have all the app associations intact.
- Business app and SDLC component links are maintained.
- Manual steps aren't required after cloning.

## Preserving data on target instance

Aim to preserve the existing tools, tool connections, and apps on the target instance.

## Level 1 data preservers

### Required data preservers

| Title | Table name | Purpose | Suggested filter |
|---|---|---|---|
| DevOps tool | sn_devops_tool | To preserve top-level DevOps tool list. | `connection_state=connected^` to preserve all connected tools or filter on specific tool IDs. |
| Connection & Credential Aliases | sys_alias | Specified in DevOps tool to hold connection details. | `idLIKEdevops^ORidLIKEspoke^` to preserve all aliases related to DevOps. |
| DevOps app | sn_devops_app | To preserve top-level DevOps App list. | |

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## Manual steps on preserved tools after cloning

1. Maintained by

   If the tool on the target instance had any **Maintained by** user groups specified before cloning, update the user groups, and set them on the tool record manually after cloning.

2. Discover
   - Projects, pipelines, plans, and repositories aren't present for preserved tools after the clone.
   - For Azure DevOps tools, first perform **Discover projects**.
   - Perform **Discover** action on the tool or the project to bring the pipelines, plans, and repositories details.
3. Track

   Track the required pipelines, plans, and repositories.

4. Configure
   - Optional for tools where the webhook url holds a reference to tool sys_id only. For example, GitHub, GitLab, Jira, Bitbucket.
   - You must reconfigure Azure DevOps projects because the project sys_id has changed after rediscover.
   - Token remains the same for the tool.
   - Verify that there are no duplicate webhooks created in the third-party DevOps tool after reconfiguring.
5. Historical import

   Use the import action or workspace to import historical data for plans, repositories, and pipelines.

## Manual steps on preserved apps after cloning

1. Maintained by

   If the app on the target instance had any **Maintained by** user groups specified before cloning, update the user groups, and set them on the app record manually after cloning.

2. Associate with app

   Manually reassociate plans, repositories, and pipelines with the app.

3. Relink to SDLC component and application model

   Manually associate the DevOps app to the SDLC component, and SDLC component to the application model.

## Level 2 data preservers

Aim to preserve the data and relations under DevOps tools and DevOps apps. These preservers should be used along with the level1 preservers and manual steps.

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### Required data preservers

| Title | Table name | Purpose | Suggested filter |
|---|---|---|---|
| **Plugin: DevOps Data Model** | | | |
| Artifact Repository | sn_devops_artifact_repository | Top-level list of artifact repositories. Required to keep artifact repos that are associated with a preserved tool. | `tool=toolid^EQ`, where `toolid` is the tool being preserved. |
| Artifact | sn_devops_artifact | Top-level list of artifacts. Required to keep artifacts that are associated with a preserved tool. | `artifact_repository.tool=to` where "`toolid`" is the tool being preserved. |
| Pipeline | sn_devops_pipeline | Top-level list of pipelines. Required to keep pipelines that are associated with a preserved tool. | `tool=toolid^EQ`, where `toolid` is the tool being preserved. |
| Release Version | sn_devops_plan_version | Top-level list of release versions. Required to keep release versions that are associated with a preserved planning tool. | `plan.tool=toolid^EQ`, where `toolid` is the tool being preserved. |
| Plan | sn_devops_plan | Top-level list of plans. Required to keep plans that are associated with a preserved planning tool. | `tool=toolid^EQ`, where `toolid` is the tool being preserved. |
| Project | sn_devops_project | Top-level list of projects. Required to keep projects that are associated with a preserved tool. Currently supported by Azure DevOps. | `tool=toolid^EQ`, where `toolid` is the tool being preserved. |
| Repository | sn_devops_repository | Top-level list of repositories. Required to keep repositories that are associated with a preserved coding tool. | `tool=toolid^EQ`, where `toolid` is the tool being preserved. |
| App to Artifact Repository | sn_devops_m2m_app_artifact_repo | App/Artifact Repo associations. Required to keep the relationship between preserved apps and artifact repositories. | `app=appid^EQ`, where `appid` is the app being preserved. |

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### Required data preservers (continued)

| Title | Table name | Purpose | Suggested filter |
|---|---|---|---|
| App to Artifact | sn_devops_m2m_app_artifact | App/Artifact associations. Required to keep the relationship between preserved apps and artifacts. | `app=appid^EQ`, where `appid` is the app being preserved. |
| App to Plan | sn_devops_m2m_app_plan | App/Plan associations. Required to keep the relationship between preserved apps and plans. | `app=appid^EQ`, where `appid` is the app being preserved. |
| **Plugin: DevOps Vulnerability Integrations** | | | |
| DevOps Security Orchestration Relation | sn_devops_security_orchestration_relation | Required to keep the relation between DevOps entitiy (for example, pipeline) and a security tool. | reference_table=sn_devops_pipeline |

## Custom integration data preservers

Aim to preserve the meta-data related to any custom tool integrations on the target instance. These data preservers can be used with both level1 and level2 preservers.

### Required data preservers

| Title | Table name | Purpose | Suggested filter |
|---|---|---|---|
| **Plugin: DevOps Data Model** | | | |
| Custom tool Integration Capability | sn_devops_integration_capability | Required to keep the supported actions to integration capability mapping records of custom tool integration. | `tool_integration=customTool`, where `customToolIntegrationId` is the *`sys_id`* of the custom tool integration. |
| Custom tool Integration Capability Mapping | sn_devops_tool_capability_mapping | Required to keep the integration capability mapping records of custom tool integration. | `tool_integration=customTool`, where `customToolIntegrationId` is the *`sys_id`* of the custom tool integration. |
| Custom DevOps Tool Integration | sn_devops_tool_integration | Required to keep the tool integration record of custom tool integration. | `sys_id=customToolIntegratio` where `customToolIntegrationId` is the *`sys_id`* of the custom tool integration. |

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### Required data preservers (continued)

| Title | Table name | Purpose | Suggested filter |
|---|---|---|---|
| Custom Tool permissions | sn_devops_tool_permission | Required to keep the permission check records of custom tool integration. | `tool_integration=customTool`, where `customToolIntegrationId` is the *`sys_id`* of the custom tool integration. |
| **Plugin: DevOps Workspace** | | | |
| Custom tool Onboarding task type | sn_devops_ws_onboarding_task_type | Required to keep the onboarding task types of custom tool integration. | `tool_integration=customTool` where `customToolIntegrationId` is the sys_id of the custom tool integration. |

## Level 3 data preservers

Aim to have all the m2m mapping intact in the target instance.

**Note:**
The following are DevOps specific tables. If you require other data to be in place, then you can add those tables in the preservers list. For example, Change Requests.

### Preserve and exclude tables

| Name | Table name | Application |
|---|---|---|
| App | sn_devops_app | DevOps Data Model |
| Artifact | sn_devops_artifact | DevOps Data Model |
| Artifact Repository | sn_devops_artifact_repository | DevOps Data Model |
| Artifact Staged Request | sn_devops_artifact_staging | DevOps Data Model |
| Artifact Version | sn_devops_artifact_version | DevOps Data Model |
| Base Planning Item | sn_devops_base_planning_item | DevOps Data Model |
| Branch | sn_devops_branch | DevOps Data Model |
| Build Test Result | sn_devops_build_test_result | DevOps Data Model |
| Build Test Summary | sn_devops_build_test_summary | DevOps Data Model |
| Callback | sn_devops_callback | DevOps Data Model |
| Change Reference | sn_devops_change_reference | DevOps Data Model |
| Commit | sn_devops_commit | DevOps Data Model |
| Committer | sn_devops_committer | DevOps Data Model |
| Commit Details | sn_devops_commit_details | DevOps Data Model |
| Contributor Score Change Factor | sn_devops_contributor_score_change_factor | DevOps Data Model |
| Environment | sn_devops_environment | DevOps Data Model |

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### Preserve and exclude tables (continued)

| Name | Table name | Application |
|---|---|---|
| Import Request | sn_devops_import_request | DevOps Data Model |
| Import Request Page | sn_devops_import_request_page | DevOps Data Model |
| Inbound Event | sn_devops_inbound_event | DevOps Data Model |
| App to Artifact | sn_devops_m2m_app_artifact | DevOps Data Model |
| App to Artifact Repository | sn_devops_m2m_app_artifact_repository | DevOps Data Model |
| App to Plan | sn_devops_m2m_app_plan | DevOps Data Model |
| Deployed Artifact to TaskExecution | sn_devops_m2m_artifact_execution | DevOps Data Model |
| Artifact Version to Commit | sn_devops_m2m_artifact_version_commit | DevOps Data Model |
| Artifact Version to Package | sn_devops_m2m_artifact_version_package | DevOps Data Model |
| Branch To Commit | sn_devops_m2m_branch_commit | DevOps Data Model |
| Run Commit | sn_devops_m2m_commit_execution | DevOps Data Model |
| Commit to Pull Request | sn_devops_m2m_commit_pull_request | DevOps Data Model |
| Commit To Work Item | sn_devops_m2m_commit_work_item | DevOps Data Model |
| Import Request to Inbound Event Mapping | sn_devops_m2m_inbound_event_import_request | DevOps Data Model |
| Tool Integration Configuration Template | sn_devops_m2m_tool_integration_configuration_template | DevOps Data Model |
| Work Item To Release Version | sn_devops_m2m_work_item_plan_version | DevOps Data Model |
| Orchestration Task | sn_devops_orchestration_task | DevOps Data Model |
| Orchestration Task Definition | sn_devops_orchestration_task_definition | DevOps Data Model |
| DevOps Package | sn_devops_package | DevOps Data Model |
| Participant | sn_devops_participant | DevOps Data Model |
| Performance test summary | sn_devops_performance_test_summary | DevOps Data Model |
| Pipeline | sn_devops_pipeline | DevOps Data Model |
| Pipeline Execution | sn_devops_pipeline_execution | DevOps Data Model |
| Plan | sn_devops_plan | DevOps Data Model |
| Release Version | sn_devops_plan_version | DevOps Data Model |
| Processed Inbound Event | sn_devops_processed_inbound_event | DevOps Data Model |
| Project | sn_devops_project | DevOps Data Model |
| Pull Request | sn_devops_pull_request | DevOps Data Model |
| Repository | sn_devops_repository | DevOps Data Model |
| Software Quality Category | sn_devops_software_quality_category | DevOps Data Model |
| Software Quality Category Detail | sn_devops_software_quality_category_detail | DevOps Data Model |

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**Preserve and exclude tables (continued)**

| Name | Table name | Application |
|---|---|---|
| Software Quality Scan Detail | sn_devops_software_quality_scan_detail | DevOps Data Model |
| Software Quality Scan Summary | sn_devops_software_quality_scan_summary | DevOps Data Model |
| Software Quality Scan Summary Relations | sn_devops_software_quality_scan_summary_relation | DevOps Data Model |
| Software Quality Sub Category | sn_devops_software_quality_sub_category | DevOps Data Model |
| Step | sn_devops_step | DevOps Data Model |
| Step Execution | sn_devops_step_execution | DevOps Data Model |
| Tag | sn_devops_tag | DevOps Data Model |
| Task Execution | sn_devops_task_execution | DevOps Data Model |
| Test Execution | sn_devops_test_execution | DevOps Data Model |
| Test Result | sn_devops_test_result | DevOps Data Model |
| Test Summary | sn_devops_test_summary | DevOps Data Model |
| Test Summary Relations | sn_devops_test_summary_relation | DevOps Data Model |
| DevOps Tool | sn_devops_tool | DevOps Data Model |
| Tool Connection Status | sn_devops_tool_connection_status | DevOps Data Model |
| Tool Connectivity History | sn_devops_tool_connectivity_history | DevOps Data Model |
| Waiting Reason Tracking | sn_devops_waiting_reason_tracking | DevOps Data Model |
| Work Item | sn_devops_work_item | DevOps Data Model |

## Onboard a new tool using DevOps generic playbook

DevOps Change has a pre-build playbook setup for users to configure a new tool. Custom tool integrations can be created using the guided playbook experience in the DevOps Change Workspace.

Playbooks provide end users with a visual, task-oriented guide with the steps to complete a process, ensuring a consistent experience for tool onboarding. For detailed information about playbooks, see About Playbook Experience.

Perform the following steps to onboard your custom tool using the DevOps generic playbook.

### 1. Identify tool capabilities

To configure a tool using the generic playbook, first you must identify the capabilities supported by the tool. A tool can have one or more capabilities like code, plan, and orchestration.

The Generic playbook consists of the following stages and each stage has its related activities:

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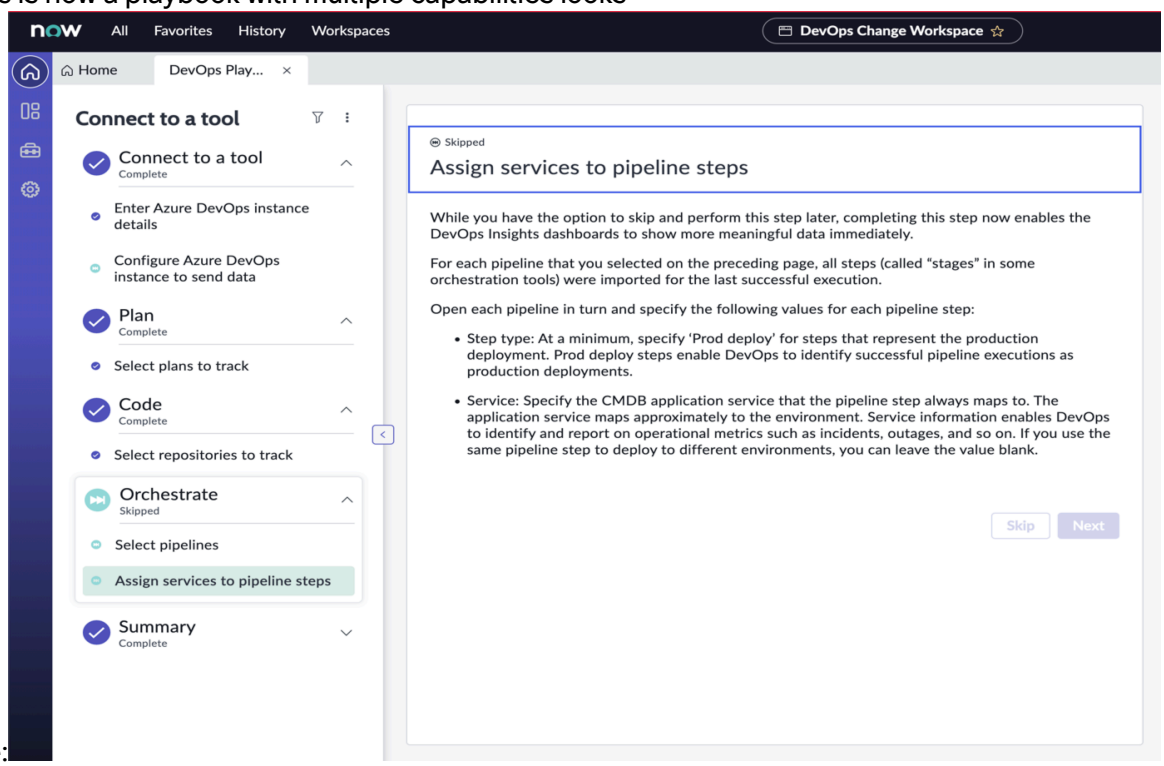
1. Connect to a tool
   a. Connect to a tool
   b. Specify tool access
   c. Configure the tool
2. Capability

   Capability can be of type plan, code, or orchestrate. If the tool has multiple capabilities, multiple stages exist with the capability name.

   a. Select to track
   b. Import data
   c. Associate (This activity is for the Orchestration tools to associate pipeline steps)
3. Summary

This is how a playbook with multiple capabilities looks like:




## 2. Configure Activity Definitions

Each Activity in a playbook is associated to an activity definition. DevOps has the following activity definitions:

- DevOps CreateTool AD
- DevOps Configure & Test AD
- DevOps Select Associated Objects AD
- DevOps Import Data AD
- DevOps Associate Services AD
- DevOps Summary AD

For more information, see Exploring Playbooks and About Playbook Experience.

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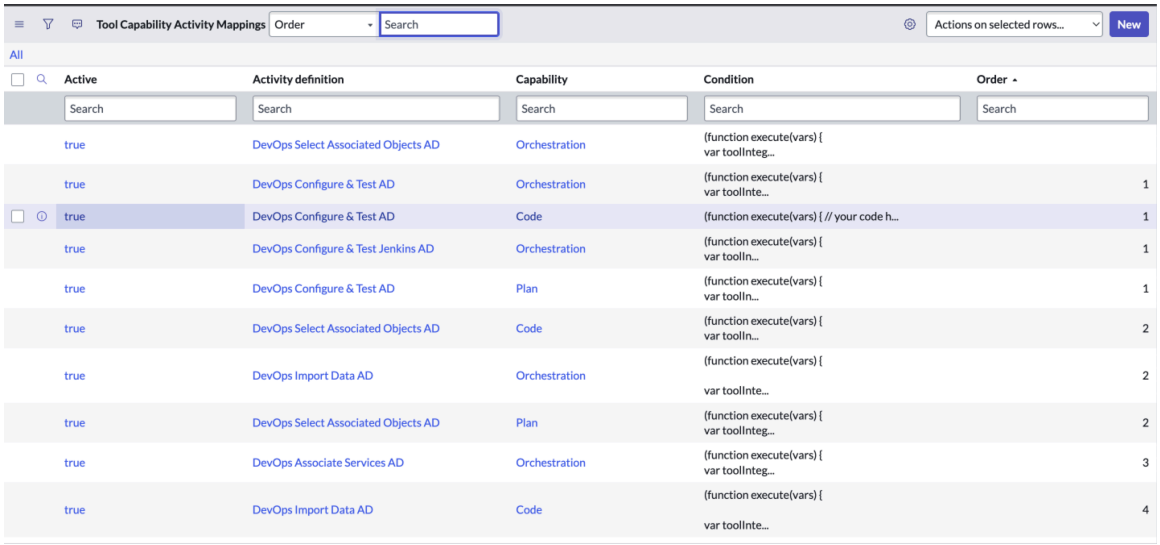
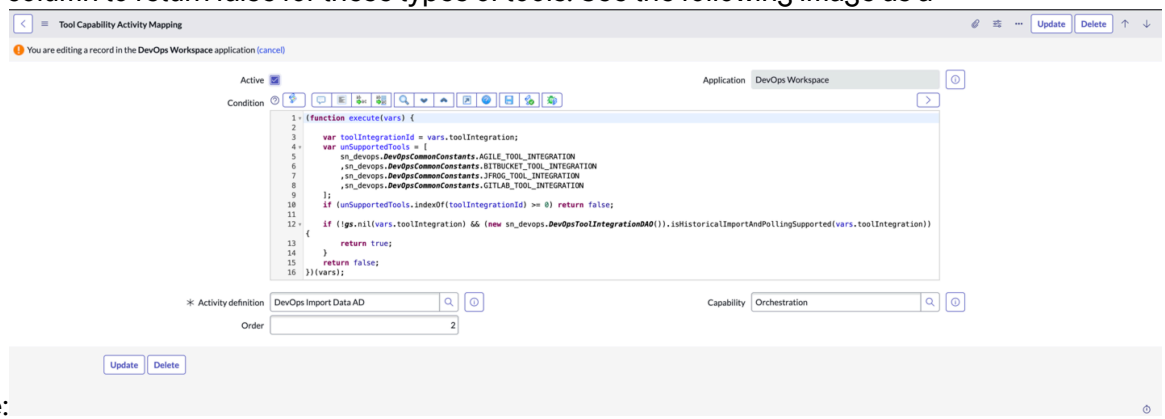
The DevOps table *sn_devops_capability_activity_mapping* has been created to maintain associations between Activity definitions and capabilities. This table configuration is used to dynamically render the stages and activities for a tool. You can update the conditions as needed to either enable or disable a particular activity for a tool.




| Active | Activity definition | Capability | Condition | Order |
|---|---|---|---|---|
| true | DevOps Select Associated Objects AD | Orchestration | (function execute(vars) { var toolInteg... | |
| true | DevOps Configure & Test AD | Orchestration | (function execute(vars) { var toolInte... | 1 |
| true | DevOps Configure & Test AD | Code | (function execute(vars) { // your code h... | 1 |
| true | DevOps Configure & Test Jenkins AD | Orchestration | (function execute(vars) { var toolIn... | 1 |
| true | DevOps Configure & Test AD | Plan | (function execute(vars) { var toolIn... | 1 |
| true | DevOps Select Associated Objects AD | Code | (function execute(vars) { var toolIn... | 2 |
| true | DevOps Import Data AD | Orchestration | (function execute(vars) { var toolInte... | 2 |
| true | DevOps Select Associated Objects AD | Plan | (function execute(vars) { var toolInteg... | 2 |
| true | DevOps Associate Services AD | Orchestration | (function execute(vars) { var toolInteg... | 3 |
| true | DevOps Import Data AD | Code | (function execute(vars) { var toolInte... | 4 |

For example, tools like GitLab and JFrog don't support data import. So you don't require the Data Import activity for such tools. In that case, you must add the logic in the condition column to return false for these types of tools. See the following image as a reference:




## 3. Configure Activity UI for the Activity Definition

Playbook Activity UIs define the experience type and UI template rendered to users while managing Playbooks. You can configure multiple Activity UIs for an Activity Definition and render any one dynamically based on the condition evaluation.

DevOps has the following AUIs for Create Tool activity. Except this, all other activity definitions have only one Activity UI.




| Name | Activity UI | Roles Required | Prioritized | Playbook experience | Parent Table | Associated Table | Activity State |
|---|---|---|---|---|---|---|---|
| DevOpsCreateTool-Basic PAO | DevOpsCreateTool - Basic AUI | | | DevOps Playbook Experience | DevOps Tool [sn_devops_tool] | | |
| DevOpsCreateTool-Jenkins PAO | DevOps Create Tool - Jenkins AUI | | | DevOps Playbook Experience | DevOps Tool [sn_devops_tool] | | |
| DevOpsCreateTool-Jira PAO | DevOps Create Tool - Jira AUI | | | DevOps Playbook Experience | DevOps Tool [sn_devops_tool] | | |
| DevOpsCreateTool-Github PAO | DevOps Create Tool - GitHub AUI | | | DevOps Playbook Experience | DevOps Tool [sn_devops_tool] | | |

1 to 4 of 4

You can configure any one the Activity UI based on the requirement. Refer to  to navigate the Playbook Activity UI.

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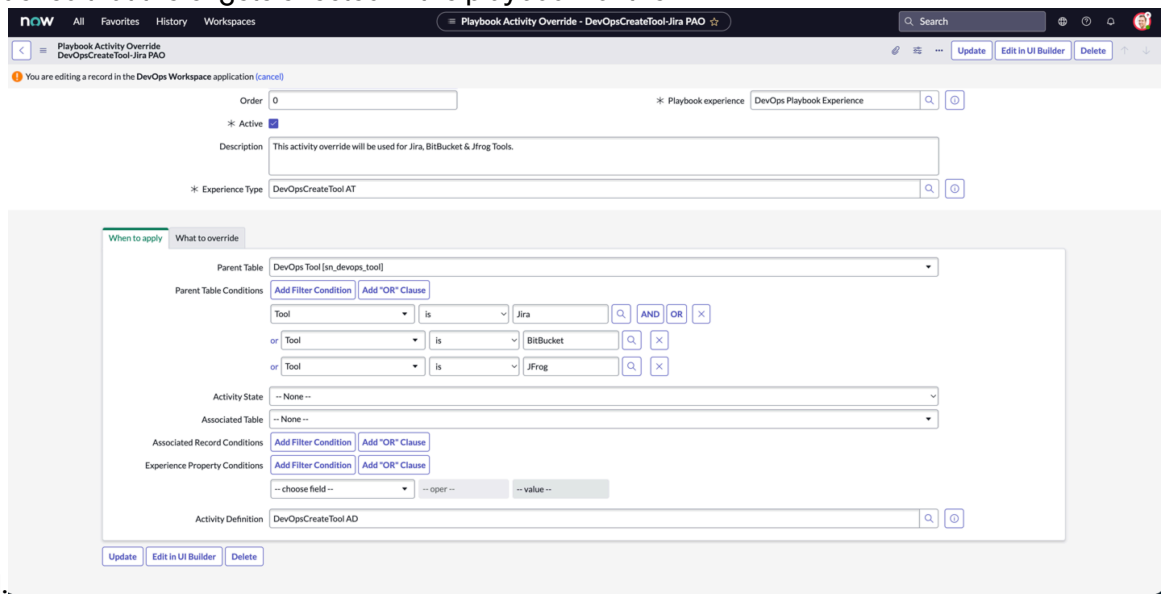
Identify the required activity UI and add your tool in the condition builder so that the UI gets effected in the playbook for the tool.




**Result**

After completing these steps, your tool can be onboarded using the DevOps generic playbook.

## Additional information for onboarding DevOps tools and apps using the Service catalog

Use the onboarding catalog items as a self-service approach to onboard your DevOps tools and apps.

## Onboarding tools and apps

> **Note:**
> This content pertains to the Classic Environment, which refers to working in lists of records and on record forms directly, not in the Configurable Workspace interface. You can work in the Classic Environment with Next Experience active, or with it inactive, which is referred to as Core UI, (formerly known as UI16).

Use the ServiceNow Service Catalog to request the onboarding of tools and apps. Fill out the onboarding form details for a tool or an app and submit the request. You can also import the DevOps data for the app that you are creating for swifter and easier onboarding.

Prior to the request creation, an automated workflow approves or rejects the request.

- When the workflow is approved, a success message displays.
- When rejected, an inbound event is created capturing error logs. By ensuring the log is error free, you can create a request again.

You can onboard DevOps tools and apps using self-service catalog items.

- Navigate to **All > Service Catalog > Catalog Definitions > Maintain Items > DevOps App Onboarding**, and set the **Active** state to **True** to activate the **DevOps App Onboarding** maintain item. By default the catalog items (App Onboarding) is turned off.
- Navigate to **All > Service Catalog > Catalog Definitions > Maintain Items > DevOps Tool Onboarding**, and set the **Active** state to **True** to activate the **DevOps Tool Onboarding** maintain item. By default the catalog items (Tool Onboarding) is turned off.

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- To add the DevOps catalog items in the Service Catalog categories in Service Portal, set the category of these items to **DevOps** and add the **Service Catalog** catalog. If the **DevOps** category is not available, you must create a new category called **DevOps** from the catalog item record itself and assign the **DevOps Onboarding** catalog to it.
- To add the DevOps catalog items in Employee Service Center, add a new topic in the **Assigned Topics** related list with taxonomy as **Employee** in the **IT > IT for IT** section. The Assigned Topics related list is not available in the Default view of the Catalog Item form. To add it, select **Additional icons > Configure > Related Lists** and move the **Connected Content → Catalog item** field to the selected section.
- Navigate to **All > Flow Designer > Flows**, and activate the **Request for onboarding approval** flow, so that the tool or app onboarding requests are approved by default. If you want to request manual approval for onboarding catalog items (i.e. from a user other than the DevOps system user), you can update the rule set in the **Ask For Approval** action of the flow. You can configure manual request approval for such items by configuring the fulfillment process for the catalog item. For more information, see Service Catalog request fulfillment.
- Customize roles for approvals of the request for onboarding approval flow from Flow Designer.

## Onboarding at scale

You can also use the onboarding APIs to onboard DevOps tools & apps in bulk instead of onboarding one tool or app per request. In the request parameters for tools or apps, you can specify multiple values to onboard them in one go. For example:

```
{
    "tools":[
    {
        "name": "jira_revamp",
        "type": "Jira",
        "url": "http://jira1.sndevops.xyz",
        "username": "admin",
        "password": "DevOps1!",
        "useMidServer": false
    },
    {
        "name" : "azure_revamp",
        "type" : "Azure DevOps",
        "url"  :
 "https://dev.azure.com/ADOLightweight/Testing%20ADO%20On%20empm
olugu",
        "username" : "devops.integration.user",
        "password" :
 "a5xvoea2osy3ld43p2biojcu6eog5y5q3xicqbbgxwuphjbbcu6a",
        "useMidServer" : false
    },
    {
        "name" : "jenkins_revamp",
        "type" : "Jenkins",
        "url"  : "http://jenkins5.sndevops.xyz/",
        "username" : "admin",
        "password" : "DevOps1!",
        "useMidServer" : false
    },
    {
        "name" : "github_revamp",
        "type" : "GitHub",
```

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```
        "url"  : "https://api.github.com",
        "username": "admin",
        "password": "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",
        "useMidServer" : false
    },
    {
        "name" : "bitbucket_revamp",
        "type" : "Bitbucket",
        "url"  : "",
        "username" : "admin",
        "password" : "DevOps1!",
        "useMidServer" : false
    },
    {
        "name": "gitlab_revamp",
        "type": "GitLab",
        "url": "http://gitlab2.sndevops.xyz",
        "username": "admin",
        "password": "mYdAJQCLi6Qft4Nk3XvS",
        "useMidServer": false
    }],
    "credentials" : {
        "name" : "devops.integration.user",
        "password" : "devops"
    }
}
```

- Onboard DevOps apps at scale by using the DevOps app onboarding API. The POST/devops/onboarding/app request creates an onboarding app event that is asynchronously processed by the DevOps service. For more information, see POST/devops/onboarding/app.
- Onboard DevOps tools at scale by using the DevOps tool onboarding API. The POST/devops/onboarding/tool request creates an onboarding tool event that is asynchronously processed by the DevOps service. For more information, see POST/devops/onboarding/tool.

### Importing historical data for DevOps tools

Use the service catalog to onboard a new app and import historical DevOps data for that app. Enable polling to import data that is mapped to associated plans, repositories and pipelines on a scheduled frequency.

## Import historical DevOps data for existing tools

You can create an app onboarding request and import historical data for a DevOps tool that you have already on-boarded, using the app onboarding catalog form. Currently, you can import historical data for the last 90 days from current date, and enable polling on a scheduled frequency for the following tools:

- Jira (Plan)
- GitHub and GitHub Enterprise (Coding)
- Jenkins (Orchestration)

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**Note:**

- Ensure that you have created, connected, and discovered the tool you are importing data for.
- Import requests for Plan tool (Jira) are processed first, followed by repository and pipeline import requests.

## Import workflow and retries

On successfully submitting the catalog request from the Self-service catalog, the request is sent for approval following the designated approver flow that you have configured. When the request is approved, an inbound event is created for the app onboarding request. The **Processing details** field of the inbound event record displays the import request ID and status. A single import request creates multiple child import request pages that display in the related list. The import request pages are created based on the following logic for the supported tools:

- Jira: a page is created for a range of 15 days.
- GitHub : a page is created for every 100 commits.
- Jenkins: pages are created per build.

. After import requests are complete processing, the associated Work items, Commits, Branches, Tags, Pipeline executions, Test summaries that you mapped are created and persisted in the system.

On successful import you can view all imported commits in the **DevOps** > **Develop**:

- Branches
- Commits
- Committers
- Tags
- Repositories
- Work Items

for details to confirm successful import for the specified date range.

While processing an import request, if any page errors out, an inbuilt retry mechanism tries processing the page for a set number of times. After all automatic retries, if the page is still in error state, the subsequent or remaining pages in the import request are processed. The overall state of the import request remains in error.

For example, if the Plan import request failed (after all retries), we will proceed to process Repository and Pipeline imports. You can configure the retries for the import request from **DevOps** > **Administration** > **Properties** > **Maximum retries per page, while importing**.

- Specify the count of retries to auto-attempt, in case the import request page fails in the **Maximum retries per page, while importing** field. If after all the automatic retries, page does not succeed, the import request will process the remaining pages. The overall status of the import request reflects as errored.
- You can manually retry attempting a failed import by clicking the **Retry import** button, on the failed import request page,

### Polling schedule and configuration

Enable polling to import DevOps data on a scheduled frequency to apps that have imported historical data, and are mapped to associated plans, repositories, and pipelines.

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After you have onboarded an app and imported the associated DevOps data, you can enable the base system schedule for import requests to be created for the plans, repositories, and pipelines that are tracked and associated to an app. When the import requests complete processing, the associated data is persisted and display against the app. While the base system *DevOpsImportPolling* schedule job is active by default, you must enable polling from the DevOps properties to run the scheduled job.

To enable polling, navigate to **DevOps** > **Administration** > **Properties** > **Enable Import Polling** and select the check box.

Turning this property flag on, enables the base system *DevOpsImportPolling* schedule job. The scheduled job for polling considers either the last successful import or 30 days, whichever is later as the 'start date', and the current day's date as the 'end date' for the data import, for all apps that are active and have tracked pipelines. The job looks up the time of the last successful import and creates the subsequent import request accordingly. This logic ensures that the scheduled polling job imports the delta of relevant DevOps data for that app, from the last successful import till date, to a maximum of thirty days.

**Note:**
Do not configure a polling frequency that is less than a day or 24 hours.

The default frequency of the job is set to run daily at midnight using the system time zone. To change the frequency of scheduled job you need the ServiceNow ServiceNow AI Platform Administrator (admin) role.

Navigate to **System Definition** > **Scheduled Jobs** > **DevOpsImportPolling** and modify the **Run** frequency, **Time zone**, and **Time** field values, as needed. For more information, see Schedule Jobs

**Note:**

- The scheduled job only applies to active apps. Ensure that the app you are configuring polling for is in active state and the **Track** field is enabled for the relevant pipelines.
- Consider the following when you're modifying the schedule frequency:
  - For JIRA the default time zone is based on the time zone of the JIRA server's location.
  - For Jenkins the default time zone is UTC. For more information see Jenkins documentation on System Time time zones.

The schedule jobs that polls to import DevOps data honours the default values for the following DevOps properties related to imports and import requests:

- Maximum retries per page while importing
- Maximum number of pages to process at a time for an import request
- To save payloads as attachments on the Import Request Page record, set the "Value" field to "true". Anything else is considered false.

### Import existing Azure DevOps pipelines, repositories, and plans

After you have integrated Azure DevOps with DevOps, you can import up to 90 days of existing Azure DevOps pipeline, repository, and plan data. You can then use DevOps dashboards to view and manage Azure DevOps data.

**Before you begin**
Role required: admin

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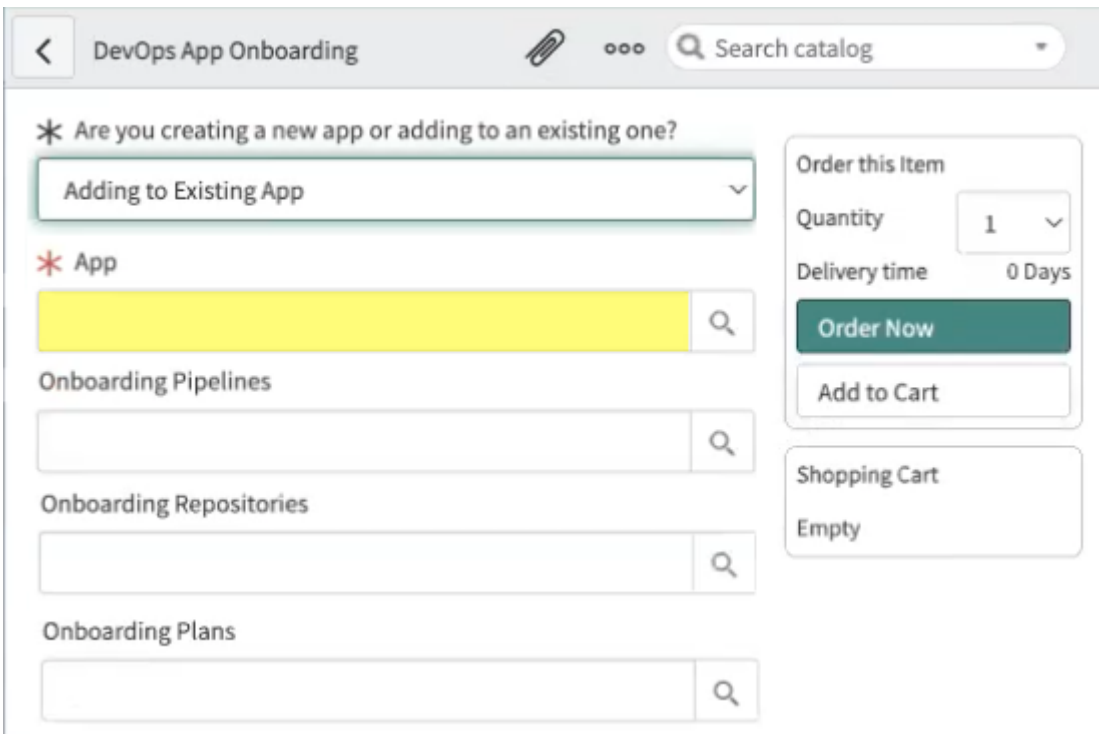
### About this task

- You will request the data from the service catalog as a predefined catalog item.
- Imported test summaries, artifacts, and packages are linked to pipeline executions and not to step executions.
- SonarQube scan results are not imported.
- Azure DevOps imposes the following restrictions:
  - Maximum 20,000 work items can be imported every 15 days.
  - Maximum 200 run commits can be mapped to any pipeline execution.
  - Test results for pipeline executions longer than 7 days are not returned.

**Note:**
The import process can take some time, hours for very large data sets.

### Procedure

1. Navigate to **All** > **Service Catalog** > **Catalog Definitions** > **My Catalogs** and then select **DevOps Onboarding**.
2. In the **Catalog Items** related list, select **DevOps App Onboarding**.
3. On the Catalog Item form, select **Try It** to request the data.
   The resulting DevOps App Onboarding form enables you to specify the catalog item to order. In this case, the "app" to order is your Azure DevOps instance.




4. Select the Select in list icon ( ) on the **App** field and then select your instance of Azure DevOps.
   Now that you have specified the instance, you will specify date range and sources of data to import.
5. Repeat the following procedure for each pipeline, repository, and plan that you want to import:

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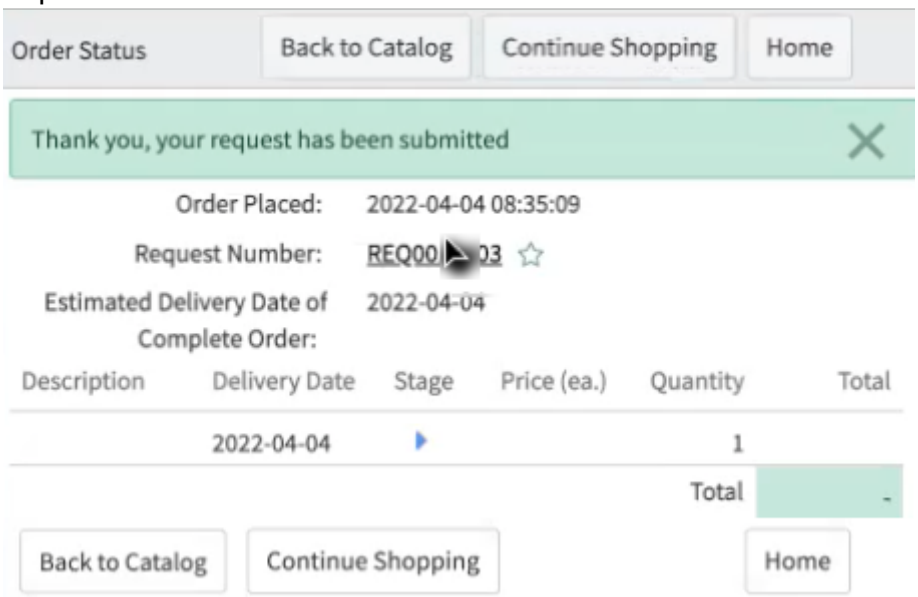
a. Select the Select in list icon ( ) on the appropriate **Onboarding** field to select the item to import.
You can select multiple items.

b. Specify the range of dates for the data in the **Import From** and **Import To** fields.

6. Select **Order Now**.
Your request appears on the Order Status page.
7. Select the request number so you or another user with the admin role can approve the request.




8. Approve the request: On the Request form, set **Approval** and **Request state**to **Approved**.
The import process begins immediately on approval.

### Import existing GitLab pipelines and repositories

After you have integrated GitLab with DevOps, you can import up to 90 days of existing GitLab pipeline and repository data. You can then use DevOps dashboards to view and manage GitLab data.

## Before you begin

Role required: admin

## About this task

- You will request the data from the service catalog as a predefined catalog item.
- Imported test summaries are linked to pipeline executions and not to step executions.
- Only artifacts published using the artifacts keyword are imported.
- Test results are not displayed for artifacts that have expired. You can set the expiration date of an artifact by configuring the **expire_in** property in the pipeline. For more information on artifact expiration policies, see Artifact and job meta data expiration .
- SonarQube scan results are not imported.
- Only 6400 commits per branch can be imported in a single import.
- GitLab imposes the following restriction: While associating run commits to a pipeline execution, GitLab doesn't provide the starting part of the commit details in some scenarios. It

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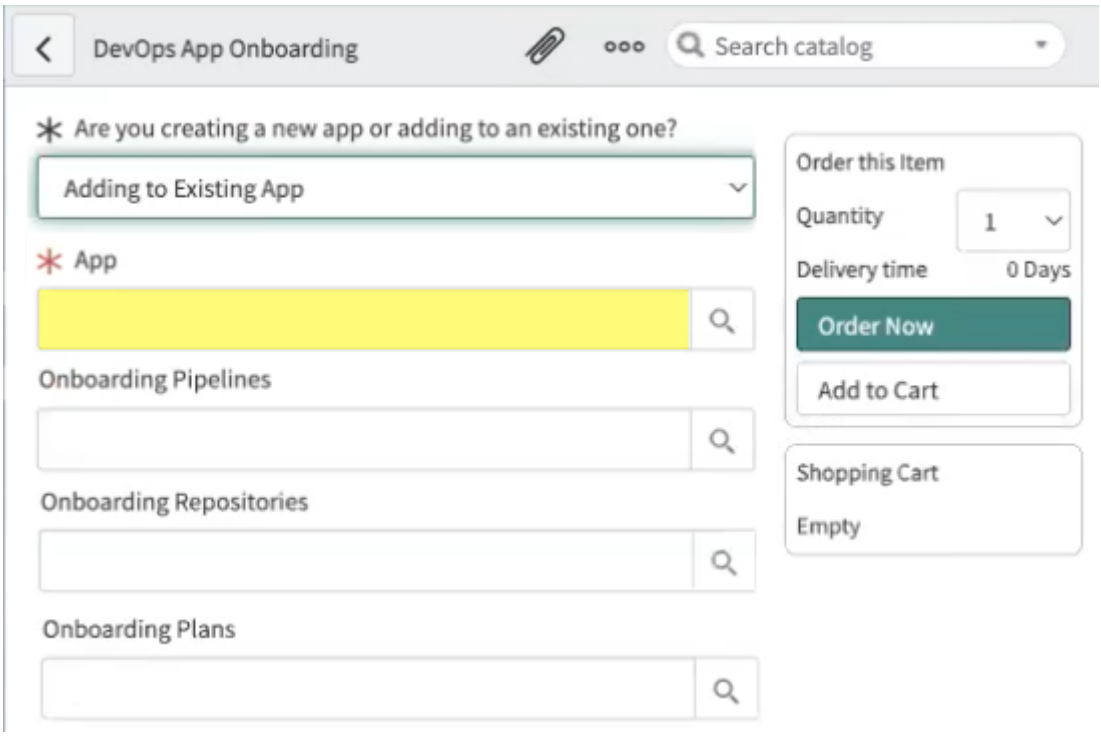
provides only the part before the SHA as '0000000000000000'. In such scenarios, the latest commit will be associated as the run commit. For example, when a new branch is created or when a pipeline is run manually.

**Note:**
The import process can take some time, hours for very large data sets.

### Procedure

1. Navigate to **All** > **Service Catalog** > **Catalog Definitions** > **My Catalogs** and then select **DevOps Onboarding**.
2. In the **Catalog Items** related list, select **DevOps App Onboarding**.
3. On the Catalog Item form, select **Try It** to request the data.
   The resulting DevOps App Onboarding form enables you to specify the catalog item to order. In this case, the "app" to order is your GitLab instance.




4. Select the Select in list icon ( ) on the **App** field and then select your instance of GitLab.
   Now that you have specified the instance, you will specify date range and sources of data to import.
5. Repeat the following procedure for each repository that you want to import:

   a. Select the Select in list icon ( ) on the **Onboarding Repositories** field and then select the item to import.
   You can select multiple items.

   b. Specify the range of dates for the data in the **Import From** and **Import To** fields.

**Note:**
The pipelines mapped to the repositories are automatically selected when you select the repository in the **Onboarding Repositories** field. You do not have to select the pipelines separately.

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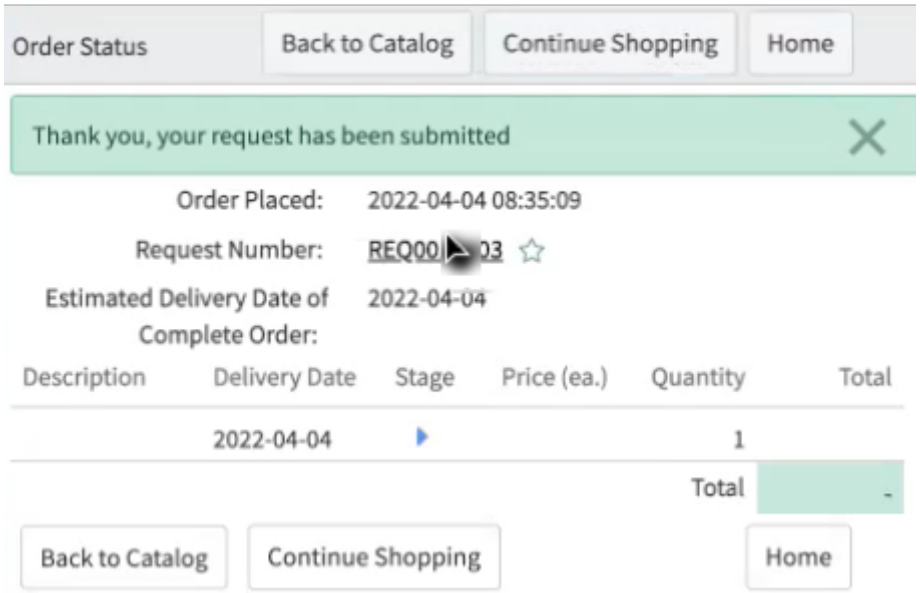
6. Select **Order Now**.
   Your request appears on the Order Status page.
7. Select the request number so you or another user with the admin role can approve the request.




8. Approve the request: On the Request form, set **Approval** and **Request state** to **Approved**.
   The import process begins immediately upon approval.

## Deleting a record in DevOps Change Velocity

Cascade record deletion is implemented to delete all dependent lower level DevOps records whenever a parent or higher level DevOps entity is deleted. Confirmation popups ensure that you understand that data will be lost when you delete a record (for example, the record of a tool connection).

For example, when a Plan record is deleted, all dependent Work Item, Plan Version, and many-to-many relation (like App to Plan, and Work Item to Plan Version) records are deleted.

DevOps cascade deletion is implemented for these tables.

- Pipeline, Pipeline Execution, Step, Orchestration Task, Task Execution
- Repository, Commit, Branch, Tag
- Plan, Work item, Plan Version
- DevOps Tool, Artifact Repository, Artifact, Test Summary / Performance test summary

## Delete action on a DevOps form

A user with the sn_devops.admin role can delete a DevOps record, but only if it meets the defined ACL criteria.

**Note:**
To see the **Delete** button on a form, you must have the sn_devops.admin role, and the current record must meet the criteria defined in the scripted ACL.

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| Entity | Scripted ACL criteria |
| --- | --- |
| Pipeline | A Pipeline record can be deleted only if no other pipeline executions from other pipelines are dependent on the artifact versions generated by the pipeline executions of this pipeline. |
| Pipeline Execution | A Pipeline Execution record can be deleted only if no other pipeline executions are dependent on the artifact versions generated by this pipeline execution. |
| Task Execution | A Task Execution record can be deleted if ALL of these conditions are met.<br>• There are no step executions referencing it.<br>• There are no downstream task executions referencing it.<br>• There are no pipeline executions dependent on the artifact versions built by this task execution. |
| Step | A Step record can be deleted only if there are no orchestration tasks or step executions referencing this step. |
| Orchestration Task | If the orchestration task has a step associated, it can be deleted only if there are no task executions referencing this orchestration task.<br>If the orchestration task does not have a step associated (example Jenkins freestyle job), it can be deleted only if no other pipeline executions are dependent on the artifact versions generated by the task executions of this orchestration task. |
| Repository | A Repository record can be deleted only if none of the commits of this repository are associated to the artifact versions (Artifact Version to Commit table) or task executions (Run Commit table).<br>Therefore, before cleaning up the repository, delete the dependent pipeline entities. |
| Branch | A Branch record can be deleted only if there are no commits associated to it in the Branch To Commit table. |
| Tag | A Tag record cannot be deleted by a sn_devops.admin. |

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| Entity | Scripted ACL criteria |
| --- | --- |
| Commit | A Commit record can be deleted if ALL of these conditions are met.<br>• The commit is not associated to the artifact version (Artifact Version to Commit table).<br>• The commit is not associated to task executions (Run Commit table).<br>• The commit is not being referenced by other commits as a revert commit. |
| Plan | A Plan record can be deleted only if none of the work items of this plan are associated or referenced by any commits. |
| Work Item | A Work Item record can be deleted if ALL of these conditions are met.<br>• The work item is not being referenced by another work item as parent.<br>• There are no commits referencing or associated to this work item. |
| Plan Version | A Plan Version record can be deleted only if there are no work items associated to it in the Work Item To Plan Version table. |
| Test Summary / Performance Test Summary | A Test Summary record can be deleted only if it doesn't have an associated related record (Artifact version/Package/Task Execution) in the Test Summary Relations table. |
| Artifact | An Artifact Record can be deleted only if all the artifact versions belonging to it are deletable. |
| Artifact Repository | An Artifact Repository record can be deleted only if all the artifacts belonging to it are deletable. |
| Artifact Version | An Artifact Version record can be deleted only if it's built by task execution field is empty. |
| Artifact Staged Request | An Artifact Staged Request record can be deleted when it is either an orphaned record, or the state is Processed / Error. |
| Package | A Package record can be deleted if ALL of these conditions are met.<br>• There are no pipeline executions referenced to it.<br>• The built by task execution value on the Package record is null. |
| DevOps Tool | A DevOps Tool record cannot be deleted by a sn_devops.admin. |

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| Entity | Scripted ACL criteria |
| --- | --- |
| Build Test Summary<br>Build Test Result<br>Commit Details<br>Event<br>Inbound Event | These entities cannot be deleted by a sn_devops.admin. |

## DevOps record delete cascade

Deleting a record in a parent table cascade deletes all the child records in the hierarchy.

| Parent record being deleted | Cascade deleted child records |
| --- | --- |
| Pipeline | Step: Orchestration Task<br>Pipeline Execution:<br>• Step Execution<br>• Callback<br>• Task Execution<br>  ○ Package<br>  ○ Run Commit<br>  ○ Test Summary Relations<br>  ○ Build Test Summary: Build Test Result<br>  ○ Artifact Version<br>  ▪ Artifact Staged Request<br>  ▪ Artifact Version To Commit<br>  ▪ Artifact Version To Package |
| Pipeline Execution | Step Execution<br>Callback<br>Task Execution:<br>• Package<br>• Run Commit<br>• Test Summary Relations<br>• Build Test Summary: Build Test Result<br>• Artifact Version<br>  ○ Artifact Staged Request<br>  ○ Artifact Version To Commit<br>  ○ Artifact Version To Package |

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| Parent record being deleted | Cascade deleted child records |
| --- | --- |
| Step | None.<br>A Step record can be deleted only if there are no Orchestration Task or Step Execution records associated to it. |
| Orchestration Task | Task Execution<br>• Package<br>• Run Commit<br>• Test Summary Relations<br>• Build Test Summary: Build Test Result<br>• Artifact Version<br>  ○ Artifact Staged Request<br>  ○ Artifact Version to Commit<br>  ○ Artifact Version to Package |
| Repository | Tag<br>Branch: Branch to Commit<br>Commit:<br>• Commit Details<br>• Branch to Commit<br>• Tag |
| Branch | Branch to Commit |
| Tag | No dependent child records. |
| Commit | Commit Details<br>Branch to Commit<br>Tag |
| Plan | Work Item<br>App to Plan<br>Plan Version: Work Item to Plan Version |
| Work Item | Work Item to Plan Version |
| Plan Version | Work Item to Plan Version |
| Test Summary / Performance Test Summary | Test Summary Relations |
| Artifact | Artifact Version |

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| Parent record being deleted | Cascade deleted child records |
| --- | --- |
| | • Artifact Staged Request<br>• Artifact Version to Commit<br>• Artifact Version to Package |
| Artifact Repository | Artifact<br>Artifact Version:<br>• Artifact Staged Request<br>• Artifact Version to Commit<br>• Artifact Version to Package |
| DevOps Tool | Event<br>Inbound Event<br>Test Summary / Performance Test Summary: Test Summary Relations<br>Plan:<br>• Work Item<br>• App to Plan<br>• Plan Version: Work Item to Plan Version<br>Artifact Repository<br>Artifact<br>Artifact Version:<br>• Artifact Staged Request<br>• Artifact Version to Commit<br>• Artifact Version to Package<br>Repository:<br>• Tag<br>• Branch: Branch to Commit<br>• Commit<br>◦ Commit Details<br>◦ Branch to Commit<br>◦ Tag<br>Pipeline<br>• Step: Orchestration Task<br>• Pipeline Execution |

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| Parent record being deleted | Cascade deleted child records |
| --- | --- |
| | ○ Step Execution<br>○ Callback<br>○ Task Execution<br>▪ Package<br>▪ Run Commit<br>▪ Test Summary Relations<br>▪ Build Test Summary: Build Test Result<br>▪ Artifact Version<br>▪ Artifact Staged Request<br>▪ Artifact Version To Commit<br>▪ Artifact Version To Package |

## DevOps record delete cascade exceptions

These records are always deleted in the foreground.

| Parent record being deleted | Cascade deleted child records |
| --- | --- |
| Artifact Version | These records are deleted along with Artifact Version.<br>• Artifact Staged Request<br>• Artifact Version To Commit<br>• Artifact Version to Package |
| Build Test Summary | These records are deleted along with Build Test Summary. |
| Package | These records are deleted along with Package.<br>• Artifact Staged Request<br>• Artifact Version to Package |

## Foreground deletion threshold property

Deletion of DevOps records occurs in the foreground (synchronously) by default. Meaning, other UI actions cannot be performed during synchronous deletion. Because the deletion of a parent record can result in the deletion of multiple child records, you can set a threshold value so the remaining records are deleted in the background.

**Note:**
Artifact Version, Build Test Summary, and Package records are always deleted in the foreground.

To set the DevOps Cascade delete threshold property, navigate to **DevOps** > **Administration** > **Properties**. Define the total number of records that can be cascade deleted in the foreground, after which the remaining records are deleted in the background. Default is 1000.

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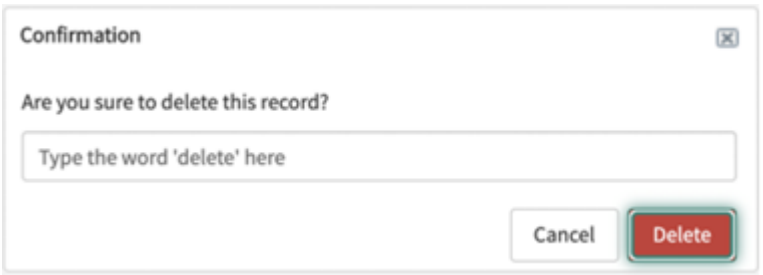
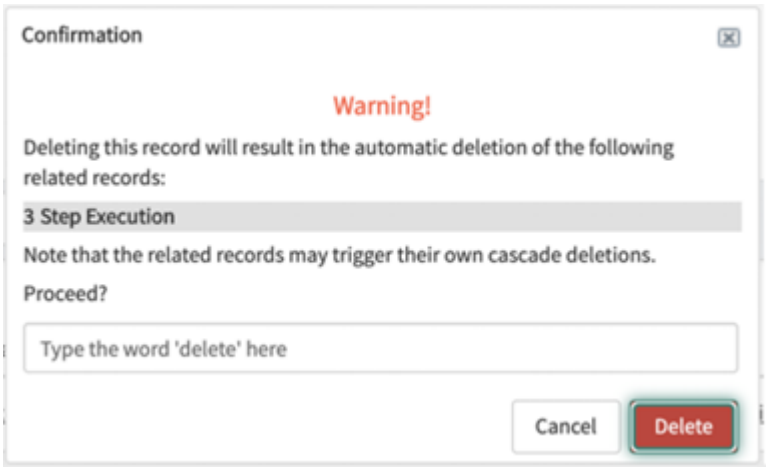
**Note:**
The records of tables in a hierarchy are deleted in a bottom-up manner. For example, it might be possible that even after triggering the delete action on a Repository record, it will still be available for read, write, and update in the system until deletion is complete.

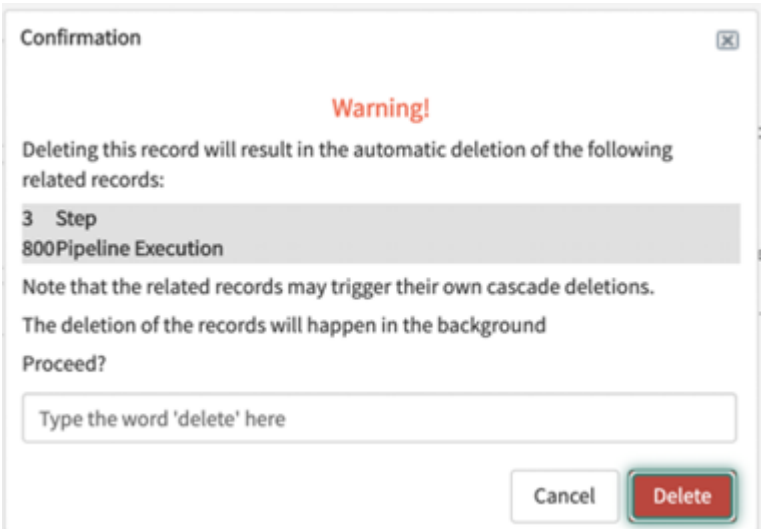
DevOps record deletions do not trigger any business rules or workflows.

## DevOps record deletion UI

Cascade delete of a DevOps record triggers multiple confirmation approvals.




## Software Quality Results

Software Quality Results display scan details from SonarQube scans configured on your GitHub Actions, Jenkins, Azure DevOps, or Harness pipelines.

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## Software Quality Results

You can configure SonarQube scan results from your GitHub Actions, Jenkins, Azure DevOps, and Harness pipelines to be fetched into ServiceNow DevOps. SonarQube notifications create inbound events which are then processed by base system subflows associated with all inbound events with Software Quality capability.

After you have configured SonarQube scans on your pipelines and configured the corresponding plugins, run the pipelines to fetch software quality scan results into ServiceNow DevOps. You can view the scan results by Scan ID for each SonarQube scan that was part of your build or release pipeline execution steps.

**Note:**
For Harness pipelines, you can configure SonarQube scans only through the generic Docker Container Image. For more information, Implement custom actions for pipelines using generic Docker container image. For GitHub Actions, Jenkins, and Azure DevOps, you can either use the corresponding plugins from the marketplace or the Docker container image.

### Software Quality Summaries

Software Quality Summaries shows you a summary of the scans that are run on the pipelines with SonarQube scans on the DevOps app on your ServiceNow AI Platform instance.

## Software Quality Summaries

1. Navigate to **Software Quality Results** > **Software Quality Summaries**.
2. Click a **Scan ID** record to view scan details.

The following Software Quality Scan Summary Details appear for the Scan ID.

**Software Quality Scan Summary results**

| Field | Value |
|---|---|
| Number | The Scan record number in the CMDB. |
| Initiated By | The user who initiated the scan |
| Scan ID | The unique Scan ID |
| Project Name | The SonarQube project name or key. |
| Last Scanned | Date Time stamp of the last scan |
| Scan URL | The SonarQube project URL you configured in the extension task. |
| Scanner name | The code quality scanner tool name. |
| Domain | The domain name in which the scans are configured in the instance. |
| Tool | The name of the SonarQube tool you created. |

**Note:**
The scanID, lastScannedBy, and initiatedBy details are not retrieved when you onboard Sonar using a non-admin user.

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The Software Quality Scan Details related list (for each Scan ID) displays for the following categories with a corresponding value signifying the count value against the scan result category.

Software Quality categories for Overall Code metrics:

- Coverage
- Bugs
- Reliability
- Rating
- Code
- Smells
- Duplications
- Security Rating
- Lines of Code
- Vulnerabilities
- Security hotspots
- Maintainability rating

Software Quality categories for New Code metrics:

- Duplications
- New Duplications
- Vulnerabilities
- New Vulnerabilities
- Technical Debt
- New Technical Debt
- Maintainability rating
- New Maintainability rating
- Bugs
- New Bugs
- Lines to Cover
- New Lines to Cover
- Lines of Code
- New Lines of Code
- Coverage
- New Coverage
- Reliability Rating
- New Reliability Rating
- Code Smells
- New Code Smells
- Security Rating
- New Security Rating

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- Security Review
- New Security Review
- Security Hotspots
- New Security Hotspots

### Software Quality subcategories

The Software Quality Scan Details related list (for each Scan ID) displays software quality subcategories that you can configure for results of the **Vulnerabilities** and **New Vulnerabilities** categories from the scan results.

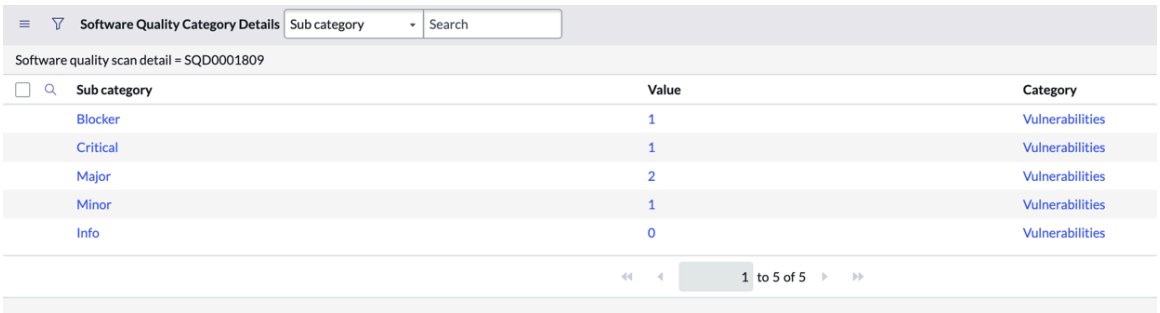
## Software Quality subcategories- Vulnerabilities and New Vulnerabilities

Use seeded subcategories or create new categories to prioritize and list your scan results of category type- Vulnerabilities and New Vulnerabilities.

1. Navigate to **DevOps** > **Integrations** > **Software Quality Sub Categories**.

   The Software Quality Sub Categories form displays with the following base-system subcategories:

   - Blocker
   - Critical
   - Major
   - Minor
   - Info




2. Click the **New** button to create custom sub categories.
3. On the form, fill in the fields.

### Software Quality Sub Category

| Field | Description |
|---|---|
| Label | A unique label for the sub category. |
| Domain | The domain in which the DevOps app is running. |
| Name | A unique name for the sub category. |
| Category | Select a category from the seeded base-system categories from the lookup list. |

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4. Click **Submit**.

   You have successfully created a custom sub category.

To view the Software Quality Scan Detail and the Software Quality Category Details related list > Sub category, follow these steps:

- View scan details as part of Task Executions. View details of all the Sonar scans that are part of the task execution mapped to a build or release pipeline execution step.

  1. Navigate to **DevOps** > **Orchestrate** > **Task Execution** click a relevant Task Execution record.
  2. Click the Software Quality Summary related list.
  3. Click a relevant Scan ID record.
     The Software Quality Scan Summary and Scan Details are displayed.

- View scan details as part of Change Request. View all the scans that were part of this build/ release pipeline in the **Software Quality Results** > **Software Quality Summary** related list.

  1. Navigate to **DevOps** > **Orchestrate** > **Pipeline Change Requests**
  2. Click the Software Quality Summary related list.
  3. Click a relevant Scan ID record.
     The Software Quality Scan Summary and Scan Details are displayed.

## Check permissions and update credentials for tools — Workspace

You can perform permission checks and update credentials like passwords and access tokens for your tools from the tool details page.

### Permission checks

You can perform permission checks on connected tools at any time, to verify if the existing credentials have the necessary permissions. This check helps to determine if there are possible impacts or if you must get a token or credential with higher-level permissions for the tool.

**Note:**

SonarQube and Rally doesn't have the option to check for permissions.

1. From the DevOps Change Workspace, navigate to Tools and select the tool to open the details page.

   The **Permission check result** field shows whether the tool credentials have all the necessary permissions, have partial permissions, or if permissions haven't been checked. The **Last Permission check** field tells you when the permission checks were previously run.

2. Click **More Actions**.

   - For Bitbucket, select **Check password permissions**.
   - For GitHub and GitHub Enterprise with OAuth credentials using the GitHub app, select **Check credential permissions** and then enter the **GitHub app slug name**. Click **Check permissions**.
   - For others, select **Check credential permissions**.

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You can see the status of the checks depending on your credential permissions. You need sufficient permissions on your credentials for seamless discovery and import.

3. If permissions aren't sufficient, it's recommended to update the credentials with those having higher-level permissions, or update the permissions for the objects on the external tool.

## Update credentials

You can update the tool credentials with credentials having sufficient permissions for seamless discovery and import of data from your tool.

1. From the DevOps Change Workspace, navigate to Tools and select the tool to open the details page.
2. Click **More Actions**. Depending on your tool, the options to update your credentials are displayed.

| Tool | Steps |
|---|---|
| Bitbucket | **a.** Click **Update password**.<br>**b.** Enter the user name and the new password.<br>**c.** Click **Check permissions**.<br>**d.** The permission check results are shown in the Permission check dialog box. If you are satisfied with the permissions for your tool, then update the credentials. |
| Azure DevOps | **a.** Click **Update credentials**.<br>**b.** Select the **Credential type**.<br>▪ If the credential type is **Basic Auth**, enter the new password or access token.<br>▪ If the credential type is **OAuth**, enter the new credential.<br>**c.** Click **Check permissions**.<br>**d.** The permission check results are shown in the Permission check dialog box. If you're satisfied with the permissions for your tool, then update the credentials.<br>**Note:** Since the DevOps tool maps to an Azure DevOps organization, the **Project Administrators** privilege requires the owner of the PAT to be a member of the organization's **Project Collection Administrators** group. |
| Jira, Jenkins, JFrog | **a.** Click **Update credentials**.<br>**b.** Select the **Credential type**. |

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| Tool | Steps |
| --- | --- |
| | ▪ If the credential type is **Basic Auth**, enter the new password or access token.<br>▪ If the credential type is **OAuth**, enter the new credential.<br>**Note:** OAuth 2.0 credentials are not available for Jenkins and JFrog.<br>**c.** Click **Check permissions**.<br>**d.** The permission check results are shown in the Permission check dialog box. If you're satisfied with the permissions for your tool, then update the credentials. |
| GitLab | **a.** Click **Update credentials**.<br>**b.** Select the **Credential type**.<br>▪ If the credential type is **Basic Auth**, enter the new password or access token.<br>▪ If the credential type is **OAuth**, enter the new credential.<br>**c.** Click **Check permissions**.<br>**d.** The permission check results are shown in the Permission check dialog box. If you're satisfied with the permissions for your tool, then update the credentials. |
| GitHub, GitHub Enterprise | **a.** Click **Update credentials**.<br>**b.** Select the **Credential type**.<br>▪ If the credential type is **Basic Auth**, enter the user name and new password or access token.<br>▪ If the credential type is **OAuth** using the GitHub app, enter the new credential. If you don't want to check for permissions, then click **Update** directly, and the credentials are updated.<br>To check the permissions, you must enter the **GitHub app slug name**.<br>▪ If the credential type is OAuth using the OAuth app (not the GitHub app) at GitHub end, enter the new credential.<br>**c.** Click **Check permissions**.<br>**d.** The permission check results are shown in the Permission check dialog box. If you're satisfied with the permissions for your tool, then update the credentials. |
| Argo CD, SonarQube, Rally | These tools don't check for permissions. To update credentials: |

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| Tool | Steps |
| --- | --- |
| | **a.** Click **Update credentials**.<br>**b.** Enter the user name and new password or access token.<br>**c.** Click **Update** to update the credentials. |

Permission checks are run on the new credentials. Once permissions check is completed, you can proceed with updating the credentials. If you want to abort the update, click **Cancel**.

### Permissions required for DevOps tools

Permissions required in your third-party tool to connect to DevOps Change Velocity.

## Azure DevOps permissions

**Important:**
With the access level permissions specified in the following table in Azure DevOps, and the ServiceNow DevOps extension, you can connect to Azure DevOps from ServiceNow. Your Azure DevOps admin does not have to manually configure webhooks and service connections in Azure DevOps.

**Important:**

- When onboarding a Project, the **Project Administrators** privilege requires the owner of the PAT to be a member of the project's **Project Administrators** group.
- When onboarding an Organization, the **Project Administrators** privilege requires the owner of the PAT to be a member of the organization's **Project Collection Administrators** group.

| Object | Permissions required | Impact |
| --- | --- | --- |
| Work Items | Read | Required to discover the boards and receive the work items either through import, polling, or real time with a configured webhook. |
| Code | Read | Required to discover repositories and receive branches, commits, and tags either through import, polling, or real time with a configured webhook. |
| Build | Read and execute | Read: Required to discover the build pipelines and receive pipeline execution details like stages, artifacts, test results, code security results, and so on, either through import, polling, or real time with a configured webhook. |

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| Object | Permissions required | Impact |
|---|---|---|
| | | Execute: Required to pause or resume the pipelines based on the change control step. |
| Release | Read, write, and execute | Read: Required to discover the release pipelines and receive pipeline execution details like stages, artifacts, test results, code security results, and so on, either through import, polling, or real time with a configured webhook.<br><br>Write and Execute: Required to pause or resume the pipelines based on change control step. |
| Test Management | Read | Required to receive test results for pipeline execution. |
| Service Connections | Read, query, and manage | Required to create Service connection automatically which is used to configure ServiceNow tasks like change acceleration, artifact, and package registration, and so on. |
| Packaging | Read | Required to discover the artifact repositories and receive the feeds and packages either through import, polling, or real-time with a configured webhook. |
| Permissions | Project Administrators | Required to create webhooks automatically to receive data in real-time and to create Service connections automatically which is used to configure ServiceNow tasks like change acceleration, artifact and package registration, and so on. |

### Limitation of Azure DevOps

If you create an Azure tool with custom defined access level, and you reconfigure such a tool because of change in your Integration user credentials, then the existing service hooks for release created and release deployment are not updated. Instead, two new service hooks are created with new configuration details. To avoid the duplication of these service hooks, you must create the tool with full access level.

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## Bitbucket

| Object | Permissions required | Impact |
|---|---|---|
| Permissions | Admin | Required to discover repos and fetch branches, commit, and tags either through import, polling, or configured webhook. |

## GitHub permissions

The following table lists the GitHub permissions for basic authentication.

| Object | Permissions required | Impact |
|---|---|---|
| repo | repo | Required to discover repositories and their respective workflows and receive branches, commits, pull requests, and tags either through import, polling, or real-time with a configured webhook. |
| admin:repo_hook | write:repo_hook | Required to create webhooks automatically to receive repo data in real time. |
| admin:repo_hook | read:repo_hook | Required to lookup already existing webhooks before any new webhook is automatically created to receive repo data in real time. |
| user | user:email | Required to discover pull requests actors like approvers, raised by, merged by, reviewers, and assignees either through import, polling, or real time with a configured webhook. |

The following table lists the GitHub permissions required for OAuth 2.0 authentication.

| Object | Permissions required | Impact |
|---|---|---|
| Actions | Read-only | Required to receive workflows associated to the respective repos real time with a configured webhook. |
| Contents | Read-only | Required to discover repositories and its respective workflows and receive branches, commits, and tags |

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| Object | Permissions required | Impact |
|---|---|---|
| | | either through import/polling or real time with a configured webhook. |
| Deployments | Read and write | Required to resume the workflow which has environment with ServiceNow change as an environment secret. |
| Environments | Read-only | Required to lookup for existing environment secrets for change creation. |
| Metadata | Read-only | Required to discover repositories and its respective workflows. |
| Secrets | Read-only | Required to get access to environment secrets (to create change). |
| Webhooks | Read and write<br>**Note:** Read and write permissions are required to configure webhooks from ServiceNow. | Required to create webhook automatically to receive repo data in real time. |
| Pull requests | Read-only | Required to discover pull requests and receive related details like pull request ID, commits, raised by, approvers, comments, reviewers, etc., either through import/polling or real time with a configured webhook. |
| Checks | Read-only | Required to process workflow events associated with private repositories. |

**Note:**
If you are connecting using a GitHub App and are experiencing issues with the permissions check, ensure that your GitHub App's Client ID prefix is available in the DevOps property: **Client ID specifier for GitHub App**. For more information, see Add Client ID to DevOps property

## GitLab permissions

| Object | Permissions required | Impact |
|---|---|---|
| api | Read and write | Required to discover plans, repos, and pipelines and receive branches, commit, |

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| Object | Permissions required | Impact |
| --- | --- | --- |
| | | and tags, and pipeline execution details (like stages, artifacts, test results, code security results), work items, tags, branches, and commits either through import, polling, or real time with a configured webhook. Also, to pause or resume the pipelines based on change control step. |

## Jenkins permissions

| Object | Permissions required | Impact |
| --- | --- | --- |
| Overall | Read | Required to discover the pipelines and receive pipeline execution details like jobs or stages, artifacts, test results, code security results, and so on, either through import, polling, or real time with ServiceNow DevOps Jenkins plugin. |
| Job | Read | Required to discover the pipelines and receive pipeline execution details like jobs or stages, artifacts, test results, code security results, and so on, either through import, polling, or real time with ServiceNow DevOps Jenkins plugin. |

## JFrog permissions

| Object | Permissions required | Impact |
| --- | --- | --- |
| Roles | Administer Platform | Required to access artifact details like artifact name, artifact repo, and artifact version. |

## Jira permissions

| Object | Permissions required | Impact |
| --- | --- | --- |
| Groups | jira-software-users | Required to discover plans and fetch features, stories, and so on, either through |

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| Object | Permissions required | Impact |
|---|---|---|
| | | import, polling, or configured webhook. |
| Permissions | Jira Administrators | Required to create webhooks automatically for fetching features and stories in real time. |

[store-future: BEGIN review]

### Agile Development 2.0 permissions

| Object | Permissions required | Impact |
|---|---|---|
| api | Read and write | Required to discover repos and pipelines and receive branches, commit, and tags, and pipeline execution details like stages, artifacts, test results, code security results, and so on, either through import, polling, or real time with a configured webhook. Also, to pause or resume the pipelines based on change control step. |

[End]

## Manual configuration mode in DevOps

As an alternative to making a connection using the standard setup process, you can use manual configuration mode to set up a webhook manually.

For example, if you do not have admin privileges for a tool (to allow automatic configuration the webhook URL), you can send an email to the admin of the tool requesting the ServiceNow instance be added to the webhook. Once the instance is added, you can **Enter Manual Configuration Mode** and change the **Connection state** field to Connected (to connect manually).

This way you only need read-only permission to the tool. Once the connection is made, click **Exit Manual Configuration Mode**.

**Note:**
The **Connection state** field can only be edited in manual configuration mode.

All planning, coding, and orchestration tool connections support manual configuration mode.

**Note:**
Connection state automatically changes to disconnected if there is a change in configuration, such as URL, credentials, alias, type, or MID Server settings.

## Configure webhooks from the tool record

Configure webhooks from the tool record to send data to DevOps Change Velocity after your tool is connected.

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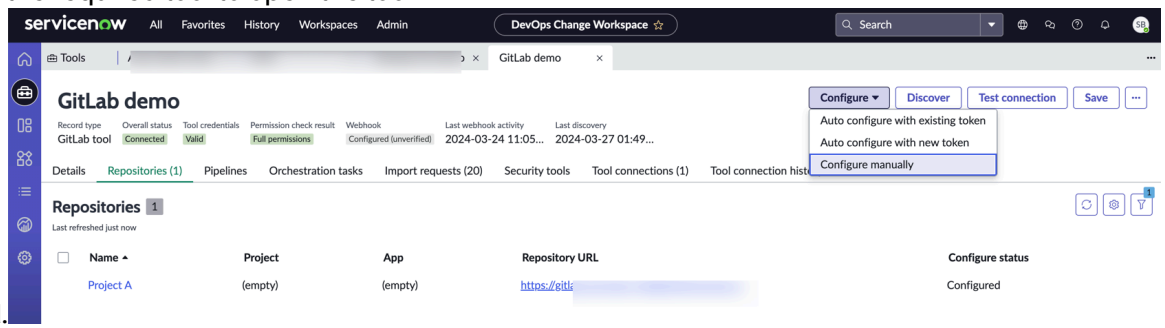
### Before you begin

Role required: sn_devops.admin or sn_devops.tool_owner in DevOps Change Velocity, and respective tool's admin access to access and configure webhooks.

### Procedure

1. Navigate to **All** > **Workspaces > DevOps Change Workspace > Tools**.
2. Select the required tool to open the tool record.




3. Select the **Configure** drop-down menu, and select one of the following actions.

> **Note:**
> You can also select the a Project, Plan, or Repository record and configure the corresponding webhooks for them specifically.

Webhooks are configured in your third-party tool's instance to send data to DevOps Change Velocity.

## Test webhooks manually

For tools including GitLab, Rally, Split.io, Jira, Bitbucket, and Argo CD, you have to test webhooks manually if there is any issue with the connection.

## GitLab

Role required:

- GitLab: GitLab admin privileges
- DevOps Change: sn_devops.admin or sn_devops.tool_owner

To test webhooks manually in GitLab, you must:

1. Navigate to GitLab and select the project for which you want to test webhooks.
2. Navigate to **Settings** > **Webhooks**.

   When your project is configured in DevOps Change Velocity, webhooks are created for that project in GitLab. These webhooks are available under **Project Hooks**.

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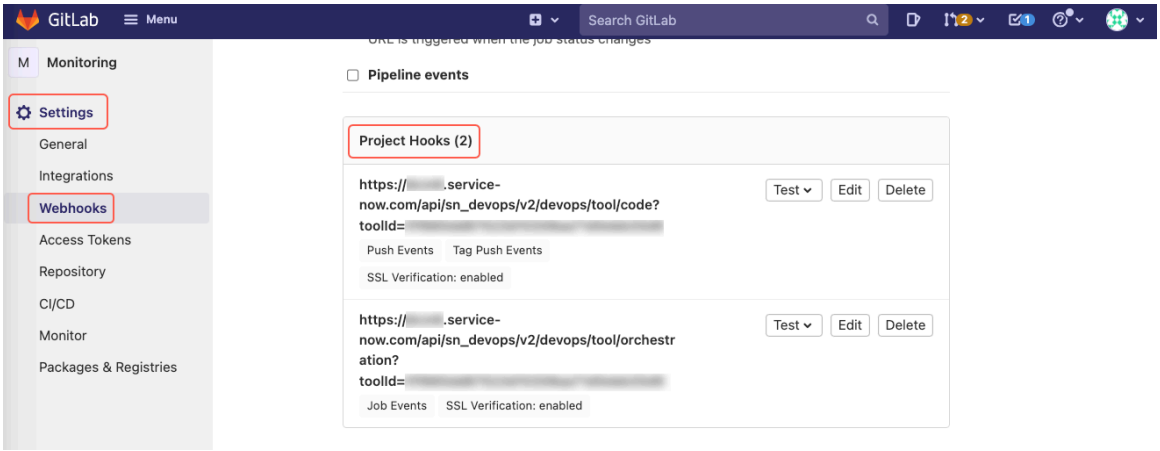
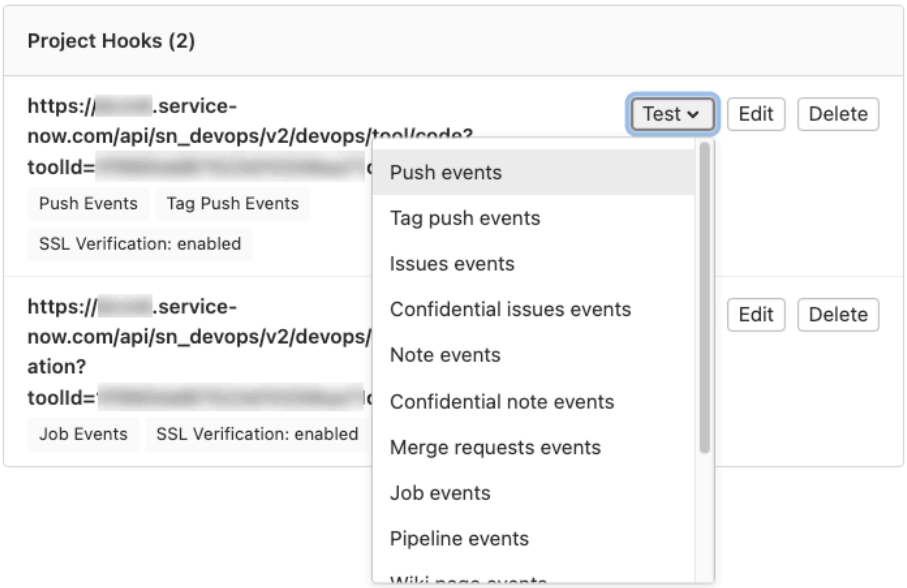


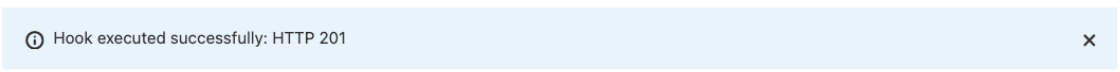

For each project, two webhooks are created. One is for code events and the other for orchestration events.

3. To test a webhook, select **Test** and select **Push events** from the list.




**Note:**
You can test for other events as well, for example Tag push events.

- If the webhook is configured correctly, you'll receive a success message. For example:




- If the webhook is configured incorrectly, you'll receive an error message. For example:




To fix a webhook, you can try the following options:

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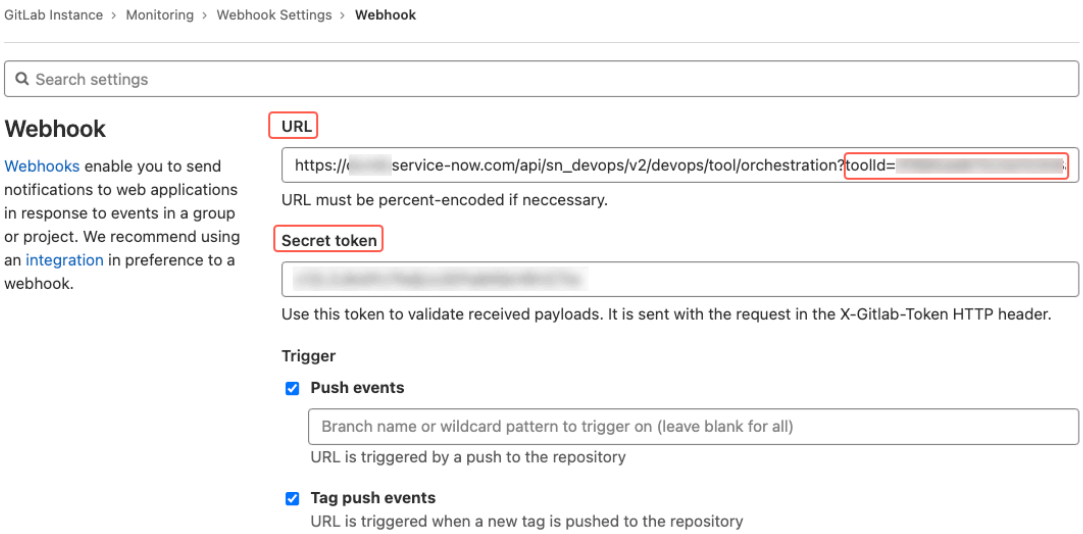
- Reconfigure the webhooks by selecting **Configure** from the project record page in DevOps Change Velocity. This reconfigures all the existing webhooks for the project.

- Select **Edit** for the webhook and verify if the *toolId* is correct in the **URL** field. Verify if the **Secret token** is correct.

  You can find the correct values in the tool record page in DevOps Change Velocity.




For detailed information about webhooks in GitLab, see Webhooks.

## Rally

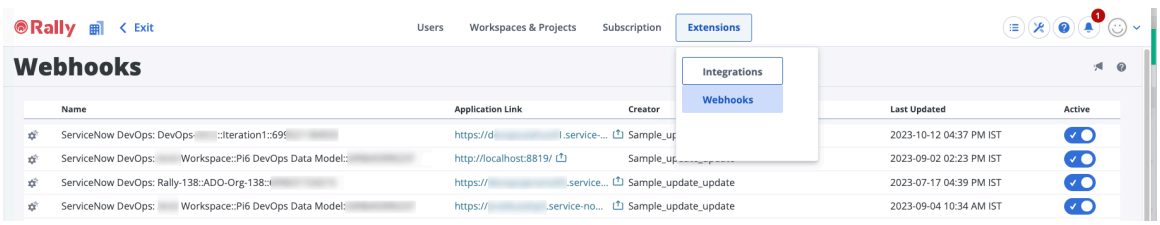
Role required:

- Rally: Rally admin privileges
- DevOps Change: sn_devops.admin or sn_devops.tool_owner

Rally doesn't provide an option to directly test for webhook connectivity. If you're not seeing Rally events in DevOps Change Velocity, you can try the following options:

- From your Rally instance, navigate to **My Settings** > **System Administration** > **Extensions** > **Webhooks**.

  Check if there's a corresponding webhook created for your DevOps Change instance, and that it's **Active**.




- Reconfigure the webhook by selecting **Configure** from the project record page in DevOps Change Velocity. This reconfigures the existing webhook for the project.

For detailed information about webhooks in Rally, see Manage Webhooks.

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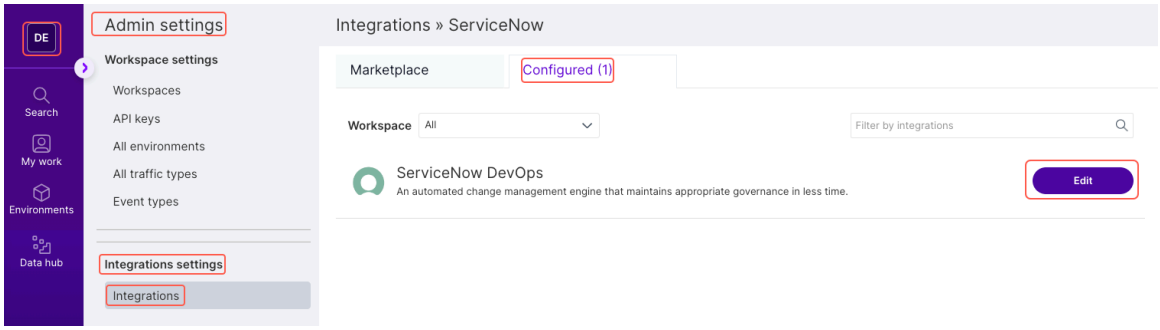
## Split.io

Role required:

- Split.io: Split.io admin privileges
- DevOps Change: sn_devops.admin or sn_devops.tool_owner

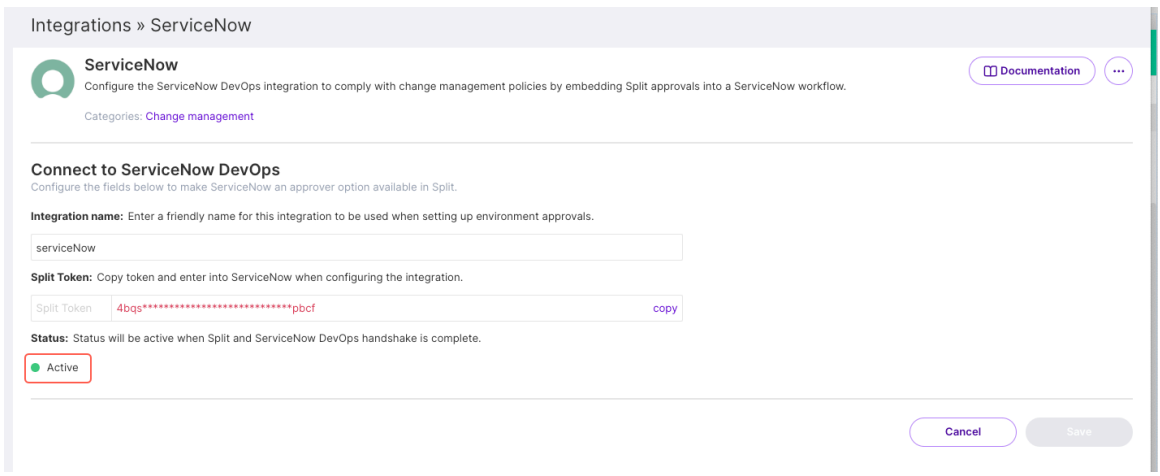
Split.io doesn't provide an option to directly test for webhook connectivity. If you're not seeing Split.io events in DevOps Change Velocity, you can try the following options:

- From your Split.io instance, navigate to **Admin Settings** > **Integration settings** > **Integrations**. Select the **Configured** tab, and select **Edit** for the ServiceNow DevOps application.




  Check if the ServiceNow DevOps application is configured correctly in Split.io. For details on configuring, see Enable integration with ServiceNow DevOps in Split tool.

- Check if the status of the ServiceNow DevOps application is **Active**.




- Reconfigure the webhook by selecting **Configure** from the tool record page in DevOps Change Velocity. This reconfigures the existing webhook for the Split.io tool.

You can also refer to ServiceNow integration with Split.io.

## Jira

Role required:

- Jira: Jira admin privileges
- DevOps Change: sn_devops.admin or sn_devops.tool_owner

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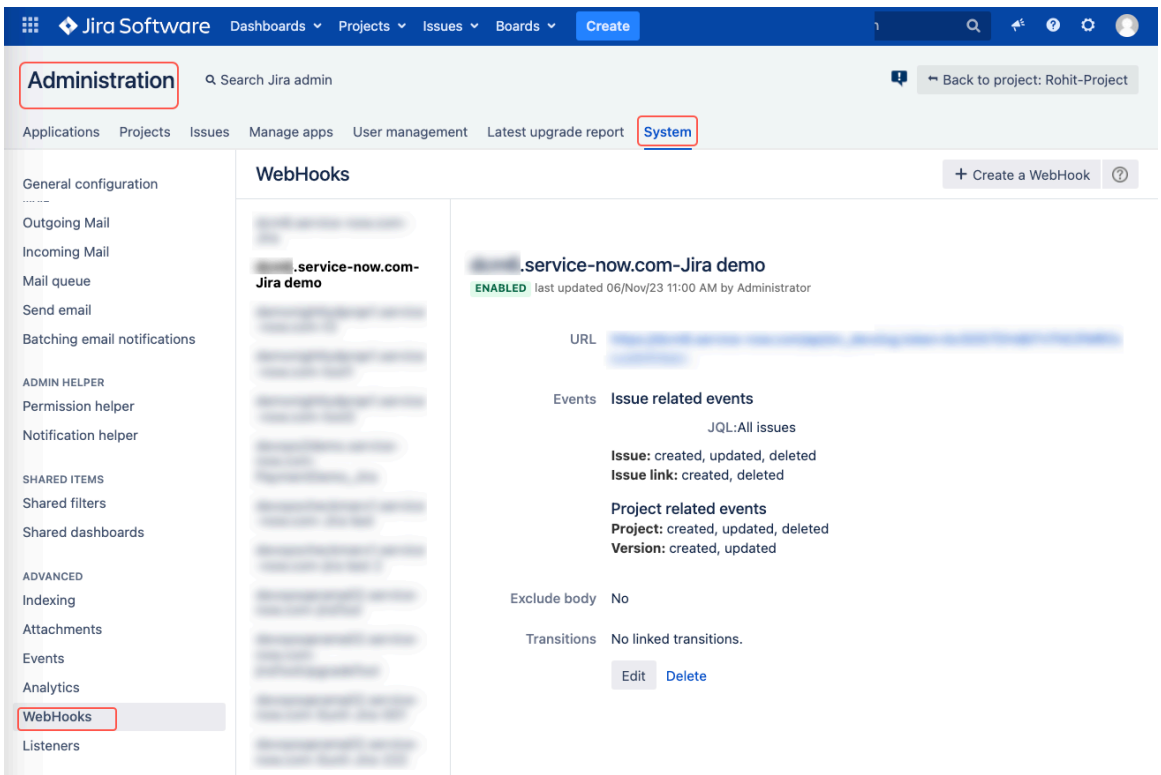
Jira doesn't provide an option to directly test for webhook connectivity. If you're not seeing Jira events in DevOps Change Velocity, you can try the following options:

- Navigate to:
  - For Jira Server navigate to **Administration** > **System** > **WebHooks**.
  - For Jira Cloud instance, navigate to **Settings** > **System** > **WebHooks**.

  Check if there's a corresponding webhook created for your DevOps Change instance.




- Select **Edit** for the webhook.
  - Check if the status is **Enabled**.
  - Check if the *Tool ID* in the **URL** field is correct. The *Tool ID* is the value after *?toolId=*.
  - Check if the secret token in the **URL** field is correct. Token value is at the end of the URL, after *token=*.

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You can find the correct values of the *Tool ID* and *Secret token* in the tool record page in DevOps Change Velocity.

For detailed information about webhooks in Jira, see Webhooks.

- Reconfigure the webhook by selecting **Configure** from the tool record page in DevOps Change Velocity. This reconfigures the existing webhook for the Jira tool.

  **Note:**

  If you have connected your Jira tool using OAuth 2.0 based authentication, the webhooks are created for the OAuth 2.0 integration app in Jira when you configure automatically, whereas if you have connected using basic authentication, the webhooks are created for all your projects in Jira. If you choose to configure the webhooks manually for a Jira tool created using OAuth 2.0 based authentication, a duplicate webhook may get created.

## Bitbucket

Role required:

- Bitbucket: Bitbucket admin privileges
- DevOps Change: sn_devops.admin or sn_devops.tool_owner

Bitbucket doesn't provide an option to directly test for webhook connectivity. If you're not seeing Bitbucket events in DevOps Change Velocity, you can try the following options:

- Navigate to Bitbucket and select the repository for which you want to test webhooks. Navigate to **Repository settings** > **Workflow** > **Webhooks**.

  Check if there's a corresponding webhook created for your DevOps Change instance.

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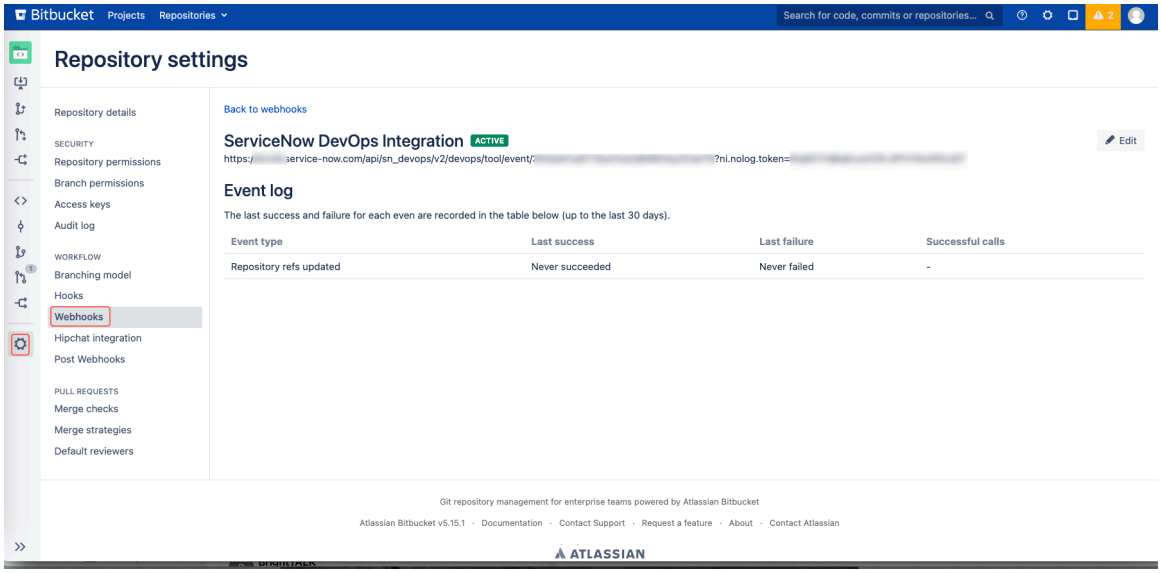
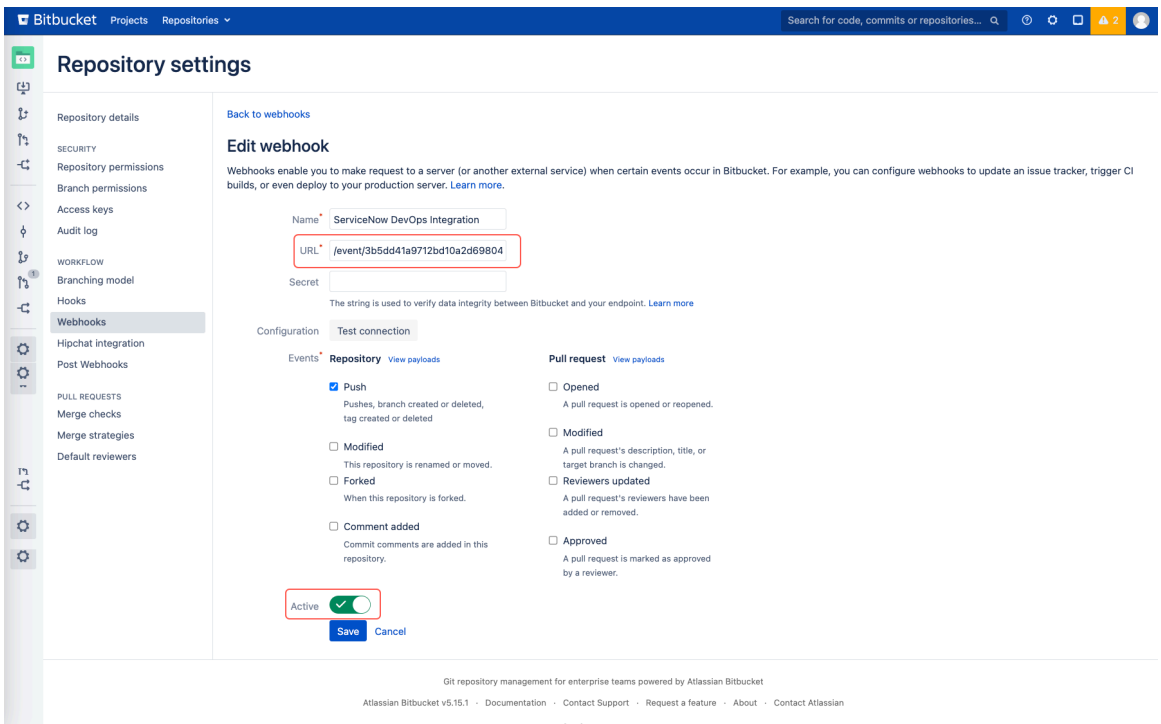



- Select **Edit** for the webhook.
  - Check if the status is **Active**.
  - Check if the *Tool ID* in the **URL** field is correct. The *Tool ID* is the value after */event/*.
  - Check if the secret token in the **URL** field is correct. Token value is at the end of the URL, after *token=*.

  You can find the correct values of the *Tool ID* and *Secret token* in the tool record page in DevOps Change Velocity.




  For detailed information about webhooks in Bitbucket, see Manage webhooks.

- Reconfigure the webhook by selecting **Configure** from the tool record page in DevOps Change Velocity. This reconfigures the existing webhook for the Bitbucket tool.

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## Argo CD

Role required:

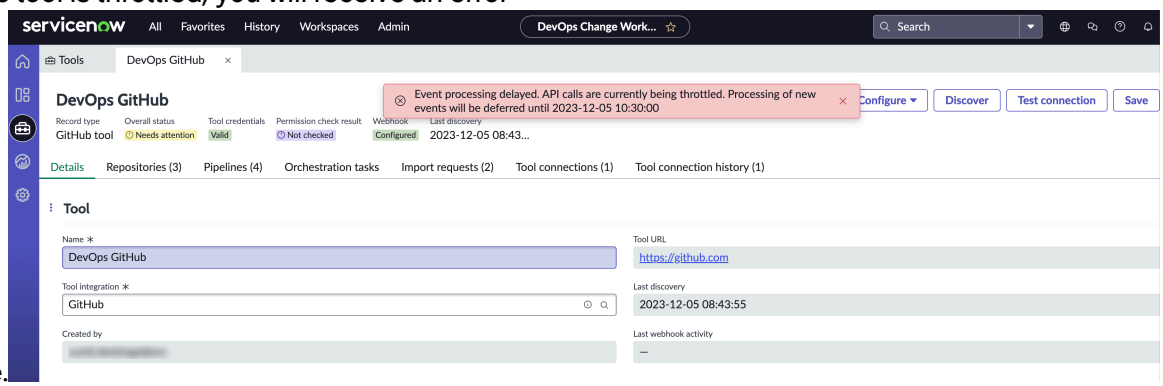
- Argo CD: Argo CD admin privileges
- DevOps Change: sn_devops.admin or sn_devops.tool_owner

Argo CD doesn't provide an option to directly test for webhook connectivity. To configure webhooks, see Configure webhooks in Argo CD manually.

## Tool throttling

In DevOps Change Velocity, when a tool is throttled, processing of new events is delayed until the throttling expires and the tool status changes to **Throttled**. This is available for Azure DevOps, GitHub, and GitLab.

When the tool is throttled, you will receive an error message.




### Throttled status

Throttled status means that the tool is not allowing API requests to get data because it has reached or exceeded a certain usage limit. API response has a rate limit or too many request errors. In that case, DevOps tool status is changed to **Throttled**.

### Why does this happen

Some tools limit the number of API requests that can be made within a specific amount of time. This limit helps prevent abuse and denial-of-service attacks, and ensures that the API remains available for all users.

When this happens, the DevOps tool status is changed to **Throttled** and further inbound events aren’t processed until the rate limit imposed by the tool is removed. Till that time, the inbound events will be in the **Deferred** state. After the throttle expires, processing of events resumes.

### How to reset the throttle

Generally, the tool API provides the information about how long the rate limit will be imposed. This indicates the throttle reset time. This information is used to resume API requests for that tool, if there are any pending inbound events or discover or historical import requests.

If a tool doesn't provide the throttle reset time, the default value, which is 15 minutes is applied. The default value can be changed using the property *`Default throttle reset time in minutes from current time`* (sn_devops.throttle.reset.time.default), from the DevOps properties page.

### Where to check for the throttled status and reset status

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Tool Connection Status (sn_devops_tool_connection_status) table contains tool throttling related information. It has columns like tool, throttle reset time, throttle active, which indicates which tool is under throttle, when this throttle will be reset, and whether the throttle is active or




not.

REST_RATE_LIMIT_ERROR will be logged in DevOps error logs. Also, the tool under throttle will have **Throttled** status.

## Inbound event table data archiving and cleanup

Use table cleaners on the inbound events table to purge event data records beyond a specified period. Configure a retention policy with table rotation on the auto-flush form to manage table size growth and archiving data beyond the specified duration.

## Data management

The data management feature allows you to enable archiving and purging of inbound event data. Database rotation and table cleanup configurations are enabled to ensure that eight weeks of event data is retained. Instance performance is preserved using ServiceNow AI Platform features such as Database rotation, table rotation, and table cleanup. A scheduled job is auto-enabled two weeks after you upgrade.

## Table rotation on processed inbound events table

The DevOps processed inbound events [sn_devops_processed_inbound_event_list.do] table contains copies of event data from the DevOps inbound events [sn_devops_inbound_list.do] table, that is in state '*processed*' and '*ignored*'.

The processed inbound events table has the table rotation feature enabled. In all, there are eight preconfigured shards, each containing a week's event data from the DevOps inbound event table. By default, once you have 56 days (7 days) (Duration) *8 shards (Rotations) of data in the processed inbound table, table rotation is activated. For more information on applying table rotation, see Apply table rotation

**Tip:**
To modify table rotation configuration, navigate to **System Definitions** > **Table Rotation** and open the record for DevOps processed inbound events table.

## Scheduled jobs and Table cleaners

**Important:**
A scheduled job is auto-enabled two weeks after you upgrade . The scheduled job will run every seven days and is deactivated after the last update.

Scheduled jobs activate tables cleaners on the inbound events if either of the following scenarios are met:

- A week after you upgrade, and the processed inbound table has records older than seven weeks.
- Two weeks after you upgrade.

The table cleanup feature for the inbound events table [sn_devops_inbound_table] has two cleaners that are part of the base system upgrade.

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1. Table cleaners are activated and run on the inbound events [sn_devops_inbound_table_list.do] for events in the following states.
   - *Processed*
   - *Ignored*

   based on the value specified in the **Age in seconds** field against the value in `sys_created_on` field.
2. Table cleaners are activated and run on the inbound events table [sn_devops_inbound_table_list] for events in the following states.
   - *New*
   - *Retry*
   - *In-progress*
   - *Deferred*

   based on the value specified in the **Age in seconds** field against the value in `sys_created_on` field.

**Note:**
By default, table cleaners are run on the inbound events table for these states from the time the schedules jobs are activated. The default value in the **Age in Seconds** field is 4,838,400 seconds (56*24*60*60).

## Auto-updates to table cleaner frequency

Events in states *processed* and *ignored* are backed up and copied to the processed inbound events [sn_devops_processed_inbound_event_list] table. By default, the process cleaners are auto-updated to an interval of 30 minutes or 1800 seconds, on the inbound events table, if the following conditions are met:

- Two weeks have passed since the scheduled job is active.
- The processed inbound event table has event data older than 7 weeks.

## Data archiving rules for DevOps tables

Base system table archiving rules ensure that DevOps data stored in the Configuration Management Database (CMDB) are systematically archived and purged.

## Archiving rules for DevOps data in CMDB tables

Data archiving involves managing table size growth and archiving old data. It moves data that is no longer needed every day from primary tables to a set of archive tables. For more information, see Data archiving. Base-system archive rules are configured to auto-archive DevOps tables that are older than a specified period. An archive table is created for any table that has an archive rule associated with it. You can also choose to restore data from archive tables.

**Note:**
While you can restore any record from the archive tables. Once archived data is restored, the same data is no longer auto-archived. For more information, see Manage archived data.

- Navigate to **System Archiving** > **Archive Rules** and select the individual archive rule whose data you restored.
- Enable the **Auto rearchive** check box, to resume auto-archiving for that archive rule.

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## Modify base system value for archive rules

You can configure the auto archive duration for all the archive rules that are applicable to DevOps tables from the **Auto archive (in months)** DevOps system property. By default, this property's value is set to 9 (months). Navigate to **DevOps** > **Administration** > **Properties** > **Auto archive (in months)**, to modify the value. For more information on configuring data archiving, see Create an archive rule

The following list indicates the tables that are auto-archived.

### Auto-archived DevOps tables

| Table | Table Name | Archived table name |
|---|---|---|
| Artifact Staged Request | sn_devops_artifact_staging | ar_sn_devops_artifact_staging |
| Artifact Version | sn_devops_artifact_version | ar_sn_devops_artifact_version |
| Branch | sn_devops_branch | ar_sn_devops_branch |
| Build Test Result | sn_devops_build_test_result | ar_sn_devops_build_test_result |
| Build Test Summary | sn_devops_build_test_summary | ar_sn_devops_build_test_summary |
| Callback | sn_devops_callback | ar_sn_devops_callback |
| Commit | sn_devops_commit | ar_sn_devops_commit |
| Commit Details | sn_devops_commit_details | ar_sn_devops_commit_details |
| Deployed Artifact to TaskExecution | sn_devops_m2m_artifact_execution | ar_sn_devops_m2m_artifact_execution |
| Artifact Version to Commit | sn_devops_m2m_artifact_version_commit | ar_sn_devops_m2m_artifact_version_commit |
| Branch To Commit | sn_devops_m2m_branch_commit | ar_sn_devops_m2m_branch_commit |
| Run Commit | sn_devops_m2m_commit_execution | ar_sn_devops_m2m_commit_execution |
| Commit To Work Item | sn_devops_m2m_commit_work_item | ar_sn_devops_m2m_commit_work_item |
| Pipeline Execution | sn_devops_pipeline_execution | ar_sn_devops_pipeline_execution |
| Software Quality Scan Summary | sn_devops_software_quality_scan_summary | ar_sn_devops_software_quality_scan_summary |
| Software Quality Scan Summary Relations | sn_devops_software_quality_scan_summary_relations | ar_sn_devops_software_quality_scan_summary_relations |
| Step Execution | sn_devops_step_execution | ar_sn_devops_step_execution |
| Tag | sn_devops_tag | ar_sn_devops_tag |
| Task Execution | sn_devops_task_execution | ar_sn_devops_task_execution |
| Task Summary | sn_devops_test_summary | ar_sn_devops_test_summary |
| Test Summary Relations | sn_devops_test_summary_relations | ar_sn_devops_test_summary_relations |
| Work Item | sn_devops_work_item | ar_sn_devops_work_item |

The data archiving rules feature considers and honors parent rules before individual archive rules are run. If you have an associated parent archive rule, the child rules are run only when the parent rules are run. Similarly, when you modify individual rules, you must first disable or disassociate the parent archive rule, make the configuration changes, and re-enable the parent archive rule. Changes to the **Auto archive (in months)** DevOps property overrides any

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configuration changes made to the duration of child archive rules. For example, you could update the archive rule condition for any of the **Active** DevOps archive rules to a custom value, say three months instead of the default 9 months. However, if you modify the **Auto archive (in months)** DevOps property, all modifications made to the conditions of individual archive rules are overwritten by the value in the **Auto archive (in months)** system property.

**Note:**
The override function is binding for all scenarios except:

- When an archive rule does not belong to the DevOps scope.
- When an archive rule belongs to the DevOps scope but is inactive.

## Base system destroy rules for DevOps data

Base-system destroy rules are also enabled and activated on all the archived DevOps tables. By default, data is deleted from an archived table after 36 months or 1095 days have passed from the time the data is stored in the archive table. For more information, see Create a destroy rule.

## Map spoke alias as parent alias for new DevOps tool

Create Jira, GitHub or Jenkins tool with parent alias set to respective spoke alias instead of DevOps Basic authentication. Use a script include to reset parent alias to spoke alias for existing or onboarded tool.

### Before you begin

**Important:**
This feature is currently supported for Jira spoke v3.1, Jenkins spoke v2.1.1, and GitHub spoke v2.2.2, and later only.

- Ensure that you have an Integration Hub subscription.
- Ensure that you have set up the connection and credential alias using spoke for Jira, Jenkins and GitHub . For more information, see:
  - Jira spoke
  - Jenkins spoke
  - GitHub spoke
- Upgrade to DevOps Data Model and DevOps Integrations version 1.33 or later.

Role required: admin, sn_devops.admin

### About this task

Whenever you create a Jira, Jenkins, and GitHub tool, the parent alias will be set to their respective spoke alias, if you have set up the spokes for the supported tools. In previous versions, when we created a tool, the parent alias was set to DevOps Basic Auth (sn_devops.DevOps_BasicAuth) for all the tools we onboarded.

If you have already created / onboarded tools with a connection and credential alias; the functionality does not change on upgrade and the parent alias remains DevOps Basic Auth (sn_devops.DevOps_BasicAuth) unless Jira, Jenkins, and GitHub tools are associated to spoke alias as parent alias. You can use a base system script include to ensure that the parent alias is reset to the spoke alias, for all existing and supported tools that were created earlier.

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**Note:**
Integration Hub uses aliases to manage connection and credential information. Using an alias eliminates the need to configure multiple credentials and connection information profiles when using multiple environments. If the connection or credential information changes, you don't need to update any actions that use the connection. For more information, see Connections and Credentials.

### Procedure

1. Navigate to **All** > **System Definition** > **Script Includes** > **DevOpsReparentingConnectionAliasFixScript**.
2. Copy the script from the **Script** field.
3. Navigate to **System Definition** > **Scripts - Background**.
4. Paste the script in the **Run script (JavaScript executed on server)** field.

**Note:**
Ensure that the script is run in Global scope.

Once the script run is successfully completed, all supported tools created prior to the version 1.33 upgrade, are reset to their corresponding parent alias.

### What to do next
Verify that the parent alias is set to sn_jira_spoke.Jira for Jira, sn_github_spoke.GitHub for GitHub, and sn_jenkins_v2_spoke.Jenkins_v2 for Jenkins in the **Connection & Credentials Aliases** form.

## Delete orphan connection and credential aliases

Delete the connection and credential aliases that do not label any connection or credential record by running a background script. This helps you in freeing up space in your system.

### Before you begin
Role required: System Admin (admin)

### Procedure

1. Navigate to **All** > **System Definitions** > **Scripts - Background**.
2. Select the scope as **global**.
3. Enter the following script in the **Run script (JavaScript executed on server)** pane.

```
deleteOrphanAliases();
function deleteOrphanAliases() {
    var orphanAliases = new GlideRecord('sys_alias');
    orphanAliases.addEncodedQuery("nameSTARTSWITHDevOps-_-");
    orphanAliases.query();
    while(orphanAliases.next()) {
        if
 (!checkIfAliasHasConnection(orphanAliases.getUniqueValue()))
            orphanAliases.deleteRecord();
    }
};
function checkIfAliasHasConnection(sysAliasId) {
    var httpToolConnGR = new GlideRecord("http_connection");
    httpToolConnGR.addEncodedQuery("connection_alias=" +
 sysAliasId);
```

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```
    httpToolConnGR.query();
    if (httpToolConnGR.next())
        return true;
    return false;
};
```

4. Select **Run script**.

## DevOps Retry Policy

Enable the DevOps Custom HTTP Retry Policy for most tool communication from ServiceNow flows to automatically retry failed requests when a step encounters an intermittent issue, such as a network failure or request rate limit.

You can navigate to the action in **Flow Designer > Designer > Actions** and in the REST step, select **Enable Retry Policy**. For the DevOps Custom HTTP Retry Policy to take effect, override the default policy for the alias and select the DevOps retry policy.

To customize the retry configuration, access the DevOps Custom HTTP Retry Policy settings in **IntegrationHub > Retry Policy**.

## Commits and task executions in DevOps

Run commits in DevOps are associated to a task execution.

For a commit to show up as a run commit, the commit record must exist in ServiceNow prior to the job/pipeline run.

In the event that jobs are rerun on the same commit, these conditions apply.

- Azure DevOps doesn't show any run commits.
- GitLab displays only the last commit as a run commit.
- Jenkins displays only the last commit as a run commit on which it was run. The difference of all commits isn't shown.

Multiple commits in a single payload (commit arrays) have these limitations.

| Tool | Max commits per payload |
|---|---|
| Azure DevOps | • If the DevOps property **Enable whether Azure DevOps Run Commits must be determined from the last successful pipeline build** is enabled, DevOps Change will pick up the last commits, up to a maximum of 2000, created after the last successful pipeline build from Azure DevOps as part of Run Commits.<br>• If disabled, only the last 200 commits will be considered for Run Commits. |
| GitHub | • If the DevOps property **Enable whether GitHub Run Commits must be determined from the last successful workflow run** is enabled, DevOps Change will pick up the |

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| Tool | Max commits per payload |
| --- | --- |
| | first 2000 commits after the last successful workflow run in GitHub as part of Run Commits.<br>• If disabled, only the last commit will be picked up for Run Commits. |
| GitLab | 20 |

## Associating multiple work items to a commit in DevOps

Multiple work items for a commit are supported in DevOps for Azure DevOps, Bitbucket, GitHub, and GitLab.

Work item syntax in the commit message can be customized to reflect the processes in your organization using the DevopsCommitMessageParserSNC script include in the **System Definition > Script Includes** module.

In order to link the commits with work items, the work item native ID is extracted from the commit message. In the base system, DevOps supports following commit message formats:

```
/**
     * Supported patterns
     * Colon pattern
        * Sample supported formats:
            *   1. STRY1,STRY2: Additional bug fixes
            *   2. STRY1 , STRY2 : Additional bug fixes
            *   3. STRY1, STRY2 : Additional bug fixes
     * Hash pattern
        * Sample supported formats:
            *   1. Fixes for #STRY1, #STRY2, #STRY3
            *   2. Fixes @$#3 and #1 work item
            *   3. Fixes for #STRY1 #STRY2 #STRY3
            *   4. Fixes for AB#123
     * Jira pattern
        * Sample supported formats:
            *   1. JRA-123 fixed
            *   2. JRA-123 JRA-234 JRA-345 resolved
     */
```

If you want to add support for additional message formats to meet the processes in your organization, you can add a custom logic in the `DevopsCommitMessageParser` script include by navigating to the **System Definition > Script Includes** module. `DevopsCommitMessageParser` script include extends from `DevopsCommitMessageParserSNC`. The `DevopsCommitMessageParserSNC` has three regular expressions defined for identifying work item native IDs for supported message formats in the base system. See the following example to include a new custom message format that has work item native IDs in square brackets.

```
var DevopsCommitMessageParser = Class.create();
DevopsCommitMessageParser.prototype =
 Object.extendsObject(DevopsCommitMessageParserSNC, {
    initialize: function() {

 DevopsCommitMessageParserSNC.prototype.initialize.call(this);
        this._customPattern = /\[(.*?)\]/g; // The regex pattern
 to match the words written inside square brackets.
```

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```
        // Example commits message to match this custom pattern
 is : "[STRY1], [STRY2] Additional bug fixes"
    },
    getWorkitemsFromCommitMessage: function(message, branchName)
 {
        var workitems = [];
        // We first call the getWorkitemsFromCommitMessage
 method from the parent class to get the matching workitems ids
 for OOB formats
        var defaultWI =
 DevopsCommitMessageParserSNC.prototype.getWorkitemsFromCommitMe
ssage.call(this, message, branchName);
        if (!gs.nil(defaultWI) && defaultWI.length > 0) {
            workitems = workitems.concat(defaultWI);
        }
        // Now call your custom method that returns an array of
 workitem native IDs matching custom pattern
        var customWI = this.getWIFromCustomPattern(message);
        if (!gs.nil(customWI) && customWI.length > 0) {
            workitems = workitems.concat(customWI);
        }
        // getUniqueWorkItems method from parent class removes
 duplicates from the workitems array
        workitems = this.getUniqueWorkItems(workitems);
        // return the final list
        return workitems;
    },
    getWIFromCustomPattern: function(message) {
        var wi = [];
        var l;
        var match;
        var matches = message.match(this._customPattern);
        if (gs.nil(matches))
            return wi;
        for (var i = 0; i < matches.length; i++) {
            l = matches[i].length;
            match = matches[i].substring(1, l - 1); // trim the
 brackets
            wi.push(match);
        }
        return wi;
    },
    type: 'DevopsCommitMessageParser'
});
```

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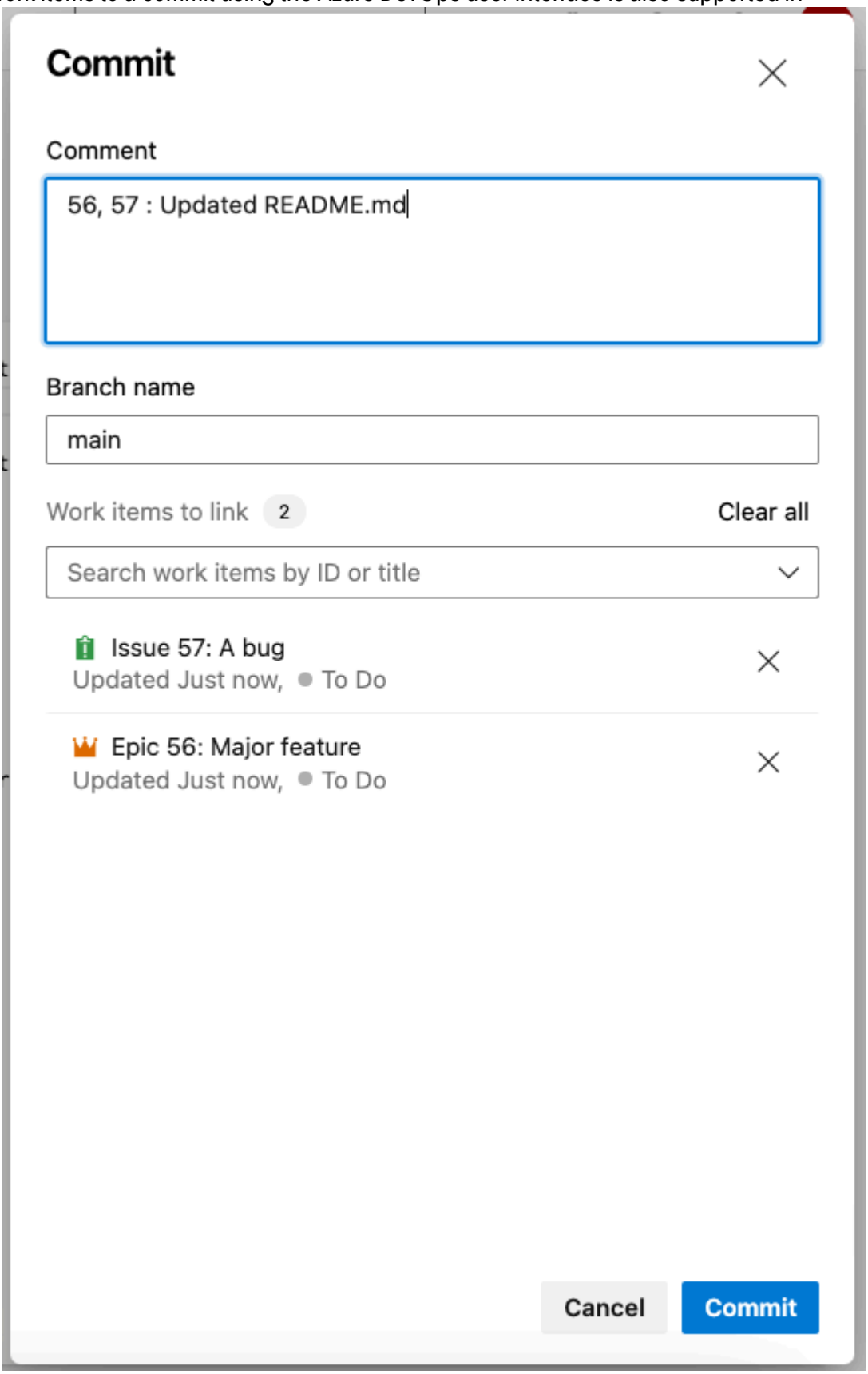
Linking work items to a commit using the Azure DevOps user interface is also supported in DevOps.




You can view the list of associated work items in the DevOps Commit record, and in the Pipeline UI.

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## Filter ignorable DevOps events

Filter out ignorable DevOps events before they trigger a Flow execution to improve performance.

Azure DevOps and GitHub tool integrations have a filtering mechanism that determines if any incoming event can be ignored before it causes a Flow to be triggered. Both the integrations have their own filters, which may be deactivated or overridden to alter the filtering criteria. These filters check whether the tool is connected, referenced object is tracked and is present in the system.

You can activate or deactivate these filters.

1. Navigate to **All** > **System Extension Points** > **Scripted Extension Points** and search for DevOps.
2. Select **sn_devops.DevOpsEventFilterAPI**.
3. From the **Extension Instances** section under **Related links**, select the extension instance of the tool for which you want to activate or disable the filter.
4. Select the **Active** check box to enable the filter.

   By default, the check box is selected. If you want to disable the filter, clear the check box.

## Disable recommendation prompts

Disable the prompts recommending the use of DevOps Change Workspace from appearing while creating tools and applications using Classic UI, Service Catalog, Service Portal, and Employee Service Center.

1. Navigate to **All** > **Service Catalog** > **Catalog Definitions** > **Maintain Items** and search for DevOps.
2. For each of the following 4 DevOps catalog items, you must edit the catalog client scripts to comment out the call to `showWorkspaceAdvertisement`.
   - Create DevOps Application
   - Create DevOps tool
   - DevOps App Onboarding
   - DevOps Tool Onboarding
3. Select each DevOps catalog item listed earlier and navigate to the **Catalog Client Scripts** tab under **Related Links**.
4. Select each script available under **Catalog Client Scripts**.
5. Search for the method `showWorkspaceAdvertisement`.
6. If present, comment it out.

   For example, `//showWorkspaceAdvertisement();`.

7. Save the changes.

## Domain separation and DevOps Change Velocity

Domain separation is unsupported for DevOps Change Velocity. Domain separation enables you to separate data, processes, and administrative tasks into logical groupings called domains. You can control several aspects of this separation, including which users can see and access data.

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### Support level: No support

- The domain field may exist on data tables but there is no business logic to manage the data.
- This level is not considered domain-separated.

For more information on support levels, see Application support for domain separation.

## Domain separation in DevOps Change Velocity overview

Use the ServiceNow® DevOps application with your DevOps toolchain to provide data insights, accelerate change, and increase visibility in your DevOps environment using a single system. In DevOps, domain separation targets tenant domain requester use cases in an application. The application has been designed to support requester activities within tenant domains. Logic is in place to route data to tenant domains, based on applicable use cases. The owner of the instance must be able to set up the application to function normally across multiple tenants. The application handles data routing to domains.

All tables in DevOps support data separation only; delegated domain separation is not supported.

To ensure that domain-sensitive information is not available at a global domain, ensure that you create policies at a domain level and not at a global level. While managing Service Providers, create policies at the Service Provider level. If you create policies at a global level instead, when you run the audit, the tag policy "run" findings are created in the Global domain, instead of respective domains.

**Related topics**

Domain separation for service providers

## DevOps Insights Standard dashboard - Classic

Use the DevOps Insights application with ServiceNow Performance Analytics to gain insight into your DevOps environment.

**Important:**
The Insights Standard dashboard is deprecated for new users. Instead, you can use the Insights dashboard from the DevOps Workspace. For more information, see DevOps Insights dashboard - Workspace

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**Note:**
To collect daily or historical Insights data, unless these jobs were previously customized, you must select **Active** and set the **Run As** credentials to **System Administrator**:

- **[DevOps] Daily Data Collection (Daily)** (active by default)

  **Note:**
  This is a scheduled job (to be run regularly) to collect daily DevOps data. For optimal performance, set this job to run during periods of low usage.

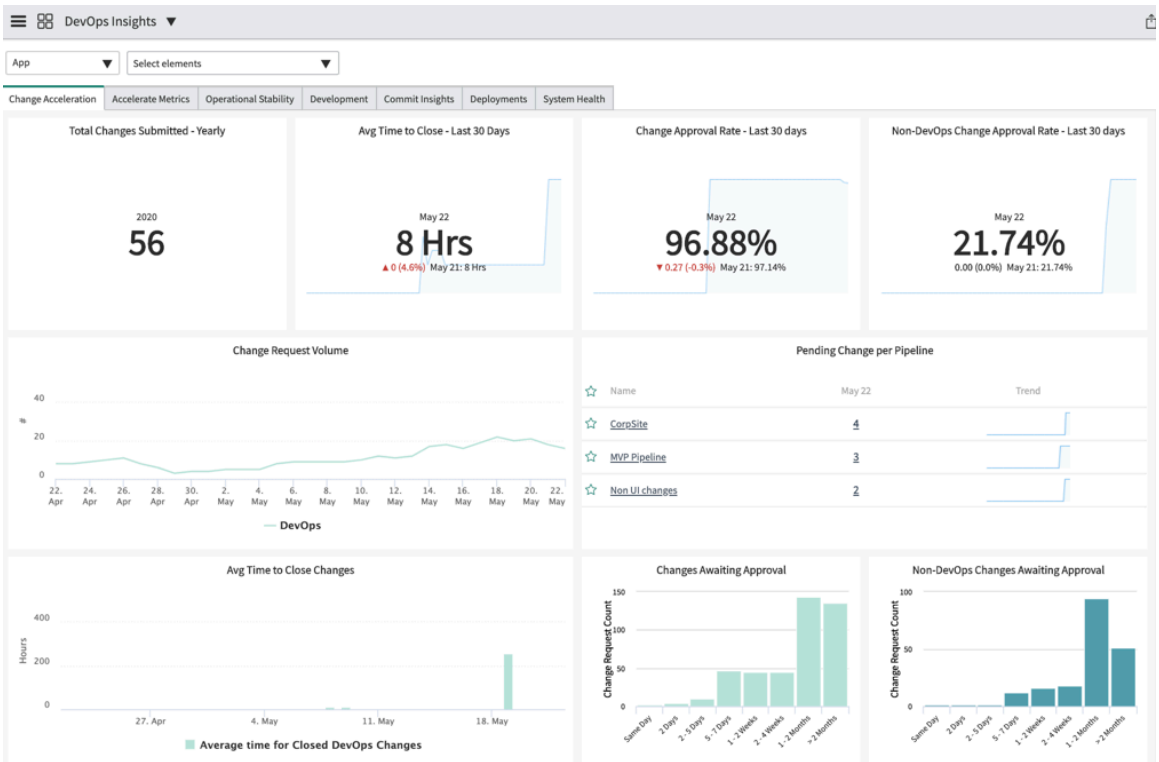
- **[DevOps] Historical Data Collection (On Demand)** (inactive by default)

  For new DevOps Insights installations, if you have already been using the DevOps app and you Installed DevOps Insights at a later date, run the Historical Data Collection job to collect historical Insights data.

  **Note:**
  This is a one-time job to collect historical DevOps data, and not meant to be on a schedule. It might take awhile, so plan on running this job during a period of low usage.

Reports in the dashboard tabs get updated when the dashboard is refreshed.

## Change Acceleration




### Change Acceleration

| Report | Source list | Description |
|---|---|---|
| Total Changes Submitted - Yearly | Change Request | Total DevOps changes submitted yearly. |

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### Change Acceleration (continued)

| Report | Source list | Description |
|---|---|---|
| Avg Time to Close - Last 30 days | Change Request | Average time to close DevOps changes in the last 30 days.<br>**Note:** This widget uses average aggregation and does not support multi-element selection. |
| Change Approval Rate - Last 30 days | Change Request | DevOps average change success rate for change requests in the last 30 days:<br>([[DevOps Change Success]] / [[DevOps Change]]) * 100<br>**Note:** This widget uses average aggregation and does not support multi-element selection. |
| Non-DevOps Change Approval Rate - Last 30 days | Change Request | Non- DevOps change approval rate for change requests in the last 30 days:<br>([[Non-DevOps Change Approval]] / [[Non-DevOps Change]]) * 100<br>**Note:** Filter is not applicable to this widget. |
| Change Request Volume | Change Request | Volume of change requests created for DevOps in the last 7 days.<br>Compare the number of change requests created after your transition to DevOps so you can see the advantage of running DevOps in your environment. |
| Pending Changes per Pipeline | Step Execution | Number of change requests that have not been closed for each pipeline.<br>See the blockages in each pipeline that are keeping |

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**Change Acceleration (continued)**

| Report | Source list | Description |
|---|---|---|
| | | the change request from being completed so you can investigate the cause. |
| Average Time to Close Changes | Change Request | Average time to close DevOps changes by app.<br><br>Compare DevOps change request statistics with non-DevOps change requests to see that DevOps change requests are getting resolved faster. |
| Changes Awaiting Approval | Change Request | Number of DevOps changes awaiting approval by date range.<br><br>Compare DevOps change request statistics with non-DevOps change requests to see that DevOps change requests are getting resolved faster. |
| Non-DevOps Changes Awaiting Approval | Change Request | Number of Non-DevOps changes awaiting approval by date range.<br><br>Compare DevOps change request statistics with non-DevOps change requests to see that DevOps change requests are getting resolved faster. |

## Accelerate Metrics

The Accelerate Metrics tab shows deployment frequency, lead time, MTTR, and change failure rate info.

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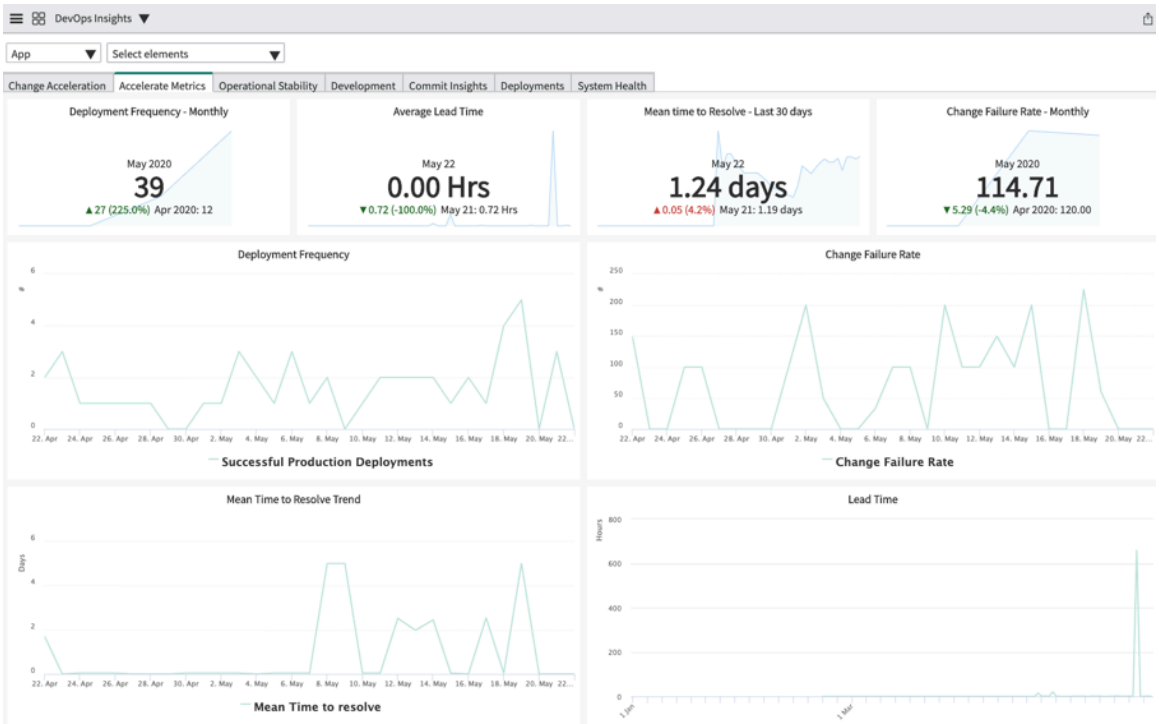


## Accelerate Metrics

| Report | Source list | Description |
|---|---|---|
| Deployment Frequency - Monthly | Step Execution | Number of successful production deployments in a month.<br><br>Applies to steps of type **Prod Deploy** that are in completed state. |
| Average Lead Time | Pipeline Execution | Average of:<br><br>([Time the code is successfully pushed to production] - [Earliest commit time])<br><br>Applies to steps of type **Prod Deploy** that are in completed state.<br><br>**Note:** This widget uses average aggregation and does not support multi-element selection. |
| Mean Time to Resolve - Last 30 days | Database view joined by Incident, Change Request, Step Execution, Step, Pipeline, and App lists. | Average resolve time for an incident caused by a DevOps change in the last 30 days. |

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**Accelerate Metrics (continued)**

| Report | Source list | Description |
|---|---|---|
| | | **Note:** This widget uses average aggregation and does not support multi-element selection. |
| Change Failure Rate - Monthly | Change Request | Average change failure rate in a month.<br>**Note:** This widget uses formula and does not support multi-element selection. |
| Deployment Frequency | Step Execution | Number of successful production deployments in the last 30 days.<br>Applies to steps of type **Prod Deploy** that are in completed state. |
| Change Failure Rate | Change Request | Average change failure rate in the last 30 days. |
| Mean Time to Resolve Trend | Database view joined by Incident, Change Request, Step Execution, Step, Pipeline, and App lists. | Daily average resolve time for an incident caused by a DevOps change. |
| Lead Time | Pipeline Execution | ([Time the code is successfully pushed to production] - [Earliest commit time])<br>Applies to steps of type **Prod Deploy** that are in completed state.<br>**Note:** This widget uses average aggregation and does not support multi-element selection. |

## Operational Stability

The Operational Stability tab shows:

- Service availability

  Average service availability and daily service availability.

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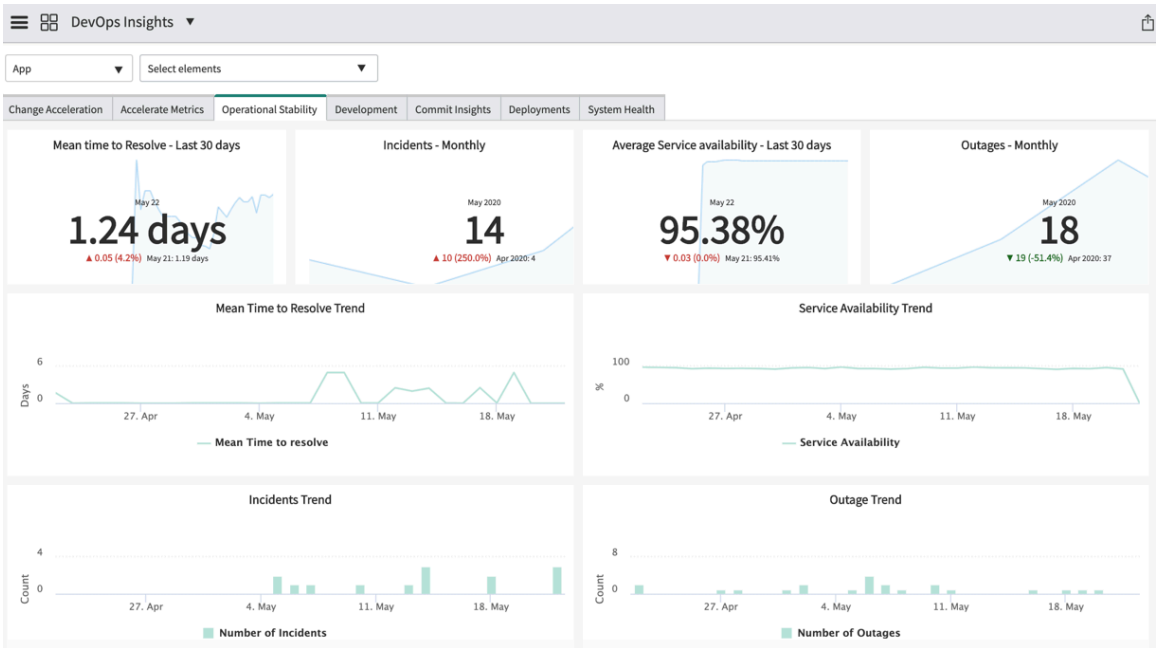
- Mean time to resolve (MTTR)

  Mean time to resolve and daily mean time to resolve.

**Note:**
You must install the Service Portfolio Management Foundation (com.snc.service_portfolio) plugin to see service availability widgets.

Demo data is also provided for the service availability widgets.

**Note:**
You must install the Service Portfolio Management Foundation (com.snc.service_portfolio) plugin before installing the DevOps Insights application to see demo data.




### Operational Stability

| Report | Source list | Description |
|---|---|---|
| Mean Time to Resolve - Last 30 days | Database view joined by Incident, Change Request, Step Execution, Step, Pipeline, and App lists. | Average resolve time for an incident caused by a DevOps change in the last 30 days.<br>**Note:** This widget uses average aggregation and does not support multi-element selection. |
| Incidents - Monthly | Incident | Number of incidents in a month (based on pipeline steps of type **Prod Deploy**) linked to business service in CMDB. |

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### Operational Stability (continued)

| Report | Source list | Description |
|---|---|---|
| | | This report provides an indication of environment stability. |
| Average Service Availability - Last 30 days | Database view joined by Service Availability, Service Offering, Business Service, Step, Pipeline, and App lists. | Average service availability in the last 30 days (based on pipeline steps of type **Prod Deploy**) linked to application service in CMDB.<br><br>This report provides an indication of environment stability. |
| Outages - Monthly | Outage | Number of outages in a month (based on pipeline steps of type **Prod Deploy**) linked to the associated business service in CMDB.<br><br>This report provides an indication of environment stability. |
| Mean Time to Resolve Trend | Database view joined by Incident, Change Request, Step Execution, Step, Pipeline, and App lists. | Daily average resolve time for an incident caused by a DevOps change. |
| Service Availability Trend | Database view joined by Service Availability, Service Offering, Business Service, Step, Pipeline, and App lists. | Daily average service availability (based on pipeline steps of type **Prod Deploy**) linked to application service in CMDB.<br><br>This report provides an indication of environment stability. |
| Incidents Trend | Incident | Daily number of incidents (based on pipeline steps of type **Prod Deploy**) linked to business service in CMDB.<br><br>This report provides an indication of environment stability. |
| Outage Trend | Outage | Daily number of outages (based on pipeline steps of |

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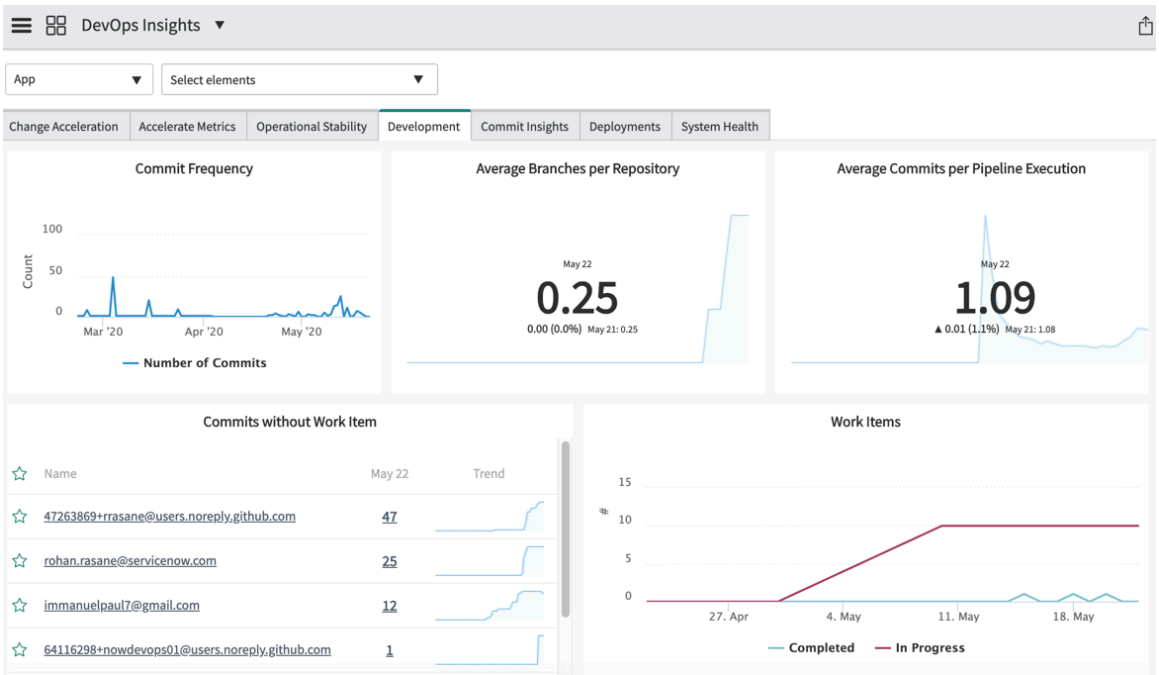
### Operational Stability (continued)

| Report | Source list | Description |
|---|---|---|
| | | type **Prod Deploy**) linked to business service in CMDB.<br><br>This report provides an indication of environment stability. |

## Development




### Development

| Report | Source list | Description |
|---|---|---|
| Commit Frequency | Commit | Number of commits measured daily.<br><br>Smaller more frequent commits are preferred over larger less frequent ones. |
| Average Branches per Repository | Branches, Repository | Average branches per repository on a given day.<br><br>**Note:**<br>This widget uses formula and does not support multi-element selection. |

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### Development (continued)

| Report | Source list | Description |
|---|---|---|
| Average Commits per Pipeline Execution | Commit, Pipeline Execution | Average commits per pipeline on in the last 30 days:<br><br>[[Total number of commits]] / [[Number of pipeline executions]]<br><br>**Note:** This widget uses average aggregation and does not support multi-element selection.<br><br>A low number is preferable, which indicates a concentrated effort, versus switching from task to task without completion. |
| Commits without Work Item | Commit | Commits made that are not tied to a work item, grouped by committer, in the last 30 days.<br><br>This report is useful for investigating and resolving why a commit is not tied to a work item, because all commits should be tied to a work item. |
| Work Items | Work Item | Number of work items that are complete or working in progress in the last 30 days.<br><br>**Note:** Filter is not applicable to this widget. |

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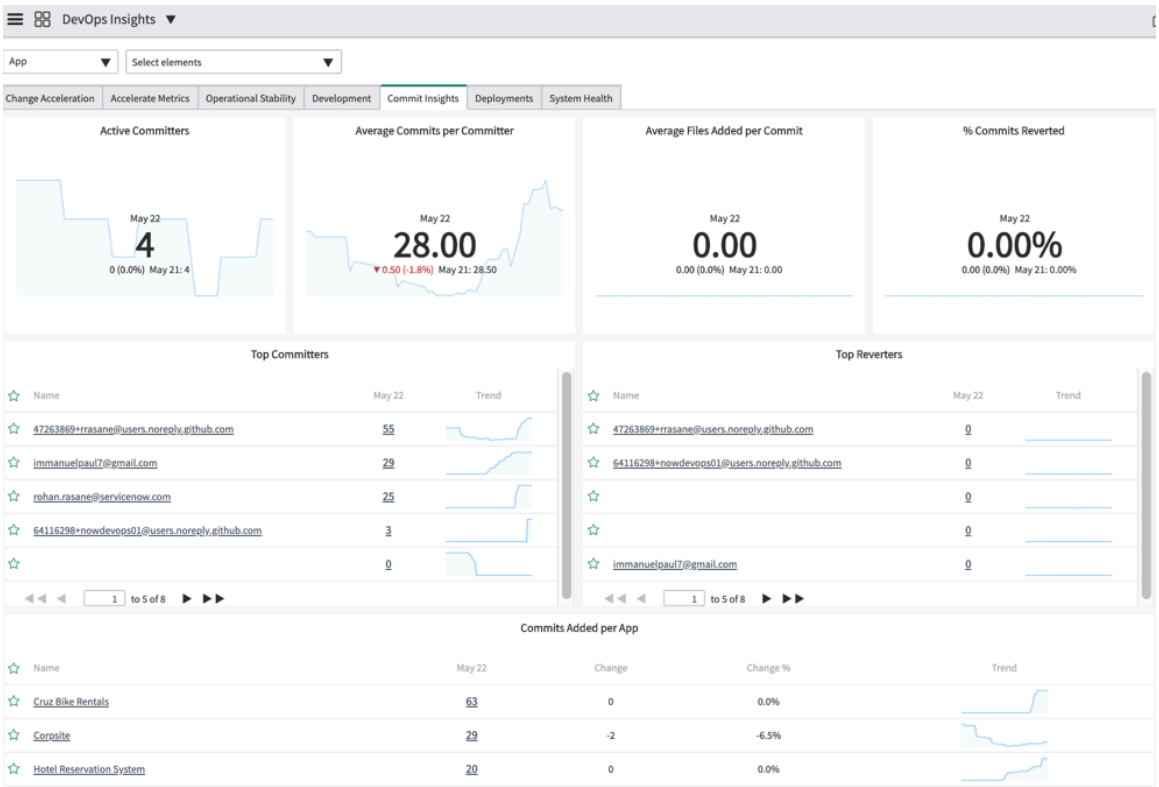
# Commit Insights




## Commit Insights

| Report | Source list | Description |
|---|---|---|
| Active Committers | Commit | Committers that submitted commits in the last 30 days.<br><br>Shows how many active committers there are.<br><br>**Note:** This widget uses count distinct aggregation and does not support multi-element selection. |
| Average Commits per Committer | Commit | Total number of commits in the last 30 days / Active committers.<br><br>Shows how often committers are committing. A higher value is more favorable.<br><br>**Note:** This widget uses formula and does not support multi-element selection. |

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### Commit Insights (continued)

| Report | Source list | Description |
|---|---|---|
| Average Files Added per Commit | Commit, Commit Details | Total number of files added in the last 30 days / Total number of commits in the last 30 days.<br><br>Shows how few files are committed at a time. A lower value is more favorable.<br><br>**Note:** This widget uses formula and does not support multi-element selection. |
| % Commits Reverted | Commit | Commits reverted in the last 30 days / Total number of commits in the last 30 days.<br><br>Shows how many commits have been reverted. A lower value is more favorable.<br><br>**Note:** This widget uses formula and does not support multi-element selection. |
| Top Committers | Commit | Committers with the highest number of commits in the last 30 days.<br><br>Provides visibility into the users that commit the most. |
| Top Reverters | Commit | Committers with the highest number of reverts in the last 30 days.<br><br>Provides visibility into the users that revert commits the most. |
| Commits Added per App | Commit, Commit Details | Number of commits added per app in the last 30 days.<br><br>Provides visibility into the development activity for each app. |

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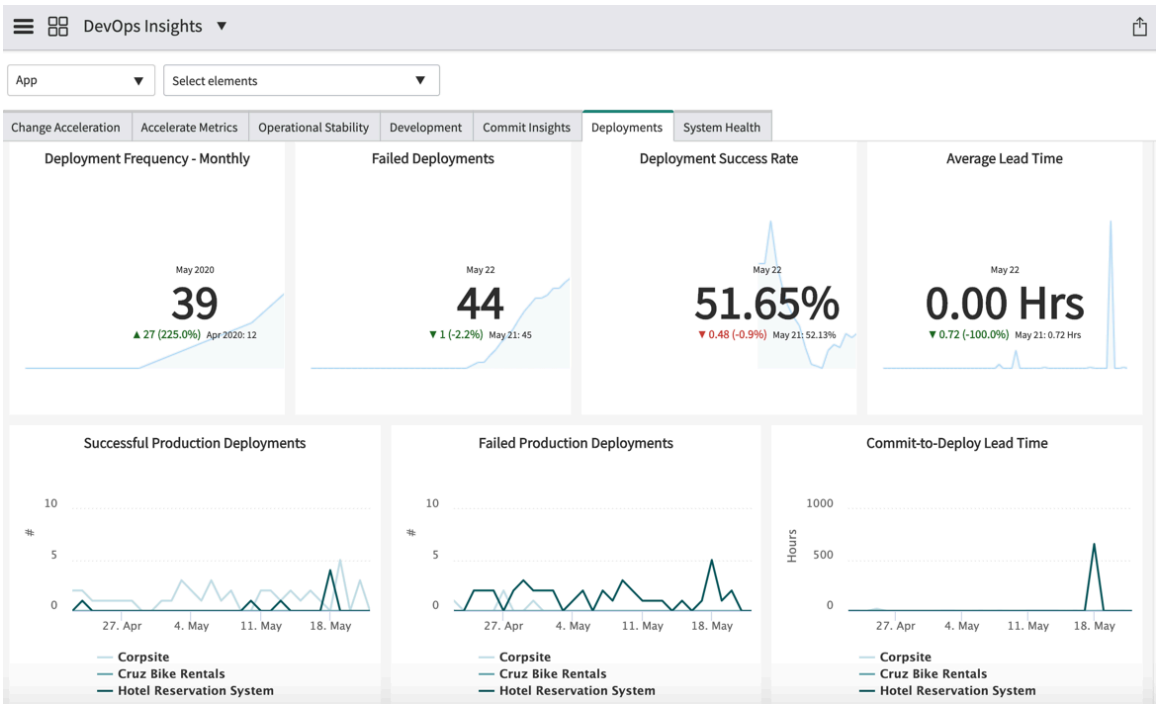
### Commit Insights (continued)

| Report | Source list | Description |
|---|---|---|
| | | **Note:** Filter is not applicable to this widget. |

## Deployments




Deployment frequency lets you know how often you are delivering value based on production deployments. Typically, more frequent deployments are desired.

**Note:**
Metrics are based off production deployments (**Type** field is set to Prod Deploy in the app step).

### Deployments

| Report | Source list | Description |
|---|---|---|
| Deployment Frequency - Monthly | Step Execution | Number of successful production deployments in a month.<br><br>Applies to steps of type **Prod Deploy** that are in completed state. |
| Failed Deployments | Step Execution | Number of failed production deployments in the last 30 days. |

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### Deployments (continued)

| Report | Source list | Description |
|---|---|---|
| | | Applies to steps of type **Prod Deploy** that are in failed or user-canceled state. |
| Deployment Success Rate | Step Execution | Deployments success rate over the last 30 days.<br><br>Deployment Success Rate = (Number of Successful Deployments in the last 30 days / Total Number of Deployments in the last 30 days) * 100<br><br>Applies to steps of type **Prod Deploy** in completed state.<br><br>**Note:** This widget uses formula and does not support multi-element selection. |
| Average Lead Time | Pipeline Execution | Average of:<br><br>([Time the code is successfully pushed to production] - [Earliest commit time])<br><br>Applies to steps of type **Prod Deploy** that are in completed state.<br><br>**Note:** This widget uses average aggregation and does not support multi-element selection. |
| Successful Production Deployments | Step Execution | Frequency of successful production deployments over time broken down by app.<br><br>More frequent production deployments are preferred. |
| Failed Production Deployments | Step Execution | Frequency of failed production deployments over time broken down by app. |

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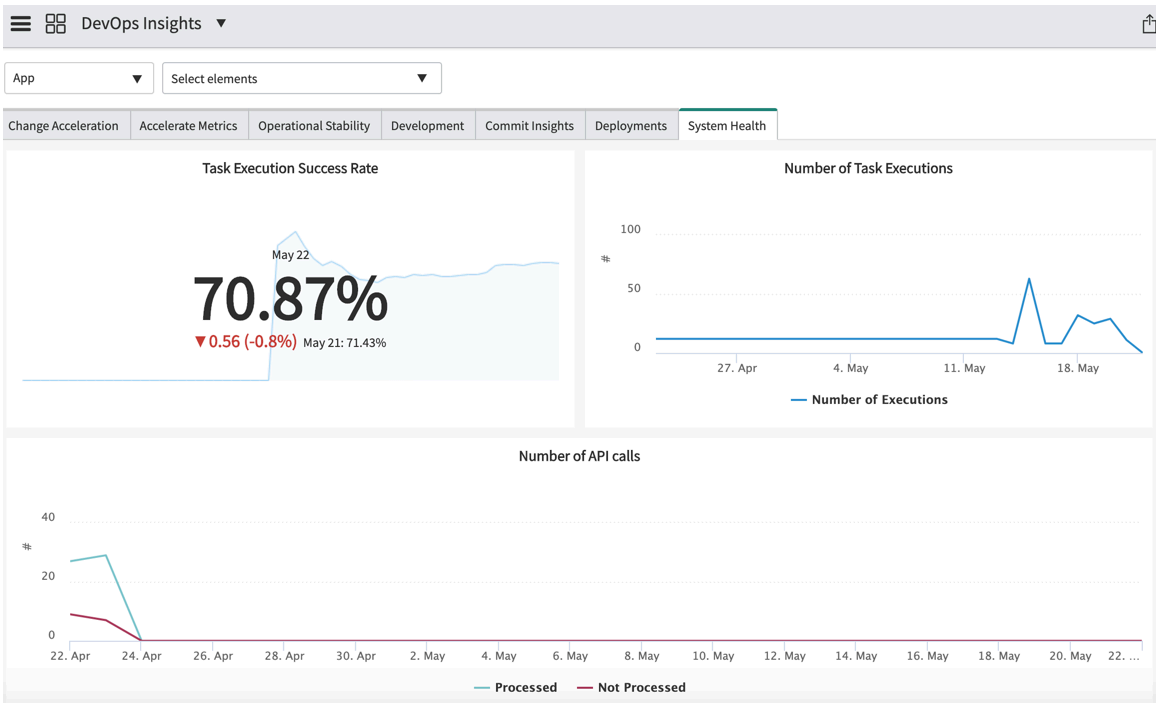
### Deployments (continued)

| Report | Source list | Description |
|---|---|---|
| Commit-to-Deploy Lead Time | Pipeline Execution | Duration from the earliest commit time to production deployment (for a successful pipeline execution).<br><br>Minimizing the time it takes from committing code to successfully running it in production is preferable.<br><br>When the lead time is high, you can investigate the pipeline to identify the slowest steps. For example, a manual change approval process could increase lead time. |

## System Health




### System Health

| Report | Source list | Description |
|---|---|---|
| Task Execution Success Rate | Task Executions | Success rate for tasks run by the execution tools over time:<br><br>[[Task Execution Success]] / [[Task Execution]] * 100 |

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**System Health (continued)**

| Report | Source list | Description |
|---|---|---|
| | | **Note:** This widget does not support multi-element selection. |
| Number of Task Executions | Task Executions | Default number of tasks executions in the last 30 days. |
| Number of API calls | Event | Default number of API calls in the last 30 days.<br>**Note:** Filter is not applicable to this widget. |

## DevOps Change Velocity APIs

The DevOps Change Velocity APIs provides endpoints that enable the interaction with external DevOps tools.

For more information, see DevOps API.

## Implement custom actions for pipelines using generic Docker container image

Use the ServiceNow custom actions to collect data related to change request creation, Sonar scan, artifact registration, and package registration in your pipeline with the help of the generic Docker Container Image.

Docker Image is a software package that can be used to run an application. This image informs how a container should instantiate, and which software components must be run. Docker Container is a virtual environment that combines application code and all the dependencies required to run the application. For more information on Docker, see Docker documentation.

## Environmental variables for GitLab

To configure Docker Images, the following environmental variables must be available in your GitLab instance for your project.

- SNOW_TOKEN: ServiceNow token number. It's a masked variable and wont be displayed in the jobs.
- SNOW_TOOLID: ServiceNow tool ID.
- SNOW_URL: ServiceNow instance URL.

When you configure a GitLab project, the environmental variables are created for the project and the latest configured variable values are considered. If you're an upgrading customer, you must reconfigure your existing GitLab projects or manually add the environmental variables in your GitLab instance. For information on adding variables, see GitLab documentation.

When adding the SNOW_TOKEN variable, you can acquire the token by selecting the **Copy token** button on the tool record, located in the Tool [sn_devops_tool] table.

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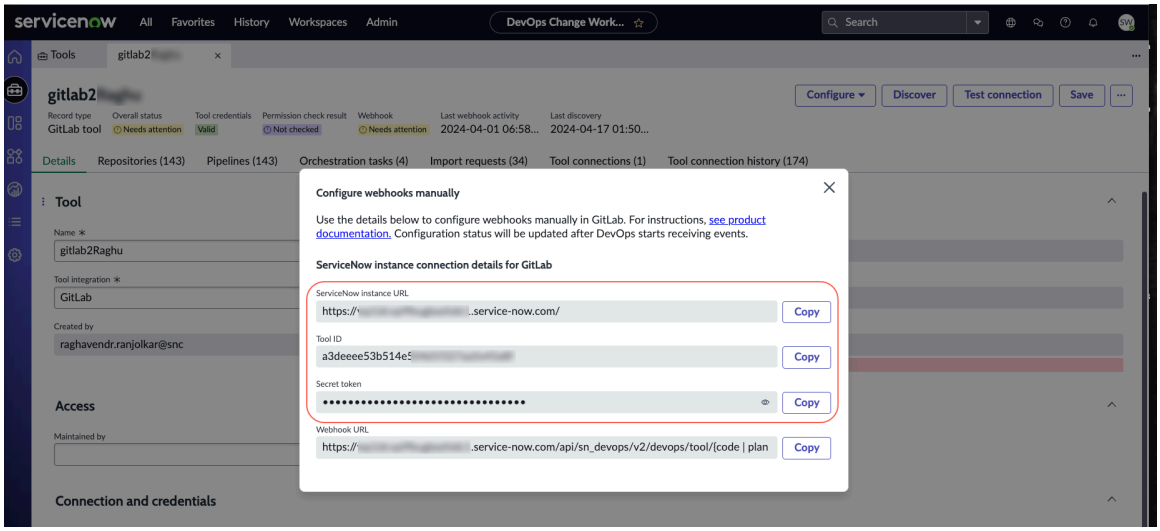
The environmental variables must be updated with the values available in the Configure webhooks manually pop-up in the tool record page. For details on how to view the connection details, see Configure webhooks from the tool record and Configure webhooks in GitLab manually.




## Environmental variables for GitHub Actions

To configure Docker Images, certain environmental variables must be available in your GitHub Actions instance.

The following environmental variables must be configured in your GitHub Actions instance.

**Note:**
The variables must be updated with the values available in the Configure webhooks manually pop-up in the tool record page.

- SNOW_TOKEN: ServiceNow token number. It's a masked variable and wont be displayed in the jobs.
- SNOW_TOOLID: ServiceNow tool ID.
- SNOW_URL: ServiceNow instance URL.

**Note:**
For information on adding variables in GitHub Actions, see GitHub documentation.

The following environment variables must be passed in your GitHub Actions pipeline:

**Note:**
The values for these variables are dynamically retrieved from GitHub, and you do not have to configure them separately.

- CI_PIPELINE_ID: Workflow run ID of a repository. Usage - CI_PIPELINE_ID: ${{github.run_id }}
- CI_API_V4_URL: URL of the GitHub server. Usage - CI_API_V4_URL: ${{ github.server_url }}
- CI_JOB_ID: Workflow run ID of a repository. Usage - CI_PIPELINE_ID: ${{ github.run_id }}
- CI_PROJECT_PATH: Name of the workflow. Usage - CI_PROJECT_PATH: ${{ github.repository }}/${{github.workflow}}
- CI_REPOSITORY_NAME: Name of the repository. Usage - CI_REPOSITORY_NAME: ${{ github.repository }}

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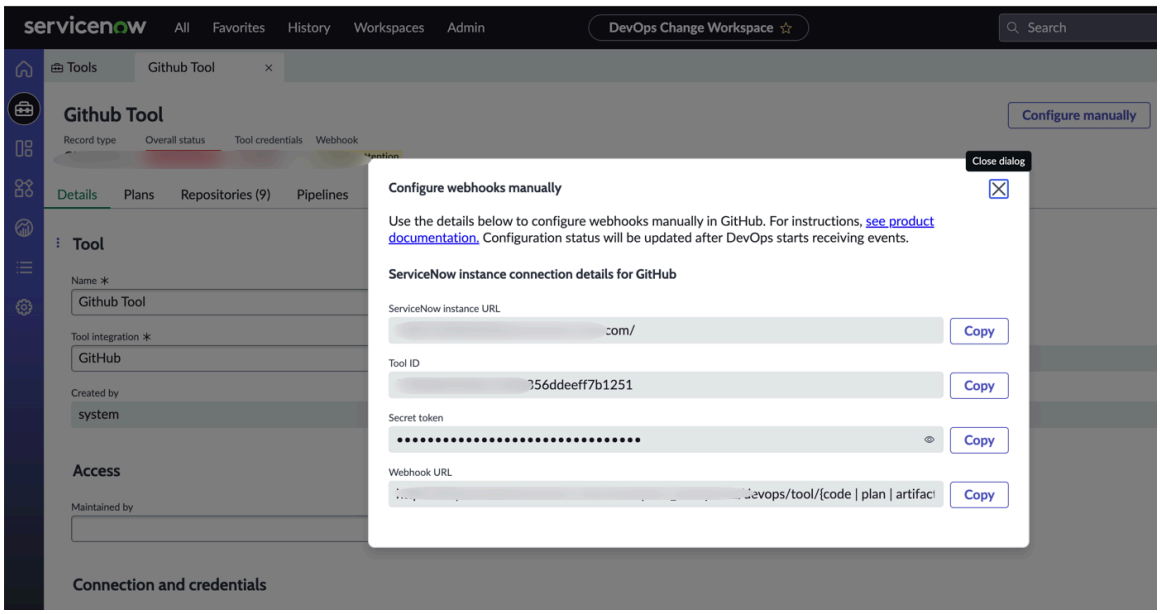
- CI_RUN_ATTEMPT: Number of workflow attempts. Usage - CI_RUN_ATTEMPT: ${{ github.run_attempt }}
- CI_PROJECT_TITLE: Name of the workflow. Usage - CI_PROJECT_TITLE: ${{ github.repository }}/${{github.workflow}}
- CI_COMMIT_BRANCH: Name of the branch on which the workflow is running. Usage - CI_COMMIT_BRANCH: ${{ github.ref_name }}
- CI_WORKFLOW_NAME: Name of the workflow. Usage - CI_WORKFLOW_NAME: ${{ github.workflow }}

When you configure a repository, the environmental variables are created for the repository and the latest configured variable values are considered. If you're an upgrading customer, you must reconfigure your existing repositories or manually add the environmental variables in your instance.




## Environmental variables for Harness

To configure Docker Images, certain environmental variables must be available in your Harness instance.

The following environmental variables must be configured in your Harness instance.

> **Note:**
> The variables must be updated with the values available in the Configure webhooks manually pop-up in the tool record page.

- SNOW_TOKEN: ServiceNow token number. It's a masked variable and wont be displayed in the jobs.
- SNOW_TOOLID: ServiceNow tool ID.
- SNOW_URL: ServiceNow instance URL.

The following environment variables must be passed in your Harness pipeline:

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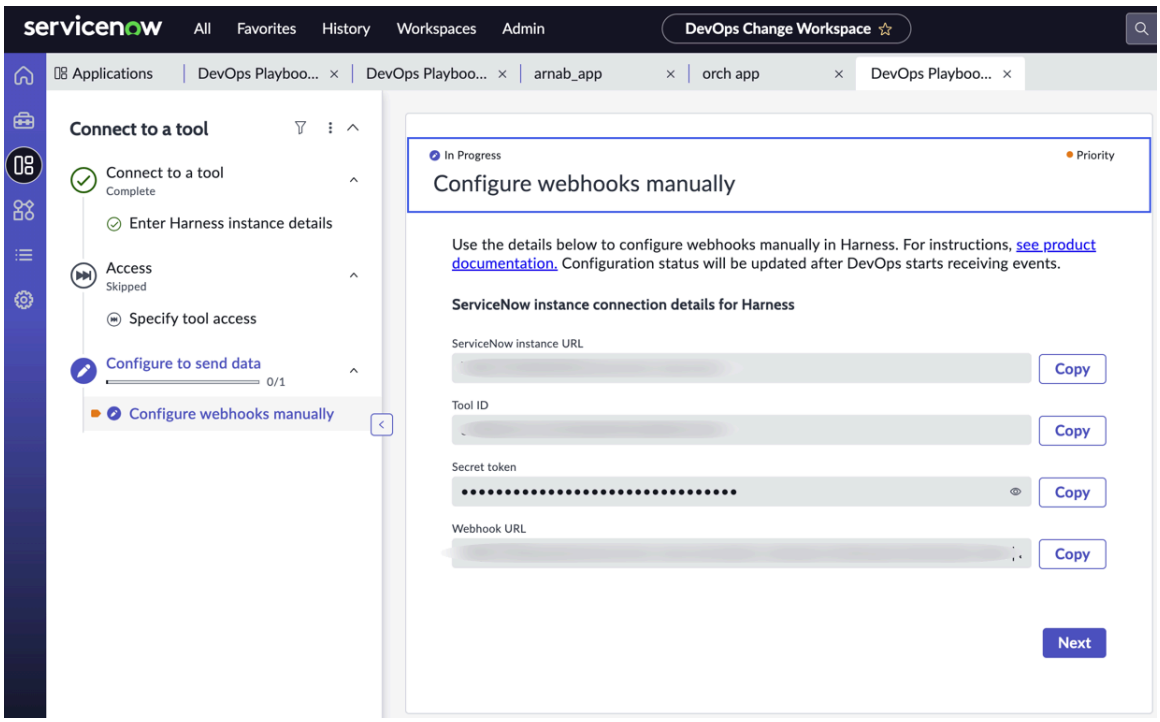
- HARNESS_STAGE_NAME: "<+stage.identifier>"
- HARNESS_PIPELINE_NAME: "<+org.identifier>/<+project.identifier>/<+pipeline.name>"

When you configure a repository, the environmental variables are created for the repository and the latest configured variable values are considered. If you're an upgrading customer, you must reconfigure your existing repositories or manually add the environmental variables in your instance.




## ServiceNow Docker Image

You must pass the ServiceNow Docker Image (servicenowdocker/sndevops:5.1.0) in your pipeline before adding custom actions in your pipeline. You can clone the app-devops-gitlab public repository located at https://github.com/ServiceNow/app-devops-gitlab, and create the Docker Image by running the following commands:

```
docker build -t servicenowdocker/sndevops:5.1.0
```

```
docker push servicenowdocker/sndevops:5.1.0
```

You can add the Docker Image at the starting of the .yml file. You don't have to add it for each job separately.

**Note:**
If you want to use multiple images, then add them at the job levels.

You can also customize the **app-devops-gitlab** public repository and create your own Docker Image to pass in the pipeline.

## ServiceNow DevOps Change Step

Add the ServiceNow DevOps Change custom step at the job level to create a change in your ServiceNow instance. For example:

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```
stages:
  - DevOpsChangeApproval

ServiceNow DevOps Change:
  stage: DevOpsChangeApproval
  image: servicenowdocker/sndevops:5.1.0
  script:
    - sndevopscli create change -p
 "{\"changeStepDetails\":
{\"timeout\":3600,\"interval\":100},\"attributes\":
{\"short_description\":\"Software
 Deployment\",\"description\":\"Software
 Deployment.\",\"assignment_group\":\"xxxxxxxxx\",
\"implementation_plan\":\"Software update is tested and results
 can be found in Test Summaries Tab.\",\"backout_plan\":\"When
 software fails in production, the previous software release
 will be re-deployed.\",\"test_plan\":\"Testing if the software
 was successfully deployed or not\"}}"
```

**Note:**
If you're using both the Docker change step and the when: manual instruction change step, ensure that you add them at different job levels.

You must enter the input values for this custom action as a JSON-formatted string.

- **changeStepDetails**: [optional] It holds the timeout and interval details.
- **interval**: [optional] The time in seconds to wait between trying the API. The default value is 100 seconds.
- **timeout**: [optional] The maximum time in seconds to wait until the action should fails. The default value is 3600 seconds.

  **Note:**
  When the timeout value is available here as well in your tool, the timeout value which is earlier is considered.

- **attributes**: [optional] The change request attribute details are to be used while creating a change in a ServiceNow instance. The change request is a JSON object surrounded by curly braces {} containing key-value pairs separated by a comma(,). A key-value pair consists of a key and a value separated by a colon(:). The keys supported in key-value pair are short_description, description, assignment_group, implementation_plan, backout_plan, test_plan, and so on.
- **-ctx**: [optional] Additional context parameters in JSON format. Environmental variable details from GitHub that will be used to build the request for the DevOps Change API. For example,

```
sndevopscli create change -ctx "{\"projectId\": \"123456\",
 \"attemptNumber\": \"${{ github.run_attempt }}\"}" -p
 "{\"changeStepDetails\":
 {\"timeout\":3600,\"interval\":100},\"autoCloseChange\":true,\
"attributes\":{\"short_description\":\"G Venkata Automated
 Software Deployment\",\"description\":\"Automated Software
 Deployment.\",\"assignment_group\":
\"a715cd759f2002002920bde8132e7018\",\"implementation_plan\":
\"Software update is tested and results can be found in
```

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```
Test Summaries Tab.\",\"backout_plan\":\"When software
fails in production, the previous software release will be
re-deployed.\",\"test_plan\":\"Testing if the software was
successfully deployed or not\"}}"
```

- **-w**: [optional] Specify whether the pipeline should wait for change creation and approval. By default, the pipeline will be waiting until the change creation and it's approval.

**Note:**
The name of the change step must contain the **ServiceNow DevOps Change** keyword, which is the job name.

### ServiceNow DevOps SonarScan Results

Add the ServiceNow DevOps SonarScan Results custom step at the job level to create a Sonar summary in your ServiceNow instance. For example:

```
stages:
  - DevOpsSonarStage

ServiceNow DevOps SonarScan Results:
  stage: DevOpsSonarStage
  image: servicenowdocker/sndevops:5.1.0
  script:
    - sndevopscli create sonar -url 'https://sonarcloud.io'
 -projectKey 'devsystem2019_TestImportTest'
```

- **url**: [Required] This specifies the Sonar URL.
- **projectKey**: [Required] This specifies the Sonar project key.

**Note:**
The name of the Sonar step must be same as the job name, which is **ServiceNow DevOps SonarScan Results**.

#### Limitation

While creating software quality summary results, the CI_MERGE_REQUEST_SOURCE_BRANCH_NAME environment variable will be used for merge pipelines, and CI_DEFAULT_BRANCH will be used for tag pipelines because the CI_COMMIT_BRANCH variable isn't available for merge or tag pipelines. For more information, see GitLab documentation.

### Register Artifact

Add the artifact custom step at the job level to register an artifact in your ServiceNow instance. For example:

```
stages:
  - artifact

artifact:
  stage: artifact
  image: servicenowdocker/sndevops:5.1.0
  script:
```

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```
    - sndevopscli create artifact -a
 "[{\"name\":\"Artifact-${CI_JOB_NAME}\",\"repositoryName\":
\"Repo\",\"version\":\"1.${CI_JOB_ID}.0\"}]"
```

You must enter the input values for this custom action as a JSON-formatted string.

**-a**: [Required] This specifies artifact details.

### Register Package

Add the package custom step at the job level to register a package in your ServiceNow instance. For example:

```
stages:
  - package

package:
  stage: package
  image: servicenowdocker/sndevops:5.1.0
  script:
    - sndevopscli create package -n "Package2" -a
 "[{\"name\":\"Artifact-${CI_JOB_NAME}\",\"repositoryName\":
\"Repo\" ,\"version\":\"1.${CI_JOB_ID}.0\"}]"
```

You must enter the input values for this custom action as a JSON-formatted string.

**-n**: [Required] This specifies the package name.

### Get change

Add at job level to get changeRequestNumber from ServiceNow instance with the given changeDetails to identify the change request.

For example:

```
stages:
  - DevOpsGetChange

ServiceNow DevOps Get Change:
  stage: DevOpsGetChange
  image: servicenowdocker/sndevops:5.1.0
  script:
    - sndevopscli get change -p
 "{\"buildNumber\":${CHG_JOB_ID},\"stageName\":\"ServiceNow
 DevOps Change
 Step\",\"pipelineName\":\"GitlabDockerGetAndUpdateChange\"}"

-p: It stands for changeDetails. The change details to be used
 for identifying change request in ServiceNow instance. The
 change details is a JSON object surrounded by curly braces {}
 containing key-value pair separated by a comma ,. A key-value
 pair consists of a key and a value separated by a colon :. The
 keys supported in key-value pair are buildNumber, pipelineName,
 stageName
```

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```
buildNumber: [mandatory]
This specifies ID of the Job where we have created change
 request.

stageName: [mandatory]
This specifies the Job name where we have created change
 request..

pipelineName: [mandatory]
This specifies the pipeline name.

Outputs:
  sndevopschg.json file created with content: {
    "status": "SUCCESS",
    "changeRequestNumber": "CHGXXXXX"
  }

  changeRequestNumber: Change Request Number found for the given
 change details
  status: To know the status of the Change Request GET.
```

## Update change

Add at job level to update change in ServiceNow instance for the changeRequestNumber provided as input along with changeRequestDetails.

For example:

```
stages:
  - DevOpsUpdateChangeStage

ServiceNow DevOps Update Change:
  stage: DevOpsUpdateChangeStage
  image: servicenowdocker/sndevops:5.1.0
  script:
    - sndevopscli update change -n 'CHGXXXXXX' -p
 "{\"short_description\":\"G Venkata12345 Automated
 Software Deployment\",\"description\":\"Automated Software
 Deployment.\",\"assignment_group\":\"XXXXX\",
\"implementation_plan\":\"Software update is tested and results
 can be found in Test Summaries Tab.\",\"backout_plan\":\"When
 software fails in production, the previous software release
 will be re-deployed.\",\"test_plan\":\"Testing if the software
 was successfully deployed or not\"}"

-n [Not mandatory if we have sndevopschg.json in our pipeline
 yml]: It stands for changeRequestNumber. The change request
 number to identify a unique change request.
   Precedence of choosing changeRequestNumber:
     - changeRequestNumber mentioned in the pipeline yml
     - changeRequestNumber stored in sndevopschg.json.

-p : It stands for changeDetails. The change details to be used
 for Updating the change request information identified by the
 specified change request number with the key-value pairs. The
```

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```
 change details is a JSON object surrounded by curly braces {}
 containing key-value pair separated by a comma ,. A key-value
 pair consists of a key and a value separated by a colon :. The
 keys supported in key-value pair are short_description, state,
 description, work_notes ..so on

OR
  - sndevopscli update change -p
 "{\"short_description\":\"Updated Automated Software
 Deployment\",\"description\":\"Automated Software
 Deployment.\",\"assignment_group\":\"XXXXXXXXXX\",
\"implementation_plan\":\"Software update is tested and results
 can be found in Test Summaries Tab.\",\"backout_plan\":\"When
 software fails in production, the previous software release
 will be re-deployed.\",\"test_plan\":\"Testing if the software
 was successfully deployed or not\"}"

NOTE: State should be specified at last in case if you are
 update the state of change request.
- sndevopscli update change -p "{\"short_description\":\"Updated
 Automated Software Deployment\",\"description\":\"Automated
 Software
 Deployment.\",\"assignment_group\":\"XXXXXXXXXX\",
\"implementation_plan\":\"Software update is tested and results
 can be found in Test Summaries Tab.\",\"backout_plan\":\"When
 software fails in production, the previous software release
 will be re-deployed.\",\"test_plan\":\"Testing if the software
 was successfully deployed or not\",\"state\":\"3\"}'
```

### Auto close change

Incorporate auto close change in ServiceNow instance. For detailed information about auto close, see Configuring DevOps change request details within the pipeline.

For example:

```
stages:
  - changeapproval

ServiceNow DevOps Change Step:
  stage: changeapproval
  image: servicenowdocker/sndevops:5.1.0
  script:
     - sndevopscli create change -p
 "{\"changeStepDetails\":
{\"timeout\":3600,\"interval\":100},\"autoCloseChange\":true,\"a
ttributes\":{\"short_description\":\"G Venkata Automated
 Software Deployment\",\"description\":\"Automated Software
 Deployment.\",\"assignment_group\":\"xxxxxxxx\",
\"implementation_plan\":\"Software update is tested and results
 can be found in Test Summaries Tab.\",\"backout_plan\":\"When
 software fails in production, the previous software release
 will be re-deployed.\",\"test_plan\":\"Testing if the software
 was successfully deployed or not\"}}"

autoCloseChange: [optional] : Boolean value
```

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### Security scan results

Add the ServiceNow DevOps Security Scan Results custom step at the job level to retrieve security scan results. For example:

```
stages:
  - DevOpsSecurityScanStageServiceNow

ServiceNow DevOps Security Scan Results:
  stage: DevOpsSecurityScanStageimage
  image: servicenowdocker/sndevops:5.1.0
  script:
      - sndevopscli create securityScan -p
 "{\"pipelineInfo\":{\"buildNumber\":
\"${CI_PIPELINE_ID}\",\"pipelineExecutionUrl\":
\"${CI_PIPELINE_URL}\" },\"securityResultAttributes\":
{ \"scanner\":\"Veracode\",\"applicationName\":
\"PetStoreAPI-Github\",\"buildVersion\":\"\",\"securityToolId\":
\"\"}}"
  -p: [mandatory]It the payload of security result attributes.
 The payload will have attributes as follows:
    buildNumber: CI_PIPELINE_ID (mandatory)pipelineExecutionUrl:
 CI_PIPELINE_URL (mandatory)scanner: Scanning tool and is
 required e.g. Checkmarx One.projectName/projectId: Name/Id
 of your Checkmarx One project and is required. This attribute
 is applicable only for Checkmarx One.applicationName: Name
 of your Veracode application and is required. This attribute
 is applicable only for Veracode.buildVersion": Veracode
 Scan name / build version and is optional. This attribute is
 applicable only for Veracode.scanId: Checkmarx One scan id and
 is optional. This attribute is applicable only for Checkmarx
 One.securityToolId: Security tool onboarded in ServiceNow
 (sys_id of the onboarded security tool) and is optional.
```

### Sample pipelines

### Example: Sample GitLab pipeline

```
image: servicenowdocker/sndevops:5.1.0
stages:
  - pre-build
  - build
  - sonar
  - securityscan
  - changeapproval
  - getchange
  - updatechange
  - deploy


Pre-Build:
  stage: pre-build
  script:
    - echo $CI_JOB_NAME
```

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```
Artifact and Package:
  stage: build
  script:
    - sndevopscli create artifact -a
 "[{\"name\":\"Artifact-${CI_JOB_NAME}\",\"repositoryName\":
\"TestRepo\",\"version\":\"1.${CI_RUNNER_ID}.0\"}]"
    - sndevopscli create package -n "Test_Package" -a
 "[{\"name\":\"Artifact-${CI_JOB_NAME}\",\"repositoryName\":
\"TestRepo\",\"version\":\"1.${CI_RUNNER_ID}.0\"}]"


ServiceNow DevOps SonarScan Results:
  stage: sonar
  script:
    - sndevopscli create sonar -url 'https://sonarcloud.io'
 -projectKey 'xxxxxxx'


ServiceNow DevOps Security Scan Results:
  stage: securityscan
  script:
    - sndevopscli create securityScan -p
 "{\"pipelineInfo\":{\"buildNumber\":\"${CI_JOB_ID}\",
 \"stageName\":\"ServiceNow DevOps Security Scan
 Results\",\"taskExecutionUrl\":\"${CI_JOB_URL}\" },
\"securityResultAttributes\":{ \"scanner\":\"Veracode\",
\"applicationName\":\"PetStoreAPI-Github\",\"buildVersion\":
\"\",\"securityToolId\":\"\"}}"

ServiceNow DevOps Change Step:
  stage: changeapproval
  variables:
    CHG_JOB_ID: $CI_JOB_ID
  script:
    - echo "CHG_JOB_ID=$CHG_JOB_ID" >> generated_job_id.env
    - sndevopscli create change -p
 "{\"changeStepDetails\":
{\"timeout\":3600,\"interval\":100},\"autoCloseChange\":true,\"a
ttributes\":{\"short_description\":\"G Venkata Automated
 Software Deployment\",\"description\":\"Automated Software
 Deployment.\",\"assignment_group\":
\"a715cd759f2002002920bde8132e7018\",\"implementation_plan\":
\"Software update is tested and results can be found in
 Test Summaries Tab.\",\"backout_plan\":\"When software
 fails in production, the previous software release will be
 re-deployed.\",\"test_plan\":\"Testing if the software was
 successfully deployed or not\"}}"
    - sndevopscli get change #If we are placing get change cli
 command in the same job where we are creating change then no
 need to mention the changeDetails.
  artifacts:
    paths:
      - generated_job_id.env

DevOps Get Change:
  stage: getchange
  script:
```

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```
    - source generated_job_id.env
    - sndevopscli get change -p
 "{\"buildNumber\":${CHG_JOB_ID},\"stageName\":\"ServiceNow
 DevOps Change
 Step\",\"pipelineName\":\"SmrutiTestDemoProject\"}"
  artifacts:
    paths:
      - sndevopschg.json
  dependencies:
    - ServiceNow DevOps Change Step

DevOps Update Change:
  stage: updatechange
  script:
    #- sndevopscli update change -n 'CHGXXXX'
 -p "{\"short_description\":\"Automated Software
 Deployment\",\"description\":\"Automated Software
 Deployment.\",\"assignment_group\":\"xxxxxxx\",
\"implementation_plan\":\"Software update is tested and results
 can be found in Test Summaries Tab.\",\"backout_plan\":\"When
 software fails in production, the previous software release
 will be re-deployed.\",\"test_plan\":\"Testing if the software
 was successfully deployed or not\"}"
    - sndevopscli update change -p
 "{\"short_description\":\"Updated Automated Software
 Deployment\",\"description\":\"Automated Software
 Deployment.\",\"assignment_group\":\"xxxxxxx\",
\"implementation_plan\":\"Software update is tested and results
 can be found in Test Summaries Tab.\",\"backout_plan\":\"When
 software fails in production, the previous software release
 will be re-deployed.\",\"test_plan\":\"Testing if the software
 was successfully deployed or not\"}"
  dependencies:
    - DevOps Get Change

Deploy Job:
  stage: deploy
  script:
    - echo $CI_JOB_NAME
```

### Example: Sample GitHub Actions pipeline

```
name: GithubAction

on:
  push:
    branches: ["main"]
  pull_request:
    branches: ["main"]

permissions:
  contents: read
env:
  SNOW_URL: ${{ secrets.SNOW_URL }}
  SNOW_TOKEN: ${{ secrets.SNOW_TOKEN }}
  SNOW_TOOLID: ${{ secrets.SNOW_TOOLID }}
  # These are the optional env variables
```

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```
  #CI_PIPELINE_ID: ${{ github.run_id }}
  #CI_API_V4_URL: ${{ github.server_url }}
  #CI_JOB_ID: ${{ github.run_id }}
  #CI_PROJECT_PATH: ${{ github.job }}
  #CI_REPOSITORY_NAME: ${{ github.repository }}
  #CI_RUN_ATTEMPT: ${{ github.run_attempt }}
  #CI_PROJECT_TITLE:
 ${{ github.repository }}/${{github.workflow}}
  #CI_COMMIT_BRANCH: ${{ github.ref_name }}
  #CI_WORKFLOW_NAME: ${{ github.workflow }}

jobs:
  build:
    runs-on: ubuntu-latest
    steps:
      - name: Set up JDK 17
        run: |
          echo 'hello'

  ServiceNowDevOpsChange:
     runs-on: ubuntu-latest
     needs: build
     container:
       image: servicenowdocker/sndevops:5.1.0
     env:
       CI_JOB_NAME: "ServiceNowDevOpsChange"

     steps:
       - name: create change
         run: |
           sndevopscli create change -p
 "{\"changeStepDetails\":
{\"timeout\":3600,\"interval\":10},\"autoCloseChange\":true,\"at
tributes\":{\"short_description\":\"G Venkata Automated
 Software Deployment\",\"description\":\"Automated Software
 Deployment.\",\"assignment_group\":
\"a715cd759f2002002920bde8132e7018\",\"implementation_plan\":
\"Software update is tested and results can be found in
 Test Summaries Tab.\",\"backout_plan\":\"When software
 fails in production, the previous software release will be
 re-deployed.\",\"test_plan\":\"Testing if the software was
 successfully deployed or not\"}}"

  ServiceNowUpdateDevOpsChange:
       runs-on: ubuntu-latest
       needs: ServiceNowDevOpsChange
       container:
         image: servicenowdocker/sndevops:5.1.0
       env:
         CI_JOB_NAME: "ServiceNowDevOpsChange"

       steps:
         - name: update change
           run: |
             sndevopscli update change -p
 "{\"short_description\":\"Updated Automated Software
 Deployment\",\"description\":\"Automated Software
```

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```
 Deployment.\",\"assignment_group\":
\"a715cd759f2002002920bde8132e7018\",\"implementation_plan\":
\"Software update is tested and results can be found in
 Test Summaries Tab.\",\"backout_plan\":\"When software
 fails in production, the previous software release will be
 re-deployed.\",\"test_plan\":\"Testing if the software was
 successfully deployed or not\"}"

  ArtifactAndPackage:
      runs-on: ubuntu-latest
      needs: build
      container:
        image: servicenowdocker/sndevops:5.1.0
      env:
        CI_JOB_NAME: "ArtifactAndPackage"
      steps:
        - name: create artifact
          run: |
             sndevopscli create artifact -a
 "[{\"name\": \"com:customactiondemo\",\"version\":
 \"1.${{ github.run_number }}\",\"semanticVersion\":
 \"1.${{ github.run_number }}.0\",\"repositoryName\":
 \"${{ github.repository }}\"}]"
             sndevopscli create package -n "Test_Package"
 -a "[{\"name\": \"com:customactiondemo\",\"version\":
 \"1.${{ github.run_number }}\",\"semanticVersion\":
 \"1.${{ github.run_number }}.0\",\"repositoryName\":
 \"${{ github.repository }}\"}]"

  ServiceNowDevOpsSonarScanResults:
      name: ServiceNowDevOpsSonarScanResults
      needs: ArtifactAndPackage
      runs-on: ubuntu-latest
      container:
        image: servicenowdocker/sndevops:5.1.0
      env:
        CI_JOB_NAME: "ServiceNowDevOpsSonarScanResults"
      steps:
        - name: devops soanr results
          run: |
            sndevopscli create sonar -url
 'https://sonarcloud.io' -projectKey 'xxxxxxx'

  ServiceNowDevOpsSecurityScan:
      name: ServiceNowDevOpsSecurityScan
      runs-on: ubuntu-latest
      needs: build
      container:
        image: servicenowdocker/sndevops:5.1.0
      steps:
        - name: security scan
          run: |
           sndevopscli create securityScan -p
 "{ \"pipelineInfo\": {  \"runId\": \"${{ github.run_id }}\",
   \"runNumber\": \"${{ github.run_number }}\",
 \"runAttempt\": \"${{ github.run_attempt }}\",
   \"job\": \"ServiceNowDevOpsSecurityScan\",
```

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```
 \"workflow\": \"${{ github.workflow }}\",  \"repository\":
 \"${{github.repository}}\" }, \"securityResultAttributes\":
 { \"scanner\": \"Veracode\",    \"applicationName\":
 \"PetStoreAPI-Github\",\"buildVersion\": \"\",
 \"securityToolId\": \"\"}}"
```

### Example: Sample Harness pipeline

```
# This is an example pipeline, and your pipeline and container
 configurations may vary from the setup shown here.
# Refer to the pipeline stages for Security, Software, and
 Change configurations.
# Using this YAML file directly will not work as it contains
 several Harness-specific configurations; check the Command
 section present for container steps.
pipeline:
  name: Example pipeline
  identifier: Example_pipeline
  projectIdentifier: Example_project
  orgIdentifier: ExampleOrg
  tags: {}
  stages:
    - stage:
        name: Build
        identifier: Build
        description: ""
        type: Custom
        spec:
          execution:
            steps:
              - step:
                  type: ShellScript
                  name: ShellScript_1
                  identifier: ShellScript_1
                  spec:
                    shell: Bash
                    executionTarget: {}
                    source:
                      type: Inline
                      spec:
                        script: echo "Building.."
                    environmentVariables: []
                    outputVariables: []
                  timeout: 10m
        tags: {}
    - stage:
        name: ServiceNow DevOps Sonar Scan Results
        identifier: ServiceNow_DevOps_Sonar_Scan_Results
        description: ""
        type: Custom
        spec:
          execution:
            steps:
              - step:
                  type: Container
                  name: Sonar container
                  identifier: Sonar_container
```

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```
                  spec:
                    connectorRef: docker_connector # harness
 docker connector
                    image: servicenowdocker/sndevops:5.1.0
                    command: |-
                      export SNOW_URL="<+variable.SNOW_URL>"
                      export
 SNOW_TOOLID="<+variable.SNOW_TOOLID>"
                      export SNOW_TOKEN="<+variable.SNOW_TOKEN>"
                      export
 HARNESS_STAGE_NAME="<+stage.identifier>"
                      export
 HARNESS_PIPELINE_NAME="<+org.identifier>/<
+project.identifier>/<+pipeline.name>"
                      export CI_COMMIT_BRANCH="main"
                      sndevopscli create sonar -url
 'https://sonarcloud.io' -projectKey 'SONAR_PROJECT_KEY' -branch
 "main"
                    shell: Sh
                    infrastructure:
                      type: KubernetesDirect
                      spec:
                        connectorRef: KUBE_CONNECTOR # harness
 kubernates connector
                        namespace: harness-delegate-ng
                        resources:
                          limits:
                            cpu: "0.5"
                            memory: 500Mi
                        annotations: {}
                        labels: {}
                        containerSecurityContext:
                          capabilities:
                            drop: []
                            add: []
                        nodeSelector: {}
                    reports:
                      type: JUnit
                      spec:
                        paths: []
                    outputVariables: []
                    envVariables: {}
                  timeout: 1h
        tags: {}
    - stage:
        name: ServiceNow DevOps Security Scan Results
        identifier: ServiceNow_DevOps_Security_Scan_Results
        description: ""
        type: Custom
        spec:
          execution:
            steps:
              - step:
                  type: Container
                  name: security
                  identifier: security
                  spec:
```

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```
                    connectorRef: docker_connector # harness
 docker connector
                    image: servicenowdocker/sndevops:5.1.0
                    command: |-
                      export SNOW_URL="<+variable.SNOW_URL>"
                      export
 SNOW_TOOLID="<+variable.SNOW_TOOLID>"
                      export SNOW_TOKEN="<+variable.SNOW_TOKEN>"
                      sndevopscli create securityScan -p \
                      "{\"pipelineInfo\":{

 \"buildNumber\":\"<+stage.nodeExecutionId>\",

 \"taskExecutionUrl\":\"<
+pipeline.executionUrl>?stage=<+stage.nodeExecutionId>\",

 \"orchestrationPipeline\":\"<+org.identifier>/<
+project.identifier>/<+pipeline.name>\"
                        },
                        \"securityResultAttributes\":{
                           \"scanner\":\"Veracode\",
                           \"applicationName\":\"VeraDemo-10\"
                        }
                      }"
                    shell: Sh
                    infrastructure:
                      type: KubernetesDirect
                      spec:
                        connectorRef: KUBE_CONNECTOR # harness
 kubernates connector
                        namespace: harness-delegate-ng
                        resources:
                          limits:
                            cpu: "0.5"
                            memory: 500Mi
                        annotations: {}
                        labels: {}
                        containerSecurityContext:
                          capabilities:
                            drop: []
                            add: []
                        nodeSelector: {}
                    reports:
                      type: JUnit
                      spec:
                        paths: []
                    outputVariables: []
                    envVariables: {}
                  timeout: 1h
        tags: {}
    - stage:
        name: Deploy
        identifier: Deploy
        description: ""
        type: Deployment
        spec:
          deploymentType: Kubernetes
```

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```
          service:
            serviceRef: service
          environment:
            environmentRef: Dev
            deployToAll: false
            infrastructureDefinitions:
              - identifier: Infra
          execution:
            steps:
              - step:
                  type: Container
                  name: ServiceNow change
                  identifier: ServiceNow_change
                  spec:
                    connectorRef: docker_connector # harness
 docker connector
                    image: servicenowdocker/sndevops:5.1.0
                    command: |-
                      # set mandetory variables. These can be
 set from Environment variable section of Optional configuration
 as well.
                      export
 HARNESS_STAGE_NAME="<+stage.identifier>"
                      export SNOW_URL="<+variable.SNOW_URL>"
                      export
 SNOW_TOOLID="<+variable.SNOW_TOOLID>"
                      export SNOW_TOKEN="<+variable.SNOW_TOKEN>"
                      # "sndevopscli create change" command
 notifies ServiceNow DevOps to create a change.
                      # Ensure to update "upstreamStage"
 accordingly. Example, if you have 3 stages Test, Change
 and Deploy in your pipeline, then you must update as
 "upstreamStage": "<+pipeline.stages.Test.nodeExecutionId>".
 Note that if your change stage is the first stage, you can
 remove this line.
                      sndevopscli create change -ctx \
                      "{

 \"pipelineExecutionUrl\":\"<+pipeline.executionUrl>\",
                          \"stageIdentifier\":
 \"<+stage.identifier>\",
                          \"stageNodeExecutionId\":
 \"<+stage.nodeExecutionId>\",
                          \"pipelineName\":
 \"<+pipeline.name>\",
                          \"upstreamStage\":
 \"<
+pipeline.stages.ServiceNow_DevOps_Security_Scan_Results.nodeExe
cutionId>\"
                      }" -p \
                      "{
                          \"changeStepDetails\":
                          {
                                  \"timeout\":3600,
                                  \"interval\":100
                          },
                          \"autoCloseChange\":true,
```

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```
                        \"attributes\":{

\"chg_model\":\"adffaa9e4370211072b7f6be5bb8f2ed\",
                            \"short_description\":\"Software
Deployment\",
                            \"description\":\"Automated
Software Deployment.\",
                            \"implementation_plan\":\"Software
update is tested and results can be found in Test Summaries
Tab.\",
                            \"backout_plan\":\"When software
fails in production, the previous software release will be
re-deployed.\",
                            \"test_plan\":\"Testing if the
software was successfully deployed or not\"
                          }
                      }"
                  shell: Sh
                  infrastructure:
                    type: KubernetesDirect
                    spec:
                      connectorRef: KUBE_CONNECTOR # harness
kubernates connector
                      namespace: harness-delegate-ng
                      resources:
                        limits:
                          cpu: "0.5"
                          memory: 500Mi
                      annotations: {}
                      labels: {}
                      containerSecurityContext:
                        capabilities:
                          drop: []
                          add: []
                      nodeSelector: {}
                  reports:
                    type: JUnit
                    spec:
                      paths: []
                  outputVariables: []
                  envVariables: {}
                timeout: 1h
            - step:
                type: ShellScript
                name: ShellScript_1
                identifier: ShellScript_1
                spec:
                  shell: Bash
                  executionTarget: {}
                  source:
                    type: Inline
                    spec:
                      script: echo "Deploying.."
                  environmentVariables: []
                  outputVariables: []
                timeout: 10m
          rollbackSteps: []
```

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```
        tags: {}
        failureStrategies:
          - onFailure:
              errors:
                - AllErrors
              action:
                type: StageRollback
  properties:
    ci:
      codebase:
        connectorRef: CI_CONNECTOR
        repoName: REPO_NAME
        build: <+input>
        sparseCheckout: []
  notificationRules:
    - name: devopsbugbashwp5
      identifier: devopsbugbashwp5
      pipelineEvents:
        - type: AllEvents
      notificationMethod:
        type: Webhook
        spec:
          webhookUrl:
 https://{instance_url}/api/sn_devops/v2/devops/tool/orchestrati
on?toolId={tool sys id}&projectId={project sys
 id}&ni.nolog.token={token}
      enabled: true
```

**Note:**
If you want to add the Sonar Scan Results and Security Scan Results on the same stage, you can use different step names for both the custom actions by updating their default value in the **sonar_step_names** and **security_step_names** fields in the sn_devops_tool_integration_configuration table.

## Run health scans for DevOps Change Velocity

Run health check scans on your DevOps Change Velocity instance and get recommendations on fixing any errors that may exist.

### Before you begin

Role required: sn_devops.admin

Activate the DevOps Change Health Scan Content Pack application to use this feature. For information on activating a plugin, see Activate a plugin.

### About this task

If you are in version (3.0 to 5.0) of DevOps Change Velocity, but you have installed the DevOps Change Health Scan Content Pack application, you can access this feature only from the Classic UI in the ServiceNow AI Platform. For more information on health scans in ServiceNow AI Platform, see Scan checks.

Scan suites are collections of security center checks that execute together. The DevOps Change Velocity Health parent suite contains the DevOps Change Velocity Health - Scheduled and DevOps Change Velocity Health - On-demand suites within it.

You can choose to run the DevOps Change Velocity Health parent scan, which will execute all the checks available in the DevOps suite of scans or run each child suite individually which will execute the checks applicable to that child suite. Using the DevOps Change Velocity Health -

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Scheduled child suite, you can create a schedule to regularly trigger DevOps Health instance suite scans even when you don't have an active session. And using the DevOps Change Velocity Health - On-demand suite, you can run the available DevOps Health scan checks on a specific target to obtain focused scan results.

You can also choose to navigate to the Checks list, and run a specific health check scan directly by selecting the check and then selecting **Test Check**. The following checks are available in the DevOps suite.

### DevOps suite scan checks

| Suite name | Check name | Check description | Resolution details |
|---|---|---|---|
| DevOps Change Velocity Health - Scheduled | DevOps - subflows frequently exceeding execution timeouts | DevOps capability handler subflows have a default time out limit of 45 seconds in the base system. Under normal operating conditions, these timeouts are not usually exceeded. When multiple subflows are timing out frequently, it indicates a potential issue. | Increase the timeout value for the subflow that is timing out, in the Integration Capability table. You must have the DevOps Admin role to perform this action. |
| DevOps Change Velocity Health - Scheduled | DevOps - empty roles in the base system | If any of your base system roles have an empty role reference, it could impact a wide range of DevOps functionality, including the Discover action and event processing. | See the [KB1642669 article for resolution details. |
| DevOps Change Velocity Health - Scheduled | DevOps - duplicate pipelines | The DevOps data model doesn't enforce uniqueness on key records like pipelines, which can lead to intermittent or unpredictable issues. This check identifies duplicate pipeline records in primary DevOps tables, which could cause processing problems if not addressed. | Delete the duplicate pipeline that does not have any associated pipeline executions or is not linked to an app. |
| DevOps Change Velocity Health - Scheduled | DevOps System user access | The devops.system user is used for most server side transaction processing, and in the course of that | Make sure DevOps System user exists. Ensure there are no field level ACLs on sys_connection and credential table |

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### DevOps suite scan checks (continued)

| Suite name | Check name | Check description | Resolution details |
|---|---|---|---|
| | | processing if it cannot access certain key tables the process will fail. Because it's not practical to verify if the user has appropriate access every time it makes a query, the failures tend to manifest indirectly, making them hard and time consuming to diagnose. This check will ensure the devops.system has appropriate access to a specific list of tables required for core product functionality. | |
| DevOps Change Velocity Health - On-demand | DevOps - incorrectly configured module access policies | If there are missing or incorrectly configured module access policies in your instance, it could impact a wide range of DevOps functionality, including tool connectivity, event processing, pipeline processing, and change creation. Auto-generated module access policies are set to reject by default. This check identifies the module access policies that are configured with the reject result state. | Set the result value of the module access policy for the DevOps application to "Track' to allow the DevOps application to access the credentials. See the [KB1112530] KB article for more details. |
| DevOps Change Velocity Health - On-demand | DevOps - change control steps with untracked pipelines | If a pipeline has change control enabled but it is not marked for tracking, a change request might not get created when it is run, and the pipeline may get stuck. | Enable tracking for pipelines under change control by selecting the Track option in the tool record page or add the pipeline to an app. |

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### Procedure

1. Navigate to **Workspaces** > **DevOps Change Workspace**.
2. In the Lists module, select **Health scans > Suites**.
3. Select any of the scan suites based on your requirement.
4. Select **Execute suite scan**.

### Result

Once the scan is executed, you can view the results and findings of the scan in the Results and Findings lists respectively. A scan result reports the status and type of the scan. You can also see all the checks that ran as part of the scan and all other information related to the scan such as errors and scan logs. A finding is a reference to a record that has violated a rule from a check on the instance. You can find the source record and the number of times the record triggered the rules of a given check.

# DevOps Config

The ServiceNow® DevOps Config application validates and manages the configuration data of your enterprise applications across every stage of the DevOps pipeline.

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

## Request apps on the Store

Visit the ServiceNow Store website to view all the available apps and for information about submitting requests to the store. For cumulative release notes information for all released apps, see the ServiceNow Store version history release notes.

Watch this short video for an introduction to the DevOps Config application.

DevOps Config overview

## Get started

| Explore | Configure | Integrate |
| --- | --- | --- |
|  |  |  |
| Learn about how DevOps engineers and developers use DevOps Config. | Plan and configure your implementation. | Extend DevOps Config capabilities by integrating your pipeline. |

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| Use | Analytics and Reporting Solutions | Reference |
| --- | --- | --- |
|  |  |  |
| Use DevOps Config to validate and manage your configuration data. | Coordinate work and improve processes with dashboards and reports. | Get details about supported configuration data, CDM APIs, and PaCE policies. |

### Troubleshoot and get help

- Ask or answer questions in the ServiceNow Community
- Search the Known Error Portal for known error articles
- Contact Customer Service and Support

### Related ServiceNow applications and features

DevOps Change Velocity application.

## Exploring DevOps Config

Use DevOps Config to store and manage all of your config data as a single source of truth. You can also use DevOps Config to validate your config data before deployment, and resolve conflicts in deployed config data.

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

Watch this short video to see how config data snapshots in DevOps Config can help you identify issues caused by unintended config data changes.

DevOps Config investigation with config data

Use root cause analysis of configuration-related outages or alerts to quickly identify and resolve unintended config data changes, also known as configuration "drift." Compare current and past versions of intended config data changes attached to change requests, and roll back to the desired state when needed.

For more information, see Investigate an alert that involves a change to config data.

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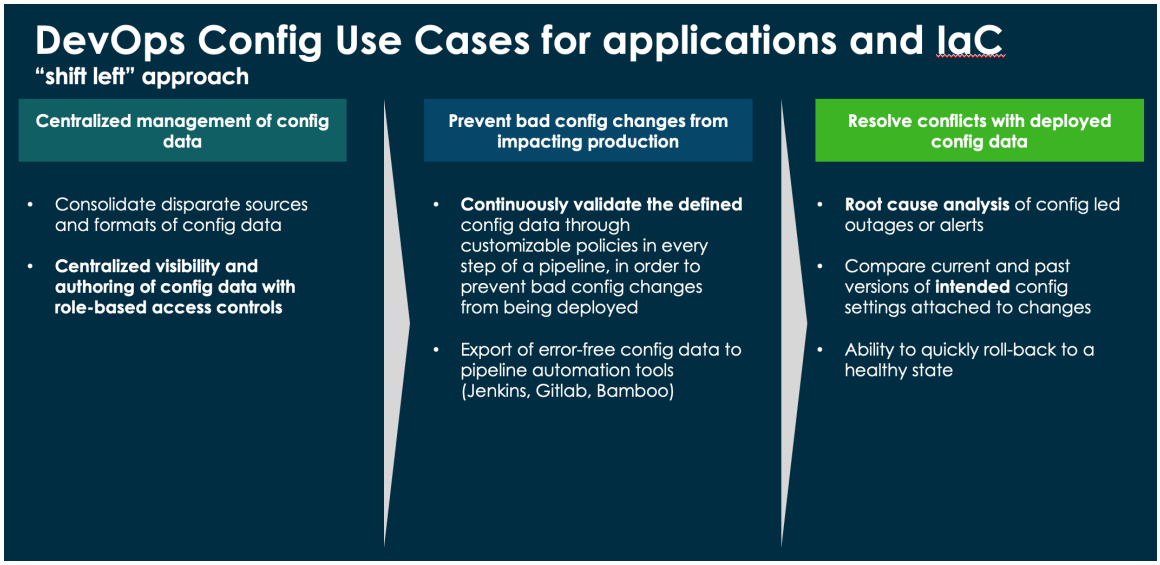


## Manage your configuration data

DevOps Config becomes the single source of truth for your configuration data, rather than the source tool. A consolidated model manages and secures config data across multiple sources with role-based access control.

Although DevOps Config prevents non-compliant changes by validating your configuration data before deployment, security of the configuration data can't be enforced if the data is kept at the source and not stored in DevOps Config.

- Workflow

  DevOps Config manages all your data in one location, validates it as it's written, and exports, when needed.

- DevOps Engineer persona

  Use DevOps Config and DevOps Config API to manage and validate configuration data. Thus, enabling DevOps teams to release at a faster speed, ensuring that no risky or non-compliant changes are introduced in production.

  Use automated gates in a CI/CD pipeline or deployment script so that a deployment is stopped if any change to the application or infrastructure configuration is deemed risky or non-compliant.

  Manage DevOps Config as more policies are added and more exporters are defined.

## Validate your configuration data

DevOps Config acts as a test tool by automatically validating your configuration data before deployment to prevent non-compliant changes, while ensuring adherence to policy frameworks.

Validation before deployment occurs by executing policies on the configuration data. The DevOps Config Policy content pack includes generic policies that check for standard issues, but can be customized based on use case.

- Workflow

  When configuration data is changed or added, DevOps Config runs policies on the configuration data that's stored across multiple sources, validates it, and returns the outcome.

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In the pipeline, the decision on whether to deploy is made, and the configuration data is retrieved from the source (Git, for example) to deploy.

- App Engineer (or IT infrastructure owner) persona

  Use DevOps Config to validate configuration data. Thus, making sure no risks are introduced and that all changes are compliant with company policies before any changes are applied in a production environment.

  Since the tool integrates with the existing toolset, there's no change to the way work is done and there are no new tools to learn. Changes made to configuration data are validated in the background, and when the outcome is reported, action can be taken.

## DevOps Config and DevOps Change Velocity

DevOps Change Velocity collects data from all of your DevOps tools, providing visibility across the entire lifecycle of deployment, while DevOps Config manages and validates your DevOps configuration data.

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DevOps Change Velocity is a horizontal solution orchestrating on top of all of your separate DevOps tools. DevOps Change Velocity features change acceleration and can pause your pipeline. DevOps Config serves a different purpose.

DevOps Config is a point solution that functions as one of your DevOps tools, managing and testing your configuration data prior to production.

## DevOps Config works better together with DevOps Change Velocity

Use DevOps Config with DevOps Change Velocity to manage and validate configuration data collected by DevOps Change Velocity.

DevOps Change Velocity is an umbrella product that sits on top of your entire release pipeline (planning, coding, testing, orchestration tools) as your application supply chain (value stream map).

DevOps Config manages, validates, and provides results on how your application and infrastructure are configured, which are the elements instrumented in DevOps Change Velocity.

DevOps Change Velocity and DevOps Config are synced by app object.

With the DevOps Change Velocity change control feature, a change request is created for DevOps Config configuration changes.

In DevOps Change Velocity, navigate to **DevOps** > **Orchestrate** > **Pipeline Change Requests** to view and approve DevOps change requests created by DevOps Config changes. CDM snapshots are listed in the **Config data** related list of the DevOps change request.

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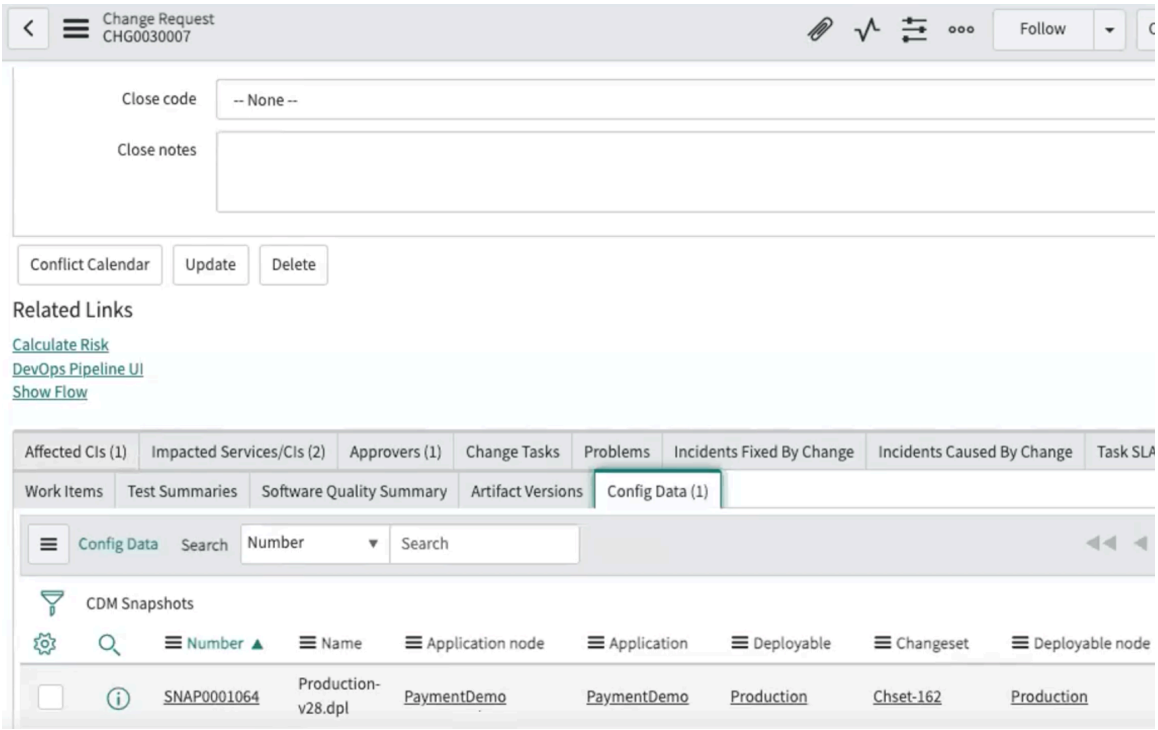


## Using an app in DevOps Config

When you create an app in DevOps Config, not only is it the container for the config data of the application, but the application model you choose links DevOps Config with other ServiceNow products, including DevOps Change Velocity.

**Important:**
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Each application model has an SDLC Component of the CMDB that is the link between ServiceNow DevOps pipeline products.

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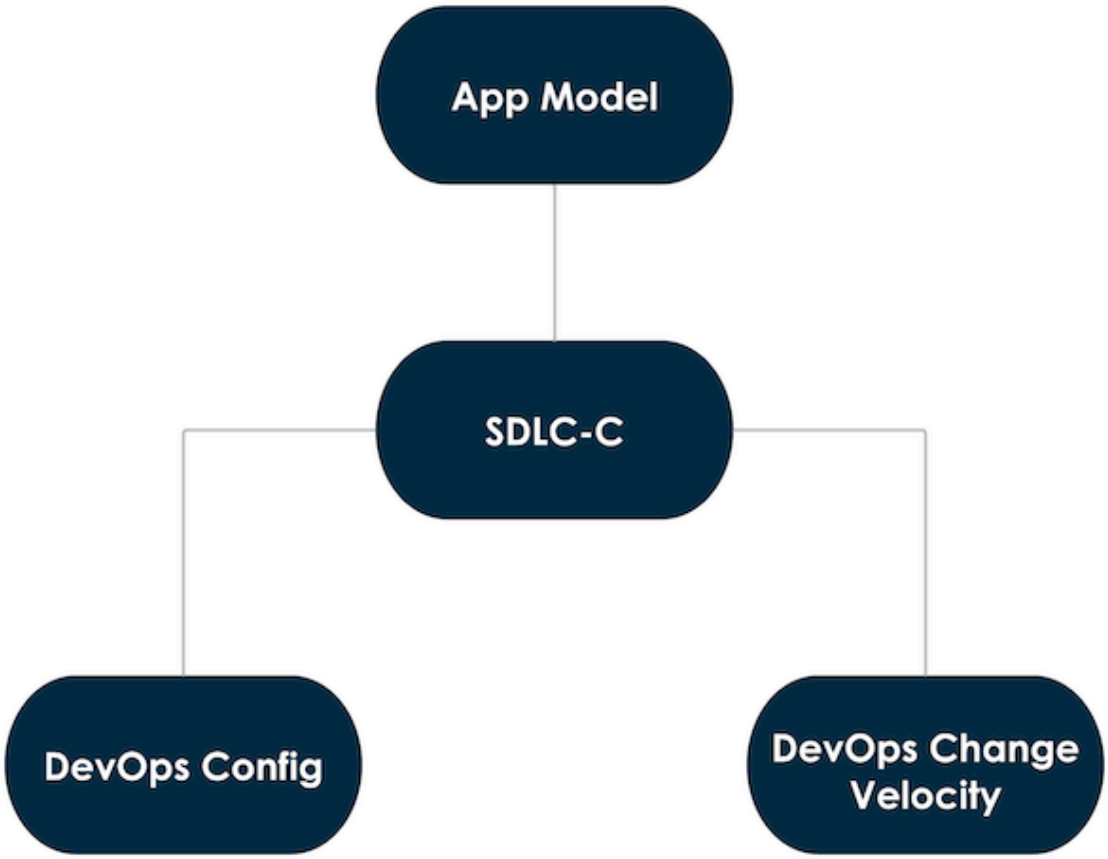
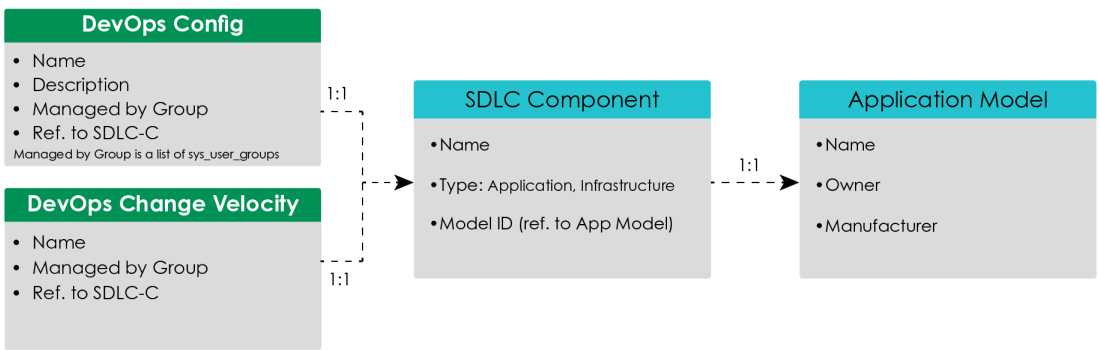



When you create an app in DevOps Config, it's synced with DevOps Change Velocity. Updates and deletions to the app made in either application are also synced.

**Note:**
An SDLC-C cannot be deleted if there is a DevOps Config or DevOps Change Velocity app associated with it.

**Related entities and attributes**




Mapping:

- 1:1 mapping between SDLC-C and App Model
- 1:1 mapping between DevOps Config app and SDLC-C
- 1:1 mapping between DevOps Change Velocity and SDLC-C

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## DevOps Config powered by CDM and PaCE

DevOps Config uses Configuration Data Management and Policy as Code Engine platform capabilities to manage configuration data and policies.

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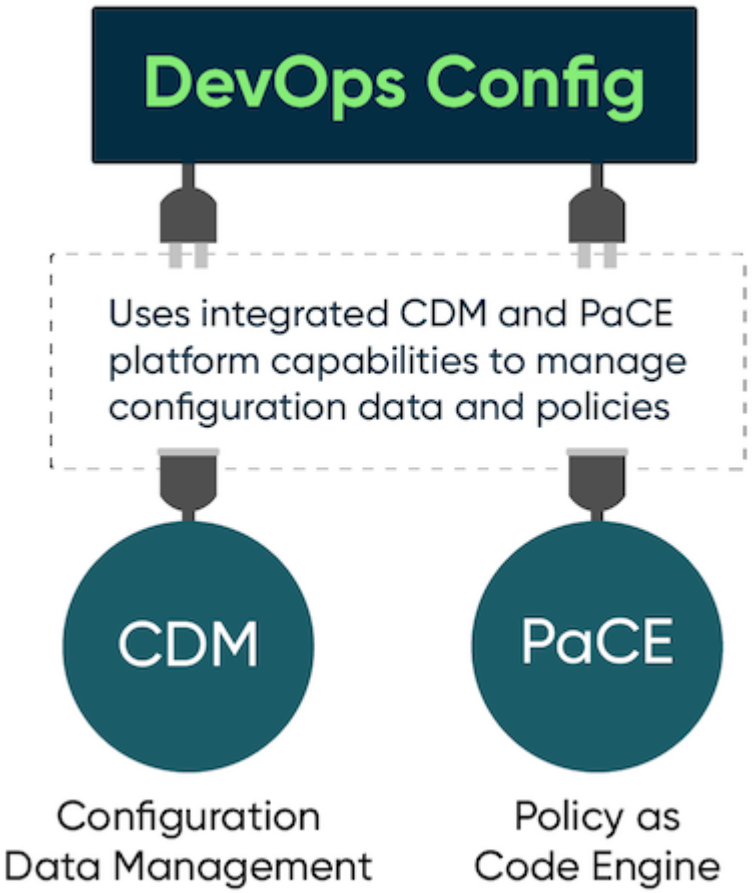
## DevOps Config platform capabilities




### Configuration Data Management (CDM)

CDM is one of two main capabilities in the DevOps Config product. The CDM plugin manages application and/or infrastructure configuration data within the ServiceNow AI Platform.

CDM consists of the backend tables and logic that handles all aspects of an application configuration data model. The workspace pages that users interact with to manage their data model are also managed by this plugin.

The CDM Context Menu Component plugin is a sub-component of the CDM plugin. It provides the context (for example, three dot) menu for the node list pane in the Config Data tab for an application.

### Policy as Code Engine (PaCE)

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PaCE is the second main capability in the DevOps Config product. It provides a robust policy engine that uses a policy script (written in javascript) to evaluate a snapshot of configuration data and verifies compliance.

PaCE provides of a comprehensive versioning system so users can audit their policy changes over time. It also contains a test playground to evaluate potential policy script changes before going live with user configuration data.

## DevOps Config core application

### DevOps Config

DevOps Config is the main application for the DevOps Config product.

The DevOps Config application consists of the workspace that connects users into their data model to manage their config data per application, manage policies to validate their config data, and review the health of their application configuration data.

The Insights dashboard widgets lets users gain insights on their configuration data acumen, and build better habits in managing their configuration data.

## DevOps Config content packs

### DevOps Config Exporter Content Pack (Optional)

The DevOps Exporter Content Pack is an optional plugin that contains curated exporters that the DevOps Config team created and that users can leverage out-of-the-box to export the config data from their snapshots as they see fit.

### DevOps Config Policy Content Pack (Optional)

The DevOps Config Policy Content Pack is an optional plugin that contains curated policies that the DevOps Config team created and that users can leverage out-of-the-box so they can get to validating their config data right away.

**Note:**
if users install either of these optional plugins first, they will get DevOps Config and all Dependencies plugins automatically installed as well.

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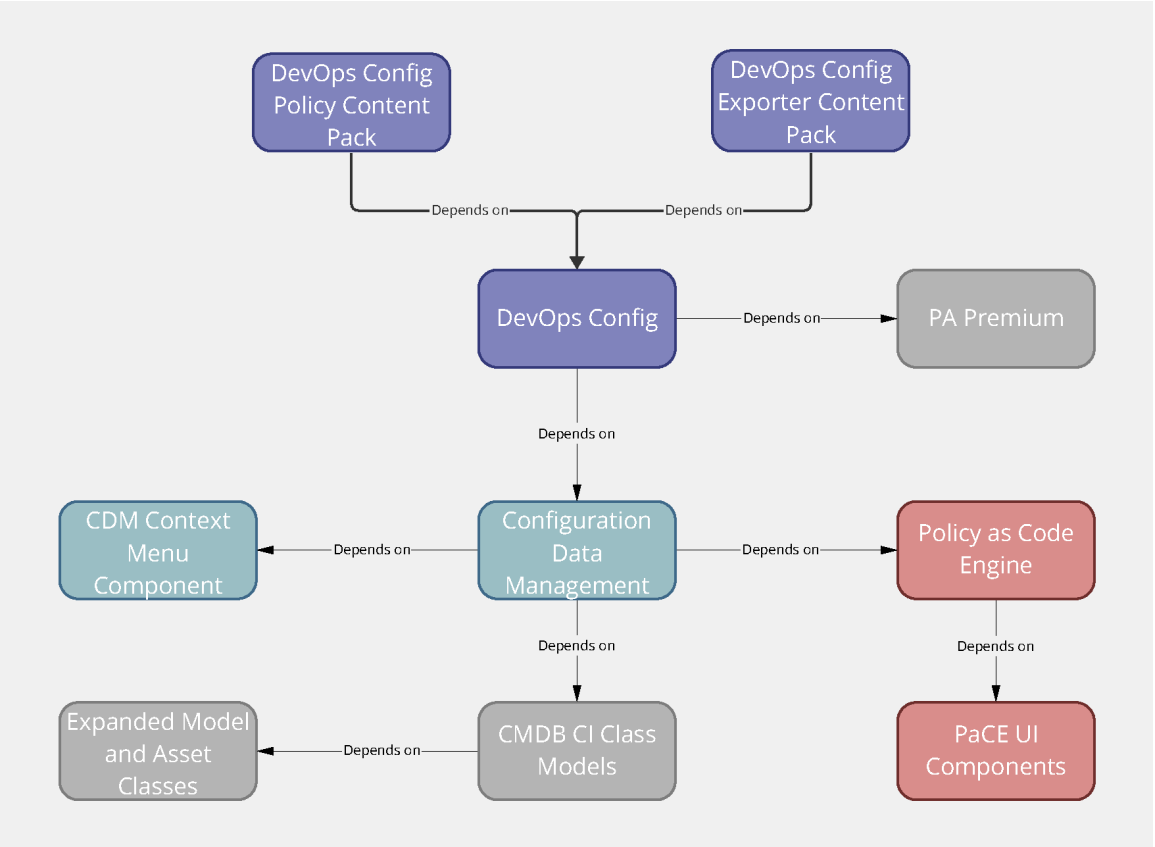
## DevOps Config dependencies




These plugins are installed with core DevOps Config applications. They are critical to DevOps Config and do not function properly without them.

**CMDB CI Class Models**

CDM leverages the CMDB CI Class Models plugin to connect aspects of user application configuration data model to the ServiceNow AI Platform CMDB.

Applications are linked to an Application Model, which is part of the Build phase of the Common Service Data Model (CSDM). Similarly, deployables are linked to an Application Service, which is part of the Operations phase of the CSDM.

The link between DevOps Config and the CSDM is critical for solving problems that may arise across a user software factory.

For example, an operator is able to trace the cause for an alert for a particular CI, to a configuration change, to an application service (of which that CI is a part). This can reduce mean time to resolution, or MTTR, from hours to minutes.

**PA Premium**

Performance Analytics (PA) Premium plugin is leveraged by the DevOps Config Insights plugin to allow for more than 180 days of reporting data for all DevOps Config Insights widgets.

**Expanded Model and Asset Classes**

The Expanded Model and Asset Classes Store application adds enterprise model and asset classes that extend out-of-the-box product model and asset classes within the Configuration Management Database (CMDB) class hierarchy.

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These extensions include class descriptions, identification rules, identifier entries, and dependent relationships.

## DevOps Config terms

These are some of the common DevOps Config terms.

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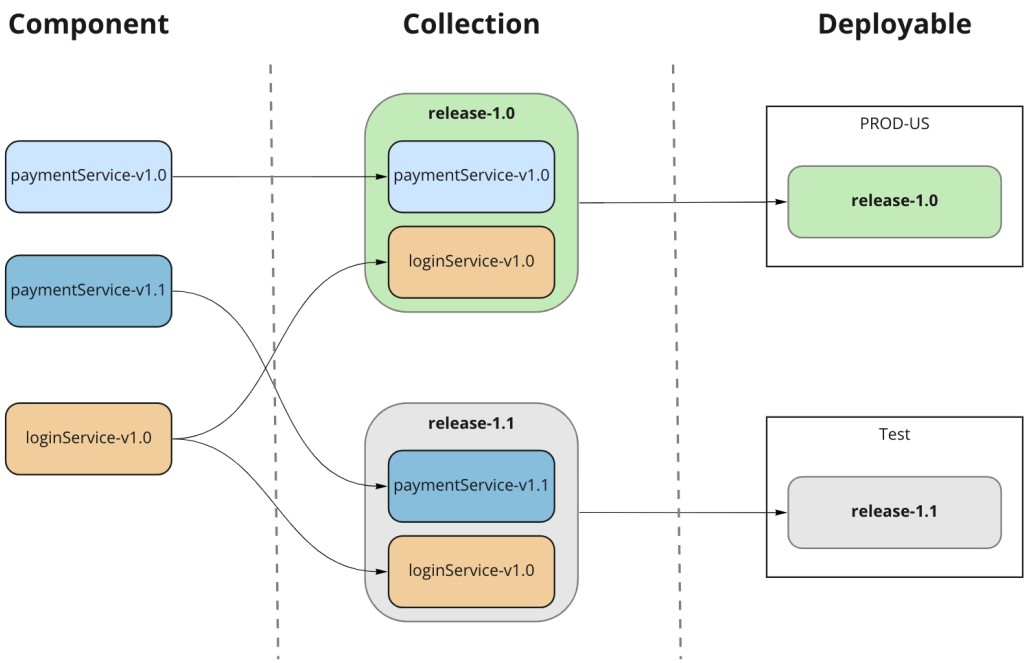
### Application

The logical composition of an application or application stack, containing the relevant configuration data needed to provision or deploy into a fleet. This can range from a traditional, monolithic structure to a modern structure that can contain multiple micro-services.

### Collection

A set of components that make up a release composition. Collections are included into deployables, and can be used to test different versions of components.

This example shows release-1.0 of an application that is currently deployed to the Production environment.




The microservice team that owns the payment service makes a hotfix and decides to add that into a release-1.1 collection that they are now testing in their Test environment.

### Component

The smallest aggregation unit of configuration data. A microservice that is part of a larger application stack is an example of a component.

### Configuration Data Item (CDI)

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A single unit of configuration data (for example, connection string, heap size, etc.) that is stored as a key-value pair.

**Data Model**

A hierarchy of related configuration data used to deploy an application or infrastructure.

**Deployable**

A subset of the data model, which encapsulates the set of configuration data that is used to deploy/provision an application or infrastructure for a specific target environment. It generally shares the same nomenclature (for example, Production, Staging, Test, Development, etc.).

**Snapshot**

The complete data model of a deployable at the time a configuration change is committed. This includes any included components, collections, and vars, as well as deployable-specific vars and overrides.

**Vars**

Variable configuration data that can be used to roll up configuration values that are used multiple times throughout different sections in the data model.

Vars created at the component level can be reused anywhere further down, like in a collection and/or deployable. However, vars defined in a particular deployable are intended to be used only in that context (for example, environment-specific creds, memory settings, etc.).

## Configuring DevOps Config

The DevOps engineer role installs and sets up DevOps Config, which is used to validate config data (committed by developers, or app engineers) before deployment.

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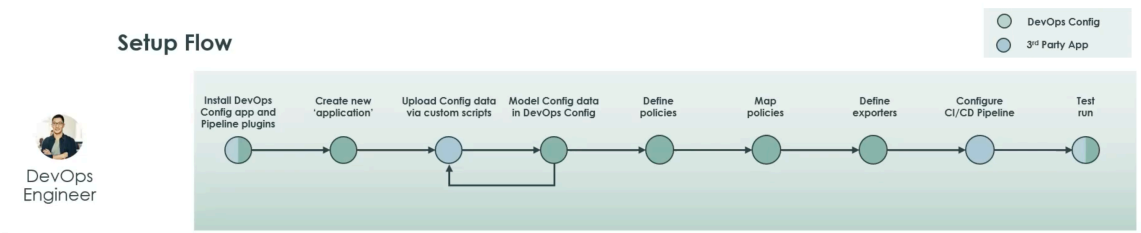


| Data validation configuration tasks | (Optional) Advanced configuration tasks to extend the use of the data model |
|---|---|
| 1. Install DevOps Config.<br><br>Install DevOps Config application, content packs, and pipeline plugins. | N/A |

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| Data validation configuration tasks | (Optional) Advanced configuration tasks to extend the use of the data model |
| --- | --- |
| • DevOps Config application.<br>• (Optional) DevOps Config Policy content pack.<br>• (Optional) DevOps Config Exporter content pack.<br>• (Optional) Pipeline integration with DevOps Config.<br>  ○ Argo CD plugin for ServiceNow DevOps<br>  ○ ServiceNow DevOps extension for Azure DevOps.<br>  ○ Jenkins plugin for ServiceNow DevOps. | |
| 2. Create an application in DevOps Config.<br><br>Create an application to set up the entity, and link between ServiceNow products. | N/A |
| 3. Create a deployable in DevOps Config.<br><br>Create a deployable to define the environments to deploy the configuration data for your application (typically Dev, Test, and Production). | Extend the use of the data model by using components and collections for a deployable in DevOps Config. |
| 4. Upload your configuration data.<br><br>Upload your configuration data from each tool source to DevOps Config by creating and running an import script. | Upload configuration data depending on use case. |
| 5. Define policies in DevOps Config.<br><br>Define policies to run for validation of config data using default DevOps Config policies. | Administrate the full life cycle of PaCE policies and create your own. |
| 6. Map policies to a deployable.<br><br>Map policies to a deployable to run for validation of config data. | Extend the use of the data model by mapping policies to components and collections in DevOps Config. |
| 7. Define exporters in DevOps Config.<br><br>Define exporters to export config data to your pipeline using default DevOps Config exporters. | • Export config data for use by your deployment tools downstream in your CI/CD pipeline.<br>• Extend the use of the data model by creating a custom exporter. |

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| Data validation configuration tasks | (Optional) Advanced configuration tasks to extend the use of the data model |
|---|---|
| 8. Configure your pipeline in DevOps Config.<br><br>Configure your pipeline to interact with your data model.<br><br>Use DevOps Config Azure DevOps pipeline tasks and Jenkins pipeline actions to integrate your pipeline with DevOps Config. | N/A |
| 9. Run validation in DevOps Config.<br><br>Run validation and review the results. | N/A |

## Install DevOps Config

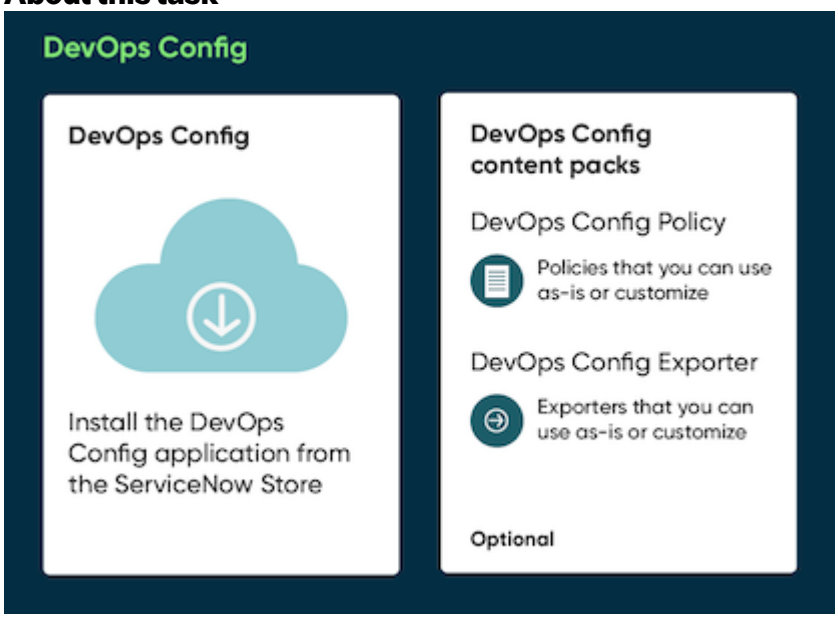
Install the DevOps Config application from ServiceNow Store applications. Visit the ServiceNow Store website to view all the available apps and for information about submitting requests to the store. For cumulative release notes information for all released apps, see the ServiceNow Store version history release notes.

### Before you begin

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

Role required: admin

### About this task

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### Procedure

1. Navigate to **System Applications** > **All Available Applications** > **All**.
2. Click the **Not Installed** tab to view a list of applications available for installation.
3. Locate the DevOps Config application and click **Install**.
   Configuration Data Management and Policy as Code Engine platform capabilities are also installed.

## Install DevOps Config Policy content pack

Install DevOps Config Policy content pack for a default set of DevOps Config policies that you can use as-is, or customize for your needs.

### Before you begin

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

**Note:**
You must install the DevOps Config application before installing the DevOps Config Policy content pack.

Role required: admin

### About this task

The DevOps Config Policy content pack contains a set of default DevOps Config policies to validate your configuration data.

### Procedure

1. Navigate to **System Applications** > **All Available Applications** > **All**.
2. Click the **Not Installed** tab to view a list of applications available for installation.
3. Locate the DevOps Config Policy content pack and click **Install**.

## Install DevOps Config Exporter content pack

Install DevOps Config Exporter content pack for a default set of DevOps Config exporters that you can use as-is, or customize for your needs.

### Before you begin

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

**Note:**
You must install the DevOps Config application before installing the DevOps Config Exporter content pack.

Role required: admin

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### About this task

The DevOps Config Exporter content pack contains a set of Default DevOps Config exporters to export your configuration data.

### Procedure

1. Navigate to **System Applications** > **All Available Applications** > **All**.
2. Click the **Not Installed** tab to view a list of applications available for installation.
3. Locate the DevOps Config Exporter content pack and click **Install**.

## Create an application in DevOps Config

Create an app in DevOps Config to manage its configuration data, and link DevOps Config with other ServiceNow products, including DevOps Change Velocity.

### Before you begin

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

An admin can create, edit, delete, and view DevOps Config apps.

Role required: sn_devops_config.admin

### About this task

Watch this short video to see how to create an application in DevOps Config.

Create an application in DevOps Config

An app in DevOps Config is the container for the config data of an application. An app also ties it with the DevOps Change Velocity application, where configuration data can be viewed in the DevOps Pipeline UI.

In DevOps Change Velocity, an app links work items, code commits and CI/CD pipeline executions together in the DevOps data model, which is displayed in change request, as well as the DevOps Insights dashboard.

Apps in the DevOps Config application and in the DevOps Change Velocity application are synced. Meaning, when an app is created in DevOps Config, it is also created in DevOps Change Velocity, if installed, and vice versa.

You can edit or delete apps in DevOps Config. When you delete an app:

- In DevOps Config, the state of the application is set to **Inactive** and is no longer accessible in DevOps Config.
- In DevOps Change Velocity, it's also deleted in DevOps Config (if installed).

### Procedure

1. Navigate to **All** > **DevOps Config** > **DevOps Config Workspace**.
2. Click the apps icon ( ) in the left navigation to open the Apps tab.
3. On the Applications form, click **New** to create an application and a new model, or to create an application and specify an existing model (or service).

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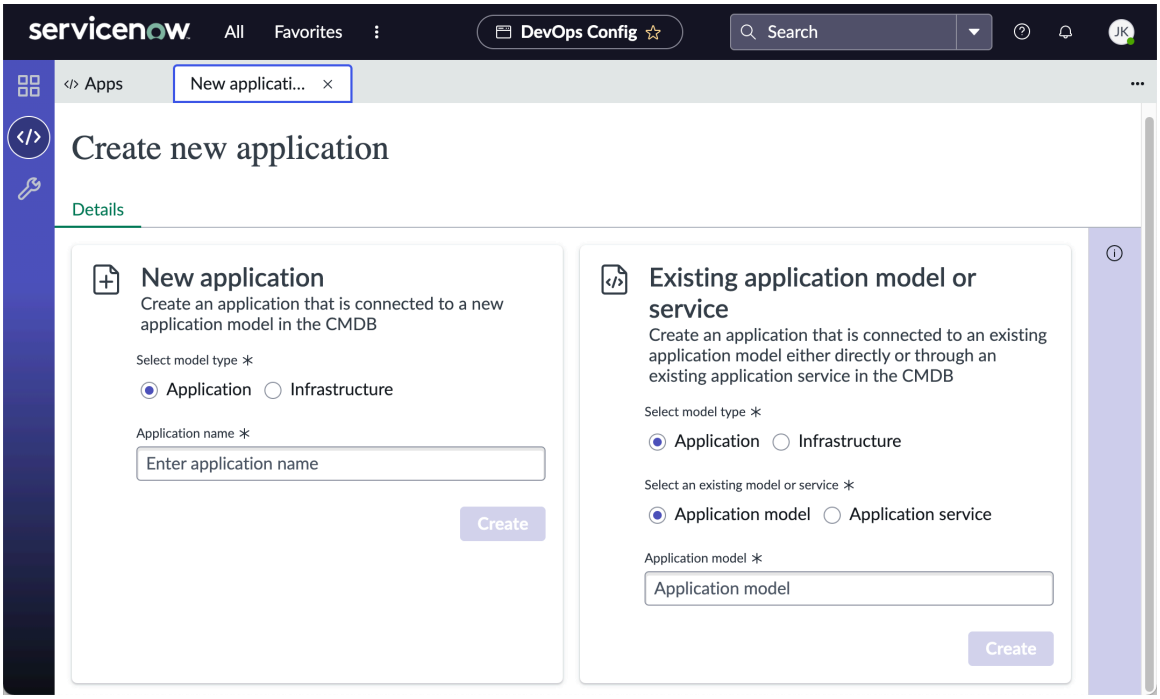


For a **New application** without an existing application model, both application and model are created.

For a new application to be tied to an **Existing application model or service**, only the application is created.

The CSDM application model (name, owner, manufacturer) functions as the link between ServiceNow DevOps products. There is an SDLC Component of the CMDB for each CSDM application model.

4. In the **Overview** tab, fill in the Application details and select **Save**.

| | |
|---|---|
| Maintained by | User groups that maintain the application.<br><br>With the cdm_admin role, you can add or remove any user groups.<br><br>If groups you're a member of are removed, you will lose access to the application.<br><br>**Note:**<br>A user with cdm_all_app_access and one of the other roles (cdm_admin, cdm_editor, or cdm_viewer) can see and manage the application even if they are not in those groups. For more information, see Roles in CDM. |
| Application description | Description of the application. |
| Application model owner | Username who owns the application model. |
| Manufacturer | Manufacturer of the application. |

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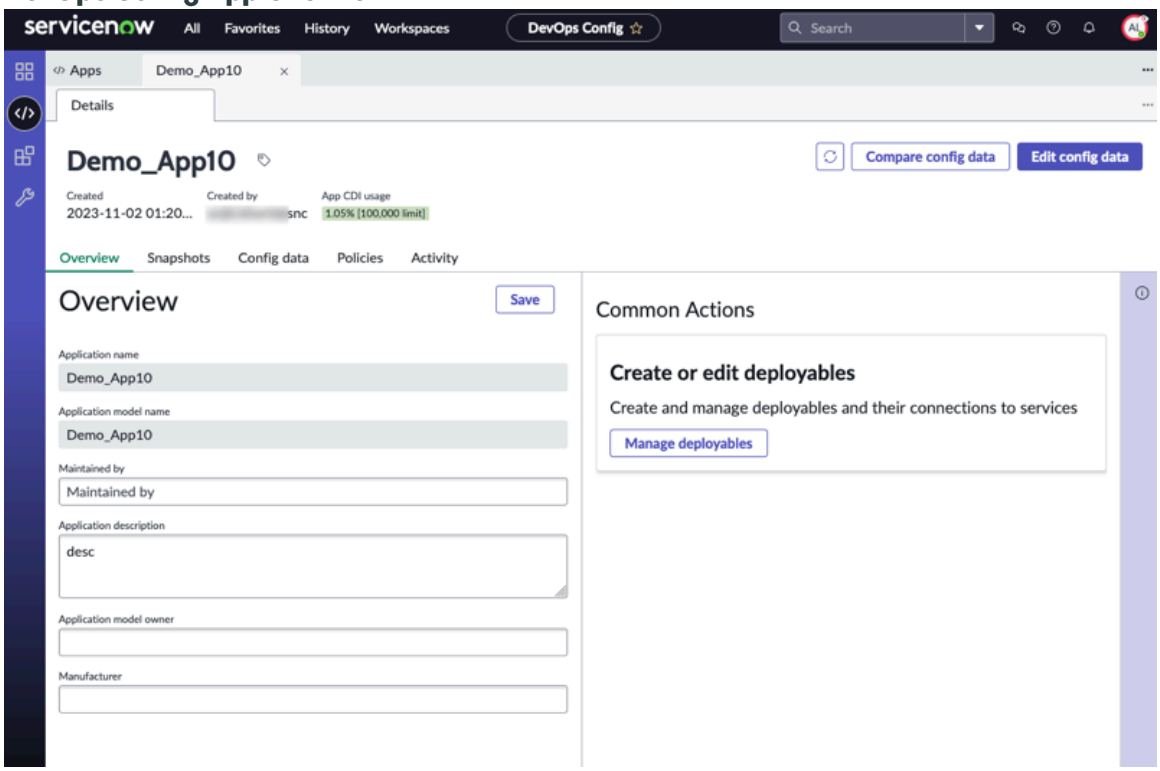
The application does not yet contain config data, so the next step is to import your existing config data into the application.

After you have imported config data and snapshots are generated, the list of snapshots are displayed in the **Overview** tab.

**Example:**

**DevOps Config App Overview**




### Create a CDM application that generates a new service in the CMDB

Generate a new service (an application service, application model, or dynamic CI group [infrastructure application type]) in the CMDB) and create a CDM application as the container for the config data for the service.

### Before you begin

**Important:**
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Role required: CDM Admin [sn_cdm.cdm_admin]

### About this task

For the application, you specify the number of deployables to generate and the SDLC environment that the deployables represent. When you upload existing config data into the application, the system maps the data as `[name:value]` pairs (config data items — CDIs) in the appropriate node in the data structure of the CDM application. For an overview of the process of preparing a new application to receive config data, see Preparing an application for config data upload.

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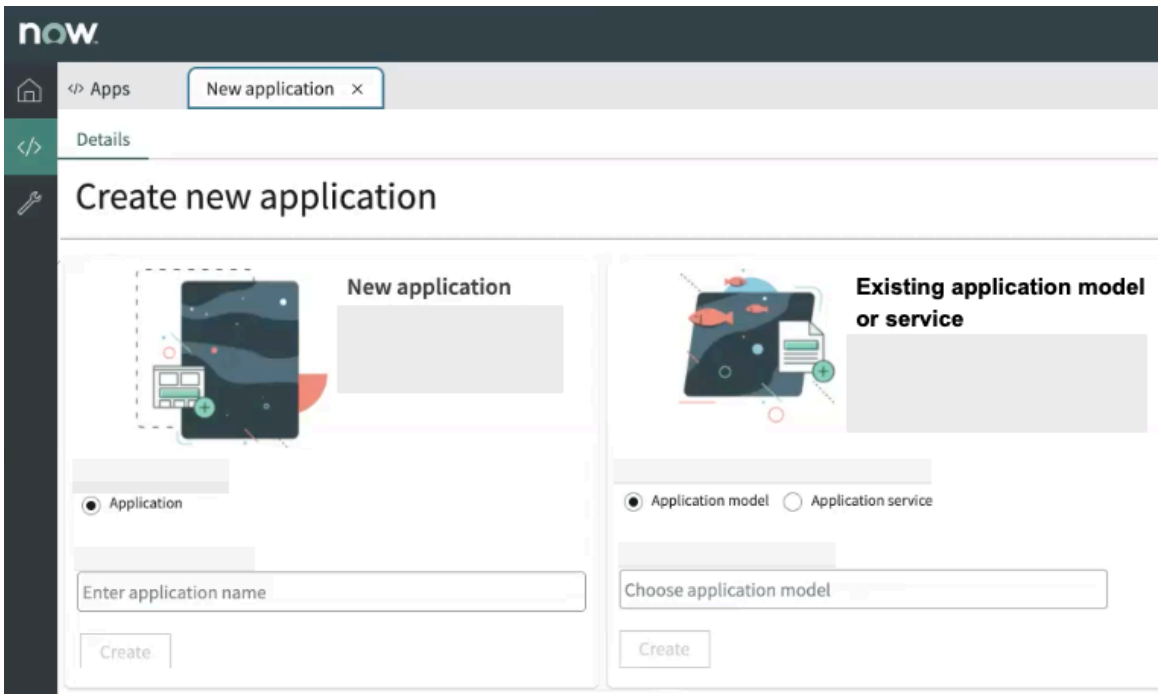
## Procedure

1. Select the **Applications** icon ( ) to open the Create new application page and then select **New application**.




2. On the **Overview** tab for the new CDM application, fill in additional application details that further identify the service in the CDM.

   The CSDM application model (name, owner, manufacturer) functions as the link between DevOps features. There is an SDLC component of the CDM for each CSDM application model.

### Application settings on the Details tab

| | |
|---|---|
| Application name | Unique and meaningful name for the application. |
| Application model name | Name of the application model. |
| Maintained by | Groups with access to the application. Only members of these groups can access the application data. |
| Application description | Description that helps other users understand the purpose, scope, and intent of the application. |
| Application model owner | Name of the owner of the application model. |
| Manufacturer | Manufacturer of the application. |

3. Select **Manage deployables** to open the **Edit deployables** tab where you can configure the deployables.
4. Select **Create deployables** and then fill in the settings on the Create Deployables dialog box to specify the quantity and environment type of deployables to create and the CMDB services to connect them to.

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### Create Deployables settings

| Field | Description |
|---|---|
| Environment | The kind of environment that is configured by the config data in the deployables.<br>○ Development<br>○ Test<br>○ Production |
| Connection preference | Option to connect the newly created deployables to the new services. Auto-connect is the only option when creating an application to an existing CMDB entry.<br>**Note:** Because the DevOps pipeline applies config data in a deployable only to the services that the deployable is connected to, every deployable must be connected to a service. |
| Quantity | The number of deployables to create.<br>Limit: 100. |

When you select **Create**, the system generates an application model in the CMDB and the CDM application with the specified number and types of deployables. The system auto-generates names of the form <AppName_EnvironmentType_number>.

5. On the **Edit deployables** tab, select the card for each deployable in turn and update its settings.

   You connect each deployable to a service in the CMDB. The deployable holds the config data for its associated service.

   The system auto-saves your updates to settings.

### Deployable details settings

| Field | Description |
|---|---|
| Deployable name | Default name for the deployable. To ensure that the auto-generated names are unique, the system adds a timestamp.<br>Rename as needed. |
| Deployable description | Description that helps other users understand the purpose, scope, and intent of the deployable. |

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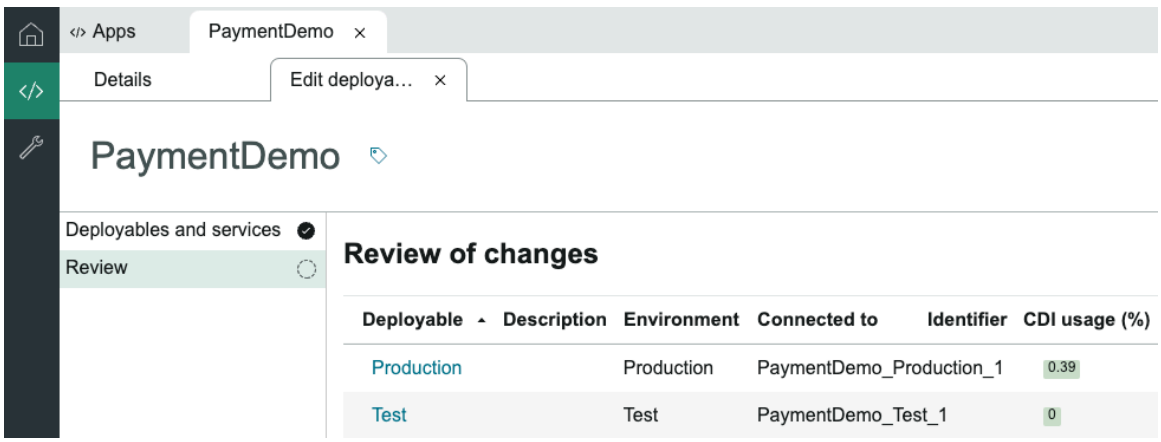
| Field | Description |
| --- | --- |
| Identifier | Unique identifier that distinguishes this deployable from other deployables that share the same name and possibly many config data settings.<br><br>For example, the production deployable that has the identifier **Pacific** might have different config settings for the `language` setting than the deployable that has the identifier **EU**. |
| Connected to | Service in the CMDB that the deployable is associated with. Select a service in the **Available services** list.<br><br>Perform one of the following actions:<br><br>○ Link the deployable to a CI in the CMDB: Select the cmdb_ci and then select **Next**.<br>○ Create a CI to link to: Select **New**, define the CI, and then select **Next**.<br><br>**Note:**<br>To continue, you must connect each deployable to a service. |

6. Click **Next** to view the list of deployables on the **Edit deployables** tab.




### What to do next

The application is not yet structured to accept config data, so the next step is to add the data structure. See Add the nodes that will contain config data to a new CDM application.

### Related topics

CDM data model

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### Create a CDM application that is based on an existing service in the CMDB

Create an application as the container for all config data for a service (an application service, application model, or dynamic CI group [infrastructure] in the CMDB).

## Before you begin

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

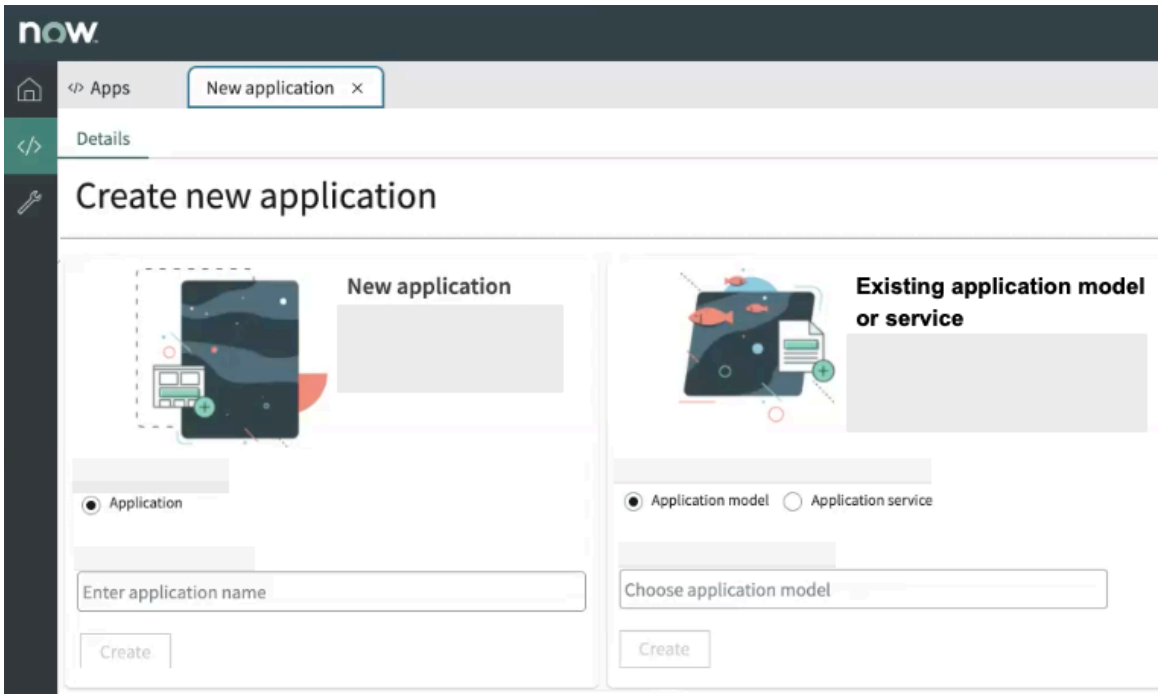
Role required: CDM Admin [sn_cdm.cdm_admin]

## About this task

For the application, you specify the number of deployables to generate and the SDLC environment that the deployables represent. When you upload existing config data into the application, the system maps the data as `[name:value]` pairs (config data items — CDIs) in the appropriate node in the data structure of the CDM application. For an overview of the process of preparing a new application to receive config data, see Preparing an application for config data upload.

## Procedure

1. Select the Applications icon ( ) to open the Create new application page and then select **Application based on existing services** to specify the CMDB service that the new application will hold config data for.




2. Fill in the settings on the Create Deployables dialog box to specify the quantity and environment type of the deployables and the CMDB services to connect them to.

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### Create Deployables settings

| Field | Description |
|---|---|
| Environment | The kind of code environment that is configured by the config data in the deployable.<br>○ Production<br>○ Development<br>○ Test |
| Connection preference | Option to connect the newly created deployables to services.<br>○ Auto-connect each new deployable to a service in the application model or dynamic CI group.<br>○ Manually specify the service to connect each new deployable to. You make the connections on the next page.<br>**Note:** Because the DevOps pipeline applies config data in a deployable only to the services that the deployable is connected to, every deployable must be connected to a service. |
| Quantity | The number of deployables to create.<br>If the number exceeds the number of services that are associated with the existing item in the CMDB, then the system generates new blank services. |

When you select **Create**, the system generates the application with the specified number and types of deployables and opens the **Edit deployables** tab for the application.

3. Select **Manage deployables** to open the **Edit deployables** tab where you can configure the deployables.
4. On the **Edit deployables** tab, update the settings for each deployable and then select **Next**. You connect each deployable to a service in the CMDB. The deployable holds the config data for its associated service.

   The system auto-saves your updates to settings.

### Deployable details settings

| Field | Description |
|---|---|
| Deployable name | Default name for the deployable that the system generates.<br>Rename as needed. |

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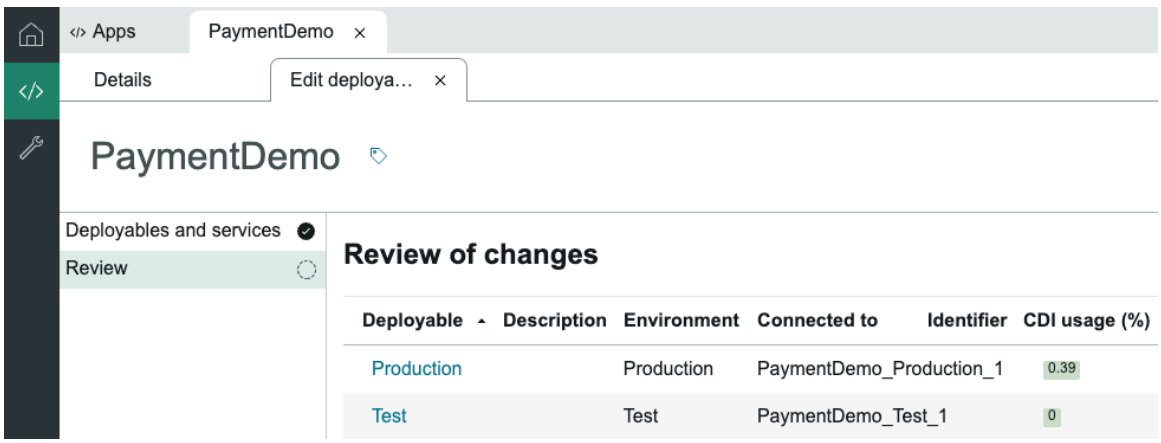
| Field | Description |
|---|---|
| Deployable description | Description that helps other users understand the purpose, scope, and intent of the deployable. |
| Identifier | Unique identifier that distinguishes this deployable from other deployables that share the same name and possibly many config data settings.<br><br>For example, the production deployable that has the identifier **Uraguay** might have different config settings for the `currency` setting than the deployable that has the identifier **Greenland**. |
| Connected to | Service in the CMDB that is configured by the data in snapshots of the deployable. Select a service in the **Available services** list.<br><br>**Note:**<br>To continue, you must connect each deployable to a service.<br><br>Perform one of the following actions:<br>○ Connect the deployable to a CI in the CMDB: Select the cmdb_ci and then select **Next**.<br>○ Create a CI to connect to: Select **New**, define the CI, and then select **Next**. |

The Review page opens.

5. Click **Next** to view the list of deployables on the **Edit deployables** tab.




### What to do next

The application is not yet structured to accept config data, so the next step is to add the data structure. See Add the nodes that will contain config data to a new CDM application.

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**Related topics**

- CDM data model
- Viewing and editing config data
- Define or update a component
- Define or update a collection in an application
- Create or update a variable CDI
- How encrypted data is handled

## Create and update a deployable

Create a deployable while working in a changeset. You can add multiple components and collections to a deployable.

### Before you begin

Role required: cdm_editor or cdm_admin

### About this task

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

**Important:**
Save your changes whenever you are confident of the changes and before you leave the **Config data** tab.

**Note:**
Uploaded data items are sorted alphabetically within the structural folders to enable you to locate particular items quickly.

The system places the following limits on the count of config data items (CDIs):

- An application can contain a maximum total of 100,000 CDIs.
- Any single deployable can contain a maximum of 10,000 CDIs.

See CDM system properties for information on configuring the *sn_cdm.max_allowed_cdi_per_application* and *sn_cdm.max_allowed_cdi_per_deployable* property settings.

### Procedure

1. On the **Settings** tab for an application, select **Deployables** in the tree view and then select **New**.
2. Fill in the fields on the Enter details page of the wizard and then select **Next**.

**Enter details page**

| Field | Description |
|---|---|
| Name | Unique and meaningful name for the deployable. |

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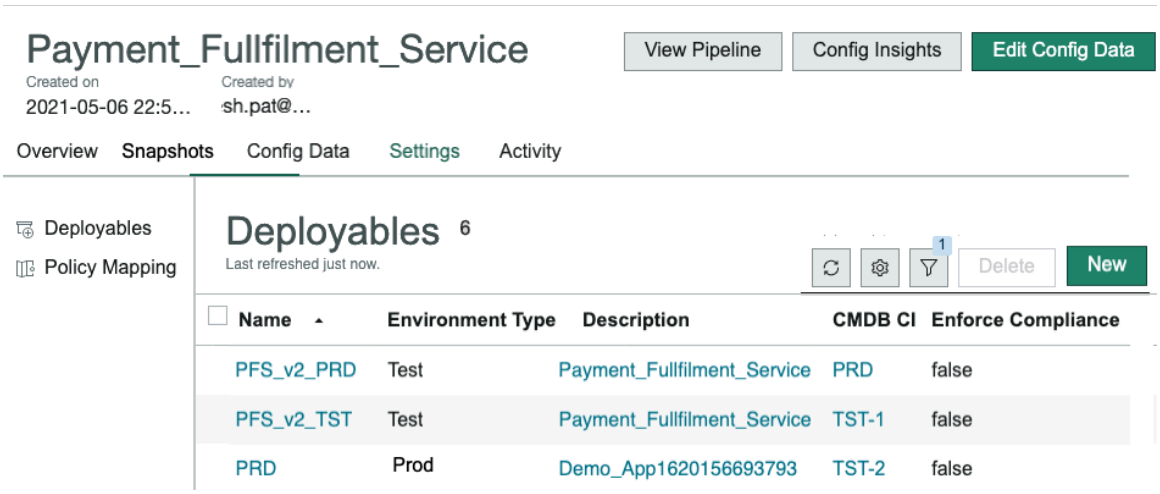
| Field | Description |
|---|---|
| Description | Description that helps other users understand the purpose, scope, and intent of the deployable. |
| Environment | The kind of application or infrastructure environment that the deployable implements.<br>○ Development<br>○ Production<br>○ Test |
| Restrict export | Option to ensure that only snapshots that pass validation can be exported. |

The wizard moves to the Link to CMDB page of the wizard.

3. On the Link to CMDB page and perform either of the following actions:
   - Link the deployable to a CI in the CMDB: Select the cmdb_ci and then select **Next**.
   - Create a CI to link to: Select **New**, define the CI, and then select **Next**.

   The wizard moves to the Review page.
4. On the Review page, verify the settings for the new deployable.
   Select **Back** to change settings. Select **Create** to create the deployable.
   The system generates the deployable and displays it in the list on the **Settings** tab for the application.




5. **Optional:** Follow this procedure to add a collection to one or multiple deployables:

   a. For the collection node in the tree, select the menu icon ( ⋮ ) and select **Include in deployables**.

   b. Select all deployables in which to include the collection and then select **Include**.

   **Note:**
   Only deployables that do not already include the collection appear in the list.

   The collection is included in each selected deployable.

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(Optional) When you add a collection to a deployable, the Editor panel lists included collection names but not contents. The Preview panel displays the full state of the data.

6. **Optional:** Add CDI settings to the deployable that will override or overlay settings in components or collections.
   For more information, see Define or update a component, Define or update a collection in an application, or Create or update a variable CDI.
7. Select **Save** to save the changes in the changeset and ready the changes in the changeset to be committed.
   The Editor panel, List view, and Preview panel refreshes to reflect the resolved state of the changeset. The system updates the changeset but does not update the application. Changes appear on the **Activity** tab. You must commit a changeset to update the config data for the application. After saving, you can move on to other activities and return later to edit the changeset.
8. **Optional:** Select **Commit**.
   The Commit changeset dialog box opens and lists each deployable that is affected by the changes.

   **Note:**
   After you commit a changeset, the changeset cannot be modified.

   The system generates a snapshot of each deployable that is affected by the changes. The dialog box offers the following **Additional actions**:

   - If no deployables are affected by the changes, select **No additional actions**. The system will update the application to persist the changes.
   - - Select **Validate snapshots** to perform the following operations on all generated snapshots:
       - The system executes all policies that are statically or dynamically mapped to the associated deployable.
       - If the snapshot passes all policies, then the Validation status value is set to **Passed** and no entries are listed on the **Validation Results** tab. If validation was invoked with the **Publish Valid** publish option, then valid snapshots are auto-published.
       - If any policy encounters issues, then the Validation status value is set to **Failed**. The **Validation Results** tab displays all failures or warnings returned by policies.
       - If any policy failed to run to completion, then the Validation status value is set to **Execution error** and the **Validation Results** tab indicates that validation failed due to error.
     - Select **Validate and publish snapshots** to perform validation as described in the **Validate snapshots** action. Only snapshots that pass validation are published. Only published snapshots can be exported.

     Select **Commit**.
     - The system updates the application to persist the changes to config data.
     - The changeset state changes to **Committed**.
     - The changeset cannot be modified.
     - If snapshots were created, the confirmation message includes a link to the snapshots.
     - If an error occurs during the commit process, the changeset state is set to Commit failed.

### What to do next

Map policies to the deployable

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**Related topics**

- CDM data model
- Viewing and editing config data
- Define or update a component
- Define or update a collection in an application
- Create or update a variable CDI
- How encrypted data is handled

### Delete a deployable

Delete a deployable to delete its config data and all associated snapshots.

#### Before you begin

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

Role required: CDM Admin [sn_cdm.cdm_admin]

#### About this task

**Note:**
When you delete a deployable, existing snapshots cannot be exported or validated and cannot be referred to in exporters or policies.

#### Procedure

1. For an open application, select the **Settings** tab.
2. Select **Deployables** to view the list of deployables for the application.
3. Select one or more deployables and select **Delete**.
   - The deployables no longer appear in any list.
   - All config data in the deployables is deleted.
   - All existing snapshots are deleted.
   - You can create a new deployable with the same name as a deleted deployable.

## Uploading your config data

You first create a new CDM application structure and then upload the existing config data into the structure.

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

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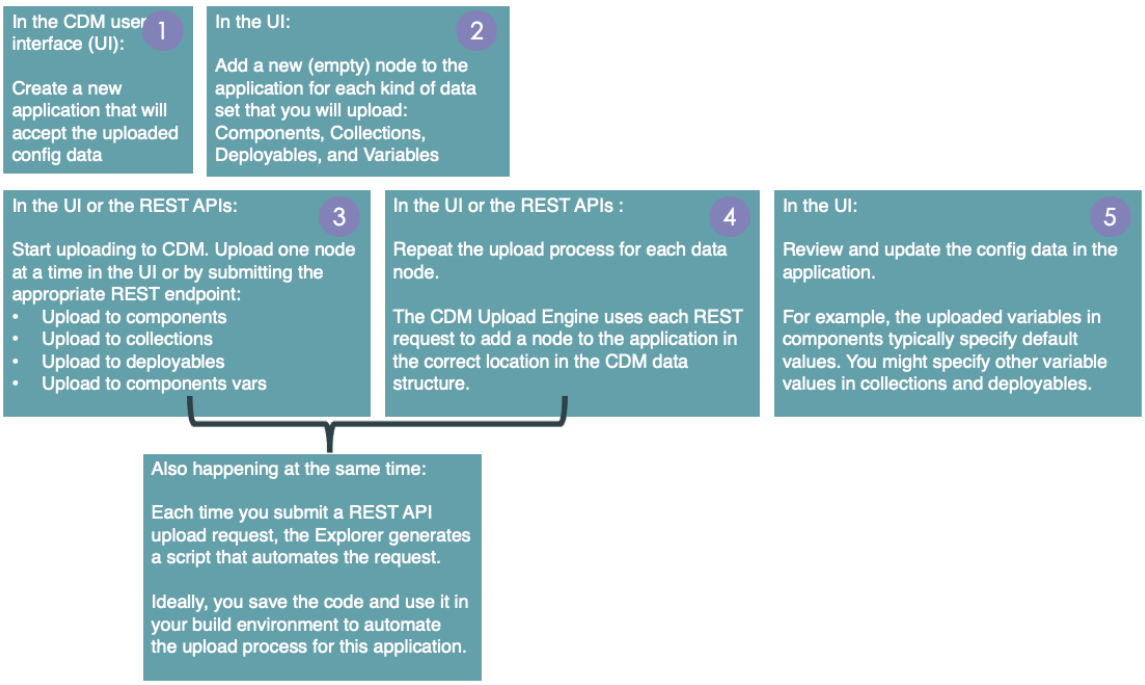
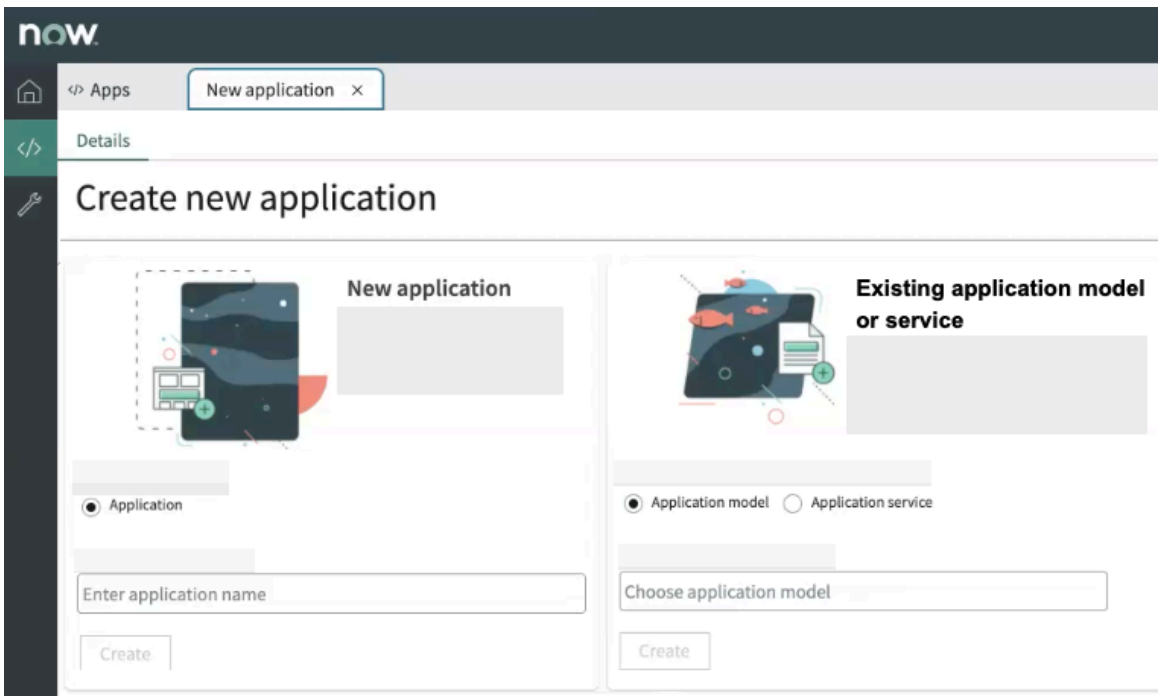
## How it works: Performing the initial upload of your existing config data into CDM data tables




1. Open the CDM user interface and create a new application. For example, let's create the Bookstore application to support an online bookstore. An application in CDM is the full collection of config data for an application service, application model, or dynamic CI group [infrastructure] in the CMDB.




2. Now open the Bookstore application and generate a new changeset so you can begin to put the data structure in place. (A more detailed overview of this process appears in Preparing an application for config data upload.)

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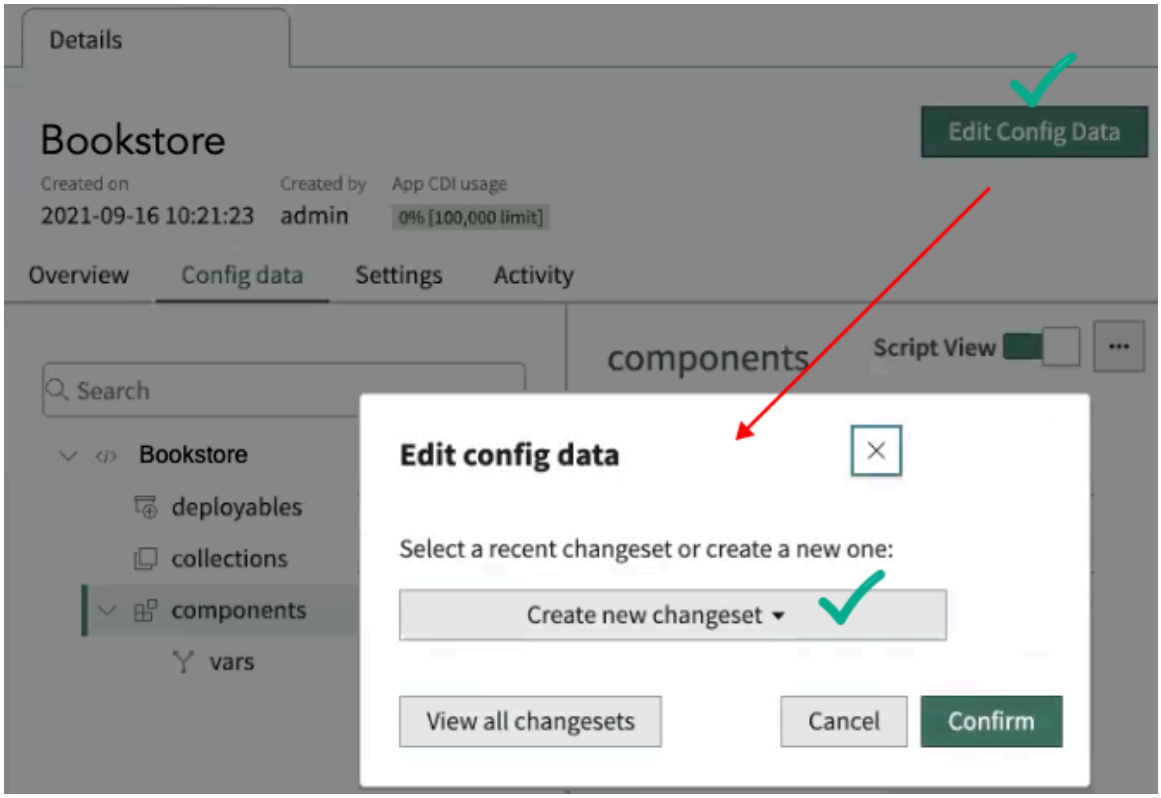
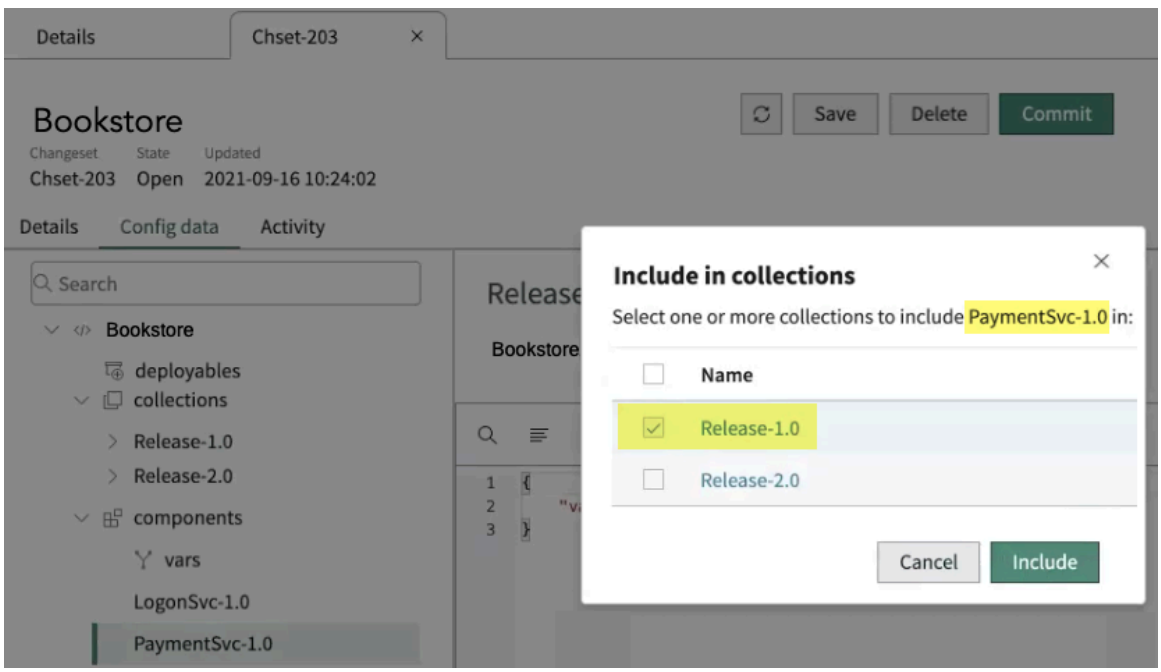



In the changeset, define the data structure that includes a node for each set of config data that you will upload. This process is called modeling the data. You add components, collections, deployables, and CDIs as needed. For information on each of these items, see CDM data model. For additional information on adding nodes to an application, see Preparing an application for config data upload.

In this example, two components and two collections have been added. Now, the **PaymentSvc-1.0** component is included in the **Release-1.0** collection. As with all collections, this means that any data in the **PaymentSvc-1.0** component is now included in the **Release-1.0** collection.

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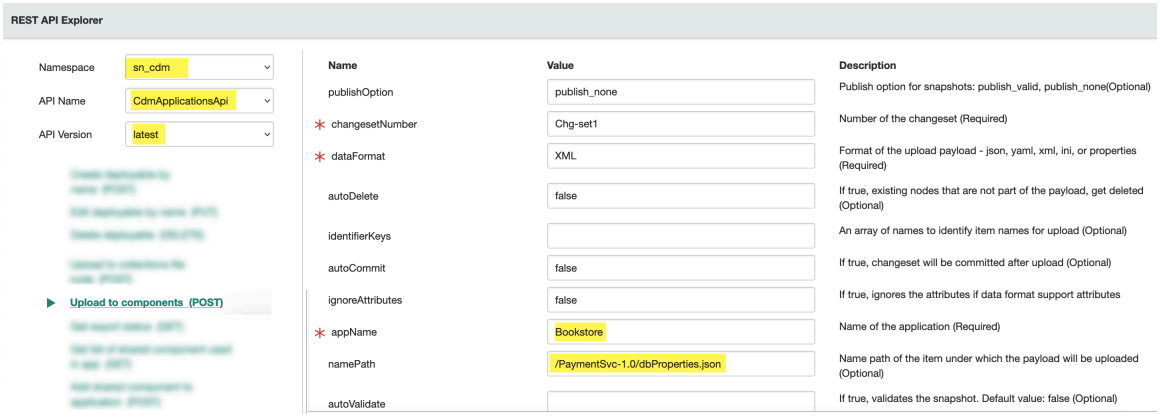
When you are satisfied with the structure (you can update at any time), you open the REST Explorer to begin the process of uploading the source config data into the CDM data tables. Do not commit the changeset — it remains open so you can upload data.

3. Using the REST APIs or the config data editor, set parameter values that specify the name of the application to upload to, the path within the CDM application data structure to place the data, the format of the source data (JSON in the example), and so on.

   **Note:**
   When you upload your existing config from an XML file and the **ignoreAttributes** is set to **false**, the CDM XML Parser retains the attributes in JSON using identifiers. For more information, see Parsing of XML files in CDM.

   This example shows the REST API Explorer platform utility for clarity. This is an example of how you might construct an *`Upload to components`* REST POST request that creates a `dbProperties.json` node in the **PaymentSvc-1.0** component and then adds the source data to the new node. (You specify the source data to upload in another field.) The APIs are described in CdmApplicationsApi, CdmChangesetsApi, and CdmSnapshotApi.




4. When you select **Send**, the API reads the original config data, uploads it and aligns it into the CDM data structure.

   **Note:**
   Uploaded data items are sorted alphabetically within the structural folders to enable you to locate particular items quickly.

   The system places the following limits on the count of config data items (CDIs):

   - An application can contain a maximum total of 100,000 CDIs.
   - Any single deployable can contain a maximum of 10,000 CDIs.

   See CDM system properties for information on configuring the *`sn_cdm.max_allowed_cdi_per_application`* and *`sn_cdm.max_allowed_cdi_per_deployable`* property settings.

   **Important:**
   Each time you submit a POST request, the API performs the POST and also generates an upload script. You can specify one of several script languages. The purpose is for you to use the code in your pipeline system to automate the upload process for this application in future uploads.

5. Back to CDM: Review and update the config data as described in Preparing an application for config data upload.

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6. When you are satisfied that the application is a full and correct representation of the config data, you can commit the changeset. The commit action generates a snapshot of each deployable and causes the API to store the data in CDM tables.

   Now that the application is fully in place, you can manage the data as needed: Update config settings, apply policies to validate the data, export valid snapshots of config data, and so on.

   While you export any snapshot, the system can generate API code that you can use to automate the export process. See Generate API invocation code for an exporter for details.

**Related topics**

Preparing an application for config data upload

Parsing of XML files in CDM

Parsing of CSV files in CDM

### Preparing an application for config data upload

An application in CDM is the full collection of config data for an application service, application model, or dynamic CI group [infrastructure] in the CMDB. After you upload your source config data, the application can support all potential deployables that make up each version of the development, test, and production environments of the service.

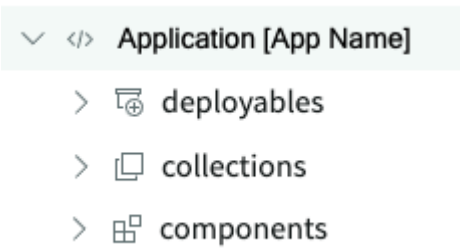
**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

## Overview: Preparing an application to accept uploaded config data

You follow this general process to prepare an application to accept the upload of config data:

1. On the **Apps** tab, you, a user with the CDM Admin [sn_cdm.cdm_admin] role, create an application record.

   The system generates an application that includes several standard folders in a hierarchical structure. You will map your existing config data into this data structure to enable the benefits that are described in CDM data model.




   The application supports creation of multiple deployables. For example, you might create a deployable for each typical environment: Development, Test, and Production. You might also create multiple versions of each deployable for each environment type.

2. Working in the CDM code editor, you now create a changeset — a draft copy of the application that you can edit.

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3. While working in the changeset, you create the following types of nodes in the appropriate folders. This process models the config data, that is, it prepares the application to map your source config data into the CDM data structure.

   **Note:**

   Starting with Configuration Data Management version 4.2, you can define a node using any UTF-8 character, including the forward slash (/).

4. Now that the structure is in place, you use the REST APIs or the CDM code editing panel to upload your existing configuration data into the changeset. The process is described in Uploading your config data. For more information, see CdmApplicationsAPI, CdmChangesetsAPI, and CdmSnapshoAPI.

   **Note:**
   If you're uploading an XML or CSV file to import your existing config data into CDM, the CDM parser parses the data in a specific way. For more information, see Parsing of XML files in CDM and Parsing of CSV files in CDM.

   You can upload the following types of datasets: component variables, components, collections, and deployables.

   **Components**

   Components are the building blocks that typically represent the config data for a logical element of an application or a part of an infrastructure service. For example, a monolithic app, a micro-service, a physical server, or a Docker template.

   A component can contain variables that can take on different values in collections and deployables. More detailed instructions appear in Define or update a component.

   **Collections**

   A collection is the set of components that together define a release — You can think of a collection as a release composition.

   A collection can contain variable or override settings that are specific to the particular version. For example, the VM config data used in release-1 is different from the data used in release-2. release-1 might use the value 2Gb for the *memory* setting (`"memory": "2Gb"`) and release-2 might specify a different value (`"memory": "4Gb"`). In addition, a collection might include config settings that do not appear in its components. You might think of such values as "overlays".

   **Deployables**

   A deployable is a config dataset (for a development, test, or production environment) that can be deployed into your CI/CD pipeline as a service. Each deployable in an application configures a service in the CMDB. For example, you might create three deployables, one for each environment type: Development, Test, and Production.

   A deployable is made up of the collection or set of collections that define the release for a particular environment. The combination of collections+environment link to an application service in the CMDB or an infrastructure service.

   A deployable can contain variable or override settings that are specific to the environment. For example, the `database` variable has one value in the

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development environment and a different value in the production environment. An override value in the production deployable might specify a required container parameter that is not needed in the development environment.

5. After the data is uploaded, you return to CDM. You update variable and override values so that the relatively small set of components and collections can provide config data for all three deployable environments. For example, the `Development` deployable can use the same components and collections as the `Test` deployable. `Development` uses the default *`database`* variable value. `Test`, in contrast, uses a different value that is appropriate for the test environment.
6. Now, save and commit the changeset. The system performs the following actions:
   - Determine whether there are conflicts with other earlier commits. If the system reports a conflict, you must resolve it and recommit or create a changeset and redo your changes. For more information on conflict resolution, see Conflicts between changeset commits.
   - Push all changes into the data model of the application (the config data is persisted).
   - Generate a snapshot of each deployable that is affected by the changes in the changeset. The system validates config data by executing specified policies against a snapshot. At the moment that the snapshot is created, the snapshot can be published and used to export the config data. Snapshots are permanent records that cannot be edited.

The source config data is now held in CDM tables. You can now manage the data as needed: map policies to each deployable so that the snapshots can be validated, validate the data in a snapshot (apply the policies), export config data, and so on.

**Note:**
You can map policies to an empty deployable, but that is not a typical procedure.

**Related topics**

Define or update a component

Define or update a collection in an application

Create and update a deployable

Changesets and version control in CDM

Conflicts between changeset commits

Validating and correcting configuration data

### Add the nodes that will contain config data to a new CDM application

Add the data structure to a new application that will accept the uploaded config data into appropriate nodes.

#### Before you begin

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

Role required: CDM Admin [sn_cdm.cdm_admin]

#### About this task

When the system creates a new application, the application has only the highest level of structure: **components**, **collections**, and **deployables** folders. In this procedure, you add

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the component, collection, and deployable nodes that will accept the uploaded config data. When you upload existing config data into the application, the system maps the data as `[name:value]` pairs (config data items — CDIs) in the appropriate node in the data structure of the CDM application. For more information, see CDM data model.

**Note:**

Starting with Configuration Data Management version 4.2, you can define a node using any UTF-8 character, including the forward slash (/).

### Procedure

1. Create the components that will be included in the collections.
   For more information, see Define or update a component and Define or update a collection in an application.
2. Add a collection to one or multiple deployables:

   a. For the collection node in the tree, select the menu icon ( ⋮ ) and select **Include in deployables**.

   b. Select all deployables in which to include the collection and then select **Include**.

   **Note:**
   Only deployables that do not already include the collection or any of its descendants appear in the list. If the collection has the same name as an existing node, then the collection is transformed into an override or overlay.

   The collection is included in each selected deployable.

   When you add a collection to a deployable, the **Editor** panel displays the included collection names but not their contents (overrides or overlays do appear). This strategy reduces clutter and clarifies the structure. To view the fully-resolved content of the data, view the **Preview** panel.
3. Create the components that will be included in the collections.
4. **Optional:** Add CDIs to the deployable that will override or overlay settings in components or collections.

   **Note:**
   Uploaded data items are sorted alphabetically within the structural folders to enable you to locate particular items quickly.

   The system places the following limits on the count of config data items (CDIs):

   - An application can contain a maximum total of 100,000 CDIs.
   - Any single deployable can contain a maximum of 10,000 CDIs.

   See CDM system properties for information on configuring the *sn_cdm.max_allowed_cdi_per_application* and *sn_cdm.max_allowed_cdi_per_deployable* property settings.

   For more information, see Define or update a component, Define or update a collection in an application, or Create or update a variable CDI.
5. Select **Save** to save the changes in the changeset and ready the changes in the changeset to be committed.
   The Editor panel, List view, and Preview panel refreshes to reflect the resolved state of the changeset. The system updates the changeset but does not update the application. Changes

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appear on the **Activity** tab. You must commit a changeset to update the config data for the application. After saving, you can move on to other activities and return later to edit the changeset.

6. **Optional:** Select **Commit**.
   The Commit changeset dialog box opens and lists each deployable that is affected by the changes.

   **Note:**
   After you commit a changeset, the changeset cannot be modified.

   The system generates a snapshot of each deployable that is affected by the changes. The dialog box offers the following **Additional actions**:

   - If no deployables are affected by the changes, select **No additional actions**. The system will update the application to persist the changes.
   - Select **Validate snapshots** to perform the following operations on all generated snapshots:
     - The system executes all policies that are statically or dynamically mapped to the associated deployable.
     - If the snapshot passes all policies, then the Validation status value is set to **Passed** and no entries are listed on the **Validation Results** tab. If validation was invoked with the **Publish Valid** publish option, then valid snapshots are auto-published.
     - If any policy encounters issues, then the Validation status value is set to **Failed**. The **Validation Results** tab displays all failures or warnings returned by policies.
     - If any policy failed to run to completion, then the Validation status value is set to **Execution error** and the **Validation Results** tab indicates that validation failed due to error.
   - Select **Validate and publish snapshots** to perform validation as described in the **Validate snapshots** action. Only snapshots that pass validation are published. Only published snapshots can be exported.

   Select **Commit**.
   - The system updates the application to persist the changes to config data.
   - The changeset state changes to **Committed**.
   - The changeset cannot be modified.
   - If snapshots were created, the confirmation message includes a link to the snapshots.
   - If an error occurs during the commit process, the changeset state is set to Commit failed.

### What to do next

The application does not yet contain config data, so the next step is to import your existing configuration data into the appropriate nodes in the application. See Uploading your config data.

### Related topics

CDM data model

Parsing of XML files in CDM

Parsing of CSV files in CDM

Viewing and editing config data

Define or update a component

Define or update a collection in an application

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Create or update a variable CDI

How encrypted data is handled

### Parsing of XML files in CDM

The CDM XML parser enables the parsing of attribute key-value pairs in XML files, so when you upload config data from an XML file into CDM, you can easily identify the attributes of each element in the CDM editor or list view.

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

This parsing of attribute key-value pairs from an XML file to a JSON format in CDM helps you in the following ways:

- Uploading existing config data from an XML file, including the attributes of XML elements as appropriate key-value pairs in JSON.
- Differentiating attributes from the config data items easily in the CDM editor.
- Validating imported CSV data with attributes in CDM for deployment.
- Converting attribute key-value pairs in JSON format as XML element attributes in XML file.

## Parsing of XML to JSON during import

When you import an XML file to upload your config data into CDM, the parser converts attributes and enclosing text in XML elements to the JSON format as follows:

- Adds the *@* prefix to all key names corresponding to attributes of XML elements.
- Adds a *#text* key for the enclosing text value of XML elements that have both attributes and enclosing text.

These options help in identifying attributes and enclosing text in the Editor panel and List view while reviewing the config data.

The following example shows how the conversion looks between XML and JSON formats:

**XML format**

```
<app>
        <components>
                <paymentService  type="B2C">
                                <provider  region="EMEA">ABCPay</provider>
                                <service>XYZPay</service>
                </paymentService>
        </components>
<app>
```

**JSON format**

```
{
    "app"  :  {
              "components"  :  {
                            "paymentService"  :  {  //key-value pair for XML
elements with attributes
                                          "@type"  :  "B2C",  // @ prefix for attribute
```

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```
                                    "provider"  :  {
                                                "@region"  :  "EMEA",  // @
prefix to key name for attribute
                                                "#text"  :  "ABCPay"    // #text
key name for enclosing text
                                        } ,
                                "service"  :  "XYZPay"  //key-value pair for XML
elements without attributes
                                }
                        }
            }
}
```

## Parsing of JSON to XML during export

To keep the XML attributes and enclosing text in their original format when exporting the config data to an XML file format, you must update the config data as follows:

- Add the *@* prefix to all key names to make them parse as attributes of XML elements.
- Add keys named *#text* to CDIs that should be parsed as the enclosing text value of XML elements, when both attributes and enclosing text are present.

### Related topics

Uploading your config data

Add the nodes that will contain config data to a new CDM application

Parsing of CSV files in CDM

### Parsing of CSV files in CDM

The CDM CSV parser enables parsing of data in CSV files, so when you upload config data from a Comma-Separated Values (CSV) file into CDM, you can easily identify the data format attributes and config data in the CDM editor or list view.

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

The CDM CSV parser follows the CSV standard RFC 4180. This parsing of data from a CSV file to a JSON format in CDM helps you in the following ways:

- Uploading existing config data from a CSV file with custom header and delimiter attributes to parse them as appropriate key-value pairs in JSON.
- Differentiating data format attributes (metadata) from the config data items (data) in the CDM editor.
- Validating imported CSV data in CDM for deployment.
- Converting config data from JSON format to CSV format with attributes in the original format.

## Parsing of CSV to JSON during import

When you import a CSV file into CDM, the parser converts the data in CSV format to the JSON format as follows:

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- Adds each record from the CSV file as a CDI in separate indexed nodes under the *data* node in JSON format.
- Adds the data format attributes used during CSV upload under the *metadata* node.

The query parameter *dataFormatAttributes* includes attributes for determining the delimiter, headers, first row as header, and secured headers.

**Attributes for the CDM CSV parser**

| Attribute name | Description |
|---|---|
| delimiter | Character to separate out each header field as a key and the record field as a value of a CDI. You can specify a valid character as the delimiter.<br><br>Default: `"delimiter": ","`. |
| containsHeader | Option to determine whether the first row in the CSV file is considered as the header row. This attribute is optional.<br>○ true: The CSV file contains the first row as the header.<br>○ false: The CSV file doesn't have the first row as the header. In this case, you must provide the headers in the *headers* attribute.<br><br>Default: `"containsHeader": "true"`. |
| headers | List of header fields for record fields in the CSV file. These headers are converted to the key names of the CDIs in the JSON format.<br><br>**Note:** This attribute is applicable only if the *containsHeader* attribute is set to **false**.<br><br>If your CSV file doesn't have the first row with headers, you can provide an array of headers. The number of headers must match the number of record fields. Example: `"headers": ["FirstName","LastName","Location","Salary`<br><br>Default: An empty array: `"headers": []`. |
| securedHeaders | List of header fields for which the value for all records is displayed in the encrypted format in the JSON format. This attribute is optional.<br><br>You can provide an array of headers that must be secured. The name of the secured headers must match the name of the headers |

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| Attribute name | Description |
| --- | --- |
| | in the **headers** attribute or CSV file. Example: `"securedHeaders": ["Salary"]`.<br><br>Default: An empty array: `"securedHeaders": []`. |

## Example: Conversion of CSV to JSON format

This example shows the given data format attributes and the conversion of CSV content to the JSON format based on these attributes.

**Data format attributes**

> **Note:**
> This parameter is optional. If you don't provide values, the default values of the attributes are used.

```
{ "delimiter": ",", "containsHeader": "true", "headers":
[], "securedHeaders": ["salary"] }
```

**CSV format**

```
//Sample CSV file content: no header in the first row;
 each line represents a record
  FirstName,LastName,Location,Salary
  David,Ben,NYC,1000
  Jakes D,Ron,IRE,1220
  "George, R",Martin,US,12120
  "Antony, ""Ron",Mak,US,1210
```

**JSON format**

```
//data node for the records from CSV - each record row converted to individual
 nodes with fields separated by delimiter character converted to individual items
 of the node{
  "data": {
   "0": {
    "FirstName": "David",
    "LastName": "Ben",
    "Location": "NYC",
    "Salary": "*****"
   },
   "1": {
    "FirstName": "Jakes D",
    "LastName": "Ron",
    "Location": "IRE",
    "Salary": "*****"
   },
   "2": {
    "FirstName": "George, R",     //the name has a delimiter char so the full
name is enclosed within " "
    "LastName": "Martin",
    "Location": "US",
    "Salary": "******"
   },
```

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```
  "3":  {
    "FirstName":  "Antony, \"Ron",  //the last name has "" so a \ is added to
include " in the last name
    "LastName":  "Mak",
    "Location":  "US",
    "Salary":  "*****"
   }
  },
//metadata added for the data format attributes
  "metadata":  {
   "containsHeader":  "true",
   "delimiter":  ",",
   "headers":  "FirstName#LastName#Location#salary",
   "securedHeaders":  "Salary"
  }
}
```

## Parsing of JSON to CSV during export

To keep the CSV config data in its original format when exporting the config data to a CSV file format, ensure that you have the *data* and *metadata* nodes in your data.

- Config data items within the *data* node are converted to individual record rows in the CSV file.
- Data format attributes within the *metadata* node are used to define the delimiter, header, and secret header information in the CSV file.

### Related topics

Uploading your config data

Add the nodes that will contain config data to a new CDM application

Parsing of XML files in CDM

## Define policies in DevOps Config

Define policies in DevOps Config to validate your configuration data.

### Before you begin

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

Role required: sn_devops_config.admin

### About this task

You can use or customize default DevOps Config policies to validate that your config data content is compliant, or write and test custom DevOps Config policies.

### Procedure

1. In the **Admin** view, select the **Policies** tab.
2. Select a default policy or select **New** to create a policy.

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3. Enter the policy name, category, and a description for the policy and select **Save**.

**Note:**
You must publish a policy version to make it current, and activate it before it can be invoked.

**Related topics**

Default DevOps Config policies

How to write and test custom PaCE policies

## Mapping policies in DevOps Config

Mapping a policy to a deployable enables you to validate updates on it. These policies in DevOps Config are powered by Policy as Code Engine (PaCE).

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

After you create a policy, you can map it to a deployable to invoke the policy when any changes are made to the deployable. You can map policies using the following mappings:

**Static mapping**

In static mapping, a policy is directly mapped to deployables. This mapping type helps you to apply policies to different environments or configurations. However, if you have to map a policy to multiple deployables, you would have to do it multiple times for each deployable. Validation is triggered on directly mapped policies for a deployable.

**Dynamic mapping**

In dynamic mapping, a policy is mapped to deployables dynamically based on pre-defined conditions. This mapping type helps you to apply policies to a larger set of deployables across multiple applications that all meet the same conditions. Validation is triggered on dynamically mapped policies at run time for a deployable.

You can view all policies mapped to deployables of an application by selecting the **View mapped policies** option on the **Policies** tab on the Application form. Select a deployable from the list to view policies mapped to it using both static mapping or dynamic mapping.

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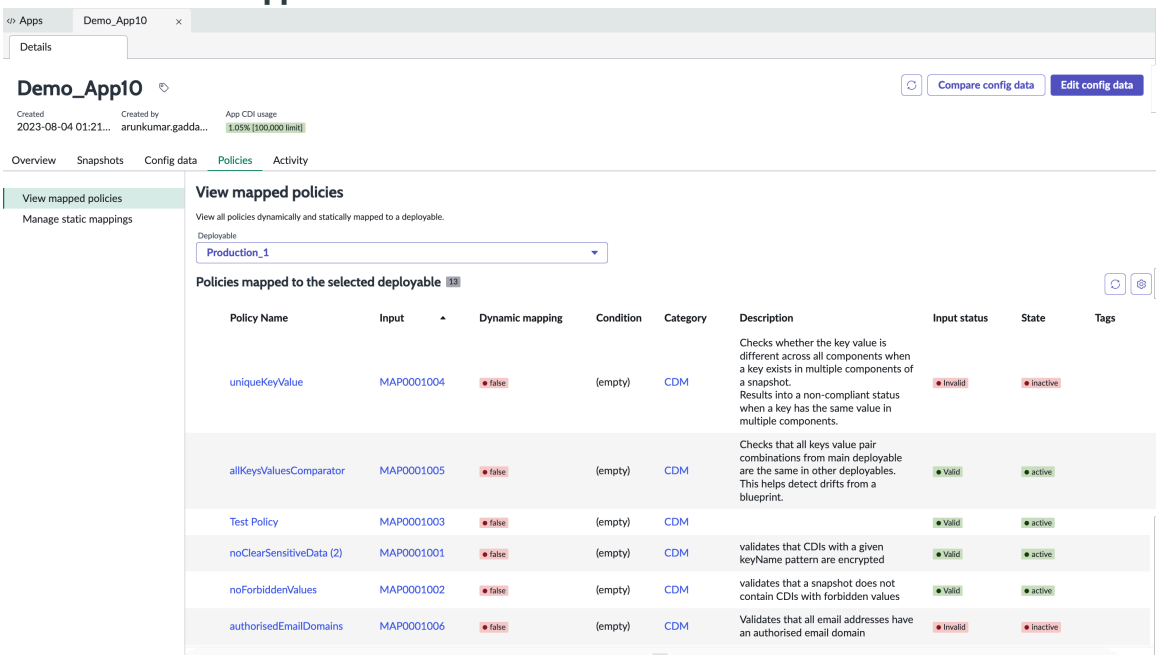
### Policies tab on the Application form




## Map policies to a deployable

Map policies to a deployable to define the validation processes that the config data must pass. You can map policies to a deployable using static mapping or dynamic mapping.

### Before you begin

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

Role required: cdm_policy_editor or cdm_editor or cdm_admin

### About this task

Policies validate any changes to the mapped deployable. Whenever changes that affect a deployable are committed, the system generates a new snapshot of the deployable and then executes all mapped policies against the snapshot. You can also manually execute a policy at any time (for example, to test a policy operation).

### Procedure

1. On the **Policies** tab for an application, select **Manage static mappings**.
   The Manage static mappings page lists all deployables that have mapped policies. Policies are grouped by the deployable to which they're mapped.
2. Select **Add**.
   The Map Policies dialog box displays with a list of available policies.
3. Select a deployable against which the policies should be executed.
4. Select the policies in the **Policies** list.
   You can map any number of policies.
5. Select **Map Policies**.
   On the **Manage static mappings** page, the deployable is updated with the list of mapped policies.

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### Mapped Policies list - Columns

| Column header | Description |
|---|---|
| Policy name | Name of the policy. Policies appear grouped under the deployable to which they're mapped. |
| Input | Policy settings that are configurable. |
| Dynamic mapping | Identifier to denote whether the policy is mapped dynamically or statically.<br>○ **true**: The policy is mapped dynamically based on the defined conditions.<br>○ **false**: The policy is mapped statically. |
| Condition | Business conditions based on which the policy is mapped dynamically to specific deployables.<br><br>For example, to dynamically map policies to only deployables that have the environment type as production, you can define the condition as: **[Environment][is][Production]**.<br><br>For more information on defining a condition, see Map PaCE policies using Dynamic Mapping. |
| Description | Description of the policy, specifying what it validates. |
| Category | Identifier that enables policy grouping. For example, `Production Policies`. |
| Input status | Validation state of the mapping inputs in the policy.<br><br>**Note:**<br>○ This information reflects the validity of the input settings (that is, the readiness of the policy to perform validation).<br>○ All mapping inputs are valid on insertion. Inputs become invalid if the policy version is archived or deleted.<br>○ This value does not indicate whether the snapshot passed validation (that is, whether the snapshot is compliant). |
| State | Mapping state of the policy with the deployable. |

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| Column header | Description |
|---|---|
| | Only mapped policies that are **active** execute during snapshot validation. |
| Tags | Tags that are associated with the policy. |

**Related topics**

Map PaCE policies using Static Mapping

Map PaCE policies using Dynamic Mapping

## Define exporters in DevOps Config

Define exporters in DevOps Config to export config data from all or part of the data model as input for further deployment or provisioning activities.

### Before you begin

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

Role required: sn_devops_config.admin

### Procedure

1. In the **Admin** view, select the **Exporters** tab.
2. Select a default exporter or select **New** to create a custom exporter.
   See Create a custom exporter for details.
3. Enter the exporter name and description and then click **Confirm**.

**Related topics**

Default DevOps Config exporters

## Configure your pipeline in DevOps Config

Configure your Argo CD, Azure DevOps, or Jenkins pipeline with DevOps Config to interact with your data model.

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

These orchestration tool integrations are included with the DevOps Config base system.

- Argo CD
- Azure DevOps
- Jenkins

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## Required plugins

### Argo CD

Visit the Ancillary Software section on the ServiceNow Store website to download the Argo CD plugin for ServiceNow DevOps to integrate your Argo CD pipeline with the ServiceNow DevOps Config application.

### Azure DevOps

Use the ServiceNow DevOps extension for Azure DevOps on Visual Studio Marketplace to integrate your Azure pipeline with the ServiceNow DevOps Config application.

### Jenkins

Visit the Ancillary Software section on the ServiceNow Store website to download the Jenkins plugin for ServiceNow DevOps to integrate your Jenkins pipeline with the ServiceNow DevOps Config application.

## Run validation in DevOps Config

After you have installed and configured DevOps Config, validate the configuration and review the results.

### Before you begin

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

Role required: sn_devops_config.admin

### About this task

Having the policy validation action at the deployable level and the publish action at the snapshot level protects against non-compliant changes in your production environment.

You can also validate further by mapping more policies to a deployable and validating against your latest snapshot.

### Procedure

1. Open your application and in the **Snapshots** tab, and select the snapshot created from the changeset created.
2. Select **Validate** and confirm.
   All policies that are mapped statically and dynamically are run to validate the snapshot.
3. Review compliance results.
   Any future snapshots generated are automatically validated against the configured statically mapped policies. Dynamic mappings are determined at runtime based on the latest conditions matching the deployable.

## Fix the data that caused a validation failure

When a policy that executes against a deployable snapshot fails or generates an error or warning, the policy identifies the offending CDI and the reason for the failure. While working in a changeset, you can use the Validation failures panel to navigate directly to the offending CDI so you can correct the issue.

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### Before you begin

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

Role required: sn_devops_config.admin

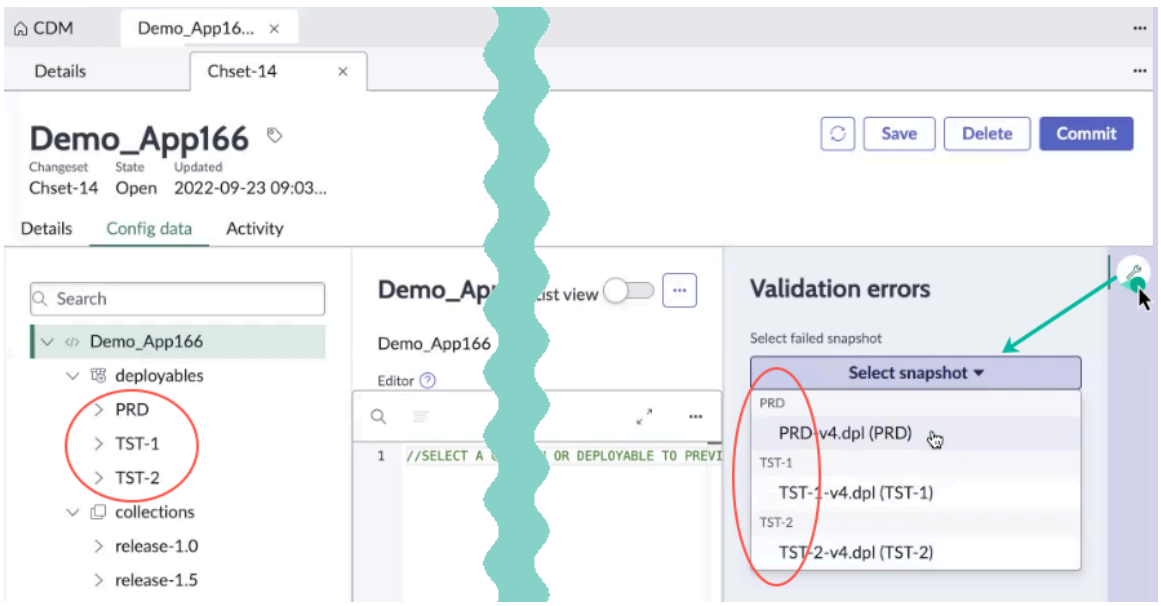
### About this task

The Validation failures panel appears on the application tab whenever validation fails for any deployable in the application. The panel displays only snapshots with error, warning, or execution failure status for validation. Snapshots with not validated or in progress status do not appear.

**Important:**
The data changes and status settings that you update in this procedure apply only to the selected changeset. For that reason, be sure to coordinate your work with others on your team.

### Procedure

1. While working in a changeset, select the validation failures icon ( ) to view the list of snapshots from the application that failed validation.
   In this example, the snapshots for all three deployables in the application failed validation in some way (error, warning, or execution failure).




2. Navigate to the failure.

   a. Select a snapshot to view the cards.
   Each card represents a policy validation failure. Use the filter to find a card with a particular validation result. If another user has worked on the issue, you might also filter on a resolution state (resolved, unresolved, or ignored).

   b. Select a card to open the editor directly to the problematic CDI.

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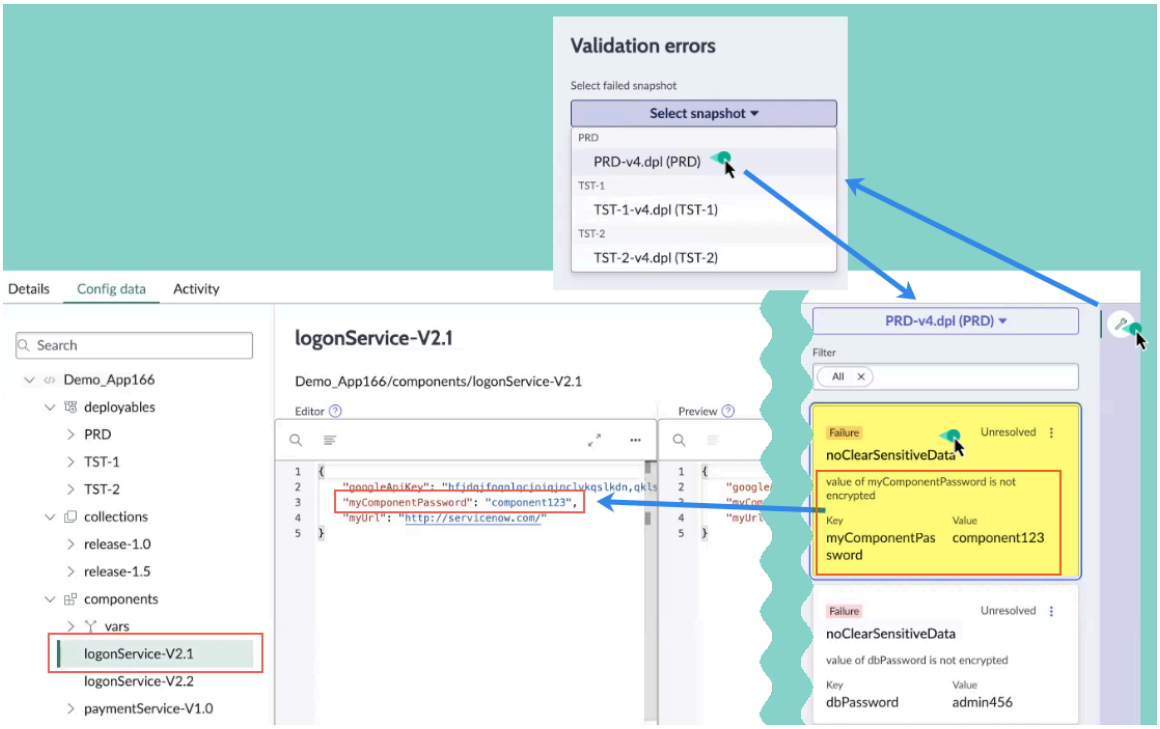


3. Review the data and perform the necessary updates.
4. When you finish working on the data, update the status of the error.

   Open the more actions more actions icon ( ⋮ ) to update the status of the error.

   - **Unresolved**: This status is the initial status for a validation error. Leave this status if you are unable to repair the data. You might work on the issue with another user.
   - **Resolved**: You have fixed the error. Be sure to commit the changeset and validate the data to ensure that the data is correct.
   - **Ignored**: This status indicates that no further actions will be taken.

## CDM system properties

CDM system properties

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

## CDM system properties

### CDM system properties

| Property | Description |
|---|---|
| sn_cdm.variable_regex | The regex used to capture variables referenced in a CDI value. With this value, the syntax to use a variable is:<br>`@@name@@` |

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### CDM system properties (continued)

| Property | Description |
|---|---|
| | Default: @@([^@].*?)@@ |
| sn_cdm.cdm_queue_request_expiry_time_ms | The maximum time for a process to be available for processing before it is marked as expired.<br><br>Default: 900000 ms (15 min) |
| sn_cdm.cdm_validation_timeout_ms | The maximum time limit for a validation of a snapshot.<br><br>Default: 900000 ms (15 min) |
| sn_cdm.default_node_identifier_keys | The keys used to identify node objects within an array node.<br><br>Default: (none) |
| sn_cdm.execute_exporter_async_for_standard_request | If set to `false`, exporter requests skip the request queue and their output is returned immediately. Changing this setting may decrease system performance if there are many export requests.<br><br>Default: true |
| sn_cdm.exception_enabled | If set to false, the control exception functionality is disabled regardless of other policy settings.<br><br>Default: true |
| sn_cdm.node_name_allowed_character_regex | The regex used to validate the name of a node. Default allowed characters are:<br><br>`0-9, A-Z, a-z, _, -, ., %, $, whitespace, :, #`<br><br>Default: `[\\w-.% :$#]` |
| sn_cdm.app_name_allowed_character_regex | The regex used to validate the name of an application. Default allowed characters are:<br><br>`0-9, A-Z, a-z, _,-, ., whitespace, \|, :, [], (), %, $, #`<br><br>Default: `[\\w-.%$#() :\|[\\]]` |

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### CDM system properties (continued)

| Property | Description |
|---|---|
| sn_cdm.snapshot_name_allowed_character_regex | The regex used to validate the name of a snapshot. Default allowed characters are:<br>`0-9, A-Z, a-z, _,-, ., %`<br>Default: `[\\w-.%]` |
| sn_cdm.exporter_name_allowed_character_regex | The regex used to validate the name of an exporter. Default allowed characters are:<br>`0-9, A-Z, a-z, _,-, .,%`<br>Default: `[\\w-.%]` |
| sn_cdm.exporter_argument_name_allowed_character_regex | The regex used to validate the name of an exporter argument. Default allowed characters are:<br>`0-9, A-Z, a-z, _`<br>Default: `[\\w]` |
| sn_cdm.cdm_max_allowed_open_changesets | The maximum allowed number of open changesets.<br>Default: 10 |
| sn_cdm.preventative_duplicate_node_name_check | If set to true, validating for node name duplication will check name usage across all other open changesets as well (as opposed to limiting the check within the changeset).<br>Default: false |
| sn_cdm.max_allowed_upload_file_size | The maximum payload size for upload of config data via the REST API.<br>Default: 5 MB |
| sn_cdm.max_allowed_cdi_per_application | The maximum number of CDIs allowed per application. If the number is exceeded, further upload of config data via the REST APIs is blocked.<br>Increasing this limit may significantly decrease performance and break UI functionality. If you change the value, you must recalculate the CDI usage data by running the following command: |

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**CDM system properties (continued)**

| Property | Description |
| --- | --- |
| | `new sn_cdm.CdmApplicationManager().updateCdiCountOfApplications();`<br><br>Default: 100000 |
| sn_cdm.max_allowed_cdi_per_deployable | The maximum number of CDIs allowed per deployable. If the number is exceeded, further upload of config data via the REST APIs is blocked.<br><br>Increasing this limit may significantly decrease performance and break UI functionality. If you change the value, you must recalculate the CDI usage data by running the following command:<br>`new sn_cdm.CdmApplicationManager().updateCdiCountOfApplications();`<br><br>Default: 10000 |
| sn_cdm.max_nodes_in_memory | The maximum number of nodes that can be supported when using the `queryTree` method of `CdmQuery`.<br><br>Default: 10000 |
| sn_cdm.reserved_node_names | Names that cannot be used for nodes.<br><br>Default: vars, collections, deployables, components |
| sn_cdm.max_allowed_cdi_per_shared_component | The maximum number of CDIs allowed per shared component. If the number is exceeded, further upload of config data via the REST APIs is blocked.<br><br>Increasing this limit may significantly decrease performance and break UI functionality. If you change the value, you must recalculate the CDI usage data by running the following command:<br>`new sn_cdm.CdmApplicationManager().updateCdiCountOfApplications();` |

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**CDM system properties (continued)**

| Property | Description |
|---|---|
| | Default: 10000 |
| sn_cdm.max_allowed_cdi_per_library | The maximum number of CDIs allowed per shared component library. If the number is exceeded, further upload of config data via the REST APIs is blocked.<br><br>Increasing this limit may significantly decrease performance and break UI functionality. If you change the value, you must recalculate the CDI usage data by running the following command:<br>`new sn_cdm.CdmApplicationManager().updateCdiCountOfApplications();`<br><br>Default: 10000 |
| sn_cdm.attachment.display_mime_types | File types for which the content preview is available on the Preview pane.<br><br>You can add additional MIME types to display in the Preview pane. However, the preview is not available for binary file MIME types, such as audio, image, and video.<br><br>Default: `text/yaml,text/css,text/csv,text/html,text/javascript,text/plain,text/richtext,text/x-vcard,text/x-vcalendar,application/xml,application/javascript,application/json` |

## Integrating your pipeline in DevOps Config

Integrate your Argo CD, Azure DevOps, or Jenkins pipeline with DevOps Config to interact with your data model.

**Important:**
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Validate application and infrastructure details against your organization policies, and commit config data the same way software code is committed to a code repository.

Configuration data is pulled in your CI/CD pipeline to deploy not just a code for an application, but all the related configuration with that code as well.

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**Note:**
Pipeline integration requires plugin installation. See Configure your pipeline in DevOps Config for installation requirements.

## DevOps Config and DevOps Change Acceleration

With the DevOps Change Velocity change control feature, a change request is created as part of the pipeline for DevOps Config configuration changes.

Set up change acceleration in your pipeline.

**Argo CD**

**Azure DevOps**

Using the `ServiceNow-DevOps-Server-Change-Acceleration` Azure DevOps task.

**Jenkins**

Using the `snDevOpsChange` Jenkins action.

In DevOps Change Velocity, navigate to **DevOps** > **Orchestrate** > **Pipeline Change Requests** to view and approve DevOps change requests created by DevOps Config changes.

See Accelerating your DevOps change process for more information regarding the DevOps Change Acceleration feature.

## Azure DevOps pipeline tasks

Use these tasks in your Azure DevOps pipeline to interact with the DevOps Config data model.

**Important:**
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These tasks are provided to create a specific pipeline definition to achieve your goal.

- ServiceNow-DevOps-Config-Agent-Upload-Config

  Upload config data to a deployable in the data model via Agent Job.

- ServiceNow-DevOps-Config-Agent-Get-Snapshot

  Get the snapshots for an application.

- ServiceNow-DevOps-Config-Agent-Get-Snapshot-Name

  Extract the name of a snapshot.

- ServiceNow-DevOps-Config-Agent-Publish-Snapshot

  Publish a snapshot of your configuration data.

- ServiceNow-DevOps-Config-Agent-Export-Snapshot

  Export a subset of your configuration data.

- ServiceNow-DevOps-Config-Agent-Register-Pipeline

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Register a changeset and/or snapshot to a pipeline execution.

- ServiceNow-DevOps-Config-Agent-Validate-Snapshot

  Validate configuration data against organization policies.

- ServiceNow-DevOps-Server-Change-Acceleration

  Create a change request as part of the pipeline.

## ServiceNow-DevOps-Config-Agent-Upload-Config

Task to upload a configuration file to a given location within an application data model.

This task is meant to be used in an iterative nature for all config files the user chooses to upload to their application data model during the pipeline run.

**Note:**
Pre-uploaded files must be in a compatible format.

**Input variables**

| | |
|---|---|
| connectedServiceName | Specifies the DevOps pipeline endpoint connection. |
| applicationName | Specifies the application to where config data is uploaded. |
| deployableName | Specifies the deployable for the application (required if target is deployable). |
| uploadTarget | Specifies the data model target to where config data is uploaded (for example, `component`, `collection`, `deployable`). |
| collectionName | (Optional) Specifies the collection to where config data will be uploaded (required if target is collection). |
| namePath | Specifies the data model path to where config data is uploaded.<br><br>**Note:**<br>When uploading to a vars folder, you must start the name path with "vars/" to specifiy the variable folder path. |
| configFilePath | Specifies the source folder from which config data is uploaded to the component or deployable path in the data model.<br><br>Empty is the root of the repo.<br>Use variables if files are not |

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| | |
|---|---|
| | in the repo (for example, `$(agent.builddirectory)`). |
| convertPath | (Optional) Specifies whether to preserve the directory structure of the configuration files (with respect to the workspace), and convert the directory to paths within the data model. Default is false. |
| dataFormat | Specifies the data format of the config_file (for example, `JSON`, `YAML`, `XML`, etc.). |
| changesetNumber | (Optional) Specifies the (open) changeset to which this upload activity is associated. If not provided, a new changeset is created.<br>**Note:** Only used for multiple upload scenarios. |
| autocommit | Specifies whether to commit configuration data after upload (true/false). Default is false. |
| autoValidate | Specifies whether to validate configuration data during commit (true/false). Default is true. |

**Output variable**

| | |
|---|---|
| changesetNumber | Changeset record created/committed during the upload.<br>Provide a name to the task so it can be used later in the pipeline (per example, `componentUpload`). |

**Example - Upload config**

```
-task: ServiceNow-DevOps-Config-Agent-Upload-Config
 name: componentUpload
 inputs:
   connectedServiceName: 'MyServiceNowInstance'
   applicationName: 'PaymentDemo'
   uploadTarget: 'component'
   namePath: 'wep-api-v1.0'
   configFilePath: 'k8s/helm/values.yml'
   dataFormat: 'yaml'
   autoCommit: true
   autoValidate: true
```

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### Example - Multiple uploads (component)

You can call the upload task more than once to upload configuration data in different file formats from different locations, while still keeping the uploads part of one changeset.

- In the first upload, name the task so the changesetNumber output variable can be reused in subsequent uploads.

  YAML file upload:

```
-task: ServiceNow-DevOps-Config-Agent-Upload-Config
   name: componentUpload
   inputs:
     connectedServiceName: 'MyServiceNowInstance'
     applicationName: 'PaymentDemo'
     uploadTarget: 'component'
     namePath: 'wep-api-v1.0'
     configFilePath: 'k8s/helm/values.yml'
     dataFormat: 'yaml'
     autoCommit: false
     autoValidate: false
```

- In subsequent uploads, reference the changesetNumber output variable from the first upload as an input variable.

  JSON file upload:

```
-task: ServiceNow-DevOps-Config-Agent-Upload-Config
   inputs:
     connectedServiceName: 'MyServiceNowInstance'
     applicationName: 'PaymentDemo'
     uploadTarget: 'component'
     namePath: 'wep-api-v1.0'
     configFilePath: 'featureToggles/set1.json'
     dataFormat: 'json'
     autoCommit: true
     autoValidate: true
     changesetNumber:
 '$(componentUpload.changesetNumber)'
```

### Example - Multiple uploads (collection and vars)

You can call the upload task more than once to upload configuration data in different file formats from different locations, while still keeping the uploads part of one changeset.

- In the first upload, make sure to name the task so the changesetNumber output variable can be reused in subsequent uploads.

  XML file upload:

```
-task: ServiceNow-DevOps-Config-Agent-Upload-Config
   name: componentUpload
   inputs:
     connectedServiceName: 'MyServiceNowInstance'
     applicationName: 'PaymentDemo'
```

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```
    uploadTarget: 'collection'
    collectionName: 'release-1.0'
    namePath: 'v1-common-configs'
    configFilePath: 'infra/v1/config.xml'
    dataFormat: 'xml'
    autoCommit: false
    autoValidate: false
```

- In subsequent uploads, reference the changesetNumber output variable from the first upload as an input.

  JSON file upload:

```
-task: ServiceNow-DevOps-Config-Agent-Upload-Config
   inputs:
     connectedServiceName: 'MyServiceNowInstance'
     applicationName: 'PaymentDemo'
     uploadTarget: 'deployable'
     deployableName: 'Production-EMEA'
     namePath: 'vars/dbSettings'
     configFilePath: 'infra/prodc/dbSettings.json'
     dataFormat: 'json'
     autoCommit: true
     autoValidate: true
     changesetNumber:
 '$(componentUpload.changesetNumber)'
```

**Note:**
To upload to a variable folder, uploadTarget must be set to `deployable`, and the correct values must be set for deployableName and changesetNumber.

### ServiceNow-DevOps-Config-Agent-Get-Snapshot

This task is intended to be used in different scenarios:

- Retrieve a specific snapshot.

  Following the CD flow, a specific snapshot is retrieved so it can be published and then exported to be consumed downstream (for example, to provision out infrastructure or application).

- Retrieve latest validated snapshot.

  The latest validated snapshot is retrieved for the given application-deployable combination.

- Retrieve all snapshots for any impacted deployables.

  When config files are uploaded to an application data model, the system will create snapshots for any deployables determined to be impacted by the upload. Following along the CI flow, assuming the last Upload call had validation enabled, the next step would be to iterate through the list of snapshots and ensure they all passed validation.

- Retrieve the latest snapshots for a deployable of an application in the event an upload does not generate any snapshots.

  A set of config data is available to deploy to an environment for an application-deployable-changeset combination when no configuration changes are made.

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- Show policy validation results in a pipeline execution.

  View policy validation results as test results on the ADO build tests results page, including compliant with exception, when getting a snapshot.

  **Input variables**

| | |
|---|---|
| connectedServiceName | Specifies the DevOps pipeline endpoint connection (defined in the service connection settings of the project). |
| applicationName | Specifies the application to upload config data to, or export data from. |
| deployableName | (Optional) Specifies the deployable (per the specified application) on which to get the latest snapshot data. |
| changesetNumber | (Optional) Specifies the changeset ID for the applicable set of config changes. |
| isValidated | (Optional) Specifies whether to return only snapshots that are passed, or passed with exception (true/false). Default is true. |
| continueWithLatest | (Optional) Specifies whether to return the latest snapshot per the `applicationName-deployableName-changesetNumb` combination if no snapshots are generated (true/false). Default is false. |

  **Output variable**

| | |
|---|---|
| snapshotObject | A JSON object containing the requested snapshots.<br><br>Provide a name to the task so it can be used later in the pipeline (per example, `getSnapshot`). |

  **Example - Specific snapshot**

```
-task: ServiceNow-DevOps-Config-Agent-Get-Snapshot
 name: getSnapshot
 inputs:
   connectedServiceName: 'MyServiceNowInstance'
   applicationName: 'PaymentDemo'
   deployableName: 'Production'
   changesetNumber: 'Chset-16'
   isValidated: true
   continueWithLatest: true
```

  **Example - Latest validated snapshots (for a given application-deployable combination)**

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```
-task: ServiceNow-DevOps-Config-Agent-Get-Snapshot
 name: getSnapshot
 inputs:
   connectedServiceName: 'MyServiceNowInstance'
   applicationName: 'PaymentDemo'
   deployableName: 'Production'
   isValidated: true
```

**Example - All changeset snapshots**

```
-task: ServiceNow-DevOps-Config-Agent-Get-Snapshot
 name: getSnapshot
 inputs:
   connectedServiceName: 'MyServiceNowInstance'
   applicationName: 'PaymentDemo'
   changesetNumber: 'Chset-16'
```

**Example - Show policy validation results**

Assign a variable to the path of the file that contains the snapshot validation results generated during the `ServiceNow-DevOps-Config-Agent-Get-Snapshot` task.

To load the snapshot validation results in your pipeline execution, you need to leverage the ADO native Publish Test Results v2 task, using the variable as an input.

```
stages:
- stage: Two
  jobs:
    - job: A
 variables:
      - name: validationResultsPath
        value:
 1/TEST_DATA_$(Build.DefinitionName)_$(Build.BuildNumbe
r)_*.xml
      steps:
        - task: PublishTestResults@2
          inputs:
             testResultsFormat: 'JUnit'
             testResultsFiles:
 '$(validationResultsPath)'
             searchFolder: '$(System.WorkFolder)'
```

## ServiceNow-DevOps-Config-Agent-Get-Snapshot-Name

This task is used as a follow-up from the `ServiceNow-DevOps-Config-Agent-Get-Snapshot-Name` task to get the snapshot name from a particular snapshot. From here, the snapshot name can be used as an input to a downstream task, like publishing the snapshot.

**Input variables**

| | |
|---|---|
| deployableName | Specifies the deployable to get the snapshot object that was returned from the `ServiceNow-DevOps-` |

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| | |
|---|---|
| | `Config-Agent-Get-Snapshot` task. |
| script | Specifies the script to extract the snapshot name from the snapshot object. |

**Output variable**

| | |
|---|---|
| snapshotName | The snapshot name for the deployable.<br><br>Provide a name to the task so it can be used later in the pipeline (per example, `getSnapshotName`). |

**Example - Get snapshot name**

Use this script to extract the snapshot name retrieved from the `ServiceNow-DevOps-Config-Agent-Get-Snapshot` task.

```
-task: ServiceNow-DevOps-Config-Agent-Get-Snapshot-Name
 inputs:
   deployableName: 'PRD'
   script: |
 function run() {
        let name;
        let deployableName = process.argv[2];
        let jsonObj = $(getSnapshot.snapshotObjects);
        let size = jsonObj.result.length;
        for(let i=0; i<size; i++) {
         obj = jsonObj.result[i];
         if(obj[“deployable_id.name”].toLowerCase() ==
 deployableName) {
           name = obj.name;
           console.log(name);
          }
         }
        }
        run();
```

**Example - Get snapshot name used with get snapshot**

Call the `ServiceNow-DevOps-Config-Agent-Get-Snapshot-Name` task right after the `ServiceNow-DevOps-Config-Agent-Get-Snapshot` task to return the snapshot name.

Get snapshots (returns a JSON object containing impacted snapshots):

```
-stage: Two
 jobs:
    -job: B
     steps:
        -task:
 ServiceNow-DevOps-Config-Agent-Get-Snapshot
         name: getSnapshot
```

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```
        inputs:
           connectedServiceName:
 'MyServiceNowInstance'
           applicationName: 'PaymentDemo'
           deployableName: 'Production-2'
           changesetNumber: 'Chset-16'
```

Get snapshot name (returns snapshot name for a specific deployable):

```
-stage: Two
 jobs:
    - job: B
      steps:
        - task:
 ServiceNow-DevOps-Config-Agent-Get-Snapshot
          name: getSnapshotName
          inputs:
              deployableName: 'Production-2'
              script:|
              function run() {
               let name;
               let deployableName = process.argv[2];
               let jsonObj =
 $(getSnapshot.snapshotObjects);
               let size = jsonObj.result.length;
               for(let i=0; i<size ;i++) {
                obj = jsonObj.result[i];

 if(obj["deployable_id.name"].toLowerCase() ==
 deployableName) {
                 name = obj.name;
                 console.log(name); // This standard
 output of inline script is given as the task output
                }
               }
              }
              run();
```

Use returned snapshot name in the pipeline (for example, publish):

```
-stage: Three
 jobs:
    -job: C
     variables:
       varSnapshotName:
 $[stageDependencies.Two.B.outputs['getSnapshotName.sna
pshotName']]
     steps:
        -task:
 ServiceNow-DevOps-Config-Agent-Publish-Snapshot
         inputs:
           connectedServiceName: 'MyServiceNowInstance'
           applicationName: 'PaymentDemo'
           deployableName: 'Production-2'
           snapshotName: '$(varSnapshotName)'
```

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## ServiceNow-DevOps-Config-Agent-Publish-Snapshot

This task publishes a snapshot for the given application and deployable. From here, the snapshot can be consumed through the Export process.

**Input variables**

| | |
|---|---|
| connectedServiceName | Specifies the ServiceNow endpoint connection. |
| applicationName | Specifies the application to publish. |
| deployableName | Specifies the deployable for the application to publish config data. |
| snapshotName | Specifies the name of the snapshot to publish. |

**Output variable**

Not applicable (returns true if successful, otherwise false).

**Example**

```
-task: ServiceNow-DevOps-Config-Agent-Publish-Snapshot
 inputs:
   connectedServiceName: 'MyServiceNowInstance'
   applicationName: 'PaymentDemo'
   deployableName: 'Production-2'
   snapshotName: 'Production-v23.dpl'
```

## ServiceNow-DevOps-Config-Agent-Export-Snapshot

This task exports a snapshot for the given application and deployable. Specify the exporter, relevant exporter arguments, the export format (for example, YAML, JSON, etc.), and output location for the exported config data. From here, the config data can be used directly as an input for a deployment or provisioning tool downstream in the pipeline.

**Input variables**

| | |
|---|---|
| connectedServiceName | Specifies the ServiceNow endpoint connection. |
| applicationName | Specifies the application from which to publish. |
| deployableName | Specifies the deployable for the application from which to export config data. |
| snapshotName | Specifies the name of the snapshot from which to export config data. |
| exporterName | Specifies the exporter to apply to the snapshot (for example, `UniqueCDIs`). |
| args | (Optional) Specifies arguments to be used along with the exporter. |

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| | |
|---|---|
| exportFormat | Specifies the format to export the snapshot data (for example, `INI`, `YAML`, `PROPS`). |
| saveFile | Checks if file is to be saved to an Azure repository (true/false). Default is false.<br><br>**Note:** Appropriate permission/OAuth token access to script is required.<br><br>Otherwise the export file is created in the pipeline workspace directory. |

**Output variable**

Not applicable (returns true if successful, otherwise false).

**Example**

```
-task: ServiceNow-DevOps-Config-Agent-Export-Snapshot
 inputs:
   connectedServiceName: 'MyServiceNowInstance'
   applicationName: 'PaymentDemo'
   deployableName: 'Production-2'
   exporterName: 'returnAllData-nowPreview'
   dataFormat: 'yaml'
   args: ''
   snapshotName: 'Production-v23.dpl'
   saveFile: true
   fileName:
 'ExporterOutput/ExportData_$(build.definitionName)_$(b
uild.buildNumber).yaml'
```

## ServiceNow-DevOps-Config-Agent-Register-Pipeline

This task ties a changeset and a snapshot to the pipeline so that it can be tracked during the pipeline execution. In DevOps Change Velocity, this is shown in the Pipeline UI.

**Input variables**

| | |
|---|---|
| connectedServiceName | Specifies the DevOps pipeline endpoint connection. |
| applicationName | Specifies the application name. |
| changesetNumber | (Optional) Specifies the ID of the changeset to associate to the pipeline execution. |
| snapshotName | (Optional) Specifies the name of the snapshot to associate to the pipeline execution. |

**Output variable**

Not applicable (returns true if successful, otherwise false).

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**Example**

```
-task: ServiceNow-DevOps-Config-Agent-Publish-Snapshot
 inputs:
   connectedServiceName: 'MyServiceNowInstance'
   changesetNumber: 'Changeset-143'
```

## ServiceNow-DevOps-Config-Agent-Validate-Snapshot

Validate config data against your organization policies.

**Input variables**

| | |
|---|---|
| connectedServiceName | Specifies the ServiceNow endpoint connection. |
| applicationName | Specifies the application to validate. |
| deployableName | Specifies the deployable (per the specified application) to validate. |
| snapshotName | (Optional) Specifies the name of the snapshot to validate. |
| showResults | (Optional) Specifies to show validation results in the console log. |

**Output variable**

Not applicable (returns true if successful, otherwise false).

**Example**

```
-task: ServiceNow-DevOps-Config-Agent-Validate-Snapshot
 inputs:
   connectedServiceName: 'MyServiceNowInstance'
   applicationName: 'PaymentDemo'
   deployableName: 'Production-2'
   snapshotName: ''
   showResults: false
```

## ServiceNow-DevOps-Server-Change-Acceleration

This task is required for agentless (server) jobs to automatically create a change request in ServiceNow Change Management as part of the Azure DevOps pipeline.

In DevOps Config, to associate multiple snapshots of the same changeset to a change request, use snapshot name and application name to track specific configuration data for a given application service.

See Accelerating your DevOps change process for more information regarding the DevOps Change Acceleration feature.

**Input variables (related to DevOps Config)**

| | |
|---|---|
| connectedServiceName | Specifies the DevOps pipeline endpoint connection. |

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| | |
|---|---|
| applicationName | Application associated with the snapshot being attached to the change request. |
| snapshotName | Name of the snapshot to attach to the change request. |

**Example**

```
-stage: ChangeRequest
 jobs:
    -job: 'changerequestjob'
     pool: server
     steps:
        -task:
 ServiceNow-DevOps-Server-Change-Acceleration
         inputs:
            connectedServiceName:
 'MyServiceNowInstance'
            applicationName: 'PaymentDemo'
            snapshotName: 'Production-v23.dpl'
```

## YAML pipeline example

```
trigger:
  branches:
    include:
    - none
stages:
- stage: One
  displayName: Upload Configuration Data
  pool:
    vmImage: ubuntu-latest
  jobs:
  - job: A
    displayName: Upload
    steps:
    - task: ServiceNow-DevOps-Config-Agent-Upload-Config@1
      name: componentUpload
      inputs:
        connectedServiceName: 'MyServiceNowInstance'
        applicationName: 'PaymentDemo'
        uploadTarget: 'component'
        configFile: 'k8s/helm/values.yml'
        namePath: 'processor-api-v1.0'
        dataFormat: 'yaml'
        autoValidate: true
        autoCommit: true
        convertPath: true
- stage: Two
  displayName: Get Latest Snapshot
  pool:
    vmImage: ubuntu-latest
  jobs:
  - job: B
    displayName: Get Snapshot
```

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```
    variables:
    - name: varChangesetNumber
      value:
 $[stageDependencies.One.A.outputs['componentUpload.changesetNum
ber'] ]
    - name: varConfigValidationResults
        value:
 1/TEST_DATA_$(Build.DefinitionName)_$(Build.BuildNumber)_*.xml
    steps:
    - task: ServiceNow-DevOps-Config-Agent-Get-Snapshot@1
      name: getSnapshot
      inputs:
        connectedServiceName: 'MyServiceNowInstance'
        applicationName: 'PaymentDemo'
        deployableName: 'Production-EMEA'
        changeSetNumber: '$(varChangesetNumber)'
        continueWithLatest: true
    - task: ServiceNow-DevOps-Config-Agent-Get-Snapshot-Name@1
      name: getSnapshotName
      inputs:
        deployableName: 'Production-EMEA'
        script: "function run() {\n  let name;\n
  let deployableName = process.argv[2]; \n  let
 jsonObj = $(getSnapshot.snapshotObjects);\n  let
 size = jsonObj.result.length;\n  for(let i=0;
 i<size ;i++) {\n    obj = jsonObj.result[i];\n
 if(obj[\"deployable_id.name\"].toLowerCase() == deployableName)
 {\n      name = obj.name;\n      console.log(name);   // This
 standard output of inline script is given as the task output\n
   }\n  }\n}\nrun();\n"
    - task: PublishTestResults@2
          inputs:
             testResultsFormat: 'JUnit'
             testResultsFiles: '$(varConfigValidationResults)'
             searchFolder: '$(System.WorkFolder)'
    - task: ServiceNow-DevOps-Config-Agent-Register-Pipeline@1
      inputs:
        connectedServiceName: 'MyServiceNowInstance'
        snapshotName: '$(getSnapshotName.snapshotName)'
        applicationName: 'PaymentDemo'
- stage: Three
  displayName: Publish Snapshot
  pool:
    vmImage: ubuntu-latest
  jobs:
  - job: C
    displayName: Publish
    variables:
    - name: varSnapshotName
      value:
 $[stageDependencies.Two.B.outputs['getSnapshotName.snapshotName
']]
    steps:
    - task: ServiceNow-DevOps-Config-Agent-Publish-Snapshot@1
      inputs:
        connectedServiceName: 'MyServiceNowInstance'
        applicationName: 'PaymentDemo'
```

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```
        deployableName: 'Production-EMEA'
        snapshotName: '$(varSnapshotName)'
- stage: ChangeRequest
  dependsOn:
  - Two
  - Three
  jobs:
  - job: 'changerequestjob'
    timeoutInMinutes: 2
    pool:
      name: server
    variables:
    - name: varSnapshotName
      value:
 $[stageDependencies.Two.B.outputs['getSnapshotName.snapshotName
']]
    steps:
    - task: ServiceNow-DevOps-Server-Change-Acceleration@1
      inputs:
        connectedServiceName: 'MyServiceNowInstance'
        applicationName: 'PaymentDemo'
        snapshotName: '$(varSnapshotName)'
- stage: Four
  displayName: Export Snapshot
  dependsOn:
  - Two
  - Three
  - ChangeRequest
  pool:
    vmImage: ubuntu-latest
  variables:
  - name: varSnapshotName
    value:
 $[stageDependencies.Two.B.outputs['getSnapshotName.snapshotName
']]
  jobs:
  - job: D
    displayName: Export
    steps:
    - task: ServiceNow-DevOps-Config-Agent-Export-Snapshot@1
      inputs:
        connectedServiceName: 'MyServiceNowInstance'
        applicationName: 'PaymentDemo'
        deployableName: 'Production-EMEA'
        exporterName: 'returnAllData-now'
        dataFormat: 'yaml'
        snapshotName: '$(varSnapshotName)'
        saveFile: true
        fileName:
 'ExportData_$(build.definitionName)_$(build.buildNumber).yaml'
    - task: CmdLine@2
      inputs:
        script: |
          echo Write your commands here
          echo Hello world
          tree $(Pipeline.Workspace)
```

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## Jenkins pipeline actions

Use these actions in your Jenkins pipeline to interact with the DevOps Config data model.

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

Jenkins scripted and declarative piplines are supported.

These actions are provided to create a specific pipeline definition to achieve your goal. Add a command to your Jenkins file to perform these actions.

- snDevOpsConfig

  Combined action to upload, validate, and publish config data.

- snDevOpsConfigUpload

  Upload config data to DevOps Config via Agent Job.

- snDevOpsConfigGetSnapshots

  Retrieve snapshots for a specific deployable, or all impacted deployables.

- snDevOpsConfigPublish

  Publish a snapshot for the given application and deployable.

- snDevOpsConfigExport

  Export a snapshot for a given application and deployable.

- snDevOpsConfigRegisterPipeline

  Tie a changeset and/or snapshot to a pipeline execution.

- snDevOpsConfigValidate

  Validate config data against your organization policies.

- snDevOpsChange

  Create a change request with associated snapshot attached.

## snDevOpsConfig

Upload, validate, and publish config data changes in one step.

This action combines snDevOpsConfigUpload, snDevOpsConfigGetSnapshots, and snDevOpsConfigRegisterPipeline actions into one action, rather than having to execute each action separately.

**Input variables**

| | |
|---|---|
| configFile | Specifies the configuration data file to upload to the component or deployable path in the data model. |

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| | |
|---|---|
| applicationName | Specifies the application to where config data will be uploaded. |
| target | Specifies the data model target to where config data will be uploaded (for example, `component`, `collection`, `deployable`). |
| collectionName | (Optional) Name of the collection to upload to (required if target is collection). |
| deployableName | (Optional) Name of the deployable to upload to (required if target is deployable). |
| namePath | Specifies the name path in the data model to where config data will be uploaded.<br>**Note:** When uploading to a vars folder, you must start the name path with "vars/" to specifiy the variable folder path. |
| dataFormat | Specifies the data format of the config file (for example, `JSON`, `YAML`, `XML`, etc.) |
| autoCommit | Specifies whether to commit configuration data after upload (true/false). Default is true. |
| autoValidate | Specifies whether to validate configuration data during commit (true/false). Default is true. |
| autoPublish | Specifies whether to publish the configuration data after validation (true/false). Default is true. |
| changesetNumber | (Optional) Specifies the (open) changeset to which this upload activity is associated. If not provided, a new changeset is created.<br>**Note:** Only used for multiple upload scenarios. |
| markFailed | (Optional) Fail the pipeline in the event that the validation attempt failed (due to a backend issue). |
| showResults | (Optional) Show validation results in the Jenkins job console log. |
| continueWithLatest | (Optional) Specifies whether to return the latest snapshot per the |

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| | |
|---|---|
| | `applicatioName-deployableName-changesetNumbe` combination if no snapshots are generated (true/false). Default is false. |

**Output**

- If successful, a snapshot or set of snapshots.
- If failure, an API/backend failure message is shown.

**Example**

- Input:

```
snapshotObj = snDevOpsConfig(
     applicationName: "PaymentDemo",
     configFile:
 "config/application/Collection/Collection2/*.json",
     target: "collection",
     collectionName: "release-1.0",
     namePath: "settings/infrastructure/database",
     dataFormat: "json",
     autoCommit: 'true',
     autoValidate: 'true',
     autoPublish: 'true',
     continueWithLatest: 'true',
     markFailed: 'true',
     showResults: 'false'
)
```

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```
echo"*************************\n ${snapshotObj}"
```

```
[Pipeline] snDevOpsConfig
[ServiceNow DevOps] Config step execution starts
[ServiceNow DevOps] snDevOpsConfigUpload - Config upload step execution starts
Looking for file : config/application/Collection/Collection2/*.json
[ServiceNow DevOps] snDevOpsConfigUpload - New changeset created, Since it is not provided with inputs
[ServiceNow DevOps] snDevOpsConfigUpload - Initiating the upload
[ServiceNow DevOps] snDevOpsConfigUpload - Polling for upload status of the file -
config/application/Collection/Collection2/0-9A-Za-z_-.whitespace $#.json
[ServiceNow DevOps] snDevOpsConfigUpload - Polling for upload status of the file -
config/application/Collection/Collection2/ConfigColl2File2.json
[ServiceNow DevOps] snDevOpsConfigUpload - Polling for upload status of the file -
config/application/Collection/Collection2/ConfigColl2File1.json
[ServiceNow DevOps] snDevOpsConfigUpload - Files got uploaded under the changeset : Chset-59
[ServiceNow DevOps] ------------------------------------
[ServiceNow DevOps] snDevOpsConfigGetSnapshots - Config status step execution starts
[ServiceNow DevOps] snDevOpsConfigGetSnapshots Poll Success
[ServiceNow DevOps] snDevOpsConfigGetSnapshots - Deployables which got impacted are : [preprod, prod, test]
[ServiceNow DevOps] snDevOpsConfigGetSnapshots - Polling for creation
[ServiceNow DevOps] snDevOpsConfigGetSnapshots - Checking for snapshot
[ServiceNow DevOps] snDevOpsConfigGetSnapshots - Checking for snapshot
[ServiceNow DevOps] snDevOpsConfigGetSnapshots - Snapshots found : 1
[ServiceNow DevOps] snDevOpsConfigGetSnapshots - Checking for snapshot
[ServiceNow DevOps] snDevOpsConfigGetSnapshots - Snapshots found : 2
[ServiceNow DevOps] snDevOpsConfigGetSnapshots - Checking for snapshot
[ServiceNow DevOps] snDevOpsConfigGetSnapshots Poll Success
[ServiceNow DevOps] snDevOpsConfigGetSnapshots - Polling for validation : 3
[ServiceNow DevOps] snDevOpsConfigGetSnapshots Poll Success
[ServiceNow DevOps] snDevOpsConfigGetSnapshots - Preparing to fetch policy validation results for snapshots
[ServiceNow DevOps] snDevOpsConfigGetSnapshots -  Result [{"sys_id":"[redacted]","name":"Preprod-
v7.dpl","deployableName":"Preprod","environmentType":"Development","description":"","validation":"passed","last_validated":nu
ll,"published":true,"last_published":null,"validationResults":null,"sys_created_on":"2023-07-20 10:26:20"},
{"sys_id":"[redacted]","name":"Prod-
v7.dpl","deployableName":"Prod","environmentType":"Production","description":"","validation":"passed","last_validated":null,"
published":true,"last_published":null,"validationResults":null,"sys_created_on":"2023-07-20 10:26:20"},
{"sys_id":"[redacted]","name":"Test-
[ServiceNow DevOps] ------------------------------------
[ServiceNow DevOps] ------------------------------------
[ServiceNow DevOps] snDevOpsConfigRegisterPipeline - Config register pipeline step execution starts
[ServiceNow DevOps] snDevOpsConfigRegisterPipeline - Successfully registered pipeline with given changeset / snapshot
[Pipeline] echo
************************
 [{"sys_id":"[redacted]","name":"Preprod-
v7.dpl","deployableName":"Preprod","environmentType":"Development","description":"","validation":"passed","last_validated":"2
023-07-20 10:26:24","published":true,"last_published":"2023-07-20 10:26:24","validationResults":null,"sys_created_on":"2023-
07-20 10:26:20"},{"sys_id":[redacted]","name":"Test-
v7.dpl","deployableName":"Test","environmentType":"Test","description":"","validation":"passed","last_validated":"2023-07-20
10:26:24","published":true,"last_published":"2023-07-20 10:26:24","validationResults":null,"sys_created_on":"2023-07-20
10:26:20"},{"sys_id":"[redacted]","name":"Prod-
v7.dpl","deployableName":"Prod","environmentType":"Production","description":"","validation":"passed","last_validated":"2023-
07-20 10:26:25","published":true,"last_published":"2023-07-20 10:26:25","validationResults":null,"sys_created_on":"2023-07-20
10:26:20"}]
[Pipeline] }
```

- Output

### Example - collection

**Note:**
When uploading to a collection, the `collectionName` argument is required.

```
snDevOpsConfig(
     applicationName: 'PaymentDemo',
     target: 'collection',
     collectionName: 'release-1.0',
     namePath: 'web-api-v1.0',
     configFile: 'k8s/helm/*.yml',
     dataFormat: 'yaml',
     autoCommit: 'true',
     autoValidate: 'true',
```

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```
    autoPublish: 'true'
)
```

**Example - deployable**

> **Note:**
> When uploading to a deployable, the `deployableName` argument is required.

```
snDevOpsConfig(
    applicationName: 'PaymentDemo',
    target: 'deployable',
    deployableName: 'Production',
    namePath: 'web-api-v1.0',
    configFile: 'k8s/helm/*.yml',
    dataFormat: 'yaml',
    autoCommit: 'true',
    autoValidate: 'true',
    autoPublish: 'true'
)
```

**Multiple uploads in one commit**

To upload configuration data from different locations, or to upload a set of data to multiple targets (for example, one component, one deployable) tracked as a single commit to your data model, you can call the `snDevOpsConfigUpload` action as many times as necessary for the first set of uploads, then call the `snDevOpsConfig` action for the final upload.

Here's an example.

- In the first upload, create a variable (for example, $changeset), and assign the return value of the step to it so it can be reused in subsequent uploads.

  Upload 1 - XML file to component:

  ```
  $changeset = snDevOpsConfigUpload(
      applicationName: 'PaymentDemo',
      target: 'component',
      namePath: 'paymentService-v1.0',
      configFile: 'infra/v1/config.xml',
      dataFormat: 'xml',
      autoCommit: 'false',
      autoValidate: 'false',
      autoPublish: 'false'
  )
  ```

- In subsequent uploads (and final upload), use the variable as an input.

  Upload 2 - JSON file to vars folder of deployable:

  ```
  snDevOpsConfig(
      applicationName: 'PaymentDemo',
      target: 'deployable',
  ```

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```
    deployableName: 'Production',
    namePath: 'vars/dbSettings',
    configFile: 'infra/prod/dbConfig.json',
    dataFormat: 'json',
    changesetNumber: "${changeset}",
    autoCommit: 'false',
    autoValidate: 'false',
    autoPublish: 'false',
    continueWithLatest: 'true'
)
```

#### Upload multiple data formats

To upload configuration data in different file formats, you can call the `snDevOpsConfig` action with these specifications.

- Ensure the `configFile` argument is using a wildcard in the path.
- Do not specify the `dataFormat` argument.

Here's an example.

- Let's say we have these config files.

| Name | Last commit message | Last commit date |
|---|---|---|
| config.xml | Created initial config | 2 years ago |
| server.xml | Changed listening port | yesterday |
| dbSettings.json | Updated connection string... | last month |

- This is how to upload the config files using `snDevOpsConfig`.

```
snDevOpsConfig(
    applicationName: 'PaymentDemo',
    target: 'component',
    namePath: 'paymentService-v1.0',
    configFile: 'infra/v1/*',
    autoCommit: 'true',
    autoValidate: 'true',
    autoPublish: 'true'
)
```

### snDevOpsConfigUpload

This action uploads a configuration file to a given location within an application data model.

It is meant to be used in an iterative nature for all config files to upload to the application data model during the pipeline run.

Supports:

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- Upload to:
  - A component, collection, or deployable.
  - The variable (vars) folder of a component, collection, or deployable.
- Regex pattern for config file input.
- Ability to be called multiple times in the same pipeline.

**Input variables**

| | |
|---|---|
| configFile | Specifies the configuration data file to upload to the component or deployable path in the data model. |
| applicationName | Specifies the application to where config data will be uploaded. |
| target | Specifies the data model target to where config data will be uploaded (for example, `component`, `collection`, `deployable`). |
| collectionName | (Optional) Name of the collection to upload to (required if target is collection). |
| deployableName | Name of the deployable to upload to (required if target is deployable). |
| namePath | Specifies the name path in the data model to where config data will be uploaded.<br>**Note:** When uploading to a vars folder, you must start the name path with "vars/" to specifiy the variable folder path. |
| dataFormat | Specifies the data format of the config file (for example, `JSON`, `YAML`, `XML`, etc.) |
| convertPath | (Optional) Specifies whether to preserve the directory structure of configuration files (with respect to the workspace) and convert the directory to paths within the data model. |
| changesetNumber | (Optional) Specifies the (open) changeset to which this upload activity is associated. If not provided, a new changeset is created.<br>**Note:** Only used for multiple upload scenarios. |

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| | |
|---|---|
| autoCommit | Specifies whether to commit configuration data after upload (true/false). Default is false. |
| autoValidate | Specifies whether to validate configuration data during commit (true/false). Default is false. |

**Output variable**

| | |
|---|---|
| changesetNumber | (Optional) Specifies the (open) changeset to which this upload activity is associated.<br><br>If a changeset number is not provided, a new changeset is created. |

**Example**

- Input:

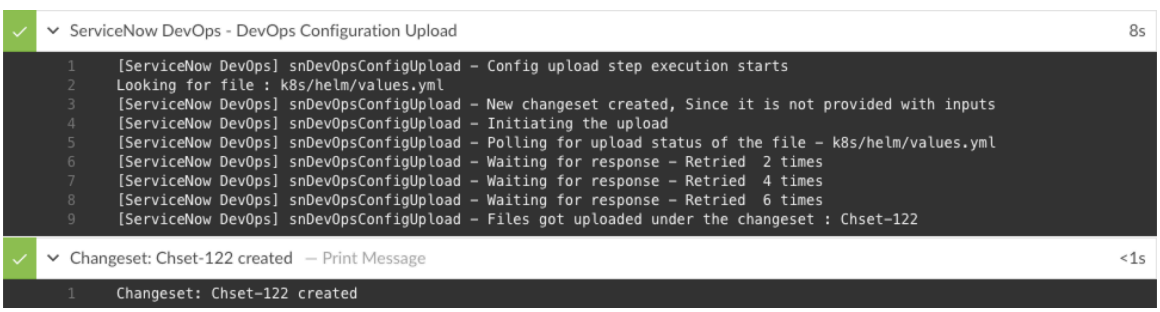
  Here is an example of the `snDevOpsConfigUpload` action. For the sake of illustration, we'll assign the response to a variable, `changeSetId`, which could be echoed out to our console log for debugging scenarios.

```
changeSetId = snDevOpsConfigUpload(
     applicationName: "PaymentDemo",
     target: 'component',
     namePath: "web-api-v1.0",
     configFile: "k8s/helm/values.yml",
     dataFormat: "json",
     autoCommit: 'true',
     autoValidate: 'true'
)

echo "Changeset: $changeSetId created"
```

- Output:

  In addition to the data being uploaded to our data model in DevOps Config, the output would look something like this (using the Blue Ocean plugin to visualize the console output).




**Example - Multiple uploads (component)**

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You can call the upload action more than once to upload configuration data in different file formats from different locations, while still keeping the uploads part of one changeset.

- In the first upload, name the action so the changesetNumber output variable can be reused in subsequent uploads.

  YAML file upload:

```
$changeset = snDevOpsConfigUpload(
     applicationName: 'PaymentDemo',
     target: 'component',
     namePath: 'wep-api-v1.0',
     configFile: 'k8s/helm/values.yml',
     dataFormat: 'yaml',
     autoCommit: 'false',
     autoValidate: 'false'
)
```

- In subsequent uploads, reference the changesetNumber output variable from the first upload as an input variable.

  3 JSON files upload:

```
snDevOpsConfigUpload(
     applicationName: 'PaymentDemo',
     target: 'component',
     namePath: 'wep-api-v1.0',
     configFile: 'infra/*.json',
     dataFormat: 'json',
     autoCommit: 'false',
     autoValidate: 'false',
     changesetNumber: "${changeset}"
)
```

- In the final call, in addition to referencing the changesetNumber output variable from the first upload as an input variable, set autoCommit and autoValidate to `true`.

  INI file upload:

```
snDevOpsConfigUpload(
     applicationName: 'PaymentDemo',
     target: 'component',
     namePath: 'wep-api-v1.0',
     configFile: 'featureToggles/set1.ini',
     dataFormat: 'ini',
     autoCommit: 'true',
     autoValidate: 'true',
     changesetNumber: "${changeset}"
)
```

**Example - Multiple uploads (collection and vars)**

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You can call the upload action more than once to upload configuration data in different file formats from different locations, while still keeping the uploads part of one changeset.

- In the first upload, create a variable (for example, $changeset), and assign the return value of the step to it so it can be reused in subsequent uploads.

  XML file upload:

```
$changeset = snDevOpsConfigUpload(
     applicationName: 'PaymentDemo',
     target: 'collection',
     collectionName: 'release-v1.0',
     namePath: 'v1-common-configs',
     configFile: 'infra/v1/config.xml',
     dataFormat: 'xml',
     autoCommit: 'false',
     autoValidate: 'false'
)
```

- In subsequent uploads, use the variable as an input.

  JSON file upload:

```
snDevOpsConfigUpload(
     applicationName: 'PaymentDemo',
     target: 'deployable',
     deployableName: 'Production',
     namePath: 'vars/dbSettings',
     configFile: 'infra/prod/dbConfig.json',
     dataFormat: 'json',
     autoCommit: 'true',
     autoValidate: 'true',
     changesetNumber: "${changeset}"
)
```

**Note:**
To upload to a variable folder, uploadTarget must be set to `deployable`, and the correct values must be set for deployableName and changesetNumber.

## snDevOpsConfigGetSnapshots

This action is intended to be used in different scenarios:

- Retrieve all snapshots for any impacted deployables.

  When config files are uploaded to an application data model, the system will create snapshots for any deployables determined to be impacted by the upload. Following along the CI flow, assuming the last Upload call had validation enabled, the next step would be to iterate through the list of snapshots and ensure they all passed validation.

- Retrieve a specific snapshot.

  Following the CD flow, a specific snapshot is retrieved so it can be published and then exported to be consumed downstream (for example, to provision out infrastructure or application).

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- Retrieve the latest snapshots for a deployable of an application in the event an upload does not generate any snapshots.

  A set of config data is available to deploy to an environment for an application-deployable-changeset combination when no configuration changes are made.

- Show policy validation results in a pipeline execution.

  View policy validation results as test results on the Jenkins build tests results page, including compliant with exception, when getting a snapshot.

**Input definitions**

| | |
|---|---|
| applicationName | Specifies the application to upload config data to or export data from. |
| deployableName | (Optional) Specifies the deployable for the application on which to get the latest snapshot data. |
| changesetNumber | (Optional) Specifies the changeset ID for the set of config changes the user is interested in. |
| isValidated | (Optional) Specifies whether to return only snapshots that are passed, or passed with exception (true/false). Default is true. |
| continueWithLatest | (Optional) Specifies whether to return the latest snapshot per the `applicatioName-deployableName-changesetNumbe` combination if no snapshots are generated (true/false). Default is false. |

**Output**

- If successful, a snapshot or set of snapshots.
- If failure, an API/backend failure message is shown.

**Example**

- Specific snapshot (specified):

```
$snapshots = snDevOpsConfigGetSnapshots(
     applicationName: 'PaymentDemo',
     deployableName: 'Production',
     changesetNumber: 'Chset-16',
     isValidated: 'true',
     continueWithLatest: 'true'
)
```

- Latest validated snapshot (returns the latest snapshot for application and deployable combination):

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```
$snapshots = snDevOpsConfigGetSnapshots(
     applicationName: 'PaymentDemo',
     deployableName: 'Production',
     isValidated: 'true'
)
```

- All changeset snapshots (returns all snapshots for application and deployable combination):

```
$snapshots = snDevOpsConfigGetSnapshots(
     applicationName: 'PaymentDemo',
     changesetNumber: 'Chset-16'
)
```

- Show policy validation results in a pipeline execution.

1. Assign a variable to the path of the file that contains the snapshot validation results generated during the `snDevOpsConfigGetSnapshots` action.
2. Call the JUnit action to load the snapshot validation results into the pipeline execution test section.

```
stage('Validate') {
    steps {
 script {
           changeSetResults =
 snDevOpsConfigGetSnapshots( … )
           if (!changeSetResults) {
              echo "No snapshots were created"
           } else {
        def changeSetResultsObject = readJSON text:
 changeSetResults

        changeSetResultsObject.each {
                  snapshotName = it.name
                  snapshotObject = it
        }
        // STEP 1
  validationResultsPath =
 "${snapshotName}_${currentBuild.projectName}_${curren
tBuild.number}.xml"
     }
 }
    }
}

post {
    always {
        // STEP 2
        junit testResults: "${validationResultsPath}",
 skipPublishingChecks: true
    }
}
```

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## snDevOpsConfigPublish

This action publishes a snapshot for the given application and deployable. From here, the snapshot can be consumed through the Export process.

### Input definitions

| | |
|---|---|
| applicationName | Specifies the application from which to publish config data. |
| deployableName | Specifies the deployable for the application from which to publish config data. |
| snapshotName | Specifies the name of the snapshot to publish. |

### Output

- If successful, true.
- Otherwise false.

### Example

```
snDevOpsConfigPublish(
     applicationName: 'PaymentDemo',
     deployableName: 'Production',
     snapshotName: 'Production-v23.dpl',
)
```

## snDevOpsConfigExport

This action exports a snapshot for the given application and deployable.

The user should specify the exporter, relevant exporter arguments, the export format (for example, YAML, JSON, etc.), and output location for the exported config data.

From here, the config data can be used directly as an input for a deployment or provisioning tool downstream in the pipeline.

### Input arguments

| | |
|---|---|
| applicationName | Specifies the application from which to export data. |
| deployableName | Specifies the config deployable for the application from which to export data. |
| snapshotName | (Optional) Specifies snapshot from which to export data.<br><br>If a snapshot is not specified, the latest snapshot for the deployable is used. |
| exporterName | Specifies the exporter to apply to the snapshot (for example, `UniqueCDIs`). |

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| | |
|---|---|
| exporterArgs | (Optional) Specifies arguments to be used along with the exporter. |
| exportFormat | Specifies the format to export the snapshot data (For example, `INI`, `YAML`, `PROPS`). |
| fileName | Specifies the file to export data to (assumed to be in the workspace).<br><br>If a filename is not specified, a concatenation of application name and deployable name (plus file extension) is used by default. |

**Output**

- If successful, true.
- Otherwise false.

**Example**

```
snDevOpsConfigExport(
     applicationName: 'PaymentDemo',
     deployableName: 'Production',
     snapshotName: 'Production-v23.dpl',
     exporterFormat: 'yaml',
     exporterName: 'returnAllData-now',
     exporterArgs: '',
     fileName: 'exported_file-Production-20220302.yml'
)
```

## snDevOpsConfigRegisterPipeline

This action ties a changeset and/or snapshot to the pipeline so that it can be tracked during the pipeline execution. In DevOps Change Velocity, this is shown in the Pipeline UI.

See Accelerating your DevOps change process for more information regarding the DevOps Change Acceleration feature.

**Input arguments**

| | |
|---|---|
| applicationName | Specifies the name of the application. |
| changesetNumber | (Optional) Specifies the changeset to associate with the pipeline execution.<br><br>**Note:** Specify either changesetNumber or snapshotName, but not both. |

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| | |
|---|---|
| snapshotName | (Optional) Specifies the name of the snapshot to associate to the pipeline execution.<br><br>**Note:** Specify either changesetNumber or snapshotName, but not both. |

**Output**

- If successful, true.
- Otherwise false.

**Example**

- Input:

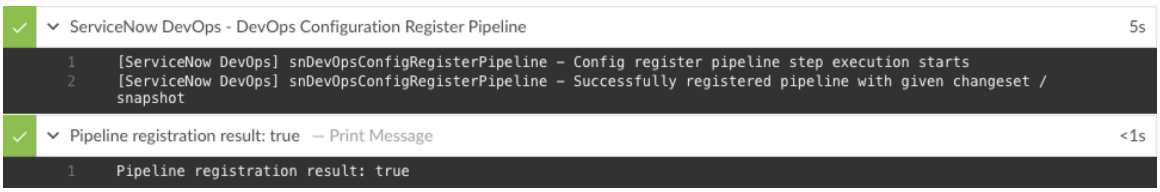
  Here is an example of the `snDevOpsConfigRegisterPipeline` action. For the sake of illustration, we'll assign the response to a variable, `changeSetRegResult`, which could be echoed out to our console log for debugging scenarios.

```
changeSetRegResult = snDevOpsConfigRegisterPipeline(
     applicationName: "PaymentDemo",
     changesetNumber: "Chset-122"
)

echo "Pipeline registration result:
 ${changeSetRegResult}"
```

- Output:

  In addition to the data being uploaded to our data model in DevOps Config, the output would look something like this (using the Blue Ocean plugin to visualize the console output).




## snDevOpsConfigValidate

Validate config data against your organization policies.

**Input arguments**

| | |
|---|---|
| applicationName | Application to validate. |
| deployableName | Deployable for the application to validate. |

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| | |
|---|---|
| snapshotName | (Optional) Name of the snapshot to validate. |
| markFailed | (Optional) Fail the pipeline in the event that the validation attempt failed (due to a backend issue). |
| showResults | (Optional) Show validation results in the Jenkins job console log. |

**Output**

- If successful, no output.
- If failure, an API/backend failure message is shown.

**Example**

- Specific snapshot (specified):

```
snDevOpsConfigValidate(
     applicationName: 'PaymentDemo',
     deployableName: 'Production',
     snapshotName: 'Production-v23.dpl',
)
```

- Latest snapshot (retrieves and validates the latest snapshot for application and deployable combination):

```
$changeset = snDevOpsConfigValidate(
     applicationName: 'PaymentDemo',
     deployableName: 'Production'
)
```

## snDevOpsChange

Create a change request and attach a snapshot for reference.

See Accelerating your DevOps change process for more information regarding the DevOps Change Acceleration feature.

**Input arguments**

| | |
|---|---|
| applicationName | Specifies the name of the application. |
| snapshotName | Specifies the name of the snapshot to associate with the change request. |

**Example**

```
snDevOpsChange(
     applicationName: 'PaymentDemo',
     snapshotName: 'Production-v23.dpl'
)
```

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### Jenkins pipeline example

```
pipeline {
    environment {
        buildArtifactsPath =
 "build_artifacts/${currentBuild.number}"
        validationResultsPath = ""
    }

    agent any

    stages {
        // Initialize pipeline
        stage('Initialize') {
            steps {
                script {
                    // DevOps Config application related
 information
                    appName = 'PaymentDemo'
                    deployableName = 'Production'
                    componentName = "web-api-v1.0"
                    collectionName = "release-1.0"
                    // Configuration file information
                    exportFormat = 'yaml'
                    configFilePath = "k8s/helm/values.yml"
                    // Exporter related information
                    exporterName = 'returnAllData-nowPreview'
                    exporterArgs = ''
                    // Jenkins variables declared to be used in
 pipeline
                    exportFileName =
 "${buildArtifactsPath}/export_file-${appName}-${deployableName}
-${currentBuild.number}.${exportFormat}"
                    changeSetId = ""
                    snapshotName = ""
                    snapshotObject = ""
                    isSnapshotValidateionRequired = false
                    isSnapshotPublisingRequired = false
                }
            }
        }

        // Validate configuration data changes
        stage('Validate') {
            parallel {
                stage('Config') {
                    stages('Config Steps') {
                        // Upload configuration data to DevOps
 Config
                        stage('Upload, Validate, & Publish') {
                            steps {
                                sh "echo uploading and
 auto-validating configuration file: ${configFilePath}"
                                script {
                                    changeSetResults =
 snDevOpsConfig(
```

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```
                                        applicationName:
"${appName}",
                                        target: 'component',
                                        namePath:
"${componentName}",
                                        configFile:
"${configFilePath}",
                                        dataFormat:
"${configFileFormat}",
                                        autoCommit: 'true',
                                        autoValidate: 'true',
                                        autoPublish: 'true',
                                        isValidated: 'true',
                                        continueWithLatest:
'true',
                                        markFailed: 'true'
                                    )

                                    echo "Snapshots generated,
validated, and published: ${changeSetResults}"

                                    def changeSetResultsObject =
readJSON text: changeSetResults

                                    changeSetResultsObject.each
{
                                        snapshotName = it.name
                                        snapshotObject = it
                                    }

                                    validationResultsPath =
"${snapshotName}_${currentBuild.projectName}_${currentBuild.num
ber}*.xml"
                                }
                            }
                        }
                        // Export published snapshot to be used
by downstream deployment tools
                        stage('Export') {
                            steps {
                                script {
                                    // create build artifacts
dir to store export file
                                    sh "mkdir -p
${buildArtifactsPath}"

                                    exportResponse =
snDevOpsConfigExport(
                                        applicationName:
"${appName}",
                                        snapshotName:
"${snapshotObject.name}",
                                        deployableName:
"${deployableName}",
                                        exporterFormat:
"${exportFormat}",
```

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```
                                        fileName:
"${exportFileName}",
                                        exporterName:
"${exporterName}",
                                        exporterArgs:
"${exporterArgs}"
                                    )
                                }
                            }
                        }
                    }
                }
            }

            // Create change request and attach snapshot for
reference
            stage('Change Management') {
                steps {
                    script {
                        // Trigger change request
                        snDevOpsChange(
                            applicationName: "${appName}",
                            snapshotName: "${snapshotName}"
                        )
                    }
                }
            }
        }
        // NOTE: attach snapshot validation results to run (if the
snapshot fails validation)
        post {
            always {
                // attach policy validation results
                junit testResults: "${validationResultsPath}",
skipPublishingChecks: true
            }
        }
}
```

## GitHub pipeline actions

Use these actions in your GitHub pipeline to interact with the DevOps Config data model.

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

GitHub scripted and declarative pipelines are supported.

The ServiceNow DevOps Config Validate (servicenow-devops-config-validate) and DevOps Config Export (servicenow-devops-config-export) GitHub Actions are provided to create a specific pipeline definition.

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## DevOps Config Validate (servicenow-devops-config-validate)

Upload and validate configuration data in a ServiceNow instance.

**Input arguments**

| Argument | Description |
|---|---|
| instance-url | ServiceNow instance URL. |
| devops-integration-username | DevOps Config integration username. |
| devops-integration-user-password | DevOps Config integration user password. |
| application-name | DevOps Config application name. |
| target | Data model target where configuration files are uploaded.<br><br>Example data model targets are:<br>• `component`<br>• `collection`<br>• `deployable` |
| deployable-name | Deployable name in the DevOps Config data model. |
| collection-name | (Optional) Collection name in the data model. Required when target is collection. |
| name-path | (Optional) Name path of the node in the data model where the configuration files are uploaded. |
| config-file-path | File path when uploading a single file or file path pattern based on the Ant-style pattern when uploading multiple files to the data model. See Directory-based Tasks for information on Ant-style patterns in the Apache Ant.1.10.14 Manual documentation. |
| data-format | Data format of the configuration files.<br><br>Example data formats are:<br>• `CSV`<br>• `INI`<br>• `JSON`<br>• `Properties`<br>• `RAW`<br>• `XML`<br>• `YAML` |
| data-format-attribute | (Optional) Extended data format attributes for parsing configuration data. |

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| Argument | Description |
|---|---|
| auto-commit | Boolean (true or false) input to commit configuration data after successful upload.<br><br>Default value: `true` |
| auto-validate | Boolean (true or false) input to validate configuration data after successful commit.<br><br>Default value: `true` |
| auto-publish | Boolean (true or false) input to publish configuration data after successful validation.<br><br>Default value: `true` |
| changeset | (Optional) Open changeset associated with the upload action. If not provided, a new changeset is created. |
| snapshot-validation-timeout | (Optional) Maximum time in minutes for validation to complete before failing the action.<br><br>Default value: `60` |
| terminate-on-policy-validation-failures | (Optional) Boolean (true or false) input to terminate the GitHub workflow after policy validation failures.<br><br>Default value: `false` |

**Outputs**

**changeset-number**

Changeset number associated with the upload action.

**snapshot-name**

Name of the latest snapshot of the deployable.

**validation-status**

Validation status of the snapshot. Example: `passed`, `passed_with_exception`, `failed`, `execution_error`, `not_validated`

**validation-results**

Validation results in the JSON format for the snapshot.

**Example — Uploading config files to a deployable**

```
upload_and_validate_job:
    name: Upload and validate
    needs: <upstream job>
    runs-on: ubuntu-latest
```

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```
    steps:
      - name: ServiceNow Devops Config Validate
        uses:
 ServiceNow/servicenow-devops-config-validate@v1.0.0-b
eta
        with:
          instance-url: ${{ secrets.SN_INSTANCE_URL }}
          devops-integration-username:
 ${{ secrets.SN_DEVOPS_CONFIG_USERNAME }}
          devops-integration-user-password:
 ${{ secrets.SN_DEVOPS_CONFIG_PASSWORD }}
          application-name: PaymentDemo
          target: deployable
          deployable-name: Production
          name-path: web-api-v1.0
          auto-commit: true
          auto-validate: true
          auto-publish: true
          config-file-path: data/k8s/helm/*.yml
          data-format: yaml
          snapshot-validation-timeout: 60
          terminate-on-policy-validation-failures: true
```

**Example — Uploading config files to a collection**

```
upload_and_validate_job:
    name: Upload and validate
    needs: <upstream job>
    runs-on: ubuntu-latest
    steps:
      - name: ServiceNow Devops Config Validate
        uses:
 ServiceNow/servicenow-devops-config-validate@v1.0.0-b
eta
        with:
          instance-url: ${{ secrets.SN_INSTANCE_URL }}
          devops-integration-username:
 ${{ secrets.SN_DEVOPS_CONFIG_USERNAME }}
          devops-integration-user-password:
 ${{ secrets.SN_DEVOPS_CONFIG_PASSWORD }}
          application-name: PaymentDemo
          target: collection
          deployable-name: Production
          collection-name: release-1.0
          name-path: web-api-v1.0
          auto-commit: true
          auto-validate: true
          auto-publish: true
          config-file-path: data/k8s/helm/*.yml
          data-format: yaml
          snapshot-validation-timeout: 60
          terminate-on-policy-validation-failures: true
```

**Example — Uploading config files to a component**

```
upload_and_validate_job:
    name: Upload and validate
    needs: <upstream job>
```

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```
    runs-on: ubuntu-latest
    steps:
      - name: ServiceNow Devops Config Validate
        uses:
 ServiceNow/servicenow-devops-config-validate@v1.0.0-b
eta
        with:
          instance-url: ${{ secrets.SN_INSTANCE_URL }}
          devops-integration-username:
 ${{ secrets.SN_DEVOPS_CONFIG_USERNAME }}
          devops-integration-user-password:
 ${{ secrets.SN_DEVOPS_CONFIG_PASSWORD }}
          application-name: PaymentDemo
          target: component
          deployable-name: Production
          name-path: web-api-v1.0
          auto-commit: true
          auto-validate: true
          auto-publish: true
          config-file-path: data/k8s/helm/*.yml
          data-format: yaml
          snapshot-validation-timeout: 60
          terminate-on-policy-validation-failures: true
```

**Example — Uploading multiple config files in a single commit**

```
upload_and_validate_job:
    name: Upload and validate

    needs: <upstream job>
    runs-on: ubuntu-latest
    # Upload an XML file to a component
    steps:
      - name: ServiceNow Devops Config Validate
        id: upload_and_validate_xml
        uses:
 ServiceNow/servicenow-devops-config-validate@v1.0.0-b
eta
        with:
          instance-url: ${{ secrets.SN_INSTANCE_URL }}
          devops-integration-username:
 ${{ secrets.SN_DEVOPS_CONFIG_USERNAME }}
          devops-integration-user-password:
 ${{ secrets.SN_DEVOPS_CONFIG_PASSWORD }}
          application-name: PaymentDemo
          target: component
          deployable-name: Production
          name-path: web-api-v1.0
          auto-commit: false
          auto-validate: true
          auto-publish: true
          config-file-path: data/infra/v1/*.xml
          data-format: xml
          snapshot-validation-timeout: 60
          terminate-on-policy-validation-failures: true
```

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```
    # Upload a JSON file to the vars folder of a
 deployable
    steps:
      - name: ServiceNow Devops Config Validate
        id: upload_and_validate_json
        uses:
 ServiceNow/servicenow-devops-config-validate@v1.0.0-b
eta
        with:
          instance-url: ${{ secrets.SN_INSTANCE_URL }}
          devops-integration-username:
 ${{ secrets.SN_DEVOPS_CONFIG_USERNAME }}
          devops-integration-user-password:
 ${{ secrets.SN_DEVOPS_CONFIG_PASSWORD }}
          application-name: PaymentDemo
          target: component
          deployable-name: Production
          name-path: web-api-v1.0
          auto-commit: true
          auto-validate: true
          auto-publish: true
          config-file-path: data/infra/prod/*.json
          data-format: json
          snapshot-validation-timeout: 60
          terminate-on-policy-validation-failures: true
          changeset :
 ${{ steps.upload_and_validate_xml.outputs.changeset-nu
mber }}
```

## DevOps Config Export (servicenow-devops-config-export)

Export configuration data using ServiceNow DevOps Config.

**Input arguments**

| Argument | Description |
|---|---|
| instance-url | ServiceNow instance URL. |
| devops-integration-username | DevOps Config integration username. |
| devops-integration-user-password | DevOps Config integration user password. |
| application-name | DevOps Config application name. |
| deployable-name | Deployable name in the DevOps Config data model. |
| exporter-name | Exporter name that exports configuration data from the DevOps Config data model. |
| snapshot-name | (Optional) Snapshot from which to export data. If a snapshot is not specified, the latest snapshot for the deployable is used. |
| exporter-data-format | (Optional) Format to export the snapshot data. |

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| Argument | Description |
| --- | --- |
| | Example data formats are:<br>• `CSV`<br>• `INI`<br>• `JSON`<br>• `Properties`<br>• `RAW`<br>• `XML`<br>• `YAML` |
| exporter-arguments | (Optional) Arguments to be used along with the exporter. The value must be a JSON object represented as a string. |

**Output**

**exporter-content**

Configuration data that the exporter exports.

**Example — Export specific snapshot**

```
export:
    name: Export config
    needs: <upstream job>
    runs-on: ubuntu-latest
    steps:
    - name: ServiceNow DevOps Config Export
      uses:
 ServiceNow/servicenow-devops-config-export@v1.0.0-beta
      with:
        instance-url: ${{ secrets.SN_INSTANCE_URL }}
        devops-integration-username:
 ${{ secrets.SN_DEVOPS_CONFIG_USERNAME }}
        devops-integration-password:
 ${{ secrets.SN_DEVOPS_CONFIG_PASSWORD }}
        application-name: PaymentDemo
        deployable-name: Production
        exporter-name: returnDataforNodeName-now
        snapshot-name: Production-v1.dpl
        exporter-arguments: '{ "nodeName": "node1" }'
```

**Example — Export the latest deployed snapshot with additional parameters**

```
export:
    name: Export config
    needs: <upstream job>
    runs-on: ubuntu-latest
    steps:
    - name: ServiceNow DevOps Config Export
      uses:
 ServiceNow/servicenow-devops-config-export@v1.0.0-beta
      with:
        instance-url: ${{ secrets.SN_INSTANCE_URL }}
```

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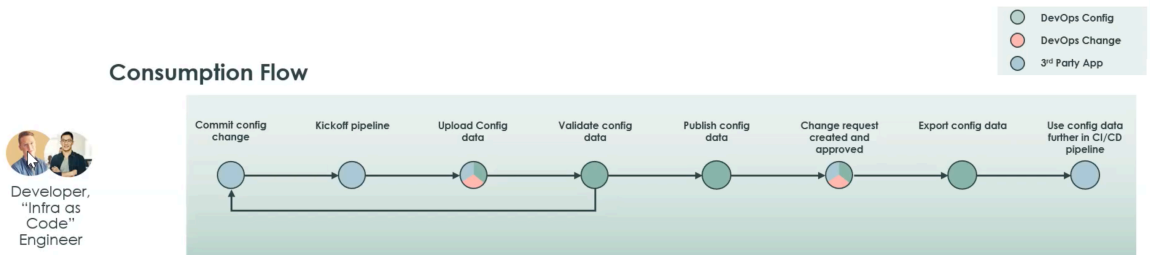
```
        devops-integration-username:
${{ secrets.SN_DEVOPS_CONFIG_USERNAME }}
        devops-integration-password:
${{ secrets.SN_DEVOPS_CONFIG_PASSWORD }}
        application-name: PaymentDemo
        deployable-name: Production
        exporter-name: returnDataforNodeName-now
        exporter-arguments: '{ "nodeName": "node1" }'
        exporter-data-format: XML
```

## Using DevOps Config

The developer, or app engineer, role uses DevOps Config, once it's installed and set up by the DevOps engineer role, to validate and correct config data (that they commit) before it gets deployed.

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.




Consumption process:

1. A configuration change is committed as part of the role of the developer, or app engineer.
2. The build process is kicked off in the pipeline.

   When a configuration change is committed in the source code repository, it typically kicks off the build process in the pipeline.

3. Upload configuration data using Azure DevOps pipeline tasks or Jenkins pipeline actions.

   DevOps Config pipeline tasks and actions are used to interact with your data model to upload config data for validation.

4. Get snapshot status of the uploaded configuration file.

   A snapshort (of configuration data) is created when the configuration change is committed.

5. Check validity of the snapshot using DevOps Config policies.

   Once config data is uploaded and the snapshot is created, it's validated in DevOps Config against a set of policies predefined for the specific deployment environment.

6. Publish snapshot after validation.

   Once validated by DevOps Config, the config data is then published and a DevOps change request is created by DevOps Change Velocity (change control).

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Snapshot information is shown in the DevOps change request **Config changes** tab for accelerated root cause analysis.

7. Approve the DevOps change request.

   Once the DevOps change request is approved, the config data is used downstream in your CI/CD pipeline.

8. Deploy to your environment.

   Once the change is deployed to your environment, the change request is closed.

9. Use DevOps Config exporters to export your config data to be used by your deployment tools.

## Viewing and editing config data

You can update the config data of an application by creating or opening a changeset on the **Config data** tab, where you update the structure and CDIs of the config data.

> **Important:**
> Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

## Tabs on the Application page

When you open an application, the header area for each tab displays administrative details for the application: Application name, name of the user that created the application, and timestamp of creation.

- **Overview**: Basic settings of the application and a **Manage deployables** button that enables you to edit config data.
- **Snapshots**: List of snapshots for each deployable in the application. Each entry includes validation and publication status. Policies that execute against a snapshot return validation result. Published snapshots are available for release to the CI/CD pipeline.
- **Config data**: Read-only view of the config data in a tree structure. Select a node in the tree to view the config data for that node in the application service or infrastructure service. (You can edit an open changeset or create a new or changeset. The tab then updates to show an Editor panel and a Preview panel where you can create, edit, and save the changeset. You cannot change an existing snapshot, but you can start with a snapshot changeset and save the changes in a new changeset.)

  > **Important:**
  > Save your changes whenever you are confident of the changes and before you leave the **Config data** tab.

- **Settings**: A list of policies that are mapped to the deployables. Select an item to open it.
- **Activity**: List of changesets. On this tab, you can open a changeset to continue editing or publish a changeset as a new version of the application config data.

## Config data tab

After you open a changeset by selecting **Edit config data**, you can edit the config data on the Config Data tab. In the config data tree (A in the screenshot), select the node to edit. By default,

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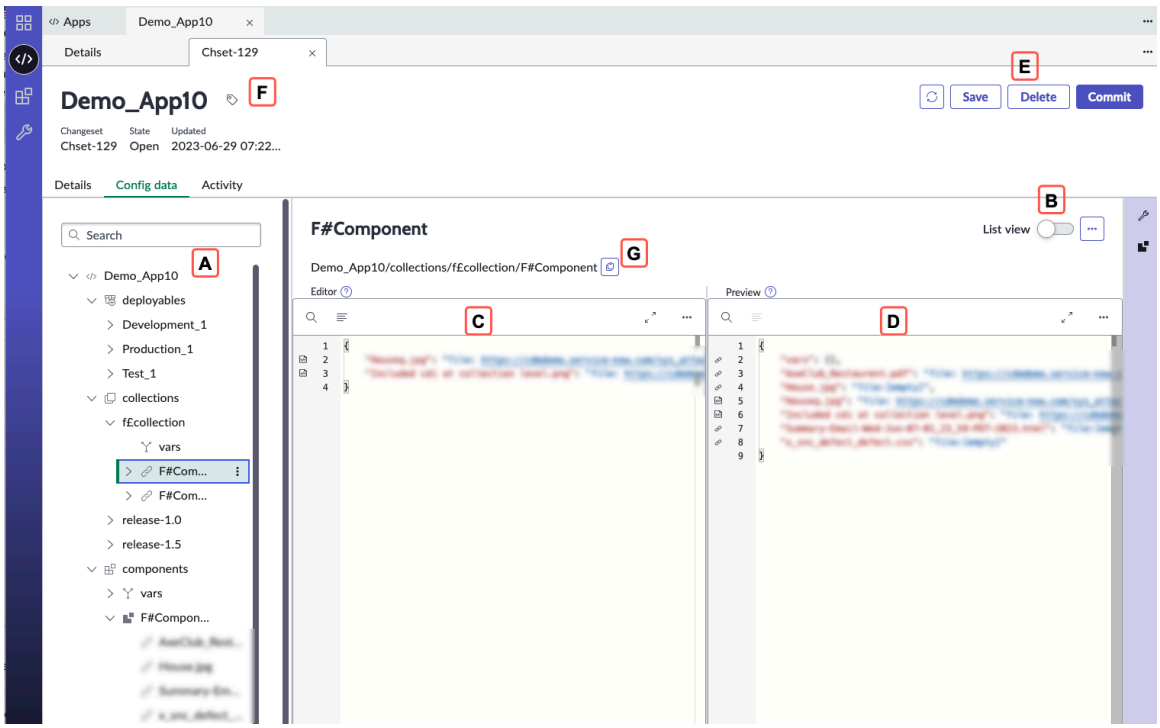
the editing panel (C) displays the script view of the key-value pairs (the config data items or CDIs) in the selected node.




### A: Config data tree

The config data tree displays the structured config data. Select a node to edit the associated data.

### B: View selector

To switch from the Script view (shown as panels C and D) to an editable list of CDIs and their values, slide the selector to **List view**.

### C: Editor panel

The Editor panel displays the contents of the selected node. You can edit the config data directly in the Editor panel.

> **Important:**
> To ensure that you edit only the data that you intend to edit, the panel displays only data that is directly in the selected node. The Editor panel lists all included collection and component names but not their contents. This strategy reduces clutter and clarifies the structure of the deployable. To view the fully resolved config data, view the Preview panel (D).

### D: Preview panel

The Preview panel displays the persisted state of the data in structured form. If you make any changes in the Editor panel and save the changes, the data in the Preview panel is updated to include the changes.

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- To resolve variables and view the fully resolved data in the preview panel: In the More actions menu ( ), select **Apply variables**.
- Encrypted data appears as ********. Users with the CDM Secrets [sn_cdm.cdm_secrets] role can view all encrypted values in the preview panel. In the More actions menu ( ), select **View encrypted data**.
- To see nodes and CDIs that are excluded from inheritance: In the More actions menu ( ), select **View excluded data**.

**E: Actions**

- **Refresh View**: Update data in the view.
- **Save Changes**: Save (persist) the current changes but do not commit the data. The Editor panel, List view, and Preview panel refreshes to reflect the resolved state of the changeset. The system updates the changeset but does not update the application. Changes appear on the **Activity** tab. You must commit a changeset to update the config data for the application. After saving, you can move on to other activities and return later to edit the changeset. The button appears only if you have made changes.
- **Delete Changeset**: Delete the record of the changeset.
- **Commit Changeset**:  The system generates a snapshot of each deployable that is affected by the changes.

> **Note:**
> Because changes in two changesets that are open at the same time can conflict, the system blocks such commits. See Conflicts between changeset commits.

**F: Header for the changeset**

The header displays general read-only information about the changeset. You can view this information and additional information on the **Details** tab, as described in the next section.

**G: Name path of the selected node**

The name path is the complete folder path of the selected node in the list. Select the copy name path to clipboard icon ( ) to copy the name path of the node.

## Changeset - Header and Details tab

### Information on the Changeset Header and on the Details tab

| Field | Description |
|---|---|
| Changeset number | Unique sequential changeset number that the system auto-assigns. |
| Description | Description that helps other users understand the purpose, scope, and intent of the changeset. |
| Application | Application on which the changeset is based. |

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**Information on the Changeset Header and on the Details tab (continued)**

| Field | Description |
|---|---|
| State | • Committed: This draft of the changeset has been committed.<br>• Open: The changeset is being updated and is not committed.<br>• Blocked: Other commits conflict with this commit. The changeset cannot be committed. See Conflicts between changeset commits.<br>• Commit in progress: A draft of the changeset that is currently being committed. |
| Created / Created by | User who created the changeset and the timestamp of creation. |
| Updated / Updated by | User who updated the changeset and the timestamp of the update. |
| Committed / Committed by | User who committed the changeset and the timestamp of the commit. |

### Define or update a component

Define or update a component while working in a changeset.

## Before you begin

Role required: cdm_editor or cdm_admin

## About this task

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

**Important:**
Save your changes whenever you are confident of the changes and before you leave the **Config data** tab.

## Procedure

1. Follow this procedure to add a component to an application:
   a. While working in a changeset, select the more actions icon ( ) for the **components** node and select **Create component**.
   b. Enter a unique and meaningful name and then select **Create**.
2. To perform other actions, select the more actions icon ( ) for a component and select the action, as follows.

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3. Add a CDI: Select the more actions icon ( ⋮ ) for the item and select **Create CDI**.

**Create CDI**

| | |
|---|---|
| Name | Unique and meaningful name for the CDI. |
| Value | Value that the CDI has in the current context or define a variable.<br>○ You can specify a direct `key : value` pair.<br>○ You can define a variable and specify its default value. Variable definitions have the following form:<br>`@@<variableName>@@: <value>`<br>○ You can specify a value for a variable using the following form:<br>`"<variableName>": "<value>"`<br>○ You can specify a contextual variable. These are variables defined out-of-the-box that use the context of the node to set the variable value. The variable uses the following form:<br>`"<variableName>": "(#<value>#)"`<br>○ You can use recursive variables for a CDI value. Recursive variables use other variable values as parameters to set the CDI value. For example, each of these CDI values can resolve the same due to recursive variables:<br>`cdi1: @(favorite_food/@(person)@)@`<br>`cdi2: @(favorite_food/@(john)@)@`<br>`cdi3: waffles` |
| Encrypted | Option to specify that the value of the CDI should be encrypted. This option appears only for users with the CDM Secrets [sn_cdm.cdm_secrets] role.<br>After you create the CDI, the value appears in all views as `*******`. To view the value on any tab that displays the CDI, users with the CDM Secrets [sn_cdm.cdm_secrets] role can select the **View encrypted data** menu option. |

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**Related topics**

- Create or update a variable CDI
- Manage files in the config data model using file nodes
- CDM data model
- Viewing and editing config data
- How encrypted data is handled

### Define or update a collection in an application

Define or update a collection while working in a changeset of a application.

## Before you begin

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

Role required: cdm_editor or cdm_admin

## About this task

**Important:**
Save your changes whenever you are confident of the changes and before you leave the **Config data** tab.

## Procedure

1. To add a collection to the application: While working in a changeset, select the more actions icon ( ) for the **collection** node and select **Create collection**.
2. To edit individual data items, you can either work directly in the code or select the more actions icon ( ) for an item and select an action, as follows.
3. Add a CDI: Select the more actions icon ( ) for the item and select **Create CDI**.

**Create CDI**

| | |
|---|---|
| Name | Unique and meaningful name for the CDI. |
| Value | Value that the CDI has in the current context or define a variable.<br>○ You can specify a direct `key : value` pair.<br>○ You can define a variable and specify its default value. Variable definitions have the following form:<br>`@@<variableName>@@: <value>`<br>○ You can specify a value for a variable using the following form: |

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| | |
|---|---|
| | `"<variableName>": "<value>"`<br>○ You can specify a contextual variable. These are variables defined out-of-the-box that use the context of the node to set the variable value. The variable uses the following form:<br>`"<variableName>": "(#<value>#)"`<br>○ You can use recursive variables for a CDI value. Recursive variables use other variable values as parameters to set the CDI value. For example, each of these CDI values can resolve the same due to recursive variables:<br>`cdi1: @(favorite_food/@(person)@)@`<br>`cdi2: @(favorite_food/@(john)@)@`<br>`cdi3: waffles` |
| Encrypted | Option to specify that the value of the CDI should be encrypted. This option appears only for users with the CDM Secrets [sn_cdm.cdm_secrets] role.<br>After you create the CDI, the value appears in all views as `*******`. To view the value on any tab that displays the CDI, users with the CDM Secrets [sn_cdm.cdm_secrets] role can select the **View encrypted data** menu option. |

4. **Optional:** Add CDI settings that will override or overlay settings in collections. For more information, see Define or update a component.

**Related topics**

- CDM data model
- Viewing and editing config data
- How encrypted data is handled
- Create or update a variable CDI

### Create or update a variable CDI

Define variables and set their values in components, collections, and deployables.

**Before you begin**
Role required: cdm_editor or cdm_admin

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### About this task

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

**Important:**
Save your changes whenever you are confident of the changes and before you leave the **Config data** tab.

- When you create an application, the system auto-generates an empty **vars** folder in each of the three top-level folders: **component**, **collection**, and **deployable**.
- When you add a collection or deployable, the system adds an empty **vars** folder to the item that you created.
- A **vars** folder can contain only variable CDIs or folders. Any subfolder can contain only variables or folders.
- The value of a variable in a collection overrides the value of the variable in a component.
- The value of a variable in a deployable overrides the value of the variable in a collection or component.

### Procedure

1. Use either of the following methods to edit or add an instance of a variable while working in a changeset:
   - Edit directly in the editing panel. Use the following format to set the value of a variable:

     ```
     "<variableName>": "<value>"
     ```

     In this example, the *dbName* variable and several others reside in the *database* folder. In addition, the *backup* folder (a child of the *database* folder) holds the *dbServer* variable.

     ```
     {
         "database": {
             "dbName": "paymentX_dev22",
             "dbUserName": "root2",
             "dbPassword": "admin1",
             "dbServer": "db22.paymentx.be",
             "dbPort": "03306",
             "backup":{
                 "dbServer": "1625575668.paymentx.be"
             }
         }
     }
     ```

   - Create the variable in a dialog box. Follow the procedure in the next step.
2. Select the more actions menu icon ( ⋮ ) for the appropriate **vars** folder, select **Create variable**, and then specify its settings.

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**Create variable**

| | |
|---|---|
| Name | Unique and meaningful name for the variable. |
| Value | Value that the variable has in the current context.<br><br>**Tip:**<br>It is often useful to define a default value for a variable in a component or collection. This is a powerful strategy because you can create a broad variety of deployables from a small set of components and collections. Deployables that inherit a component or collection can use overrides, overlays, and variable settings to meet the needs of the environment type. For example, the `Development` deployable can use the same components and collections as the `Test` deployable. `Development` uses the default *`database`* variable value. `Test`, in contrast, uses a different value that is appropriate for the test environment. |
| Encrypted | Option to specify that the value of the variable should be encrypted. The option appears only for users with the CDM Secrets [sn_cdm.cdm_secrets] role.<br><br>After you create the variable, the value appears in all views as `*******`. To view the value on any tab that displays the variable, users with the CDM Secrets [sn_cdm.cdm_secrets] role can select the **View encrypted data** menu option. |

## Manage files in the config data model using file nodes

Add and manage files using file nodes in the config data model of a CDM app or in a component library.

### Before you begin

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

Role required: cdm_editor or cdm_admin

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### About this task

When you attach a file to an applicable node, a file node is created under that node. The file node contains a link to the attached file that stores configuration data. For example, a properties file or a logo image file.

- In an app, you can add the file node to a node under the component, collection, or deployable folder. The file nodes in a component are also included when you include a component to a collection and the collection to the deployable in an app. You can override the file nodes included at the collection or deployable level, like any other config data item.
- In a component library, you can add a file node to a node under a shared component. When the shared component is used in an app, the file nodes are copied along with the file attached to them.

App developers and members of the authoring group of the app can access the file nodes and also download their attached files. They can manually validate the content of the file and then publish the snapshot. DevOps users can export the validated config data, including file nodes with URLs to the attached files hosted on the ServiceNow instance where the export was executed.

### Procedure

1. Navigate to **All** > **DevOps Config** > **DevOps Config Workspace**.
2. Open a DevOps Config app or a component library to add a file node to its config data model. A changeset is opened with the **Config data** tab selected.
3. In the config data tree, select the more actions icon ( ⋮ ) next to a node to which you want to add a file node, and then select the **Add file** from the menu.

   **Note:**
   In an app, you can add a file node to a node under the component, collection, or deployable, but not directly to the component, collection, or deployment folder in an app. In a shared library, you can add a file node to a node under a shared component.

4. Add a file to create a file node.

   a. In the Add file dialog box, browse and select a file from your system, and select **Add file**. You can add a MIME-type file supported by the ServiceNow AI Platform with a maximum file size of 5 MB.

   b. In the **Node name** field, provide a name for the file node.
   By default, the attached file name is populated as the file node name. The **Content type** field is also populated with the content type of the attached file.

   c. Select **Add file**.

   The file node is added to the selected node. Select the file node in the config data tree to display its metadata in the File information pane and preview the file's content in the File content pane.

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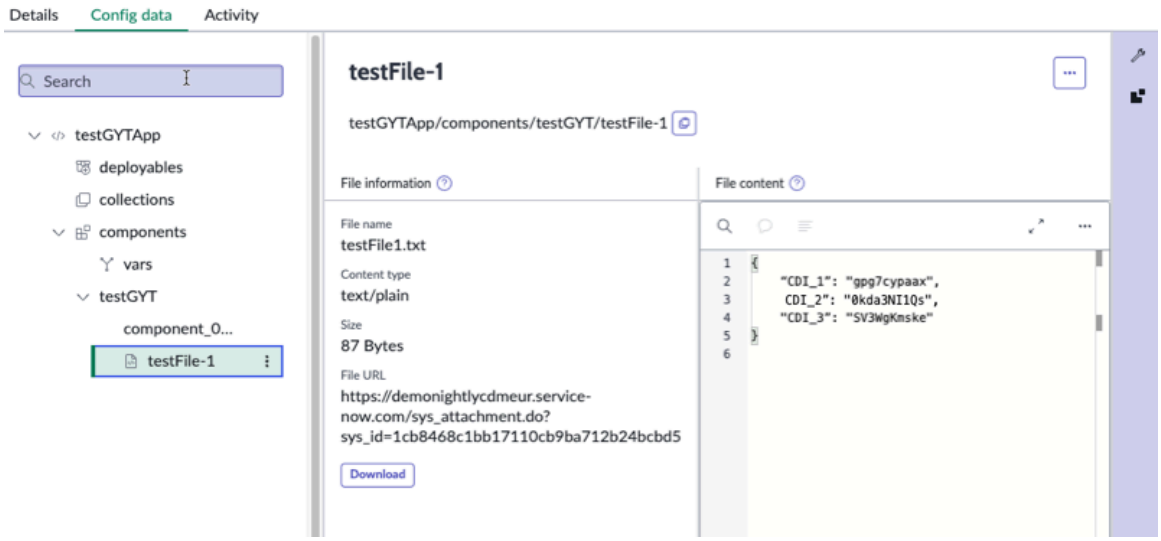
**Note:**
The content preview is available for the files with the following MIME types: `text/yaml,text/css,text/csv,text/html,text/javascript,text/plain,text/richtext,text/x-vcard,text/x-vcalendar,application/xml,application/javascript,application/json`. To view content for additional MIME type files, add them as a comma separated list to the system property *`sn_cdm.attachment.display_mime_types`*. The preview is not available for binary file MIME types, such as audio, image, and video.




5. **Optional:** After the file node is added to the config data, you can perform the following actions on the file node or the file attachment within it.

**Note:**
All actions on the file node or its file attachment can only be done via the More actions menu on the file node.

## Compare config data of two CDM applications

Use the Config Data Analyzer tool to find similarities and differences between the config data of two applications. You can compare either different applications or different changesets of a particular application.

### Before you begin

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

Role required:cdm_viewer, cdm_editor, or cdm_admin

### Procedure

1. While viewing an application, select **Compare config data**.
   The **Compare config data** tab opens.

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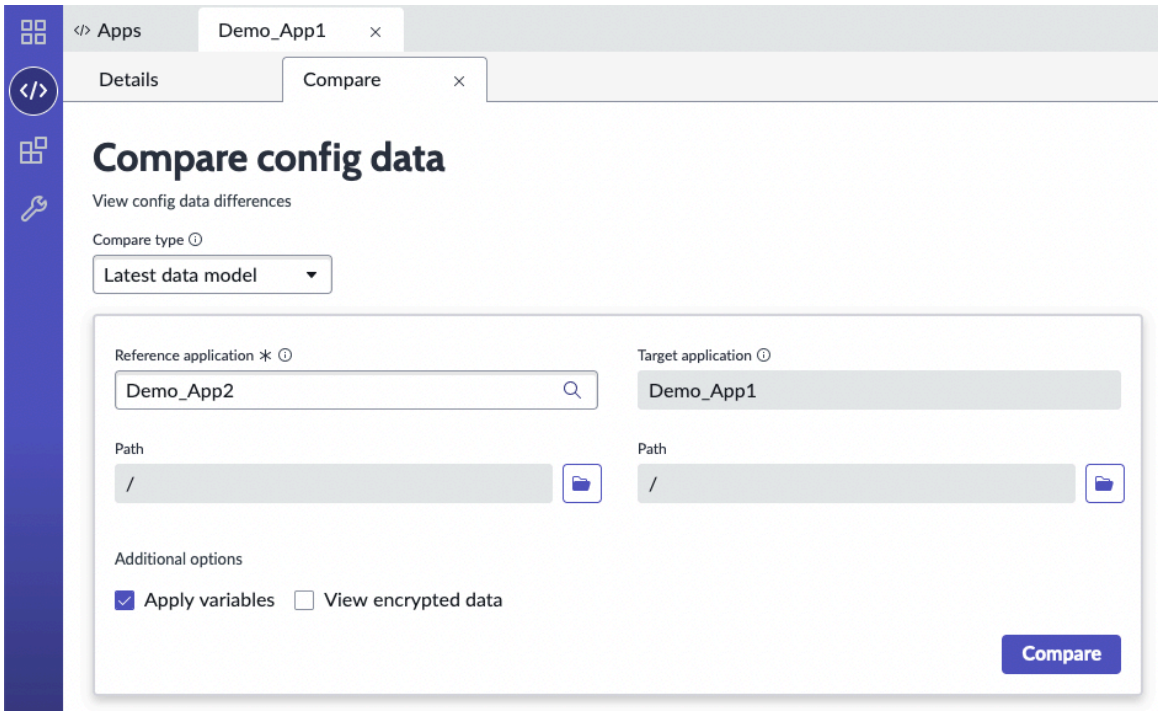
The current application (the application that you started with, *Demo_App1* in the example) is called the target. The application to compare to the target is called the reference application. The **Target application** field is set as the latest committed data for the target and is read-only.




2. Select the **Latest data model** option in the **Compare type** field.
3. Select a reference application (*Demo_App2* in the example).
   The **Reference application** selection list includes the latest committed data for all applications except the target application.
4. **Optional:** Select the folder icon ( ) to specify a folder path for comparison.
5. **Optional:** Select **Apply variables** to display fully resolved variable values in the comparison results.
6. **Optional:** If you've the cdm_secrets role, you can select **View encrypted data** to view encrypted values in clear text in the comparison results.

   **Note:**
   The check box is inactive for users who do not have the cdm_secrets role. When the values in the target and reference differ, the comparison results indicate that the values differ, but the data itself still appears as ********.

7. Select **Compare**.

   The Comparison results section displays the differences between the reference changeset and the target changeset.

   **Important:**
   If you commit changes to a reference application while the **Compare config data** tab is open: When you return to the **Compare config data** tab and select **Compare**, the comparison is performed on the most recently committed changeset, and the updated results are displayed in the results section.

The letters in the following illustration identify the tools that you can use to analyze the data.

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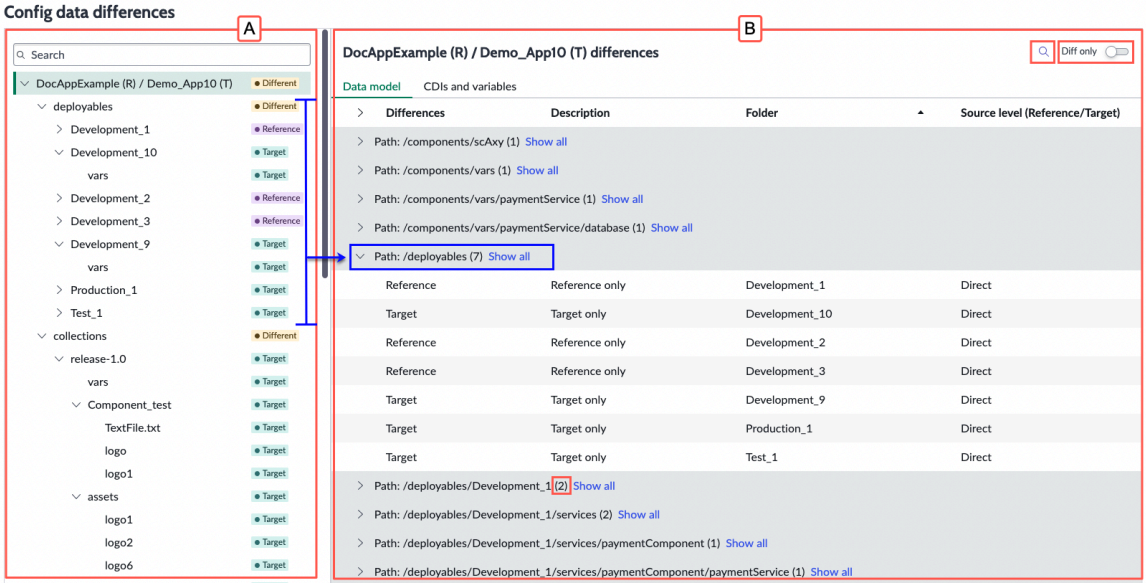


### A. Navigation panel

The navigation panel displays the node structure of the applications.

- Nodes that include changed CDIs (either directly or in descendent nodes) are annotated with **Different**.
- Nodes that include newly added CDIs (either directly or in descendent nodes) are annotated with the identity of the application changeset that includes the new data, either **Reference** or **Target**.
- Use the **Search** field to search for text in the navigation panel.
- Select a node to view its contents in the Differences panel.

### B: Differences panel

- By default, all config data is displayed. Select **Diff only** to view only data that differs between the two changesets.
- Use the **Search** icon ( ) to search for text in the Component differences panel.
- The panel offers two tabs: **Data model** and **CDIs and variables**. In either tab, expand and close groupings with the expansion icon ( ).
- If a selection includes more than 50 CDIs, then CDIs are organized into pages of 50.

The **Data model** tab displays changes to the structure of the application at the folder level, such as, adding, deleting, or renaming a folder.

#### Data model tab - List columns

| Column | Description |
|---|---|
| Differences | The path of the structure for which differences are described. |
| Description | Text that describes any differences between the reference and target changesets. |
| Folder | The folder in the structure. |

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| Column | Description |
| --- | --- |
| Source level (Reference/Target) | ○ Direct: The folder is explicitly specified or deleted in the node.<br>○ Included: The folder is included from a child folder. |

The **CDIs and variables** tab displays changes to individual CDIs for the node that is selected in the navigation panel.

- By default, the root node is selected and the data panel includes all CDIs for both changesets. Select a node in the navigation panel to display data for only that node and its descendents.
- When **Diff only** is selected, the number of CDIs that differ appears after the node path.
- Node paths are displayed in gray. Use the expansion icon (  ) to view CDIs in a folder.

### CDIs and variables tab - List columns

| Column | Description |
| --- | --- |
| Differences | Indicator to show where the differences are.<br>○ Target: The CDI appears only in the target changeset.<br>○ Reference: The CDI appears only in the reference changeset.<br>○ Different: For the specified CDI, the values in the target and reference changesets differ. |
| Description | Statement of how the changesets differ. For example, the text might indicate that a CDI appears only in the reference changeset or that the values for variable differ between the changesets. See Types of differences between CDM applications for the full list of difference types and their causes. |
| Name | Name of the CDI. |
| Reference (R) | Value of the CDI in the reference changeset. |
| Target (T) | Value of the CDI in the target changeset. |
| Source level (R/T) | The node level in the code at which the CDI is defined.<br>○ Direct: The CDI is defined in the selected node.<br>○ Include: The value of the CDI is obtained from a node that is included in the selected node.<br>○ Override: The value of the CDI in an included node is overridden by a value that is specified in the including node.<br>Values appear in the following formats: |

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| Column | Description |
|---|---|
| | ○ `<reference level / target level>` when a value appears in both target and reference.<br>○ `<reference level>` when a value appears in only the reference changeset.<br>○ `<target level>` when a value appears in only the target changeset.<br><br>For example, when a CDI is defined in the reference changeset with the value `true` and the CDI does not appear in the target changeset, then the last three columns in **CDIs and variables** tab will have the following values:<br>○ **Reference (R)**: `true`<br>○ **Target (T)**: [Empty]<br>○ **Source level (R/T)**: `Direct` |

If a file node is selected in the tree, the **File information** tab displays its metadata.

### File information tab - List columns

| Column | Description |
|---|---|
| Differences | Indicator to show where the differences are.<br>○ Target: The file node is available only in the target changeset.<br>○ Reference: The file node is available only in the reference changeset.<br>○ Different: The file node data differs in the target and reference changesets. |
| File metadata | Metadata of the file attached to the file node.<br>○ File name: Name of the attached file in the file node.<br>○ Content type: Content type of the file.<br>○ Content: Content of the attached file. Preview is not available on the list, but you can download the file to preview it.<br>○ File URL: Folder path where the file exists. |
| Reference (R) | Details of the file present in the reference changeset. |
| Target (T) | Details of the file present in the target changeset. |

### Types of differences between CDM applications

Descriptions and examples of differences between CDM applications when using the Config Data Analyzer tool.

**Important:**
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## Types of differences

On the **App compare** tab, the **CDIs and variables** tab displays changes to individual CDIs for the node that is selected in the navigation panel. The **Description** column displays one of the following values that describes how the changesets differ.

### Values are different

Both the reference and target changesets include a particular CDI, but the values differ between the two changesets. See the **Reference** and **Target** columns for the values.

### Encryption settings are different

The **View encrypted data** setting is selected for one changeset and not selected for the other changeset.

> **Note:**
> For users that do not have the CDM Secrets [sn_cdm.cdm_secrets] role, encrypted data always appears as ********.

### Source levels are different

One of the following cases:

- The value is direct in one changeset and is overridden in the other changeset.
- The value is direct in one changeset and is included in the other changeset.

### Source levels and values are different

In addition to the cases described in "Source levels are different", the value differs between changesets.

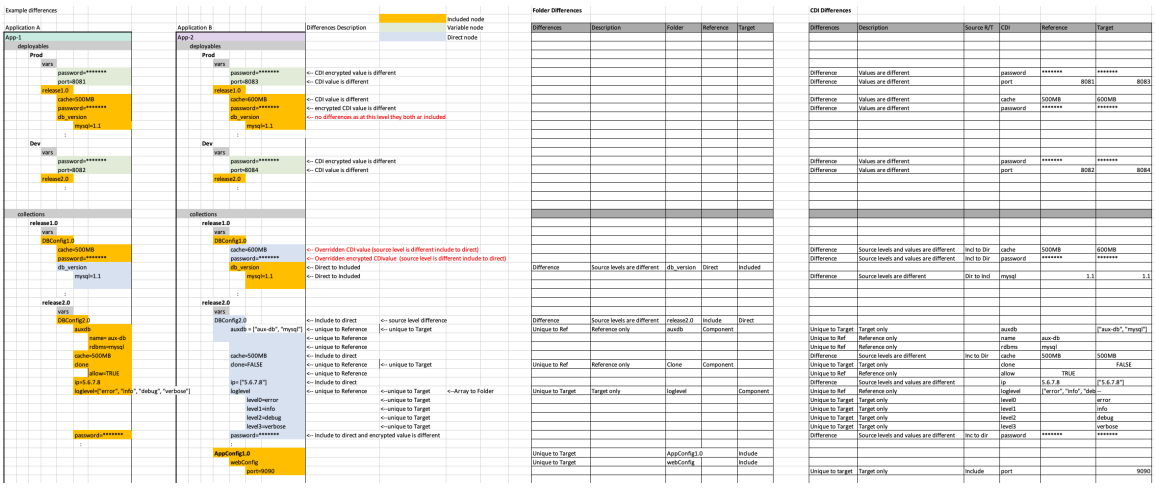
### Target only

A CDI or the value for a CDI appears only in the target changeset.

### Reference only

A CDI or the value for a CDI appears only in the reference changeset.

## Examples of differences

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## Changesets and version control in CDM

A changeset is a draft copy of an application that you can update and save as often as needed. When you are satisfied with your changes, you can commit the changeset to apply the changes to the application. Committing

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### About changesets

To edit config data, you create a changeset and make changes in the changeset. You can perform the following actions:

- Create a new changeset: The changeset includes the full config dataset of the application.
- Save a changeset: The Editor panel, List view, and Preview panel refreshes to reflect the resolved state of the changeset. The system updates the changeset but does not update the application. Changes appear on the **Activity** tab. You must commit a changeset to update the config data for the application. After saving, you can move on to other activities and return later to edit the changeset.
- Update an existing changeset: Edit a changeset that had been saved but not committed.
- Commit a saved changeset:  The system generates a snapshot of each deployable that is affected by the changes.

### About conflicts with other changesets of the application that you are working on

Sometimes, UserA and UserB are working at the same time on two different changesets of the same application. If UserA commits a changeset that sets *`variableX`* to A and later, UserB tries to commit a changeset with *`variableX`* set to B, a conflict results.

An open changeset with conflicts is blocked—it cannot be committed. The system notifies you of conflicts with a warning message on the page. In addition, the **State** value in the header changes from **Open** to **Blocked**.

See Conflicts between changeset commits for descriptions of the types of conflicts that the system identifies.

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### Open a changeset to update config data

Update config data in an existing changeset or in a new changeset. You can save your changes for later updates or save and commit the changes. Committing the changes generates a snapshot for each deployable that is affected by the changes.

## Before you begin

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Role required: cdm_editor or cdm_admin

## About this task

- When you commit the changes that you have made to an application (commit the changeset), the system generates a snapshot of each deployable that has been updated. A snapshot is an exact record of the config data for a deployable. Snapshots are read-only — you cannot modify a snapshot. You can, however, start a new changeset that is based on a particular snapshot.
- Sometimes, another user has committed changes to a data set (thus creating a new snapshot) while you are working on a changeset of the same data. In this case, the data that you are working on is stale (the data is in the state it was in before the other user committed changes). This can result in data conflicts. Learn more about how you use changesets and how CDM manages version control at Changesets and version control in CDM.

## Procedure

1. Use one of the following methods to open a changeset for editing:
   - On the **Activity** tab for an application, select a changeset number.
   - On the **Overview** or **Config data** tab for an application, select **Edit Config Data**.

   **Important:**
   Save your changes whenever you are confident of the changes and before you leave the **Config data** tab.

   The changeset opens on the **Config data** tab.
2. In the config data tree, select the item to edit in either the script view or the list view.

   By default, the Editor panel displays the script view of the key:value pairs (the config data items — CDIs) in the selected node. See Viewing and editing config data for details on operations in the **Config data** tab.
3. Add components, collections or deployables, see the instructions in Define or update a component, Define or update a collection in an application, and Create and update a deployable.
4. Select **Save** to save the changes in the changeset and ready the changes in the changeset to be committed.
   The Editor panel, List view, and Preview panel refreshes to reflect the resolved state of the changeset. The system updates the changeset but does not update the application. Changes appear on the **Activity** tab. You must commit a changeset to update the config data for the application. After saving, you can move on to other activities and return later to edit the changeset.
5. **Optional:** Select **Commit**.

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The Commit changeset dialog box opens and lists each deployable that is affected by the changes.

**Note:**
After you commit a changeset, the changeset cannot be modified.

The system generates a snapshot of each deployable that is affected by the changes. The dialog box offers the following **Additional actions**:

- If no deployables are affected by the changes, select **No additional actions**. The system will update the application to persist the changes.
- Select **Validate snapshots** to perform the following operations on all generated snapshots:
  - The system executes all policies that are statically or dynamically mapped to the associated deployable.
  - If the snapshot passes all policies, then the Validation status value is set to **Passed** and no entries are listed on the **Validation Results** tab. If validation was invoked with the **Publish Valid** publish option, then valid snapshots are auto-published.
  - If any policy encounters issues, then the Validation status value is set to **Failed**. The **Validation Results** tab displays all failures or warnings returned by policies.
  - If any policy failed to run to completion, then the Validation status value is set to **Execution error** and the **Validation Results** tab indicates that validation failed due to error.
- Select **Validate and publish snapshots** to perform validation as described in the **Validate snapshots** action. Only snapshots that pass validation are published. Only published snapshots can be exported.

Select **Commit**.

- The system updates the application to persist the changes to config data.
- The changeset state changes to **Committed**.
- The changeset cannot be modified.
- If snapshots were created, the confirmation message includes a link to the snapshots.
- If an error occurs during the commit process, the changeset state is set to Commit failed.

**Related topics**

Changesets and version control in CDM

Define or update a component

Define or update a collection in an application

Publish or unpublish a snapshot

Validate a snapshot manually

View the results of snapshot validation

View snapshots

### Conflicts between changeset commits

Service delivery can include multiple teams working at the same time on config data with potentially hundreds of configuration changes every day. Because changes can be in conflict with earlier changes by a different user, CDM manages commits and snapshots to block commits that conflict. You are notified of changeset conflicts to help you to resolve them.

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## When a conflict happens

Every time you attempt to commit a changeset, the system determines whether there are conflicts with other earlier commits. If the system reports a conflict, you can choose to attempt to keep some of the changes or discard all conflicted changes and start from a new changeset. For this reason, to ease the task of recreating your work, you might copy-paste larger changes to a text editor before closing a conflicted changeset.

## How to avoid conflicts

Follow these suggestions to avoid conflicts:

- Try to keep a changeset open for a brief period. If you need to do research, close the changeset and start a new changeset after you have the information.
- Coordinate your code editing tasks with coworkers. This enables you to avoid updating the same configuration item at the same time.

## Types of conflicts

In each of the following examples of an identified conflict, the "item" being described is the configuration data item (CDI) in your changeset. Another user committed changes that your changes conflict with.

**Stale data in your working changeset**

- The value of the item was changed in another changeset.
- The item is no longer included in a collection or deployable in another changeset.
- Data corruption caused by an incorrect change in the data table: The newly added item in your open changeset was modified in the data table to incorrectly refer to a previous version. The item in your open changeset was superseded by a change in the data table. The updated or deleted item in your open changeset was incorrectly modified in the data table to not refer to the previous version.

**Changed parent**

The item is an orphan because its parent was deleted or renamed in another changeset.

**Changed parent/child relationship**

New items were added in another changeset while you made changes to the parent data item.

**Changed references**

- The Item was included in a collection or deployable in another changeset.
- The item cannot be deleted because it is included in a collection or deployable in another changeset.

**Duplicate**

An item with the same name already exists.

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### Invalid includes

- The component or collection to which the include referred was deleted in another changeset.
- The component or collection to which the include referred was renamed in another changeset.
- A descendent of the component to be included is already included in the collection in another changeset.

## View the history of changes to a changeset

View the details of changes in each committed changeset on the **Activities** tab.

## Before you begin

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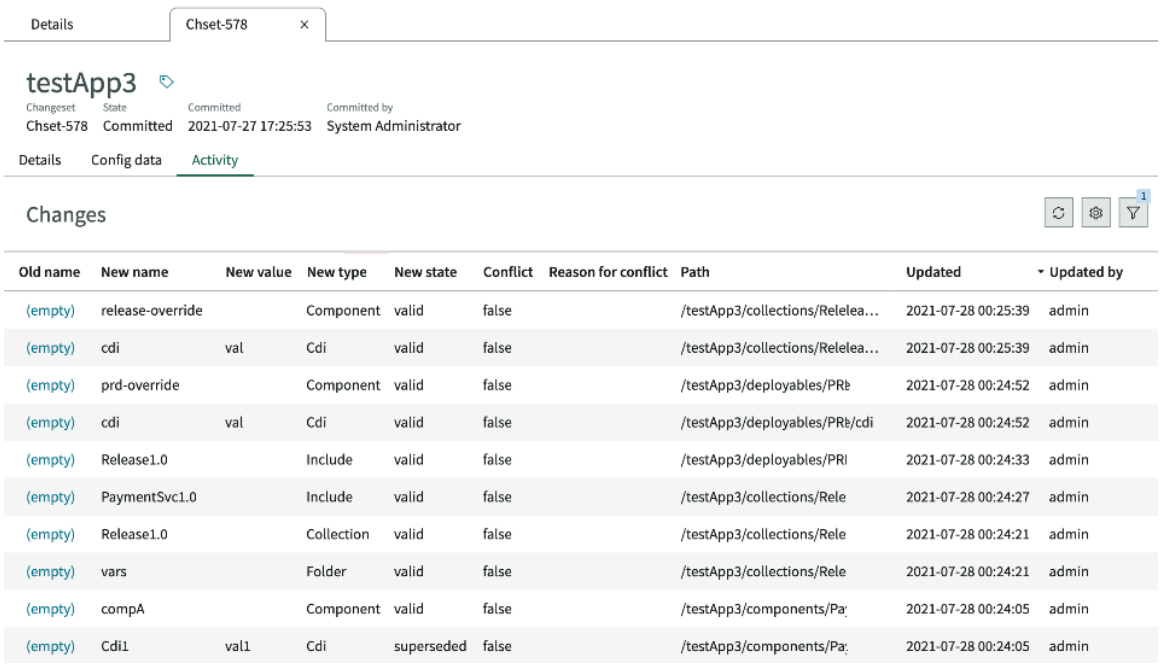
Role required: cdm_viewer or cdm_editor or cdm_exporter_editor or cdm_policy_editor or cdm_admin

## Procedure

1. While working on a changeset, select the **Activity** tab.
   The **Changes** section displays the list of individual nodes for which changes were committed.




| Old name | New name | New value | New type | New state | Conflict | Reason for conflict | Path | Updated | Updated by |
|---|---|---|---|---|---|---|---|---|---|
| (empty) | release-override | | Component | valid | false | | /testApp3/collections/Relelea… | 2021-07-28 00:25:39 | admin |
| (empty) | cdi | val | Cdi | valid | false | | /testApp3/collections/Relelea… | 2021-07-28 00:25:39 | admin |
| (empty) | prd-override | | Component | valid | false | | /testApp3/deployables/PRb | 2021-07-28 00:24:52 | admin |
| (empty) | cdi | val | Cdi | valid | false | | /testApp3/deployables/PRb/cdi | 2021-07-28 00:24:52 | admin |
| (empty) | Release1.0 | | Include | valid | false | | /testApp3/deployables/PRl | 2021-07-28 00:24:33 | admin |
| (empty) | PaymentSvc1.0 | | Include | valid | false | | /testApp3/collections/Rele | 2021-07-28 00:24:27 | admin |
| (empty) | Release1.0 | | Collection | valid | false | | /testApp3/collections/Rele | 2021-07-28 00:24:21 | admin |
| (empty) | vars | | Folder | valid | false | | /testApp3/collections/Rele | 2021-07-28 00:24:21 | admin |
| (empty) | compA | | Component | valid | false | | /testApp3/components/Pa | 2021-07-28 00:24:05 | admin |
| (empty) | Cdi1 | val1 | Cdi | superseded | false | | /testApp3/components/Pa | 2021-07-28 00:24:05 | admin |

### Fields on the Changes section of the Activity tab

| Header | Description |
|---|---|
| Old name | The original name of the item. The entry is listed as "(empty)" when the name of the item |

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| Header | Description |
|---|---|
| | has not changed. Select the link to view a detailed list of changes. |
| New name / New value / New type / New state | The setting that the item was changed to in the changeset.<br><br>For all items, a value appears only if the data changed. |
| Conflict / Reason for conflict | Boolean that indicates whether this changeset has settings in conflict with another committed changeset. |
| Path | Path to the item that changed. |
| Updated / Updated by | User that updated the changeset and timestamp when it was committed. |

2. Select the **New name** link to view the new, old, and current setting of the name, value, type, and state of a CDI or variable.

   The Details dialog box displays the settings and indicates whether the changeset is in conflict with another changeset.

**Details dialog box**

| Field | Description |
|---|---|
| New name, New value, New type, New state | The new setting that the item was changed to in this changeset.<br><br>A value appears only if the data changed.<br><br>**Important:**<br>The value that appears in the **New name** column might represent a setting that has not changed. To determine whether the name has changed, select the link. If there is a **New name** value in the dialog box, then the name has changed. |
| Old name, Old value, Old type, Old state | The original setting that the item had before the changes in this changeset were committed. |
| Current name, Current value, Current type, Current state | The setting of the item in the case that a changeset was committed after this changeset was committed.<br><br>A value appears only if a valued changed in the other changeset. |

### Delete a changeset

Select the changeset on the Activity tab and then select Delete.

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### Before you begin

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Role required: CDM Admin [sn_cdm.cdm_admin]

### Procedure

Select the changeset on the **Activity** tab and then select **Delete**.

#### Delete a CDM application

Delete a CDM application to delete all associated config data and snapshots.

### Before you begin

**Important:**
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Role required: CDM Admin [sn_cdm.cdm_admin]

### Procedure

1. Select the **Applications** icon ( ) and then select one or more applications.
2. Select **Delete** and then confirm the delete action.

### Result

The system performs the following operations when you delete an application:

- Change the state of the application to "Deleted".
- Disconnect the application from its associated SDLC component.
- Disconnect deployables from CMDB services.
- Return an error for any attempt to query associated snapshots.

## Compare changesets from the same or different CDM applications

Use the Config Data Analyzer tool to find similarities and differences between any two committed changesets from the same or different applications.

### Before you begin

**Important:**
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Role required:cdm_viewer, cdm_editor, or cdm_admin

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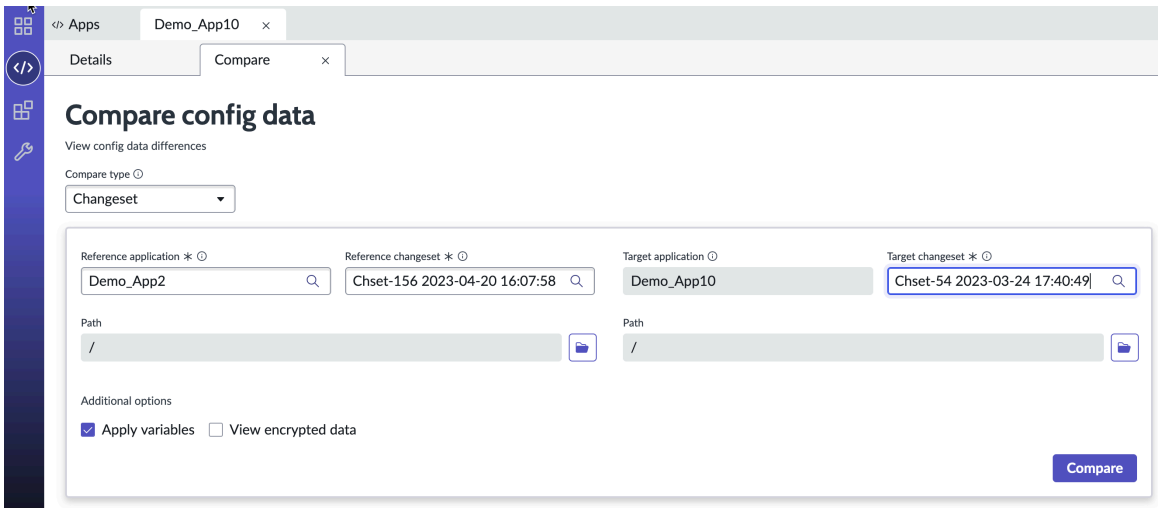
## Procedure

1. While viewing an application, select **Compare config data**.
   The **Compare config data** tab opens. The current application is the target application, and its name is pre-populated in the **Target application**.




2. Select the **Changeset** option in the **Compare type** field.
3. Select an application and then their snapshots to compare.

| Option | Description |
|---|---|
| Reference application | Application to compare with the target application. The field lists the latest committed data for all applications including the target application. |
| Reference snapshot | Snapshot of the reference application to compare. |
| Target snapshot | Snapshot of the target application against which the reference snapshot is compared. |

4. **Optional:** Select the folder icon ( ) to specify a folder path for comparison.
5. **Optional:** Select **Apply variables** to display fully resolved variable values in the comparison results.
6. **Optional:** If you've the cdm_secrets role, you can select **View encrypted data** to view encrypted values in clear text in the comparison results.

   **Note:**
   The check box is inactive for users who do not have the cdm_secrets role. When the values in the target and reference differ, the comparison results indicate that the values differ, but the data itself still appears as ********.

7. Select **Compare**.

   The Comparison results section displays the differences between the reference changeset and the target changeset.

   The letters in the following illustration identify the tools that you can use to analyze the data.

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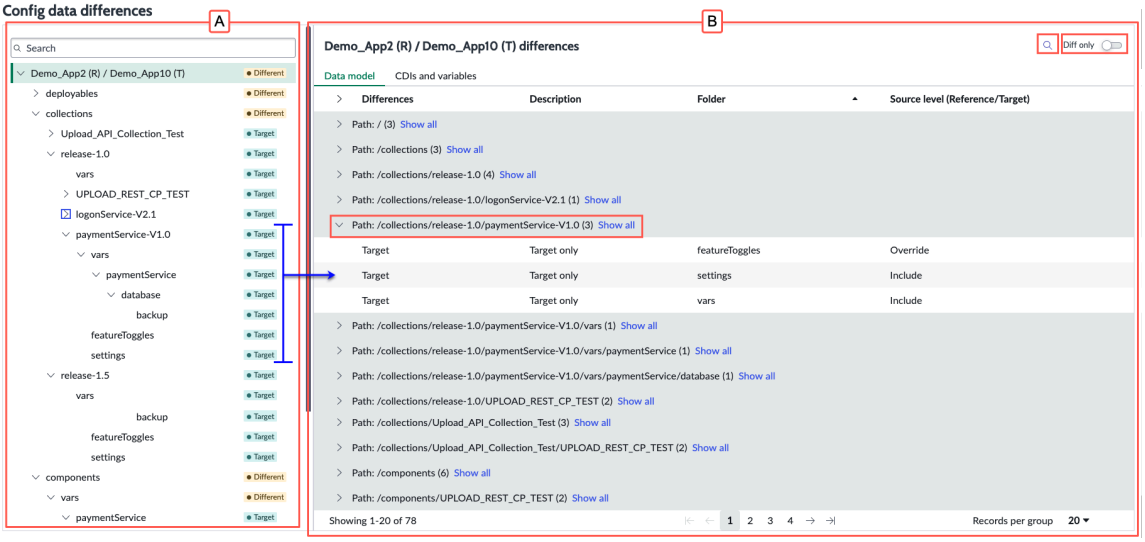


### A. Navigation panel

The navigation panel displays the node structure of the applications.

- Nodes that include changed CDIs (either directly or in descendent nodes) are annotated with **Different**.
- Nodes that include newly added CDIs (either directly or in descendent nodes) are annotated with the identity of the application changeset that includes the new data, either **Reference** or **Target**.
- Use the **Search** field to search for text in the navigation panel.
- Select a node to view its contents in the Differences panel.

### B: Differences panel

- By default, all config data is displayed. Select **Diff only** to view only data that differs between the two changesets.
- Use the **Search** icon ( ) to search for text in the Component differences panel.
- The panel offers two tabs: **Data model** and **CDIs and variables**. In either tab, expand and close groupings with the expansion icon ( ).
- If a selection includes more than 50 CDIs, then CDIs are organized into pages of 50.

The **Data model** tab displays changes to the structure of the application at the folder level, such as, adding, deleting, or renaming a folder.

#### Data model tab

| Column | Description |
|---|---|
| Differences | The path of the structure for which differences are described. |
| Description | Text that describes any differences between the reference and target changesets. |
| Folder | The folder in the structure. |

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| Column | Description |
| --- | --- |
| Source level (Reference/Target) | ○ Direct: The folder is explicitly specified or deleted in the node.<br>○ Included: The folder is included from a child folder. |

The **CDIs and variables** tab displays changes to individual CDIs for the node that is selected in the navigation panel.

- By default, the root node is selected and the data panel includes all CDIs for both changesets. Select a node in the navigation panel to display data for only that node and its descendents.
- When **Diff only** is selected, the number of CDIs that differ appears after the node path.
- Node paths are displayed in gray. Use the expansion icon (  ) to view CDIs in a folder.

### CDIs and variables tab

| Column | Description |
| --- | --- |
| Differences | Indicator to show what was the change type.<br>○ Target: The CDI appears only in the target changeset.<br>○ Reference: The CDI appears only in the reference changeset.<br>○ Different: For the specified CDI, the values in the target and reference changesets differ. |
| Description | Statement of how the changesets differ. For example, the text might indicate that a CDI appears only in the reference changeset or that the values for the variable differ between the changesets. See Types of differences between CDM applications for the full list of difference types and their causes. |
| Name | Name of the CDI. |
| Reference (R) | Value of the CDI in the reference changeset. |
| Target (T) | Value of the CDI in the target changeset. |
| Source level (R/T) | The node level in the code at which the CDI is defined. |

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| Column | Description |
| --- | --- |
| | ○ Direct: The CDI is defined in the selected node.<br>○ Include: The value of the CDI is obtained from a node that is included in the selected node.<br>○ Override: The value of the CDI in an included node is overridden by a value that is specified in the including node.<br><br>Values appear in the following formats:<br><br>○ `<reference level / target level>` when a value appears in both target and reference.<br>○ `<reference level>` when a value appears in only the reference changeset.<br>○ `<target level>` when a value appears in only the target changeset.<br><br>For example, when a CDI is defined in the reference changeset with the value `true` and the CDI does not appear in the target changeset, then the last three columns in the **CDIs and variables** tab will have the following values:<br><br>○ **Reference (R)**: `true`<br>○ **Target (T)**: [Empty]<br>○ **Source level (R/T)**: `Direct` |

If a file node is selected in the tree, the **File information** tab displays its metadata.

### File information tab - List columns

| Column | Description |
| --- | --- |
| Differences | Indicator to show where the differences are.<br>○ Target: The file node is available only in the target changeset.<br>○ Reference: The file node is available only in the reference changeset.<br>○ Different: The file node data differs in the target and reference changesets. |
| File metadata | Metadata of the file attached to the file node.<br>○ File name: Name of the attached file in the file node.<br>○ Content type: Content type of the file. |

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| Column | Description |
|---|---|
| | ○ Content: Content of the attached file. Preview is not available on the list, but you can download the file to preview it.<br>○ File URL: Folder path where the file exists. |
| Reference (R) | Details of the file present in the reference changeset. |
| Target (T) | Details of the file present in the target changeset. |

## Validating and correcting configuration data

For every change to an environment, there may be tens or hundreds of rules (policies) that need to be checked. CDM enables you to auto-validate configuration data to ensure that configuration changes are error-free and policy-compliant before the config data is consumed.

**Important:**
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## CDM automates much of the validation process

When teams deploy an application, they typically need to ensure that no errors are introduced at the code and configuration level, and that compliance policies are respected. For every change to an environment, there may be tens or hundreds of rules (policies) that need to be checked. A manual validation process is prone to errors.

DevOps provides developers, IT admins, DevOps Config engineers, or team leads a way to ensure that configuration changes are error free and policy-compliant. In addition, after validation gives developers or IT admins enough contextual information to identify and fix issues. This means that after a user commits any changes to configuration data, all relevant policies are applied, results evaluated, and appropriate actions are triggered (for example, deploy or do not deploy).

Here's the CDM process that auto-validates configuration data before it is consumed.

1. You create a policy version based on an existing policy and then activate and publish the new version.
2. For dynamic mapping of policies to deployables, create a condition on the CDM Deployable [sn_cdm_deployable] table. Associate the condition with one or more policies. At runtime, these policies are executed to validate deployables that meet the defined conditions.
3. You map the policy to a deployable using static mapping or dynamic mapping to ensure that the policy executes against any snapshot of the deployable when requested (manual or automated request).

   For more information on policy mappings, see PaCE Static and Dynamic Mapping.
4. When you commit a changeset for the deployable, the system must validate the resulting snapshot. To auto-trigger execution of the mapped policies whenever a changeset is committed, select the **Validate** option when committing the changeset. You also have the option to validate the snapshot manually.

   In both cases, the policies mapped using static mapping and dynamic mapping are executed.

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- If you configured the automated process to be integrated with your pipeline, then the policies return the results of the validation process to the pipeline in JSON files. The pipeline decides whether to continue based on the validation decision: Compliant, Non-compliant.
- If the process is not integrated with your pipeline, or if validation failed or did not finish, then you review the validation decision and take appropriate action.

## Use pre-defined policies as models for your custom policies

CDM includes policies that you can use as models for custom policies that meet specific needs. Note the following important patterns in the pre-defined policies;

- The policies all use the `CdmQuery` script include to retrieve config data.
- Use `CdmQuery` with Secrets to ensure all data is included.
- The `CdmPolicyUtil` script include adds warnings and failures.
- When all policies have run and a failure has been populated in the output, the decision is `non_compliant`.
- Use the logger for debugging. Remove the logs when the policy is ready to be published.
- Use mapping input parameters to supply dynamic input values.

## Guidelines for validating snapshots

- Do not manually validate snapshots that have already been validated and published.
- If you select the **Validate snapshots** or **Validate and publish snapshots** option when committing a changeset, then the system auto-validates each snapshot when it is first generated.
- To view the current validation failures or warnings for a snapshot, open the snapshot and select the **Validation Results** tab. For details, see View the results of snapshot validation.
- Use the Policy Test Playground feature to revalidate snapshots while you develop a policy. The resulting validation results are flagged as test results and do not affect operations.
- If there is a requirement to revalidate all snapshots for a deployable, revalidate only after you have tested and published the policies.

## Practices to avoid

- Do not use *`GlideRecord`* to retrieve config data records.
- To display policy decisions on the UI, CDM requires warning and failure data in a particular structure. Use `CdmPolicyUtil` to add warnings or failures (not manual insertions). (At least understand the structure that `CdmPolicyUtil` inserts into failures and warnings.)
- In policies, do not attempt to retrieve data that does not come from CDM data. This practice can result in cross-scope access issues.
- Do not write "always-compliant" or "always-non-compliant" policies.
- Do not hard-code any names or values in policies. Instead, use mapping input parameters to supply dynamic input values.

## Snapshot status

- Not validated: This is the initial snapshot state where no policy has been executed against the snapshot.
- Requested: The validation flow has started.

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- In progress: The validation flow is running and policies are currently executing.
- Passed: The snapshot has passed all policies.
- Failed: The snapshot has failed one or more policies.
- Execution error: A policy failed to run to completion due to an unexpected error, mostly when the CdmPolicyUtil script include is not used to provide warning and failure messages..

### Example flow

A user commits changes to config data before a deployment.

Data is validated against all assigned policies.

If validation fails, then deployment is stopped. A list of errors pointing to their location in the config data is given to the user. Available actions should be determined in the context of the application itself and the environment where the application is deployed. For example:

- Allow deployment in a TEST environment regardless of the number of errors or warnings.
- Stop deployment in PROD if any error.
- Stop deployment in PROD if any warning and if the application is critical.
- Allow deployment in PROD regardless of the number of warnings if non-critical.

User fixes errors and recommits change.

Data is validated again and the results are ok.

A snapshot is taken.

Deployment is executed.

#### Related topics

CdmQuery - Scoped

### Validate a snapshot manually

Validate a snapshot from the **Snapshot** tab. For example, manually validate a snapshot to ensure that its valid for new policy requirements.

#### Before you begin

**Important:**
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Role required: cdm_editor or cdm_admin

#### About this task

- Do not manually validate snapshots that have already been validated and published.
- If you select the **Validate snapshots** or **Validate and publish snapshots** option when committing a changeset, then the system auto-validates each snapshot when it is first generated.
- To view the current validation failures or warnings for a snapshot, open the snapshot and select the **Validation Results** tab. For details, see View the results of snapshot validation.

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- Use the Policy Test Playground feature to revalidate snapshots while you develop a policy. The resulting validation results are flagged as test results and do not affect operations.
- If there is a requirement to revalidate all snapshots for a deployable, revalidate only after you have tested and published the policies.

### Procedure

1. Use either of the following methods to validate a snapshot:
   - Use the REST API endpoint to validate.
   - On the **Snapshots** tab for an application, select the name of the snapshot to validate and then select **Validate**.
   - On any tab for an open snapshot, select **Validate**.
2. Confirm the action on the Validate snapshot dialog box.

   The system follows this procedure to validate snapshots:

   - The system executes all policies that are statically or dynamically mapped to the associated deployable.
   - If the snapshot passes all policies, then the Validation status value is set to **Passed** and no entries are listed on the **Validation Results** tab. If validation was invoked with the **Publish Valid** publish option, then valid snapshots are auto-published.
   - If any policy encounters issues, then the Validation status value is set to **Failed**. The **Validation Results** tab displays all failures or warnings returned by policies.
   - If any policy failed to run to completion, then the Validation status value is set to **Execution error** and the **Validation Results** tab indicates that validation failed due to error.

### What to do next

If the snapshot failed validation, you can view the issues to fix them. See View the results of snapshot validation.

#### Related topics

View the results of snapshot validation

## View the results of snapshot validation

View validation failures and warnings on the **Validation results** tab for the snapshot.

### Before you begin

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Role required: cdm_viewer or cdm_editor or cdm_exporter_editor or cdm_policy_editor or cdm_admin

### Procedure

1. On the **Snapshots** tab for an application, select the snapshot to open the **Validation results** tab.
2. View failure and warning information on the **Validation results** tab for the snapshot.

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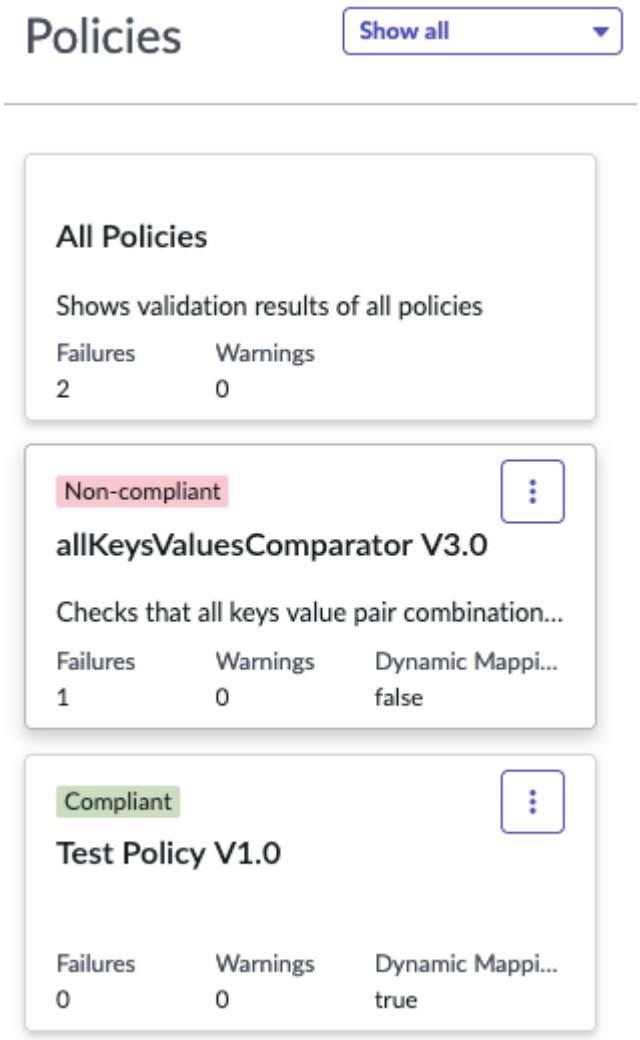
The **Policies** panel displays a card for each policy that is mapped to the associated deployable.




### Cards in the Policies panel

| Card label | Description |
|---|---|
| All Policies | The card displays the total number of failures and warnings for this validation run. |
| Name of the mapped policy | Each policy that has been executed for the deployable and its execution results with whether the snapshot is compliant with the policy. It also displays the following data:<br>○ Failures: Number of failures in the current execution.<br>○ Warnings: Number of warnings in the current execution.<br>○ Dynamic mapping: Value is **true** if the policy is dynamically mapped, or else **false**. |

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- Select a card from the **Policies** panel to view the associated data in the **Failures and warnings** panel.
- Select the more actions icon ( ⋮ ) for a policy and select an action, as follows:

**More actions menu options**

| Option | Description |
|---|---|
| Execution record | View execution information for this policy run. See View the execution record for a policy run for details. |
| Open policy | Open the policy. |
| Open business condition | Opens the condition set on the CDM Deployable [sn_cdm_deployable] table based on which the policy was dynamically mapped to the deployable and executed.<br>**Note:** This menu option is available only for the dynamically mapped policy.<br>For more information on conditions and dynamic mapping, see Map PaCE policies using Dynamic Mapping. |

The **Failures and warnings** panel displays the list of all failures and warnings for the policy that is mapped to the associated deployable.

**Failures and warnings panel - List columns**

| Column header | Description |
|---|---|
| Description | Text that provides information about the failure or warning result. |
| Type | Type of validation result:<br>○ (Empty)<br>○ Information<br>○ Failure<br>○ Warning |
| Policy | Name of the policy that returned a failure or warning. Select to open the policy. |
| Impacted data | The CDI (`name : value` pair) that resulted in the failure or warning. |
| Path | Path to the node in the data tree that includes the impacted data. |

### View the execution record for a policy run

View the execution record to analyze policy execution.

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### Before you begin

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Role required: cdm_viewer or cdm_editor or cdm_exporter_editor or cdm_policy_editor or cdm_admin

### Procedure

On the **Validation results** tab for a snapshot, select the more actions icon ( ⋮ ) for a policy and select **Execution record**.

**Policy execution information on the Details tab**

| Field | Description |
|---|---|
| Policy | Name of the policy that executed. |
| Version name | Version of the policy that executed. |
| End time | Timestamp when execution finished. |
| Decision | Result of policy execution.<br>• Compliant<br>• Non-compliant<br>• Execution error<br>• Compliant with exception |

#### Adding warning and failure messages to validation results — CdmPolicyUtil

You use the `CdmPolicyUtil` script include to add warning and failure messages to validation results in the CDM Policy Validation Results table. CDM expects validation warnings and failures to contain a node path, a snapshot ID, and a reference to the impacted node.

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## CdmPolicyUtil

- `CdmPolicyUtil` is a public script include.
- Because `CdmPolicyUtil` is a global script include, you do not need to invoke it like a new *`CdmPolicyUtil()`*.
- You can invoke `CdmPolicyUtil` in all scopes, but the expected invocation scope is PaCE (specifically, during the execution of PaCE policies).
- The proper call is `CdmPolicyUtil.methodName(parameters)`.

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**Note:**
If you add warning and failure messages to validation results manually instead of using CdmPolicyUtil, the snapshot validation status will show Execution Error.

## Methods

### addFailure

Adds a failure message. The message appears on the **Validation results** tab for the snapshot.

Parameters:

- *Output*: Policy decision for the subject snapshot (*primarySnapshotId*).
- *cdmNode*: Node (*sn_cdm_node*) that caused the failure.
- *name*: Name of the failure.
- *description*: Description of the failure.

### addWarning

Adds a policy warning message. The message appears on the **Validation results** tab for the snapshot.

Parameters:

- *Output*: Policy decision for the subject snapshot (*primarySnapshotId*).
- *cdmNode*: Node (*sn_cdm_node*) that caused the warning.
- *name*: Name of the warning.
- *description*: Description of the warning.

### getLastCreatedSnapshotIds

Returns the latest created and published snapshot IDs for the supplied *additionalDeployables*. If no published snapshot is available for a particular deployable, adds a debug message.

Parameter:

*additionalDeployables* – can be passed directly as it comes to the policy.

### getLastPublishedSnapshotIds

Retrieves the latest and published snapshot IDs for the supplied *additionalDeployables*. If no published snapshot is available for a particular deployable, adds a debug message.

Parameter:

*additionalDeployables* - can be passed directly as it comes to the policy.

## Sharing components among applications — Component libraries

Some applications may share the same basic structure and require nearly identical configuration data. Shared components in CDM enables you to use a component across several applications. For better organization, these shared components are managed in component libraries.

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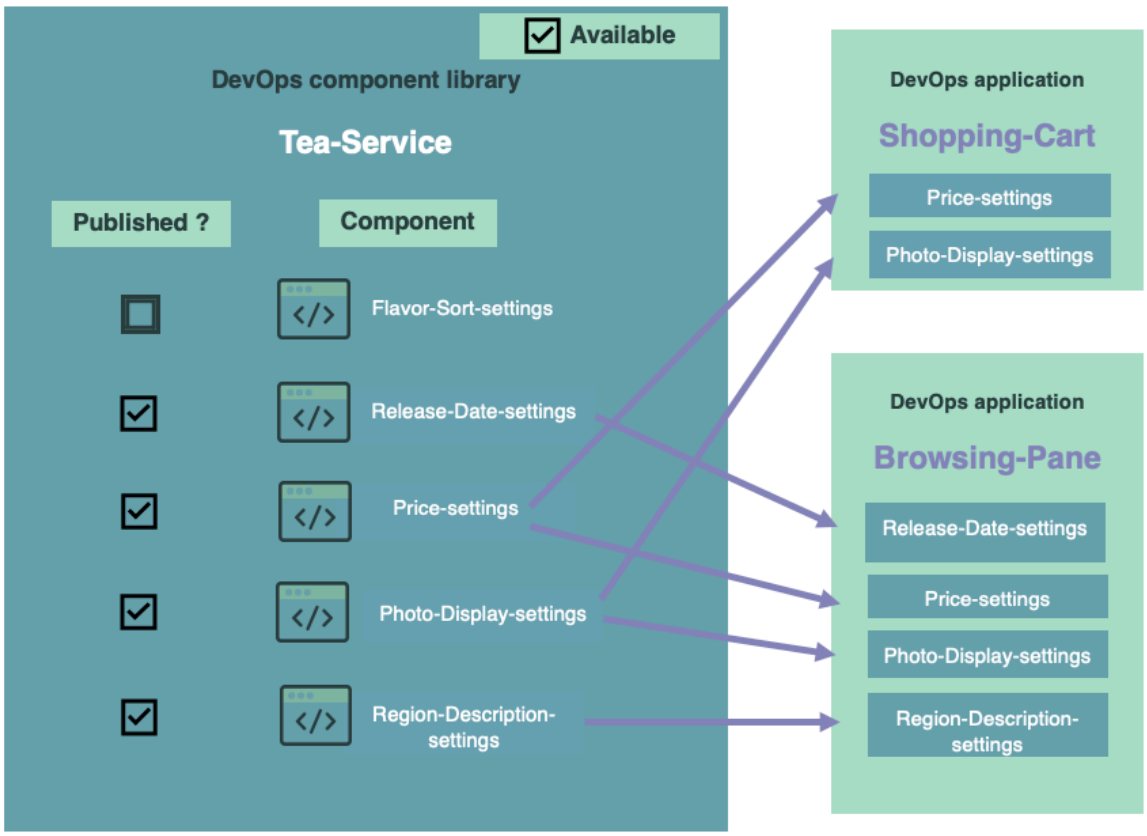
## Component libraries

Component libraries improve consistency and maintainability by ensuring a single source of truth for a component's config data across applications. You can use the unified view in the DevOps Config workspace or CdmSharedLibraryApi REST API to create and maintain these libraries.

In this example, an organization sells tea on its website. Both the *Shopping-Cart* and *Browsing-Pane* application services make use of config data for product prices and photo appearance. To ensure that the config data is identical in both DevOps applications, each application uses shared components from the *Tea-Service* component library. The components are managed in the library and the applications each use two of the components from the library.




## Working with shared components

- A user with the sn_cdm.cdm_admin role can create and manage a component library and create, add, and delete shared components in the library.
- While working in an application changeset, you can add, update, or remove a shared component.
- Applications can use any mix of components: components that are defined in the application (direct components) and components from a component library.

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- While working in an application changeset, you cannot modify a shared component in the same way as you can modify a direct component. A collection in an application can, however, override any value in a shared component.

- For a shared component to be available for use in applications, the component must be in the **Published** state and the library that holds the component must be in the **Available** state.

  In the example, no application can use the *`Flavor-Sort-settings`* component because it has not been published.

### Working on component libraries with a unified view

The unified view of component libraries in the DevOps Config Workspace provides a single location to view and manage component libraries and the components within them.

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Using the unified view, you can:

- Search for a component library or shared component.
- Navigate quickly between different component libraries or shared components.
- View a list of all applications that use shared components of a library.
- Edit the config data of a library.
- View and create changesets for the library and components.
- View different versions of a shared component, and publish or unpublish them.

## Users

The following users can view and manage the component libraries and shared components in the DevOps Config Workspace.

- CDM admin can view and manage the libraries and shared components.
- CDM editor can view and manage the shared components within the libraries.
- CDM viewers can view the libraries and shared components.

## Accessing the component libraries

To open the Component libraries, navigate to **All** > **DevOps Config** > **DevOps Config Workspace** and select the component libraries icon (  ).

## Component libraries list

On the Component libraries list, you can review all component libraries and shared components within them. The list pane has the following sections to enable you to access and manage the libraries and components quickly.

- **View**: Filter libraries by the categories: All libraries and Editable libraries. Editable libraries are the libraries that you create or that others create but grant you permission to view and edit through the associated authoring groups.
- **Search**: Search library or component by their names.

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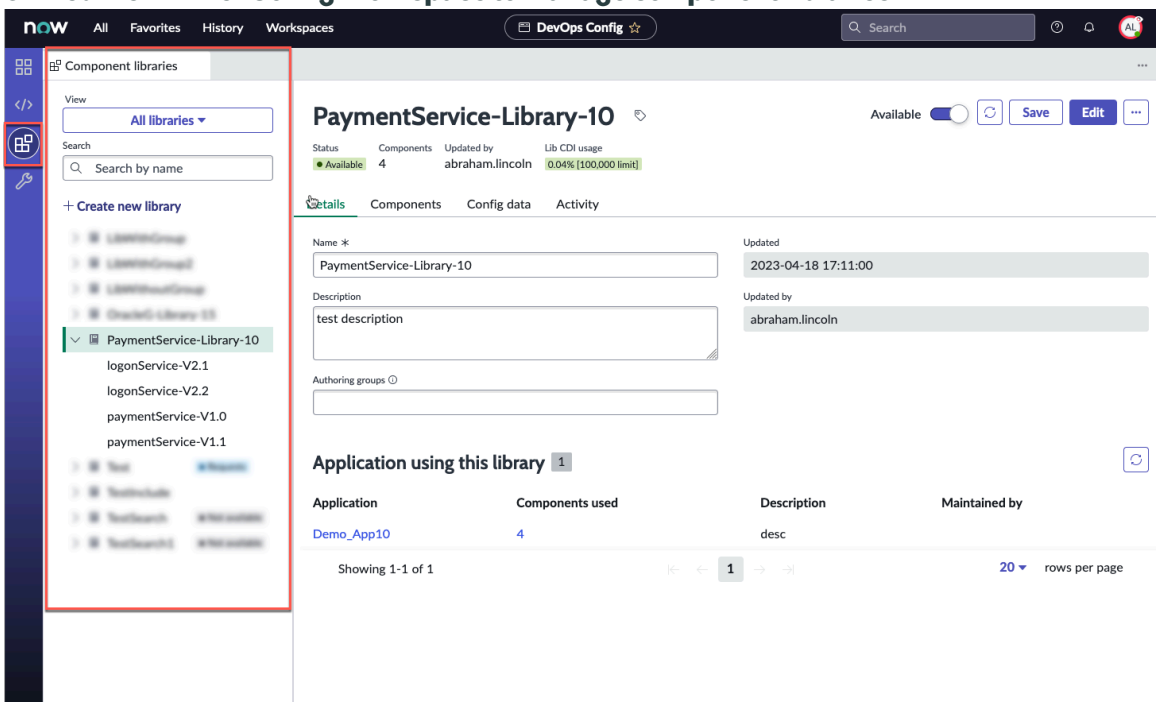
- **Create new library**: Create a library using this option.
- **Listing**: Select a library node or shared component node to view it in the form pane.

The following is an example of a unified view for Component libraries.

**Unified view in DevConfig Workspace to manage component libraries**




## Component library form

On the Component library form pane, you can review and manage your libraries and components within them. Select a library node in the left pane to view and edit the associated data.

- **Header**: The header section shows the status and other metadata of the component library. You can take the following actions:
  - Mark a library as available or unavailable for use by using the **Available** toggle switch.
  - Save the changes to the library.
  - Edit to create or open a changeset for updating shared components.
- **Tabs**: The following tabs are available:
  - **Details**: View and update a library's details such as name, description, and authoring groups. The tab also includes a list of all applications that are using one or more components of the library.
  - **Components**: View all the components available in the library.
  - **Config data**: Review the config data in each component of the library. You can switch between Editor and List view using the **List view** toggle switch.
  - **Activity**: View a list of all changesets created for updating the library, its components, and config data.

The following is an example of a component library form in the DevOps Config Workspace.

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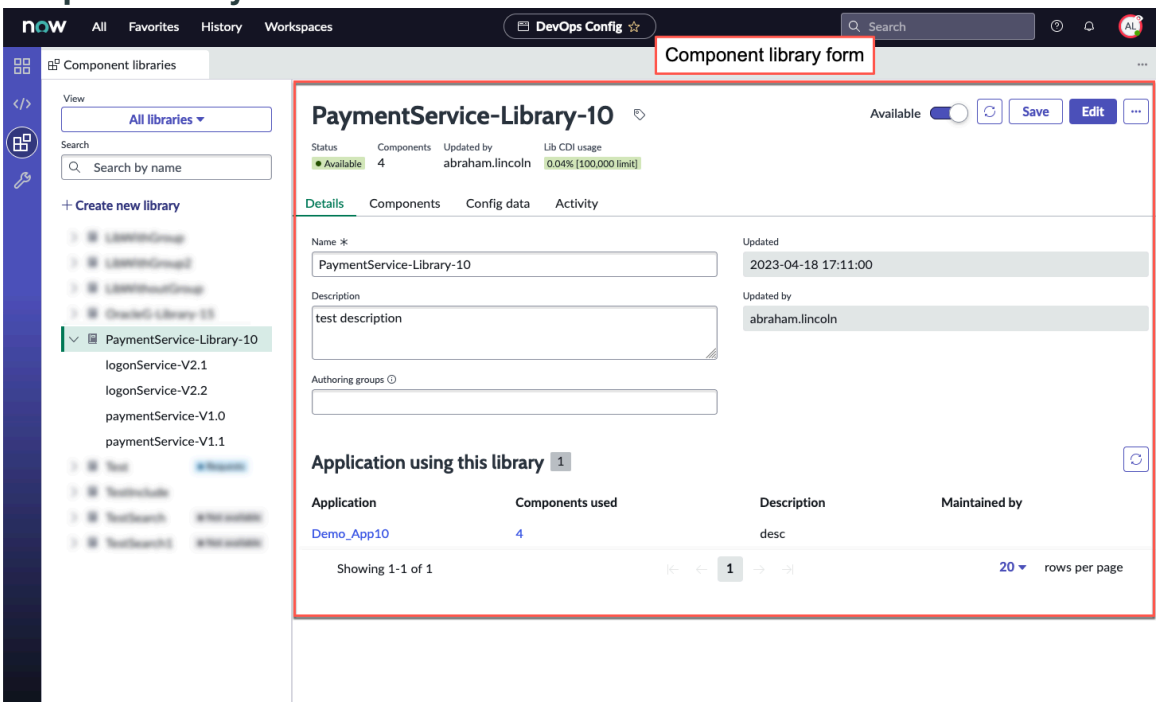
### Component library form




## Shared component form

On the Shared component form pane, you can review and manage components within your libraries. Select a component node in the left pane to view and edit the associated data.

- **Header**: The header section shows the status and other metadata of the component library. You can take the following actions:
  - Save the changes to the component.
  - Edit to create or open a changeset for updating the component.
  - Refresh the form data.
- **Tabs**: The following tabs are available:
  - **Details**: View the component's details and update its description as required. The tab also includes a list of all applications that are using the components.
  - **Versions**: View all the published and unpublished versions of the component. You can also publish a component's version or unpublish a version.

The following is an example of a shared component form in the DevOps Config Workspace.

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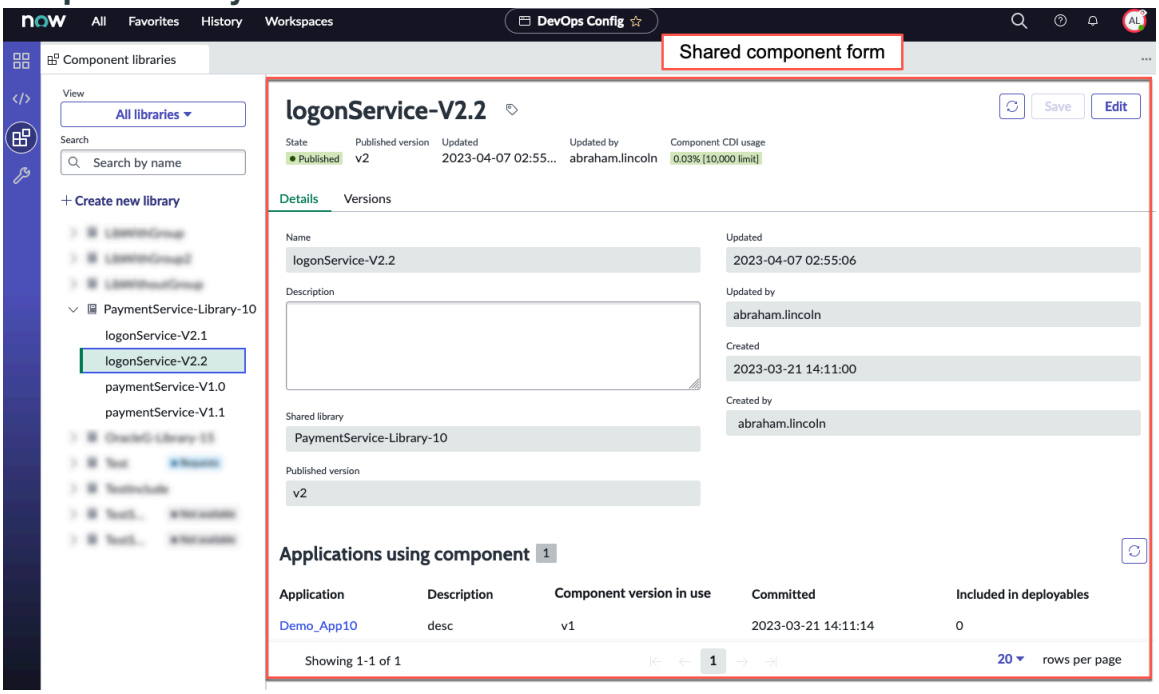
### Component library form




## Create or update a component library

Create a component library to manage components that can be reused across multiple applications.

## Before you begin

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

Role required: cdm_admin

## Procedure

1. Navigate to **All** > **DevOps Config** > **DevOps Config Workspace**.
2. Click the component libraries icon ( ) in the left navigation to open the **Component libraries** tab.
3. Click **Create new library** to create a component library.
4. On the form, fill in the fields.

### Create component library form

| Field | Description |
|---|---|
| Library name | Name of the component library.<br><br>This name must be unique across all CDM applications and libraries. |
| Description | Description about the component library, such as what type of components it includes. |

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| Field | Description |
|---|---|
| Authoring groups | User groups with access to edit the component library. Users in the groups with appropriate roles can view the component library.<br><br>**Note:**<br>If you choose an authoring group, make sure you're a member of that group, or you'll lose editing access to the library.<br><br>However, if you have the cdm_all_app_access and cdm_admin roles, you will have full access to the component library, even if you're not a member of these authoring groups. |

5. Click **Create**.

### Result
A component library is created. The state of the library is set to Not Available, which means that any components added to the library cannot be used, updated, or exported.

### What to do next
1. Add or update a shared component in a component library.
2. Activate a component library.

## Activate a component library

Activate a component library to make all of its shared components available for use.

### Before you begin

**Important:**
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Role required: cdm_admin

### About this task
A library can be in the Unavailable state in the following situations:

- When a library is created for the first time
- When a library and its components are being created
- When a newer version of the library is being created

If a library is unavailable, no component within that library can be used, updated, or exported. However, it does not impact applications that are already using components within this library.

When the library is ready for use, you can activate it.

### Procedure
1. Navigate to **All** > **DevOps Config** > **DevOps Config Workspace**.
2. Click the component libraries icon ( ) in the left navigation to open the **Component libraries** tab.

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3. In the left pane, select a component library.
4. Select the **Available** toggle switch to make the library available so that its shared components can be used in applications.

### Result

- The library and the shared components in it become available for use.
- The status of the library is set as Available.

#### Delete a component library

Delete a component library and all of its components if no application is using the library's components.

### Before you begin

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

Role required: cdm_admin

### Procedure

1. Navigate to **All** > **DevOps Config** > **DevOps Config Workspace**.
2. Click the component libraries icon ( ) in the left navigation to open the **Component libraries** tab.
3. From the **Options** button ( ), select **Delete** and then confirm the delete action.

**Note:**
If a component is being used in any application, the **Delete** option is not available.

### Result

The component library and all of its components are deleted.

#### Add or update a shared component in a component library

Add or update a shared component in a component library.

### Before you begin

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

Role required: cdm_editor or cdm_admin

### About this task

You can also add a component to the library as a shared component from a request. For more information, see Accept or reject a component request for inclusion in a component library.

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### Procedure

1. Navigate to **All** > **DevOps Config** > **DevOps Config Workspace**.
2. Select the component libraries icon (  ) in the left navigation pane to open the **Component libraries** tab.
3. Select a component library from the **Component libraries** list tab to which you want to add a shared component.
4. Select **Edit** to create a changeset or select an open changeset to work.
5. Add a shared component to the library.

   a. On the **Config data** tab of the changeset record, select the more actions icon (  ) for the **components** node and select **Create shared component**.

   b. In the Create shared component dialog box, enter a unique and meaningful name for the component.

   c. Select **Create**.
   A component is created.

6. Add config data items (CDIs) and values for the shared component.
   a. With the shared component node selected, add one or more CDIs and values in the Editor pane.
   b. Select **Save**.
7. Add a file node to the component.
   For more information on adding files, see Manage files in the config data model using file nodes.
8. **Optional:** Select the more actions icon (  ) for a component to rename or delete it.
   - To rename the component, select **Rename** from the menu.
   - To delete the component, select **Delete** from the menu.

   **Note:**
   These options are available only if the component is not being used in any application.

9. Select **Commit** to commit all changes for the shared component.
   A new version of the shared components is created.
10. In the **Additional actions** field, select an option to either publish the latest version or do it later.
    - **No additional actions**: Does not process anything for the latest version of the component.
    - **Publish latest version**: Publishes the latest version of the component.

      **Note:**
      For a shared component, only one version can be published at a time. So, any existing published version is unpublished and the new version is published.

#### Publish or unpublish a shared component version

Publish a version of a shared component in a library so that it can be used in an application.

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### Before you begin

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

Role required: cdm_admin

### About this task

When a version is unpublished, it means that the component and its version can no longer be used in an application. However, it has no impact on applications that are already using the version.

**Note:**
A shared component can only have one published version at a time.

### Procedure

1. Navigate to **All** > **DevOps Config** > **DevOps Config Workspace**.
2. Click the component libraries icon ( ) in the left navigation pane to open the **Component libraries** list tab.
3. Select a component library from the **Component libraries** list tab.
4. Select the **Components** tab and then select a component name to open.
5. Select the **Versions** tab.
6. Publish or unpublish a version of the component.

## Request to include a component to a component library

Submit a request for a component in an application that could be reused across multiple applications to be added to a shared component library.

### Before you begin

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

Role required: cdm_admin or cdm_editor

### About this task

While creating data models for their applications, DevOps Config editors and administrators may identify certain components could be reused across multiple applications. They can submit a request to the component library owners to add those components to the library.

**Note:**
You can only submit one request for a component for the same library at a time.

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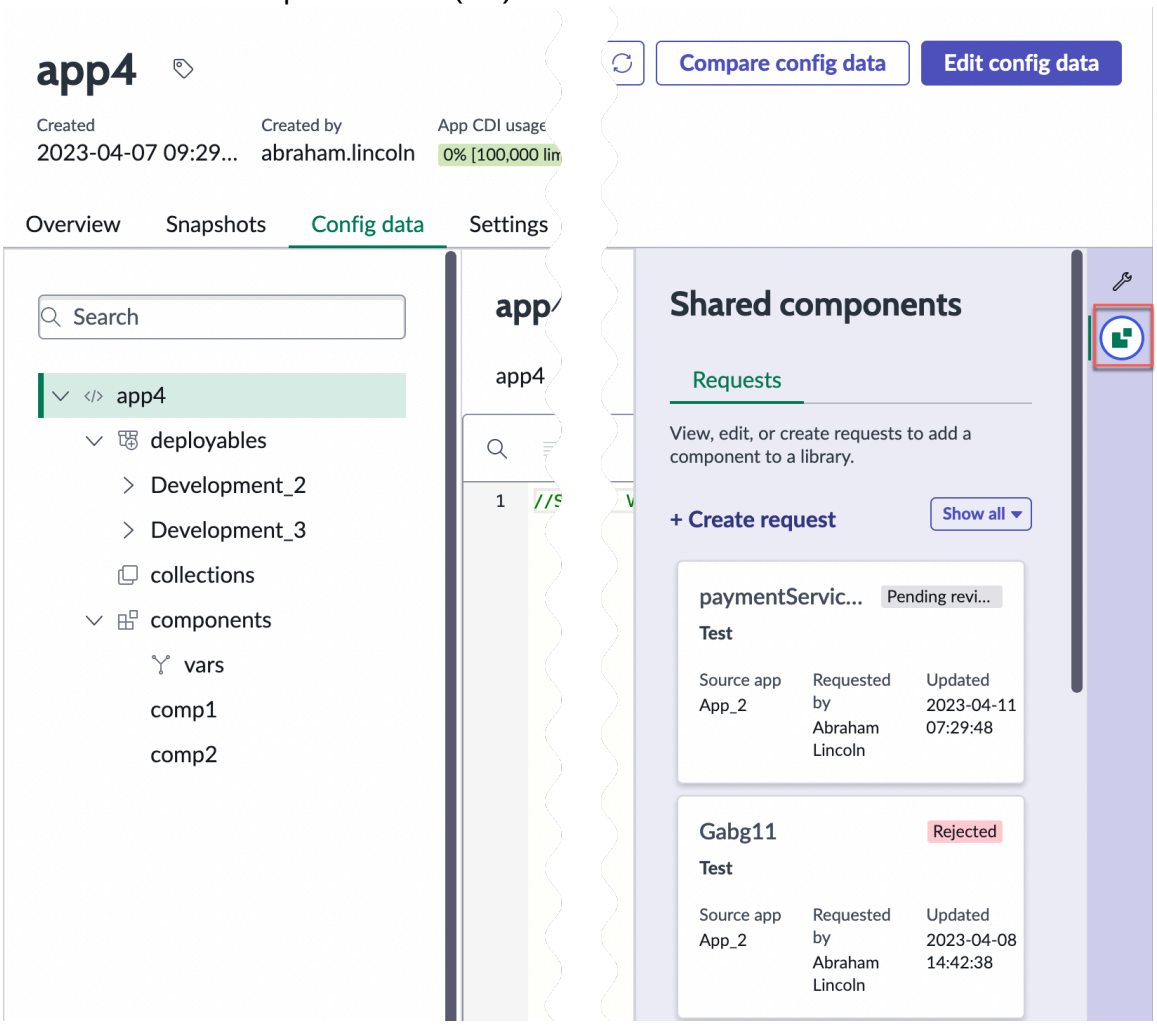
## Procedure

1. Navigate to **All** > **DevOps Config** > **DevOps Config Workspace**.
2. Select the apps icon ( ) in the left navigation to open the **Apps** tab.
3. Open an application and select the **Config data** tab.
4. Select the shared components icon ( ).




5. In the Shared components pane, select **+ Create request**.
6. Enter the details in the request form.

### Create shared component request

| Field | Description |
|---|---|
| Component | Name of the component to be added to the request.<br><br>**Note:** Config data from the last committed changeset is added to the request, excluding any secret data values for keys, referenced variables, and file attachments in file nodes. |
| Target library | Component library to which the requested component should be added.<br><br>Only existing and available libraries are listed in the field. |

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| Field | Description |
|---|---|
| Component description | Description about the component, such as how it works. |
| Additional details | More details about the component that could be helpful to the approver during approving. |

7. Select **Submit**.
   A request is created for the library owner to add the selected component as a shared component in the target library. The state of the request is set as Pending review and is listed in the Shared components pane.

   You can see all of your requests from the last 30 days and filter them by their state.

### What to do next

While a request is in the Pending review state, you can change its information or withdraw it by selecting the request card in the Shared components pane.

- To update the request, update the component's description or additional details in the respective fields and select **Update**.
- To withdraw the request, select **Withdraw**.

The library owner can review and approve or reject the request.

## Accept or reject a component request for inclusion in a component library

Review a request for adding a component to a component library and approve or reject it.

### Before you begin

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

Someone has requested to add a local component from an application to the component library as a shared component. If there are such requests in a library that need your approval, you see a **Requests** label ( ) beside the library name.

Role required: cdm_admin or cdm_editor

### Procedure

1. Navigate to **All** > **DevOps Config** > **DevOps Config Workspace**.
2. Click the component libraries icon ( ) in the left navigation to open the **Component libraries** tab.
3. Open a component library and select the **Requests** tab.

   **Note:**
   The **Requests** tab is available only when there's an open request for adding a component to the library.

4. Click a requests card to review its config data.
   The config data of the selected card appears in the preview pane.

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5. As required, click accept or reject the request.

### Result

- The request is removed from the **Requests** tab.
- Any comments added in the request can be seen by the requester in the app from where the request was submitted.
- If the request is approved:
  - The state of the request updates to Accepted.
  - The component is added to the selected component library as a shared component. Any secret data values (such as account id or passwords) for keys, referenced variables, and file attachments in file nodes are not included with the component. You have to replace the file attachments in all such file nodes.

    If the library is available, the component is ready for use in multiple CDM apps.
  - If you selected **Publish version** in the **Additional actions** field, then the shared component is published.
- If the request is rejected, the state of the request updates to Rejected.

## Manage shared components in a CDM application

Add a shared component to an application, view shared components that are available to add, or remove a shared component from an application.

### Before you begin

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

Roles required: CDM Editor [sn_cdm.cdm_editor]

### About this task

- While working in an application changeset, you can add, update, or remove a shared component.
- While working in an application changeset, you cannot modify a shared component in the same way as you can modify a direct component. A collection in an application can, however, override any value in a shared component. Also, you cannot rename a shared component in an application. If such a change is needed, a new shared component with the required name must be created, and then added again in the application.

All of these changes are withing the application changeset.

### Procedure

1. While working on the **Config data** tab for an application changeset, select the shared components icon ( ).
   - Each card on a Shared components tab displays the name, parent component library, and version for a shared component.
   - Components are grouped by library and are sorted alphabetically.

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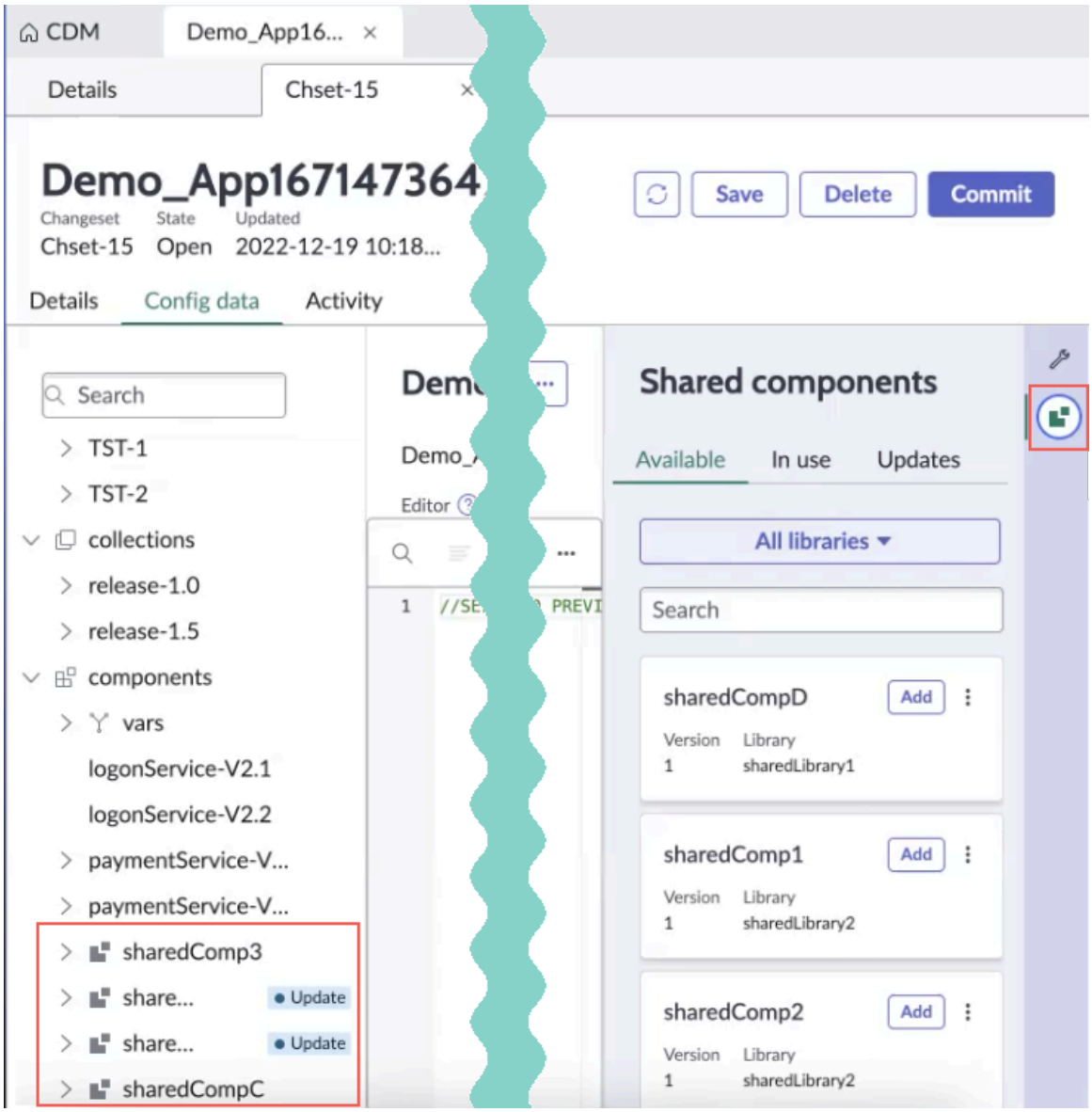
- Use the **Libraries** selector to display only components in the selected library.
- Use the **Search** text box to filter the list of components or libraries.




- **Available:** List of shared components that the application can include in its config data.

  For a shared component to be available for use in applications, the component must be in the **Published** state and the library that holds the component must be in the **Available** state.

- **In use:** List of shared components that are currently used in the application.
- **Updates:** A card appears when a newer published version of a component is available.

  Select the **refresh** icon ( ) to ensure that you're viewing all current updates.

2. Add a shared component to application data: On the **Available** tab, select **Add**.
   - The component is added to the **components** folder in the application.
   - The shared component icon ( ) indicates that the component comes from a component library.
   - The component is selected and the **Editor** and **Preview** panels display the code of the shared component.

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3. View the config data in a shared component: On any card, select the additional actions menu ( ) and then select **View config data**.

   A pop-up displays the latest published version of the shared component code. Variables are not resolved and encrypted data is not decrypted in the pop-up view.

4. Remove a shared component: Use either of the following methods to remove a shared component from the application data.
   - On the **In use** tab, select the **X** in the component card and then confirm the action in the pop-up.
   - On the **Config data** tab for an application, select the **Actions** menu ( ) for the component and then select **Remove**. Confirm the action in the pop-up.

   **Note:**
   Removal is not deletion. Removal takes the component's config data out of the application, but the component remains unchanged in the component library. When you remove a component from an application, the component card reappears on the **Available** tab.

5. Update a shared component.

   Select the **refresh** icon ( ) to ensure that you're viewing all current updates. The system indicates that a newer published version of a component is available in the following ways:
   - Highlighted text "Update" appears next to the component in the **components** folder.
   - The **Updates** tab displays a card for the component.
   - The pop-up for committing a changeset includes a notification: "One or more of the shared components have updates available".

   Follow this procedure to review the updated config data and then update a component:

   a. On the **Updates** tab, select **Update** for the component.

   b. Review the information on the Update a shared component pop-up and then select **Update**.
      - The **Details** tab displays name and version information.
      - The **Latest config data** tab displays the latest version of the shared component code. In the view, variables are not resolved and encrypted data is not decrypted.

6. Commit the application changeset to generate a snapshot containing all these changes. The system generates a snapshot of each deployable that is affected by the changes.

**Related topics**

Sharing components among applications — Component libraries

## View snapshots

View the snapshots of all deployables for an application on the **Details** tab for the application. The release pipeline can access only a snapshot that is the currently published version.

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### Before you begin

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

Role required: cdm_viewer

### Procedure

1. Open an application and select the **Snapshots** tab.
   The tab lists all deployables that are associated with the application. Each deployable displays a short list of its snapshots. Select **Show all** to view the full list of snapshots.

**Snapshots tab - Columns of the Snapshots list**

| Column name | Description |
|---|---|
| Name | Unique name for the snapshot.<br><br>When a snapshot is generated, the system uses the deployable name and the snapshot number to generate a default name (for example, `deployableName_1`, `deployableName_2`). You can edit the name.<br><br>**Tip:**<br>You can edit the name on the **Details** tab. Select the snapshot name to open the tab. |
| Description | Descriptive information that you supply to help other users.<br><br>**Tip:**<br>You can add a description on the **Details** tab. Select the snapshot name to open the tab. |
| Published | Boolean that indicates whether the snapshot is published. Only published snapshots can be exported.<br><br>**Important:**<br>By default, exporters use the most recently created published snapshot.<br><br>While defining or updating a deployable, you can specify that only validated snapshots can be published. You can unpublish a snapshot. See Publish or unpublish a snapshot. |
| Deployable | Deployable on which the snapshot is based. |
| Validation | Validation status:<br>○ Not validated: This is the initial snapshot state where no policy has been executed against the snapshot.<br>○ Requested: The validation flow has started. |

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| Column name | Description |
|---|---|
| | ○ In progress: The validation flow is running and policies are currently executing.<br>○ Passed: The snapshot has passed all policies.<br>○ Failed: The snapshot has failed one or more policies.<br>○ Execution error: A policy failed to run to completion due to an unexpected error, mostly when the CdmPolicyUtil script include is not used to provide warning and failure messages.. |
| Last validated | Timestamp when the snapshot was validated last. |
| Created | Timestamp when the snapshot was created. |
| Created by | User who created the snapshot. |
| Changeset | Changeset containing the data of the snapshot. Select the icon to open the changeset. |
| Tags | Text tag that enables you to filter the snapshots in a list. |

2. Select the snapshot name to view its details and set values on the **Details** tab.

### Publish or unpublish a snapshot

Publish a snapshot so that it can be exported to enable the CI/CD pipeline to access and use the config data. Exporters can execute only on published snapshots.

#### Before you begin

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

Role required: CDM Editor [sn_cdm.cdm_editor] or CDM Admin [sn_cdm.cdm_admin]

#### About this task

- You publish a snapshot when you feel that the deployable that it represents is ready to export to the pipeline.
- While defining or updating a deployable, you can specify that only validated snapshots can be published.
- A deployable must be connected to a service to publish its snapshots.
- If a published deployable is disconnected from services, then you can perform the following actions, but cannot publish snapshots of the deployable until it is connected to a service:
  - Edit config data.
  - Create snapshots.
  - Validate snapshots.
  - Fix validation errors.

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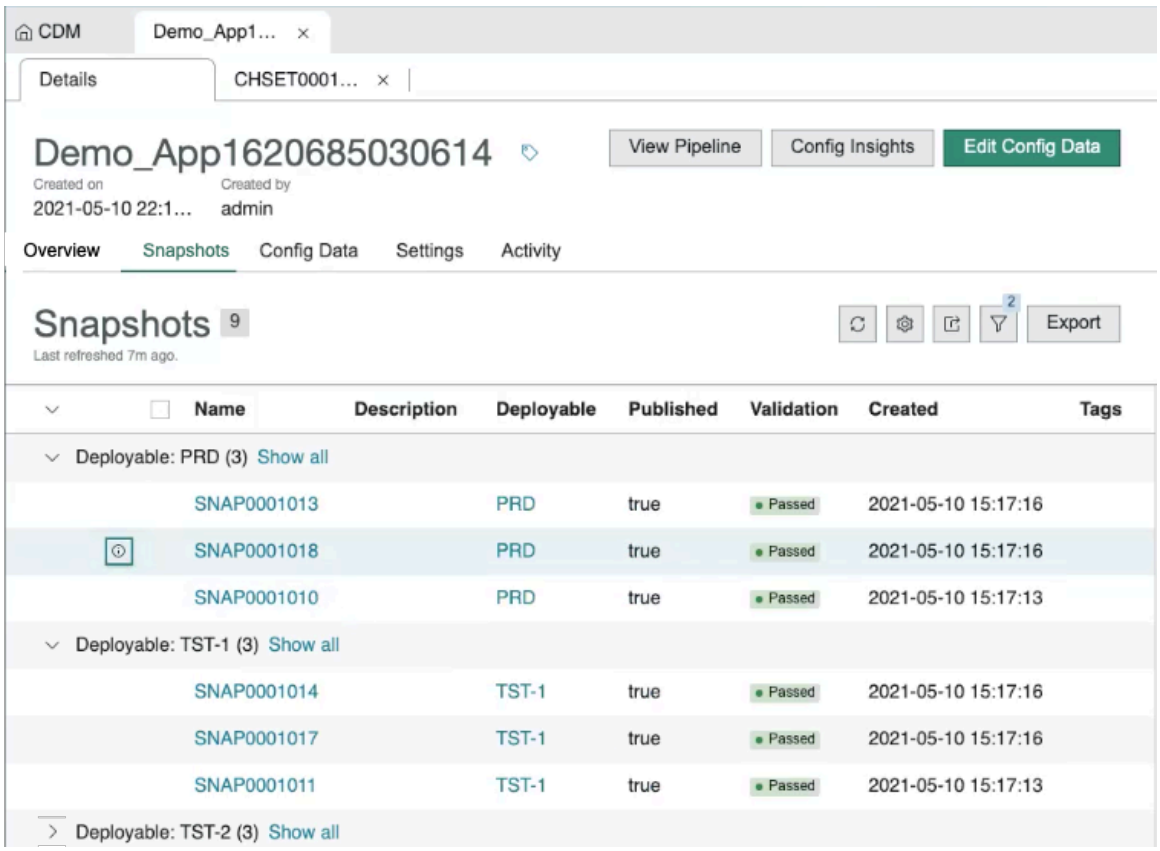
**Tip:**
You can add a text description of a snapshot or rename it on the **Details** tab for the snapshot.

- When exporters look for the latest snapshot, they should look for the latest `created` snapshot that is published.
- The published_date is the data at which the publish happens.
- The unpublish snapshot action removes the publish flag and removes the published_date value.

### Procedure

1. Use either of the following methods to publish a snapshot:
   - On any tab for an open snapshot, select **Publish**.
   - On the **Version** tab for an application, select **Publish** from the **Actions** menu for the snapshot.




2. View info

#### Information on the snapshot header and Details tab

| | |
|---|---|
| Changeset number | The system auto-assigns the changeset number. The system uses the number as the default changeset name. |
| Changeset name / Description | The system uses the changeset number as the default changeset name. Update the fields to help other users by changing to a |

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| | |
|---|---|
| | more user-friendly name or by associating descriptive information with the changeset. |
| Deployable | Deployable on which the snapshot is based. |
| Validation status | ○ Not validated: No policy has been executed against the snapshot.<br>○ Passed: The snapshot has passed all policy executions.<br>○ Failed: The snapshot has failed one or more policy executions.<br>○ In progress: Policies are currently executing.<br>○ Execution error: A policy failed to execute to completion. |
| Created / Created by | User that created the changeset and timestamp` of creation. |
| Published on | Timestamp when the snapshot was published. |

3. Use either of the following methods to unpublish a snapshot:
   - On any tab for an open snapshot, select **Unpublish**.
   - On the **Version** tab for an application, select **Unpublish** from the **Actions** menu for the snapshot.

## Compare snapshots from the same or different applications

Use the Config Data Analyzer tool to find similarities and differences between two snapshots from the same or different applications.

### Before you begin

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

Role required: cdm_viewer, cdm_editor, or cdm_admin

### About this task

You can compare and contrast snapshots from any deployable of the same or different applications.

To see the changes between two snapshots from the same deployables, see Compare two snapshots of a deployable.

### Procedure

1. While viewing an application, select **Compare config data**.
   The **Compare config data** tab opens. The current application is the target application, and its name is pre-populated in the **Target application**.

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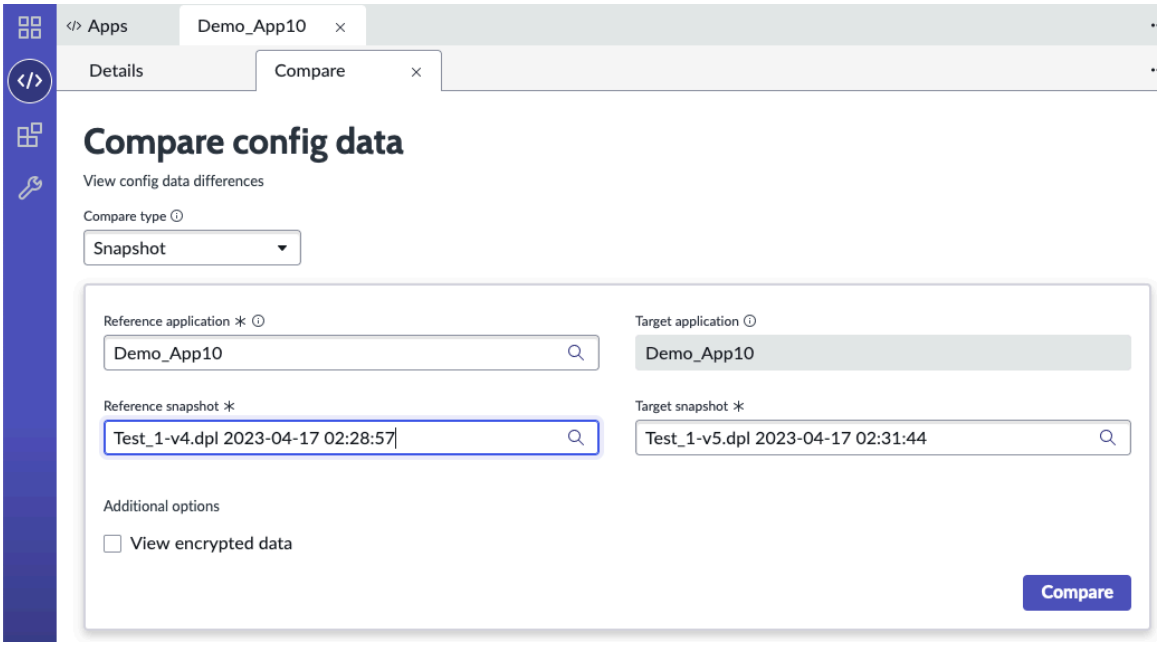


2. Select the **Snapshot** option in the **Compare type** field.
3. Select an application and then their snapshots to compare.

| Option | Description |
|---|---|
| Reference application | Application to compare with the target application. The field lists the latest committed data for all applications including the target application. |
| Reference snapshot | Snapshot of the reference application to compare. |
| Target snapshot | Snapshot of the target application against which the reference snapshot is compared. |

4. **Optional:** If you've the cdm_secrets role, you can select **View encrypted data** to view encrypted values in clear text in the comparison results.

   **Note:**
   The check box is inactive for users who don't have the cdm_secrets role. When the values in the target and reference differ, the comparison results indicate that the values differ, but the data itself still appears as ********.

5. Select **Compare**.
   The Config data differences section displays the comparison results. It shows the differences between the selected reference and target snapshots.

   **Important:**
   If you commit changes to a reference application while the **Compare config data** tab is open: When you return to the **Compare config data** tab and select **Compare**, the system uses the most recent committed changeset, performs the comparison again, and then displays the new results in the results section.

   The letters in the following illustration identify the tools that you can use to analyze the data.

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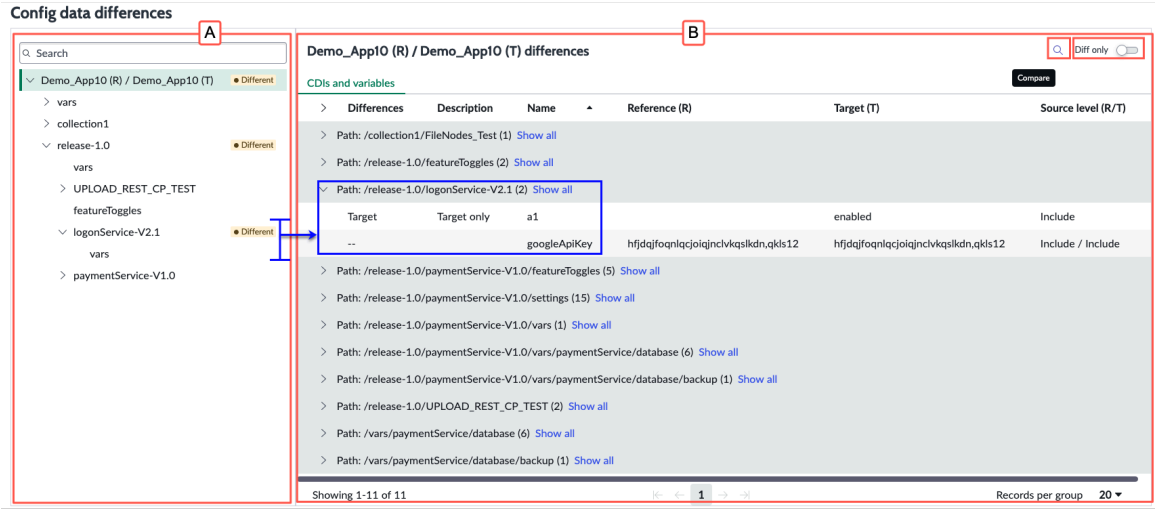


### A: Navigation panel

The navigation panel displays the node structure of the applications.

- Nodes that include changed CDIs (either directly or in descendent nodes) are annotated with **Different**.
- Nodes that include newly added CDIs (either directly or in descendent nodes) are annotated with the identity of the application changeset that includes the new data, either **Reference** or **Target**.

You can search for a node name in the **Search** field. Select a node to view its contents in the Differences panel.

### B: Differences panel

The **CDIs and variables** tab displays changes to individual CDIs for the node that is selected in the navigation panel.

- By default, the root node is selected and the data panel includes all CDIs for both changesets. Select a node in the navigation panel to display data for only that node and its descendents.
- When **Diff only** is selected, the number of CDIs that differ appears after the node path.
- Node paths are displayed in gray. Use the expansion icon ( ) to view CDIs in a folder.

#### CDIs and variables tab

| Column | Description |
|---|---|
| Differences | Indicator to show where the differences are.<br>○ Target: The CDI appears only in the target changeset.<br>○ Reference: The CDI appears only in the reference changeset.<br>○ Different: For the specified CDI, the values in the target and reference changesets differ. |

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| Column | Description |
| --- | --- |
| Description | Statement of how the changesets differ. For example, the text might indicate that a CDI appears only in the reference changeset or that the values for a variable differ between the changesets. See Types of differences between CDM applications for the full list of difference types and their causes. |
| Name | Name of the CDI. |
| Reference (R) | Value of the CDI in the reference changeset. |
| Target (T) | Value of the CDI in the target changeset. |
| Source level (R/T) | The node level in the code at which the CDI is defined.<br>○ Direct: The CDI is defined in the selected node.<br>○ Include: The value of the CDI is obtained from a node that is included in the selected node.<br>○ Override: The value of the CDI in an included node is overridden by a value that is specified in the including node.<br>Values appear in the following formats:<br>○ `<reference level / target level>` when a value appears in both target and reference.<br>○ `<reference level>` when a value appears in only the reference changeset.<br>○ `<target level>` when a value appears in only the target changeset.<br>For example, when a CDI is defined in the reference changeset with the value `true` and the CDI doesn't appear in the target changeset, then the last three columns in the **CDIs and variables** tab will have the following values:<br>○ **Reference (R)**: `true`<br>○ **Target (T)**: [Empty]<br>○ **Source level (R/T)**: `Direct` |

If a file node is selected in the tree, the **File information** tab displays its metadata.

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**File information tab - List columns**

| Column | Description |
|---|---|
| Differences | Indicator to show where the differences are.<br>○ Target: The file node is available only in the target changeset.<br>○ Reference: The file node is available only in the reference changeset.<br>○ Different: The file node data differs in the target and reference changesets. |
| File metadata | Metadata of the file attached to the file node.<br>○ File name: Name of the attached file in the file node.<br>○ Content type: Content type of the file.<br>○ Content: Content of the attached file. Preview is not available on the list, but you can download the file to preview it.<br>○ File URL: Folder path where the file exists. |
| Reference (R) | Details of the file present in the reference changeset. |
| Target (T) | Details of the file present in the target changeset. |

## Compare two snapshots of a deployable

Use the Config Data Analyzer tool to find changes between two snapshots of a deployable of an application.

### Before you begin

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

There must be more than one snapshot available in a deployable to compare and the target snapshot must not be the first snapshot in the deployable.

Role required: cdm_viewer, cdm_editor, or cdm_admin

### About this task

To compare snapshots from different deployables or applications, see Compare snapshots from the same or different applications.

### Procedure

1. While viewing an application, select the **Snapshots** tab.
2. Open a snapshot of a deployable.
3. In the Snapshot record page, select the **Config data changes** tab.
   The current snapshot is auto-populated in the **Target snapshot** field.

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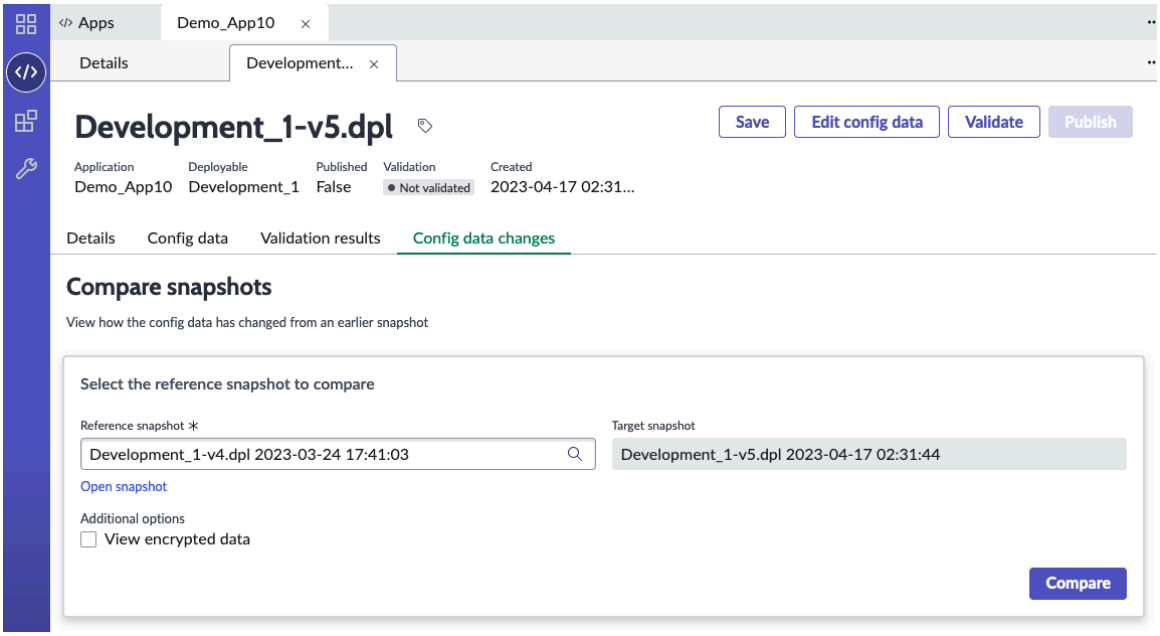
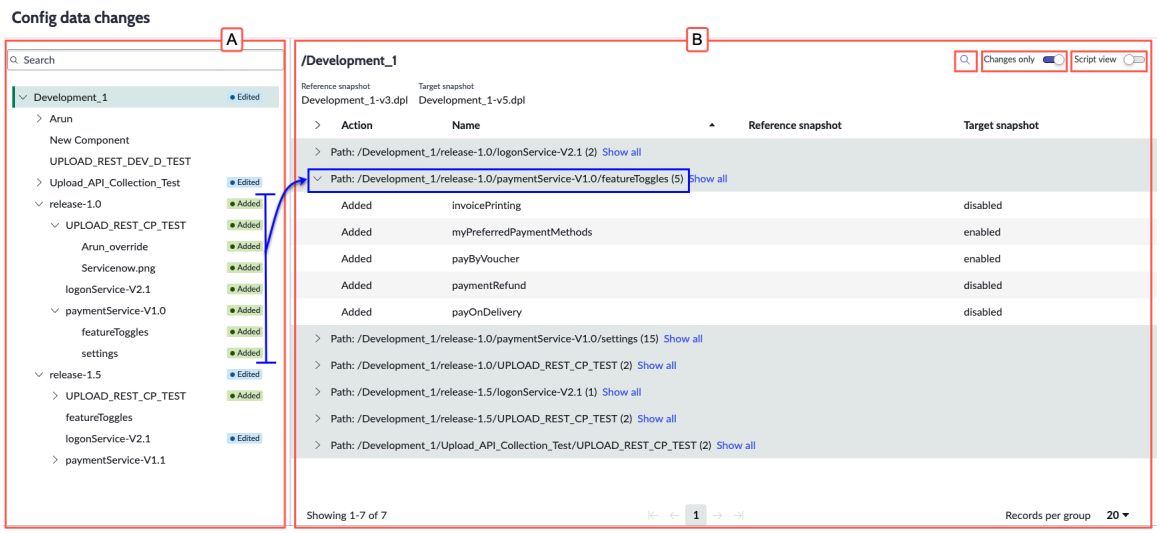



4. Select another snapshot in the **Reference snapshot** field.
   The **Reference snapshot** field lists all snapshots that are older than the target snapshot. The **Reference snapshot** field is inactive when older snapshots are not available. Even if newer snapshots created after the target snapshots exist in the deployable, they are not listed.
5. **Optional:** If you've the cdm_secrets role, you can select **View encrypted data** to view encrypted values in clear text in the comparison results.

   **Note:**
   The check box is inactive for users who don't have the cdm_secrets role. When the values in the target and reference differ, the comparison results indicate that the values differ, but the data itself still appears as ********.

6. Select **Compare**.
   The Config data changes section displays the comparison results. It shows the changes between the selected reference and target snapshots.

   The following image displays the Config data changes section that contains the comparison result that you can use to analyze the data.

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**A: Navigation panel**

The navigation panel displays the node structure of the deployable.

- Nodes that include changed CDIs (either directly or in descendent nodes) are annotated with **Edited**.
- Nodes that include newly added CDIs (either directly or in descendent nodes) are annotated with **Added**.

You can search for a node name in the **Search** field. Select a node to view its contents in the Changes panel.

**B: Changes panel**

The panel displays a list of changes to individual CDIs for the node that is selected in the navigation panel.

- By default, the root node is selected and the data panel includes all CDIs for both snapshots. Select a node in the navigation panel to display data for only that node and its descendents.
- Node paths are displayed in gray. Use the expansion icon (  ) to view CDIs in a folder.
- When **Changes only** is selected, the number of CDIs that have changes appears after the node path.
- When **Script view** is selected, the list view toggles to editor view.

### List columns in the Changes panel

| Column | Description |
|---|---|
| Action | Indicator to show what was the change type.<br>○ Added: A CDI appears only in the target snapshot.<br>○ Deleted: A CDI appears only in the reference snapshot.<br>○ Edited: For the specified CDI, the values in the target and reference snapshots differ. |
| Name | Name of the CDI. |
| Reference snapshot | Value of the CDI in the reference snapshot. |
| Target snapshot | Value of the CDI in the target snapshot. |

If a file node is selected in the tree, the comparison result displays the changes in the file between the selected reference and target snapshots.

### List columns for a file node comparison

| Column | Description |
|---|---|
| Action | Indicator to show what was the change type. |

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| Column | Description |
|---|---|
| | ○ Added: The file node is available only in the target snapshot.<br>○ Deleted: The file node is available only in the reference snapshot.<br>○ Edited: The file node data differs in the target and reference changesets. |
| File metadata | Metadata of the file attached to the file node.<br>○ File name: Name of the attached file in the file node.<br>○ Content type: Content type of the file.<br>○ Content: Content of the attached file. Preview is not available on the list, but you can download the file to preview it.<br>○ File URL: Folder path where the file exists. |
| Reference snapshot | Details of the file present in the reference changeset. |
| Target snapshot | Details of the file present in the target changeset. |

## Export a snapshot

Export a snapshot to generate config data for the pipeline to use.

### Before you begin

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

- The cdm_secrets role is required to export snapshots that include encrypted data.
- The cdm_viewer can export any snapshot that does not include encrypted data.
- The cdm_exporter_editor can create, edit, publish, activate, and delete exporters.

Role required: cdm_exporter_editor or cdm_editor or cdm_admin

### About this task

- Exporters in the content pack have the **Source** value of **ServiceNow**. You can duplicate, but cannot delete or modify content pack exporters.
- You can execute only active published exporters.
- For export, snapshots cannot exceed 10,000 config data items (CDIs) per deployable or 100,000 CDIs per application.
- Records of exporter executions are deleted after a period of three years. For instructions on changing the default time period, see Set the purge period for records of exporter executions.

### Procedure

1. Select the admin icon ( ) to open the **Administration** page.
2. On the **Exporters** tab, select the name of the exporter.

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**Tip:**
Add commonly used exporters to the **My Exporters** list for quick access.

The **Versions** tab for the exporter opens, displaying the list of draft and published versions of the exporter.

3. Select a published version of the exporter to run.
The exporter opens on the **Exporter Builder** tab. The text of the exporter script appears in a view-only panel. Use the Test playground panel to specify the snapshot to export and test settings before you export the config data.
4. Specify the settings for the exporter execution on the **Select inputs** page.

**Test playground settings**

| Field | Description |
|---|---|
| Deployable and published snapshot to export | Deployable for export and the particular published snapshot that you have validated and want to use.<br><br>Deployables appear in the list using the format `<AppName/DeployableName>`. When you select a deployable, another field lists all published snapshots for the deployable. The most recently published snapshot appears first in the list. Select the snapshot to export. |
| Input arguments | The arguments that the exporter script uses to generate config data as output. The text box displays the default values for all arguments. Update values as needed. |
| Output format | Format in which to generate the config data. |
| Additional deployables | Deployables for which to generate config data in addition to the primary deployable that you specified in the **Deployable and published snapshot to export** field.<br><br>Only the latest published snapshots appear for this optional setting. |

5. Select **Save** to save your changes and then select **Evaluate**.
The exporter script runs using the settings that you specified and then displays the resulting config data in the Output box on the Review output page.
6. Review the results.

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To make changes, select **Select inputs**, specify new settings, and then select **Evaluate**. Repeat as often as needed.

**Note:**
When you are satisfied that the exporter generates complete config data and follows the required output format standards, you can publish it and activate it.

### Test an exporter and export a snapshot

Set and validate input settings to test an exporter before you export the config data in a snapshot.

#### Before you begin

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

Role required: cdm_exporter_editor or cdm_editor or cdm_admin

- The cdm_secrets role is required to export snapshots that include encrypted data.
- The cdm_viewer can export any snapshot that does not include encrypted data.
- The cdm_exporter_editor can create, edit, publish and delete exporters.

#### About this task

Be sure to install the exporter content pack for DevOps Config. Exporters in the content pack are good starting points for your custom exporters. Some content pack exporters generate subsets of config data and others generate data for full applications. For example, to export updated config data for a database, you might select the **returnAllDataforNodeName** exporter. In the input arguments for the exporter, you would specify the database deployable as the node and then specify the updated settings as input arguments. After you determine that the settings generate the desired config data, you can export the data to the pipeline.

- Exporters in the content pack have the **Source** value of **ServiceNow**. You can duplicate, but cannot delete or modify content pack exporters.
- You can run only published exporters.
- For export, snapshots cannot exceed 10,000 config data items (CDIs) per deployable or 100,000 CDIs per application.
- For information on creating a custom exporter, see Create a custom exporter.
- Records of exporter executions are deleted after a period of three years. For instructions on changing the default time period, see Set the purge period for records of exporter executions.

#### Procedure

1. Select the admin icon (  ) to open the **Administration** page.
2. On the **Exporters** tab, select the name of the exporter.

   **Tip:**
   Add commonly used exporters to the **My Exporters** list for quick access.

3. Select the exporter version on the **Versions** tab.

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The exporter opens on the **Exporter builder** tab. The text of the exporter script appears in a view-only panel. Use the **Test playground** panel to specify the snapshot to export and test settings before you export the config data.

4. Specify the settings for the exporter execution on the **Select inputs** page.

**Test playground settings**

| Field | Description |
|---|---|
| Deployable and published snapshot to export | Deployable for export and the particular published snapshot that you have validated and want to use.<br><br>Deployables appear in the list using the format `<AppName/DeployableName>`. When you select a deployable, another field lists all published snapshots for the deployable. The most recently published snapshot appears first in the list. Select the snapshot to export. |
| Input arguments | The arguments that the exporter script uses to generate config data as output. The text box displays the default values for all arguments. Update values as needed. |
| Output format | Format in which to generate the config data. |
| Additional deployables | Deployables for which to generate config data in addition to the primary deployable that you specified in the **Deployable and published snapshot to export** field.<br><br>Only the latest published snapshots appear for this optional setting. |

5. Select **Evaluate**.
   - The exporter script executes using the settings that you specified.
   - The **Test playground** panel displays the Review output page.
   - The config data that the exporter generates appears in the **Output** box.
   - The system lists information about the execution on the **Executions** tab.
6. Review the results.
   a. To make changes, select **Select inputs**, specify new settings, and then select **Evaluate**.
   b. Repeat the previous step as often as needed.

**Note:**
When you are satisfied that the exporter generates complete config data and follows the required output format standards, you can publish it and activate it.

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7. Publish the exporter by selecting **Publish** on the **Exporter builder** tab.

> **Note:**
> You must set an exporter to active to enable it to be executed in a pipeline.

### Generate API invocation code for an exporter

Generate sample code of an API invocation for an exporter. The code can invoke the exporter. Select from several commonly used languages.

#### Before you begin

> **Important:**
> Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

Role required: cdm_exporter_editor or cdm_editor or cdm_admin

#### Procedure

1. Prepare an exporter for execution as described in Test an exporter and export a snapshot.

> **Tip:**
> Test the exporter to verify its operation.

2. In the **Evaluate** menu, select **Generate sample API**.
   The Exporter API invocation sample dialog box opens.
3. Select the language.
   The system applies the settings that you specify and displays the resulting API sample in the text box.
4. Select **Copy to clipboard**.
   You can now paste the code into an editor for use in your code.

### Create a custom exporter

Copy an existing exporter script as a starting point for a custom exporter.

#### Before you begin

> **Important:**
> Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

Role required: cdm_exporter_editor or cdm_editor or cdm_admin

#### About this task

DevOps Config content packs provide a variety of exporters. You can use any of the provided exporter scripts as a starting point for a custom exporter that you design.

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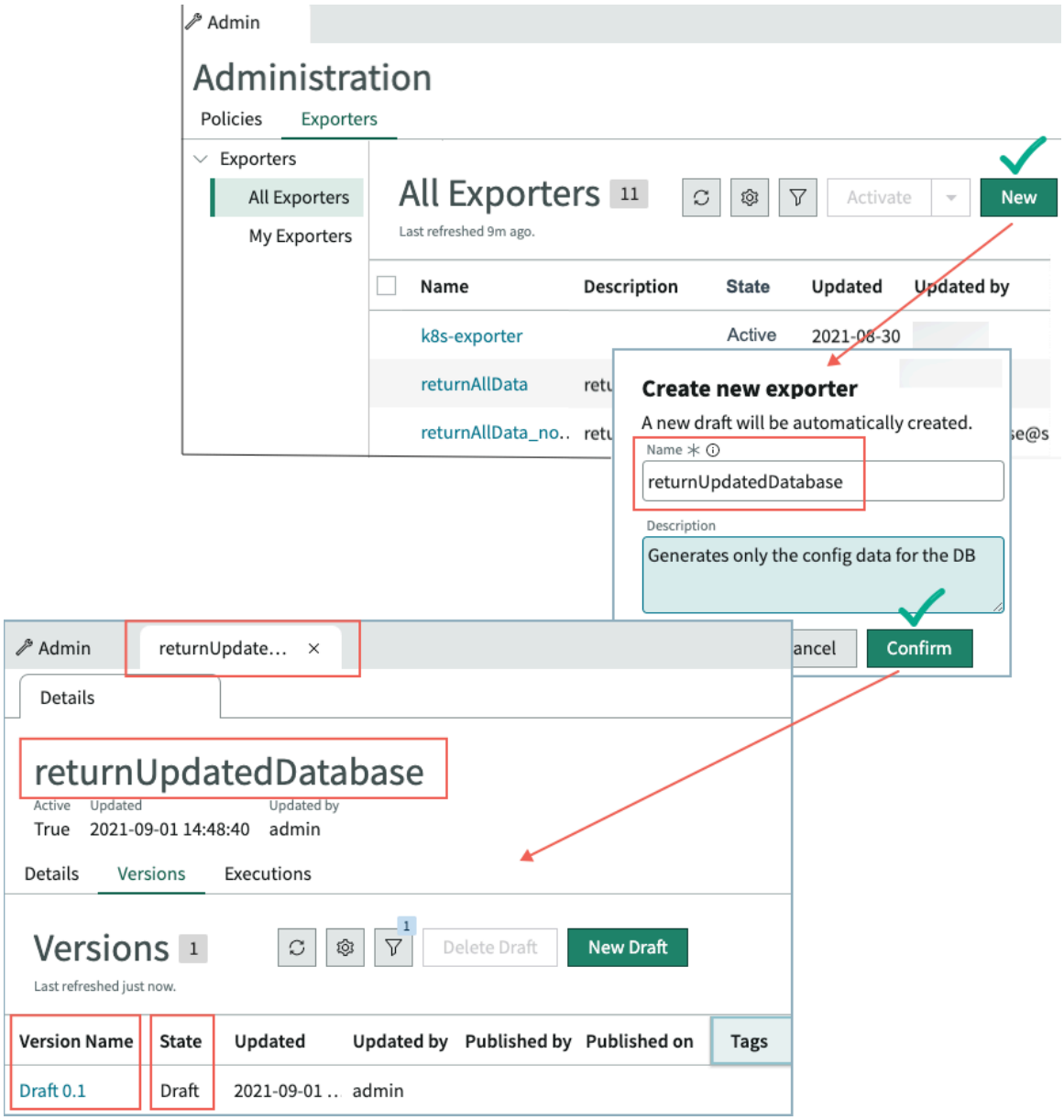
## Procedure

1. Select the admin icon ( ) to open the **Administration** page.
2. On the **Exporters** tab, select **New**, enter a unique and meaningful name and description, and then select **Confirm**.
   The first draft version of the exporter is named **Draft 0.1** and is listed on the **Versions** tab.




3. Select the **Version name** to open default exporter script on the **Exporter builder** tab.

   The text of the exporter script appears in a view-only panel.
4. On the **Exporters** tab, select the name of the exporter that will act as the starting point for the new custom exporter.
5. Select the exporter version to use on the **Versions** tab for the exporter.
   The exporter opens on the **Exporter Builder** tab. The text of the exporter script appears in a view-only panel.
6. Copy the text of the script for use in the new exporter.

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7. **Optional:** To enable users to specify dynamic execution conditions or CDI values when editing the exporter, create an input argument.

   a. On the **Input arguments** tab, click **New**.

   b. On the Create argument pop-up window, define the argument.

   **Create argument pop-up window**

| Field | Description |
|---|---|
| (Optional) Name / Description | Meaningful name and description for the argument. |
| Default value | Value that the argument will have when a user opens the exporter for editing. |
| Mandatory | Select the check box to require that the argument value is specified. |

   c. Select **Create**.
   The argument now appears in the **Input arguments** field on the Test Playground panel.

### View the history of exporter executions

View a list of exporter executions to identify config updates that are successful and to isolate changes that caused failure in the pipeline.

#### Before you begin

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

Role required: cdm_viewer or cdm_exporter_editor or cdm_editor or cdm_admin

#### About this task

#### Procedure

1. Select the Admin icon ( ) to open the **Administration** page.
2. On the **Exporters** tab, select the name of the exporter.
3. Select the **Executions** tab to view the list of executions.

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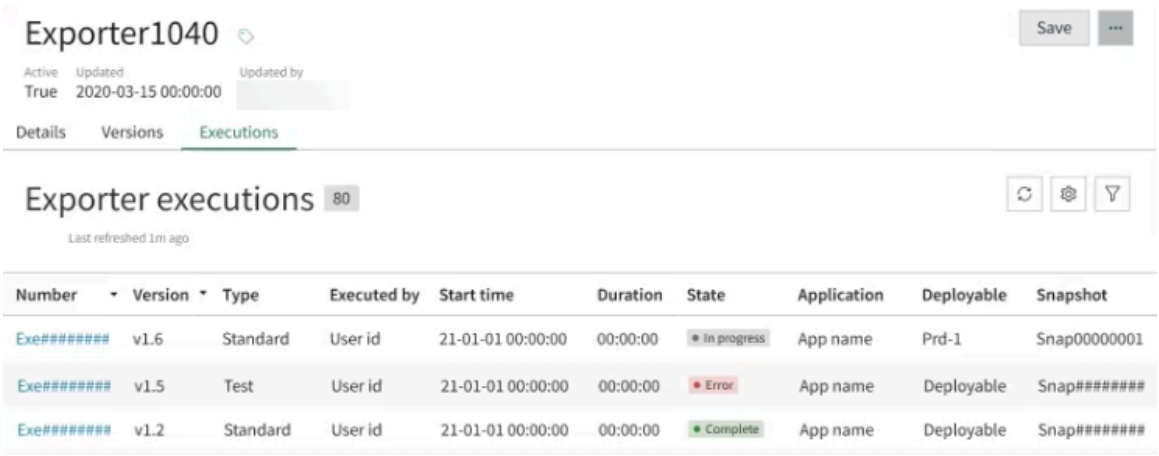


**Exporter executions list**

| Column | Description |
|---|---|
| Number | Unique auto-generated identifier for the execution. |
| Version | Version of the exporter. |
| Type | ○ Test: An execution in the test playground.<br>○ Standard: An execution that generates published config data. |
| Executed by | User that executed the exporter. |
| Start time / Duration | Timestamp when the execution started and the period of time that the exporter ran. |
| State | Result of the execution. |
| Application / Deployable / Snapshot | The application, deployable, and snapshot that the exporter used. |

## Delete an exporter

Delete an exporter to ensure that users cannot use it to generate config data.

### Before you begin

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

Role required: cdm_exporter_editor or cdm_editor or cdm_admin

### About this task

- You cannot delete, modify, or activate exporters that are included in the CDM content pack. Exporters in the content pack have a **Source** value of **ServiceNow**.
- If an exporter has performed a standard execution, you cannot delete it. This ensures a complete and accurate audit trail. You can archive an exporter that has performed a standard execution. See Archive an exporter.

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- If an exporter does not have a standard execution, then you can delete all draft versions and published versions by deleting the exporter.
- You can delete any draft version of an exporter.

**Tip:**
You cannot generate a draft version of a content pack exporter, but you can duplicate one and edit draft versions of the duplicate. Editing a duplicate of a content pack exporter is a good way to create a custom exporter. See Create a custom exporter.

### Procedure

1. Use either of the following methods to delete all versions of an exporter: While working on an exporter on the **Exporter builder** tab or viewing a list of exporters, select the exporter and then select **Delete**.
   - While working on an exporter on the **Exporter builder** tab, select **Delete**.
   - While viewing a list of exporters, select the exporter and then select **Delete**.

   All versions of the exporter are deleted and the exporter is no longer listed on the **Versions** tab.
2. To delete only a particular draft version of an exporter, select the version, select **Delete draft**, and then confirm the action.

## Archive an exporter

Archive an exporter to preserve its record and remove it from the lists that you use in your everyday work.

### Before you begin

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

Role required: cdm_exporter_editor, or cdm_editor, or cdm_admin

### About this task

- You can archive only exporters that have standard runs.
- You can copy and test run an archived exporter. You cannot use the API to run an archived exporter.
- You cannot perform the export operation using an archived exporter.
- You cannot delete, modify, publish, or rename an archived exporter or any of its versions.
- You cannot create new draft of or reuse the name of an archived exporter.
- To restore an exporter for normal use, set its **State** value to **Active** and publish a version.

### Procedure

While working on an exporter on the **Exporter builder** tab or while viewing a list of exporters, select the exporter and then select **Archive**.
The **State** value of the exporter is set to **Archived**.

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### Set the purge period for records of exporter executions

Change the default deletion period. By default, records of exporter executions are deleted after a period of three years.

#### Before you begin

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

Role required: CDM Admin [sn_cdm.cdm_admin]

#### Procedure

1. Navigate to **All** > **System Maintenance** > **Table Cleanup**.
2. In the **Tablename** column, select **sn_cdm_exporter_execution**.
3. Change the **Age** setting to the retention period in seconds and then save the record.

   Minimum: 1 year. For example:

   - 1 year = 31 536 000
   - 2 years = 63 072 000
   - 3 years = 94 608 000

## Investigate an alert that involves a change to config data

A high percentage of alerts occur due to errors in config data. If the chain of events that resulted in an alert includes a change request that involves the same CI as the alert, then you can use a variety of tools to isolate the config changes that might have caused the alert.

#### Before you begin

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

Roles required: Both cdm_viewer and evt_mgmt_user.

#### About this task

You work in the **Config changes** tab while investigating the causes of an alert. The tab includes several tools that enable you to visualize the series of config changes that might have led to the alert. You can filter, sort, and organize config data to help you identify problematic changes to the configuration data item key:value pairs (CDIs).

#### Procedure

1. Use either of the following methods to view an alert:

   - On the home page ( ) of the Service operations workspace, select an alert.
   - On the list page ( ) of the Service operations workspace, navigate to **Alerts** and then select an alert.

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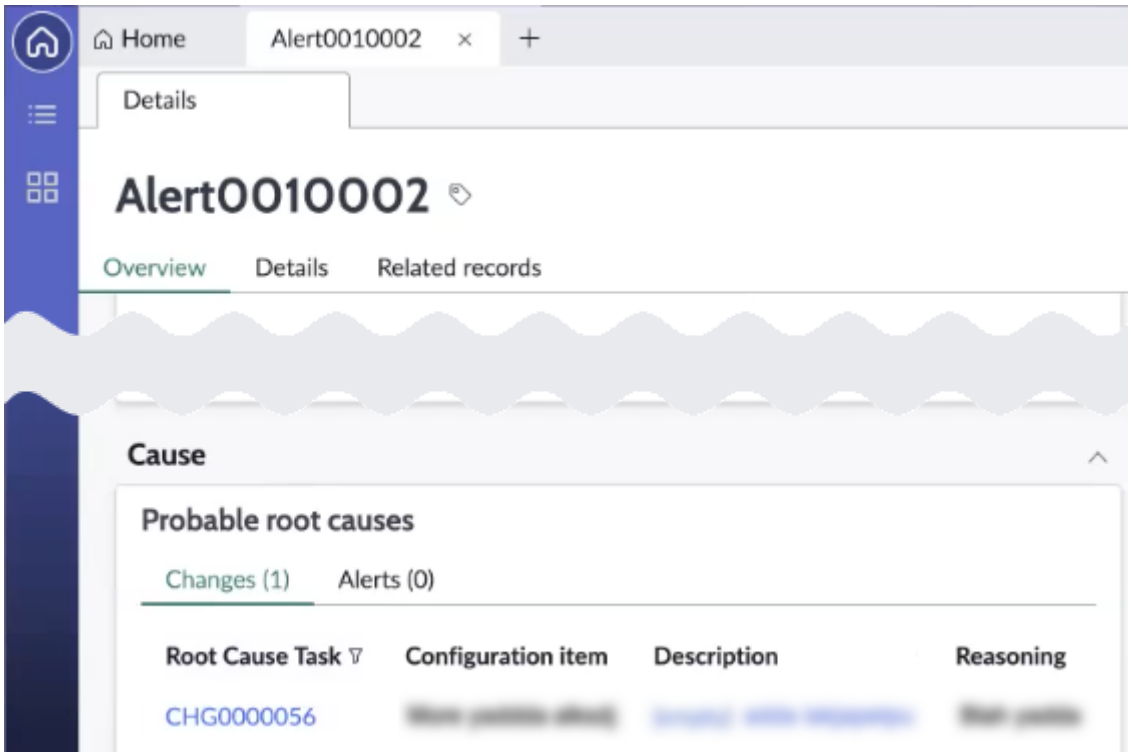
The top five most likely causes of the alert are listed in the Cause section on the **Overview** tab. If the chain of events that resulted in the alert includes a change request that involves the same CI as the alert, then that CHG record appears in the list.




2. On the **Changes** tab, select a change request.
   The change request opens. If the change request involved a change to config data because a CDM snapshot was deployed, then the **Config changes** tab appears.
3. On the **Config changes** tab, work with the information in the Investigate configuration changes section.

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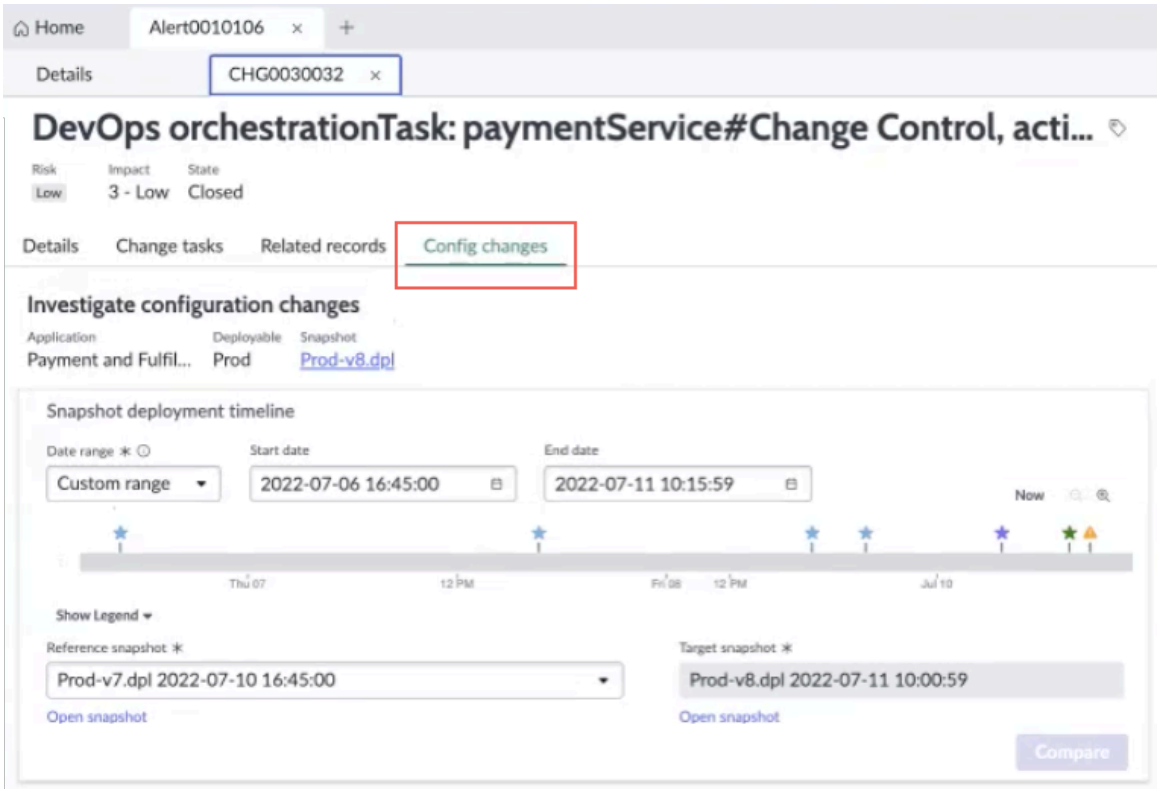


**Investigate configuration changes section on the Config changes tab**

| Field | Description |
|---|---|
| Application | The CDM application that is affected by the alert. |
| Deployable | The CDM deployable whose snapshot was deployed. |
| Snapshot | The CDM snapshot that was deployed.<br><br>To open the snapshot on a new tab in the Service Operations Workspace, select the snapshot. |
| Snapshot deployment timeline | |
| Date range / Start date / End date | The time period that the timeline displays. By default, the timeline displays the period that includes the alert, the target snapshot (the snapshot that is associated with the change request), and the five most recently deployed snapshots.<br><br>Specify a predefined period in the **Date range** box or use the calendar tools to specify custom start and end times. |

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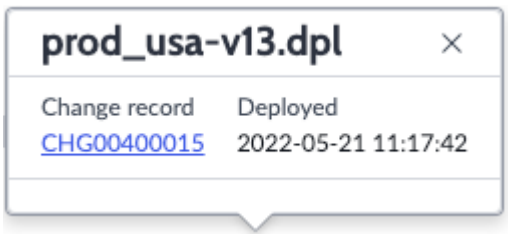
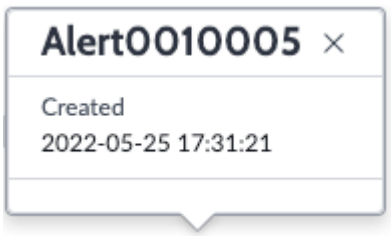
| Field | Description |
| --- | --- |
| Timeline / Show legend | The timeline displays snapshot deployments and the alert.<br><br>Select **Show legend** to view the icons that identify snapshots and events on the timeline.<br><br>In addition to the snapshot that immediately precedes the current (target) snapshot, you can compare the target snapshot to any earlier snapshot that appears on the timeline. To view additional snapshots, change the date range.<br><br>Use the zoom icons ( ) to shrink or grow the portion of the date range that appears on the timeline. Zoom does not change any of the other timeline settings. Use the left and right arrows to view items that have scrolled out of view.<br><br>Select a snapshot to view its name, associated change record, and deployment date. Select the link to open the associated change request.<br><br>  <br><br>Select an alert to view its alert ID and creation date.<br><br>  |
| Reference snapshot / Target snapshot | The target snapshot is the snapshot that is associated with the change request. (The alert can be associated with multiple change requests, each of which is associated with a target snapshot). Most often, the target snapshot immediately precedes the alert. |

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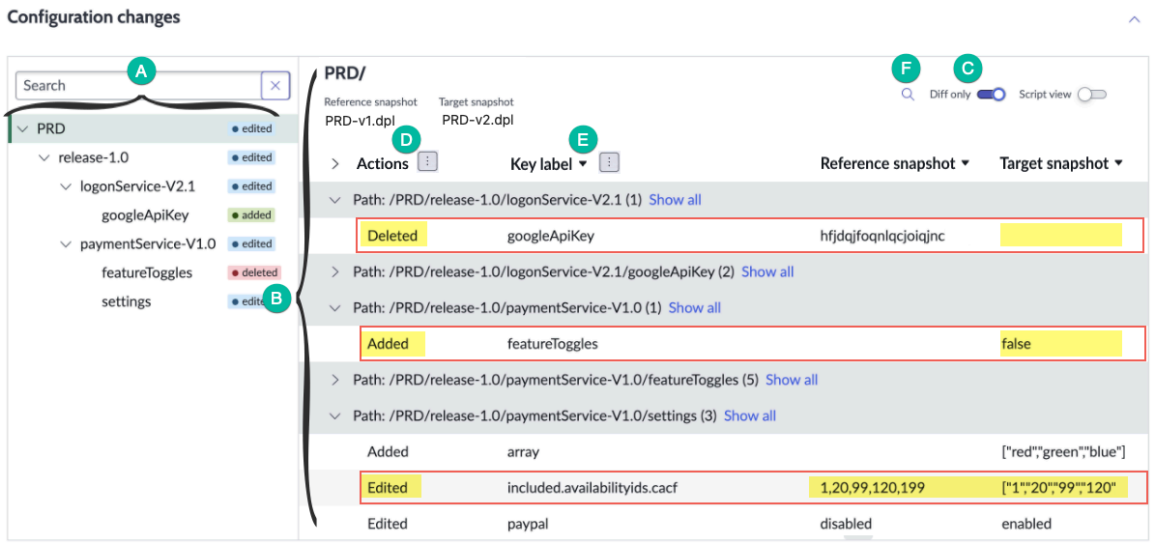
| Field | Description |
| --- | --- |
| | By default, the system selects the snapshot that immediately preceded the target snapshot as the reference snapshot.<br><br>While investigating the cause of the alert, you can use the **Reference snapshot** list to select any snapshot that precedes the reference snapshot in the selected date range on the timeline. (Snapshots on the timeline after the target snapshot do not appear in the list.) If you select a different reference snapshot, select **Compare** to generate the list of differences between the two selected snapshots. The difference information appears in the Configuration changes section.<br><br>For any snapshot on the timeline, follow these steps to open it in the Service Operations workspace.<br><br>**a.** Choose the target snapshot or select a snapshot in the **Reference snapshot** list.<br><br>**b.** Select **Open snapshot**. |

4. Now work with the information in the Configuration changes section on the **Config changes** tab.

   When the **Config changes** tab opens, the system immediately identifies the differences in the CDIs between the reference snapshot and the target snapshot. The Configuration changes section displays the differences.

   The letters in the following illustration identify the tools you can use to analyze the data.




### A. Navigation panel

The navigation panel displays the node structure of the snapshot. Select a node to view its contents in the data panel. Nodes that include changed CDIs (either

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directly or in descendent nodes) are annotated with **added**, **deleted**, or **edited**, as appropriate. Use the **Search** field to search for text in the navigation panel.

**B: Data panel**

The data panel displays groups of CDIs for the selected node. By default, the root node is selected in the node tree, and the list includes all CDIs for both snapshots. Select a node in the navigation panel to display CDIs for only that node and its descendents. You can switch from this list view of the config data to a script view, as described in G: Script view.

Expand and close groupings with the expand icon (  ). If a selection includes more than 50 CDIs, then CDIs are organized into groups of 50.

**C: Diff only**

Select **Diff only** to view only CDIs that differ between the two snapshots.

**D: Filter the types of changes that should appear in the list**

The condition builder icon (  ) appears when you point to the **Actions** column name in the list view. Select the icon to specify the types of config data changes that should appear in the list.

**"Types of changes" filters**

| Filter | Meaning |
|---|---|
| (empty) | [Not used.] |
| -- | No difference in this CDI between the reference and target snapshots. |
| Added | The CDI was added to the target snapshot. |
| Deleted | The CDI was deleted from the target snapshot. |
| Changed | The value of the CDI was changed in the target snapshot. |

**E: Filter the list based on CDI names and values**

The condition builder icon (  ) appears when you point to the **Key label** column in the list view. Select the icon to filter the list of config data changes that should appear in the list.

The sort indicator icon (  ) indicates that CDIs are sorted alphabetically by the label of the key.

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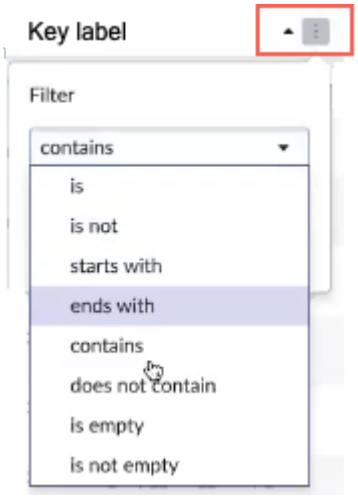
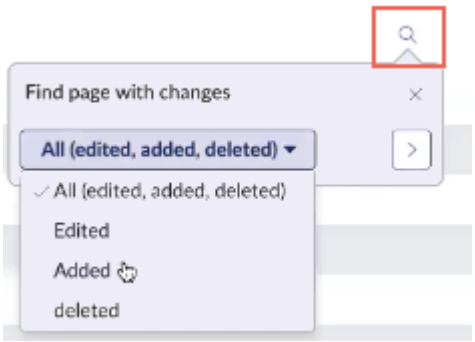



**F: Find nodes with a particular kind of change**

In the list view, select the find icon ( ) and specify the type of change to isolate.




**G: Script view**

- The data initially appears in list form. Select **Script view** to view the config data as code.
- Differences are indicated by symbols next to the line number.

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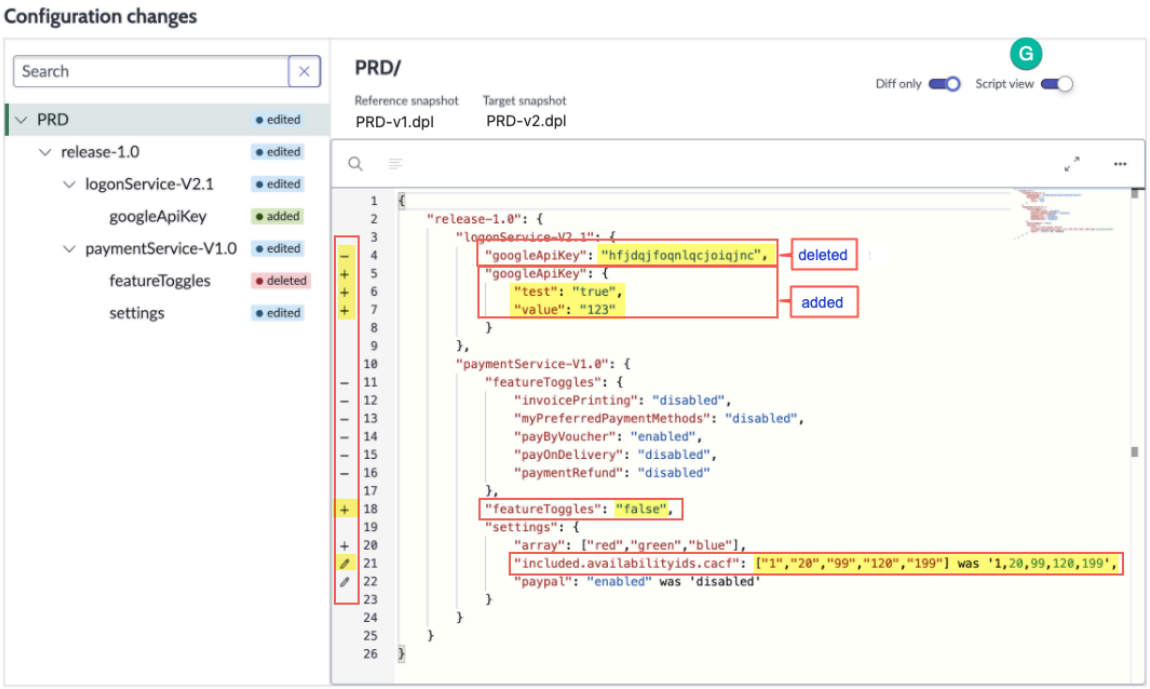
- Deletions are indicated by -
- Additions are indicated by +
- Edits are indicated by the pencil icon ( ) plus notes in the in-line text, as shown in this "Diff only" example.

- Conversions from text to array: In the example, because the data structure of the `googleApiKey` CDI changed from a text value to an array, the text form is deleted and the array form is added.




## Analytics and reporting using the DevOps Config Insights dashboard

Use the DevOps Config Insights dashboard with Performance Analytics to quickly identify configuration errors and take action. View snapshot validation trend, open changesets, and failed snaphots for all applications and deployables.

**Important:**
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Error thresholds are configurable and widgets are customizable (you can rearrange or hide them).

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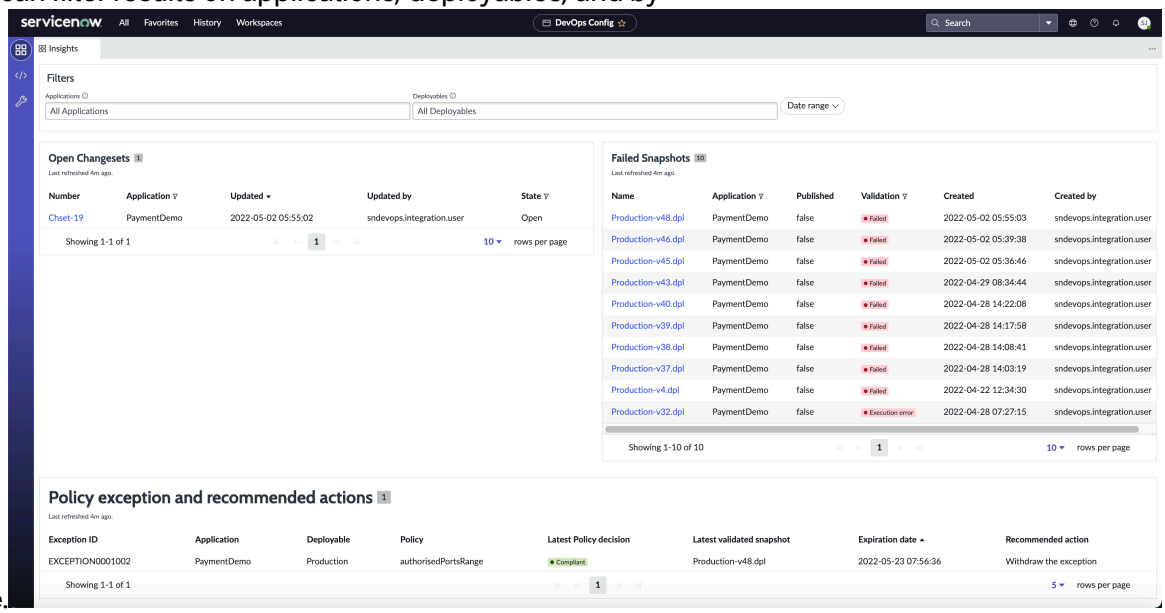
You can filter results on applications, deployables, and by date.




| Report | Description and use case |
| --- | --- |
| Open changesets | Open changeset details.<br><br>Use case:<br><br>As a DevOps engineer or App Engineer, I want to review my open changesets so that I can take action on them right away and not let them get stale.<br><br>Accidentally committing changesets later could add risk to my data model and, by consequence, the fleet. |
| Failed snapshots | Non-compliant snapshots for changes committed.<br><br>Use case:<br><br>As a DevOps engineer or App Engineer, I want to review non-compliant snapshots for changes I committed so that I ensure my changes are in line with company policies before pushing the data out to my production environment. |
| Policy exception and recommended actions | Recommended actions for policies that have exceptions.<br><br>Use case:<br><br>As a DevOps Config and GRC customer, I want to be able to see the list of active exceptions |

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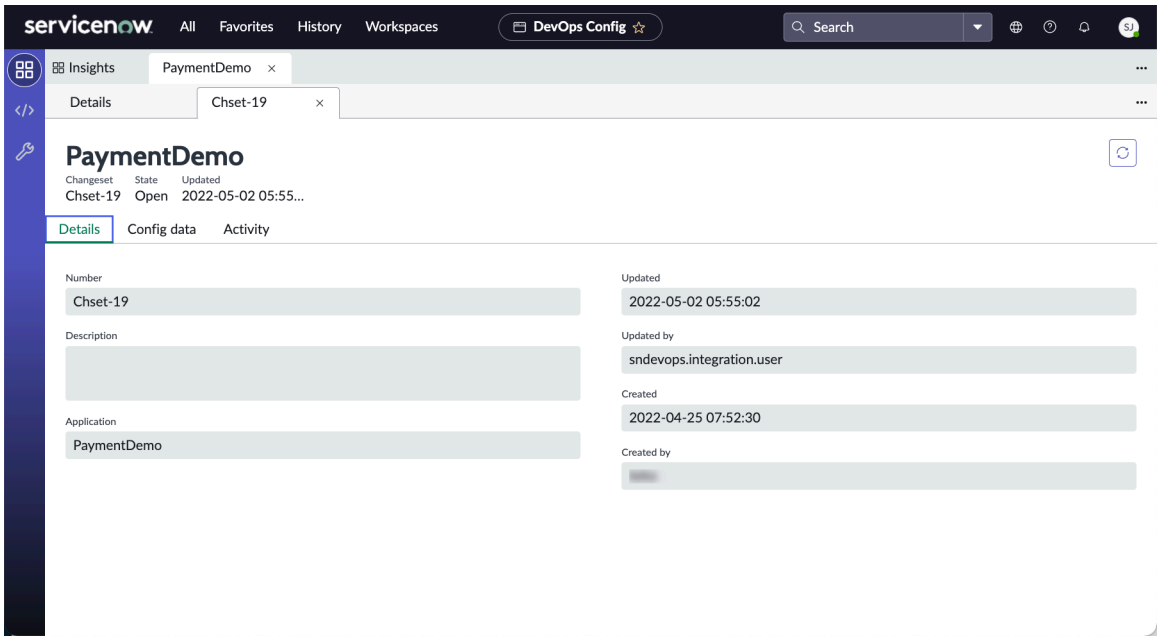
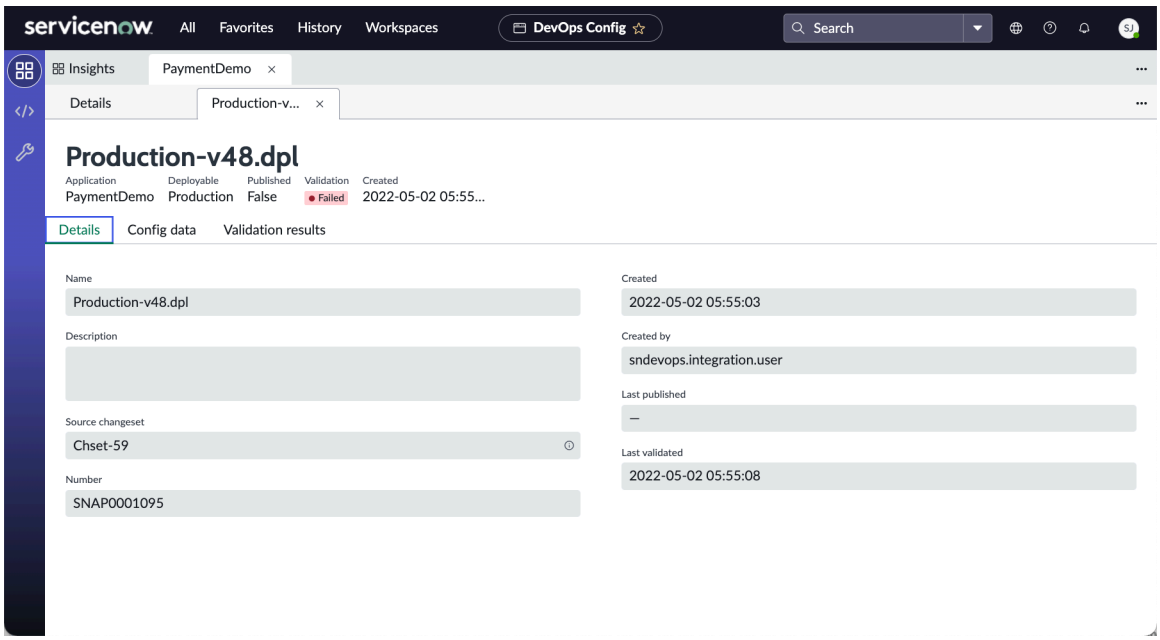
| Report | Description and use case |
| --- | --- |
| | and, for ones that are expiring soon, what the recommended action is. |

## DevOps Config Insights Open changesets




Review the changeset details and either make changes to the config data and commit the changeset, or discard the changeset altogether. You generally want this number to be 0 on the dashboard.

## DevOps Config Insights Failed snapshots




Investigate the snapshots and fix misconfigurations, or identify changes that need to be made to a policy. You generally want this number to be 0 on the dashboard.

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### DevOps Config Policy exceptions

| Possible actions | |
|---|---|
| Nothing | If the issue is already resolved and the latest snapshot status passed; or withdraw the exception if it is no longer needed. |
| Fix the issue | If the latest snapshot validation status is passed with exception and there's time to fix the issue before the exception expires. |
| Extend the exception | If the latest snapshot validation status is passed with exception and there isn't enough time to fix the issue. |

## DevOps Config reference

DevOps Config reference content.

**Important:**
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### Update the associations for a deployable

Update the name and description of a deployable as well as its associations with applications and other items. This procedure is optional.

#### Before you begin

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

Role required: cdm_policy_editor or cdm_editor or cdm_admin

#### About this task

This optional procedure explains how to update the details of a deployable definition. For information on configuring the data in a deployable, see Create and update a deployable.

**Note:**
You cannot change the SDLC environment type (development, test, or production) of a deployable because such a change would have significant impact. For example, mapped policies and their inputs might differ significantly between test and production versions of a config dataset.

#### Procedure

1. On the **Settings** tab for an application, select **Deployables** in the tree view.
2. Select the check box for the deployable, select **Edit**, and then update the settings for the deployable.

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**Edit deployable settings**

| Field | Description |
|---|---|
| Name | Unique and meaningful name for the deployable. |
| CDM Deployable Node | Deployable in the dataset. |
| Node Main | |
| CDM Application | CDM application that includes the deployable. |
| Domain | |
| Enforce Compliance | Option to ensure that only snapshots that pass validation can be exported. |
| CMDB CI | Configuration item in the CMDB. |
| Environment | SDLC environment that the deployable implements.<br>○ Development<br>○ Test<br>○ Production |
| Description | Text description that helps other users understand the purpose, scope, and intent of the deployable. |

3. Select **Update**.

**Related topics**

Create or update a variable CDI

## Types of configuration data supported by DevOps Config

DevOps Config stores configuration data of every layer of the IT stack in a centralized location.

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Configuration data includes:

- App and service configuration
- Middleware configuration (databases, message queues, load balancers, for example)
- Kubernetes and Service Mesh configuration
- Cloud resources configuration (AWS, GGP, Azure DevOps, for example)
- Traditional infra configuration (servers, VMs, network, for example)

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| | | | |
|---|---|---|---|
| API keys | passwords | usernames | feature toggles |
| install paths | load balancing methods | database connections | heap sizes |
| scaling rules | geo regions | host names | IPs |
| cluster settings | sizing | sudo user lists | ssh |
| patching levels | firewalls | URLs | certificates |
| versions | build numbers | hot fixes | -- |

Typically configuration data is stored in files (.json, .yaml, .properties, .ini, .xml, .csv) and is located in a variety of places, including GIT repos, network folders, third-party tools (JFrog artifactory, Sonatype Nexus) other databases.

DevOps Config manages and validates your configuration data in a centralized location as the single source of truth.

## CDM data model

The CDM data model is a standardized data structure that supports the broader life cycle of software delivery — automation, quality validation, and CSDM. CDM imports existing config data, validates it using policies that you define, and exports valid config data to your organization's existing DevOps pipeline to implement applications, services, and infrastructure.

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## CDM data model overview

The CDM data model does not change the way you think about configuration. Rather, you use the CDM REST API and user interface to map your existing JSON, YAML, INI, XML, and other config data into an intuitive data structure that provides the following benefits:

- Implements rigorous and transparent version and change control.
- Enables you to encrypt sensitive data and ensures appropriate access control for the data.
- Enables automated validation of config data.
- Enables you to reuse config data structures by using variables, including values, and overlaying values.

## Structure of the CDM data model

An application in CDM is the full collection of config data for an application service, application model, or dynamic CI group [infrastructure] in the CMDB. The CDM user creates an application record that includes the following empty folders in a standard hierarchical structure. After the system ingests your existing config data, you structure the data into components in the appropriate folder. You create collections of the components and then combine the collections into a deployable — a config dataset (for a development, test, or production environment) that can be deployed by your delivery process. Each component, collection, variable, and deployable is a node in the structure.

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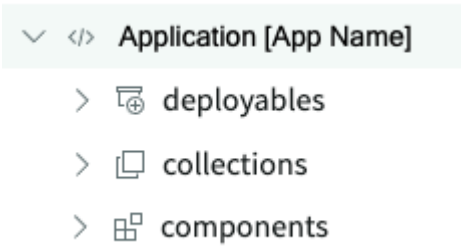


**Components**

Components are the building blocks that typically represent the config data for a logical element of an application or a part of an infrastructure service. For example, a monolithic app, a micro-service, a physical server, or a Docker template.

A component can include descendent components, either direct or included. A component can include variables that can take on different values in collections and deployables.

You can group components into a library of shared components.

> **Tip:**
> It is often useful to define a default value for a variable in a component or collection. This is a powerful strategy because you can create a broad variety of deployables from a small set of components and collections. Deployables that inherit a component or collection can use overrides, overlays, and variable settings to meet the needs of the environment type. For example, the `Development` deployable can use the same components and collections as the `Test` deployable. `Development` uses the default *`database`* variable value. `Test`, in contrast, uses a different value that is appropriate for the test environment.

**Components Vars folder**

The components **Vars** folder can contain variables that any CDI in the **Components** folder can use. There is only one components **Vars** folder.

**Collections**

A collection is the set of components that together define a release — You can think of a collection as a release composition.

A collection can include variable or override settings that are specific to the particular version. For example, the VM config data used in release-1 is different from the data used in release-2. release-1 might use the value 2Gb for the *`memory`* setting (`"memory": "2Gb"`) and release-2 might specify a different value (`"memory": "4Gb"`). In addition, a collection might include config settings that do not appear in its components. Such values are called overlays.

A collection might represent a particular version of an application, localization, or feature set. For example, a collection named `collection-2` might include the set of components or component versions that represent the `Release 2.0` functionality for the application. In contrast, a collection named `collection-3` that represents the `Release 3.0` functionality might include the same set of components or component versions, additional components or component versions, and other variable, override, and overlay settings.

**Collections Vars folder**

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The collection **Vars** folder can contain variables that any CDI in the **Collections** folder can use. Each collection has one collection **Vars** folder. A collection variable has higher precedence than a component variable.

**Deployables**

You add and configure deployables in the data structure. A deployable is a config dataset (for a DEV, TEST, or PROD environment) that can be deployed by your delivery process. Each deployable in an application represents the configuration of a service in the CMDB.

A deployable is made up of the collection or set of collections that define the release for a particular environment. The combination of collections+environment link to an application service in the CMDB or to an infrastructure service.

A deployable can include variable or override settings that are specific to the environment. For example, the `database` variable has one value in the development environment and a different value in the production environment. An override value in the production deployable might specify a required container parameter that is not needed in the development environment.

An example deployable named `DEV-2` would include the `collection-2` collection and would specify variable, override, and overlay settings that are specific to the development environment for release 2.0. In contrast, the deployable named `PROD-2` would also include the `collection-2` collection but, instead, would specify settings that are specific to the production environment for release 2.0.

When you are happy with a changeset, you can save and commit the changes. The system checks for conflicts with the committed changesets of other users. If there are no conflicts, the system persists the changes and then generates a snapshot of every deployable that is affected by the changes. A snapshot represents a potential exportable config data set. The system validates config data by executing policies against each snapshot and returning the validation results.

**Deployable Vars folder**

The deployable **Vars** folder can contain variables that any CDI in the **Deployables** folder can use. Each deployable has one deployable **Vars** folder. A deployable variable has higher precedence than a collection variable.

## Example

In the following diagram of the example BookStore application, the numbers identify the relationships among components, collections, and deployables.

1. Components are grouped to form collections that represent environments or versions of environments. The FS2 (feature set 2) collection has config data for Core version 2 of the application that is currently being developed and tested. FS1, in contrast, holds the earlier Core version 1 that has been thoroughly tested and is currently running the application in the production environment.
2. In the example, both FS2 (the collection that is used in test environments) and FS1 (the collection that is used in the production environment) use config data for both *S3* and a particular *`VM template`*. Both the FS1 and FS2 collections, therefore, inherit these two components. Because the collections represent different feature sets, it is probably the case that FS1 and FS2 use variables or overrides to specify a few different settings for the components.
3. Each deployable includes the collection that is appropriate for its environment (development, test, or production). In the example, the TEST deployable uses the FS2 collection, the newer

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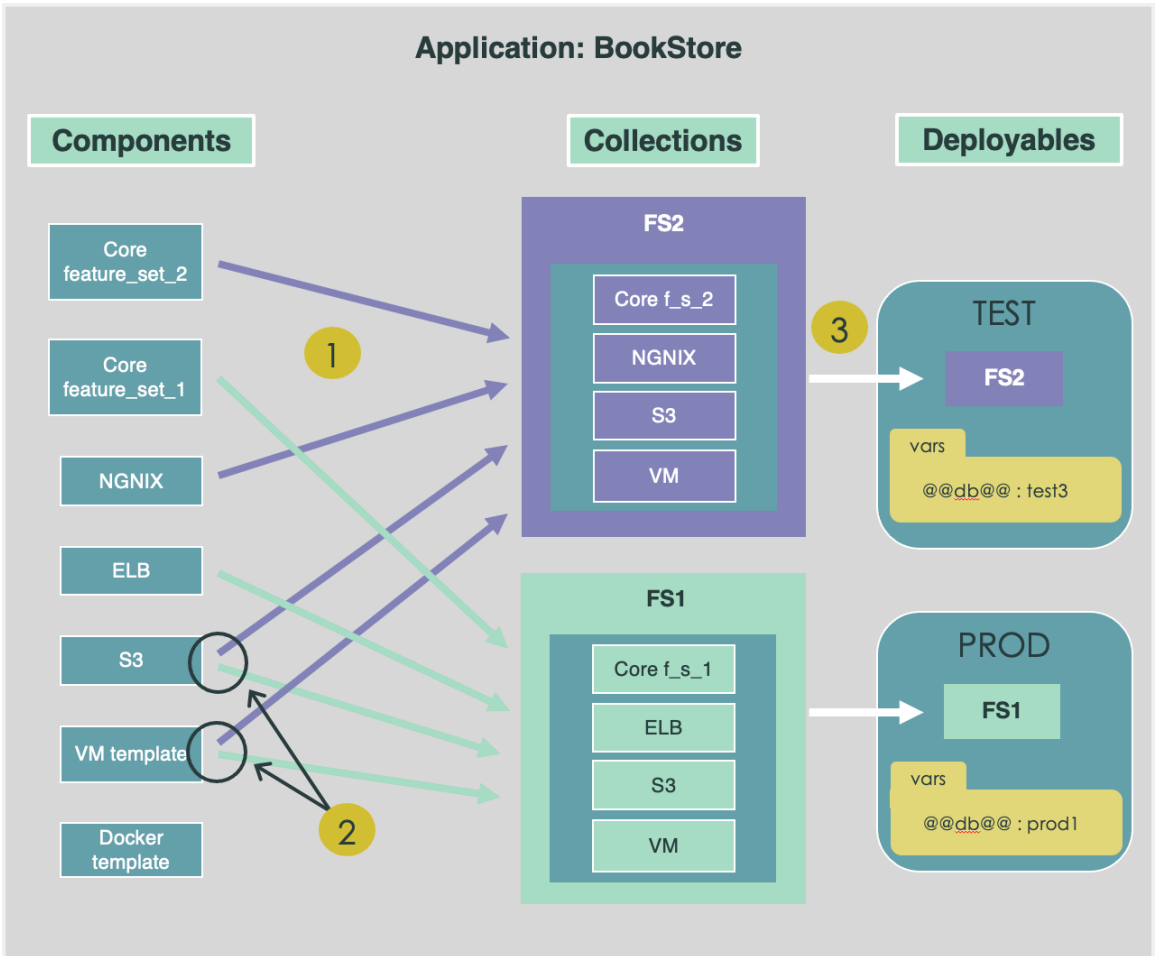
version of the feature set and other config settings that is used in test environments. The PROD deployable, in contrast, uses FS1 in the production environment. FS1 is the earlier version of the collection of config data that had been validated for production.

In each deployable, variables are set to values that are appropriate for the environment. For example, in PROD, the *`database`* variable is set to `prod1` (the production database). The TEST deployable, however, specifies one of the databases that is used by the testing team, `test3`.

This diagram is simplified. In your implementation, deployables can include multiple collections, variable and override settings, and overlay settings (settings that do not appear in the components and collections that make up the deployable). In addition, you might have several deployables for each environment type.




## Definitions

### CDI

A config data item (CDI) is simple a key-value node.

### Variable

A variable is a key-value item that can be referenced within a CDI.

### Parent nodes and child (leaf) nodes

- CDIs and variables are key-value items. CDIs and variables can only be child nodes.
- Components, collections, deployables, and folders nodes can be parent nodes—nodes that can have key-value items or other parent nodes.

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**Note:**

Starting with Configuration Data Management version 4.2, you can define a node using any UTF-8 character, including the forward slash (/).

**Name path**

The name path is the complete folder path of the selected node in the list. In REST API, you can provide name path in array in the following formats:

- Backslash format: For example - testApp/deployables/Development1/cdi1

  **Note:**
  If your node name contains a backslash ("/"), you can't use this format.

- Backend name path with replacement characters: For example - testApp#deployables#Development1#cdi1
- Array: For example - ['testApp','deployables','Development1','cdi1']

**Components**

Components are the building blocks that typically represent the config data for a logical element of an application or a part of an infrastructure service. For example, a monolithic app, a micro-service, a physical server, or a Docker template.

A component can contain variables that can take on different values in collections and deployables. More detailed instructions appear in Define or update a component.

**Collections**

A collection is the set of components that together define a release — You can think of a collection as a release composition.

A collection can contain variable or override settings that are specific to the particular version. For example, the VM config data used in release-1 is different from the data used in release-2. release-1 might use the value 2Gb for the *memory* setting (`"memory": "2Gb"`) and release-2 might specify a different value (`"memory": "4Gb"`). In addition, a collection might include config settings that do not appear in its components. You might think of such values as "overlays".

**Deployables**

A deployable is a config dataset (for a development, test, or production environment) that can be deployed into your CI/CD pipeline as a service. Each deployable in an application configures a service in the CMDB. For example, you might create three deployables, one for each environment type: Development, Test, and Production.

A deployable is made up of the collection or set of collections that define the release for a particular environment. The combination of collections+environment link to an application service in the CMDB or an infrastructure service.

A deployable can contain variable or override settings that are specific to the environment. For example, the `database` variable has one value in the development environment and a different value in the production environment. An override value in the production deployable might specify a required container parameter that is not needed in the development environment.

**Changesets and Snapshots**

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When you commit changes to a CDM application, the system persists the changes as a changeset of the application. The system then also generates a snapshot of every deployable that is affected by the changes. A snapshot represents a potential exportable config data set. The system validates config data by executing policies against each snapshot and returning the validation results. Snapshots that pass validation and that are published can be exported to the release pipeline as config data.

**Shared components and Component libraries**

Shared components in Configuration Data Management enables you to use a component across several applications.

For better organization, these shared components are managed in Component libraries. These component libraries improve consistency and maintainability by ensuring a single source of truth for a component's config data across applications.

**File nodes**

A file node is created when you attach a file to the config data model of a CDM app or a component library. It contains a link to the attached file. Using file nodes, you can attach files of any MIME type supported on ServiceNow AI Platform.

**Related topics**

Preparing an application for config data upload

Create and update a deployable

### Contextual variables for config data

Contextual variables are out-of-the-box variables delivered by ServiceNow that enable you to use the context of a node to define a variable.

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

For example: CollectionA has defined these variables:

- "environment": "(#DEPLOYABLE.ENVIRONMENT_TYPE#)"
- "deployable": "(#DEPLOYABLE.NAME#)"

When you add the collection to a deployable, these variables are set to the values defined in the context, which would be the environment type and name of the deployable for CollectionA.

The available out-of-the-box contextual variables are:

**Contextual Variables**

| Variable | Description |
|---|---|
| NAME | Name of the node. |
| APPLICATION.NAME | Name of the application. |
| DEPLOYABLE.NAME | Name of the deployable. |
| DEPLOYABLE.ENVIRONMENT_TYPE | Environment type of the deployable. |
| COLLECTION.NAME | Name of the collection. |

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**Contextual Variables (continued)**

| Variable | Description |
|---|---|
| FULL_PATH | The full file path of the collection. |
| RELATIVE_PATH | The file path of the collection, relative to the deployable. |
| RELATIVE_PARENT_PATH | The file path of the parent to the node. |

## APIs and DevOps Config

You can use DevOps Config and CDM APIs to access your config data.

**Important:**
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### DevOps Config

#### DevOps Config API

Manage your application lifecycle, using delete, get, patch, and post operations.

### CDM

#### CdmApplicationsApi

Upload configuration data to the component, collection, deployable, and component variable folders found in the DevOps Config Workspace UI. Export deployable configuration data to your DevOps pipeline and manage shared components and shared applications.

#### CdmChangesetsApi

Manage your changesets, including:

- Create new changesets.
- Deploy changesets.
- Retrieve lists of or individual changesets.
- Retrieve node changes within a changeset.
- Retrieve a list of applications or deployables impacted by a changeset.
- Delete changesets.
- Return a list of shared components associated with a specified changeset.

#### CdmEditorApi

Create nodes, update nodes, include existing nodes under other nodes, delete nodes, and retrieve nodes and node includes.

#### CdmPoliciesApi

Manage policy mappings of deployables in CDM. Policies that are properly mapped to a deployable are executed when a snapshot of the deployable is validated.

#### CdmSharedLibraryApi

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Create and manage shared libraries and shared components. Upload and export the configuration data of a shared component.

**CdmSnapshotApi**

Publish, unpublish, and revalidate snapshots in CDM.

**CdmVersionApi**

Publish, unpublish, and export versions (snapshots) in CDM for shared components under shared libraries.

## DevOps Config roles

DevOps Config uses these roles.

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| Role title [name] | Description | Contains Roles |
|---|---|---|
| [sn_devops.app_admin] | DevOps Config app admin<br><br>Can create/read/update/delete DevOps Config apps. | None |
| [sn_devops_config.viewer] | DevOps Config viewer<br><br>Has read-only access in DevOps Config. | sn_cdm.cdm_viewer |
| [sn_devops_config.editor] | DevOps Config editor<br><br>Can manage config data, create/commit changesets, and publish/unpublish snapshots. | • sn_devops_config.viewer<br>• sn_cdm.cdm_editor |
| [sn_devops_config.secrets] | DevOps Config secrets<br><br>Able to manage encrypted config data within an application. | sn_cdm.cdm_secrets |
| [sn_devops_config.admin] | DevOps Config admin<br><br>Has editor role permissions plus ability to manage policies and exporters, and applications. | • sn_devops.app_admin<br>• sn_devops_config.editor<br>• sn_cdm.cdm_admin |

### Roles in CDM

List of roles and permissions in CDM.

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**Important:**
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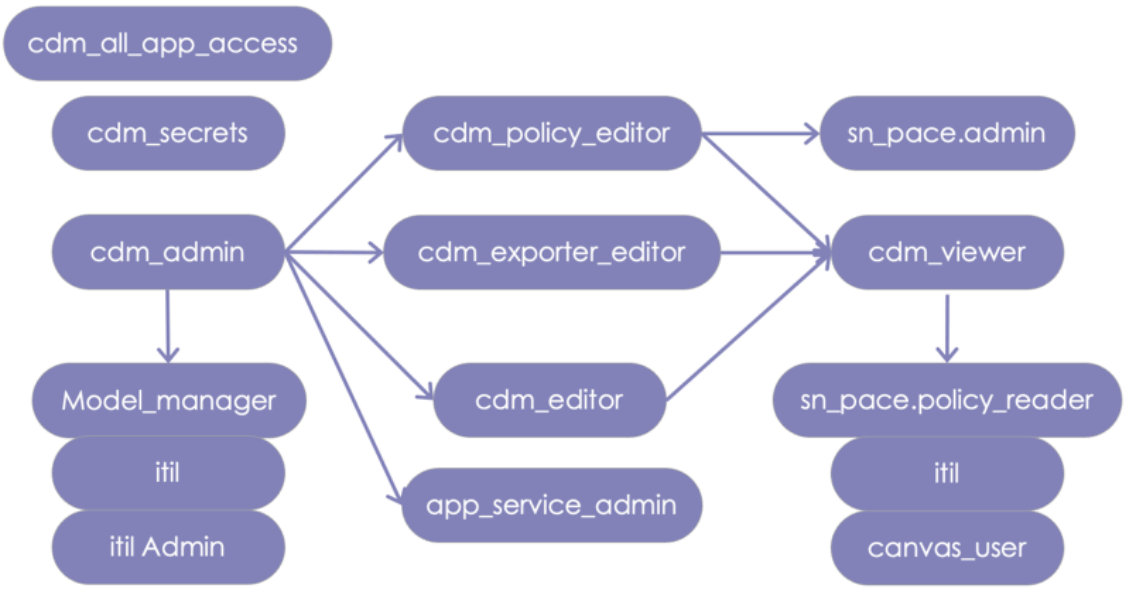
## CDM roles




| Role title [name] | Permissions | Contains roles |
|---|---|---|
| CDM Viewer [sn_cdm.cdm_viewer] | • Read config data from any application that they have access to (governed through user groups that are set by the **Maintained by** property).<br>• View the list and content of component libraries as well as the shared components contained within them.<br>• View the list and content of changesets.<br>• View the list and content of snapshots and validation results.<br>• Export snapshots.<br>• View exporters.<br>• View policies and policy mappings.<br>• View the Investigate page for a change request (CHG) on the Service Operations Workspace. | • [sn_pace.policy_reader]<br>• [itil]<br>• [canvas_user] |

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| Role title [name] | Permissions | Contains roles |
| --- | --- | --- |
| | **Note:** If the **Maintained by** group is set at the application level to view config data, then this user must be a member of the group. | |
| Event Management user [evt_mgmt_user] | • View the contents of the snapshots.<br>• View the Investigate page for a change request (CHG) on the Service Operations Workspace.<br>• View snapshots, nodes, and changesets, regardless of whether this user is a member of **Maintained by** groups set at the application level. | itil |
| CDM Editor [sn_cdm.cdm_editor] | • Create/update/delete config data within components and collections, including variables, overrides, and includes.<br>• Create and commit changesets.<br>• Validate snapshots.<br>• Publish and unpublish snapshots.<br>• Create, update, and delete config data withing CDM applications.<br>• Add and manage component libraries.<br>• Add and delete shared components in a component library. | cdm_viewer |

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| Role title [name] | Permissions | Contains roles |
|---|---|---|
| | **Note:** The cdm_editor role doesn't grant permission to create/update/delete an application and its deployables, or to change the **Enforce validation** setting on deployables.<br><br>If the **Maintained by** group is set at the application level to view config data, then this user must be a member of the group. | |
| CDM Exporter Editor [sn_cdm.cdm_exporter_editor] | Create/update/delete exporters. | cdm_viewer |
| CDM Policy Editor [sn_cdm.cdm_policy_editor] | • Create/update/delete policies.<br>• Map policies to deployables. | • cdm_viewer<br>• [sn_pace.admin] |
| CDM Secrets [sn_cdm.cdm_secrets] | • Read and export encrypted data (when granted to a user with the cdm_viewer role).<br>• Permanently encrypt / decrypt data (when granted to a user with the cdm_editor role).<br>• Edit encrypted data (when granted to a user with the cdm_editor role).<br><br>**Note:** The cdm_secrets role is effective only with the cdm_viewer, cdm_editor, or cdm_admin role. | None |
| Application Service Admin [sn_cdm.app_service_admin] | Enables the CDM Admin to create an application service. | None |

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| Role title [name] | Permissions | Contains roles |
|---|---|---|
| CDM Admin [sn_cdm.cdm_admin] | • Create/update/delete applications.<br>• Create/update/delete deployables.<br>• Create/update/delete config data.<br>• Change settings on deployables to enforce snapshot validation. | • cdm_editor<br>• cdm_exporter_editor<br>• cdm_policy_editor<br>• app_service_admin<br>• Model_manager (for create/update/delete of application model)<br>• [itil] (for create/update/delete of SDLC components)<br>• [itil admin] |
| CDM All App Access [sn_cdm.cdm_all_app_access] | **Note:** The cdm_all_app_access role is effective only with the cdm_admin, cdm_editor, or cdm_viewer roles.<br>• Users with the cdm_all_app_access and cdm_admin role can update or delete an application or shared component library regardless of whether they're a member of the user groups that maintain the application (**Maintained by** field) or library (**Authoring groups** field).<br>• Users with the cdm_all_app_access and cdm_editor role can edit an application or shared component library regardless of being a member of any of the user groups that maintain the application or library.<br>• Users with the cdm_all_app_access and cdm_viewer role can view an application regardless of being a member of any of the user groups that maintain the application. | None |

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## How encrypted data is handled

By default, encrypted values appear in all views as `*******`. Only users with the CDM Secrets [sn_cdm.cdm_secrets] role can view, create, update, and delete encrypted values in config data. The system validates and exports encrypted data appropriately.

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

## Permissions of users with the CDM Secrets [sn_cdm.cdm_secrets] role

- Encrypted values appear in all views as `*******` by default.
- Select the **View encrypted data** menu option to display encrypted values in any view.
- Validate and export a snapshot that includes encrypted data. All exported data is readable by the CI/CD pipeline apps.
- Create, update, delete abilities:
  - View an encrypted value.
  - Edit an encrypted value.
  - While creating a CDI, specify that the value should be encrypted.
  - Permanently encrypt a value that is currently not encrypted.
  - Permanently decrypt a value that is currently encrypted.
  - Delete a CDI that has an encrypted value.

## Permissions of all other users

- Encrypted values always appear in all views as `*******`.
- Request manual validation of snapshots that include encrypted data.
- Delete encrypted values in config data.
- Cannot view, create, or update encrypted values in config data.
- Cannot export a snapshot that includes encrypted data.

## Domain separation and DevOps Config

Domain separation is unsupported for DevOps Config. Domain separation enables you to separate data, processes, and administrative tasks into logical groupings called domains. You can control several aspects of this separation, including which users can see and access data.

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

## Support level: No support

- The domain field may exist on data tables but there is no business logic to manage the data.
- This level is not considered domain-separated.

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For more information on support levels, see Application support for domain separation.

## DevOps Config Domain Separation overview

The DevOps Config application validates and manages the configuration data of your enterprise applications across every stage of the DevOps pipeline. Domain separation is supported at the data segregation layer only.

**Related topics**

Domain separation for service providers

### Domain separation and CDM

Domain separation is supported for CDM. Domain separation enables you to separate data, processes, and administrative tasks into logical groupings called domains. You can control several aspects of this separation, including which users can see and access data.

**Important:**
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## Support level: Basic

- Business logic: Ensure that data goes into the proper domain for the application's service provider use cases.
- The application supports domain separation at run time. The domain separation includes separation from the user interface, cache keys, reporting, rollups, and aggregations.
- The owner of the instance must set up the application to function across multiple tenants.

Sample use case: When a service provider (SP) uses chat to respond to a tenant-customer's message, the customer must be able to see the SP's response.

For more information on support levels, see Application support for domain separation.

## CDM Domain Separation overview

Domain separation for CDM means that only a user in the application's domain or parent domain can access the data. All functionality for CDM works in a domain-separated environment as long as all of the following actions are performed by users within that domain:

- Create application
- Create/upload config data
- Commit changeset
- Create snapshots
- Validate snapshots
- Map policies
- Export snapshots

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## How domain separation works in CDM

To set up domain separation for CDM:

1. Create your domain and then create CDM users in that domain.
2. Only a specified user (CDM admin in that domain) should populate config data in the application's domain.
3. Only users in the application's domain should upload or create data in the domain.

Follow these guidelines for successful domain separation:

- Create a separate user for each domain to perform upload, edit, or export of config data.
- Only users in the application's domain should upload or create data in the domain.
- Avoid uploading or creating config data for a given application in multiple domains.
- Policies and exporters must be either in the application's domain or in the global domain.

## Domain-separated tables in CDM

CDM tables include a **Domain** column.

- sn_cdm_application
- sn_cdm_changeset
- sn_cdm_deployable
- sn_cdm_exporter
- sn_cdm_exporter_execution
- sn_cdm_exporter_execution_log
- sn_cdm_exporter_version
- sn_cdm_exporter_version_argument
- sn_cdm_node
- sn_cdm_node_main
- sn_cdm_pace_policy_mapping
- sn_cdm_restricted_groups
- sn_cdm_snapshot

### Related topics

Domain separation for service providers

## Default DevOps Config policies

The DevOps Config Policy content pack contains a set of default DevOps Config policies to validate your configuration data.

**Important:**
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Select a category to view the DevOps Config policies available within the category.

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| Generic | Kubernetes |
| --- | --- |
|  |  |
| **Red Hat OpenShift** | |
|  | |

### Generic policies in DevOps Config

By default, the DevOps Config Policy content pack contains a set of generic policies to validate your configuration data.

**Important:**
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You can use or customize these default DevOps Config policies to validate that your configuration data content is conformable, or administrate the full life cycle of PaCE policies.

**Note:**
You can't modify the default policies. However, you can make a copy of the policy and customize your copy.

**First-letter navigation for policies on this page**

A | C | D | F | G | K | L | M | N | S | U

## All Key-Value Comparator (allKeysValuesComparator)

Checks whether all the key-value combinations of any additional deployables are the same as the main deployable.

Results into a non-compliant status for the following conditions:

- When a key is present in the main deployable but not in the additional deployables.
- When a key is present in the additional deployables but not in the main deployable.
- When a key is present in both the main and additional deployables but with different values

Use case: Detect any configuration drifts between staging and production environments.

**Input arguments**

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- additionalDeployablesInput
  - A list of additional deployables to be compared with the main deployable.
  - Type: List
  - Mandatory: True
- includeNodes
  - A boolean value to indicate whether to include nodes other than the config data items (CDI) for the validation.
  - Default: `False`
  - Type: True | False
  - Mandatory: False
- exceptionList
  - A comma-separated list of key names that should be ignored during comparison.
  - Type: String
  - Mandatory: False

## Authorized Email Domains (authorizedEmailDomains)

Checks whether an email domain value that is identified based on a regular expression are included in the authorized email domain list.

Results into a non-compliant status when an email domain isn't an authorized domain.

Use case: Prevent (sensitive) data from leaving a trusted company email domain.

**Input arguments**

- authorizedDomains
  - A comma-separated list of authorized email domains.
  - Example:

    ```
    gmail.com,servicenow.com
    ```

  - Type: String
  - Mandatory: True
- exceptionList
  - A comma-separated list of key names that are ignored by the policy.
  - Type: String
  - Mandatory: False

## Authorized Hosts in URLs (authorisedHostsInURLS)

Checks whether the format of the host component of the URL values in a snapshot are authorized.

Results into a non-compliant status when the URL values in a snapshot aren't according to the format specified for the host component.

Use case: Prevent exposure of (sensitive) data through unauthorized URLs.

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**Input arguments**

- authorizedHostsRegex
  - A comma-separated list of regular expressions used for validating the host component in URLs.
  - Example:

    ```
    notpresent$,code.devsnc+,mydomain.com
    ```

  - Type: String
  - Mandatory: True
- exceptionList
  - A comma-separated list of key names that are ignored by the policy.
  - Type: String
  - Mandatory: False

## Authorized Key-Value Combinations (authorisedKVCombinations)

Checks whether the input key values found in a snapshot are authorized.

Results into a non-complaint status when a key has an unauthorized value.

**Input arguments**

- authorisedList
  - A JSON list of keys with a list of authorized string values for each key.
  - Example:

    ```
    {

     "image":"k8s.example.io,gke.example.io,docker.examp
    le.com:8444",
      "domain":"example.service-now.com"
    }
    ```

  - Type: JSON
  - Mandatory: True
- caseSensitive
  - A boolean value to indicate whether the authorized keys and their key values used for the validation are case-sensitive.
  - Default value: `False`
  - Type: True | False
  - Mandatory: False

## Authorized Ports Range (authorisedPortsRange)

Checks whether the input port values found in a snapshot are authorized.

Results into a non-complaint status when a port value is not in the acceptable range.

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Use case: Check that port names are within the acceptable range for the environment in which they're used. The policy can be used for any range value check, not just port numbers. For example, to check that all the parameters defining a heap size are within the appropriate range.

**Input arguments**

- keysRegexWithRange
  - A JSON list of port keys and port range with the minimum and maximum values. A key is identified as a port when the key matches the regular expressions specified in the input.
  - Example:

```
{
  "^web_port$": "5000-5003",
  "env.db.port": "10000-65535"
}
```

  - Type: JSON
  - Mandatory: True
- exceptionList
  - A comma-separated list of key names that are ignored by the policy.
  - Type: String
  - Mandatory: False

## Certificate Validator (certificateValidator)

Checks whether certificates exist in a snapshot and whether the certificates have expired or are going to expire within the expiration period.

Results into a non-compliant status when the `expiration-date` key or the `certificate` key with the PEM-encoded format value in a snapshot has expired or will expire within the expiration period. The expiration period is calculated from the date on which the policy is executed plus the expiration days.

**Input arguments**

- certificatesNode
  - The name of the node that contains the certificates.
  - Default value: `certificates`
  - Type: String
  - Mandatory: True
- expirationDays
  - The number of days to calculate the expiration period for the certificates. The expiration period is calculated from the date on which the policy is executed plus the expiration days.
  - Type: Integer
  - Mandatory: False
- exceptionList

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- A comma-separated list of certificate names that are ignored by the policy.
- Type: String
- Mandatory: False

### Consistent Nodes Comparator (consistentNodesComparator)

Checks whether all the key-value combinations are the same for every first-level node in a snapshot.

Results into a non-complaint status when any two first-level nodes in a snapshot have different key-value combinations.

Use case: When all the nodes in a snapshot are a group of devices or virtual machines (VMs), they have the same configuration.

**Input argument**

exceptionList

- A comma-separated list of nodes or key-value combinations to be excluded from the validation.
- Type: String
- Mandatory: False

### Correct Host Regex (correctHostRegex)

Checks the format for host-related keys to ensure that a host name is authorized to use.

Results into a non-complaint status when a key with a URL value in a snapshot doesn't match the regular expression provided for the authorized hosts.

**Input arguments**

- authorizedHostRegex
  - A regular expression used for validating the host component in the URLs.
  - Example:

    ```
    mydomain.com
    ```

  - Type: String
  - Mandatory: True
- exceptionList
  - A comma-separated list of keys with the URL values to be excluded from the comparison.
  - Type: String
  - Mandatory: False

### Detect Unused Variables (detectUnusedVariables)

Checks whether the `vars` folder of a deployable or a collection includes variables that are not used in a snapshot.

Results into a warning when a variable is declared but not used in a snapshot.

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### Different Key Names Same Values (differentKeyNamesSameValues)

Checks whether the values are the same for key pairs.

Results into a non-compliant status when the specified key pairs do not have the same value.

Use case: Obtain a finer grained control of conditions by checking that the values are the same for different keys.

**Input argument**

keyPairs

- An array of key pairs that should have the same values. A key pair should have different keys and should not consist of a single key (`[key1`) or more than two keys (`[key1=key2=key3]`).
- Example:

```
["key1=key3","key2=key4"]
```

- Type: Array of strings
- Mandatory: True

### Different Values Nodes Comparator (differentValuesNodesComparator)

Checks whether the key value is different across all components when a key exists in multiple components of a snapshot.

Results into a non-compliant status when a key has the same value in multiple components.

**Note:**
If a key has multiple occurrences inside the same component, use the Unique Key Value (uniqueKeyValue) policy.

**Input argument**

keynameList

- A comma-separated list of key names that should have different values for first-level nodes.
- Example:

```
key1,key2
```

- Type: String
- Mandatory: True

### Docker Image Format Validator (dockerImageFormatValidator)

Checks whether the docker image of a service follows the regex as specified in the input. For example, provide a regex value to ensure the tagging and versioning of docker images follow best practices.

Results into a non-compliant status when the image value does not match the regex input value in the `imageExpectedRegex` input argument.

**Input arguments**

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- imageExpectedRegex
  - A regex value for a docker image.

    Example input value to ensure that the tag of an image is an alphanumeric value:

    ```
    ^.*:([0-9]+.?)+([-_]{1}[A-Za-z0-9.]+)?$
    ```

  - Type: String
  - Mandatory: True
- serviceExceptionList
  - A comma-separated list of services that are exempted from the validation.
  - Type: String
  - Mandatory: False

## Docker Image Registry Validator (dockerImageRegistryValidator)

Checks whether the registry of a docker image is included in the authorized list of registries.

Parses the docker image for each service, fetches the value of a registry in an image, and then checks whether the fetched registry value is included in the *`authorizedRegistryList`* input.

Results into a non-compliant status when the image registry is not in the *`authorizedRegistryList`* input.

**Input argument**

authorizedRegistryList

- A comma-separated list of registries.

  Example:

  ```
  k8s.example.io,gke.example.io,docker.example.com:8444
  ```

- Type: String
- Mandatory: True

## Docker Network Validator (dockerNetworkValidator)

Checks whether the network for a docker service is defined in the network sections.

Results into a non-compliant status when the network for a service is not defined in the top-level network section or the network for a service configured in the *`labels/com.docker.lb.network`* property is not defined in the service-level section and the top-level network section.

## Duplicate Values (duplicateValues)

Checks for duplicate values within a snapshot.

Results into a non-compliant status when there are duplicate key values in a snapshot except for the values defined in the exception list.

Use case: Obtain a finer-grained control of conditions by checking that snapshot values are different.

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**Input arguments**

- includePath
  - A boolean value to indicate whether to include the full path of the node in the output.
  - Default value: `True`
  - Type: True | False
  - Mandatory: True
- pathSeparator
  - A string to indicate the path separator for nodes.
  - Default value: `/`
  - Type: String
  - Mandatory: True
- exceptionList
  - An array of strings to be excluded from the validation.
  - Default value: `["true", "false", "yes", "no", "enabled", "disabled"]`
  - Type: Array of strings
  - Mandatory: False

## Forbidden Key-Value Combinations (forbiddenKVcombinations)

Checks whether there are any forbidden key-value combinations in a snapshot.

Results into a non-complaint status when any key found in a snapshot has a forbidden value as specified in the input list.

**Input argument**

forbiddenKV

- A JSON list of keys with a list of forbidden values for each key.
- Example:

```
{
  "username":"root,admin",
   "password":"qwerty123"
}
```

- Type: JSON
- Mandatory: True

## Generic List Validator (genericListValidator)

Compares the key values of a snapshot with the list of values provided in the input. The key value might be a string, a list of comma-separated strings, an array of strings, or an object. When the key value is an object, the keys of the object are used in the comparison.

Note the following points for the policy compliance:

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- When the operator is `IN`, the policy is compliant when all the strings in the key value are included in the input list.
- When the operator is `EQUALS`, the policy is compliant when all the strings in the key value match all the strings, listed in any order, in the input list.
- When the operator is `CONTAINS`, the policy is compliant when the key value contains all the strings in the input list.
- When the operator is `NOT CONTAINS`, the policy is compliant when none of the strings in the key value exist in the input list.

**Input arguments**

- keysToValidateObject
  - An array of objects where each object contains a key path, an operator, and a reference list.
  - Allowed operators are `IN`, `CONTAINS`, `NOT CONTAINS`, and `EQUALS`.
  - Example input value to enforce that a user defined in the system `/root/user path` is either `user1` or `user2`:

```
[
  {
   keyPath: ["system", “root”, "user"]

   operator: "IN"

   referenceList: [user1, user2]

   }
]
```

  - Default value: `[ ]`
  - Type: Array of objects
  - Mandatory: True
- caseSensitive
  - A boolean value to indicate whether the list comparison should be case-sensitive.
  - Default value: `True`
  - Type: True | False
  - Mandatory: False

## Generic Validator (genericValidator)

Checks whether the value of a key is valid based on the operator and reference input value.

Note the following points for the policy compliance:

- When the operator is `=` or `==`, the policy is compliant when the key value matches with the reference input value.
- When the operator is `<`, the policy is compliant when the key value is less than the reference input value.

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- When the operator is `>`, the policy is compliant when the key value is greater than the reference input value.
- When the operator is `<=`, the policy is compliant when the key value is less than or equal to the reference input value.
- When the operator is `>=`, the policy is compliant when the key value is greater than or equal to the reference input value.
- When the operator is `!=` or `<>`, the policy is compliant when the key value does not match the reference input value.
- When the operator is `IN`, the policy is compliant when the key value is included in the reference input list.
- When the operator is `NOT IN`, the policy is compliant when the key value is not included in the reference input list.
- When the operator is `CONTAINS`, the policy is compliant when the key value contains the reference input value.
- When the operator is `NOT CONTAINS`, the policy is compliant when the key value does not contain the reference input value.
- When the operator is `REGEX`, the policy is compliant when the key value matches the regular expression pattern as specified in the reference input value.

**Input arguments**

- keysToValidate
  - An array of objects where each object contains a key, an operator, and a reference value.
  - Allowed operators are `<`, `<=`, `>`, `>=`, `=` or `==`, `<>` or `!=`, RANGE, `CONTAINS`, `NOT CONTAINS`, `IN`, `NOT IN`, and `REGEX`.
  - Example:

```
[
      {
        "key": "webport-KO",
        "operator": "RANGE",
        "refValue": "8000-9000"
      },
      {
        "key": "webport-OK",
        "operator": ">=",
        "refValue": 8000
      },
      {
        "key": "fqdn-OK",
        "operator": "REGEX",
        "refValue":
 ".francecentral.cloudapp.azure.com$"
      },
      {
        "key": "trace_level-KO",
        "operator": "IN",
        "refValue": "INFO,ERROR,FATAL"
      },
      {
        "key": "trace_level-KO",
```

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```
        "operator": "NOT IN",
        "refValue": "DEBUG,VERBOSE"
      },
      {
        "key": "trace-KO-ifcasesensitive",
        "operator": "CONTAINS",
        "refValue": "ERROR"
      }
    ]
```

  - Type: String
  - Mandatory: True
- caseSensitive
  - A boolean value to indicate whether the list comparison should be case-sensitive.
  - Default value: `True`
  - Type: True | False
  - Mandatory: False

### Key Existence Comparator (keyExistenceComparator)

Checks whether all the keys from a main deployable also exist in the additional deployables provided in the input.

Results into a non-compliant status if a key is present in the main deployable but not in the additional deployables.

Use case: Compare your environment variables and check that they're consistent.

**Input arguments**

- additionalDeployablesInput
  - A list of additional deployables to be compared with the main deployable.
  - Type: List
  - Mandatory: True
- includeNodes
  - A boolean value to indicate whether to include child nodes of deployables during comparison.
  - Default value: `False`
  - Type: True | False
  - Mandatory: False
- caseSensitive
  - A boolean value to indicate whether the key comparison is case-sensitive.
  - Default value: `False`
  - Type: True | False
  - Mandatory: False
- exceptionList

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- A comma-separated list of key names that should be ignored during comparison.
- Type: String
- Mandatory: False

### Key Naming Convention (keyNamingConvention)

Checks whether key names follow a given naming pattern.

Results into a non-complaint status when keys don't follow the prefix-suffix naming pattern as specified in the input arguments.

**Input arguments**

- maxLength
  - An integer value indicating the maximum length for a key name.
  - Type: Integer
  - Mandatory: False
- approvedPrefixArray
  - An array of strings that indicate approved prefixes for a key name.
  - Type: Array of strings
  - Mandatory: False
- includePath
  - A boolean value to indicate whether to include the full path of the node in the output.
  - Default value: `True`
  - Type: True | False
  - Mandatory: True
- approvedSuffixArray
  - An array of strings that indicate approved suffixes for a key name.
  - Type: Array of strings
  - Mandatory: False
- exceptionList
  - A comma-separated list of keys to be excluded from validation.
  - Type: String
  - Mandatory: False

### Key Path Validator (keyPathValidator)

Checks whether a key for the specified key path is found in a snapshot, and if found, the value of the key is valid based on the operator value and reference input value.

Results into a non-complaint status when the key for the specified key path has an invalid value. In addition, if the `ignoreIfNotFound` input argument is `False`, results into a non-complaint status when the key path specified in the input argument is not found in a snapshot.

**Input arguments**

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- pathAndDesiredValues
  - A JSON object that contains a set of keys and a mapping of condition and value the keys must have.
  - Example:

```
{
    "release-1.0/paymentService-V1.0/integerValues":
 ["<","3"],

 "release-1.0/paymentService-V1.0/database/dbPort":
 [">","8000"]
}
```

  - Type: JSON
  - Mandatory: True
- pathSeparator
  - A string to indicate the path separator for nodes.
  - Default value: `/`
  - Type: String
  - Mandatory: True
- ignoreIfNotFound
  - A boolean value to indicate whether the key for the specified key path should exist in a snapshot.
  - Default value: `True`
  - Type: True | False
  - Mandatory: False

## Key Value Substring Check (keyValueSubstringCheck)

Checks for the specified substring in a snapshot value for a specified key name.

Results into a non-complaint status when the value of a key name does not contain the substring as specified in the input argument.

**Input argument**

keyNameWithKeyValues

- A JSON object that contains a required substring set including key name substring, and key value substring pairs.
- Example:

```
{
  "live": "2022"
  "environment": "aws"
}
```

- Type: JSON
- Mandatory: True

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## List Comparator (listComparator)

Checks whether any two keys have the same values by comparing the list of values between the two keys. The comparison is case insensitive.

Results into a non-compliant status when all the list of values in the first key match all the values, listed in any order, in the second key.

**Input arguments**

- list1Node
  - The key name of the primary node.
  - Type: String
  - Mandatory: True
- list2Node
  - A key name of the node to be compared with the primary node.
  - Type: String
  - Mandatory: True

## Mandatory Keys (mandatoryKeys)

Checks whether the list of key names specified in the input are present in a snapshot.

Results into a non-compliant status when the specified key name is not present in a snapshot.

**Input arguments**

- mandatoryKeys
  - A comma-separated list of key names.
  - Type: String
  - Mandatory: True
- caseSensitive
  - A boolean value to indicate whether the key comparison is case-sensitive.
  - Default value: `False`
  - Type: True | False
  - Mandatory: False

## Memory Limit Validator (memoryLimitValidator)

Checks whether the memory resources assigned to a key value are within the specified limits of a memory unit. #Compares case-insensitive key values of metric units (including KB, MB, and GB) and binary units (including KiB, MiB, and GiB). Converts a key value and its input values to bytes before comparing.

Results into a non-compliant status when a key value is not within the specified limits or is not a memory unit.

**Input argument**

pathAndLimitsArray

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- An array of key paths and the minimum and maximum values for memory unit limits as min and max.
- Type: Array of objects
- Mandatory: True

Example:

```
[
  {
  keyPath: ["deploy", "resources", "limits", "cpu"],
  min: "250m",
  max: "500m"
  },
  {
  keyPath: ["deploy", "resources", "limits", "cpu"],
  min: "1GB",
  max: "8GB"
  }
]
```

## Mandatory Tags List (mandatoryTagsList)

Checks whether the tag nodes found in a snapshot have authorized values.

Results into a non-complaint status when a tag node has a value not included in the authorized tag list.

**Input arguments**

- tagsNodeName
  - A comma-separated list of key names.
  - Type: String
  - Mandatory: True
- tagsList
  - A comma-separated list of authorized tag values.
  - Type: String
  - Mandatory: True
- caseSensitive
  - A boolean value to indicate whether the key comparison is case-sensitive.
  - Default value: `False`
  - Type: True | False
  - Mandatory: False

## Mandatory Value (mandatoryValue)

Checks whether all the keys provided as input have a non-empty value.

Results into a non-compliant status when the value of a key is null or empty, or results into a warning when the key name specified in the input is not found in a snapshot.

**Input arguments**

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- keysList
  - A comma-separated list of key names.
  - Type: String
  - Mandatory: True
- stopAtFirstFound
  - A boolean value to indicate whether to check only the first occurrence of the key value in a snapshot.
  - Default value: `True`
  - Type: True | False
  - Mandatory: True
- trimValue
  - A boolean value to indicate whether to remove any leading or trailing spaces from the key value before comparison.
  - Default value: `True`
  - Type: True | False
  - Mandatory: True
- caseSensitive
  - A boolean value to indicate whether the key comparison is case-sensitive.
  - Default value: `False`
  - Type: True | False
  - Mandatory: False

## Mandatory Value By Type (mandatoryValueByType)

Checks whether all the keys provided as input have a non-empty value.

Results into a non-compliant status for the following conditions:

- When the value of a key specified in the `keyNamesString` input argument is not a string value or is empty.
- When the value of a key specified in the `keyNamesInteger` input argument is not an integer value or is empty.
- When the value of a key specified in the `keyNamesBoolean` input argument is not a boolean value or is empty.

### Input arguments

- keyNamesString
  - A comma-separated list of key names that must have a string value.
  - Type: String
  - Mandatory: False
- keyNamesInteger

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- A comma-separated list of key names that must have an integer value.
- Type: String
- Mandatory: False

- keyNamesBoolean

- A comma-separated list of key names that must have a boolean value.
- Type: String
- Mandatory: False

## No Clear Sensitive Data (noClearSensitiveData)

Checks whether the values are encrypted for the key names containing the specified keywords.

Results into a non-compliant status when the key name containing the specified keywords is not encrypted.

Use case: DevOps Config is used by organizations to manage and govern sensitive data (passwords, API keys, and tokens) through its permission-based access controls.

**Input arguments**

- keyWords
  - A comma-separated list of strings used for identifying sensitive keys in a snapshot. The policy uses the case insensitive comparison.
  - Default value: `pass,pwd,secret`
  - Type: String
  - Mandatory: True
- exceptionList
  - A comma-separated list of keys to be excluded from validation.
  - Type: String
  - Mandatory: False

## No Duplicate Keys (noDuplicateKeys)

Checks whether there are no duplicate key names in a snapshot.

Results into a non-compliant status if a key name has multiple occurrences in a snapshot.

Use case: Deployment automation tools can handle multiple occurrences of settings badly resulting into downtime of services.

**Input argument**

keyNames

- A comma-separated list of key names.
- Default value:`#dbConnectionString,dbUserName`
- Type: String
- Mandatory: False

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## No Empty Values (noEmptyValues)

Checks whether all the keys have a non-empty value.

Results into a non-compliant status when the value of a key not included in the exception list is null or empty.

**Input arguments**

- trimValue
  - A boolean value to indicate whether to remove any leading or trailing spaces from the key value before comparison.
  - Default value: `True`
  - Type: True | False
  - Mandatory: True
- caseSensitive
  - A boolean value to indicate whether the key comparison is case-sensitive.
  - Default value: `False`
  - Type: True | False
  - Mandatory: False
- exceptionList
  - A comma-separated list of keys to be excluded from validation.
  - Type: String
  - Mandatory: False

## No Forbidden Values (noForbiddenValues)

Checks whether there are any key names with forbidden values in a snapshot.

Results into a non-complaint status when any key found in a snapshot has a forbidden value as specified in the input list.

**Input arguments**

- forbiddenValues
  - A comma-separated list of forbidden values.
  - Default value: `root`
  - Type: String
  - Mandatory: False
- excludedKeyNames
  - A comma-separated list of keys to be excluded from validation.
  - Default value: `name,*desc*`
  - Type: String
  - Mandatory: False

## No FTP (noFTP)

Checks whether all the URLs in a snapshot use the FTPS protocol.

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Results into a non-compliant status when a URL contains FTP in a snapshot.

**Input arguments**

- searchValue
  - A search term that should not be present in the key value.
  - Default value: `FTP:/`
  - Type: String
  - Mandatory: True
- caseSensitive
  - A boolean value to indicate whether the key comparison is case-sensitive.
  - Default value: `False`
  - Type: True | False
  - Mandatory: False
- exceptionList
  - A comma-separated list of keys to be excluded from validation.
  - Type: String
  - Mandatory: False

## No HTTP (noHTTP)

Checks whether all the URLs in a snapshot use the HTTPS protocol.

Results into a non-compliant status when a URL contains HTTP in a snapshot.

**Input arguments**

- searchValue
  - A search term that should not be present in the key value.
  - Default value: `HTTP:/`
  - Type: String
  - Mandatory: True
- caseSensitive
  - A boolean value to indicate whether the key comparison is case-sensitive.
  - Default value: `False`
  - Type: True | False
  - Mandatory: False
- exceptionList
  - A comma-separated list of keys to be excluded from validation.
  - Type: String
  - Mandatory: False

## Node Keys Comparator (nodeKeysComparator)

Checks whether all the keys from the primary node are the same in the secondary node.

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Results into a non-compliant status if a key is present in the primary node but not in the secondary node or vice versa.

**Input arguments**

- fromNode
  - An array of strings indicating the path of the primary node in a snapshot.
  - Default value: `[ ]`
  - Type: Array of strings
  - Mandatory: True
- toNode
  - An array of strings indicating the path of the secondary node in a snapshot.
  - Default value: `[ ]`
  - Type: Array of strings
  - Mandatory: True
- includePath
  - A boolean value to indicate whether to include the full path of the node in the output.
  - Default value: `True`
  - Type: True | False
  - Mandatory: False

## No LDAP (noLDAP)

Checks whether all the URLs in a snapshot use the LDAPS protocol.

Results into a non-compliant status when a URL contains LDAP in a snapshot.

**Input arguments**

- searchValue
  - A search term that should not be present in the key value.
  - Default value: `LDAP : /`
  - Type: String
  - Mandatory: True
- caseSensitive
  - A boolean value to indicate whether the key comparison is case-sensitive.
  - Default value: `False`
  - Type: True | False
  - Mandatory: False
- exceptionList
  - A comma-separated list of keys to be excluded from validation.
  - Type: String
  - Mandatory: False

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## Nodes Value Comparator (nodesValueComparator)

Compares all key-value combinations between two nodes in a snapshot.

Results into a non-compliant status for the following conditions:

- When a key specified in the `sameValueKeys` input argument has a different value in two nodes.
- When a key specified in the `diffValueKeys` input argument has the same value in two nodes.
- When the `allowMissingKeys` input argument is set to `False` and if a key is present in the primary node but not in the secondary node or vice versa.

Use case: Ensure consistency between nodes by comparing the values for keys between two nodes.

**Input arguments**

- fromNode
  - An array of strings indicating the path of the primary node in a snapshot.
  - Default value: `[ ]`
  - Type: Array of strings
  - Mandatory: True
- toNode
  - An array of strings indicating the path of the secondary node in a snapshot.
  - Default value: `[ ]`
  - Type: Array of strings
  - Mandatory: True
- includePath
  - A boolean value to indicate whether to include the full path of the node in the output.
  - Default value: `True`
  - Type: True | False
  - Mandatory: False
- sameValueKeys
  - A comma-separated list of key names with the same values.
  - Type: String
  - Mandatory: False
- diffValueKeys
  - A comma-separated list of key names with different values.
  - Type: String
  - Mandatory: False
- allowMissingKeys
  - A boolean value indicating whether to check all the keys from the primary node are the same in the secondary node.
  - Default value: `False`

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- Type: True | False
- Mandatory: False

### No White-Space Characters Allowed (noWhiteSpaceAllowed)

Checks whether the key values do not contain white-space characters including leading and trailing spaces.

Result into a non-compliant status when a key value includes a white-space character.

Use case: Prevent white-space characters from causing issues for tools or applications when settings are applied.

**Input argument**

excludedKeyNames

- A comma-separated list of keys to be excluded from validation.
- Default value: `description`
- Type: String
- Mandatory: False

### Same Key Value (sameKeyValue)

Checks whether the values of a key if included in multiple components of a snapshot are the same across all components.

Results into a non-compliant status when a key has different values in multiple components.

**Input argument**

keyList

- A comma-separated list of key names
- Mandatory: True
- Type: String

### Same Values Comparator (sameValuesComparator)

Checks whether all the keys provided as the `keyList` input argument have the same value across the deployables.

Results into a non-compliant status when the value of a key is different in multiple deployables, or results into a warning when the key name specified in the input is not found in any of the deployables.

Use case: Detect any configuration drifts between staging and production environments.

**Input arguments**

- additionalDeployablesInput
  - A list of additional deployables to be compared with the main deployable.
  - Type: List
  - Mandatory: True
- keysList

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- A comma-separated list of key names.
- Type: String
- Mandatory: True

- stopAtFirstFound
  - A boolean value to indicate whether to check only the first occurrence of the key value in a snapshot.
  - Default value: `True`
  - Type: True | False
  - Mandatory: True
- caseSensitive
  - A boolean value to indicate whether the key comparison is case-sensitive.
  - Default value: `True`
  - Type: True | False
  - Mandatory: False

### Unique Key Value (uniqueKeyValue)

Checks whether the key value is different for a key when the key has multiple occurrences in a snapshot.

Results into a non-compliant status when a key has the same value in more than one occurrence.

**Input argument**

keyList

- A comma-separated list of key names.
- Mandatory: True
- Type: String

### Unique Values Across Deployables (checkUniqueKeyValue_crossDeployables)

Checks whether all the keys provided as the `keyName` input argument have different values across the deployables.

Results into a non-compliant status when the value of a key is the same in multiple deployables, or results into a warning when the key name specified in the input is not found in any of the deployables.

Use case: Detect any configuration drifts between staging and production environments.

**Input arguments**

- additionalDeployablesInput
  - A list of additional deployables to be compared with the main deployable.
  - Type: List
  - Mandatory: True
- keyName

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- A comma-separated list of key names.
- Type: String
- Mandatory: True

### Unresolved Variables (unresolvedVariables)

Checks whether there are any unresolved variables in a snapshot.

Results into a non-compliant status when a variable used in a key value cannot be resolved.

Use case: Ensure all the variables used in the configuration data settings are replaced with a value because any unresolved variables can break the deployment operation.

#### Kubernetes policies in DevOps Config

By default, the DevOps Config Policy content pack contains a set of policies to validate your Kubernetes configuration.

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

You can use or customize these default DevOps Config policies to validate that your configuration data content is conformable, or administrate the full life cycle of PaCE policies.

**Note:**
You can't modify the default policies. However, you can make a copy of the policy and customize your copy.

**First-letter navigation for policies on this page**

A | B | C | D | I | K | M | N | P | R | S | T

### Always Pull Images Admission Control Plugin Is Enabled (container_always_pull_images_plugin_is_enabled)

Checks whether the `AlwaysPullImages` admission controller plugin is enabled for the Kubernetes API server.

Results into a non-compliant status when the `AlwaysPullImages` plugin is not specified with the `--enable-admission-plugins` argument when using the `kube-apiserver` command.

### Basic Auth File Isn't Set (container_basic_auth_file_is not_set)

Checks whether the Kubernetes API server is not using the basic user authentication mechanism.

Results into a non-compliant status when the `--basic-auth-file` argument is specified for a container when using the `kube-apiserver` command.

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### Bind Address Isn't Set (container_bind_address_not_set_to_localhost)

Checks whether the bind address of the Kubernetes scheduler or Kubernetes controller manager is not `127.0.0.1`.

Results into a non-compliant status when the `--bind-address` argument is set to `127.0.0.1` for a container when using the `kube-controller-manager` or `kube-scheduler` command.

### Containers Don't Run With Low UID (container_uid_minimum_limit)

Checks whether the UID of each container within a Kubernetes pod is greater than or equal to the specified minimum UID value.

Results into a non-compliant status if the UID defined for a container is less than the minimum UID value. If the UID is not defined for a container, the UID of the associated pod is validated.

**Input argument**

min_uid

- The minimum UID value required for the containers in a pod.
- Default value: `10000`
- Type: Integer
- Mandatory: False

### Containers Require Drop Capabilities (container_requires_drop_capabilities)

Checks whether the drop capabilities are defined for containers within a Kubernetes pod.

Results into a non-compliant status when the drop capabilities for a container are not defined.

### Containers Run as a Non-Root User (container_run_as_nonroot_user)

Checks whether the containers within a Kubernetes pod run only as a non-root user to limit the exploitability of security misconfiguration and to restrict an attacker's possibilities in case of compromise.

Results into a non-compliant status when the `runAsNonRoot` key for a container is set to `false` or the user ID (UID) of a container is zero.

### Containers Run Without Privilege Access (container_is_not_privileged)

Checks whether the containers within a Kubernetes pod are run without privileged access.

Results into a non-compliant status when the privileged field for a container is set to `true`.

### Containers Run Without Sys Admin Capability (container_is_without_sys_admin_capability)

Checks whether the containers within a Kubernetes pod are run without the SYS_ADMIN capability.

Results into a non-compliant status when the SYS_ADMIN privileges are assigned to a container.

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### CPU Requests Are Within Limits (container_cpu_request_within _limits)

Checks whether the containers within a Kubernetes pod are requesting the central processing unit (CPU) resources within the specified CPU limit.

Results into a non-compliant status when either the `limits.cpu` key is not defined or when the value of the `requests.cpu` key exceeds the value of the `limits.cpu` key.

### Docker Daemon Socket Isn't Exposed (docker_daemon_socket_not_exposed)

Checks whether the Docker daemon socket is not exposed to containers.

Results into a non-compliant status when the `hostPath.path` key for a volume is set to `/var/run/docker.sock`.

### Image Pull Policy Is Always (container_imagePullPolicy_is_always)

Checks whether the `imagePullPolicy` field for each container within a Kubernetes pod is set to `Always`.

Results into a non-compliant status if the `imagePullPolicy` field is not defined or the `Always` criterion is not met.

### Insecure Bind Address Isn't Set (container_insecure_bind_address_is_not_set)

Checks whether the Kubernetes API server does not bind to an insecure address that otherwise could enable attackers to connect to the server over the insecure port and potentially read sensitive data in transit.

Results into a non-compliant status when the `insecure-bind-address` argument is specified when using the `kube-apiserver` command.

### Kubelet HTTPS Is True (container_kubelet_https_is_true)

Checks whether the connections between the Kubernetes API server and the kubelet use the HTTPS protocol to secure data transfer.

Results into a non-compliant status when the `-kubelet-https` argument is set to false when using the `kube-apiserver` command.

### Memory Requests Are Within Limits (container_memory_request_within _limits)

Checks whether the containers within a Kubernetes pod are consuming resources within the specified memory limit.

Results into a non-compliant status when either the `limits.memory` key is not defined or when the value of the `requests.memory` key exceeds the value of the `limits.memory` key.

### No Wildcard in the RBAC Rule (rbac_no_wildcard_in_rule)

Checks whether the Role and ClusterRole resources are not using wildcards to refer to objects or actions for role-based access control (RBAC) rule.

Returns into a non-compliant status when the wildcards are used in `apiGroups`, `resources`, or `verbs` for the RBAC rule.

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### Privilege Escalation Not Allowed (container_privilege_escalation_not_allowed)

Checks whether the containers within a Kubernetes pod have less privileges than their parent process.

Results into a non-compliant status when the `allowPrivilegeEscalation` key for a container is either set to `true` or not defined.

### Root Containers Admitted (container_read_only_root_file_system)

Checks whether the containers within a Kubernetes pod have the root file system set to read only.

Returns into a non-compliant status when the `readOnlyRootFilesystem` key for a container is not defined or set to `false`.

### Seccomp Profile Is Configured (container_seccomp_profile_is_configured )

Checks whether the containers within a Kubernetes pod are configured with a secure computing mode (seccomp) profile to restrict potentially dangerous system calls (syscalls).

Results into a non-compliant status when the `seccompProfile.type` key for a container is either not defined or set to a value other than `Localhost` or `RuntimeDefault`.

### Service Account Private Key File Is Specified (container_service_account_private_key_file_is_specified)

Checks whether the `--service-account-private-key-file` argument is specified with the `kube-controller-manager` command for a container.

Results into a non-compliant status when the `--service-account-private-key-file` argument is not specified for a container when using the `kube-controller-manager` command.

### Secure Port Isn't Set to Zero (container_secure_port_not_set_to_zero)

Checks whether the Kubernetes API server is not using port `0` for the HTTPS authentication and authorization.

Results into a non-compliant status when the `--secure-port` argument is set to `0` for a container when using the `kube-apiserver` command.

### Token Auth File Isn't Set (token_auth_file_is_not_set)

Checks whether the Kubernetes API server is not using a static token file for user authentication.

Results into a non-compliant status when the `token-auth-file` argument is specified when using the `kube-apiserver` command.

#### Red Hat OpenShift policies in DevOps Config

By default, the DevOps Config Policy content pack contains a set of policies to validate your Red Hat OpenShift configuration.

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

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You can use or customize these default DevOps Config policies to validate that your configuration data content is conformable, or administrate the full life cycle of PaCE policies.

**Note:**
You can't modify the default policies. However, you can make a copy of the policy and customize your copy.

**First-letter navigation for policies on this page**

A | B | C | H | N | R | S | T

## Audit Log Maximum Backup Is Set (openshift_audit_log_maxbackup_is_set)

Checks whether the maximum number of old audit log files to be retained for API servers is set.

Results into a non-compliant status when the `--audit-log-maxbackup` argument is either not set or not within the specified limits.

**Input arguments**

- lowerLimit
  - The lower limit of the `--audit-log-maxbackup` argument.
  - Type: Integer
  - Mandatory: False
- upperLimit
  - The upper limit of the `--audit-log-maxbackup` argument.
  - Type: Integer
  - Mandatory: False

## Audit Log Maximum File Size Is Set (openshift_audit_log_maxsize_is_set)

Checks whether the maximum file size specified as the rollover threshold for audit log files is set. After an audit log file reaches the maximum file size, the original audit log file is renamed and a new log file with the original name is created.

Results into a non-compliant status when the `--audit-log-maxsize` argument is either not set or not within the specified limits.

**Input arguments**

- lowerLimit
  - The lower memory limit of the `--audit-log-maxsize` argument.
  - Type: Integer
  - Mandatory: True
- upperLimit
  - The upper memory limit of the `--audit-log-maxsize` argument.
  - Type: Integer
  - Mandatory: True

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### Audit Log Path Isn't Set (openshift_audit_log_path_is_not_set)

Checks whether the auditing is enabled in OpenShift and the audit log file path is set.

Results into a non-compliant status when either the `--audit-log-path` argument for *`openshift-kube-apiserver`* isn't set to `/var/log/kube-apiserver/audit.log` or the `--audit-log-path` argument for *`openshift-apiserver`* isn't set to `/var/log/openshift-apiserver/audit.log`.

### Basic Auth File Isn't Set (openshift_basic_auth_file_is_not_set)

Checks whether OpenShift doesn't use the basic authentication mechanism to authenticate requests to the API server.

Results into a non-compliant status when the `--basic-auth-file` argument is set.

### Containers Run Without Privilege Access (openshift_container_is_not_privileged)

Checks whether the containers within an OpenShift pod are run without privileged access.

Results into a non-compliant status when the privileged field for a container is set to `true`.

### Host PID Namespace Is Disabled (openshift_scc_with_hostPID_namespace_disabled)

Checks whether there is at least one security context constraint (SCC) is defined that doesn't allow containers to share the host PID namespace.

Results into a warning when there's an SCC defined with the **allowHostPID** field set to `true`.

### NamespaceLifecycle Plugin Is Enabled (openshift_namespacelifecycle_plugin_is_enabled)

Checks whether the admission control plugin NamespaceLifecycle is enabled.

Results into a non-compliant status when the NamespaceLifecycle plugin is disabled.

### Read-Only Port Is Disabled (openshift_read_only_port_disabled)

Checks whether the Kubelet API server isn't using the read-only port or the read-only port is set to 0.

Results into a non-compliant status when the `kubelet-read-only-port` argument isn't set to 0.

### Request Timeout Is Set (openshift_request_timeout_is_set)

Checks whether the global request timeout for API servers is set.

Results into a non-compliant status when the `--min-request-timeout` argument is either not set or not within the specified limits.

**Input arguments**

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- lowerLimit
  - The lower limit of the `--min-request-timeout` argument.
  - Type: Integer
  - Mandatory: False
- upperLimit
  - The upper limit of the `--min-request-timeout` argument.
  - Type: Integer
  - Mandatory: False

### Streaming Connections Timeout Isn't Disabled (openshift_streaming_connections_timeout_not_disabled)

Checks whether the timeouts are set on streaming connections to ensure protection against denial-of-service attacks, inactive connections, and ephemeral ports exhaustion.

Results into a non-compliant status when the `streamingConnectionIdleTimeout` argument is set to 0 in the `Kubelet config` file.

### Token Auth File Isn’t Set (openshift_token_auth_file_is_not_set)

Checks whether OpenShift doesn't use a static token file to authenticate requests to the API server.

Results into a non-compliant status when the `--token-auth-file` argument is set.

### Default DevOps Config exporters

The DevOps Config Exporter content pack contains a set of default DevOps Config exporters of data that can be used as input for further deployment and provisioning activities.

**Important:**
Starting with the Washington DC release, DevOps Config is being prepared for future deprecation. It will be hidden and no longer installed on new instances but will continue to be supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

DevOps Config exporters allow other tools to consume the data from deployable snapshots.

**Note:**
You cannot modify default exporters. However, you can make a copy of the exporter and customize your copy.

These exporters are contained in the DevOps Config Exporter content pack.

- returnAllData-now
- returnAllData_noVars-now
- returnDataforNodeName-now
- returnDataForNodeNames-now
- returnDataForPath-now
- returnNodeListForLevel-now
- returnNodeListForPath-now

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- returnValueForKeyAtNodeName-now
- returnValueForKeyPath-now
- returnValueForUniqueKeyName-now

### Return all data (returnAllData-now)

Returns the full content of the snapshot without any filtering or modifications, including the var system folder.

**Note:**
The exporter fails if the application/deployable is not in Active state (deleted).

**Arguments**

- appName - Application name
- deployableName - Deployable name
- requestedFormat - Requested format (json/yaml/xml/ini/raw)

**Special logic**

None.

**Error handling**

None.

### Return all data except vars (returnAllData_noVars-now)

Returns all of the configuration data for the deployable, except deployable name and variables.

Response does not include:

- `vars` folder at the deployable level
- `vars` folder at each of the included collections
- Deployable name at the root level of the response

**Note:**
This exporter does not work for deleted applications/deployables.

**Arguments**

Arguments (can be provided on the command line, or entered interactively in run mode).

- appName - Application name
- deployableName - Deployable name
- requestedFormat - Requested format (json/yaml/xml/ini/raw)

**Special logic**

None.

**Error handling**

None.

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## Return data for a node name (returnDataforNodeName-now)

Returns the subset of the snapshot data for a given node name, which is provided as an argument. The argument value must be passed as string text.

**Arguments**

- appName - Application name
- deployableName - Deployable name
- requestedFormat - Requested format (json/yaml/xml/ini/raw)
- nodeName - Node name (string, in quotes)
- includeNodeInOutput - (string, default is true)

**Special logic**

- If nodeName is empty, all data is returned.
- If includeNodeInOutput is false, the node data is returned excluding the node name.

**Error handling**

- If the nodeName is not unique, `multiple instances of nodeName found`.
- If the nodeName is not found, `node not found: <nodeName>`.
- If includeNodeInOutput is false and node data is a key-value pair, an error is returned.

## Return data for list of nodes (returnDataForNodeNames-now)

Returns the full data from the snapshot for a list of nodes. Same as `Return data for a node name` but returns a nested JSON with configuration data for a list of given node names (including any child nodes).

**Arguments**

- appName - Application name
- deployableName - Deployable name
- requestedFormat - Requested format (json/yaml/xml/ini/raw)
- nodeNames - Node names (string, in quotes, comma-separated)

**Special logic**

If nodeNamesList is empty, returns all config data.

**Error handling**

None.

**Response details**

{“node1”:{“contentKey”:”contentValue”},”node2”:{ “error”:”nodeName not found”}}.

**Error handling**

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- In case the nodeName is not unique the exporter returns an error response stating “multiple instances of nodeName found” for that specific nodeName. Other nodeNames contain the data
- If a nodeName is not found it should contain error message for that node

## Return data for path (returnDataForPath-now)

Returns all of the configuration data for a given node path in the snapshot.

**Arguments**

- appName - Application name
- deployableName - Deployable name
- requestedFormat - Requested format (json/yaml/xml/ini/raw)
- nodePath - Node path (string, in quotes)

**Special logic**

If nodePath is empty, return the whole content (similar to all config data).

**Error handling**

If nodePath is not found, the last node name that was not found is stated `path not found: <nodeName>`.

## Return node list for level (returnNodeListForLevel-now)

Returns a list of names of nodes that are children of root node at specified level (depth) in the snapshot. For example, level 1 is a direct child of root node, level 2 is a grandchild, etc.

**Arguments**

- appName - Application name
- deployableName - Deployable name
- requestedFormat - Requested format (json/yaml/xml/ini/raw)
- ExcludeVarsNode [true|false] - Exclude the vars node from the result (true or false, default is true)
- nodeLevel - Level of the node (integer, default is 0)

**Special logic**

If no level is specified, then exporter returns the value for level 0 (for example, the deployable root node name).

**Error handling**

None.

**Response details**

[“node1, “node2”, “node3”]

## Return node list for path (returnNodeListForPath-now)

Returns the list of nodes for a given node path in the snapshot (not taking into account sub-nodes).

**Arguments**

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- appName - Application name
- deployableName - Deployable name
- requestedFormat - Requested format (json/yaml/xml/ini/raw)
- ExcludeVarsNode [true|false] - Exclude the vars node from the result (true or false, default is true)
- nodePath - Path to follow with list of nodes separated by pathSeparator (string, in quotes)
- pathSeparator - Character to separate list of nodePaths (string, default is ‘/’)

**Special logic**

None.

**Error handling**

None.

**Response details**

[“node1, “node2”, “node3”]

## Return value for key within a node (returnValueForKeyAtNodeName-now)

Returns the value of a specific key that is part of a node in the snapshot. The key can either be directly defined to the node, or lower in the data model to one of the children of the node.

The difference between this exporter and `export value for unique keyName` is that the key name only needs to be unique within the subtree of the node.

Key/node combination is expected to be unique in the snapshot. If the key/node combination is found more than once, there is an error.

**Arguments**

- appName - Application name
- deployableName - Deployable name
- requestedFormat - Requested format (json/yaml/xml/ini/raw)
- keyName - Key name (string, in quotes)
- nodeName - Node name (string, in quotes)

**Special logic**

None.

**Error Handling**

If keyName nodeName combination is not found an empty response is returned.

## Return value for keyPath (returnValueForKeyPath-now)

Returns the value of a specific key in a specific path.

**Arguments**

- appName - Application name
- deployableName - Deployable name
- requestedFormat - Requested format (json/yaml/xml/ini/raw)

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- keyPath - List of node names with key name at the end separated by pathSeparator (string, in quotes)
- pathSeparator - Character to separate list of keyPaths (string, default is ‘;’)

**Special logic**

None.

**Error handling**

- If the keyPath is not provided, `no keyPath argument provided`.
- If the keyPath is not found, states the last node name not found `path not found: <path>/<nodeName>`.
- If the keyPath is found and is a node (not a key), `keyPath provided is a node and not a key`.

### Return value for unique keyName (returnValueForUniqueKeyName-now)

Returns the value of a specific key based on its name in the snapshot. Unlike `export value for key within a node`, the key is expected to be unique across the snapshot data model. Multiple keys are supported.

**Note:**
Formats xml and ini are not supported for this exporter.

**Arguments**

- appName - Application name
- deployableName - Deployable name
- requestedFormat - Requested format (json/yaml/raw)
- keyName - Key name (data array)

**Special logic**

If the key is present multiple times in the snapshot, the exporter returns the first value found (returns error).

**Error handling**

- If the keyName is not provided, `no keyName argument provided`.
- If the key is not found, `key not found: <keyName>`.

## Digital Product Release

Digital Product Release (DPR) is a release management solution that helps release managers, product managers, and program managers manage the release process.

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## Get started

| | |
|---|---|
| Explore<br>  <br>Learn about how Digital Product Release help you manage the release process for delivering digital products. | Configure<br>  <br>Plan and configure your release readiness. |
| Use<br>  <br>Manage and track the process of delivering digital products, from planning to delivery. | Reference<br>  <br>Get details about components such as roles, tables, plugins, and store applications that are installed. |

### Troubleshoot and get help

- Ask or answer questions in the Digital Product Release community forum
- Search the Known Error Portal for known error articles
- Contact Customer Service and Support

# Exploring Digital Product Release

The ServiceNow® Digital Product Release application enables you to streamline the process of delivering digital products by managing the process from planning to delivery.

## Digital Product Release overview

Digital Product Release (DPR) is a release management solution that helps release managers, product managers, and program managers manage the release process. They can track the progress of releases while ensuring that the releases adhere to the company's policies.

This solution automates processes that enable collaboration between stakeholders, so everyone can track release status, from start to finish.

## Digital Product Release workflow

A digital product has a release life cycle that starts with planning, goes through development, and ends with delivery. There are many different phases to a product's release life cycle, and each phase can have its own set of activities. The following infographic illustrates the life cycle of a digital product.

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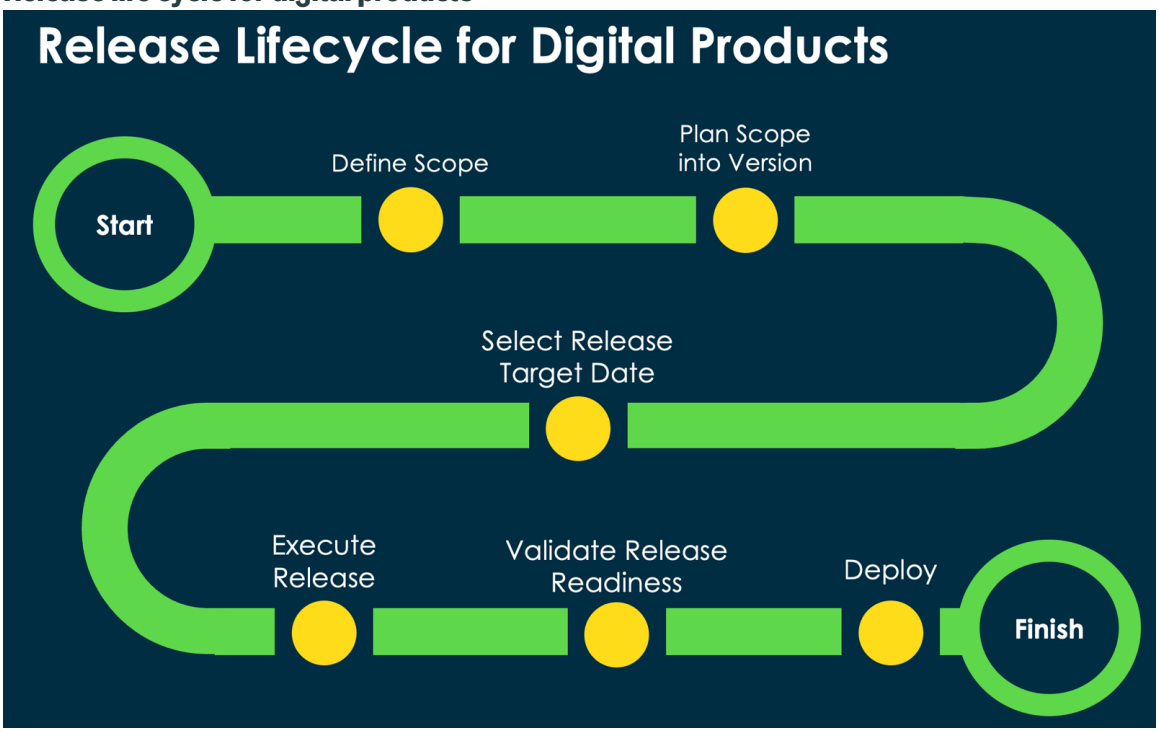
**Release life cycle for digital products**




1. Create a product and add features, product enhancements, and versions.
2. Plan the scope of a release by moving product enhancements into versions.
3. Initiate a release and set its release readiness target date.
4. Execute the release by tracking its progress and completing phases and tasks within each phase.
5. Validate the release phase against mapped policies to ensure that the release adheres to organizational standards.
6. Get the product ready by the specified target date to make it available for deployment.

## Personas

Digital Product Release is aimed at the following personas:

| | |
|---|---|
| Release manager | • Manages a Release calendar<br>• Establishes a Release process, including policy gates |
| Release coordinator or Program manager | • Communicates dependencies across a release<br>• Approves the scope of a release<br>• Provides status updates to the Release team |
| Product manager | • Releases new products, enhancements, and features<br>• Communicates updates to the development status |

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| | |
|---|---|
| | • Plans the scope of a release<br>• Initiates a release |
| Engineering lead | • Ensures development of new products, enhancements, and features<br>• Connects development scope to a release |

## Digital Product Release benefits

| Benefit | Feature | Users |
|---|---|---|
| Define release readiness targets for single or recurring release schedules. | Release readiness target | Release manager |
| Define release templates that include phases, tasks, policies, and approval tasks. | Release templates | Release manager |
| Create policies to automate the release process. | Policy administration | Release manager |
| Manage products, features, product enhancements, versions, and initiate a release. | Release planning | Product manager |
| Plan and manage the release process from start to finish. | Release execution | Release manager |

## Digital Product Release key terms

**Approval definition**

An approval definition is a set of rules that specify how tasks will be approved from a set of stakeholders for a release. For example, the QA team might approve code quality or the Security team might approve on the security aspects. An approval for a task can be requested from an individual user or a user group.

**Included products**

Included products help you organize and manage related digital products. By creating a product hierarchy using Included products, you can understand the relationships between different products and make informed decisions about product management.

**Release bundle**

A release bundle helps you to group multiple releases to track and manage them concurrently from a single place. They also help you to identify dependencies and potential conflicts, and make any necessary adjustments to ensure a smooth and coordinated release process.

**Release execution**

Release execution is a continuous process to track and monitor the progress of a release. It helps you ensure that all products in the release are ready by the release readiness target date.

**Release calendar**

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A release calendar helps you group multiple release readiness targets. It can also contain blackout, maintenance, and other user-defined schedules to avoid overlap of release targets on those dates.

**Release readiness target**

A release readiness target is when a release is ready to be released. It helps release managers to determine the dates at which the products should be ready for deployment by the team.

**Release template**

A release template is like a blueprint for a release process, which includes a predefined set of phases, tasks, policies, and approval tasks.

Release teams can use these release templates to create a release. All phases, tasks, approvals, and phase gates from the template will be automatically applied to the newly created release. It helps the release teams avoid redundant activities and focus on tracking and performing all the necessary tasks to complete the release on schedule.

**Stage-oriented release**

A release that follows a stage-oriented process. This process doesn't have phases with predefined end dates. It is suitable for teams that work toward completing product enhancements and objectives. Teams can move to the next phase after they have completed tasks and met policy compliance for the current phase. Teams have the flexibility to restart any completed phase if they encounter an issue that requires them to go back.

**Timeline-oriented release**

A release that follows a timeline-oriented process. This process has defined end dates for each phase of the release. It is suitable for teams that work toward the planned deadlines and have phases with a specific duration.

**Version planning**

Version planning is an activity to plan a product's enhancements into versions to define the scope of work for each version.

You can create a release after version planning is complete. The release must be associated with a release readiness target, which determines the start and end dates for phases and tasks based on the target date.

## Digital Product Release Workspace

The Digital Product Release Workspace provides a single location for release admins to define release processes and release readiness targets. Product managers can use it to create and manage products and features, define the scope in versions, and plan and execute releases.

## Digital Product Release Workspace users

The following users can use the Digital Product Release Workspace. The workspace is personalized for different roles.

**Digital Product Release Workspace users**

| | |
|---|---|
| Release manager | • Manages a Release calendar<br>• Establishes a Release process, including policy gates |

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**Digital Product Release Workspace users (continued)**

| | |
|---|---|
| Release coordinator or Program manager | • Communicates dependencies across a release<br>• Approves the scope of a release<br>• Provides status updates to the Release team |
| Product manager | • Releases new products, enhancements, and features<br>• Communicates updates to the development status<br>• Plans the scope of a release<br>• Initiates a release |
| Engineering lead | • Ensures development of new products, enhancements, and features<br>• Connects development scope to a release |

## Accessing the workspace

To open the workspace, navigate to **Workspaces** > **Digital Product Release Workspace**.

## Landing page

On the workspace landing page, get a quick overview of the active releases, open approval tasks, and policies compliance status.

As a release manager, you can use the onboarding tool to create and manage release processes.

**Note:**
The widgets and the data that are displayed in the widgets depend on your role.

The following is an example of the workspace landing page for the Digital Product Release application.

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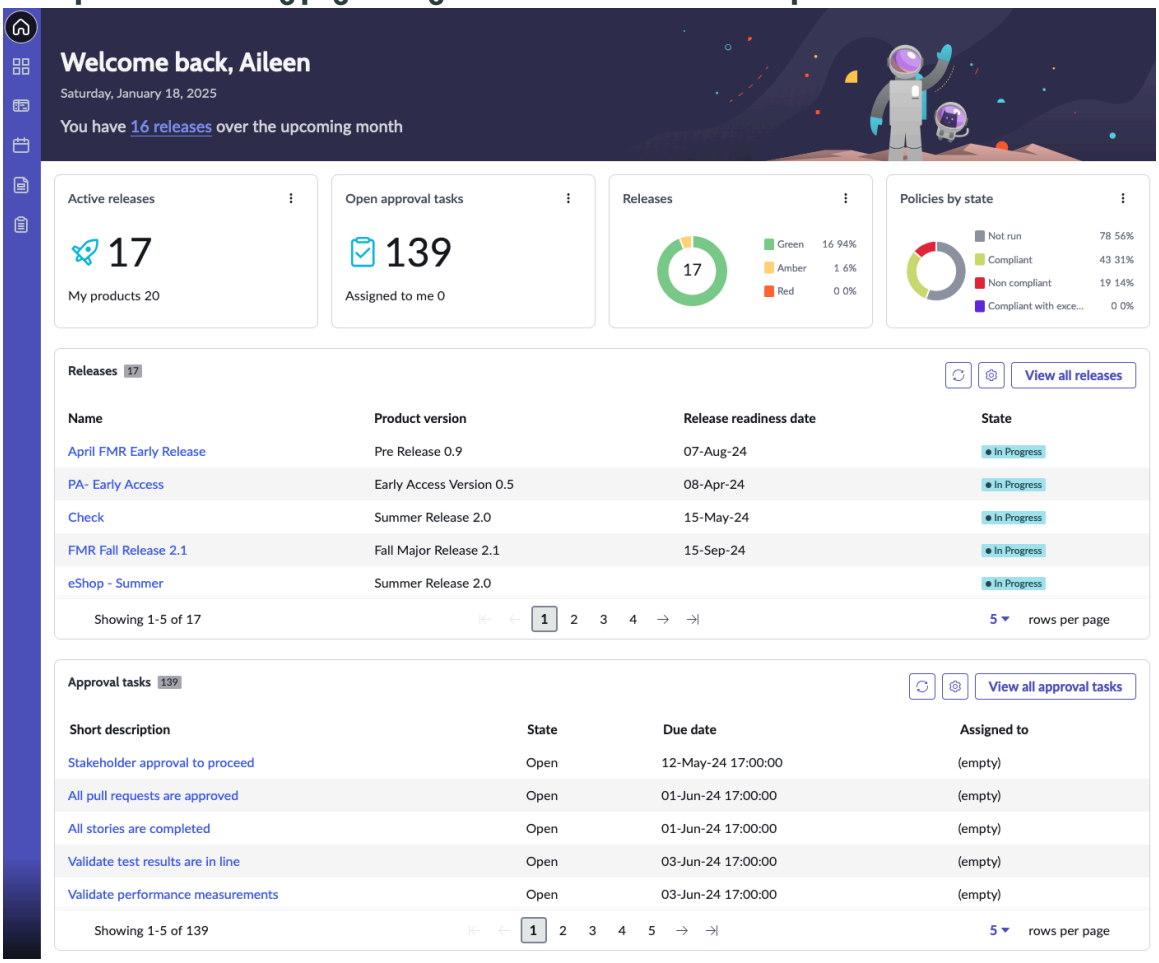
### Example of the landing page of Digital Product Release Workspace




## Release template Playbook

In the workspace, you can use the Playbook to create release templates.

The following is an example of a release template playbook. For more information, see Create a release template.

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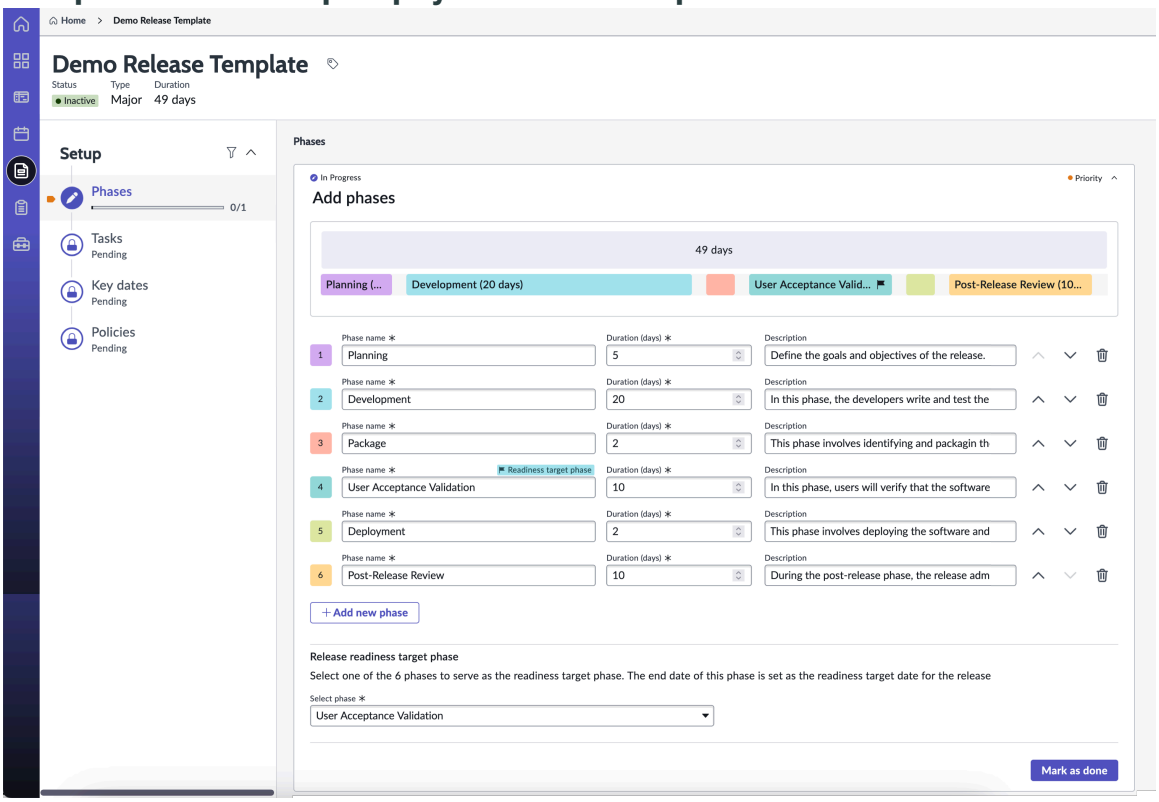
### Example of a release template playbook in the workspace




## Release for a product

A release groups all the tasks (projects, epics, stories, enhancements, defects, problems, incidents, and so on) planned for a specific version of a product or service.

A release is divided into a series of phases. During each phase, a defined list of tasks, approval processes, and policies must be fulfilled.

A defined release process ensures that the work items in releases are built, tested, and are ready for deployment. Digital Product Release provides two different processes that help you execute your releases—timeline-oriented and stage-oriented.

## Timeline-oriented release process

Timeline-oriented process is suitable for creating releases that have fixed deadlines and follow a strict schedule.

This process helps you prioritize tasks, allocate resources, and track progress against the timeline so you can make adjustments as needed to stay on track. Use this release process to:

- Set clear deadlines for each stage of your deployment, so you can plan and execute your rollout smoothly.
- Keep your team on track by defining clear goals, so you can manage your resources effectively.
- Track your progress against key dates, and adjust your plans as needed to stay on schedule.

The following is the general flow that a timeline-oriented release goes through:

- The flow starts with the first phase in the Pending state, which is the default state. The state of the phase moves to In Progress when it starts on the planned start date.
- When all tasks are done and policies are compliant, the phase ends automatically on its planned end date. The phase state updates to the Completed state.

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- After the current phase is completed, the next phase moves to the In Progress state. Only one phase can be in progress at a given time.
- When all phases in the release are completed, the release moves to the Review state.
- When the review of the release is completed, the release moves to the Completed state.

### Stage-oriented release process

Stage-oriented process is suitable for creating releases that prioritize completing objectives and features over following a strict timeline.

Certain products are not constrained by a specific time frame for how long they should remain in a particular phase. Releases for those products can follow the stage-oriented release process. This process focuses on making sure the product is ready to be released, rather than following a strict schedule or phase.

You can finish a release as soon as the product meets the set criteria, instead of waiting for a specific timeline or phase to end. However, you must ensure that all aspects of the release, including development, testing, and quality assurance, are done well to keep the product high quality.

Use this release process to:

- Set priorities for features and goals, instead of deadlines, so that you can adjust your plans throughout the development process.
- Restart the release from any of the previous phases to adjust goals and features based on testing results and user feedback.
- Track your progress by ensuring features are completed and the goals are met for a high-quality result.

The following is the general flow that a stage-oriented release goes through:

- The flow starts with the first phase in the Pending state, which is the default state. The state of the phase moves to In Progress when you manually start it.
- When the all tasks are completed and all policies are compliant or compliant with exceptions for the current phase, it automatically moves to the Completed state.
- After the current phase is completed, the next phase moves to the In Progress state. Only one phase can be in progress at a given time.
- If you encounter any issues at any point, you can restart from a previously completed phase. That phase and later phases are reset, including tasks and policy status.
- When all phases in the release are completed, the release moves to the Review state.
- When the review of the release is completed, the release moves to the Completed state.

### Single product release

A single product release enables you to release one product at a time. This release approach can be useful for smaller or less complicated products, as it makes the release process more focused and easier to manage. For more information, see Work on a timeline-oriented release for a single product and Work on a stage-oriented release for a single product.

### Multi-product release

A multi-product release enables you to release different products at the same time. You can do this by including several individual releases for each product, all tied to a main release. You manage the phases and release readiness from the main release and track the collective

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progress. However, you can set the scope, track approvals, and run policies for each individual product release. This release approach differs from release bundles, where you monitor the progress of multiple releases together but manage them independently. For more information, see Work on a timeline-oriented release for multiple products and Work on a stage-oriented release for multiple products.

## System properties to control the release processes

The following system properties control initiating automated actions during different stages during the release process.

- sn_dpr.stage_workflow_auto_transition
- sn_dpr.auto_transition_release_to_review
- sn_dpr.auto_transition_release_to_completed

For more information about these properties, see Digital Product Release properties.

**Related topics**

Create a release for a product

Managing a timeline-oriented release

Managing a stage-oriented release

Managing multiple releases through release bundles

## Release dashboards in Digital Product Release

Release dashboards provide insights into your releases. You can see their progress, identify any potential risks, and track their software quality. This information can help you to make informed decisions about your releases and ensure their success.

### Release Overview dashboard

The Release Overview dashboard provides an overview of all the information about the release, which the product team can use to assess its readiness.

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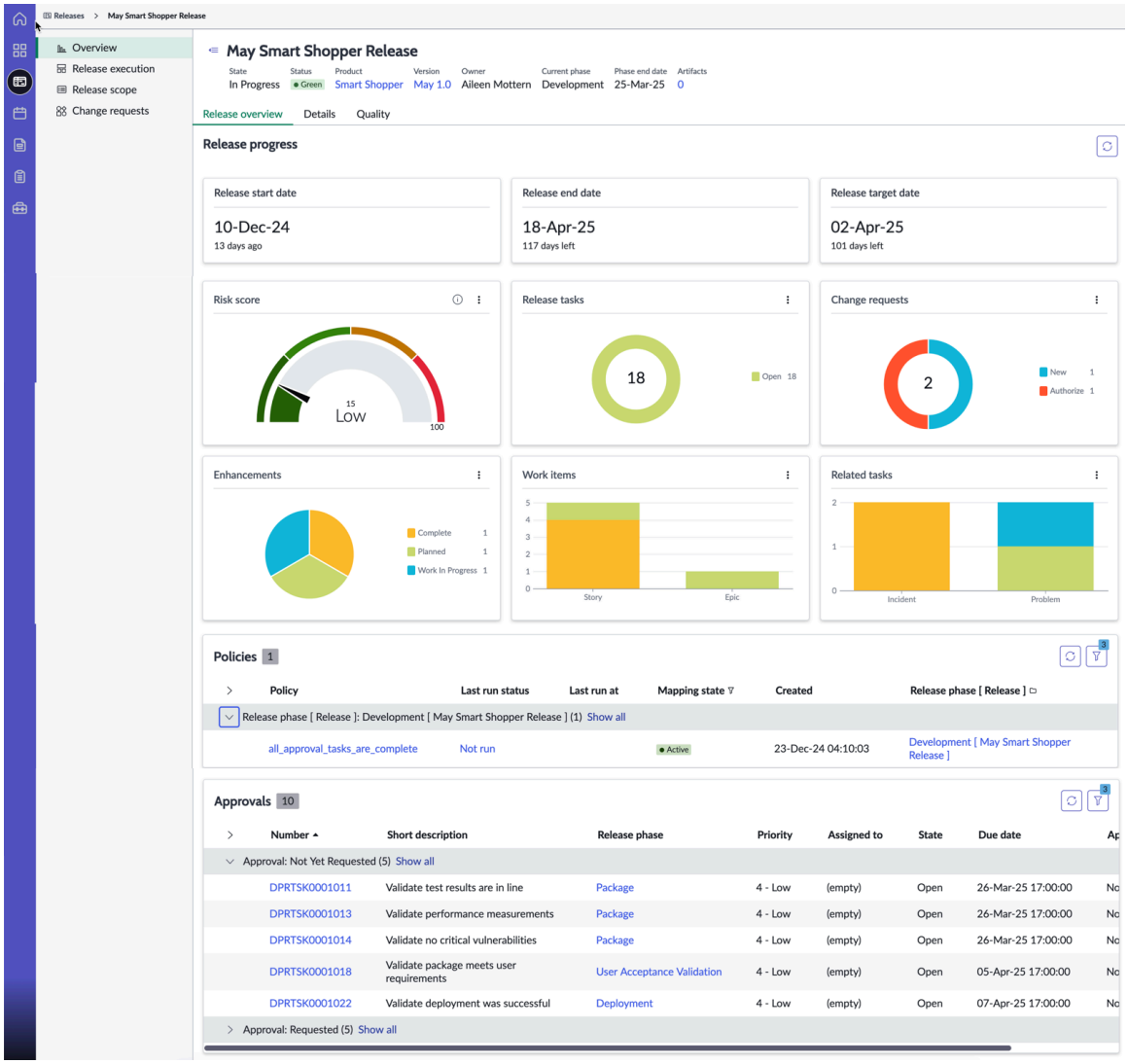


## Required ServiceNow AI Platform roles

sn_dpr_model.product_manager, sn_dpr_model.release_admin, sn_dpr_model.release_coordinator, or sn_dpr_model.release_user, needed to see the dashboard.

## Access the Release Overview dashboard

To open the dashboard, navigate to **Workspaces** > **Digital Product Release Workspace**. Select the releases icon ( ) and then select a release from the Releases list.

## Widgets

| Widget | Description |
|---|---|
| Release start date | Start date of the release.<br><br>If the release isn't started, the planned start date is shown. After the release starts, the actual start date is shown. |
| Release end date | End date of the release. |

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| Widget | Description |
|---|---|
| | If the release isn't closed, the planned end date is shown. After the release is closed, the actual end date is shown. |
| Release target date | Readiness target date of the release. |
| Risk score | Risk level of a release, calculated based on the overdue tasks and policy failures. For more information, see the calculation of the risk score in the following section. |
| Release tasks | Number of tasks in the release, grouped by their state. |
| Change requests | Number of change requests in the release, grouped by their state. |
| Enhancements | Product enhancements in the release, grouped by their state. |
| Work items | Work items in the release, grouped by their type, and stacked by their state. |
| Related tasks | Related tasks linked to the release, grouped by their type, and stacked by their state. |
| Policies | List of all policies, grouped by the phases they're mapped to. |
| Approvals | List of all approval tasks, grouped by their approval status. |

## Calculation of risk score of a release

The following calculation is used to measure the risk score of a release.

Given `overdue_weight + policy_failure_weight = 1`, the risk score of a release is calculated according to this formula:

```
Risk score = Round((Overdue task score * overdue_weight + Policy failure score * policy_failure_weight) * (Number of days elapsed in release / Total number of days in release))
```

Where the overdue task score is calculated as:

- If <10% of tasks are overdue, the overdue task score is 0
- If 10-40% of tasks are overdue, the overdue task score is 1
- If >40% of tasks are overdue, the overdue task score is 2

If the task doesn't have an end date, the phase end date is considered as the task's due date.

And, the policy failure score is calculated as:

- If <10% of policies failed, the policy failure score is 0
- If 10-40% of policies failed, the policy failure score is 1
- If >40% of policies failed, the policy failure score is 2

The risk score is categorized as follows, based on its value:

- 0 or 1 - Low
- 2 - Medium
- 3 - High
- 4 - Very high

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### Release Quality dashboard

The Release Quality dashboard provides insights into the quality of a release based on the software quality scan summaries and test summaries.

The software quality scan summaries give an overview of the code, highlighting any potential bugs or vulnerabilities that might impact the release. The test summaries provide a comprehensive view of the testing process, including the number of tests executed, passed, and failed.

## Configuration required for tracking release quality

The data displayed on the **Quality** tab is pulled from the pipeline execution, task execution, and their associated test summaries and software quality summaries. You must configure pipelines through the external tools configuration before you can see the metrics from various data sources on the Release Quality dashboard.

For more information, see Integrate external tools from Digital Product Release Workspace.

## Access the Release Quality dashboard

To open the Release Quality dashboard, navigate to **Workspaces** > **Digital Product Release Workspace**. Select the releases icon (  ) and then select a release from the Releases list. Select the **Quality** tab on the release record.

**Note:**
The **Quality** tab only appears for ongoing releases.

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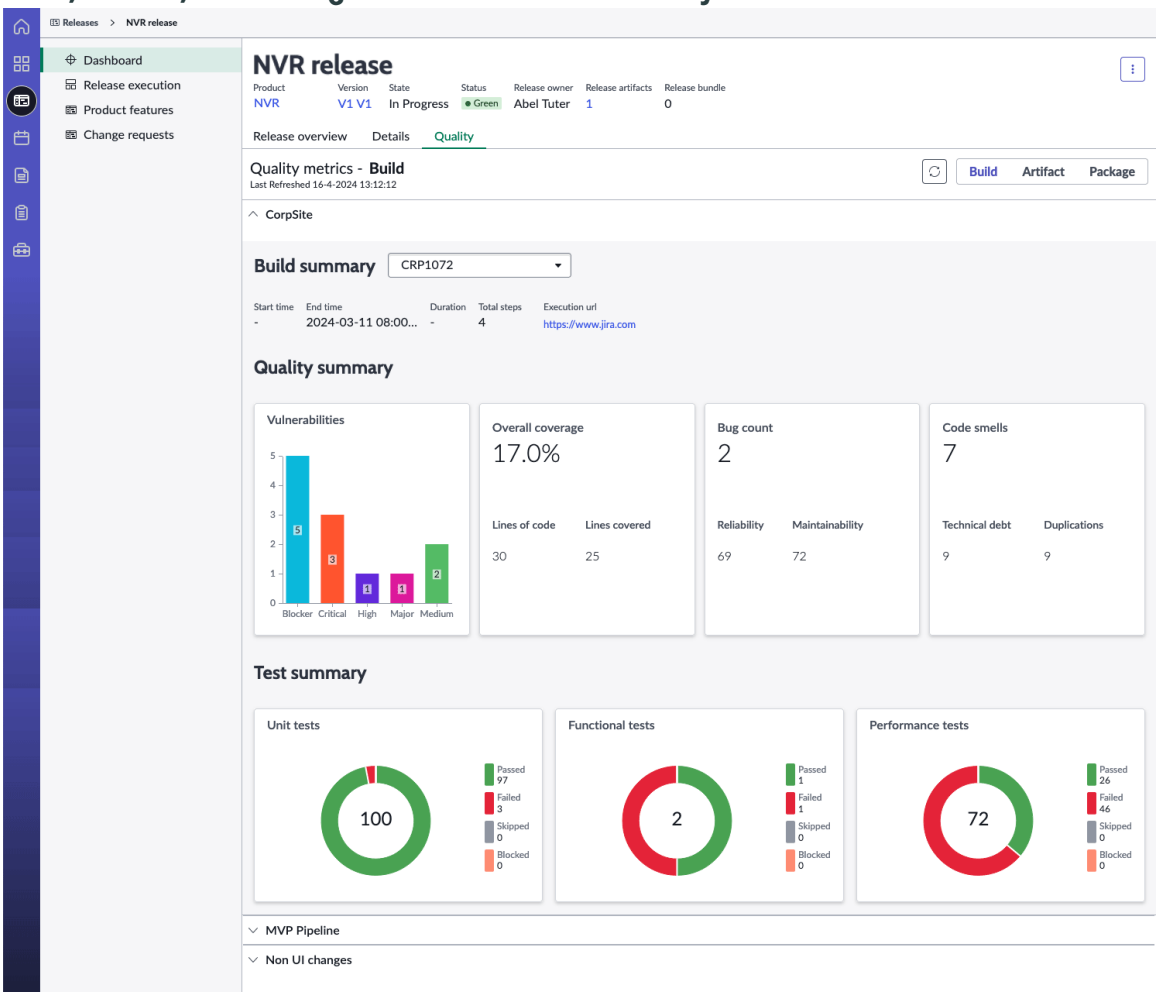
**Build, Artifact, and Package tabs on the Release Quality dashboard**




## Data in Quality metrics

The data on the Quality dashboard is organized into two sections to summarize the software code quality and test results. You can filter the quality and test results using the following options:

- **Build**: This option shows all pipelines for the product associated with the release from the sn_devops_pipeline table.

  The **Build summary** list includes build numbers that represent pipeline executions from the sn_devops_pipeline_execution_list table.

  For an active release, **Build summary** shows all the pipeline executions of the selected pipeline within the past 30 days. For a completed release, **Build summary** shows pipeline executions up to 30 days before the actual end date of the release.

- **Artifact**: This option shows all the artifacts data from the sn_devops_artifact table.

  The **Artifact version** list shows all the artifact versions generated within the past 30 days for the artifact. If the artifact's **Use latest version** option is selected, the semantic versions are listed. For more information on the artifact version, see Manage artifacts in a release.

- **Package**: This option shows all the artifact versions associated with the latest package. The artifact version data comes from the sn_devops_m2m_artifact_version_package table and the package data comes from the sn_devops_package table. However, if a package is marked as a release candidate, that package is used even if it's not the latest.

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**Note:**
The Artifact and Package options appear only when the release has an artifact and package associated with it.

### Quality summary section

The Quality summary section shows you a summary of the scans that are run on the pipelines. The source of data on these widgets is the Software Quality Scan Summary related to Task Execution. This section contains the following metrics:

**Quality summary section widgets**

| Widget | Description |
|---|---|
| Vulnerabilities | Total number of security vulnerabilities for the selected build.<br><br>This data comes from the *Vulnerabilities* category in the Software Quality Scan Details.<br><br>Use the *VulnerabilitiesTypeMapping* system property to normalize each type of vulnerability, mapping the custom values with the standard values. For more information, see Digital Product Release properties. |
| Overall coverage | Percentage of code covered by your test cases.<br><br>This data comes from the *Coverage (%)* category in the Software Quality Scan Details.<br><br>If there are multiple software quality summary results, then the percentage isn't available.<br><br>Total number of lines of code and lines covered for all software quality summary results is shown on this widget. |
| Bug count | Total number of bugs and average ratings of reliability and maintainability data for all the software quality summary results.<br><br>This data comes from the *Bugs* category in the Software Quality Scan Details. |
| Code smells | Total number of code smells and total number of technical debts and duplications for all the software quality summary results.<br><br>This data comes from the *Code Smells* category in the Software Quality Scan Details. |

### Test summary section

The Test summary section shows you a summary of the test run results. The source of data on these widgets is the Test Summary related to Task Execution. The section contains the following metrics:

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### Test summary section widgets

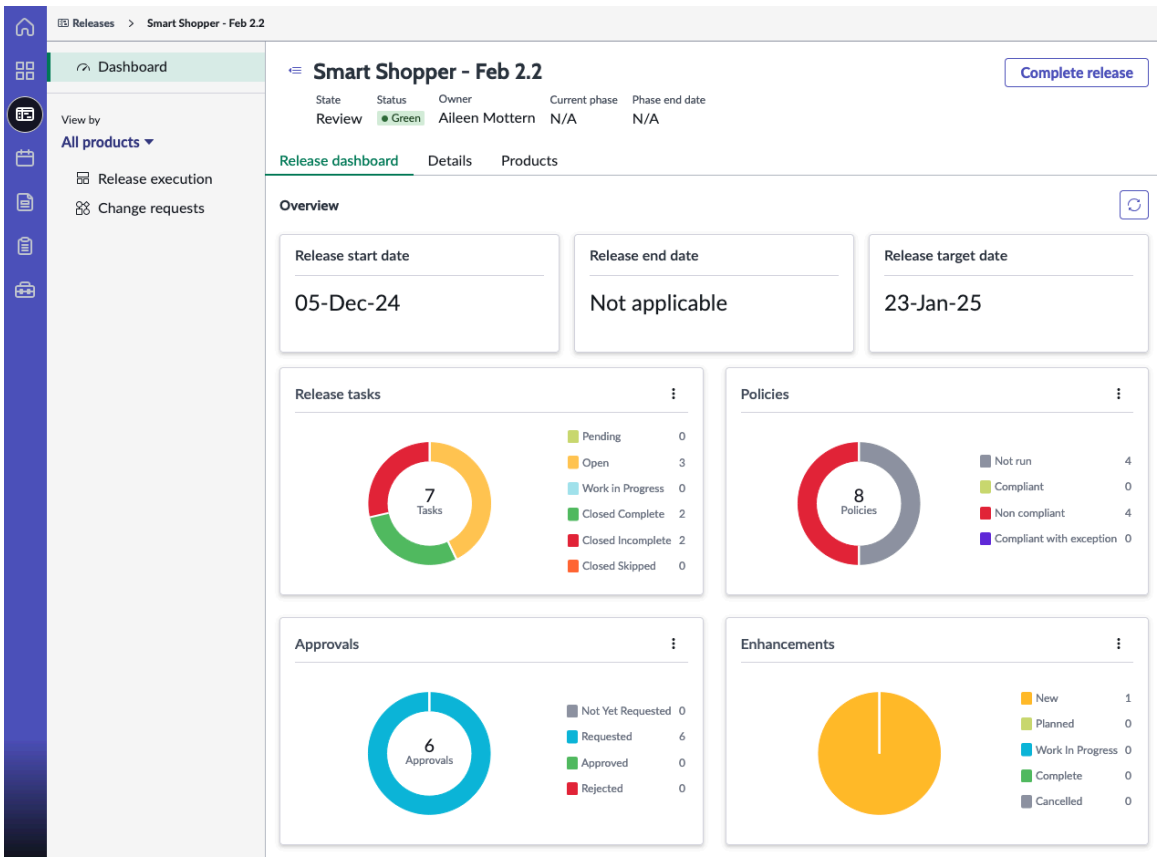
| Widget | Description |
|---|---|
| Unit tests | Total number of unit tests run across all task executions in a pipeline execution, including number of tests passed, failed, skipped, and blocked. |
| Functional tests | Total number of functional tests run across all task executions in a pipeline execution, including number of tests passed, failed, skipped, and blocked. |
| Performance tests | Total number of performance tests run across all task executions in a pipeline execution, including number of tests passed, failed, skipped, and blocked. |

**Related topics**

Quality metrics dashboard

### Release dashboard for a multi-product release

The Release Overview dashboard for a multi-product release provides an overview of all the information about every product release, which the product team can use to assess the release readiness.




## Required ServiceNow AI Platform roles

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## Access the Release Overview dashboard

To open the dashboard, navigate to **Workspaces** > **Digital Product Release Workspace**. Select the releases icon (  ) and then select a multi-product release from the Releases list. Select **All products** in the **View by** to view the Release dashboard.

## Widgets

| Widget | Description |
|---|---|
| Release start date | Start date of the release.<br><br>If the release isn't started, the planned start date is shown. After the release starts, the actual start date is shown. |
| Release end date | End date of the release.<br><br>If the release isn't closed, the planned end date is shown. After the release is closed, the actual end date is shown.<br><br>**Note:**<br>This widget is applicable only for timeline-oriented releases. |
| Release target date | Readiness target date of the release. |
| Release Tasks | Number of tasks across all releases, grouped by their state. |
| Policies | Number of policies across all releases, grouped by their run status. |
| Approvals | Number of approval tasks across all releases, grouped by their approval status. |
| Enhancements | Number of product enhancements across all releases. |

### Release Overview dashboard for a multi-product release

The Release overview dashboard provides an overview of all the information about an individual product's release in a multi-product release, which the product team can use to assess its readiness.

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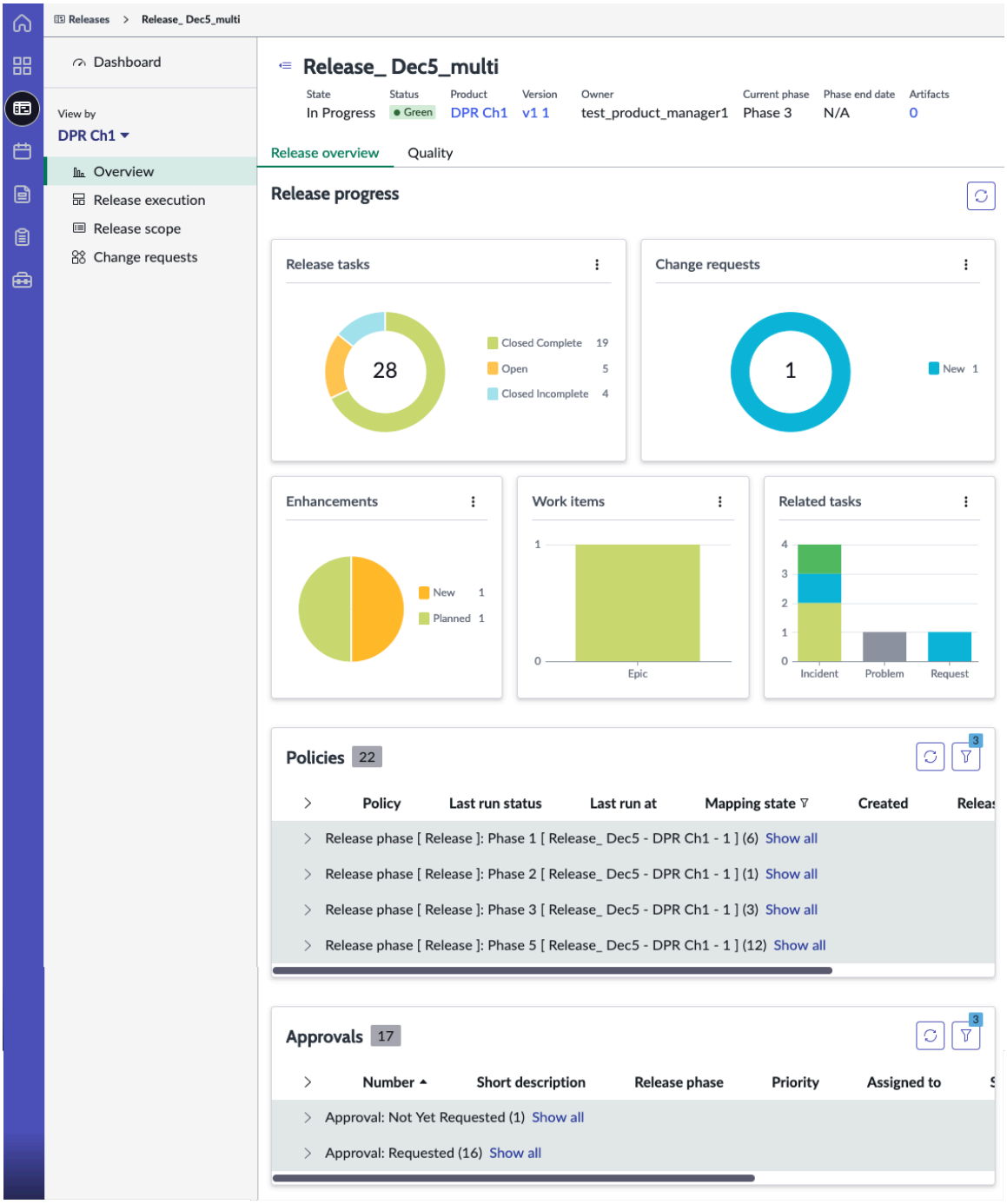


## Required ServiceNow AI Platform roles

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### Widgets

| Widget | Description |
|---|---|
| Release tasks | Number of tasks in the release, grouped by their state. |
| Change requests | Number of change requests in the release, grouped by their state. |
| Enhancements | Number of product enhancements in the release, grouped by their state. |
| Work items | Number of work items in the release, grouped by their type, and stacked by their state. |
| Related tasks | Number of related tasks (incidents, problems) linked to the release, grouped by their type, and stacked by their state. |
| Policies | List of all policies, grouped by the phases they're mapped to. |
| Approvals | List of all approval tasks, grouped by their approval status. |

## Configuring Digital Product Release

Plan and configure the Digital Product Release application.

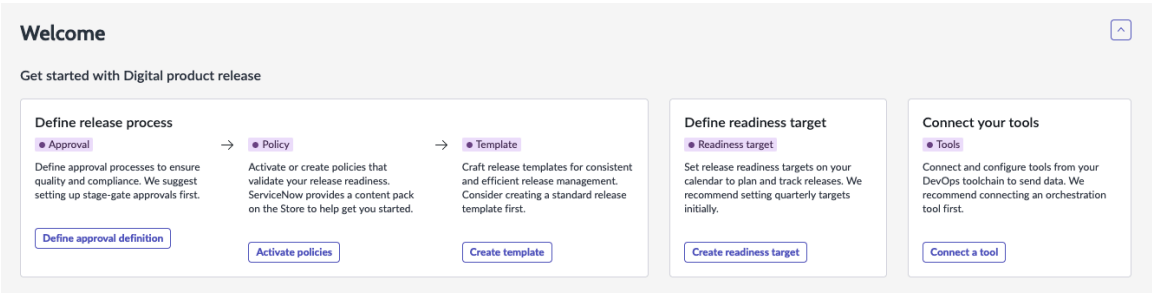
### Configuration overview

- Install Digital Product Release
- Integrate external tools from Digital Product Release Workspace
- Create a release calendar
- Create a release readiness target
- Create an approval definition in Digital Product Release
- Define policies in Digital Product Release
- Create a release template

### Get started with Digital Product Release through the Onboarding section

If you have the sn_dpr_model.release_admin or admin role, you see an Onboarding section on the home page of the Digital Product Release Workspace that helps you get started with configuration tasks.

#### Example of the Onboarding section on the homepage of Digital Product Release Workspace

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## Install Digital Product Release

You can install the Digital Product Release application (sn_dpr) if you have the admin role. The application includes demo data and installs related ServiceNow® Store applications and plugins if they are not already installed.

### Before you begin

- Ensure that the application and all of its associated ServiceNow Store applications have valid ServiceNow entitlements. For more information, see Get entitlement for a ServiceNow product or application.
- Review the Digital Product Release application listing in the ServiceNow Store for information on dependencies, licensing or subscription requirements, and release compatibility.

Role required: admin

### About this task

The following items are installed with Digital Product Release:

- Plugins:

  Global Ranking Application plugin (com.snc.sdlc.ranking)

- Store applications:
  - Digital Product Release Data Model (sn_dpr_model): Contains the core data model for Digital Product Release.
  - Digital Product Release Workspace (sn_dpr_workspace): Provides a single location for the program managers to plan the releases for the digital products and the release managers to manage the release processes.
  - Digital Product Release Policy Content Pack: Contains a set of policies and data collectors to enable automation of phase gate verification in your Digital Product Release.
  - Release Timeline Component: Timeline component for Digital Product Release to visualize phases in releases.

  The following apps are also installed:
  - Policy as Code Engine (sn_pace)
  - Policy as Code Engine UI (sn_pace_builder)
  - CMDB CI Class Models (sn_cmdb_ci_class)
  - Roadmap UI Builder Component (sn_roadmap)
  - Playbook Experience (sn_playbook_exp)
  - Playbook Experience Components (now_playbook_exp)
  - DevOps (sn_devops)
  - DevOps Workspace (sn_devops_ws)
  - DevOps Integrations (sn_devops_ints)
  - Quick filter component (sn_quick_filter)
  - Quick filter popover (sn_filter_popover)
- Roles
- Scheduled jobs
- Tables

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For more information, see Components installed with Digital Product Release.

### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the Digital Product Release application (sn_dpr) using the filter criteria and search bar.

   You can search for the application by its name or ID. If you cannot find the application, you might have to request it from the ServiceNow Store.

   In the list next to the **Install** button, the versions that are available to you are displayed.
3. Select a version from the list and select **Install**.

   In the Install dialog box that is displayed, any dependencies that are installed along with your application are listed.
4. If you're prompted, follow the links to the ServiceNow Store to get any additional entitlements for dependencies.
5. **Optional:** If demo data is available and you want to install it, select the **Load demo data** check box.
   Demo data comprises the sample records that describe application features for the common use cases. Load the demo data when you first install the application on a development or test instance.

   **Important:**
   If you don't load the demo data during installation, it's unavailable to load later.
6. Select **Install**.

## Migrate data from Release Management v2 to Digital Product Release

If you have the Release Management v2 (RM v2) application installed, you can migrate your data from RM v2 to Digital Product Release.

### Before you begin

Role required: admin

To provide access to additional roles, you can add comma-separated values of other roles installed with DPR in the system property *sn_dpr_model.rmv2.migration_roles*. For more information, see Digital Product Release properties.

### About this task

The migration utility performs the following tasks:

- Migrate RM v2 product to Digital product: Copies data from rm_product into newly created Application Product Models.
- Create Release Template from RM v2 Release: Creates a DPR Release Template by leveraging the Phases and Tasks from an existing RM v2 Release record.

For more information about migrating data from Release Management V2 to Digital Product Release, see the RMV2 Product Migration [KB1644412] article in the Now Support Knowledge Base.

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### Procedure

1. Define your custom field mappings as needed.
2. Add any additional post-processing instructions after the creation of the cmdb_application_product_model record.
3. Perform the migration either from the rm_product list view or running the migration script from the sn_dpr_model app scope.

## Integrate external tools from Digital Product Release Workspace

Integrate tools for orchestration, planning, coding, artifact, software quality, and security from the Digital Product Release Workspace for end-to-end change traceability and automation.

### Before you begin

This integration with external tools is accessible as part of the DevOps Change Velocity. For more information, see DevOps Change Velocity integrations and Integrating DevOps Change Velocity with third-party tools.

Role required: sn_dpr_model.release_admin

### About this task

The data coming from the integrated external tools provide you with insights into the breakdown of product enhancements into epics and their stories. This data also enables you to create and automate policies and determine whether the release meets the release exit criteria. For more information, see View and manage data from external tools.

You can also track the software quality of your releases on the Release Quality dashboard that uses this data to show up on different widgets.

### Procedure

1. Navigate to **Workspaces** > **Digital Product Release Workspace**.
2. Select the tools icon ( ).
3. Select the **Connect a tool**.
   The Connect to a tool dialog box appears.

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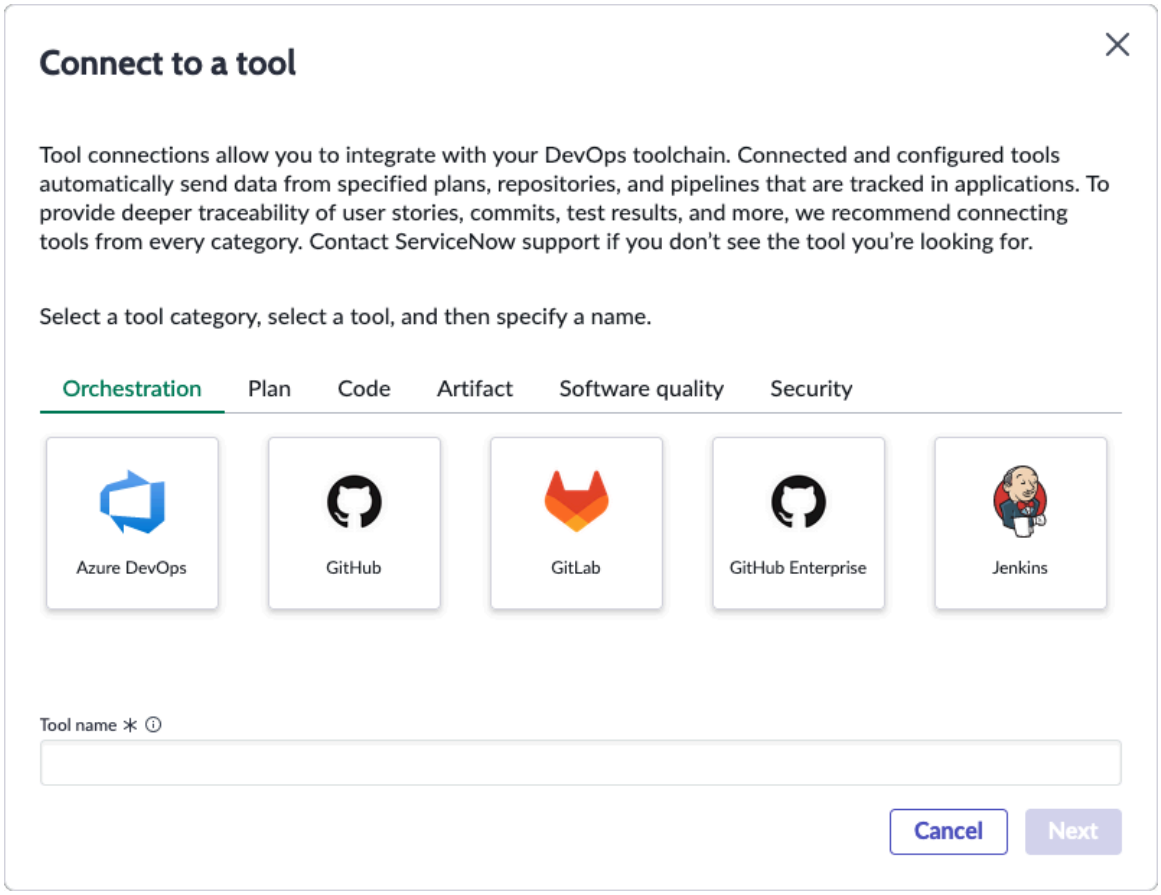


4. Select a tool category, select a tool, and then give it a name.
5. Select **Next** and follow the guided experience to connect and configure the tool.
   For more information about configuring a tool, see its onboarding under Integrating DevOps Change Velocity with third-party tools.

## Create a release calendar

Create a release calendar to define release readiness targets within it.

### Before you begin

Role required: sn_dpr_model.release_admin

### Procedure

1. Navigate to **Workspaces** > **Digital Product Release Workspace**.
2. Select the release calendar icon ( ).
3. Create a release calendar or update an existing one.
   - To create a release calendar, select the release calendar actions button ( ), and then select **Create release calendar**.
   - To modify an existing release calendar, open the release calendar from the drop-down list, select the release calendar actions button, and then select **Edit release calendar**.
4. In the dialog box, fill in the fields.

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**Release calendar dialog box**

| Field | Description |
|---|---|
| Name | Name of the release calendar. |
| Release admin | Name of the release admin who will own the release calendar. |
| Description | Brief description of the release calendar. |
| Exclusion schedules | Schedules for blackouts, maintenance, or holidays are lists of dates for planned closures or business holidays. Add these schedules to the release calendar to avoid having release targets for certain dates.<br><br>The blackouts and maintenance schedules are shown from the Schedule [cmn_schedule] table. For more information, see Define a schedule.<br><br>To include user-defined exclusion schedules under **Others** category, you can configure the system property *sn_dpr.release_calendar_exclusions*. For more information, see Digital Product Release properties. |

5. Save the release calendar.
   - Save a new release calendar by selecting **Create**.
   - Save the changes to an existing release calendar by selecting **Save**.

### Result
The release calendar is saved and displayed in the calendar layout. Events for the exclusion schedules that are added to the release calendar are shown on specific dates on the calendar.

### What to do next
Create a release readiness target

## Create a release readiness target

Create release readiness targets to define the dates by which the releases must be ready for deployment. These targets help you to track and manage capacity and conflicts while ensuring a smooth delivery of your products.

### Before you begin
Role required: sn_dpr_model.release_admin

### About this task
- The release readiness target dates indicate when the products should be ready. They aren't the actual deployment dates.
- You can set either a single or recurring release readiness target on a release calendar.

### Procedure
1. Navigate to **Workspaces** > **Digital Product Release Workspace**.
2. Select the release calendar icon (  ).
3. Select a calendar on which you want to create release readiness targets.
4. Create a release readiness target or update an existing one.

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- To create a release readiness target, select **Create release target**.
- To modify an existing release readiness target, open the release readiness target from the calendar or list.

5. In the dialog box, fill in the fields.
   For more information on release readiness target field descriptions, see Release readiness target form.
6. Select **Next**.
7. If your target dates conflict with scheduled events, you will see a list of those dates, and you can choose to create or not create targets on those dates.
   - To create release targets for conflicting dates, select the check box under the **Opt-in** column next to the dates.
   - If you don't want to create release targets for those dates, clear **Opt-in**.

   **Note:**
   By default, the **Opt-in** check boxes for all conflicting dates are clear, which means that the target dates will not be created for those dates.

8. Select **Create**.

### Result
Release readiness targets are created and displayed on the selected calendar. Release targets that overlap with dates in the exclusion schedule are created only for the dates for which you selected to opt in to.

## Create an approval definition in Digital Product Release

Create an approval definition that can be used in release tasks for getting approvals.

### Before you begin
Role required: sn_dpr_model.product_manager, sn_dpr_model.release_coordinator, or sn_dpr_model.release_admin

### About this task
An approval definition is a set of rules that specify how tasks will be approved from a set of stakeholders for a release. For example, the QA team might approve code quality or the Security team might approve on the security aspects. An approval for a task can be requested from an individual user or a user group.

### Procedure
1. Navigate to **Workspaces** > **Digital Product Release Workspace**.
2. Select the release administration icon (  ).
3. On the Release administration page, select the **Approval definitions** tab.
4. Create an approval definition or update an existing one.
   - To create an approval definition, select **New**.
   - To modify an existing approval definition, open the approval definition from the list.
5. On the form, fill in the fields.
   For more information on approval definition field descriptions, see Approval definition form.
6. Select **Submit**.

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## Define policies in Digital Product Release

Define policies to automate the release workflow based on the different states of the release.

### Before you begin

Role required: sn_dpr_model.release_admin

### About this task

The policies are defined using ServiceNow® Policy as Code Engine (PaCE), so make sure you're familiar with the basics. For more information, see Understanding PaCE.

### Procedure

1. Navigate to **Workspaces** > **Digital Product Release Workspace**.
2. Select the policy administration icon ( ).
3. Create a policy or update an existing one.
   - To create a policy, select **New**.

     For more information on creating a policy, see Create a PaCE policy.
   - To modify an existing policy, open the policy from the list.

   A policy is created in the inactive state and a draft version of the policy is added.
4. Select the **Version** tab and open the draft version.
5. On the Version record form, select the **Policy Builder** tab to write the policy.

   a. On the **Define Variables** pane, use API variables, config parameters, record references, and data collectors to write your policy.

   b. Process data from the DevOps application data model related to the product using the base system data collectors.
   The data collectors collect inputs by processing data from ServiceNow or an external data source to provide an output. The output can be used in the policy logic to take a decision.
   For more information, see Digital Product Release data collectors.
6. Test your policy in the **Test Playground** tab.
   For more information, see Use the Test Playground for PaCE policies.
7. Select **Save** to save the policy version.
   You can also save the version as a template by selecting the **Save as template**.
8. Select **Publish** to publish the policy version and make it available for use.
9. In the Publish draft dialog box, select **Activate this policy** to also activate the policy along with publishing the version.

### Result

The policy version is updated as Current and is used the next time the policy is invoked.

For more information, see Manage PaCE policy versions.

## Create a release template

Create a release template to predefine the release process. The template contains templates for release phases, tasks, exit criteria for each of the phases, key dates, and approvals.

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### Before you begin

Identify phases, tasks within each phase, exit criteria for each phase, key dates, and required approvals for a release. If there are different processes followed for each kind of release or product, you should create multiple release templates.

Role required: sn_dpr_model.release_admin

### About this task

The release teams can use these templates to create a release. All the phases, tasks, key dates, approvals, and phases' exit criteria from the template are applied to the new release. The release template helps the release team track and perform all the required tasks to complete the release on time.

**Important:**
After you mark an activity as done, you can't add or change phases, tasks, or map policies. So, be sure to review and verify all activity details before marking as done.

### Procedure

1. Navigate to **Workspaces** > **Digital Product Release Workspace**.
2. Select the release administration icon (  ).
3. On the Release administration page, select the **Release templates** tab.
4. Create a release template or update an existing one.
   - To create a release template, select **New**.
   - To modify an existing release template, open the release template from the list.
5. On the Create release template dialog box, add details like name and short description.
6. From the **Type** list, select a release type.
7. Select **Create**.
   A release template is created and opens in the release template's Setup playbook page to define the template.
8. In the Release Process activity, select between a timeline-oriented or stage-oriented release process.
9. In the Phases activity, add phases to the release template.
   a. Enter a unique phase name, the duration of the phase in days, and a short description.
   The **Duration** field appears only for the timeline-oriented process.
   b. Select **Add new phase** to add another phase.
   Repeat the steps to add more phases as required.
   c. In the **Release readiness target phase** section, choose a phase from the **Select phase** list to align it with the release readiness.
   The selected phase's end date is considered as the release readiness target date.
   d. Select **Mark as done** to complete adding all required phases to the release template.
   The Phases activity is marked as complete and can't be edited further. The Tasks activity becomes editable, displaying each phase in separate tabs.
10. In the Tasks activity, add tasks to each phase.

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a. Select a phase tab in which you want to add a task.

b. In the **Task name** field, enter a unique name for the task.

c. In the **Need approval** field, select whether the task requires approval.

d. If approval is required for the task, select an approval definition from the **Approval definition** list.
For more information, see Create an approval definition in Digital Product Release.

e. Select **Add new task** to add another task to the phase.

f. After all tasks are added to the current phase, select **Next phase**.
The tasks you added to the current phase are saved. The next available phase tab is selected so you can add tasks for that phase.

Repeat the steps to add more tasks as required for each phase.

g. After all tasks are added to all available phases, select **Save** on the last phase tab.

h. Select **Mark as done** to complete adding tasks to phases as needed.
The Tasks activity is marked as complete and can't be edited further. The next activity becomes editable.

11. In the Key dates activity, add key dates as needed.

**Note:**
This activity is available only for the timeline-oriented release process.

a. Select a phase tab in which you want to add a key date.

b. Select **Add new key date** to add a key date to the phase.
Alternatively, select anywhere on the timeline section. This action creates a key date with the number of days calculated and added to the new key date entry.

c. In the **Type** field, select the type of event to map to the phase.

d. In the **Key date** field, describe your key date.

e. Define your key date by selecting the number of days either from the beginning or before the end of the selected phase.

f. After all key dates are added, select **Mark as done** to complete adding key dates as needed.
The Key dates activity is marked as complete and can't be edited further. The Policies activity becomes editable, displaying each phase in separate tabs.

When you create a release using the template, these key dates help you track the progress of the important events of the release.

12. In the Policies activity, map policies to each phase as needed.

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a. Select a phase tab to which you want to map policies.

b. Select **Map policies**.

c. In the Map Policies dialog box, select policies from the list to map to the phase, and then select **Map policies**.

d. Select **Next phase** to save the mapped policies for the current phase and move to the next phase.

e. After policies are mapped to available phases, select **Save** from the last phase tab.

f. Select **Mark as done** to complete the Policies activity.
The Policies activity is marked as complete and can't be edited further.

13. In the Publish template pop-up window, select whether to publish the template.
    - Select **Yes** to publish and activate the template.
    - Select **No** to keep the template unpublished. You can publish and activate it later from the release template record form.

### Result

- The release template is created and opens in the release template record form.
- A published release template can be used for creating releases.

### What to do next

On the release template record form, you can update, publish, delete, or duplicate it into a new template.

| Action | Steps |
|---|---|
| Publish the release template | Select **Publish template**.<br>**Note:** The option to publish the template is only available if you didn't choose to publish it in the Publish template pop-up window. |
| Edit the release template | 1. Select the more actions button ( ) and select **Edit**.<br>2. In the Edit template pop-up window, select **Yes** to confirm editing.<br>The release template becomes inactive and can't be used for creating a release.<br>The release template opens in the Playbook for editing. |

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| Action | Steps |
| --- | --- |
| | 3. Update the template to add or change the phases, tasks, key dates, and policies as needed.<br>4. To save all the changes in the template, select **Mark as done** in the Policies activity. |
| Duplicate the release template | 1. Select **Clone template**.<br>2. In the Create release template pop-up window, enter the name, type, and description for the duplicate template and select **Create**.<br>A new release template is created identical to the current release template and is opened in the Playbook for editing.<br>3. Update the template to add or change the phases, tasks, key dates, and policies as needed.<br>4. Select **Mark as done** in the Policies activity to save all the changes in the template. |
| Delete the release template | Select the more actions button (  ) and select **Delete**. |

To create a release using the template, select **Create release**.

**Related topics**

- Release for a product
- Create a release with a wizard
- Create a release for a product
- Work on a timeline-oriented release for a single product
- Managing multiple releases through release bundles

## Using Digital Product Release

Digital Product Release helps you streamline the process of delivering digital products by managing the entire release life cycle from planning to delivery.

Use Digital Product Release Workspace to perform these tasks to manage the release cycle of your digital products.

### Request a new digital product

Request a new product to manage features, enhancements, and versions.

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### Before you begin

- Identify, prioritize, and create a backlog of features and enhancements required for the product.
- Define a roadmap of product features and enhancements to be included across multiple versions.
- Plan each version of the product requirements.

Role required: sn_dpr_model.product_manager

### About this task

The Product records are saved in the Application Model [cmdb_application_product_model] table.

If the application model has a corresponding business application, the **View Business Application** related link is displayed on the Product form. Select **View Business Application** to view details of the corresponding business application.

### Procedure

1. Navigate to **Workspaces** > **Digital Product Release Workspace**.
2. Select the products icon (  ).
3. Select **Request product** for a new product.
4. On the Request new product dialog box, provide the product's name, owner, and short description.
5. Select **Submit**.

### Result

- A request is submitted to create a product.
- The **Request Product** flow is triggered that auto-approves the request and creates the product.

> **Note:**
> You can modify the **Request Product** flow in Flow Designer according to your business needs.

- The new product is listed in the Products list.
- A DevOps app corresponding to the product is also created.

### What to do next

- Select the product name from the list to open it in the Product Overview page with the **Details** tab selected.
- Manage product hierarchy using Included products

## Manage product hierarchy using Included products

Add digital products that you manage as Included products within a digital product to create a product hierarchy.

### Before you begin

Role required: sn_dpr_model.product_manager

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### About this task

The product hierarchy created using Included products helps you see relationships between different products and make informed decisions about product development and management.

### Procedure

1. Navigate to **Workspaces** > **Digital Product Release Workspace**.
2. Select the products icon (  ).
3. Select a product from the list to open.
4. Select the **Included products** tab.
5. View and manage included products.
   - To add existing products, select **Add**, select products from the list, and then select **Confirm**.
   - To add a new product, select the more actions icon (  ) next to the **Add** button and then select **Request new product**. The new product appears in the list after it's created.
   - To remove an existing product from the hierarchy, select the product from the list, and then select **Remove**.
   - To view the details of a product, select the product from the list to open.

### Related topics

Request a new digital product

Create a release with a wizard

Work on a timeline-oriented release for multiple products

Work on a stage-oriented release for multiple products

## Define release scope using product enhancements and versions

Define the release scope of digital products by adding product features, enhancements, versions, and work items.

### Before you begin

With the Digital Product Release v1.3, you can add product enhancements to a product's version instead of product features. The product enhancements enable you to plan product features across multiple product versions.

When you upgrade to Digital Product Release v1.3, a product enhancement is created for each existing product feature and linked to the respective versions. Also, all existing links between Work Items and product features are replaced with links to the corresponding product enhancements. For more information about the data model changes and data migration after upgrading to v1.3, see the DPR Fix script for product features to enhancements [KB1703773] article in the Now Support Knowledge Base.

Role required: sn_dpr_model.product_manager

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### About this task

**Note:**
When a Plan Version from the DevOps data model is mapped to a Software Model in DPR, any Work Items associated with that Plan Version get automatically listed in the Release scope page. If a work item is associated with a product enhancement, it shows as a child under that product enhancement in the list. You can track these work items on the Release scope page of a product release.

This option is available when you have selected the **Auto-create product versions from plan versions** while associating the product with a plan from ServiceNow® Agile Development 2.0, Jira, or GitLab.

The mappings between plan versions and software models are stored in the Plan Version to Software Models (sn_devops_m2m_plan_version_software_model) table. The mappings between work items and plan versions are stored in the Work Item to Release Versions (sn_devops_m2m_work_item_plan_version) table.

### Procedure

1. Navigate to **Workspaces** > **Digital Product Release Workspace**.
2. Select the products icon (  ).
3. Select a product from the list to open.
4. Add features and enhancements to the product.
   - Add a product feature to a product
   - Add a product enhancement to a product
   - Add a product enhancement from an epic
5. Request a new version for a product.

#### Add a product feature to a product

Add a product feature to a product to help you plan and manage the scope of a product release.

### Before you begin

Role required: sn_dpr_model.product_manager

### About this task

With the Digital Product Release v1.3, you can add product enhancements to a product's version instead of product features. The product enhancements enables you to plan product features across multiple product versions.

When you upgrade to Digital Product Release v1.3, a product enhancement is created for each existing product feature and linked to the respective versions. Also, all existing links between Work Items and product features will be replaced with links to the corresponding product enhancements. For more information about the data model changes and data migration after upgrading to v1.3, see the DPR Fix script for product features to enhancements [KB1703773] article in the Now Support Knowledge Base.

### Procedure

1. Navigate to **Workspaces** > **Digital Product Release Workspace**.
2. Select the products icon (  ).
3. Select a product from the list to open.
4. Select the **Product features** tab.

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5. Add or modify a product feature.
   - To add a new product feature, select **Add feature**.
   - To modify an existing product feature, select it from the list.
6. On the Add feature dialog box, fill in the fields.

**Add feature form**

| Field | Description |
|---|---|
| Feature name | Name of the product feature. |
| Priority | Priority level for the feature. The level determines how much effort is needed to meet the feature's goals. |
| Description | Brief, high-level description of the product feature. |

7. Select **Confirm**.
   The product feature is created and opened in the Product Feature record page.
8. **Optional:** On the **Details** tab, update the details about the feature, including its state, owner name, and assignment group.
9. **Optional:** On the **Product Enhancements** tab, manage enhancements to plan the product feature into multiple versions of the product.
   a. Select **New**.
   b. Enter details for the enhancement on the **Details** tab.
   c. Select **Save**.
10. **Optional:** Add artifacts for the product feature.
    a. Select the attachment icon ( ) on the contextual menu to open the **Attachments** pane.
    b. Select the **Select** button to upload and attach a file.

### Add a product enhancement to a product

Add a product enhancement to a product to help you plan and manage the scope of a product release.

#### Before you begin
Role required: sn_dpr_model.product_manager

#### About this task
You can also add enhancement from an epic. For more information, see Add a product enhancement from an epic.

#### Procedure
1. Navigate to **Workspaces** > **Digital Product Release Workspace**.
2. Select the products icon ( ).
3. Select a product from the list to open.
4. Select the **Product enhancements** tab.
5. Select **Add enhancement**.
6. On the Add enhancement dialog box, fill in the fields.

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**Add enhancement form**

| Field | Description |
|---|---|
| Name | Name of the product enhancement. |
| Product feature | Name of the product feature to which the enhancement will be associated to. |
| Version | Version to which the enhancement is attached.<br><br>The list displays versions of the product that are in the Planning state.<br><br>**Note:**<br>If you don't select a version, the enhancement is added to the product backlog. |
| Priority | Priority level for the enhancement. The level determines how much effort is needed to meet the enhancement's goals. |
| Description | Short description of the enhancement. |

7. Select **Confirm**.
   The product enhancement is created and opened in the Product Enhancement record page.
8. **Optional:** On the **Details** tab, update the details about the enhancement, including its state, owner name, assignment group, assigned to person, and start and end dates.
9. Select **Link Epics** to associate all the top-level epics being worked on by the development team.
10. On the Link Epics dialog box, select the epics from the list, and select the **Link Epics** button.
    The selected epics are associated with the product enhancement and are listed in the **Work Items** tab.
11. **Optional:** On the **Work Items** tab, select an epic to review its details and related records.
12. **Optional:** Select the attachment icon ( ) to open the **Attachments** pane to upload and attach a file related to the feature.

### Add a product enhancement from an epic

Add a product enhancement from an epic to a product manually.

#### Before you begin

Role required: sn_dpr_model.product_manager

#### About this task

Product enhancements can also be generated automatically from the main epics imported into the ServiceNow instance through the DevOps data model if the following settings have been completed:

- The integration with the external planning tool is done.
- A project from the Planning tool is linked with the product. For more information, see View and manage data from external tools.
- The system property *sn_dpr_workspace.auto_create_product_enhancement_for_primary_epic* is set to **true**. For more information, see Digital Product Release properties.

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### Procedure

1. Navigate to **Workspaces** > **Digital Product Release Workspace**.
2. Select the products icon ( ).
3. Select a product from the list to open.
4. Select the **Product enhancements** tab.
5. Select the more actions icon next to the **Add enhancement** button and then select **Add enhancement from epic**.




The Add enhancements from epics dialog box appears. It has a list of all top-level epics from the linked project that don't have a product enhancement.

6. On the Add enhancements from epics dialog box, select the epics from the list, and then select **Add enhancements**.
The product enhancements are created for the selected epics and listed in the Product enhancements list.

### Related topics

Add a product enhancement to a product

Add a product feature to a product

## Request a new version for a product

Request a version for a product in Digital Product Release.

### Before you begin
Role required: sn_dpr_model.product_manager

### About this task
When linking a plan version from ServiceNow® Agile Development 2.0, Jira, or GitLab, you can select the **Auto-create product versions from plan versions** option. Selecting this option automatically creates a product version associated with one of the following, depending on the tool you select:

- A Fix version created in Jira.
- A Milestone created in GitLab.
- A Release created in Agile Development 2.0.

You don't need to manually create a product version and plan product enhancements, as the tool will sync with the respective planning tools during the import process.

### Procedure

1. Navigate to **Workspaces** > **Digital Product Release Workspace**.
2. Select the products icon ( ).
3. Select a product from the list to open.
4. Select the **Versions** tab to add a version for the product.
5. On the **Versions** tab, add or modify a version.

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- To add a new version, select **Request version**.
- To modify an existing version, select it from the list.

  Follow the steps from Step 8 onwards.

6. On the Request version dialog box, fill in the fields.

**New version form**

| Field | Description |
|---|---|
| Name | Name of the version. |
| Version | Version identifier. |
| Short description | Brief details about the version. |

7. Select **Submit**.
   A request is submitted to create a version and triggers the **Request Product Version** flow. The flow runs to auto-approve the request and creates a product version.

   **Note:**
   You can modify the **Request Product Version** flow in Flow Designer according to your business needs.

   The product version is saved in the Software Model [cmdb_software_product_model] table.

   The new version is listed in the **Versions** tab and select the version name from the list to open the Version record view.

8. **Optional:** On the **Details** tab, update the status of the version in **Status**.
9. **Optional:** Select the attachment icon ( ) to open the **Attachments** pane to select and upload a file related to the version.
10. Select **Save**.

### What to do next

If the product is associated with a plan and the version is not already associated with a plan version, you can select the **Link to plan version** to create an association between them. When the association is established, all product enhancements belonging to the plan version will be updated to the current version. Any other product enhancements currently existing in the version are not impacted.

## View and manage data from external tools

View and manage data coming from the DevOps application corresponding to your product that has been imported through external tools.

### Before you begin

Role required: sn_dpr_model.product_manager

### About this task

This data coming from the external tools provide you with insights into the breakdown of product features into epics and their stories. This data also enables you to create and automate policies and determine whether the release meets the release exit criteria.

The data also provides an overview of the software quality of your releases in the Release Quality dashboard. For more information, see Release Quality dashboard.

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This integration with external tools is accessible as part of the DevOps Change Velocity. For more information, see DevOps Change Velocity integrations and Integrating DevOps Change Velocity with third-party tools.

### Procedure

1. Navigate to **Workspaces** > **Digital Product Release Workspace**.
2. Select the products icon ( ).
3. Select a product from the list to open.
4. Select the **External tools** tab.
5. Associate plans, repositories, and pipelines from the **Plans**, **Repositories**, and **Pipelines** tabs respectively.
   For more information, see Associate tool objects to applications - Workspace.
6. To create product versions in DPR for each Release imported from ServiceNow® Agile Development 2.0, Fix Version imported from Jira or Milestones imported from GitLab automatically, select the **Auto-create product versions from plan versions** option when associating plans from these planning tools.

   **Note:**
   This option is only available when you select only one record (release, plan, or milestone) for association. Make sure you have completed the mapping between the apps in DevOps and the products in DPR. For all new Releases created in Agile Development 2.0, Fix versions created in Jira, or Milestones created in GitLab for the associated plan, a product version is automatically created in DPR.

7. Select the **Artifact repositories** tab to associate an artifact repository to the product.
8. Select the **Artifacts** tab to establish a relation between the artifacts and the product.
   When you create a release for the product, a relationship is established between the artifact version and the release so that policies can be run against the release.

## Plan product enhancements into different versions

Move product enhancements into different versions of the product to plan the scope of your product release in each version.

### Before you begin

Role required: sn_dpr_model.product_manager

### About this task

Release planning is done using a Kanban board. The vertical lanes represent versions, while the cards represent product enhancements.

When linking a plan version from ServiceNow® Agile Development 2.0, Jira, or GitLab, you can select the **Auto-create product versions from plan versions** option. Selecting this option automatically creates a product version associated with one of the following, depending on the tool you select:

- A Fix version created in Jira.
- A Milestone created in GitLab.
- A Release created in Agile Development 2.0.

When a product version is created from a version from one of these planning tools, the product enhancements are planned for the appropriate product version as well. This option verifies that the release planning in DPR reflects the planning state from the planning tool.

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### Procedure

1. Navigate to **Workspaces** > **Digital Product Release Workspace**.
2. Select the products icon (  ).
3. Select a product from the list to open.
4. Select **Release planning**.
5. On the Kanban board, complete your release planning.

## Create a release for a product

Create a product release when all planned product enhancements and product features in a version are ready.

### Before you begin

- Define release scope using product enhancements and versions
- Complete the release planning by moving enhancements into different versions

Role required: sn_dpr_model.product_manager

### About this task

Releases can follow a timeline-oriented and stage-oriented release process. For more information, see Release for a product.

For creating a release for multiple products using the wizard, see Create a release with a wizard.

### Procedure

1. Navigate to **Workspaces** > **Digital Product Release Workspace**.
2. Create a release for a product version from the Release planning page or the Releases list view.
3. In the dialog box, fill in the fields.
   For more information on release field descriptions, see Release form.
4. Select **Confirm**.

### Result

- A release is created and opened in the Release Dashboard page.
- If an out-of-band release is created on a date that already has a release target, it uses that release target. However, if there's no release target for that date, one is created, when the system property *sn_dpr.out_of_band_release_allowed* is set to true. The release admin for this new release target is the same as the one for the selected release calendar.
- If you have selected a timeline-oriented release template, any key dates from the template are added to the release. The date of each of these key dates is calculated based on the number of days from the start or end of the phase mentioned in the release template.
- Any artifacts associated with the product are added to the release. For more information, see View and manage data from external tools.

  You can add or remove artifacts from a release as needed. For more information, see Manage artifacts in a release.

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## Create a release with a wizard

Create a release for one or more products with the help of a wizard. The wizard guides you through the entire release creation process.

### Before you begin

- Define release scope using product enhancements and versions
- Complete the release planning by moving enhancements into different versions

Role required: sn_dpr_model.product_manager

### About this task

Releases can follow a timeline-oriented and stage-oriented release process. For more information, see Release for a product.

### Procedure

1. Navigate to **Workspaces** > **Digital Product Release Workspace**.
2. Select the releases icon ( ).
3. Select **Create release**.
4. In the **Release details** step, provide basic information about the release, including the release name, owner, and a brief description.
5. In the **Product and versions** step, select a product and its version to include in the release. Any Included products associated with the selected products are listed.

   You can add more related products or remove any listed related products and their associated versions.

   - To add more products, perform the following steps:
     a. Select **+ Add product**.
     b. Select one or more related products from the list as needed.
     c. Select **Add**.
     d. If there are Included products for any of the selected products, you can choose to include or exclude them from being added to the release.
        - To add the selected products and their Included products, select **Yes, add Included products also**.
        - To add only the selected products without Included products, select **No, add selected products**.
   - To remove an existing Included product from the list, select the remove included product icon ( ) against the product.

   **Note:**
   The number of Included products that can be added to a release depends on the system property *sn_dpr.multi_product.included_products_limit*. A release admin can update the value of this property to increase or decrease the limit.

6. In the **Release template** step, select a release template to apply to the release.
   A release structure is generated based on the selected release template. For more information about a release template, see Create a release template.

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7. In the **Release target** step, select a release readiness target to determine when the release should be ready.
   A release target is needed for timeline-oriented releases, while it's not needed for stage-oriented releases.

   a. Select a release calendar and then select a date.
      If release targets are unavailable on the selected date, a new target is created and applied to the release.

   b. If release targets are available on the selected date, select a target to apply to the release.

8. Select **Create release**.

### Result

- One or more releases are created depending on the number of products selected:
  - If you selected a single product, a release is created. The release is opened in the Release Dashboard page.
  - If you selected multiple products, the releases are created based on the value set for the *sn_dpr.multi_product.create_independent_releases* system property:
    - When the property is set to false, a main release is created for the primary product and individual releases for each included product are created and added to the main release as dependents.
    - When the property is set to true, a release bundle containing all the individual releases created for the primary product and each included product is created. The release bundle is opened in the Release bundle's Overview page.
- Any artifacts associated with the product are added to its release. For more information, see View and manage data from external tools.

  You can add or remove artifacts from a release as needed. For more information, see Manage artifacts in a release.

## Manage releases for digital products

Track the progress of your releases, and work on them to release products faster and more efficiently.

### Before you begin

Role required: sn_dpr_model.release_coordinator, sn_dpr_model.product_manager, or sn_dpr_model.release_admin

### Procedure

1. Navigate to **Workspaces** > **Digital Product Release Workspace**.
2. Select the releases icon (  ).
3. Select a release from the list to open.
4. If the release isn't in progress, select **Start release**.

#### Managing a timeline-oriented release

Managing a timeline-oriented release involves following a series of deadlines and milestones and adjusting as necessary to keep your release on track.

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## Timeline-oriented release process

Timeline-oriented process is suitable for creating releases that have fixed deadlines and follow a strict schedule.

The following is the general flow that a timeline-oriented release goes through:

- The flow starts with the first phase in the Pending state, which is the default state. The state of the phase moves to In Progress when it starts on the planned start date.
- When all tasks are done and policies are compliant, the phase ends automatically on its planned end date. The phase state updates to the Completed state.
- After the current phase is completed, the next phase moves to the In Progress state. Only one phase can be in progress at a given time.
- When all phases in the release are completed, the release moves to the Review state.
- When the review of the release is completed, the release moves to the Completed state.

For more information, see Release for a product.

## Working on a timeline-oriented release

| | | | |
|---|---|---|---|
| | Work on a release for a single product<br>  <br>Learn about working on a timeline-oriented release to deliver a single product. | Work on a release for multiple products<br>  <br>Learn about working on a timeline-oriented release to deliver multiple products. | |

### Work on a timeline-oriented release for a single product

Monitor and work on a release that follows the timeline-oriented release process to release a single product.

#### Before you begin

Role required: sn_dpr_model.product_manager or sn_dpr_model.release_admin

#### Procedure

1. Navigate to **Workspaces** > **Digital Product Release Workspace**.
2. Select the releases icon ( ).
3. Select a release from the list to open.
4. If the release isn't in progress, select **Start release**.
5. Select the **Overview** section to review and modify release details, get an overview of its status, or change its readiness target date.
   For more information, see Review and update release details and Retarget a release.
6. Select the **Release scope** section to review and update the scope of the release by adding or removing the product features and enhancements.
   For more information, see Update the scope of a release.

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7. Select the **Change requests** section to review the existing change requests in the release and add or delete them as needed.
   For more information, see Manage change requests in a release.
8. From the Release form header, select the number under the Artifacts to manage artifacts added to the release.
   For more information, see Manage artifacts in a release.

### Execute the release

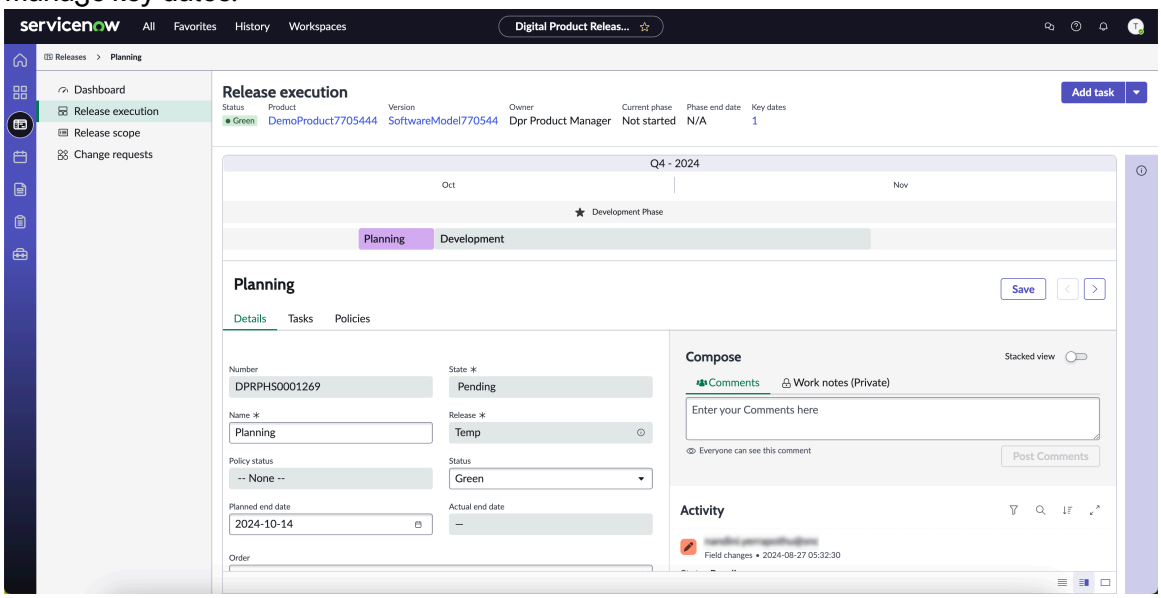
View the release status and work on its phases and tasks, and policies.

## Before you begin

Role required: sn_dpr_model.product_manager or sn_dpr_model.release_admin

## Procedure

1. Select **Release execution** to view the release status and work on its phases and tasks, and manage key dates.




2. Update a release phase.

   a. From the timeline, select a phase or use the arrow buttons to navigate to the previous or next phase.

   b. When all tasks in the current phase are complete and mapped policies comply, mark the phase as complete by selecting **Complete phase**.

      **Note:**
      Only a release admin can manually complete the phase.

      The state of the current phase is updated to Completed and the next phase is started. The actual end date of the current phase is updated to the current date.

3. **Optional:** Add a task to a release phase.

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a. From the timeline, select a phase or use the arrow buttons to navigate to the previous or next phase.

b. Select **Add task**.

c. On the Create task dialog box, add details for the task like its name, phase it belongs to, end date, and description.

d. If the task needs approval, perform the following steps:

> **Note:**
> You can select whether the task needs approval when creating it. This option can't be changed after it's saved.

i. Select **Yes** in the **Need approval** field.

The **Assigned to** and **Approval definition** fields appear.

ii. From the **Assigned to** list, select the user who would approve the task.

iii. From the **Approval definition** list, select an approval definition to trigger the approval based on the predefined condition.

e. Select **Create task**.

The task is added to the selected phase.

4. Track and manage the progress of tasks for the selected phase.

a. From the timeline, select a phase or use the arrow buttons to navigate to the previous or next phase.

b. Select the **Tasks** tab to view all tasks in the phase.
You can apply filters to view specific tasks or change the view type by selecting the **Kanban** or **List** option.

c. Select a task to open in the Task details pane.

d. Review the task in the Task details pane, or select **Full details** to open the task record in the form view.

e. Assign the task in the **Assigned to** field to the user who will work on it.

f. Review the approval status for an approval task in the **Approval** field.

g. Update the **State** field with the status of the task.

h. Select **Save** to save the changes.

5. **Optional:** Map policies to a release phase to validate it.

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a. From the timeline, select a phase or use the arrow buttons to navigate to the previous or next phase.

**Note:**
Policies can't be mapped to a completed or cancelled phase.

b. Select the **Policies** tab, and then select **Add**.

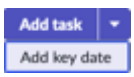
c. On the Map Policies dialog box, select one or more policies from the list to map to the phase.

d. Select **Map policies**.

6. Select **Run policies** to run policies on the current phase.
All mapped policies are executed in the background for the current phase (**In Progress** state). You can check the execution status by refreshing the list on the **Policies** tab.

   A scheduled job runs daily to execute the policies that are mapped to the phase. The Execution status column on the Policies list for each phase is updated to show the compliance status after each run.

7. **Optional:** Add or update key dates in a timeline-oriented release which should be in relation to the release target date.
These key dates help you define and track important events that can happen during the release period.
   - Add a new key date to the release:
     a. Select the more actions icon next to the **Add task** button and then select **Add key date**.

     b. In the Add key date dialog box, fill in the fields.

     (Optional) For more information, see Release key date form.

     c. Select **Save**.
   - Update the existing key dates in the release:
     a. Select a key date in the timeline bar to open the Key date details form in the side-panel.

     (Optional) Alternatively, you can select the number under **Key dates** in the form header to view a list of key dates for the release, and then open a key date.

     b. On the Key date form, update the fields.

     c. Select **Save**.
8. Close a release after verifying the completeness.
For more information, see Close a release.

### Work on a timeline-oriented release for multiple products

Monitor and work on a release that follows the timeline-oriented release process for multiple products.

## Before you begin

Role required: sn_dpr_model.product_manager or sn_dpr_model.release_admin

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### About this task

When working on a release for multiple products, you can choose to work with the main release or a specific product release. The main release controls everything and includes all the execution activities for each product release under it.

- Perform primary activities, like starting the release and managing phases and tasks in the main release.
- Define the release scope and manage change requests in each product release.
- Run policies for the current phase either from the main release level or from an individual product release. The policy statuses from the individual product releases are aggregated into the policy status of the main release. For more information about how the aggregated status is derived, see Policy status aggregation.

You can monitor the progress of an individual product release, or you can track the overall progress at the main release level.

### Procedure

1. Navigate to **Workspaces** > **Digital Product Release Workspace**.
2. Select the releases icon (  ).
3. Select a release from the list to open.
4. If the release isn't in progress, select **Start release**.
5. Select **Dashboard** to monitor the overall status of the release, see the details and all the products that have their individual releases.
   - Select the **Release dashboard** tab to view important dates of the release, release tasks, policies, related tasks, and approvals by their state for all releases together.

     For more information, see Release dashboard for a multi-product release.
   - Select the **Details** tab to make any necessary changes to the release details, such as the release name, owner, status, or description.
   - Select the **Product** tab to view a list of all products, including their release versions and statuses.
6. Select a product to work on the release from the **View by** drop-down list.
   Based on the selected option, you can see different sections as follows:

| View by option | Description |
|---|---|
| All products | You can see the following sections:<br>○ **Release execution**: Work on the main release which involves starting the release, retargeting the release, and executing the release to manage phases, tasks, key dates, policies, and approvals. All of these actions apply to all releases.<br>○ **Change requests**: View a list of all change requests across releases for all products. |
| Single product | You can see the following sections for the selected product's release: |

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| View by option | Description |
| --- | --- |
| | ○ **Overview**: View the progress and quality of the product's release on the respective dashboards. For more information, see Release Overview dashboard for a multi-product release and Release Quality dashboard.<br>○ **Release execution**: View the details of phases of the product's release or run policies mapped to its phases for compliance checks.<br>**Note:** In the **Details** tab, the **Policy status** field displays a combined compliance status for all releases.<br>○ **Release scope**: View and update the scope of the product's release, including product enhancements, planning items, and related tasks such as incidents and problems associated with the release.<br>○ **Change requests**: View and manage change requests related to the product's release.<br>On the Release form header, select the number under the **Artifacts** label to manage artifacts in the product's release. The **Artifacts** label is available in the **Overview**, **Release scope**, or **Change requests** section. For more information, see Manage artifacts in a release. |

7. Close a release after verifying the completeness.
   For more information, see Close a release.

### Managing a stage-oriented release

Managing a stage-oriented release involves completing objectives and closing the release when the work is done and meets the defined release criteria, rather than waiting for the planned end date.

## Stage-oriented release process

Stage-oriented process is suitable for creating releases that prioritize completing objectives and features over following a strict timeline.

The following is the general flow that a stage-oriented release goes through:

- The flow starts with the first phase in the Pending state, which is the default state. The state of the phase moves to In Progress when you manually start it.
- When the all tasks are completed and all policies are compliant or compliant with exceptions for the current phase, it automatically moves to the Completed state.
- After the current phase is completed, the next phase moves to the In Progress state. Only one phase can be in progress at a given time.
- If you encounter any issues at any point, you can restart from a previously completed phase. That phase and later phases are reset, including tasks and policy status.
- When all phases in the release are completed, the release moves to the Review state.
- When the review of the release is completed, the release moves to the Completed state.

For more information, see Release for a product.

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# Working on a stage-oriented release

| | Work on a release for a single product | Work on a release for multiple products | |
|---|---|---|---|
| |  |  | |
| | Learn about working on a stage-oriented release to deliver a single product. | Learn about working on a stage-oriented release to deliver multiple products. | |

## Work on a stage-oriented release for a single product

Monitor and work on a release that follows the stage-oriented release process to release a single product.

### Before you begin

Role required: sn_dpr_model.product_manager or sn_dpr_model.release_admin

### Procedure

1. Navigate to **Workspaces** > **Digital Product Release Workspace**.
2. Select the releases icon (  ).
3. Select a release from the list to open.
4. If the release isn't in progress, select **Start release**.
5. Select the **Overview** section to review and modify release details, get an overview of its status, or change its readiness target date.
   For more information, see Review and update release details and Retarget a release.
6. Select the **Release scope** section to review and update the scope of the release by adding or removing the product features and enhancements.
   For more information, see Update the scope of a release.
7. Select the **Change requests** section to review the existing change requests in the release and add or delete them as needed.
   For more information, see Manage change requests in a release.
8. From the Release form header, select the number under the Artifacts to manage artifacts added to the release.
   For more information, see Manage artifacts in a release.

## Restart the release phase

You can start over a stage-oriented release from any previously completed phase if you encounter an issue that requires you to go back.

### Before you begin

**Note:**
When you restart a release from a completed phase, it resets that phase and any later phases up to the current one. It also resets the status of tasks, approval requests, and policies linked to each affected phase.

Role required: sn_dpr_model.release_admin

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## About this task

By restarting a phase, you can reassess and adjust the plan to overcome the new issues, ensuring that the release stays on track and meets its overall goals. For example, if a certain version of an artifact is being certified during the release process and it doesn't pass the validation, a new version of the artifact can be chosen. Then, you can restart the release from an earlier phase to repeat the same tasks, mapped policies, and approvals from those phases.

## Procedure

1. On the Release execution page, select the release phase action button (⋮) and then select **Restart phase**.
2. On the Restart phase dialog box, select a phase from where you want to restart.
   The list displays the completed phases.
3. Select **Restart**.

## Result

- The state of the selected phase updates to In Progress and of all the later phases updates to Pending.
- The state of the current phase updates to Restarted.
- The state of all tasks in the affected phases updates to Open.
- The last run status of the policies mapped to theses phases updates to Not run.

### Execute the release

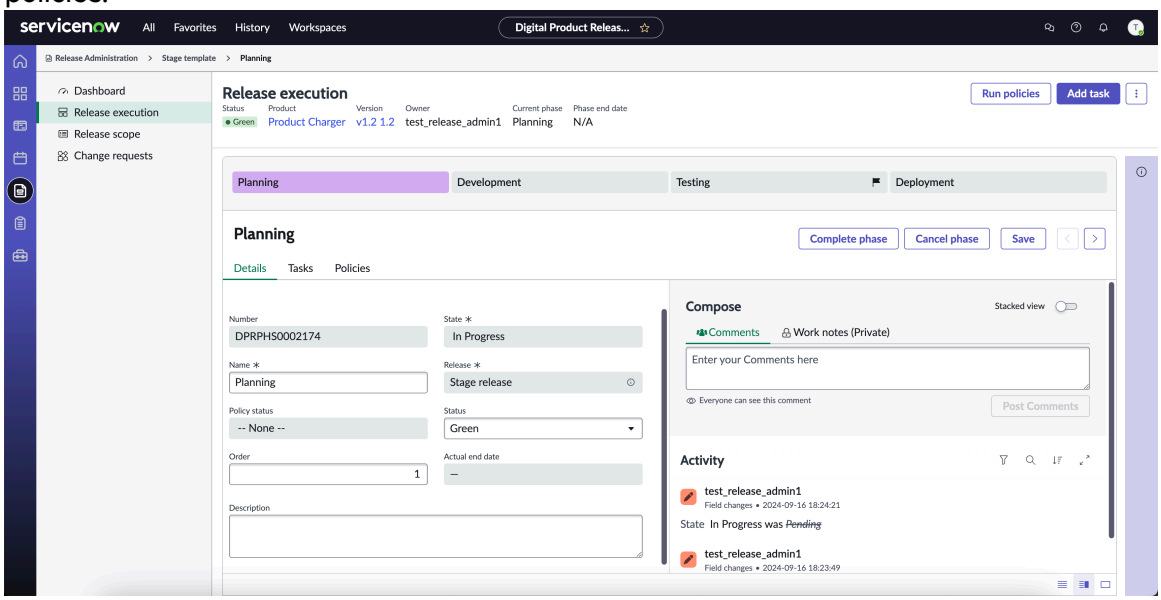
View the release status and work on its phases and tasks, and policies.

## Before you begin

Role required: sn_dpr_model.product_manager or sn_dpr_model.release_admin

## Procedure

1. Select **Release execution** to view the release status and work on its phases, tasks, and policies.




2. Update a release phase.

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**Note:**
If the *stage_workflow_auto_transition* system property is set to true, the phases are automatically closed when all tasks in it are closed and policies comply.

**a.** From the timeline, select a phase or use the arrow buttons to navigate to the previous or next phase.

**b.** When all tasks in the current phase are complete and mapped policies comply, mark the phase as complete by selecting **Complete phase**.

**Note:**
If any of the mapped policies is noncompliant, you can complete a phase only when you have either the sn_dpr_model.release_admin role or any of the roles defined in the system property *sn_dpr.complete_phase_override*.

The state of the current phase is updated to Completed and the next phase is started. The actual end date of the current phase is updated to the current date.

**3. Optional:** Add a task to a release phase.

**a.** From the timeline, select a phase or use the arrow buttons to navigate to the previous or next phase.

**b.** Select **Add task**.

**c.** On the Create task dialog box, add details for the task like its name, phase it belongs to, end date, and description.

**d.** If the task needs approval, perform the following steps:

**Note:**
You can select whether the task needs approval when creating it. This option can't be changed after it's saved.

**i.** Select **Yes** in the **Need approval** field.

The **Assigned to** and **Approval definition** fields appear.

**ii.** From the **Assigned to** list, select the user who would approve the task.

**iii.** From the **Approval definition** list, select an approval definition to trigger the approval based on the predefined condition.

**e.** Select **Create task**.

The task is added to the selected phase.

**4.** Track and manage the progress of tasks for the selected phase.

**a.** From the timeline, select a phase or use the arrow buttons to navigate to the previous or next phase.

**b.** Select the **Tasks** tab to view all tasks in the phase.
You can apply filters to view specific tasks or change the view type by selecting the **Kanban** or **List** option.

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c. Select a task to open in the Task details pane.

d. Review the task in the Task details pane, or select **Full details** to open the task record in the form view.

e. Assign the task in the **Assigned to** field to the user who will work on it.

f. Review the approval status for an approval task in the **Approval** field.

g. Update the **State** field with the status of the task.

h. Select **Save** to save the changes.

5. **Optional:** Map policies to a release phase to validate it.

   a. From the timeline, select a phase or use the arrow buttons to navigate to the previous or next phase.

   **Note:**
   Policies can't be mapped to a completed or cancelled phase.

   b. Select the **Policies** tab, and then select **Add**.

   c. On the Map Policies dialog box, select one or more policies from the list to map to the phase.

   d. Select **Map policies**.

6. Select **Run policies** to run policies on the current phase.
   All mapped policies are executed in the background for the current phase (**In Progress** state).
   You can check the execution status by refreshing the list on the **Policies** tab.
7. Close a release after verifying the completeness.
   For more information, see Close a release.

### Work on a stage-oriented release for multiple products

Monitor and work on a release that follows the stage-oriented release process for multiple products.

#### Before you begin

Role required: sn_dpr_model.product_manager or sn_dpr_model.release_admin

#### About this task

When working on a release for multiple products, you can choose to work with the main release or a specific product release. The main release controls everything and includes all the execution activities for each product release under it.

- Perform primary activities, like starting the release and managing phases and tasks in the main release.
- Define the release scope and manage change requests in each product release.

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- Run policies for the current phase either from the main release level or from an individual product release. The policy statuses from the individual product releases are aggregated into the policy status of the main release. For more information about how the aggregated status is derived, see Policy status aggregation.

You can monitor the progress of an individual product release, or you can track the overall progress at the main release level.

### Procedure

1. Navigate to **Workspaces** > **Digital Product Release Workspace**.
2. Select the releases icon (  ).
3. Select a release from the list to open.
4. If the release isn't in progress, select **Start release**.
5. Select **Dashboard** to monitor the overall status of the release, see the details and all the products that have their individual releases.
   - Select the **Release dashboard** tab to view important dates of the release, release tasks, policies, related tasks, and approvals by their state for all releases together.

     For more information, see Release dashboard for a multi-product release.
   - Select the **Details** tab to make any necessary changes to the release details, such as the release name, owner, status, or description.
   - Select the **Product** tab to view a list of all products, including their release versions and statuses.
6. Select a product to work on the release from the **View by** drop-down list.
   Based on the selected option, you can see different sections as follows:

| View by option | Description |
|---|---|
| All products | You can see the following sections:<br>○ **Release execution**: Work on the main release which involves starting the release, retargeting the release, executing the release to manage phases, tasks, policies, and approvals, and restarting the release from a previously completed phase. All of these actions apply to all releases.<br>○ **Change requests**: View a list of all change requests across releases for all products. |
| Single product | You can see the following sections for the selected product's release:<br>○ **Overview**: View the progress and quality of the product's release on the respective dashboards. For more information, see Release Overview dashboard for a multi-product release and Release Quality dashboard.<br>○ **Release execution**: View the details of phases of the product's release or run policies mapped to its phases for compliance checks.<br>**Note:** In the **Details** tab, the **Policy status** field displays a combined compliance status for all releases. |

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| View by option | Description |
| --- | --- |
| | ○ **Release scope**: View and update the scope of the product's release, including product enhancements, planning items, and related tasks such as incidents and problems associated with the release.<br>○ **Change requests**: View and manage change requests related to the product's release.<br><br>On the Release form header, select the number under the **Artifacts** label to manage artifacts in the product's release. The **Artifacts** label is available in the **Overview**, **Release scope**, or **Change requests** section. For more information, see Manage artifacts in a release. |

7. Close a release after verifying the completeness.
   For more information, see Close a release.

### Managing multiple releases through release bundles

Release bundles help you to group multiple releases to track and manage them concurrently from a single place.

Release coordinators and product managers can easily track the progress of each release using release bundles. Release bundles help to identify dependencies and potential conflicts, and make any necessary adjustments to ensure a smooth and coordinated release process. They also enable communication and collaboration among team members, as everyone can access the same information and stay updated on the status of each release.

You can include a release in multiple release bundles, which can be useful for larger projects. It can help in better coordination between multiple teams working on different features. It can also help with managing and prioritizing updates.

## Features and benefits

Release bundles offer the following features and benefits:

**Centralized management**

Provides release coordinators and project managers to manage multiple releases concurrently from one place.

**Progress and quality monitoring**

Monitor progress of releases across multiple teams and projects and ensure the quality of releases within the bundle.

**Change request tracking**

Track all change requests in releases.

### Create a release bundle

Create a release bundle to manage and track multiple releases from a single place. These releases can have different release readiness targets, yet grouping them together in bundles helps you manage them all efficiently.

#### Before you begin

Role required: sn_dpr_model.release_coordinator, sn_dpr_model.product_manager, or sn_dpr_model.release_admin

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### Procedure

1. Navigate to **Workspaces** > **Digital Product Release Workspace**.
2. Select the releases icon (  ), and then select **Bundles**.
3. Select **New**.
4. On the Create release bundle dialog box, provide the name, owner, and a description for the release bundle.
5. Select **Next**.
6. Add releases to the bundle or skip to add them later.
   - To add releases to the bundle, select them from the list, and select **Add**.
   - To add releases to the bundle later, select **Skip**.

## Track multiple releases from a release bundle

Track the progress of releases in a release bundle concurrently to improve efficiency and streamline the release management process. You can also identify dependencies and potential conflicts in your releases and coordinate with team members working on different releases.

### Before you begin

Role required: sn_dpr_model.release_coordinator, sn_dpr_model.product_manager, or sn_dpr_model.release_admin

### Procedure

1. Navigate to **Workspaces** > **Digital Product Release Workspace**.
2. Select the releases icon (  ), and then select **Bundles**.
3. Select a release bundle from the list to open.
4. On the **Overview** tab, review key metrics for all releases in the bundle.

| Widget | Description |
|---|---|
| Releases by state | Total number of releases in the bundle, grouped by their state. |
| Tasks | Total number of tasks across all releases in the bundle, grouped by their state. |
| Policies | Total number of policies across all releases in the bundle, grouped by their compliant status. |
| Approvals | List of all approval tasks across all releases in the bundle, grouped by their approval status. |
| Enhancements | Total number of product enhancements across all releases in the bundle, grouped by their state. |

5. **Optional:** On the **Details** tab, view and edit the release bundle details.
6. On the **Release** tab, view and manage releases in the bundle.

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- To add release to the bundle, select **Add** and then select from the list of releases.
- To remove an existing release from the bundle, select the release from the list, and then select **Remove**.
- To view the details of a release, select the release from the list.

7. On the **Change requests** tab, view change requests across all releases in the bundle.
   To view the details of a change request, select it from the list.

### Review and update release details

Review and modify the details of a release. You can also retarget the readiness date of the release as required.

#### Before you begin

Role required: sn_dpr_model.product_manager or sn_dpr_model.release_admin

#### Procedure

1. Navigate to **Workspaces** > **Digital Product Release Workspace**.
2. Select the releases icon (  ).
3. Select a release from the list to open.
4. Select **Overview** to review the release's progress and quality at a glance, take any necessary steps, or review and change its details.
5. Select the **Release overview** tab to review the important dates, change requests, risk scores, tasks, and policy and approval statuses.
   For more information, see Release Overview dashboard.
6. Select the **Details** tab to make any necessary changes to the release details, such as the release name, owner, status, or description.
7. Select the **Quality** tab to review the software and test quality summaries for an ongoing release.
   For more information, see Release Quality dashboard.

> **Note:**
> You must configure pipelines to track software quality of your release. For more information about setting up pipelines using external tools configuration, see Integrate external tools from Digital Product Release Workspace.

### Update the scope of a release

Review and update the scope of the release by adding or removing product enhancements, planning items, and related tasks like incidents and problems.

#### Before you begin

Role required: sn_dpr_model.product_manager or sn_dpr_model.release_admin

#### Procedure

1. Navigate to **Workspaces** > **Digital Product Release Workspace**.
2. Select the releases icon (  ).
3. Select a release from the list to open.
4. Select **Release scope** to manage product enhancements, work items, planning items, and tasks in the release.

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**Note:**
The tabs for task types that you see depend on the permissions required to view those task type records and the system property *sn_dpr.release_related_record_types*. For more information, see Digital Product Release properties.

5. Select the **Product enhancements and Work items** tab to manage product enhancements and work items in the release.
   - Add a product enhancement to a product
   - Add a product enhancement from an epic

   The product enhancements added to the release are listed in the Product enhancements and Work items tab.
6. Select the **Planning Items** tab to view planning items associated with the product enhancements in the release.

   **Note:**
   The **Planning Items** tab is available only when the following conditions are met:
   - You have one of the following roles required to view those items
     - sn_dpr_model.product_enhancement_read
     - sn_dpr_model.release_admin
     - sn_dpr_model.release_user
     - sn_dpr_model.product_manager
     - sn_dpr_model.release_coordinator
   - ServiceNow® Strategic Planning Workspace is installed with the Digital Product lens configured

     For more information about the lenses and portfolio plans, see Lenses in Strategic Planning and Portfolio plans in Strategic Planning.

   a. Select a planning item number to view its details.
   A list of the planning items associated with the product enhancements displays.
7. Manage related tasks in the release.
   - To add a related task, select **Add**.
     a. Select the tab in which you would like to add a task.

        A list of the records of the selected task type displays.

     b. Select one or more records from the list and then select **Add**.

        The selected task records are added to the release.
   - To remove a related task, select it from the list and select **Remove**.

### Manage change requests in a release

View and manage change requests in a release.

### Before you begin

Role required: sn_dpr_model.product_manager or sn_dpr_model.release_admin

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### Procedure

1. Navigate to **Workspaces** > **Digital Product Release Workspace**.
2. Select the releases icon ( ).
3. Select a release from the list to open.
4. Select **Change requests** to manage change requests in the release.
   The Change requests list displays all change requests that are associated with the current release of the product. A release is associated with a change request by entering the corresponding product version in the **Software model** field of the Change Request record.
5. To add a new change request to the release, select **New**.
6. Select a Change request model and then select **Next**.
7. Fill in the details in the Change Request form and select **Save**.
   For more information, see Create a change request.

### Result

The change request is created and listed in the Change requests list.

## Manage artifacts in a release

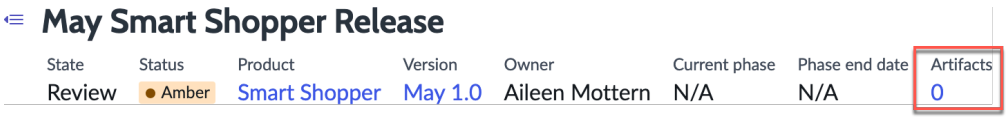
Add or remove artifacts from a release.

### Before you begin

Role required: sn_dpr_model.product_manager or sn_dpr_model.release_admin

### Procedure

1. Navigate to **Workspaces** > **Digital Product Release Workspace**.
2. Select the releases icon ( ).
3. Select a release from the list to open.
4. On the Release form header, select the number under the **Artifacts** label.
   The **Artifacts** label is available when you select **Overview**, **Release scope**, or **Change requests**.




5. On the Release Artifacts list view, add or remove artifacts.

## Retarget a release

Change the release readiness target to reschedule the release period.

### Before you begin

Role required: sn_dpr_model.product_manager or sn_dpr_model.release_admin

### Procedure

1. Navigate to **Workspaces** > **Digital Product Release Workspace**.
2. Select the releases icon ( ).
3. Select a release from the list to open.

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4. On the Release form, select **Overview**.
5. Select the release action icon ( ) and then select **Retarget release**.
6. On the Retarget release dialog box, select a different release readiness target from **Release readiness target**.
7. You can also make the release as an out-of-band release by selecting **Out of band**. This option depends on the system properties—*out_of_band_release_allowed* and *out_of_band_release_roles*. For more information, see Digital Product Release properties.
8. If you selected the out-of-band option, then select a release calendar from the **Release calendar** to tag the release and use its release target.
9. Select **Confirm**.

### Result
The readiness target date of the release is updated to new date.

For timeline-oriented releases, the key dates impacted are adjusted based on the retargeted date. This adjustment is made after recalculating the number of days that have changed from the original schedule.

#### Close a release

Complete a release after all tasks have been completed and all phases are in compliance with the mapped policies.

### Before you begin
A release must be in the Review state to mark it as complete.

Role required: sn_dpr_model.release_admin

### About this task

**Note:**
A release that follows a stage-oriented process automatically moves to Completed if the *stage_workflow_auto_transition* system property is set to true.

### Procedure

1. Navigate to **Workspaces** > **Digital Product Release Workspace**.
2. Select the releases icon ( ).
3. Select a release from the list to open.
4. Review the completeness of the release to determine if all the release work is complete.
5. Close the release.
   - In a single product release, on the Overview page, select **Complete release**.
   - In a multi-product release, on the Dashboard page, select **Complete release**.

### Result
The release is closed and its state is updated to Completed.

## View releases planned in a release readiness target

View and track all product releases that are planned in a release readiness target and track their progress.

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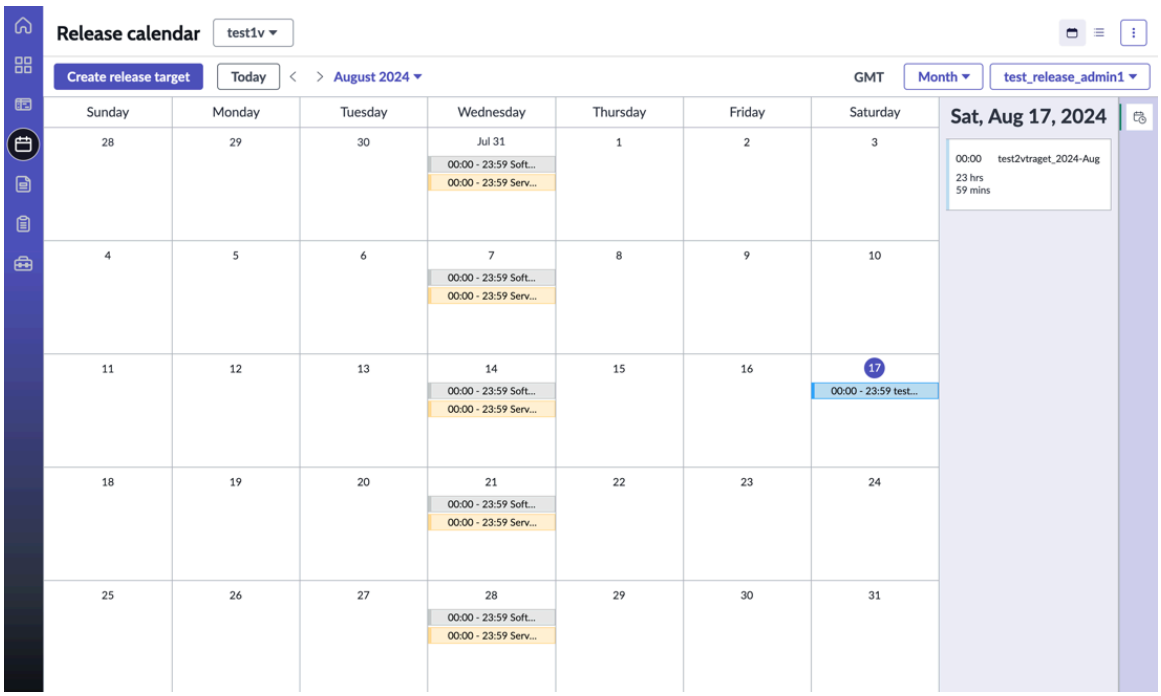
### Before you begin

Role required: sn_dpr_model.release_admin

### Procedure

1. Navigate to **Workspaces** > **Digital Product Release Workspace**.
2. Select the release calendar icon ( ).
   The release calendar appears.




3. Select a release calendar on which you want to view the releases.
4. **Optional:** Filter the release calendars by selecting a release manager from the filter list.
   Release targets are displayed for all release managers by default.
5. Select a release readiness target from the calendar, or list view, or agenda view pane.
6. On the Release target form, select the **Releases** tab to view all releases planned in the readiness target.
   The list displays all releases attached to this readiness target.
7. Select a release from the list to review its status and other details.

## Digital Product Release Policy Content Pack

The Digital Product Release Policy Content Pack includes data collectors and policies for automating the verification of phase gate in Digital Product Release.

- Data collectors enable you to create low-code policies for the DevOps data model application.

  For more information, see Digital Product Release data collectors.

- Policies enable you to automate phase gate verification and continuous evaluation of software artifacts to ensure they meet the business requirements and standards.

  For more information, see Digital Product Release policies.

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## Digital Product Release data collectors

The Digital Product Release Policy Content Pack contains a set of data collectors to collect DevOps data to be validated against policies.

## Approval Task Completeness

The Approval Task Completeness data collector checks if all approval release tasks associated with a release phase are complete.

Input: Release phase.

Output:

- true: All approval tasks are approved.
- false: One or more approval tasks aren't approved, or there are no approval tasks for the release phase.

## Artifact Story Complete

The Artifact Story Complete data collector returns the percent of stories completed that are associated with a release artifact. The formula used to calculate the percentage is: `Percentage of stories completed = (Number of completed Stories / (Total number of stories - Number of stories in cancelled state - Number of stories in deleted state)) * 100`.

Input: List of artifacts for a release phase.

Output: % of stories that are complete.

## Code Coverage

The Code Coverage data collector returns the current code coverage calculated based on the artifact versions.

Input: List of artifacts for a release phase.

Output: % of code coverage.

## Commits Without Work Item

The Commits Without Work Item data collector returns the percent of commits that don't have an associated Work Item. The formula used to calculate the percentage is: `Percentage of commits without work item = (Number of commits without work item / Total number of commits in artifact) * 100`.

Input: List of artifacts for a release phase.

Output: % of commits without Work Item.

## Planned Story Completeness

The Planned Story Completeness data collector returns the percent of planned stories that are marked as complete. Stories from the Epics that are associated with the release are considered. The data collector also checks if the product version is associated with plan version. If it is associated with plan version, it considers also all stories associated with plan version.The formula used to calculate the percentage is: `Percentage of stories completed = (Number of completed Stories / (Total number of stories - Number`

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`of stories in cancelled state - Number of stories in deleted state)) * 100;.`

Input: List of Epics associated with a release.

Output: % of planned stories that are marked as complete.

### Security Vulnerability

The Security Vulnerability data collector returns the number of security vulnerabilities that are associated with a particular category. Security vulnerabilities are identified based on the artifact versions and the category of vulnerability as follows:

- Blocker: Returns the sum of blocker issues. Valid only for DevOps data.
- Critical priority issues: For DevOps data, returns the sum of Critical issues. For SecOps data, returns the sum of Very High Priority issues. For both DevOps and SecOps data, returns the cumulative of the Critical and Very High Priority issues.
- High priority issues: Returns the sum of High Priority issues from both DevOps and SecOps data.
- Medium priority issues: Returns the sum of Medium Priority issues from both DevOps and SecOps data.
- Major issues: Return the sum of Major issues from all artifacts. Valid only for DevOps data.
- Minor issues: Return the sum of Minor issues from all artifacts. Valid only for DevOps data.

Input: List of artifacts for a release phase.

Output: Total number of vulnerabilities.

### Test Pass

The Test Pass data collector returns the percent of passed tests based on artifact versions. If the test type is provided, it returns the test results only for the given test type, otherwise for all test types for the artifact version. The formula used to calculate the percentage is: `Percentage of tests passed = (Number of tests passed / (Total number of tests - Number of skipped tests)) * 100`.

Input: List of artifacts for a release phase and Test type (optional).

Output: % of tests passed.

### Work Items Have Commits

The Work Items Have Commits data collector returns whether all Work Items have a related commit. The Work Items are identified based on the Epics related with the release. The data collector also checks if the product version is associated with plan version. If it is associated with plan version, it considers also all stories associated with plan version. The formula used to calculate the percentage is: `Percentage of stories without commits = (Number of completed stories without commits / Total number of stories in completed state) * 100`.

Input: List of artifacts for a release phase.

Output: % of commits without Work Item.

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**Related topics**

Digital Product Release policies

Passing parameters to PaCE policies

## Digital Product Release policies

By default, the Digital Product Release Policy Content Pack contains a set of policies to automate phase gate verification and continuous evaluation of software artifacts.

You can use or customize these default DPR policies to validate that your configuration data content is conformable, or administrate the full life cycle of PaCE policies. For more information, see Policy as Code Engine (PaCE).

**Note:**
You can't modify default policies. However, you can create a copy of the policy and customize it.

### All Completed Stories Have Associated Commits (all_completed_stories_have_associated_commits)

Checks whether all the completed stories of a release have associated commits.

Results into a non-compliant status when a completed story of a release has no associated commits.

### All Planned Stories Are Completed (all_planned_stories_are_completed)

Checks whether all the planned stories of a release are completed. This policy also checks if the product version is associated with plan version. If it is associated with plan version, it checks all stories associated with plan version in addition to the stories associated with epics in features or enhancements.

Results into a non-compliant status when the completion percentage of stories planned for a release isn't `100%`. The completion percentage of planned stories is calculated as `(Total completed stories/Total planned stories) * 100`.

### Code Coverage Exceeds Threshold (code_coverage_threshold)

Checks whether the percentage of code coverage exceeds the threshold value.

Results into a non-compliant status when the percentage of code coverage is less than the specified threshold value. The percentage of code coverage for a release is the average code coverage calculated for all artifact versions included in the release.

**Note:**
The artifact versions with no code coverage data are excluded from the average code coverage calculation.

**Input arguments**

minCodeCoverageThreshold

- The minimum accepted value for the code coverage for a release.
- Default value: `100`
- Type: Integer
- Usage: Mandatory

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### Integration Test Pass Exceeds Threshold (integration_test_pass_threshold)

Checks whether the percentage of passed integration tests isn't less than the threshold value.

Results into a non-compliant status when the percentage of passed integration tests is less than the specified threshold value. The percentage of passed integration tests is calculated as `(Total passed integration tests for all artifact versions/Total integration tests for all artifact versions) * 100`.

**Input arguments**

minTestPassThreshold

- The minimum accepted value for the percentage of passed integration tests.
- Default value: `100`
- Type: Integer
- Usage: Mandatory

### Load Test Pass Exceeds Threshold (load_test_pass_threshold)

Checks whether the percentage of passed load tests isn't less than the threshold value.

Results into a non-compliant status when the percentage of passed load tests is less than the specified threshold value. The percentage of passed load tests is calculated as `(Total passed load tests for all artifact versions/Total load tests for all artifact versions) * 100`.

**Input arguments**

minTestPassThreshold

- The minimum accepted value for the percentage of passed load tests.
- Default value: `100`
- Type: Integer
- Usage: Mandatory

### No Critical Vulnerabilities Found (no_critical_vulnerabilities)

Checks whether there are no critical vulnerabilities found in a release.

Results into a non-compliant status when the total number of vulnerabilities categorized as blocker, critical, high, or major is greater than zero.

### Regression Test Pass Exceeds Threshold (regression_test_pass_threshold)

Checks whether the percentage of passed regression tests isn't less than the threshold value.

Results into a non-compliant status when the percentage of passed regression tests is less than the specified threshold value. The percentage of passed regression tests is calculated as `(Total passed regression tests for all artifact versions/Total regression tests for all artifact versions) * 100`.

**Input arguments**

minTestPassThreshold

- The minimum accepted value for the percentage of passed regression tests.
- Default value: `100`

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- Type: Integer
- Usage: Mandatory

### Smoke Test Pass Exceeds Threshold (smoke_test_pass_threshold)

Checks whether the percentage of passed smoke tests isn't less than the threshold value.

Results into a non-compliant status when the percentage of passed smoke tests is less than the specified threshold value. The percentage of passed smoke tests is calculated as `(Total passed smoke tests for all artifact versions/Total smoke tests for all artifact versions) * 100`.

**Input arguments**

minTestPassThreshold

- The minimum accepted value for the percentage of passed smoke tests.
- Default value: `100`
- Type: Integer
- Usage: Mandatory

### System Test Pass Exceeds Threshold (system_test_pass_threshold)

Checks whether the percentage of passed system tests isn't less than the threshold value.

Results into a non-compliant status when the percentage of passed system tests is less than the specified threshold value. The percentage of passed system tests is calculated as `(Total passed system tests for all artifact versions/Total system tests for all artifact versions) * 100`.

**Input arguments**

minTestPassThreshold

- The minimum accepted value for the percentage of passed system tests.
- Default value: `100`
- Type: Integer
- Usage: Mandatory

### User Acceptance Test Pass Exceeds Threshold (user_acceptance_test_pass_threshold)

Checks whether the percentage of passed user acceptance tests isn't lower than the threshold value.

Results into a non-compliant status when the percentage of passed user acceptance tests is less than the specified threshold value. The percentage of passed user acceptance tests is calculated as `(Total passed user acceptance tests for all artifact versions/Total user acceptance tests for all artifact versions) * 100`.

**Input arguments**

minTestPassThreshold

- The minimum accepted value for the percentage of passed user acceptance tests.
- Default value: `100`

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- Type: Integer
- Usage: Mandatory

**Related topics**

Digital Product Release data collectors

# Digital Product Release reference

Reference topics provide additional information about the lists and forms that you use to configure and administer Digital Product Release (DPR).

## Components installed with Digital Product Release

Several types of components are installed with activation of the Digital Product Release app, including tables and user roles.

## Roles installed

| Role title [name] | Description | Contains roles |
|---|---|---|
| Product Enhancement Read<br>[sn_dpr_model.product_enhancement_read] | Reads product enhancements in a product. | None |
| Product Feature Create<br>[sn_dpr_model.product_feature_create] | Creates product features in a product. | None |
| Product Feature Delete<br>[sn_dpr_model.product_feature_delete] | Deletes product features in a product. | None |
| Product Feature Read<br>[sn_dpr_model.product_feature_read] | Reads product features in a product. Can't create or modify a product feature. | None |
| Product Feature Write<br>[sn_dpr_model.product_feature_write] | Updates product features in a product. | None |
| Digital Product Manager<br>[sn_dpr_model.product_manager] | Manages digital products. | • asset<br>• pd_operator<br>• model_manager |

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| Role title [name] | Description | Contains roles |
|---|---|---|
| | | • sn_devops.app_owner<br>• sn_change_write<br>• sn_dpr_model.product_feature_create<br>• sn_dpr_model.product_feature_delete<br>• sn_dpr_model.product_feature_read<br>• sn_dpr_model.product_feature_write<br>• sn_dpr_workspace.workspace_user<br>• sn_gf.goal_user_read<br>• sn_pace.code_reader<br>• sn_pace.execution_reader<br>• sn_pace.mapping_admin<br>• sn_pace.policy_reader<br>• task_editor<br>• template_read_global |
| Digital Product Release Admin<br>[sn_dpr_model.release_admin] | Defines the release process and monitors the release. | • pd_operator<br>• sn_change_write<br>• sn_devops.tool_owner<br>• sn_devops.viewer<br>• sn_dpr_model.product_feature_read<br>• sn_dpr_workspace.workspace_user<br>• sn_gf.goal_user_read<br>• sn_incident_read<br>• sn_pace.admin<br>• sn_pace.mapping_admin<br>• sn_problem_read<br>• sn_request_read<br>• task_editor<br>• template_editor_global |
| Digital Product Release Coordinator<br>[sn_dpr_model.release_coordinator] | Helps product teams in their responsibilities. | • pd_operator<br>• sn_change_write<br>• sn_devops.viewer<br>• sn_dpr_model.product_feature_read<br>• sn_dpr_workspace.workspace_user<br>• sn_gf.goal_user_read<br>• sn_incident_read |

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| Role title [name] | Description | Contains roles |
|---|---|---|
| | | • sn_pace.code_reader<br>• sn_pace.execution_reader<br>• sn_pace.mapping_admin<br>• sn_pace.policy_reader<br>• sn_problem_read<br>• sn_request_read<br>• task_editor<br>• template_read_global |
| Digital Product Release User<br>[sn_dpr_model.release_user] | Accesses Digital Product Release Workspace to view release details and update and approve release tasks. Can't create or modify releases. | • sn_change_read<br>• sn_devops.viewer<br>• sn_dpr_model.product_feature_read<br>• sn_dpr_workspace.workspace_user<br>• sn_gf.goal_user_read<br>• sn_incident_read<br>• sn_pace.policy_reader<br>• sn_problem_read<br>• sn_request_read<br>• task_editor |
| Digital Product Release Workspace User<br>[sn_dpr_workspace.workspace_user] | Accesses Digital Product Release Workspace. | cmdb_read |

## Scheduled jobs installed

| Scheduled job | Description |
|---|---|
| Clean 6 month old unused release target | Deletes release target records older than six months and unused.<br>Runs: Daily |
| DPR Execute policies for all active release phases | Runs policies that are mapped to phases that are currently in progress for all releases.<br>Runs: Daily |
| Release phase state transition | Manages the state of phases for ongoing releases. |

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| Scheduled job | Description |
|---|---|
| | This job checks all in-progress releases and their phases. If a phase is in progress and its planned end date is today, and its policy status is compliant, it will be marked as completed and the next phase will begin.<br><br>Runs: Every hour |
| Release state transition | Manages the states of Pending or In progress releases.<br><br>• If a release is in the Pending state and its planned start date is today, its state is updated to In progress.<br>• If a release is in the In progress state and all its phases are completed, its state is updated to Review.<br><br>Runs: Every hour |

## Tables installed

| Table | Description |
|---|---|
| Approval Definition<br><br>[sn_dpr_model_approval_definition] | Approval definitions that are used to direct approval requests for release tasks to a user or user group. |
| Epic<br><br>[sn_dpr_model_product_feature_epic_mapping] | Mapping of epics linked to a product feature. |
| Key Date<br><br>[sn_dpr_model_release_key_date] | Release key dates that define milestones, key events, deadlines, and important dates for single or recurring releases. |
| Policy<br><br>[sn_dpr_pace_policy_mapping] | Policies mapped to a release. Extends the Policy Mapping table [sn_pace_policy_mapping] from PaCE. |
| Product Enhancement<br><br>[sn_dpr_model_product_enhancement] | Product enhancements of a product feature.<br><br>Use these product enhancements to release a product feature in phases across multiple versions. |

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| Table | Description |
| --- | --- |
| Product Feature<br><br>[sn_dpr_model_product_feature] | A product feature is a function or capability that adds value to a product for the customer.<br><br>You can break down a product feature into product enhancements to release it in phases across multiple versions. |
| Related Tasks<br><br>[sn_dpr_model_release_related_task_m2m] | Mapping between records from the Task table (task) and release records in the Release table (sn_dpr_model_release). |
| Release<br><br>[sn_dpr_model_release] | A product release is the process of releasing a new version of a product. It involves several phases, tasks, policies, and approvals. |
| Release Artifact<br><br>[sn_dpr_model_release_artifact] | Artifacts in a release for a product. |
| Release Bundle<br><br>[sn_dpr_model_release_bundle] | Release bundles are groupings of releases that can be tracked concurrently. |
| Release Bundle M2M<br><br>[sn_dpr_model_release_bundle_m2m] | Relationships of releases that are grouped into various release bundles. |
| Release Calendar<br><br>[sn_dpr_model.release_calendar] | Calendars that can contain related release readiness targets within them. Release calendars can have exclusion schedules attached to them so that no release targets are created on dates that fall within those exclusion schedules. |
| Release Phase<br><br>[sn_dpr_model_release_phase] | Phases in a release for a product. |

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| Table | Description |
| --- | --- |
| Release Phase M2M<br>[sn_dpr_release_phase_m2m] | Mapping of releases and phases to the policies that are mapped to each phase. |
| Release Policy Execution<br>[sn_dpr_policy_execution] | Results of policies run on a phase of a release. |
| Release Readiness Target<br>[sn_dpr_model_release_target] | Release readiness target that defines schedules for a single or recurring releases. Release targets are added to a release calendar. |
| Release Task<br>[sn_dpr_model_release_task] | Tasks in phases for a release. |
| Release Template<br>[sn_dpr_model_release_template] | Release templates containing predefined phases, tasks, approvals, and policies. While creating a release, you can apply a release template to pre-populate these phases, tasks, approvals, and policies. |
| Work Item<br>[sn_dpr_model_product_enhancement_work_item_mapping] | Mapping between product enhancements and work items (records in the Work Item table (sn_devops_work_item)). |

## Digital Product Release properties

Configure the system properties to customize various features of Digital Product Release according to your organization's needs.

These properties are available for Digital Product Release.

**Note:**
To open the System Properties [sys_properties] table, enter `sys_properties.list` in the navigation filter.

### Properties for Digital Product Release

| Property | Description |
| --- | --- |
| sn_dpr.allow_multiple_release | Determines whether multiple releas product. |

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### Properties for Digital Product Release (continued)

| Property | Description |
| --- | --- |
| | • Type: true\|false<br>• Default value: false<br>• Other possible values: true |
| sn_dpr_workspace.allowed_states_for_create_auto_product_enhancement | States of primary epics that are con creation of product enhancements.<br>• Type: string<br>• Default value: created,planned,wip,complete,pr<br>• Other possible values: You can p the list of existing states. |
| sn_dpr_workspace.auto_create_product_enhancement_for_primary_epic | Determines whether product enhar automatically created for primary ep<br>• Type: true\|false<br>• Default value: false<br>• Other possible values: true |
| sn_dpr.out_of_band_release_allowed | Determines whether a release can date, without a release target.<br>• Type: true\|false<br>• Default value: true<br>• Other possible values: false |
| sn_dpr.out_of_band_release_roles | Specifies the comma-separated list one-off release.<br>• Type: string<br>• Default value: sn_dpr_model.rele |
| sn_dpr.release_calendar_exclusions | Restricts the schedules shown as p using the encoded query.<br>You can use an encoded query on t filter and show specific schedules i field on the Release calendar dialog Maintenance schedules are include<br>• Type: string<br>• Default value: sn_dpr_model.rele |

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### Properties for Digital Product Release (continued)

| Property | Description |
| --- | --- |
| sn_dpr.release_kanban_lanes | Shows the lanes on Kanban board i page.<br>• Type: string<br>• Default value: 1,2,3 |
| sn_dpr.release_related_record_types | Specifies the comma-separated list can be associated with a release. E name and the default view type, an shows up on the Release scope pa<br>• Type: string<br>• Default value:<br>`[ {"table":"incident", "label": "Incidents"} {"table":"problem", "label": "Problems"} {"table":"sc_request", "default", "label": "requests"} ]`<br>• Other possible values: Other Tas format as provided in the default |
| sn_dpr.stage_workflow_auto_transition | Determines whether a stage-orient can automatically transition betwee scheduled job.<br>If this property is set to false, the ph transition between states, even if th policies.<br>• Type: true\|false<br>• Default value: true<br>• Other possible values: false |
| sn_dpr.auto_transition_release_to_review | Determines whether a release can from the In Progress state to Review are completed.<br>• Type: true\|false<br>• Default value: true<br>• Other possible values: false |
| sn_dpr.auto_transition_release_to_completed | Determines whether a release can from the Review state to Completed finished. |

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### Properties for Digital Product Release (continued)

| Property | Description |
| --- | --- |
| | • Type: true\|false<br>• Default value: false<br>• Other possible values: true |
| sn_dpr.complete_phase_override | Enables users with specific roles to<br>The default role, sn_dpr_model.rele<br>**Value** field. You can append additio<br>access to the release phase state, s<br>• Type: string<br>• Default value: sn_dpr_model.rele<br>• Other possible values: Roles that<br>release phase state. |
| sn_dpr.VulnerabilitiesTypeMapping | Customizes the levels mapped to va<br>vulnerabilities so that they can be r<br>Vulnerabilities widget in the Releas |
| sn_dpr_model.rmv2.migration_roles | Specifies the comma-separated list<br>in addition to the admin role to perf<br>of data from Release Management<br>migration copies data from the rm_<br>cmdb_application_product_model |
| sn_dpr.multi_product.create_independent_releases | Determines whether to create indiv<br>managed independently for each p<br>release creation.<br>• When set to false, a main release<br>product that includes individual r<br>dependent releases.<br>• When set to true, a release bundl<br>independent releases for each in<br>For more information, see Create a<br>• Type: true\|false<br>• Default value: false<br>• Other possible values: false |
| sn_dpr.multi_product.included_products_limit | Specifies the maximum number of p<br>as Included products when creating<br>For more information, see Create a |

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**Properties for Digital Product Release (continued)**

| Property | Description |
|---|---|
| | **Note:** This property is applicable only sn_dpr.multi_product.create_in set to true.<br>• Type: Integer<br>• Default value: 10<br>• Other possible values: An integer |

## Approval definition form

Release admins can create approval definitions to get approvals of phase tasks for a release.

For more information, see Create an approval definition in Digital Product Release.

**Approval Definition form**

| Field | Description |
|---|---|
| Name | Name of the approval definition.<br>Providing a meaningful name that helps to identify the purpose of the approval. |
| Active | Option for marking the approval definition active.<br>Only active approval definitions are available for selection when creating a task or task template. |
| Approver source | Source of the user or group who approves the tasks.<br>• **Approval Definition**: Selects a specific user or group.<br>• **Digital Product**: Selects the user or group determined dynamically through a reference field from the Product table. |
| Approval action | Options for directing the approval to:<br>• An individual user based on the role<br>• A user group |
| User field | Fields from the User [sys_user] table.<br>Select a user field. When an approval is initiated from a task, the approval request is directed to the person whose name is in that **User** field. For example, if you select the **Manager** user field, the approval record is assigned to the manager of the individual assigned with the task.<br>This field appears only when **User** is selected from **Approval action**. |
| Group field | Fields from the Groups [sys_user_group] table. |

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### Approval Definition form (continued)

| Field | Description |
|---|---|
| | Select a group field. When an approval is initiated from a task, the approval request is directed to members of the group listed in the **Group** field.<br><br>This field appears only when **Group** is selected from **Approval action**. |
| Wait for | Option to determine when an approval request should be considered approved.<br><br>• All responses: The request is considered approved when all group members approve it.<br>• First response: The request is considered approved when any one of the group members approves it.<br>• Percentage of users: The request is considered approved when the minimum specified percentage of group members approves it.<br><br>When you select this option, enter the percentage in the **Percentage** field.<br><br>This field appears only when **Group** is selected from **Approval action**. |

## Release readiness target form

Release admins can create release readiness targets on a release calendar to define the dates by which the releases must be ready for deployment. Digital Product Release.

For more information, see Create a release readiness target.

### Release readiness target form

| Field | Description |
|---|---|
| Name | Name of the release readiness target. |
| Release admin | Name of the release admin who manages the release process.<br><br>Your name is pre-populated by default; however, you can select another user as the release admin for the readiness target. |
| Description | Brief description of the release readiness target. |
| Date | Date by when the product must be ready for release.<br><br>**Note:**<br>This field isn't available for release readiness targets that have a release associated.<br><br>The **Date** field is replaced by the **Start date** field when you select the **Recurring** option. |
| Recurring | Option to set the recurring target.<br><br>Select an option from **Repeat**, choose the start date, recurrence options, and end date to set the recurring targets. |

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**Release readiness target form (continued)**

| Field | Description |
|---|---|
| Schedules excluded from target | Schedules when the release readiness targets are excluded from creation that overlaps with blackout, maintenance, or other schedules.<br><br>These schedules are auto-populated from the selected calendar. |

## Release form

Product managers or release admins can create a release for a product version in Digital Product Release.

For more information, see Create a release for a product.

**Create release form**

| Field | Description |
|---|---|
| Release name | Unique release name to identify the release. |
| Product | Product for which the release is created. |
| Version | Version of the product that is included in the release. |
| Release template | Template that defines the release process. The template applies the predefined phases, tasks, policies, and approvals to this release. For more information, see Create a release template.<br><br>Based on the template you select, the release follows either a timeline-oriented or stage-oriented release process. For more information, see Release for a product. |
| Release readiness target | Readiness target to indicate when the product should be ready for the release.<br><br>**Note:**<br>This field is optional for the stage-oriented releases.<br><br>For more information, see Create a release readiness target.<br><br>This field appears only when **Out of band** is clear. |
| Out of band | Option to make this release as an out-of-band release, which means it isn't associated with any existing release readiness target. Instead, a new release readiness target is created for the selected date.<br><br>The option to create out-of-band releases depends on the following system properties configuration:<br>• *out_of_band_release_allowed* is set to **true**.<br>• You have one of the roles listed in *out_of_band_release_roles*.<br><br>For more information, see Digital Product Release properties. |
| Release date | Date of release for an out-of-band release.<br><br>This field appears only when **Out of band** is selected. |

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**Create release form (continued)**

| Field | Description |
|---|---|
| Release calendar | Release calendar on which the release is targeted. If a release target exists on the selected date in the release calendar, the release is added to it. If not, a release target is created and the release is added to it.<br><br>For more information, see Create a release calendar.<br><br>This field appears only when **Out of band** is selected. |

## Release key date form

Manage your release key dates for a timeline-oriented release.

## Release key date

For more information about adding key dates to a release, see Add key dates to a timeline-oriented release.

For more information about viewing and managing key dates in a release, see Work on a timeline-oriented release for a single product.

**Release key date form**

| Field | Description |
|---|---|
| Name | Unique name of the key date. |
| Type | Type of key date. Select one of the options:<br>• Milestone: An event used to mark the progress toward the overall goal. For example, dev complete.<br>• Key event: Any release activity that holds strategic significance.<br>• Deadline: The latest date by which a task or activity must be completed. For example, code freeze date.<br>• Important date: Any date that holds significance in the release timeline. |
| Due date | Date and time of the release key date.<br><br>This date must be between the release start date and end date.<br><br>**Note:** You can only add a future date. |
| Assigned to | The person that is responsible for achieving the key date event. |
| Description | Short description of the key date. |

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## Policy status aggregation

In a multi-product release, the policy run status of releases for all primary and included products are rolled up to the policy status of the main release.

Consider a release with a main product and three related products. Each phase has policies mapped to it. You can run policies on the current phase from the main release or from a single product release.

The following table shows how the aggregated status is calculated from the status of each release.

**Policy status in a multi-product release**

| Status for primary product | Status for Included product 1 | Status for Included product 2 | Status for Included product 3 | Aggregated status for All product |
|---|---|---|---|---|
| Not run | Not run | Not run | Not run | **Not run** |
| Not run | Non-compliant | Non-compliant | Non-compliant | **Not run** |
| Not run | Compliant | Compliant | Compliant | **Not run** |
| Non-compliant | Compliant | Compliant | Compliant | **Non-compliant** |
| Compliant | Compliant | Compliant | Compliant | **Compliant** |
| Compliant | Compliant | Compliant | Compliant with exception | **Compliant with exception** |

## Domain separation in Digital Product Release

Domain separation is supported for Digital Product Release. Domain separation enables you to separate data, processes, and administrative tasks into logical groupings called domains. You can control several aspects of this separation, including which users can see and access data.

## Support level: Basic

- Business logic: Ensure that data goes into the proper domain for the application's service provider use cases.
- The application supports domain separation at run time. The domain separation includes separation from the user interface, cache keys, reporting, rollups, and aggregations.
- The owner of the instance must set up the application to function across multiple tenants.

Sample use case: When a service provider (SP) uses chat to respond to a tenant-customer's message, the customer must be able to see the SP's response.

For more information on support levels, see Application support for domain separation.

## Overview of domain separation in Digital Product Release

All tables in Digital Product Release can be domain-separated and include the required domain separation field.

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### How domain separation works in Digital Product Release

- Each table in Digital Product Release includes the domain separation field called **Domain**.
- Customers can use this field to configure domain separation in their implementation of Digital Product Release.

**Related topics**

Domain separation for service providers

## Expense Line

Expense lines enable you to track costs and represent when a point-in-time expense incurred. Expense lines can be created manually or generated by the scheduled processing of recurring costs.

The Expense Line plugin is active for all instances. To use the Expense Allocations and Expense Allocation Rules modules, activate the Cost Management plugin.

The ServiceNow AI Platform generates expense lines automatically when you create an asset, and updates expense lines automatically when you revise the **Cost** or **Quantity** field on an asset record.

Users with the financial_mgmt_admin and financial_mgmt_user roles can work with expense lines.

Expense lines integrate closely with asset management, CMDB, cost management, and contract management, but can be used with any application. The **Source ID** field on an expense line record can be linked to any record in any table. This identifier allows expenses to be associated with a wide variety of items, such as a contract, an individual asset, a single configuration item, a software installation, a lease, a service contract, a user, or a group.

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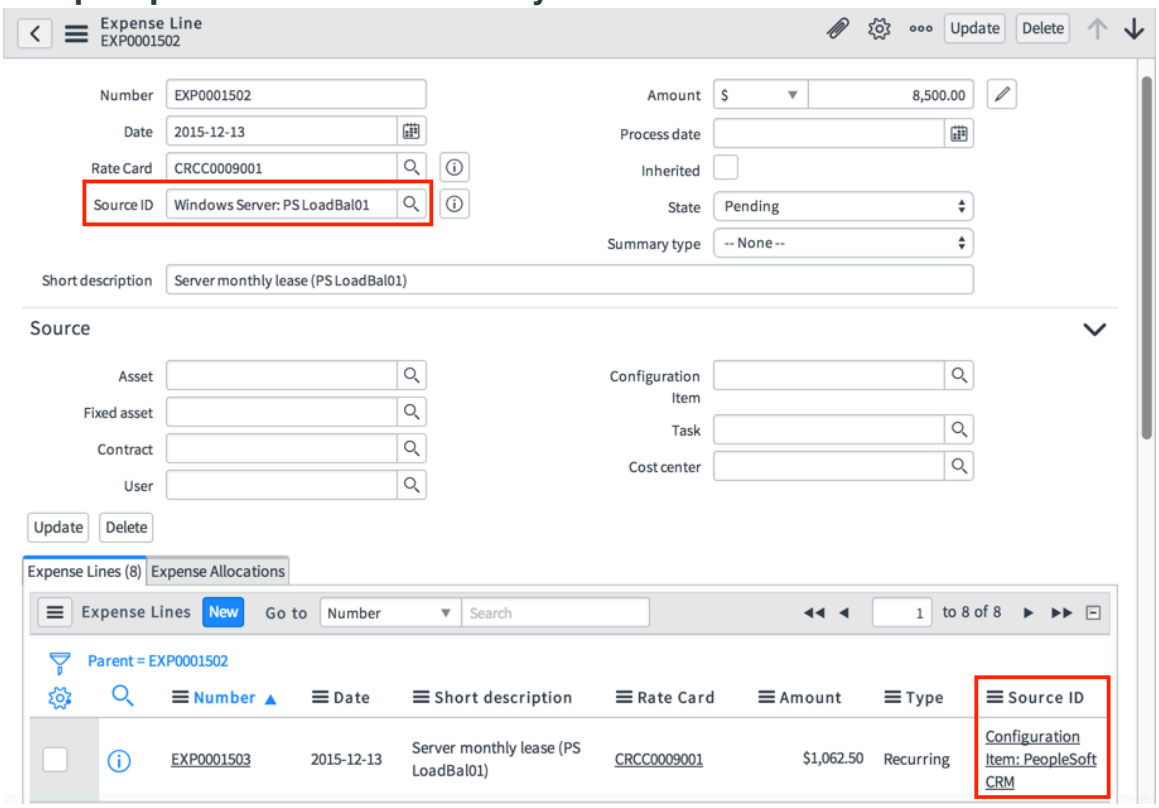
**Example expense line for an asset monthly lease**




**Related topics**

- Asset Management
- Configuration Management Database (CMDB)
- Cost Management
- Contract Management

## Components installed with Expense Line

Several types of components are installed with the Expense Line plugin.

### Tables installed with Expense Line

Tables are added with activation of Expense Line.

| Table | Description |
|---|---|
| Expense Line [fm_expense_line] | Stores information about expense lines, including a link to the associated rate card. Contains the status and next scheduled processing date for the expense line. |

### Roles installed with Expense Line

Roles are added with activation of Expense Line.

| Role | Contains roles | Description |
|---|---|---|
| Financial admin [financial_mgmt_admin] | [financial_mgmt_user] | Can create, write, and delete allocation units, fixed assets, depreciation, rate cards, |

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| Role | Contains roles | Description |
|---|---|---|
| | | distribution costs, expense lines, and expense allocations. |
| Financial user [financial_mgmt_user] | none | Can read allocation units and expense allocations. Can create, read, and write rate cards and expense lines. Can create, read, write, and delete fixed assets, depreciation, distribution costs. |

## Script includes installed with Expense Line

Script includes are added with activation of Expense Line.

| Script include | Description |
|---|---|
| ExpenseLine | Helps create expense line records. |
| ExpenseManagementUtils | Provides utilities for financial management modules. |
| ExpenseManagementUtilsAJAX | Provides AJAX utilities for expense lines. |

## Client scripts installed with Expense Line

Client scripts are added with activation of Expense Line.

| Client script | Table | Description |
|---|---|---|
| Populate sources if inherited | [fm_expense_line] | Copies the source fields of the parent expense line to the current line on the Expense Line record if an expense line is inherited. |
| Populate source fields from asset | [fm_expense_line] | If the source asset changes, updates related source fields on the Expense Line record . For example, if the asset source field changes, the configuration item source field is updated, as well. |
| Populate source fields from ci | [fm_expense_line] | Updates related source fields if the source configuration item changes on the Expense Line record. |
| Populate source fields from contract | [fm_expense_line] | Updates related source fields if the source contract changes on the Expense Line record. |
| Populate source fields from task | [fm_expense_line] | Updates related source fields if the source task changes on the Expense Line record. |

## Business rules installed with Expense Line

Business rules are added with activation of Expense Line.

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| Business rule | Table | Description |
|---|---|---|
| Create Expense Line | [alm_asset] | Automatically creates an expense line for a new asset based on asset cost unless the asset is a merged software license. |
| Set source allocation fields | [fm_expense_line] | Sets the related source fields when the source ID changes. For example, when an asset becomes the source ID, the asset source field and configuration item source field are automatically populated. |
| Update Costs | [alm_consumable] | Updates the cost of a consumable when quantity is reduced. |

### Domain separation and Expense Line

Domain separation is unsupported in Expense Line processing. Domain separation enables you to separate data, processes, and administrative tasks into logical groupings called domains. You can control several aspects of this separation, including which users can see and access data.

### Support level: No support

- The domain field may exist on data tables but there is no business logic to manage the data.
- This level is not considered domain-separated.

For more information on support levels, see Application support for domain separation.

**Related topics**

Domain separation for service providers

## View an expense

Expense lines can be used in various ways, for example, how to view expenses that are associated with a given contract.

### Before you begin

Role required: asset or contract_manager

### About this task

### Procedure

1. Navigate to **Contract** > **Contract** > **All**.
2. Select a contract.
3. View the **Expense Lines** related list.
   All the expense lines for the contract are listed. The total cost of the contract and its current value are also shown.
4. Select an expense line to view its details.

## Expense lines and expense allocations

The Expense lines application tracks costs and record expenses incurred. Expense allocations let you associate expenses with items such as users, groups, or departments.

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Expense lines are a key component of cost management because they can be generated from any application and are used to allocate expenses to business entities. Expense lines can be created manually or generated automatically when costs are created by scheduled processing.

Users with the financial_mgmt_admin and financial_mgmt_user roles can work with expense lines and expense allocation rules.

To use expense allocation rules, activate the Cost Management application.

## Create an allocation rule

Expense allocation rules enable you to associate expenses with an item, such as a user, group, or department.

### Before you begin

To use expense allocation rules, activate Cost Management.

Role required: admin, financial_mgmt_admin, or financial_mgmt_user

### About this task

**Note:**
Expense Allocations are generated through the out-of-the-box scheduled job, Process Expense Allocation.

### Procedure

1. Navigate to **All** > **Cost** > **Administration** > **Expense Allocation Rules**.
2. Click **New**.
3. Complete the form.

#### Allocation rule fields

| Field | Description |
|---|---|
| Name | The allocation rule name. |
| Table | The table to which the allocation rule is associated. |
| Allocation field | The field on the table to populate with the expense allocation. |
| Inherited | Check box that indicates whether the expense allocation is inherited. |
| Active | Check box that indicates whether the expense allocation is available to use. |
| Percentage | The percentage of the expense line allocated to the table and field combination. Not available if the **Advanced** check box is selected. |
| Summary type | The expense allocation category: **Grow Business**, **Run Business**, or **Transform Business**. Categorizing expense allocations can be useful for reporting. |
| Condition | The condition under which the expense allocation is applied. Not available if the **Advanced** check box is selected. |
| Advanced | Check box that indicates whether to display the **Script** field. |
| Script | The script field that determines expense allocations. This field is only available if the **Advanced** check box is selected. |

4. Click **Submit**.

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### Related topics

Condition builder

## Automatic expense line creation

You can automatically create expense lines to facilitate the accurate reporting of expenses.

If enabled, the following processes generate expense lines automatically.

- Active CI rate cards are processed monthly to generate expense lines for each CI in the rate card. If a CI relationship is changed, existing expense lines are not affected. Changes are reflected in the next scheduled expense line.
- Active distribution costs are processed monthly to generate expense lines based on distribution rule targets.
- Closed tasks on task rate cards are processed to generate expense lines.

Expense lines can also be imported from external systems or generated from scripts. To generate an expense from a server-side script, use the ExpenseLine API.

### Related topics

Create or edit a CI relationship

## Create expense lines manually

You can create expense lines at a single level or in a hierarchy to better organize expense information.

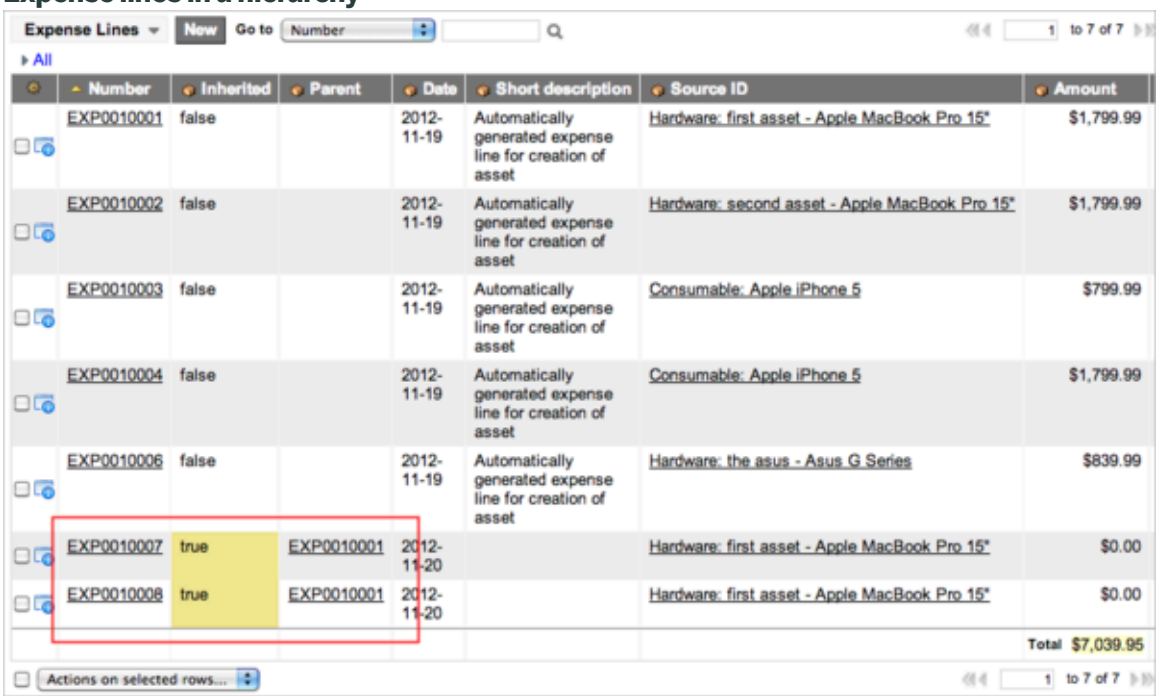
### Before you begin

Role required: admin, financial_mgmt_admin, or financial_mgmt_user

### About this task

Use a hierarchy if it makes sense for your organization. In the example below, the last two expense lines are a level under expense line number EXP0010001.

**Expense lines in a hierarchy**

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## Procedure

1. Navigate to **All** > **Costs** > **Expense Lines**.
2. Open an expense line record, or click **New** to create a new expense line.
3. Complete the form.

### Expense line table

| Field | Description |
|---|---|
| Number | The unique number identifying the expense line. |
| Date | The date on which the expense line was created. |
| Rate Card | The identification number of the rate card to which the expense line is associated. |
| Rate type | The rate type that is considered during the expense line generation. This field is read-only. |
| Source ID | The identification number of the item associated with the expense line. If this field is filled in, corresponding information is automatically added to the **Source** fields on this form. |
| Amount | The monetary value of the item specified in the **Source ID** field. Enter a negative value to indicate a credit. |
| Process date | The date the expense line is processed. |
| Inherited | Check box that indicates whether the expense line is on another expense line. |
| State | The current state of the expense line, either **Pending** or **Processed**. |
| Summary type | The expense line category: **Grow Business**, **Run Business**, or **Transform Business**. Categorizing expense lines can be useful for reporting. |
| Short description | A brief description of the expense line. |
| Asset | The identification number of the asset associated with the expense line, if any. |
| Fixed asset | Fixed asset that contains the asset in this expense line. A fixed asset is a container that holds one or more individual assets, including hardware or software assets. The system auto-populates this field with the appropriate fixed asset if the named **Asset** is contained within that fixed asset. |
| Contract | The identification number (not the contract number) of the contract associated with the **Asset**, if any. |
| User | The name of the user associated with the **Asset**, if any. |
| Configuration Item | The name of the configuration item associated with the expense line, if any. |
| Task | The identification number of the task associated with the expense line, if any. |
| Cost center | The cost center financially responsible for the item identified in **Source ID**, if any. |

## Related topics

Create fixed assets

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## Delete an expense line

Deleting an expense line also deletes all expense allocations that were generated from the expense line.

### Before you begin
Role required: admin

### About this task
Deleting expense lines and allocations should be limited to an emergency case only when they were created incorrectly.

### Procedure

1. Navigate to **All** > **Costs** > **Expense Lines**.
2. Select an expense line.
3. From the **Actions on selected rows** drop-down menu, choose **Delete**.
4. In the confirmation dialog box, click **Delete**.

## Create a sample allocation rule

You can create a sample expense allocation rule that allocates the cost of an incident to the department of the caller.

### Before you begin
To use expense allocation rules, activate the Cost Management application.

Role required: admin, financial_mgmt_admin, or financial_mgmt_user

### Procedure

1. **Costs** > **Administration** > **Expense Allocation Rules**
2. Click **New**.
3. In **Name**, enter `Incident Caller Department`.
4. In **Table**, select **Incident**.
5. In **Allocation field**, click the control, expand the **Caller** element, and select a department.
6. In **Percentage**, enter `100` to allocate all the expense to the caller's department.
7. Select the **Active** check box.
8. Click **Submit**.
   After an incident expense line is created, the allocation rule processes the expense line and generates an expense allocation linking the expense and amount to the caller's department. The expense is stored in the **Target** field on the Expense Allocation record.

### Related topics

Cost Management

## Use a scripted allocation

Scripted allocations define custom allocation amounts and targets by executing a script.

### Before you begin
Role required: admin, financial_mgmt_admin, or financial_mgmt_user

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### About this task

You can use scripted allocations to perform any of the following actions.

- Allocate an expense to all cost centers based on the current head count in the cost center.
- Query usage data to determine the allocation amount to assign to a target.
- Track the business users that are consuming business services.

### Procedure

1. Navigate to **All** > **Costs** > **Administration** > **Expense Allocation Rules**.
2. Select an expense allocation rule.
3. Select the **Advanced** check box.
4. Use the following concepts to build the script
   - Query for target records and data to use for calculating the allocation amount.
   - Create allocation records using the ExpenseAllocation API.

   The following variables are available during the script processing:
   - *allocation*: expense allocation object used to create allocations.
   - *expense*: GlideRecord for the expense_line that is being processed.
   - *rule*: GlideRecord for this rule.

   To create an allocation record, use the allocation object already instantiated in the script scope:

```
allocation.createAllocation(targetGlideRecord, amount);
```

## Domain separation and Expense Line

Domain separation is unsupported in Expense Line processing. Domain separation enables you to separate data, processes, and administrative tasks into logical groupings called domains. You can control several aspects of this separation, including which users can see and access data.

### Support level: No support

- The domain field may exist on data tables but there is no business logic to manage the data.
- This level is not considered domain-separated.

For more information on support levels, see Application support for domain separation.

**Related topics**

Domain separation for service providers

# Digital End-User Experience

ServiceNow® Digital End-User Experience (DEX) is a product that is delivered as a service from the ServiceNow Cloud. With DEX, you have full visibility and monitoring capabilities of your applications, networks, and end-user devices, regardless of location. DEX ensures that all applications are available, operational, and performing efficiently on all channels, including desktop and web/SaaS, thereby optimizing the overall digital experience.

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## Digital End-User Experience overview

ServiceNow DEX empowers IT professionals to be proactive and gain a clear overview of end-user applications, devices, and networks. It enables employees to independently address issues, receive notifications, troubleshoot problems, and interact with the Virtual Agent.

DEX adopts a comprehensive approach to enhance user experiences, offering a complete solution comprising DEX Application and Device Health, DEX Content Playbook, and DEX Desktop Assistant. With these tools, you can proactively monitor applications, networks, and devices, detecting potential issues before they lead to downtime and impact user productivity.

For a unified monitoring workspace and relevant content (policies, check definitions, and actions), refer to Application and Device Health and DEX Content Playbook. To seamlessly integrate ServiceNow functionalities into your daily workflow, explore Desktop Assistant.

## Get started with Digital End-User Experience

| | | |
|---|---|---|
| Explore DEX Application and Device Health<br>  <br>Leverage the system for monitoring and remediation objectives | Explore DEX Content Playbook<br>  <br>Manage check definitions and policies for Mac and Windows | Explore DEX Desktop Assistant<br>  <br>Get easy access to application functionalities |
| Set up Application and Device Health<br>  <br>Learn how to setup Application and Device Health | Install Desktop Assistant<br>  <br>Know how to install Desktop Assistant | DEX Architecture<br>  <br>Learn about DEX architecture |

## Better together

### DEX for Service Desk Agents

As a Service Desk agent, navigate to the DEX device health page either from the UI16 incident experience or from the Investigate tab within the Incident experience in SOW after configuring a computer CI and installing the DEX plugin. This enables you to analyze device metrics from within the platform, offering valuable insights for effective issue investigation.

As a Service Desk agent, navigate to the DEX device health page from computer CI record either in the UI16 or SOW experience after installing the DEX agent on

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the computer CI. This enables you to analyze the device's metrics from within the platform, offering valuable insights for effective issue investigation.

**Software Asset Management**

Unifying the experience of DEX application to Software Asset Management (SAM) software allows you to access SAM-normalized software content. This integration provides software metering data from DEX to easily integrate with SAM for software licensing reclamation and, in turn, reduce software license costs.

### Troubleshoot and get help

Contact Now Support.

## DEX Application and Device Health

DEX Application and Device Health is a product that is designed to be a centralized workspace, dedicated to monitoring the performance, security, and compliance of the digital workplace.

With DEX Application and Device Health, you have the capability to accumulate user experience data and performance metrics. These metrics are meticulously tracked and aggregated over time, spanning different levels such as user, application, devices and location.

Application and Device Health offers a range of features and capabilities that support DEX management, including:

- Application Management: Monitor the performance and security of installed and web/SaaS applications on users' devices.
- User Management: Monitor user activity, as well as identify and track active and impacted users.
- Device Management: Monitor the performance and security of desktops and laptops across the organization.

For details on how to set up Application and Device Health, see Configuring DEX Application and Device Health.

### Exploring DEX Application and Device Health

The DEX Application and Device Health offers proactive visibility to help you understand the end-user experience across your organization and diagnose any negative experiences.

### DEX Application and Device Health overview

Application and Device Health provides end-to-end visibility and health of applications, networks, and end-user devices, irrespective of location. With features such as application, user, and device navigation, trend analysis, and various useful metrics, Application and Device Health enables you to identify the root cause of an issue, rather than just treating the symptoms.

### DEX Application and Device Health benefits

Having a positive digital experience can lead to numerous benefits, including:

**Proactive understanding of the end-user experience**

Gain insights into the digital experience of your application and services from the end-user viewpoint, regardless of their location, device type, or network connectivity. Identify and measure the health of user systems — see what applications and system crashes are happening. All this reliability data is brought

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together in one central workspace, letting your IT teams dive deeper into more detailed data without deploying additional monitors.

**Increased productivity**

Access digital tools and resources easily to troubleshoot IT issues, reset passwords, or access software. This can lead to increased productivity by reducing the burden on IT staff.

**Analysis of issue**

Identify and analyze issues by providing insights into pain points, usage patterns, performance, and impact. By analyzing DEX data, organizations can identify areas for improvement and make data-driven decisions to enhance the digital workplace experience for their end-users.

**Evaluation of performance**

Provide insights into productivity, efficiency, user behavior, and engagement. DEX provides a wealth of device performance and health information. This data can help IT teams understand how a given application is being utilized and identify areas for improvement.

**Enhanced engagement**

Ensure end-user experience and productivity by continuously measuring and monitoring application and device health metrics. Gain end-to-end visibility and insights into overall user experience and quickly identify users, applications, and devices with poor experiences that need your attention. A positive digital experience helps you to improve end-user engagement leading to increased motivation, better job satisfaction, and lower turnover rates.

## DEX Application and Device Health use cases

For examples of how different people in your organization would use DEX Application and Device Health, see these use cases.

### Users and responsibilities

| Role title [name] | Description | Contains roles |
|---|---|---|
| DEX administrator<br><br>[sn_dex.admin] | Responsible for managing user access to DEX, managing the applications that are being monitored, and handling onboarding/offboarding-related tasks. They also troubleshoot any issues that arise within the application. | • sn_dex.user<br>• sn_dex.engineer<br>• agent_client_collector_admin<br>• report_admin |
| DEX engineer<br><br>[sn_dex.engineer] | Responsible for accessing and executing the remedial actions. | sn_dex.user |
| DEX user<br><br>[sn_dex.user] | Responsible for accessing and utilizing the features provided by DEX. | • dependency_views<br>• agent_client_collector_user<br>• itil<br>• mbplus_reader |

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**Users and responsibilities (continued)**

| Role title [name] | Description | Contains roles |
|---|---|---|
| | | • sam_user<br>• evt_mgmt_user |

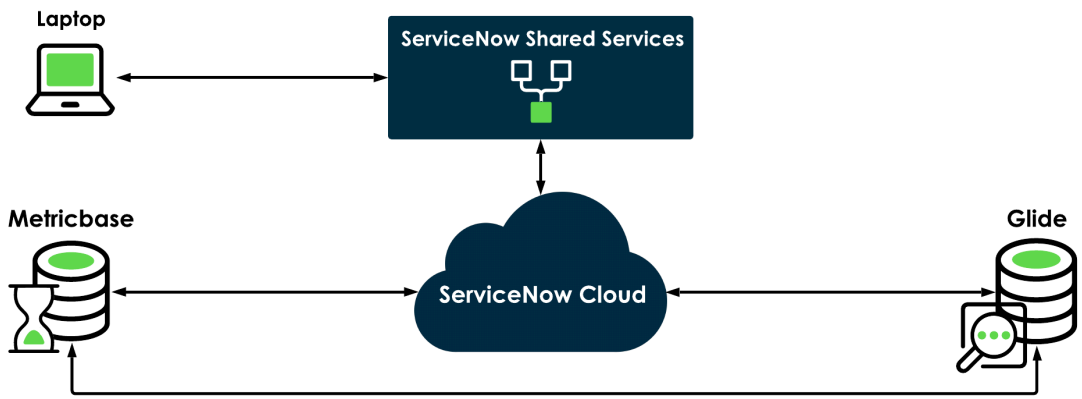
To know about the architecture, see DEX Architecture and to get started with Application and Device Health, see Configuring DEX Application and Device Health.

### DEX Architecture

Digital End-User Experience (DEX) architecture provides a seamless and integrated digital experience for end users. The topic provides a comprehensive overview of how DEX works, including its design.

DEX uses a set of new multi-tenant, cloud-native services called ServiceNow Cloud Services. In this architecture, DEX endpoint Agents ( Agent Client Collector ) are able to communicate to the ServiceNow cloud without a MID server. ServiceNow Cloud Services provide authentication to DEX Agents and enable message buffering and stateful stream processing of data that is eventually sent to customer-specific Glide and time series datastore (MetricBase ). ServiceNow Cloud Services also enable a secure way to send policy updates and on-demand execution of checks on the DEX Agents from Glide. Thus, ServiceNow Cloud Services enable secure bi-directional communication between Glide and the DEX endpoint Agents.

**DEX architectural diagram**




## Agent Registration Flow

Before Endpoint Discovery can begin, the Agent Client Collector (Agent) on an endpoint must complete registration through the Agent registration flow and be issued TLS client certificate by the customer Glide instance.

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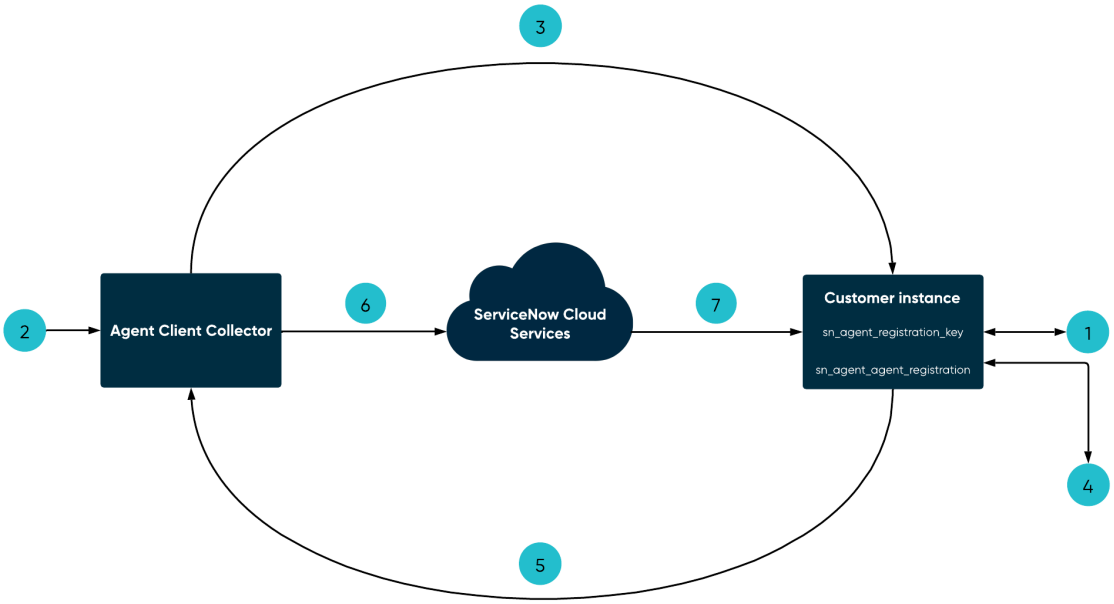


The Agent registration process involves the following steps.

1. On the customer instance, a registration key is automatically generated for the Agent Client Collector (Agent).
2. The Agent is installed in the customer instance using the registration key, instance URL, and public endpoint.

   The instance URL corresponds to the INSTANCE_URL variable in the one-line installer command. The public endpoint refers to the DNS name of the nearest ServiceNow Cloud Services endpoint, which is represented by the value of the ACC_CNC variable in the one-line installer command. For information on the command and the parameters, see Install Agent Client Collector on Windows using ITOM Cloud Services and Perform a single-line Agent Client Collector installation on macOS by using ITOM Cloud Services.
3. The Agent sends registration request to the customer instance.
4. The Agent is registered in the customer instance and issued a certificate.
5. The Agent saves both the issued certificate and the public key used for verifying code signing signatures.
6. The Agent communicates with the customer instance through the ServiceNow Cloud Services by sending messages.
7. ServiceNow Cloud Services determine the correct customer instance to which agent messages must be sent.

## Endpoint Discovery

The DEX endpoint has to be first discovered and added to CMDB before DEX metrics can be collected and processed. After the DEX agent is registered, it connects to the ServiceNow Cloud Services and uses the keep alive API to check in with glide. This updates the agent status on the Agent Client Collector Health Dashboard. Glide then pushes Checks and policies to the agent via ServiceNow Cloud Services. Some of the policies trigger discovery and populating the CMDB. For more information on how ACC is used for discovery and to populate the CMDB, see Agent Client Collector for Visibility.

DEX specific policies pushed to the agent inform the agent about the metrics to be collected for SaaS apps, installed apps and the endpoint. These policies first trigger download of Agent Client

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Collector plugins (that contain scripts and code needed to perform discovery and to collect the metrics) to the agent endpoint via ServiceNow Cloud Services by calling a direct REST API on glide.

## DEX Metrics Processing

- The DEX Chrome Extension makes an internal API call to the agent to get a list of SaaS app URLs for which it needs to collect metrics. The DEX Chrome Extension for Chrome primarily focuses on capturing performance metrics such as page load time and response time. It does not capture detailed information about user behavior, interactions, and engagement.
- ACC performs data preprocessing or filtering and sends the collected data to ServiceNow Cloud Services.
- ServiceNow Cloud Services buffers the data in raw metrics topics for further processing.
- The data in the raw metrics topic is then consumed by a stateful stream processing job that performs DEX specific data enrichment, transformation, filtering, aggregation, analysis, or event creation.
- Metric metadata required by the DEX stream processing job is retrieved from Glide.
- The enriched and aggregated data is written to the corresponding topics in ServiceNow Cloud Services.
- The data in these topics is consumed directly by MetricBase which stores it in the DEX MetricBase tables for further analysis.
- Some processed, non-metric data is stored directly in the Glide tables by the stream processing job.
- The metrics data is read from MetricBase to visualize in the DEX dashboard.

### DEX Subscription

Digital End-User Experience (DEX) license counting provides the Subscription Unit (SU) consumption counting computers where any of the DEX features (Desktop Assistant, Application and Device Health, and DEX Content Playbook) are active.

If multiple DEX features report usage on the same CIs, the SU count will remove the duplication.

## DEX capacity limitations

DEX uses the MetricBase datastore to store time-series data sampled at regular intervals. The MetricBase Series limit is controlled by data collection and retention policies for applications and devices that cannot be modified. For example, application and device metric data collected at 5-minute intervals from each device is retained for up to 7 days for troubleshooting purposes. Roll-ups of aggregated data is available for longer periods to analyze performance and usage trends. For information on policies and check definitions, see DEX Content Playbook reference.

DEX can monitor up to 50 active applications in an instance. Active applications are Software as a Service (SaaS) and installed applications on end-user user computing devices that are monitored by DEX.

DEX uses metric rules to analyze streams of metric data against sets of criteria and thresholds, triggering alerts when performance metrics deviate from specified parameters. An instance can have up to 50 active metric rules.

## DEX subscription unit calculation

DEX includes entitlement for up to the number of SUs purchased. A SU is a unit of measure applied to Managed IT Resources using Defined Ratios. For DEX, the Managed IT Resource Type

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is an End User Computing (EUC) device. The SU to EUC device ratio is 1:4. For example, 1,000 SUs = 4,000 EUCs.

## Contact info

Contact your account team for additional information regarding DEX pricing and packaging.

## Configuring DEX Application and Device Health

Explore guidelines on setting up Application and Device Health for web/SaaS and installed applications. Understand how to add applications and make modifications or removals from the monitoring system.

Before setting up and using Digital End-User Experience (DEX), it is essential to ensure that the system meets the minimum requirements to guarantee optimal performance. For more information, see DEX system requirements.

To setup Application and Device Health and begin exploring the workspace, you need to complete specific configurations. The following steps outline the key configurations.

1. Install Application and Device Health.
2. Create ACC registration key.
3. Install Agent Client Collector for DEX - Windows using a one-line installer or Install Agent Client Collector for DEX - Mac using one-line installer.
    - If you want to install ACC on Windows and Mac manually, see Install the Agent Client Collector on a Windows machine manually or Manually install Agent Client Collector on macOS. Ensure you configure MID-less ACC before proceeding to the next configuration step.
    - If you have a MID-based ACC, you need to convert it to a MID-less ACC. For more information regarding conversion, see Convert MID-based ACC to MID-less ACC.
4. Enable DEX browser extension for monitoring web/SaaS applications.
5. Onboard for Application and Device Health.
6. Explore Application & Device Health interface.

**Note:**
DEX Content Playbook provides policies, check definitions, and actions that can be used by Application and Device Health to facilitate the monitoring of applications and devices, and to provide support for application remediation. To get this content, you must install DEX Content Playbook. You can also refer to DEX Content Playbook reference to know the content it provides.

### DEX system requirements

System requirements are the fundamental specifications and configuration needed to install and run DEX effectively.

Minimum glide version required for DEX is Vancouver Patch 6.

DEX supports Agent Client Collector (ACC) versions 3.4.1 and 3.5.1. For DEX browser extension, the minimum required browser versions are Google Chrome 114 or higher, and Microsoft Edge version 96 or higher.

## Operating system requirements

DEX is available for Microsoft Windows and Apple macOS in the following versions:

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### Operating system requirements

| Operating system | Supported versions |
|---|---|
| Windows | • Windows 10 Enterprise Edition<br>• Windows 11 Professional and Enterprise |
| macOS | • Monterey<br>• Ventura<br>• Sonoma<br><br>For Desktop Assistant, the minimum OS requirement is Ventura 13 and Sonoma 14. |

### Install DEX

Digital End-User Experience (DEX) is available with activation of the Digital End-User Experience [sn_dex] plugin. You can install the DEX product [sn_dex] if you have the admin role. During installation, Application and Device Health is included as a component in DEX.

## Before you begin

- Ensure that the application and all of its associated ServiceNow Store applications have valid ServiceNow entitlements. For more information, see Get entitlement for a ServiceNow product or application.
- Review the DEX Application & Device Health application listing in the ServiceNow Store for information on dependencies, licensing or subscription requirements, and release compatibility.

Role required: admin

## About this task

The following items are installed with Digital End-User Experience:

- Roles
- Tables

For more information, see Components installed with DEX.

## Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the Digital End-User Experience application [sn_dex] using the filter criteria and search bar.

   You can search for the application by its name or ID. If you cannot find the application, you might have to request it from the ServiceNow Store.

   In the list next to the **Install** button, the versions that are available to you are displayed.
3. Select a version from the list and select **Install**.

   In the Install dialog box that is displayed, any dependencies that are installed along with your application are listed.

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4. If you're prompted, follow the links to the ServiceNow Store to get any additional entitlements for dependencies.
5. **Optional:** If demo data is available and you want to install it, select the **Load demo data** check box.
   Demo data comprises the sample records that describe application features for the common use cases. Load the demo data when you first install the application on a development or test instance.

   **Important:**
   If you don't load the demo data during installation, it's unavailable to load later.

6. Select **Install**.

### Create ACC registration key

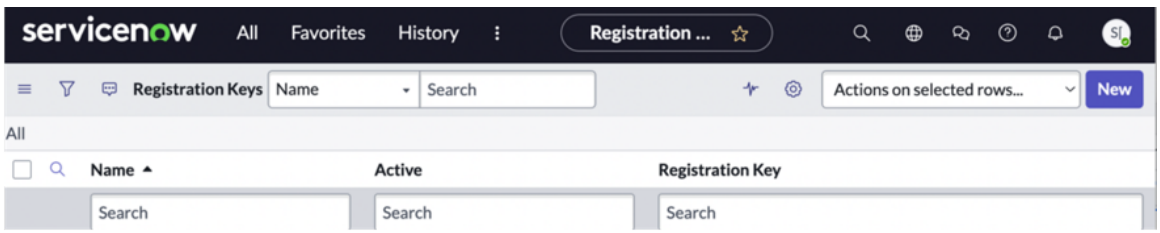
Set up an Agent Client Collector (ACC) by creating an agent registration key to uniquely identify and authenticate agents that are allowed to send data to the collector. The key helps to ensure the security and integrity of the data collected from the system.

#### Before you begin

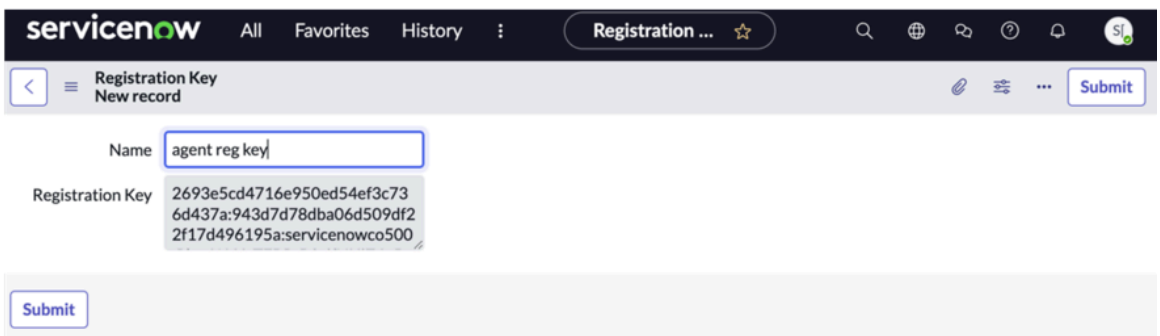
Role required: sn_dex.admin

#### Procedure

1. Navigate to **Self-Service** > **Agent Client Collector** > **Deployment** > **Agent Registration Key** or search for the `sn_agent_registration_key` table.
2. On the Registration Keys window, select **New**.




3. In the **Name** field, enter the name for the registration key.




   The **Registration Key** field automatically generates the registration key.

4. Select **Submit**.
   You can use the registration key to connect to ServiceNow Cloud Services. Ensure to save the key since it's required in the `acc.yml` configuration file.

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### What to do next

Install Agent Client Collector for DEX - Windows using a one-line installer or Install Agent Client Collector for DEX - Mac using one-line installer.

## Install Agent Client Collector for DEX - Windows using a one-line installer

Install Agent Client Collector (ACC) to monitor and collect data in a centralized and organized manner, provide insights into system performance, identify issues, and enable proactive maintenance.

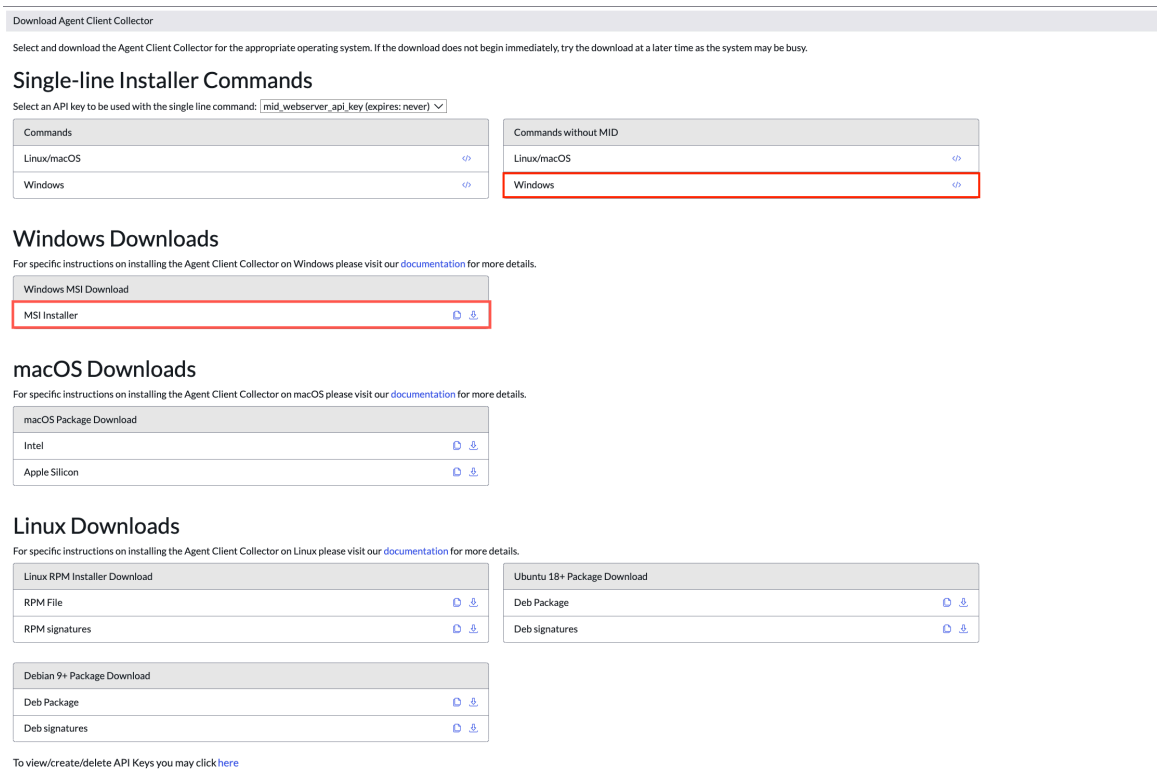
### Before you begin

Confirm that you have setup the ACC registration key.

Role required: agent_client_collector_admin

### Procedure

1. Navigate to **Self-Service** > **Agent Client Collector** > **Deployment** > **Agent Client Downloads**.
2. From the Windows Download section, download the MSI installer by selecting the Download icon ( ).




3. From **Single-line Installer Commands** > **Commands without MID** > **Windows**, copy the command or script to execute by selecting the command icon ( ).
4. On your system, open Command Prompt in the administrator mode.
5. Paste the command and replace the value in `<msi_file_path>` with the path to the MSI installer file you downloaded earlier.
6. Press Enter.
   ACC gets installed.
7. Start the ACC service using a local system account user role.

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a. On the Windows host, navigate to **Services**.

b. Select and hold (or right-click) **Agent Client Collector**.

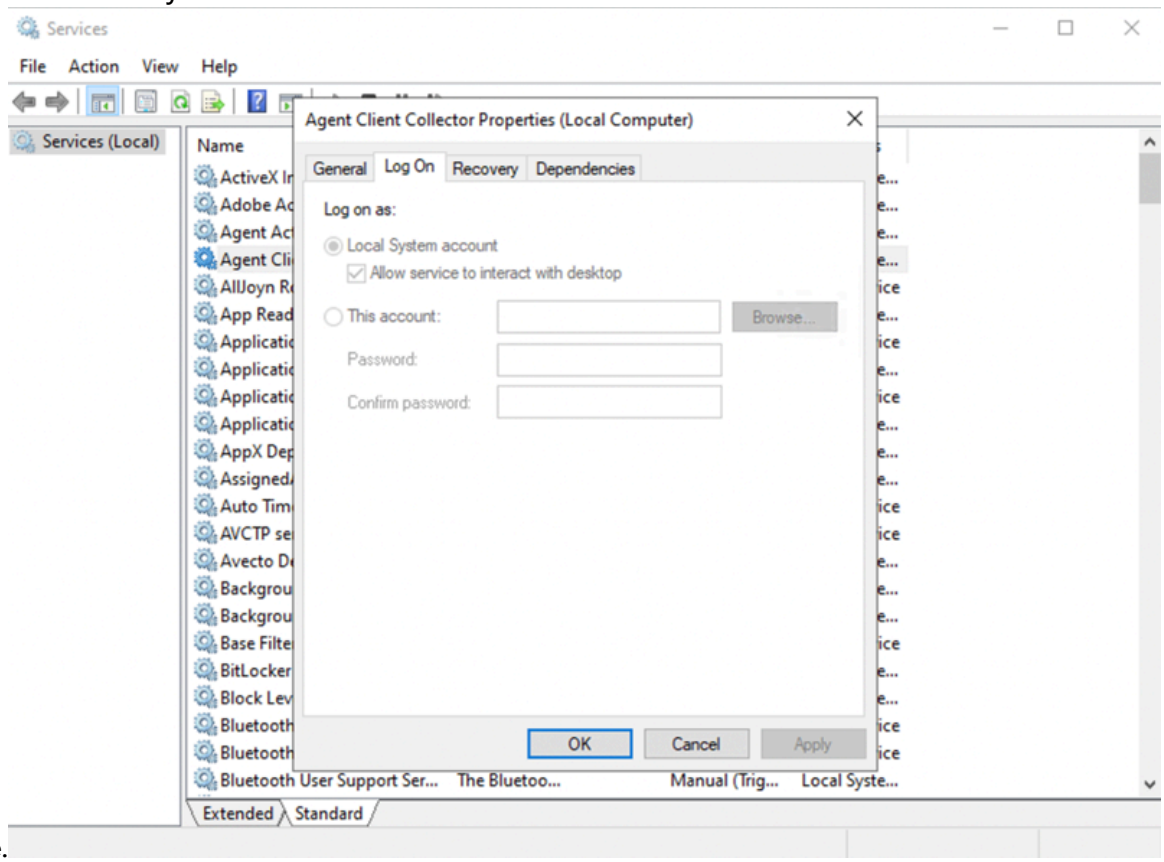
c. Select **Properties**.

d. Select the Log on tab.

e. Select **Local System account**.

f. Select **OK**.

The ACC connects to your ServiceNow instance.




8. Restart the Agent Client Collector service.

### What to do next

Enable DEX browser extension for monitoring web/SaaS applications.

## Install Agent Client Collector for DEX - Mac using one-line installer

Install Agent Client Collector (ACC) to monitor and collect data in a centralized and organized manner, provide insights into system performance, identify issues, and enable proactive maintenance.

### Before you begin

Ensure you have setup the ACC registration key.

Role required: agent_client_collector_admin

### Procedure

1. Navigate to **Self-Service** > **Agent Client Collector** > **Deployment** > **Agent Client Downloads**.
2. Copy the command or script to execute by selecting the command icon (</>) under **Single-line Installer Commands** > **Commands without MID** > **Linux/macOS**.

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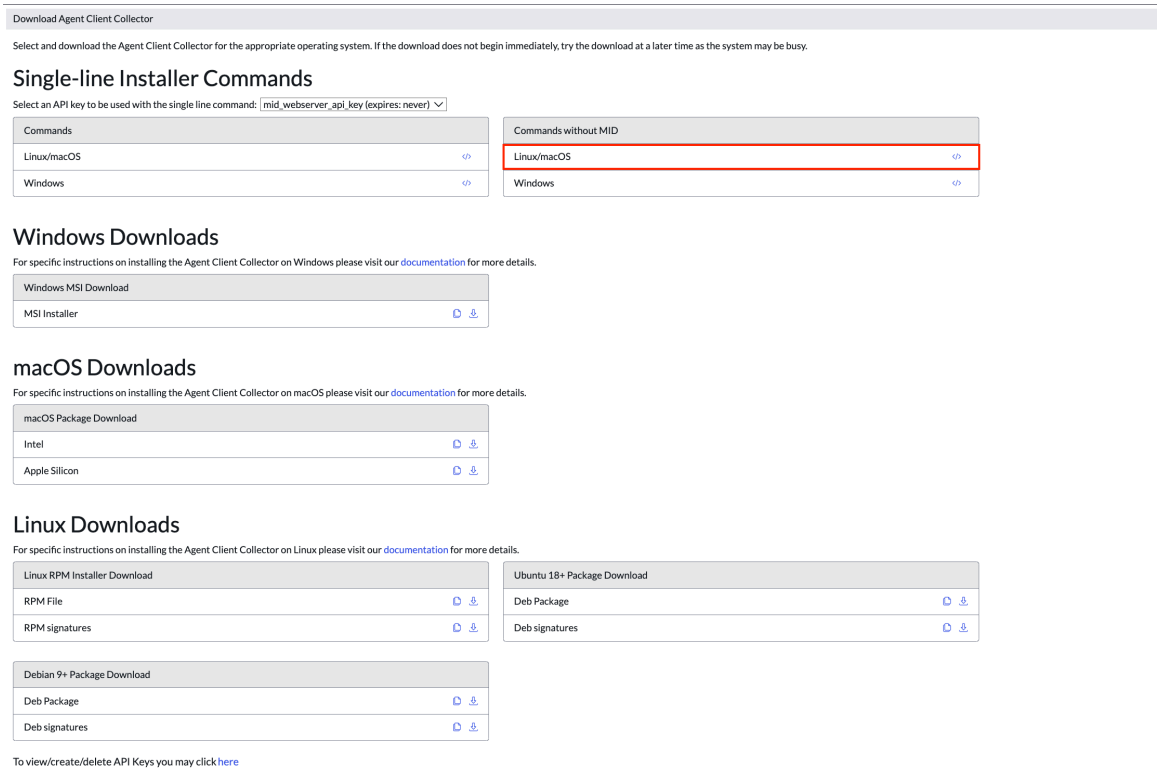


For information on the command and the parameter values, see Perform a single-line Agent Client Collector installation on macOS by using ITOM Cloud Services.

3. In your system, open Terminal.app.
4. Paste the command and press Enter.
5. Stop ACC by executing `sudo launchctl unload -w /Library/LaunchDaemons/com.sn.acc.plist`.
6. Navigate to `/Library/Application\ Support/servicenow/agent-client-collector` and edit the `acc.yml` file.
7. Restart ACC by executing `sudo launchctl load -w /Library/LaunchDaemons/com.sn.acc.plist`.

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The ACC connects to your ServiceNow instance.

**Tip:**
To deploy ACC in Mac using the Terminal window:

**a.** Install the following:

**i.** `cd /tmp;`

**ii.**
```
sudo curl -L -O -k
 https://install.service-now.com/glide/distribution/buil
ds/package/app-signed/agent-client-collector-3.1.0-macos
_x64.pkg
sudo installer -pkg
 agent-client-collector-3.1.0-macos_x64.pkg -target /;
sudo cp -p "/Library/Application
 Support/servicenow/agent-client-collector/acc.yml.examp
le" "/Library/Application
 Support/servicenow/agent-client-collector/acc.yml";
```

**b.** Launch and run the following:

```
sudo launchctl
 load /Library/LaunchDaemons/com.sn.acc.plist;
sudo launchctl
 load /Library/LaunchDaemons/com.sn.acc.plist
sudo launchctl
 unload /Library/LaunchDaemons/com.sn.acc.plist
sudo tail
 -f /var/log/servicenow/agent-client-collector/acc.log
 (only for version 3.4.0)
sudo tail -f /Library/Application\
 Support/servicenow/agent-client-collector/log/acc.log
 (for version 3.4.1 or later)
cd "/Library/Application
 Support/servicenow/agent-client-collector"
```

**c.** Stop ACC service and remove ACC:

```
sudo launchctl unload
 -w /Library/LaunchDaemons/com.sn.acc.plist;
sudo rm /Library/LaunchDaemons/com.sn.acc.plist;
sudo rm -rf /opt/servicenow/agent-client-collector;
sudo rm
 -rf /Library/Caches/servicenow/agent-client-collector;
 (only for version 3.4.0)
sudo rm -rf /var/run/servicenow/agent-client-collector;
sudo rm -rf /var/log/servicenow/agent-client-collector;
 (only for version 3.4.0)
sudo rm -rf "/Library/Application
 Support/servicenow/agent-client-collector";
```

### What to do next

Enable DEX browser extension for monitoring web/SaaS applications.

#### Enable DEX browser extension for monitoring web/SaaS applications

Activate the DEX Chrome or Edge Extension on your system to collect different operational or performance based metrics for the web/SaaS applications.

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### Before you begin
Ensure that the DEX plugin [sn_dex] is installed.

Ensure that for the DEX browser extension, the browser versions are Google Chrome 114 or higher, and Microsoft Edge version 96 or higher.

Role required: sn_dex.admin

### Procedure
1. To install DEX Browser Extension on Chrome browser, perform the following steps:
   a. Navigate to DEX Browser Extension.
   b. Click **Add to Chrome**.
   c. On the confirmation window, click **Add extension**.
2. To install DEX Browser Extension on Edge browser, perform the following steps:
   a. Navigate to DEX Browser Extension.
   b. Click **Get**.
   c. On the confirmation window, click **Add extension**.

### Result
The Chrome and Edge Extension is enabled by default, and when it begins monitoring web/SaaS applications, it sends the collected metrics to the ServiceNow instance.

### What to do next
Onboard for DEX Application and Device Health.

#### Onboard for DEX Application and Device Health

During the onboarding process, when there is no application listed to be monitored, you can begin by accessing a list of available applications. You can also add your own custom applications and enable them for monitoring along with any existing applications.

### Before you begin
To add a web/SaaS application to be monitored, ensure you have completed the following tasks:

- Create ACC registration key
- Install Agent Client Collector for DEX - Windows using a one-line installer or Install Agent Client Collector for DEX - Mac using one-line installer
- Enable DEX browser extension for monitoring web/SaaS applications

Role required: sn_dex.admin

### Procedure
1. Navigate to **Workspaces** > **Service Operations Workspace**.

   The Home page icon (  ) is selected by default, prompting you to view and add applications for monitoring to begin the onboarding process.

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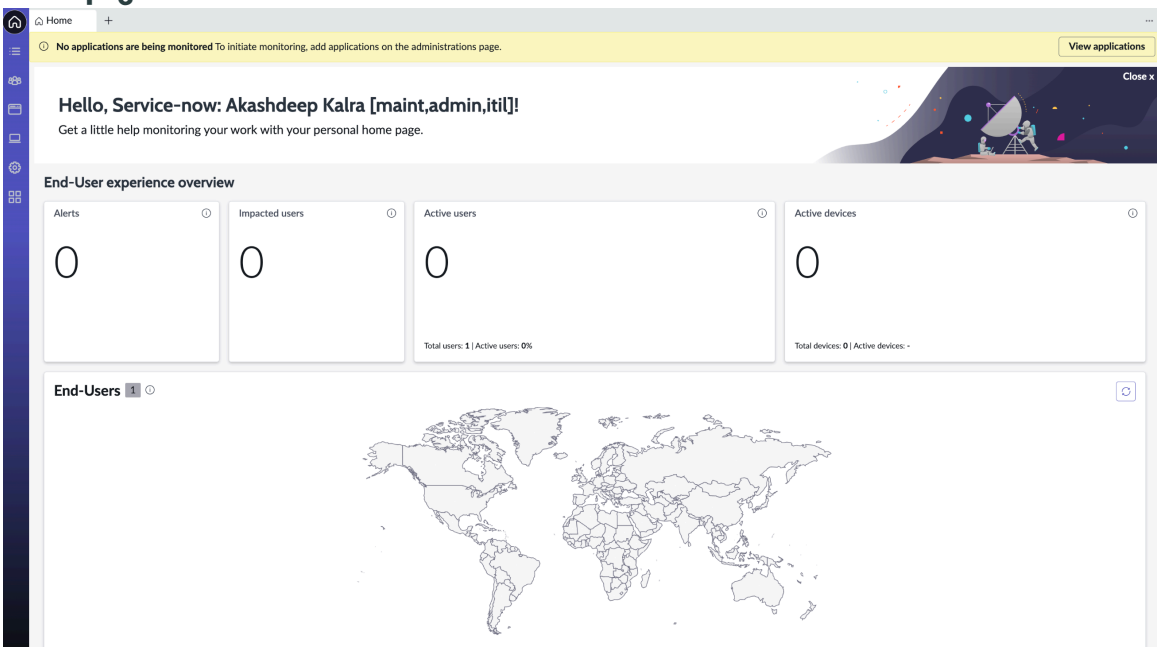
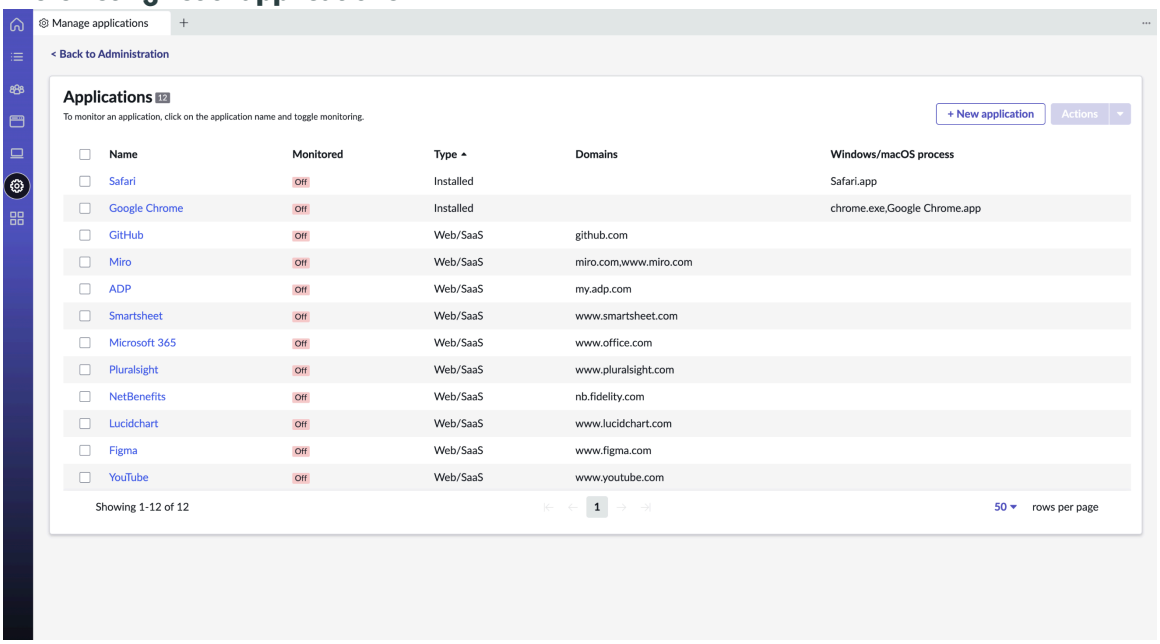
**Home page**




2. Select **View applications**.

   Out-of-the-box, a pre-existing list of monitoring-enabled applications is provided, initially turned off. You can also add your own application to the list.

**Pre-existing list of applications**




3. To add a new application, perform the following steps.

   a. Select **+ New application**.

      The Add new application form appears.

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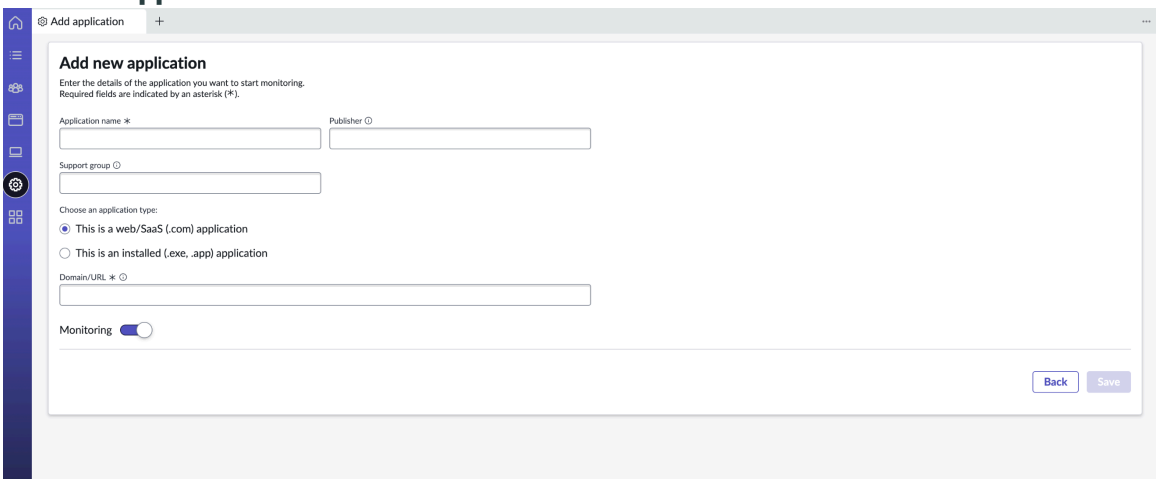
**Add new application form**




**b.** On the form, fill in the fields and select **Save**.

For more information on each field, see Custom application form.

**4.** To monitor an application from the pre-existing list, turn on the application monitoring.
For more information on how to turn on an application, see Enable application monitoring.

## What to do next

You can explore the product and learn about the various pages and their offerings by accessing Application & Device Health.

### Configure MID-less ACC for DEX

Configuration of the `acc.yml` file for the Agent Client Collector (ACC) does not require a middleware and can be configured without the need for additional software components, making it a simpler and more efficient process.

## Before you begin

Ensure you have setup the ACC registration key and installed ACC. For information on how to setup and install, see:

- Create ACC registration key.
- Install the Agent Client Collector on a Windows machine manually or Manually install Agent Client Collector on macOS.

Role required: agent_admin and agent_client_collector_admin

For more information on roles, see Agent Client Collector user roles.

## Procedure

**1.** Open the `acc.yml` file.

**2.** Edit the *`backend-url`* parameter to point to `<ITOM Cloud Services Gateway>`.

Use any of the following gateway based on the instance location:

- AMER: `itomcnc-prod-gateway-amer.sncapps.service-now.com:443`
- EMEA: `itomcnc-prod-gateway-emea.sncapps.service-now.com:443`
- APAC: `itomcnc-prod-gateway-apac.sncapps.service-now.com:443`

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For more information on how the Agent uses the ITOM Cloud Services Gateway, see DEX Architecture.

3. Add the following new parameters:
   - connect-without-mid: true
   - instance-url: <full_instance_url>, example: https://dex.servicenow.com
   - registration-key: <registration key value>

     For more information on how to create a registration key, see Create ACC registration key.
4. Comment out the parameter: api-key: "encrypted...."
5. Save the file.

### Convert MID-based ACC to MID-less ACC

Convert MID-based Agent Client Collector (ACC) to MID-less ACC by adjusting the configuration in acc.yml, offering the benefit of decoupling from a specific MID, thereby enhancing flexibility and adaptability.

#### Before you begin

Ensure you have setup the ACC registration key and installed ACC. For information on how to setup and install, see:

- Create ACC registration key.
- Install the Agent Client Collector on a Windows machine manually or Manually install Agent Client Collector on macOS.

Role required: agent_admin and agent_client_collector_admin

For more information on roles, see Agent Client Collector user roles.

#### Procedure

1. Stop ACC with the steps appropriate for your operating system.
   - For Windows, access Services as Administrator and stop the Agent Client Collector Service.
   - For Mac, execute the command: `sudo launchctl unload -w /Library/LaunchDaemons/com.sn.acc.plist;`
2. Open the `acc.yml` file.
3. Edit instance URL to the new instance.
4. Edit the *`backend-url`* parameter to point to `<ITOM Cloud Services Gateway>`.

   Use any of the following gateway based on the instance location:
   - AMER: `itomcnc-prod-gateway-amer.sncapps.service-now.com:443`
   - EMEA: `itomcnc-prod-gateway-emea.sncapps.service-now.com:443`
   - APAC: `itomcnc-prod-gateway-apac.sncapps.service-now.com:443`

   For more information on how the Agent uses the ITOM Cloud Services Gateway, see DEX Architecture.
5. Add the following new parameters:

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- connect-without-mid: true
- instance-url: <full_instance_url>, example: https://dex.servicenow.com
- registration-key: <registration key value>

  For more information on how to create a registration key, see Create ACC registration key.

6. Comment out the parameter: *api-key: "encrypted..."*
7. Save the file.
8. Delete files based on your operating system.
   - On Windows, navigate to `/agent-client-collector/config/cert/cnc` and remove the following files: `cnc_chain.crt` and `priv_key.pem.go`.
   - On Mac, access `/Library/Application Support/servicenow/agent-client-collector/cert/cnc` and delete the files: `cnc_chain.crt` and `priv_key.pem`.
9. Delete the following folders based on your operating system.
   - On Windows, delete the folder: `/agent-client-collector/cache`.
   - On Mac:
     - For Agent 3.4.1 or above, delete the folder: `/Library/Application Support/servicenow/agent-client-collector/cache`.
     - For Agent 3.4.0 or below, delete the folder: `/Library/Caches/servicenow/agent-client-collector`.
10. Initiate the ACC service by following the steps specific to your operating system.
    - On Windows, open Services as Administrator, then start the Agent Client Collector Service.
    - On Mac, use the command: `sudo launchctl load -w /Library/LaunchDaemons/com.sn.acc.plist`.

### Convert ACC from one instance to another instance

Convert Agent Client Collector (ACC) instances for monitoring to enhance data collection, visibility, tool compatibility, or meet specific monitoring needs.

#### Before you begin

Ensure you have setup the ACC registration key and installed ACC. For information on how to setup and install, see:

- Create ACC registration key.
- Install the Agent Client Collector on a Windows machine manually or Manually install Agent Client Collector on macOS.

Role required: agent_admin and agent_client_collector_admin

For more information on roles, see Agent Client Collector user roles.

#### About this task

If Agent Client Collector (ACC) is already connected to one instance, you can convert the agent to another instance by changing the configuration in `acc.yml`.

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### Procedure

1. Stop ACC with the steps appropriate for your operating system.
   - For Windows, access Services as Administrator and stop the Agent Client Collector Service.
   - For Mac, execute the command: `sudo launchctl unload -w /Library/LaunchDaemons/com.sn.acc.plist;`
2. Open the `acc.yml` file.
3. Edit instance URL to the new instance.
4. Edit the *`backend-url`* parameter to point to `<ITOM Cloud Services Gateway>`.

   Use any of the following gateway based on the instance location:
   - AMER: `itomcnc-prod-gateway-amer.sncapps.service-now.com:443`
   - EMEA: `itomcnc-prod-gateway-emea.sncapps.service-now.com:443`
   - APAC: `itomcnc-prod-gateway-apac.sncapps.service-now.com:443`

   For more information on how the Agent uses the ITOM Cloud Services Gateway, see DEX Architecture.
5. Add the following new parameters:
   - connect-without-mid: true
   - instance-url: <full_instance_url>, example: https://dex.servicenow.com
   - registration-key: <registration key value>

     For more information on how to create a registration key, see Create ACC registration key.
6. Comment out the parameter: *`api-key: "encrypted...."`*
7. Save the file.
8. Delete files based on your operating system.
   - On Windows, navigate to `/agent-client-collector/config/cert/cnc` and remove the following files: `cnc_chain.crt` and `priv_key.pem.go`.
   - On Mac, access `/Library/Application Support/servicenow/agent-client-collector/cert/cnc` and delete the files: `cnc_chain.crt` and `priv_key.pem`.
9. Delete the following folders based on your operating system.
   - On Windows, delete the folder: `/agent-client-collector/cache`.
   - On Mac:
     - For Agent 3.4.1 or above, delete the folder: `/Library/Application Support/servicenow/agent-client-collector/cache`.
     - For Agent 3.4.0 or below, delete the folder: `/Library/Caches/servicenow/agent-client-collector`.
10. Initiate the ACC service by following the steps specific to your operating system.
    - On Windows, open Services as Administrator, then start the Agent Client Collector Service.
    - On Mac, use the command: `sudo launchctl load -w /Library/LaunchDaemons/com.sn.acc.plist`.

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### Add a new application to monitor

Add a new application to the list of all the applications that are being monitored, and ensure that you have a comprehensive view of your applications and can quickly identify and address issues as they arise.

#### Before you begin

Ensure that the DEX plugin [sn_dex] is installed.

To add a web/SaaS application to be monitored, ensure you have completed the following tasks:

- Create ACC registration key
- Install Agent Client Collector for DEX - Windows using a one-line installer or Install Agent Client Collector for DEX - Mac using one-line installer
- Enable DEX browser extension for monitoring web/SaaS applications

Role required: sn_dex.admin

#### Procedure

1. Navigate to **Workspaces** > **Service Operations Workspace** and from the left pane, select the DEX Administration icon (  ).
2. Select the **Manage applications** card.
3. Select **+ New application**.
4. On the form, fill in the fields.
   For more information on each field, see Custom application form.
5. Select **Save**.

#### Result

The new application is added to the list of monitored applications.

### Edit application details

Edit various details about the application, such as its name, publisher, and support group.

#### Before you begin

Ensure that the DEX plugin [sn_dex] is installed.

Role required: sn_dex.admin

#### Procedure

1. Navigate to **Workspaces** > **Service Operations Workspace** and from the left pane, select the DEX Administration icon (  ).
2. Select the **Manage applications** card.
   The list of monitored application appears.
3. Select the application name whose details you want to modify.
   The Edit Application form appears.
4. On the form, edit the required fields.
   For more information on each field, see Custom application form.
5. Select **Save**.

#### Result

Application details are updated.

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### Add a logo for your application

Add a logo to improve the visual appeal of your application and to distinguish it from others.

#### Before you begin
Role required: sn_dex.admin

#### About this task
You can only add a logo for an existing application.

#### Procedure
1. Navigate to **Workspaces** > **Service Operations Workspace** and from the left pane, select the DEX Administration icon (  ).
2. Select the **Manage Applications** card.
   The list of monitored application appears.
3. Select the name of the application for which you'd like to add a logo.
   The Edit Application form appears.
4. Select the **Add/Edit image** link.
   The Application form opens in a new window.
5. On the **Logo** field, select **Click to add**.
6. Select **Choose file**, select **Open**, and then select **OK**.
7. Close the window.

#### What to do next
To see the new application logo, perform the following steps.

1. Navigate to **Workspaces** > **Service Operations Workspace**.
2. From the left pane, select the Applications icon (  ).
3. Open the application for which you have added the logo.

   The logo appears before the name of the application.

### Enable application monitoring

Enable application monitoring to gain insights into performance metrics, diagnose issues, and ensure optimal functionality, enhancing performance and proactively addressing potential bottlenecks or failures.

#### Before you begin
Ensure that the DEX plugin [sn_dex] is installed.

Role required: sn_dex.admin

#### Procedure
1. Navigate to **Workspaces** > **Service Operations Workspace** and from the left pane, select the DEX Administration icon (  ).
2. Select the **Manage applications** card.
   The list of monitored application appears.
3. Select the check box adjacent to the application name you wish to disable.
4. Select the **Actions** drop-down list.

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5. Select **Turn on monitoring**.
   The monitoring of the application is enabled.

### Disable application monitoring

Disable the monitoring of application in situations where monitoring is causing performance issues or interfering with the functionality of the application.

#### Before you begin

Ensure that the DEX plugin [sn_dex] is installed.

Role required: sn_dex.admin

#### Procedure

1. Navigate to **Workspaces** > **Service Operations Workspace** and from the left pane, select the DEX Administration icon (  ).
2. Select the **Manage applications** card.
   The list of monitored application appears.
3. Select the check box adjacent to the application name you wish to disable.
4. Select the **Actions** drop-down list.
5. Select **Turn off monitoring**.
   The monitoring of the application is disabled.

### Delete an application from the monitoring list

Delete an application from the monitoring list when there is no longer a need to track its performance or activity. If required, you can add the application in the monitoring list at a later time.

#### Before you begin

Ensure that the DEX plugin [sn_dex] is installed.

Role required: sn_dex.admin

#### Procedure

1. Navigate to **Workspaces** > **Service Operations Workspace** and from the left pane, select the DEX Administration icon (  ).
2. Select the **Manage applications** card.
   The list of monitored application appears.
3. Select the check box adjacent to the application name you wish to delete.
4. Select the **Actions** drop-down list.
5. Select **Delete applications**.
6. On the confirmation window, select **Delete**.

#### Result

The application is deleted from the list of monitored applications.

### View application administrators

Know the application administrators who are responsible for managing the application, ensuring its proper functioning, and handling any issues that may arise.

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### Before you begin
Ensure that the DEX plugin [sn_dex] is installed.

Role required: sn_dex.admin

### Procedure
1. Navigate to **Workspaces** > **Service Operations Workspace** and from the left pane, select the DEX Administration icon ( ).
2. Select the **Administrators** card.

### Result
The list displays all the administrators available for the application.

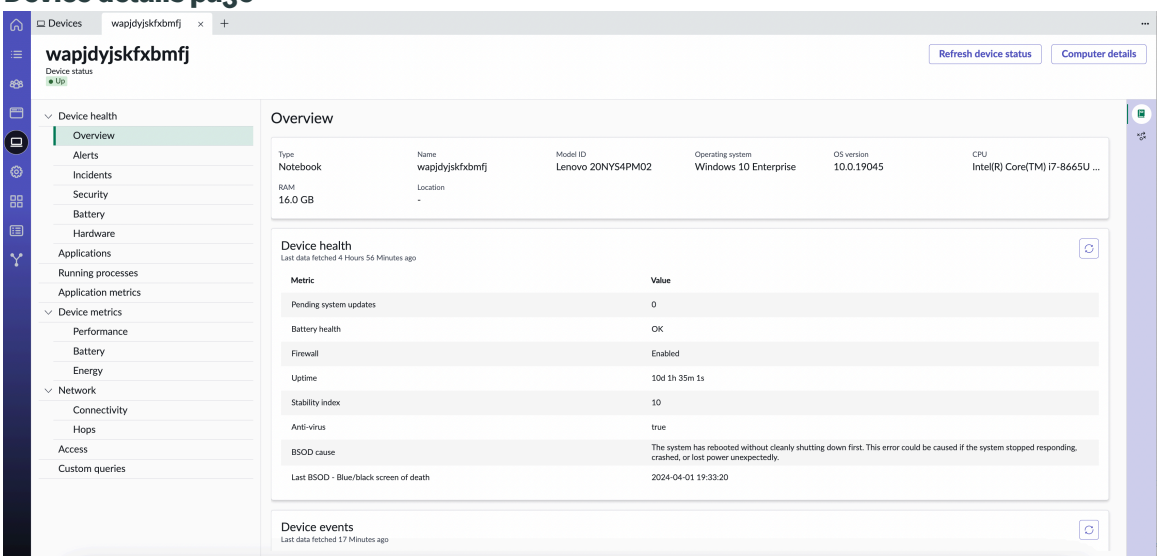
## Terminate process on your device

Terminate processe on your device to boost performance and free up valuable resources for smoother operation.

### Before you begin
Role required: sn_dex.engineer or sn_dex.admin

### Procedure
1. Navigate to **Workspaces** > **Service Operations Workspace** and from the left pane, select the Devices icon ( ).

**Device details page**




2. Select **Running processes**.

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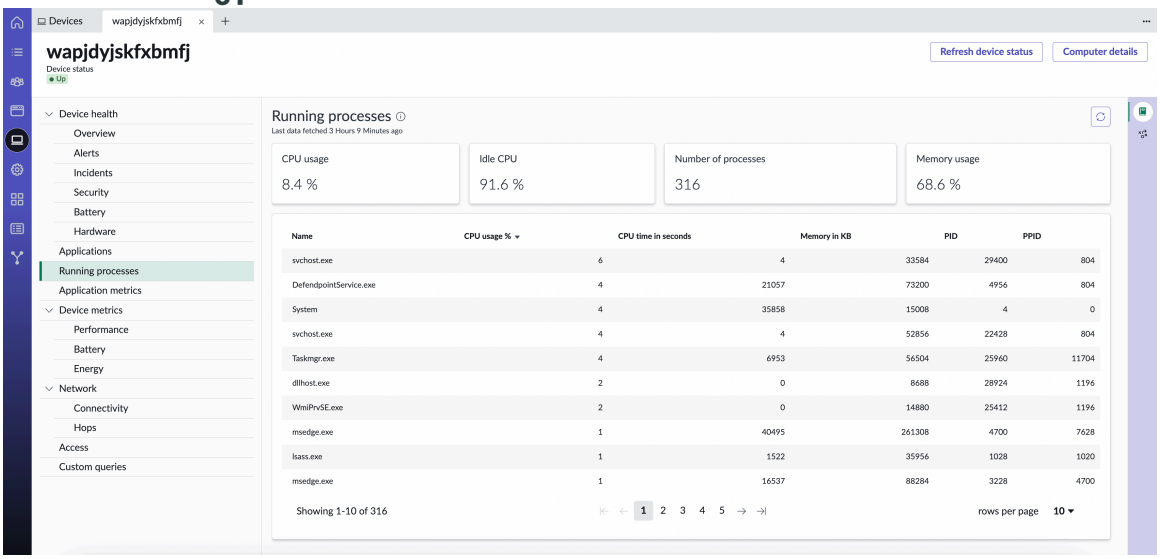
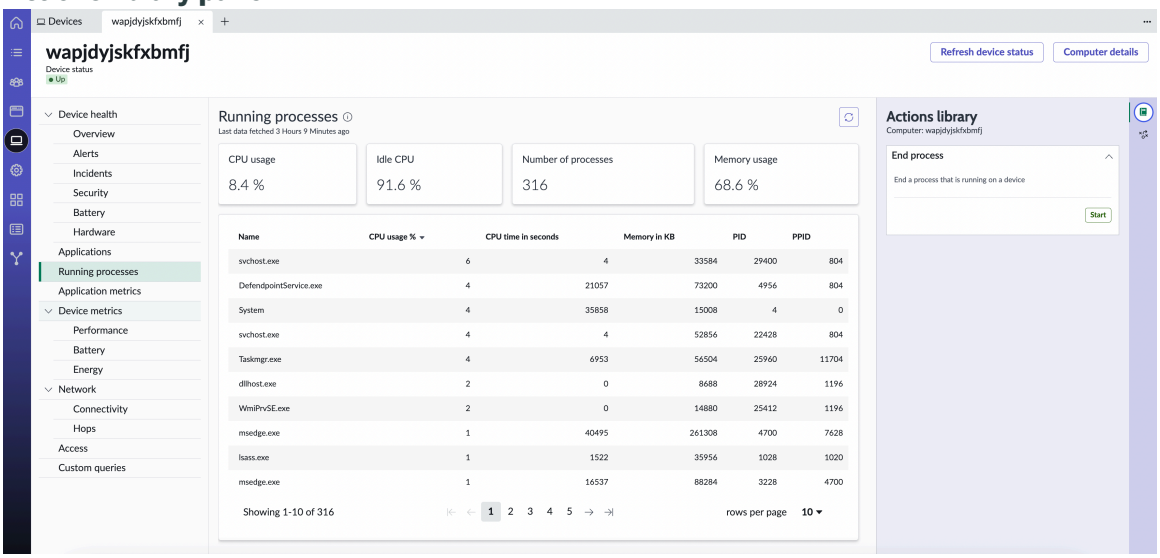
**Details of running processes**




**3.** On the right pane, select the Action library icon ( ).

**4.** In the End process card, select **Start**.

**Actions library pane**




**5.** Select the End process card that now shows the process state as **New**.

**6.** Under Get user approval card, select the **User approved action** check box and select **Submit**.

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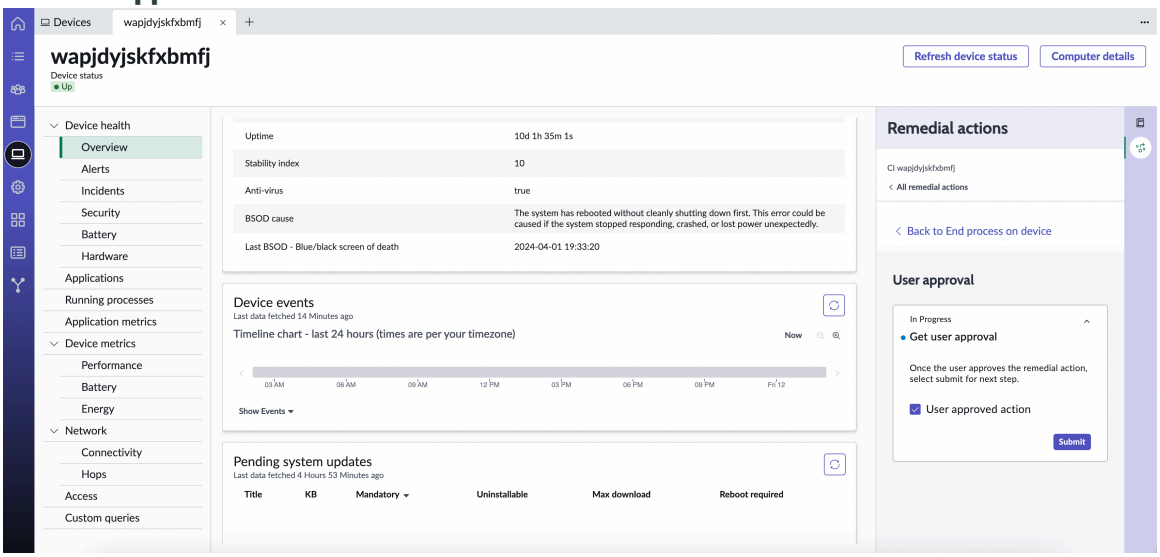
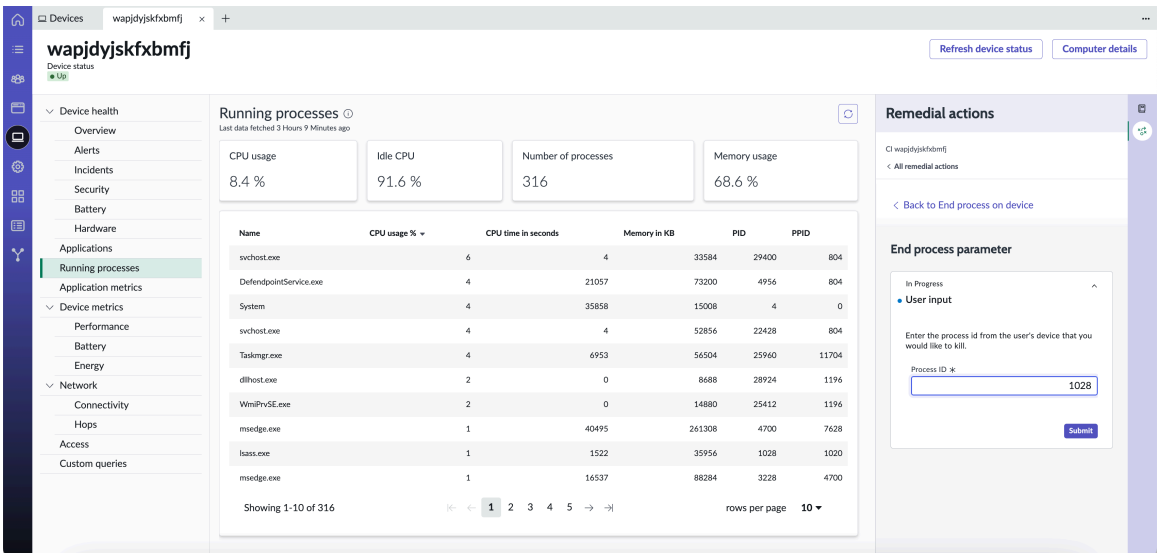
**Get user approval**




You have to provide the parameters of the running process you wish to terminate.

7. In the **Process ID** field, enter the corresponding process ID obtained from the PID column.

**Process termination interface**




8. Select **Submit**.

The process is terminated.

## What to do next

Select the Playbook icon ( ) to access the current action of the device and also to review the device's action execution history.

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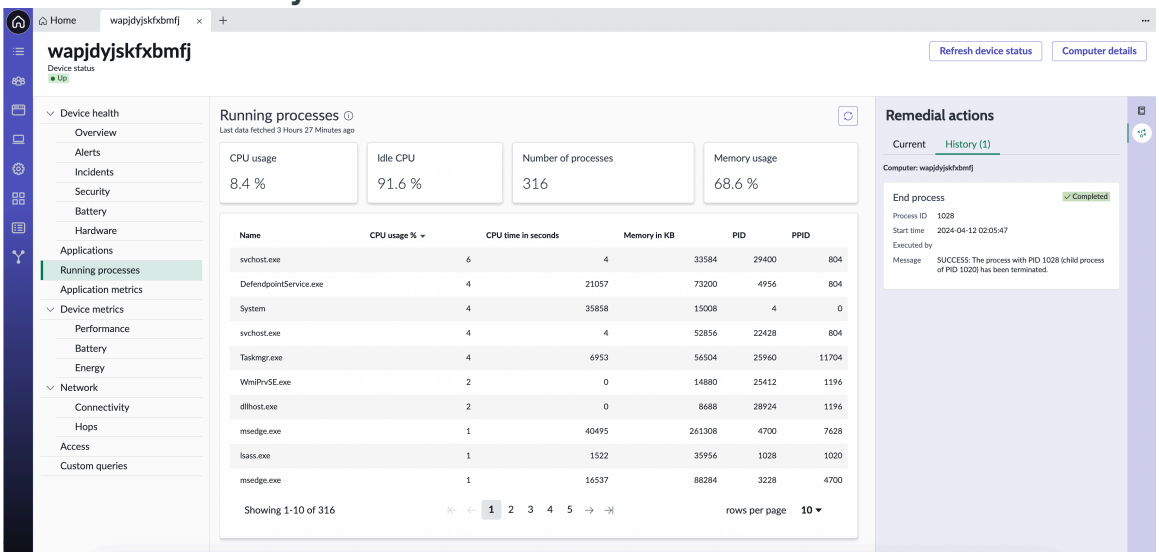
### Remedial action history



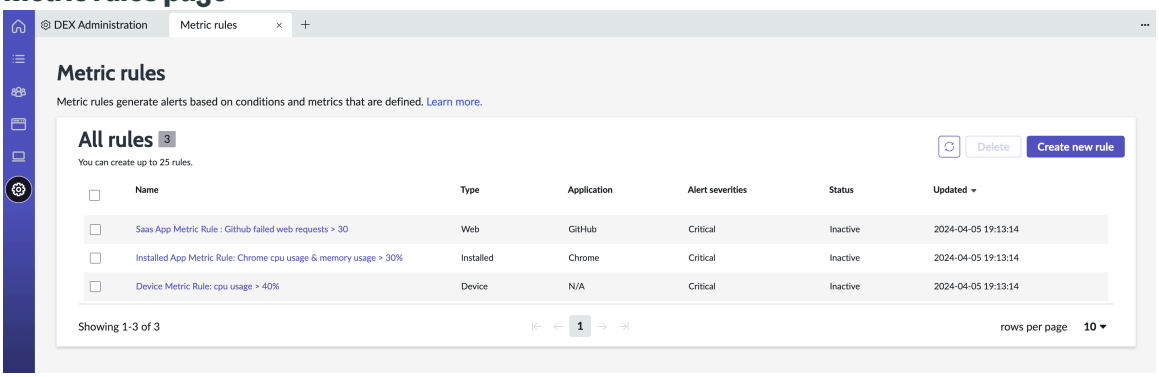

## Metric rules

Metric rules set criteria and thresholds, triggering alerts when performance metrics deviate from specified parameters, facilitating effective system monitoring and management. This comprehensive approach to alert generation ensures that potential issues are promptly identified and addressed, ultimately enhancing system reliability and operational efficiency.

To access the metric rules page, navigate to **Workspaces** > **Service Operations Workspace** and from the left pane, select the Administration icon ( ). Select the **Metric rules** card.

**Note:**
When you initially install DEX, a set of pre-configured metric rules is available out of the box. These rules remain inactive upon installation. To activate them, see Activate or deactivate metric rules. If you delete these rules, they are permanently removed and cannot be retrieved.

### Metric rules page




For details about the fields and their descriptions on the metric rules page, see Metric rules page.

## Create metric rules

Create metric rules to establish criteria and thresholds for performance metrics, enabling timely alerts and proactive system management.

To create a metric rule, you must perform the following steps.

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1. Specify the configuration item for metric rules.
2. Define alert metric criteria.
3. Define metric rule name and status.

### Specify the configuration item for metric rules

Choose application or device and define filter conditions for the metric rule.

## Before you begin

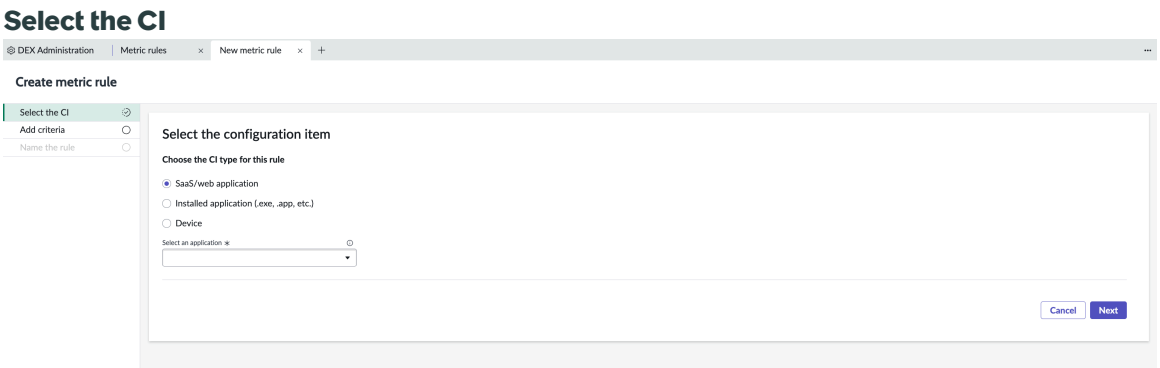
Ensure that the DEX plugin [sn_dex] is installed and you are on the Metric rules page.

Role required: sn_dex.admin

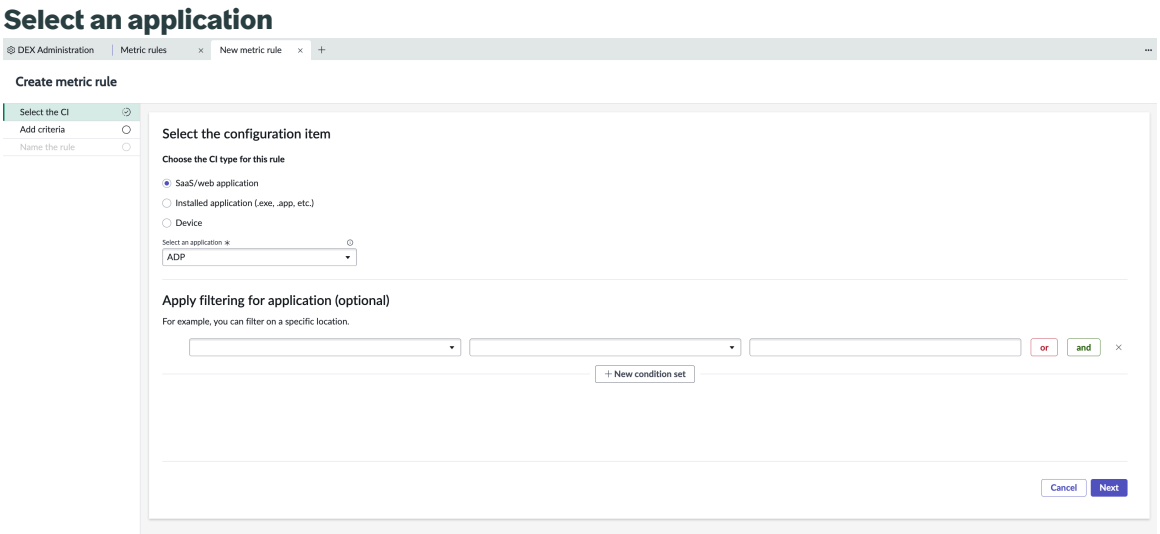
## Procedure

1. Select **Create new rule**.

   A new tab opens for the Create metric rule window, with the the **Select the CI** option pre-selected in the left pane.




2. Select any one of the following types of configuration items you want to monitor.
   - Saas/web application
   - Installed application (.exe, .app, etc.)
   - Device
3. For **Saas/web application** or **Installed application**, select the application to monitor.

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**Note:**
If you select **Device**, the option to choose an application would not be available.

4. **Optional:** Apply conditional filtering on the configuration items.
   The predetermined filtering choices include Department, Location, OS, User, and Version, with the Version option specifically designed for installed applications.

   (Optional) To add additional filters, select **+ New condition set**.

5. Select **Next**.
   The **Add criteria** option is selected in the left pane.

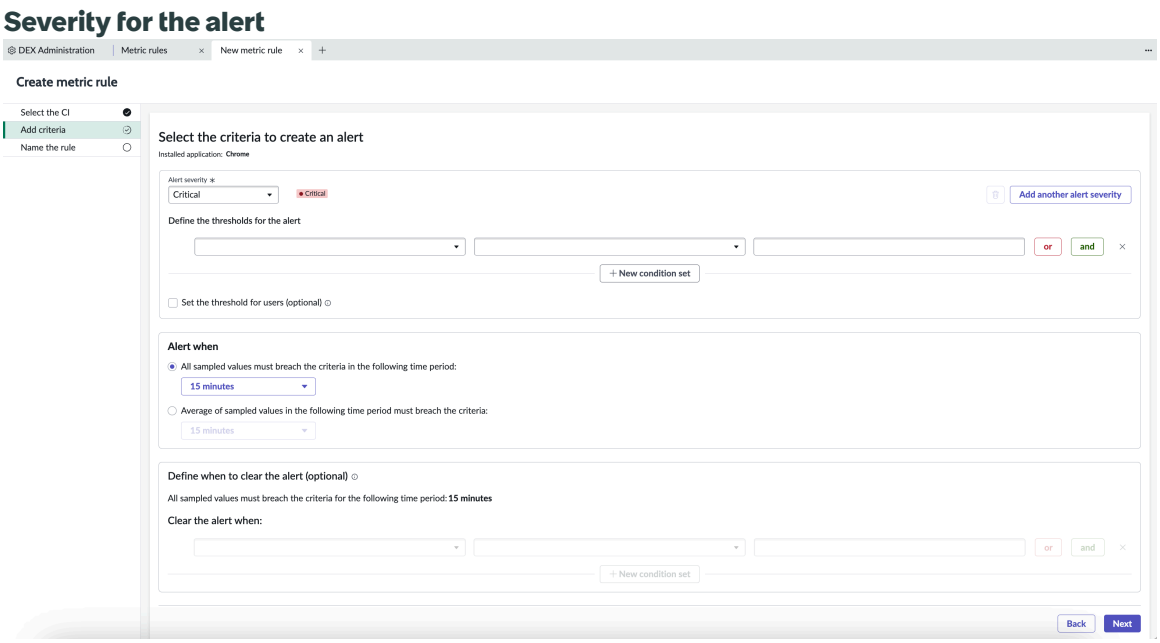
### What to do next
Define alert metric criteria.

## Define alert metric criteria

Specify alert metric criteria by choosing alert severity, defining thresholds, and specifying conditions for when the alert must be triggered, thereby ensuring timely and accurate responses to critical events.

### Before you begin
Role required: sn_dex.admin

### Procedure
1. In the **Alert severity** field, select a severity for the alert.




2. Define the thresholds for the alert.
   The predetermined metrics are based on whether the configuration item (CI) type such as SaaS/web, Installed, or Device.

**Note:**
To add another alert severity level and define the alert threshold, select **Add another alert severity**.

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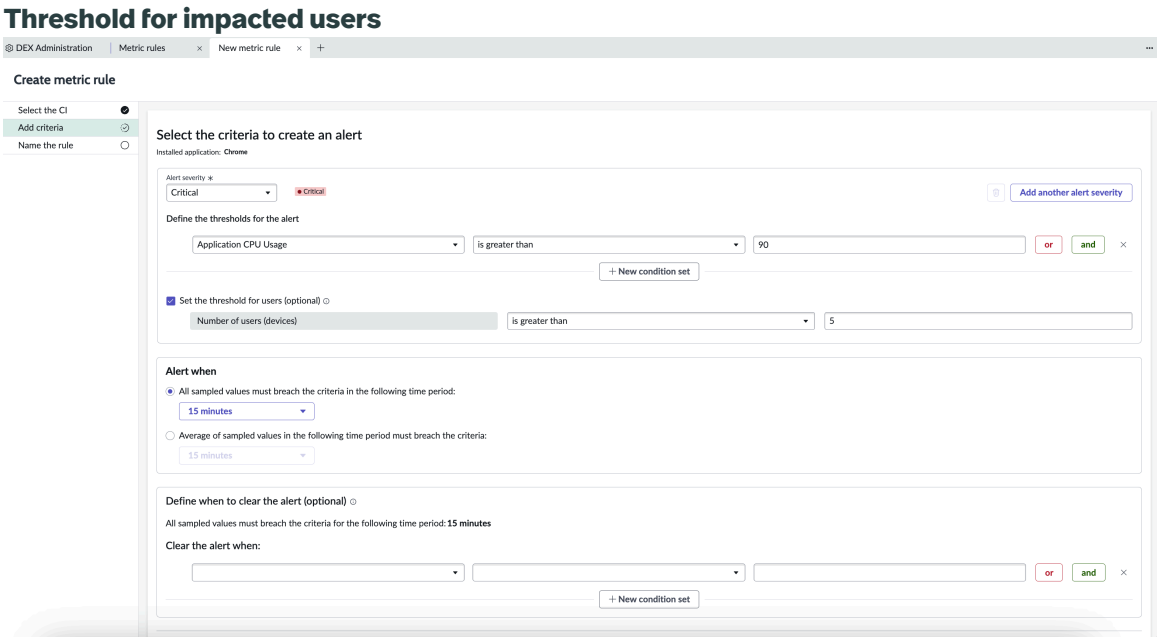
3. Select the **Set the threshold for users** check box and define the criteria based on the number of impacted users to trigger the alert.




4. In the Alert when section, perform any one of the following steps.
   - Select **All sampled values must breach the criteria in the following time period** and define the time period.
   - Select **Average of sampled values in the following time period must breach the criteria** and define the time period.
5. **Optional:** If you want to define the conditions when to clear the alert, under **Clear the alert when**, define the conditions.

   (Optional) The condition fields become active whenever you create at least one condition.
6. Click **Next**.
   The **Name the rule** option is selected in the left pane.

## What to do next

Define metric rule name and status.

### Define metric rule name and status

Define metric rule attributes, including the name and state, such as active or inactive.

## Before you begin

Role required: sn_dex.admin

## Procedure

1. In the **Name** field, enter a name for the rule.
   The metric rule is active by default.

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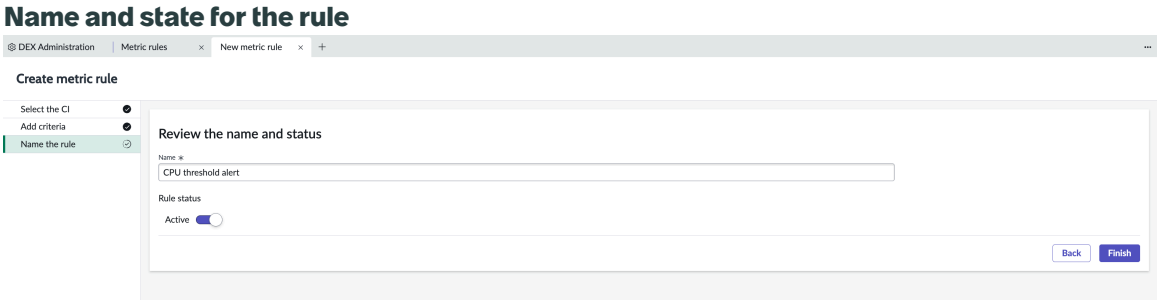



2. For setting the status of the metric rule, use the **Active** slider ( ) to enable or disable the rule.
3. Select **Finish**.

   A metric rule is created and displayed in the Metric rules window.

## View alerts generated from metric rules

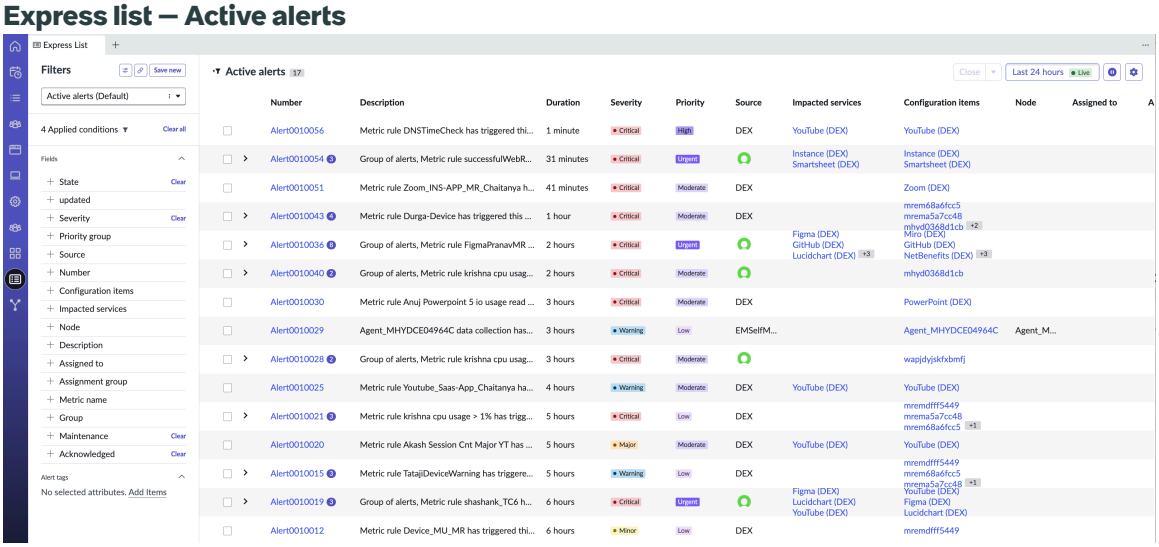
Easily track performance insights with alerts from metric rules.

### Before you begin

Role required: sn_dex.user or sn_dex.admin

### Procedure

Navigate to **Workspaces** > **Service Operations Workspace** and from the left pane, select the Express list icon ( ).




When multiple alerts are triggered for events that are part of the same rule, the alert grouping mechanism automatically groups these alerts together.

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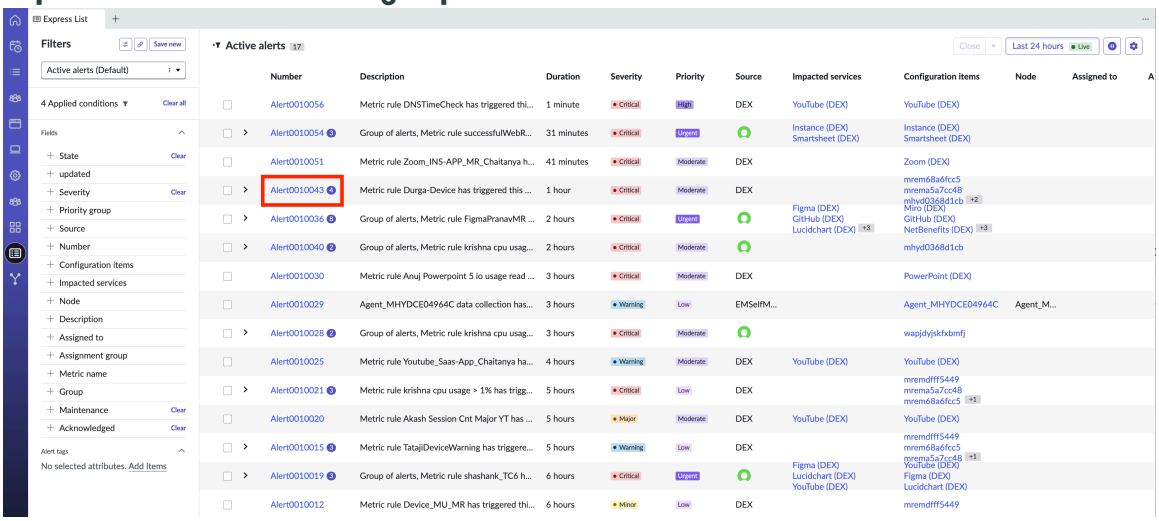
### Express list — Active alerts in groups



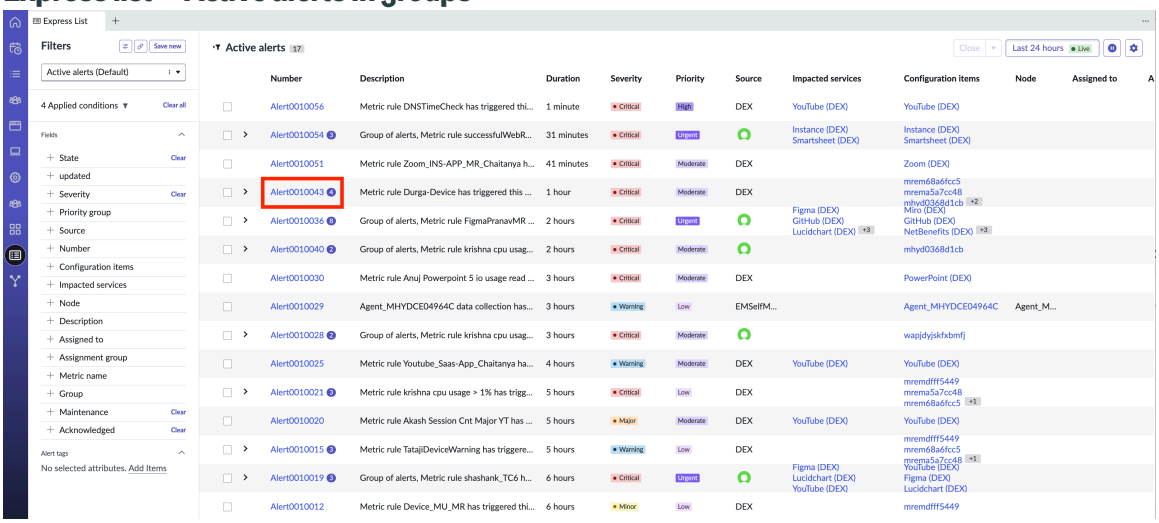

For more information on alert grouping, see DEX alert grouping.

### DEX alert grouping

When several alerts are triggered from events governed by the same metric rule in DEX, the alert grouping mechanism automatically consolidates them. This reduces the need for users to manage individual alerts, streamlining their response process, and enabling faster issue resolution.

When alerts are grouped together, you see the total count of secondary alerts grouped next to the primary alert number.

### Express list — Active alerts in groups




## DEX events and alerts representation

In the Events table [em_event], any event with the **Source** field value as DEX is classified as a DEX event. For DEX, the **Type** field displays **DEX Metric Rules** as DEX alerts are generated based on DEX metric rules. When for any event, the **State** of the event is **Processed**, an alert is generated and saved in the Alerts table [em_alert].

In the Alerts table [em_alert], select any alert to access its details. An alert that is created from a DEX event, displays the **Source** field value as DEX. The **Metric name** field value appears as either DEX App Metric or DEX Device Metric. For an alert, the **Metric name** field value is always DEX Device Metric. The **Configuration item** field shows the name of the corresponding

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application or device. For the alert whose corresponding **Group** field shows **Rules-based**, are the DEX alert groups.

## Rule for alert correlation

In **All** > **Event Management** > **Rules** > **Alert Correlation Rules**, the DEX Metric Correlation Rule determines when alerts must be grouped and provides necessary details.

**Note:**
For one application and one metric rule, DEX creates only one alert. DEX creates alert groups when the metric rule is the same, regardless of whether the configuration items are the same or different. When the problem is resolved, closing the primary alert also closes the secondary alerts within the same group.

## Time-based alert grouping

Time-based alert grouping automatically groups alerts according to predefined time intervals, which proves advantageous for services generating numerous alerts. Consolidated alerts result in fewer disruptions for responders and contribute to shorter resolution times.

In the System Properties table [sys_properties], the property *sn_dex.alert.correlation_rule.device.period* defines the time period in seconds for grouping and correlating similar metric rule-based DEX alerts. In the **Value** field, you can enter the desired time duration in seconds. For example, to set a 5-minute gap between alert groupings, enter 300. Entering 0 disables the rule.

Let's consider an example: Alert A1 is generated for rule R1 from device D1. After 2 minutes, alerts A2 and A3 are generated for the same rule R1, but from devices D2 and D3 respectively. Since A1 was the first alert, it's designated as the primary alert, and A2 and A3 are grouped as secondary alerts under A1.

Now, suppose you've set the time duration to 300 seconds (5 minutes). If no alerts for rule R1 are generated within 5 minutes, and then after this period, alerts A4, A5, and A6 are generated for the same rule, a new group is formed. Alert A4 becomes the primary alert, and A5 and A6 are grouped under A4.

However, if any alert is generated for rule R1 within 5 minutes, it's considered a secondary alert to A1 and grouped accordingly.

### Deactivate DEX alert grouping

Deactivating DEX alert grouping allows for individual alert visibility, aiding in detailed analysis and targeted response.

**Before you begin**
Role required: sn_dex.admin

**Procedure**

Perform one of the following options.

### Activate or deactivate metric rules

Activate or deactivate metric rules to streamline monitoring and adapt to changing needs, enhancing operational efficiency.

**Before you begin**
Role required: sn_dex.admin

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### Procedure

1. Select the metric rule name to open the rule.
2. On the Update metric rule page, on the left hand pane, select **Name the rule**.
3. Under Rule status, use the **Active** slider ( ) to enable the rule.

   If you wish to deactivate an active metric rule, simply slide the toggle switch to the off position.
4. Select **Update**.

## Edit metric rules

Modify metric rules to fine-tune monitoring criteria and thresholds.

### Before you begin

Role required: sn_dex.admin

### Procedure

1. Navigate to **Workspaces** > **Service Operations Workspace** and from the left pane, select the Administration icon ( ).
2. Select the **Metric rules** card.
   The metric rules home page appears.
3. Select the name of the metric rule that you want to update.
4. Modify the required values.
5. Select **Update**.

### Result

The metric rule is updated.

## Delete metric rules

Remove metric rules to adjust monitoring criteria and thresholds.

### Before you begin

Role required: sn_dex.admin

### About this task

Deleting any rules results in their permanent removal, and they cannot be retrieved.

### Procedure

1. Navigate to **Workspaces** > **Service Operations Workspace** and from the left pane, select the Administration icon ( ).
2. Select the **Metric rules** card.
   The metric rules home page appears.
3. Select the check box preceding the name of the metric rule to select it for deletion.

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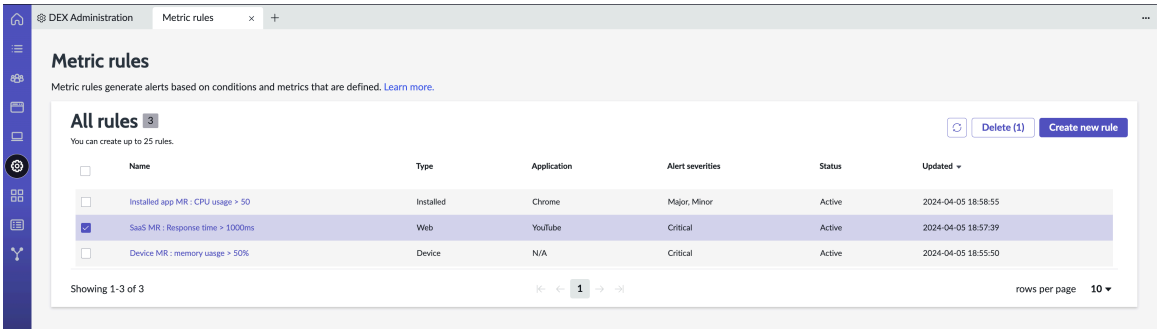


4. Select **Delete**.
5. In the confirmation window, select **Delete**.
   The metric rule is removed from the list.

## Using DEX Application and Device Health

Application and Device Health is a powerful tool that can help you monitor and manage your IT environment from an end-user's perspective. It provides a range of features that can help you gain insight into how your users are interacting with the technology they use on a daily basis.

- The Home page: Provides immediate visibility about the total number of alerts, impacted users, active users, active devices, end-users world map and a dedicated alerts section to provide details of the application alerts.
- The Users page: Provides a centralized hub for accessing user-related data, including individual alerts, associated devices, and location information, streamlining management and enhancing user experience. The user details page is designed to help you understand how the users are interacting with the application, and to identify areas where improvements may be needed.
- The Application page: Serves as a central hub where users can get visibility on the applications that are being monitored, the type of the application, the number of incidents and alerts associated with each of those applications, and number of impacted users.
- The Devices page: Provides detailed information on each device, including user assignment status, last login timestamp, matching assignments, device status, active alerts, and incidents, enabling comprehensive device management and improved operational efficiency.
- The DEX Administration page: Provides information on applications, policies, metric rules, users, administrators. You can also track Agent Client Collector installations in Agent Health. You also have the Desktop Assistant usage metrics to keep tab on your connection status ensuring seamless communication with the ServiceNow instance.

### Accessing Application and Device Health

Get insights across different Application and Device Health features by exploring pages within the application.

#### Application and Device Health pages

| Page | Description |
|---|---|
| Home page | The Home page offers access to information on alerts, impacted users, active users, active devices, world map, and an alert section. |
| Users page | The Users page acts as a central hub for user data, providing access to individual user alerts, associated devices, and their respective device locations. |

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**Application and Device Health pages (continued)**

| Page | Description |
|---|---|
| Applications page | The Application page provides insight into monitored applications, including details such as application name, type, the quantity of incidents and alerts linked to each application, and impacted users for each application. |
| Devices page | The Device page provides information on the device, its assigned user, last login, matching assignments, status, active alerts, and incidents. |
| DEX Administration page | The Administrator page has info on applications, policies, metric rules, active users, administrator count, agent downloads, service status, and usage metrics. |

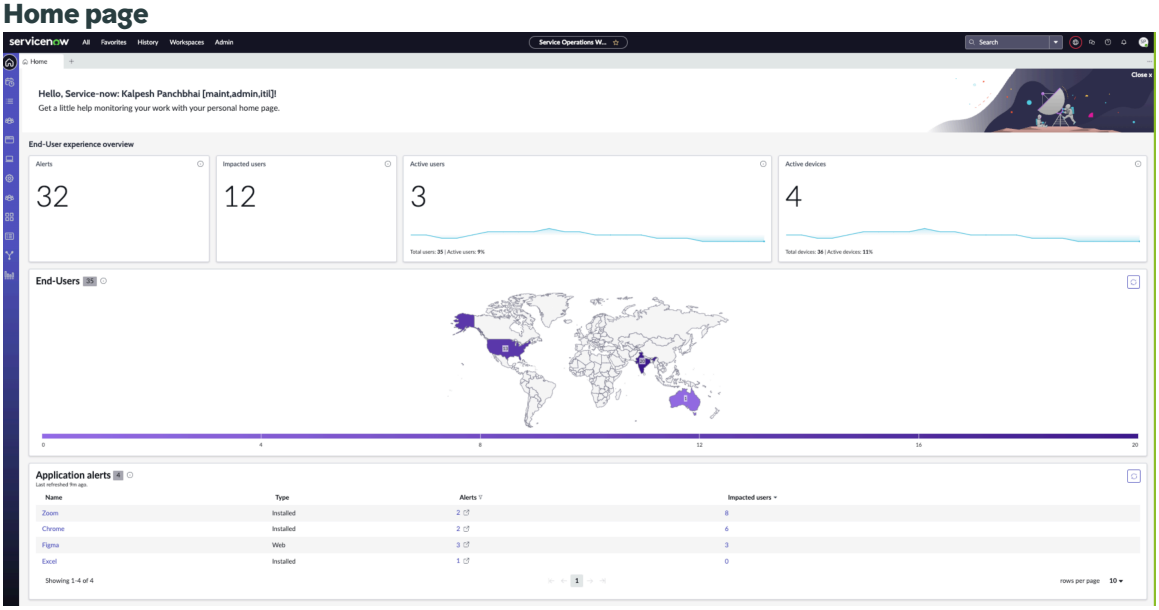
### Home page

The Home page displays information on total number of alerts, impacted users, active users, active devices, end-users world map and a dedicated alerts section to provide details of the application alerts.

To access the Home page, navigate to **Workspaces** > **Service Operations Workspace**. The Home page icon ( ) is selected by default and you can view the Home page.

**Note:**
The graphs display the latest data from the last 2 hours.

**Home page**




For more details on each card, see Home page cards.

**Note:**
The active users are the DEX application users and may or may not be ServiceNow registered users.

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## End-Users

The End-Users world map provides information about users, allowing you to narrow down your search by selecting the country, state, and city. Eventually, you can focus on users in a particular location, accessing a detailed user list specific to that area.

## Application alerts

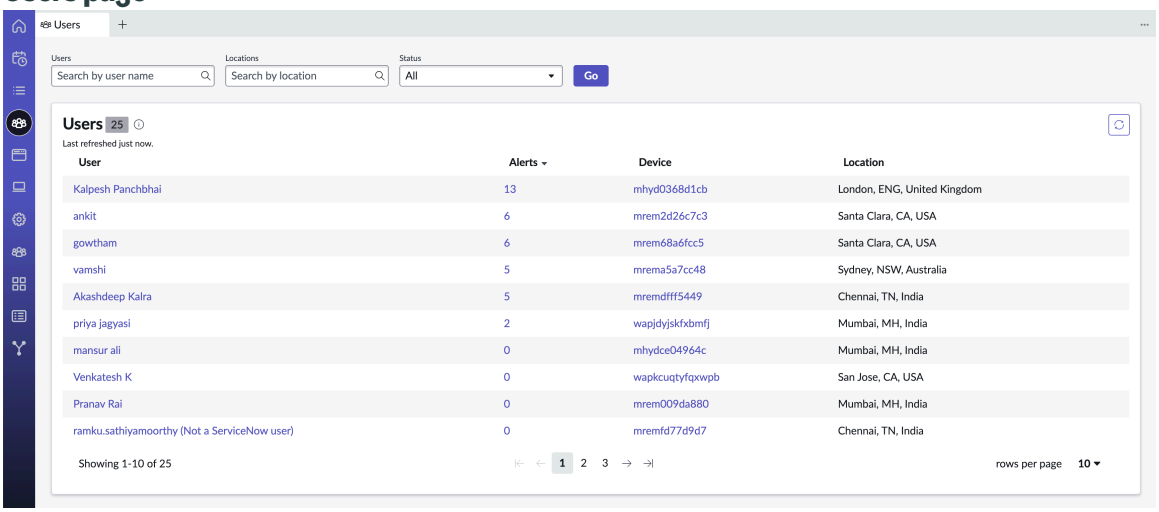
The Application alerts section provides details such as the application name, its type (installed or web/SaaS), the number of alerts associated with the application, and the count of impacted users.

### Users page

The Users page serves as a comprehensive hub for accessing user-related data, including alerts specific to individual users, devices associated with them, and corresponding location information. This consolidated view facilitates efficient monitoring and management, empowering administrators to track user activities, respond promptly to alerts, and access device locations for enhanced security and operational oversight.

To access the Users page, navigate to **Workspaces** > **Service Operations Workspace** and from the left pane, select the Users icon ( ).

**Users page**




On the Users page, there are three filters available: **Users**, **Locations** and **Status**, which enable you to refine your search. The **Locations** filter shows the location of the device connected to DEX, and you can filter the location by city, state, or country. Refresh the page to get the latest data. The **Status** provides an overview of user statuses, indicating whether they are active, impacted, or you can opt to view all users.

**Note:**
The users list is the list of all ServiceNow registered or non-registered users, or active users or it can display impacted users based on the option you select in the **Status** filter. Also, when you apply a filter condition to any of the columns, example, the **Locations** column, it does not automatically disappear when you perform other functions on any column, like sorting. You need to manually remove the filter.

For more information on each column, see Users list. Selecting the user name takes you to the details page of that user. For more information on the user applications, devices, health, running processes, application metrics, networks, logins and custom queries, see User details page.

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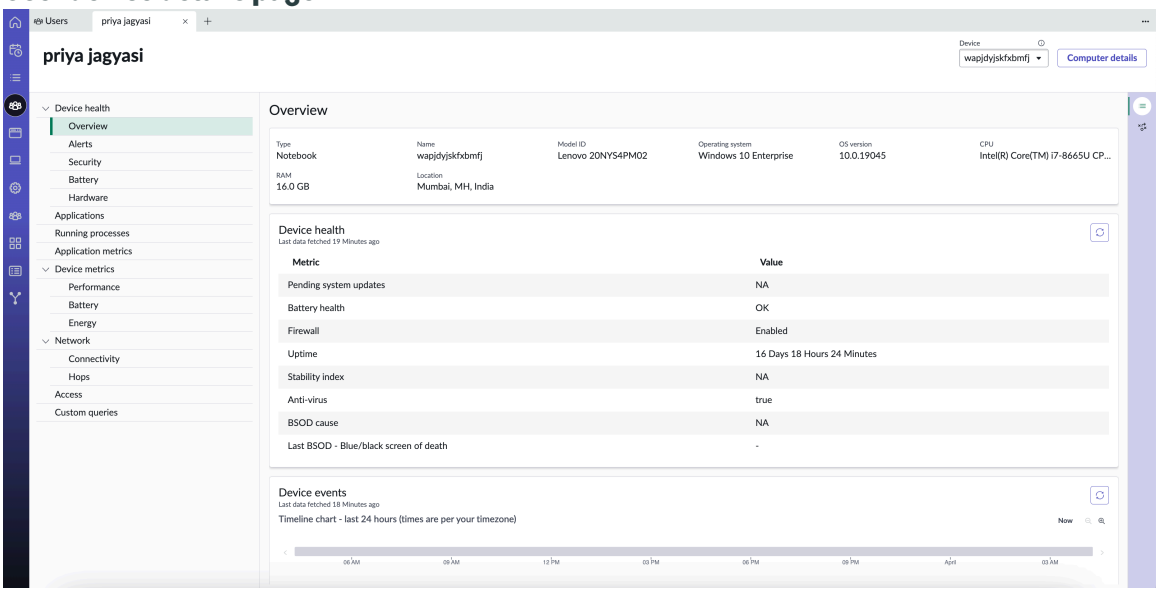
### User details page

Get an overview of the installed or the web/SaaS application that the user is engaged to, the health of the device using which the user is connected to the application, the processes running in the user's device, application metrics, user's network configuration, crucial information regarding user access details, and custom queries to access operating system information using SQL.

**Note:**
The **Device** drop-down lists all the devices that the user used to connect to the application. The **Up** and **Down** options in the menu categorize devices based on whether they are currently operational or offline. Select **Computer details** to access comprehensive information about the device, including the asset tag, serial number, model ID, manufacturer, and configuration details of connected components such as the operating system, OS domain, DNS domain, RAM, CPU manufacturer, speed, and count.

### User device details page




### Users — Device health

View details of the overall operational status and performance of a device using which a user interacts with an application. Health is assessed based on a variety of metrics and indicators, including system uptime, outstanding patches, pending software updates, the last blue/black screen of death, application crashes, battery health, and other key performance indicators.

The system updates the device data using policies every 72 hours. Additionally, you can manually populate the data on-demand by clicking the refresh icon ( ). To know more about the policies, see DEX policies for Mac and DEX policies for Windows.

## Device health overview

The Overview section provides essential device details like type, name, OS, model ID, current location, CPU, and RAM specifications. Device Metrics show key info such as pending updates, battery health, BSOD causes, and crashes, offering a comprehensive view of device performance and health. Device events in the last 24 hours include activities like software installations, providing insights into usage patterns and performance history. Pending system updates offer version details and necessary actions for improved functionality and security, while OS details provide information on the device's operating system.

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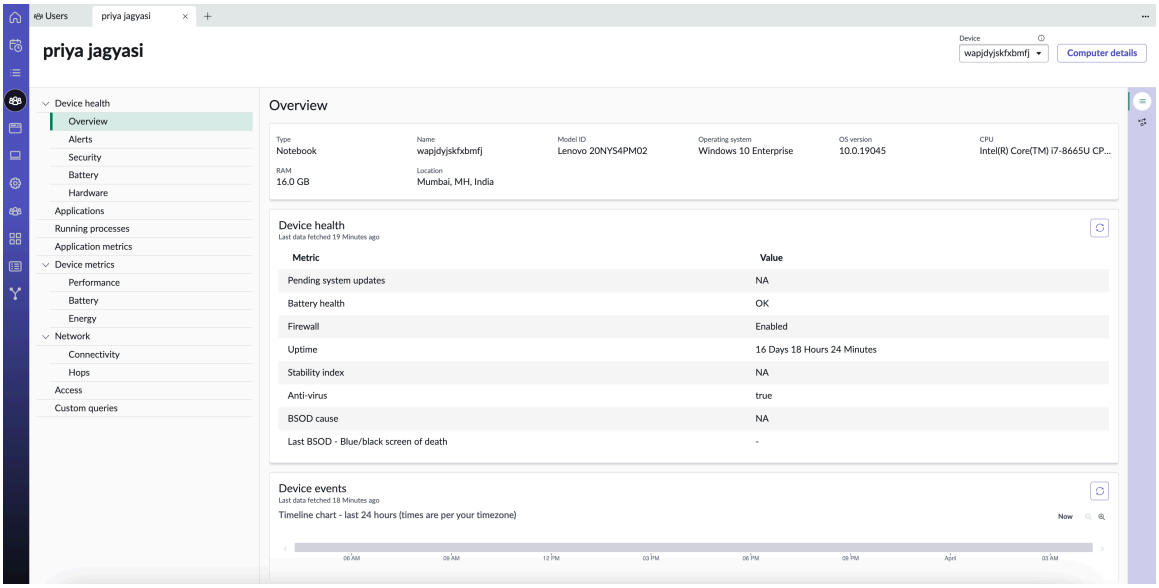
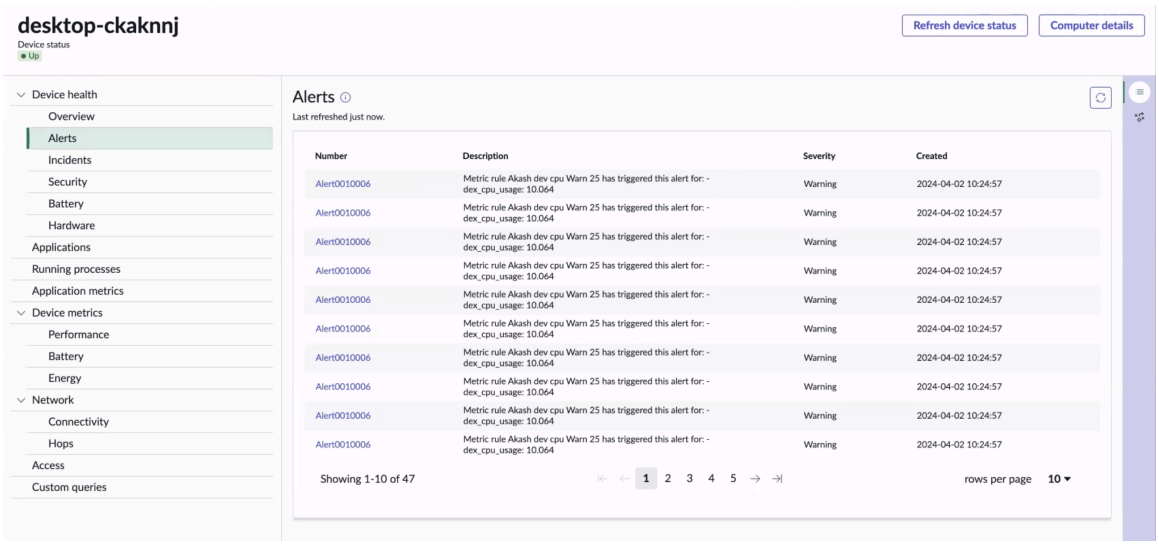
### Device health — Overview




## Device health Alerts

Navigate the Alerts section to discover the open alerts of the device. Each alert is distinguished by a unique identifier (Number) and features a summary of the issue, severity, and the timestamp of its creation (Created).

### Device health — Alerts




## Device health Security

The Security section is exclusive to Windows OS, providing crucial insights into device protection, specifically focusing on Bitlocker, a Windows disk encryption tool. It highlights key specifics like volume type, protection status, mount point, capacity, volume status, and encryption percentage, providing a comprehensive overview of the device's encrypted volumes and security status.

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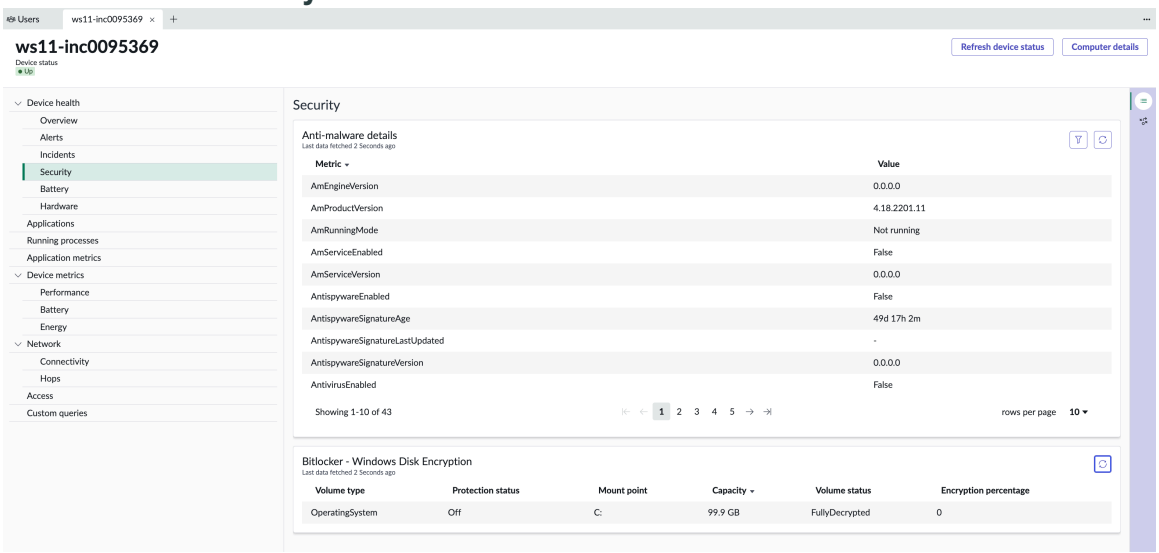
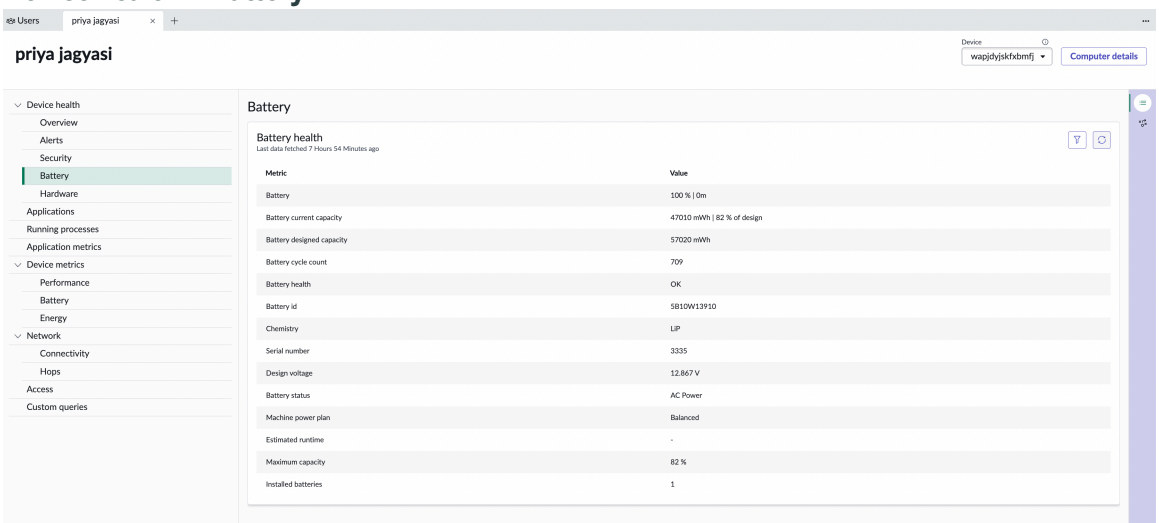
### Device health — Security




## Device health Battery

The Battery health assesses the overall condition, efficiency, and potential lifespan of the device battery, offering insights into its current capacity, cycle count, and remaining charge percentage, empowering you to optimize performance, prolong lifespan, and ensure uninterrupted device usability.

### Device health — Battery




## Device health Hardware

The Hardware section provides key details about the hard drive, offering insights into its crucial specifications. It includes information such as the drive's assigned name for identification purposes, status denoting its operational condition, manufacturer indicating the producing company, media loaded showing if any storage media is inserted, model number specifying the drive's specific version, partitions showcasing the number of distinct sections on the drive, and size revealing the total storage capacity available on the hard drive. These details collectively offer a comprehensive overview of the hard drive's characteristics and functionalities and is essential for maintenance, troubleshooting, compatibility, capacity planning, and overall system management.

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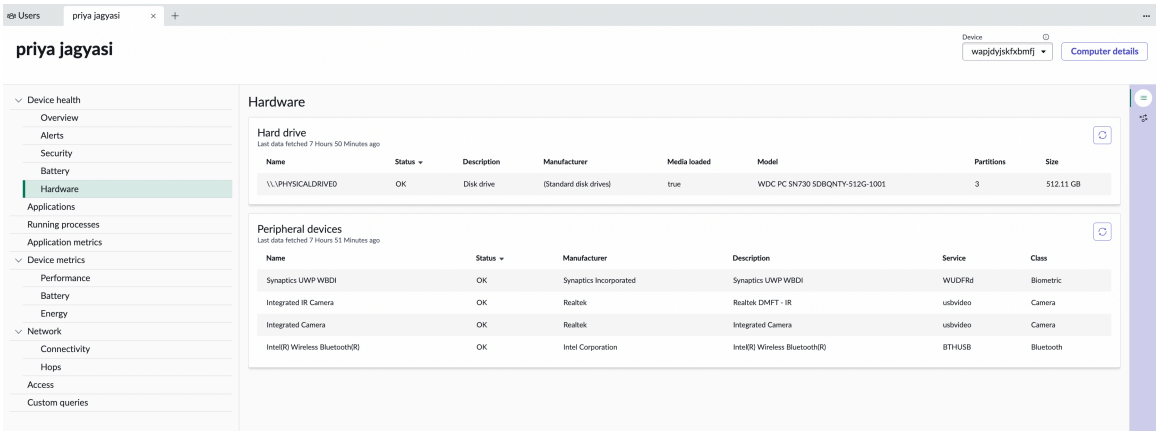
### Device health — Hardware



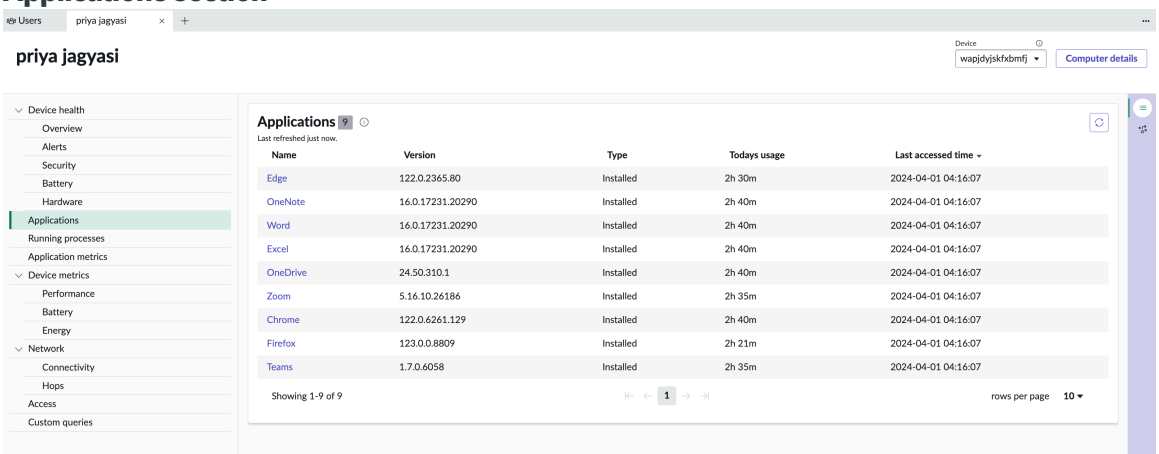

For information on each field, see Device health page.

### Users — Applications

Provides details of the installed or the web/SaaS application which the user is currently using.

The Applications section offers insights into application, aiding effective device management. Track details such as name, version, type, todays usage, and last accessed time, facilitating streamlined monitoring and optimization.

### Applications section




For information on each field, see User applications.

### Users — Running processes

View device CPU usage %, Idle CPU %, number of processes, and memory usage along with data points that provide insight into the performance and behavior of running processes. By monitoring these metrics, your organization can gain insights into how running processes are performing and identify performance bottlenecks or issues that may be impacting digital experience.

The system updates the running processes data using policies every 72 hours. Additionally, you can manually populate the data on-demand by clicking the refresh icon ( ). To know more about the policies, see DEX policies for Mac and DEX policies for Windows.

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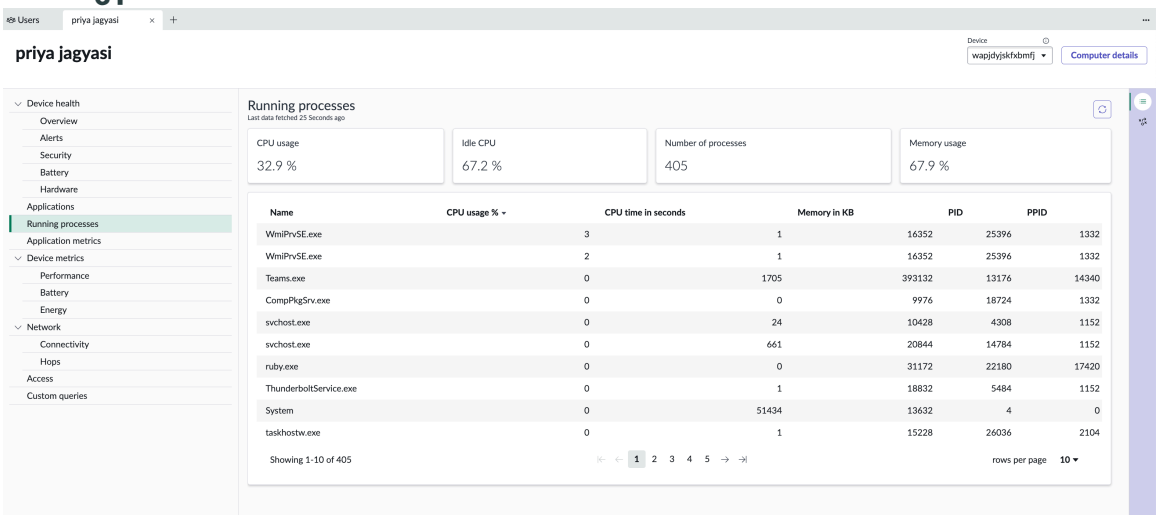
### Running processes section



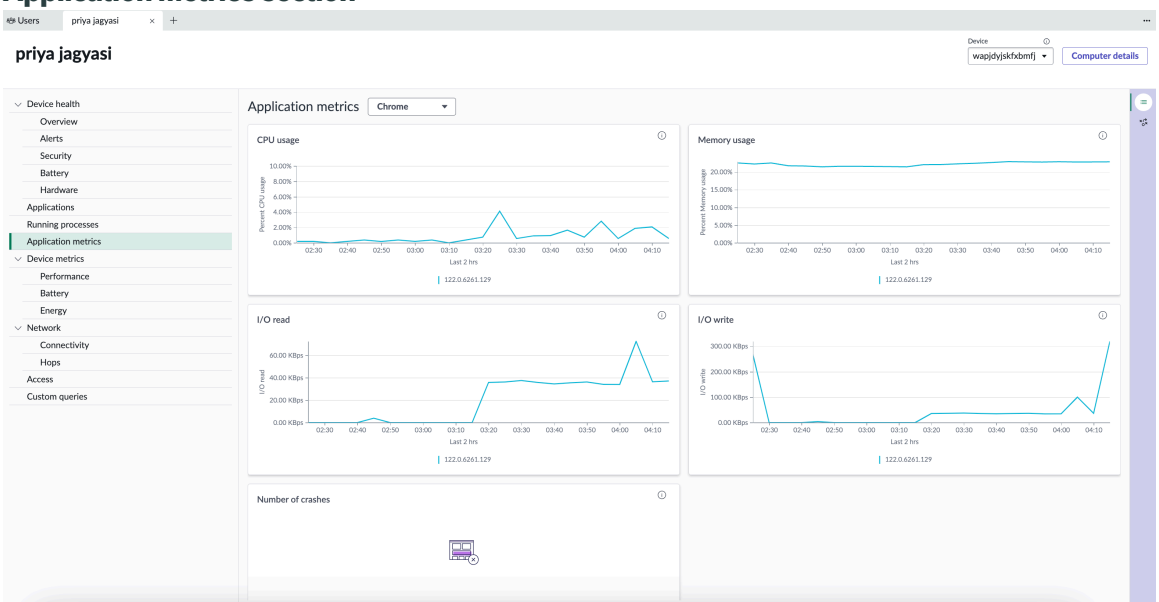

For more information on each card, see Running processes metrics page.

## Users — Application Metrics

View the performance and usage data associated with a specific application.

Application metrics provide valuable insights into how the application is being used, how well it is performing, and where improvements may be needed to enhance the user experience and achieve business objectives.

### Application metrics section




For more information on the performance and the usage metric cards, see Application metrics page.

## Users — Device Metrics

Monitor real-time metrics including CPU, memory, disk usage, and I/O read/write operations, alongside battery percentage and energy consumption and loss, for comprehensive insights into system resource utilization. These device metrics provide valuable insights into how the device is being used, its performance, and where improvements may be needed to enhance the user experience and achieve business objectives.

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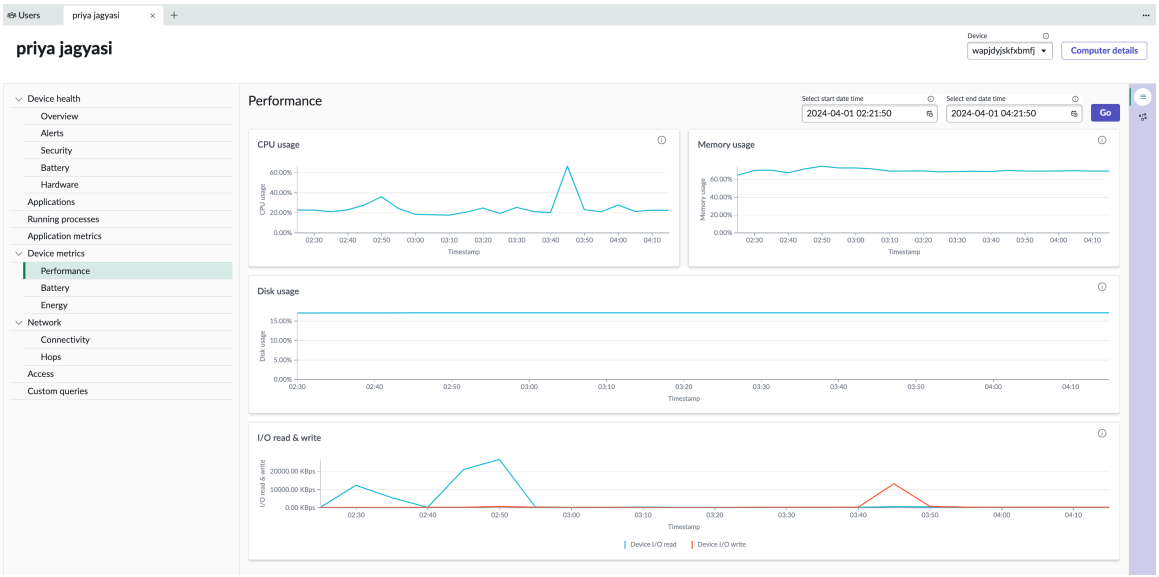
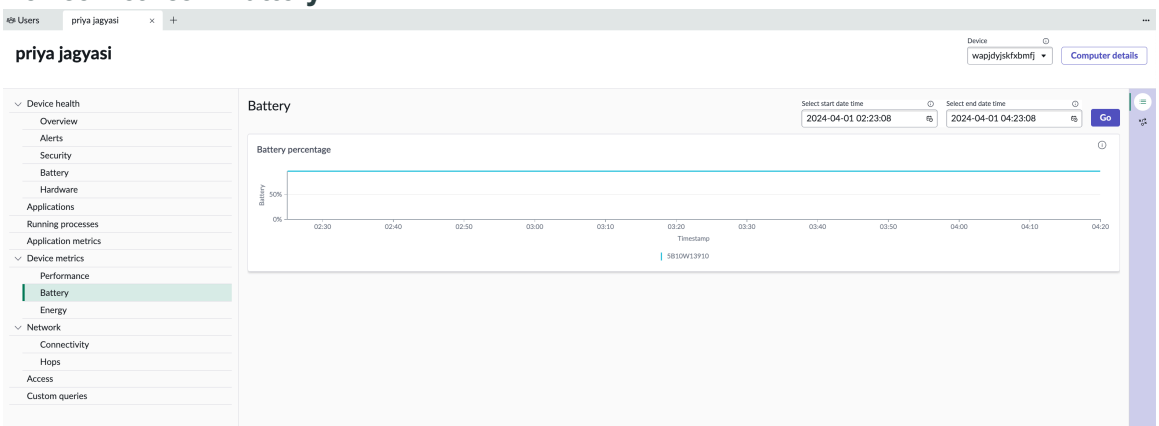
**Note:**
The start and end dates must be within 3 days from the current date, and the range cannot be more than 7 days.

### Device metrics — Performance




The Battery section assesses the remaining charge percentage, allowing you to manage usage effectively and ensure uninterrupted operation.

### Device metrics — Battery




Gain graphical insights into total energy consumption and breakdowns for CPU, disk, network, display, SOC, MBB, EMI, and other energy consumptions to visually understand resource utilization.

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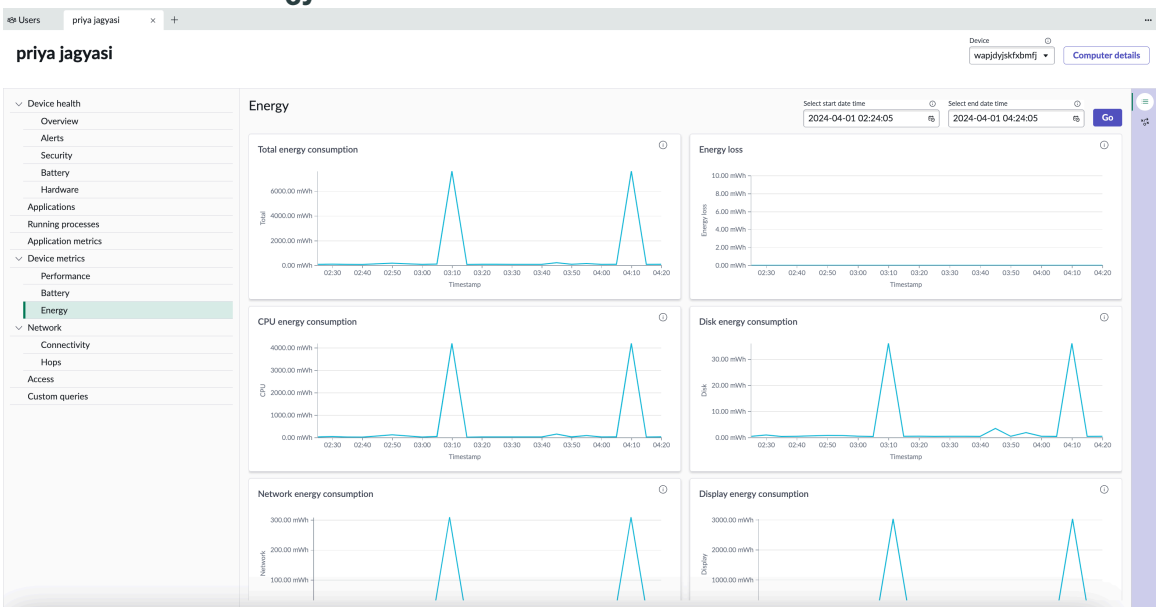
### Device metrics — Energy




For more information on the performance, battery, and energy, see Device metrics page.

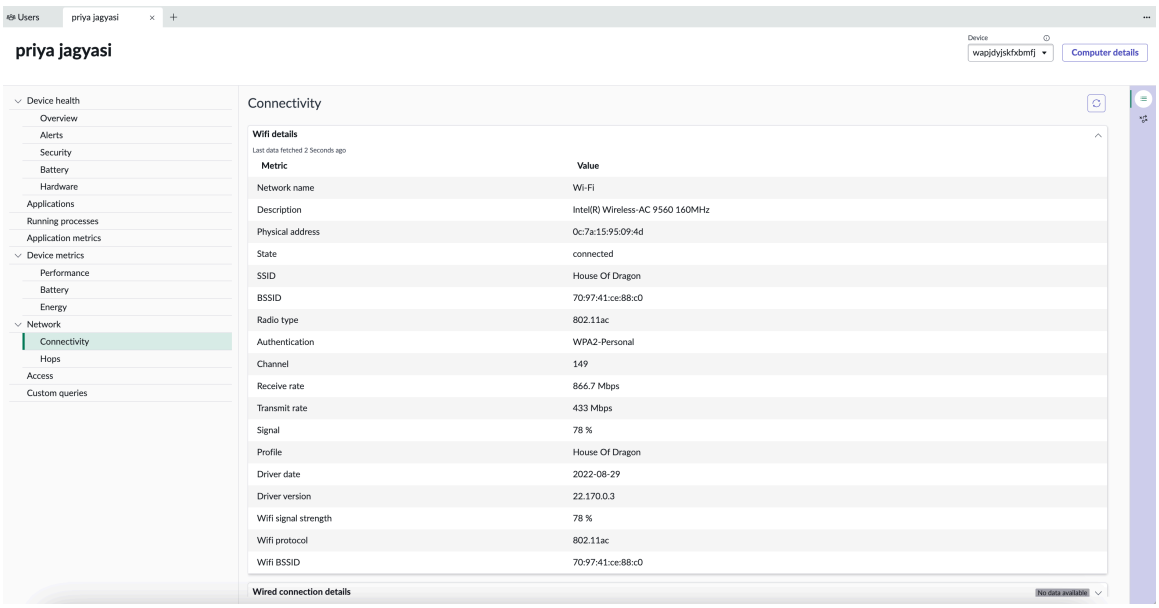
### Users — Network

Get insights into multiple facets of user's network configuration. It displays crucial information such as the network server, WiFi details, wired connection details, and application network hops.

## Network

The network details overview displays information about the user's network connection, including the connection status, WiFi signal strength, WiFi protocol, and WiFi BSSID (Basic Service Set Identifier). Under WiFi details, you can find metric names and corresponding values, providing a comprehensive overview of their WiFi performance. Similarly, the wired connection details section presents metric names and values related to the user's wired network connection.

### Network section

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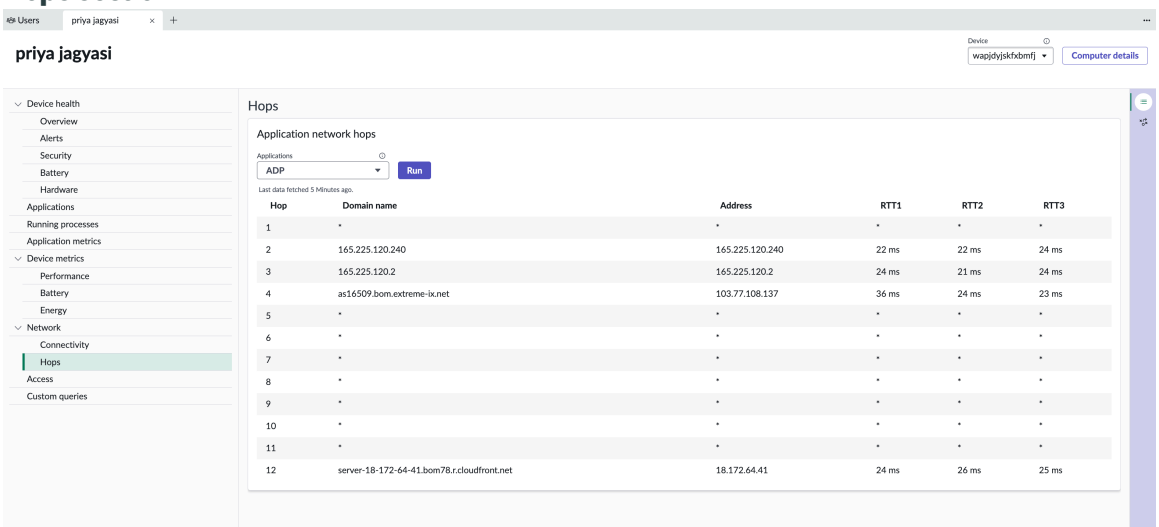
## Hops

In the Hops section, use the **Applications** drop-down to select the desired application and view its hop information. To get the latest information, select **Run**. This section showcases the applications/destination drop-down menu, each hop's domain name and address, as well as the round-trip times (RTT1, RTT2, RTT3). This information assists in understanding and optimizing their network configurations for optimal performance.

### Hops section




For more information on the network card, see Network page.

### Users — Access

View essential information regarding user login details. This tab provides crucial information, including the user's username, user type, login type, and the timestamp of their last login.

The username serves as a unique identifier within the system, allowing users to easily identify themselves. The user type field indicates the user's status, determining whether they are an active user or not. The login type field reveals the method or protocol used for the login process, such as a standard username and password. Finally, the last login timestamp indicates the date and time of the user's most recent login activity, empowering users to track and effectively manage their login information.

The system updates the login data using policies every 72 hours. Additionally, you can manually populate the data on-demand by clicking the refresh icon ( ). To know more about the policies, see DEX policies for Mac and DEX policies for Windows.

**Note:**
The **Host** field is visible only when you accesses the device remotely via RDP (Windows) or SSH (Mac). The **User profiles** section is exclusive to the Windows OS.

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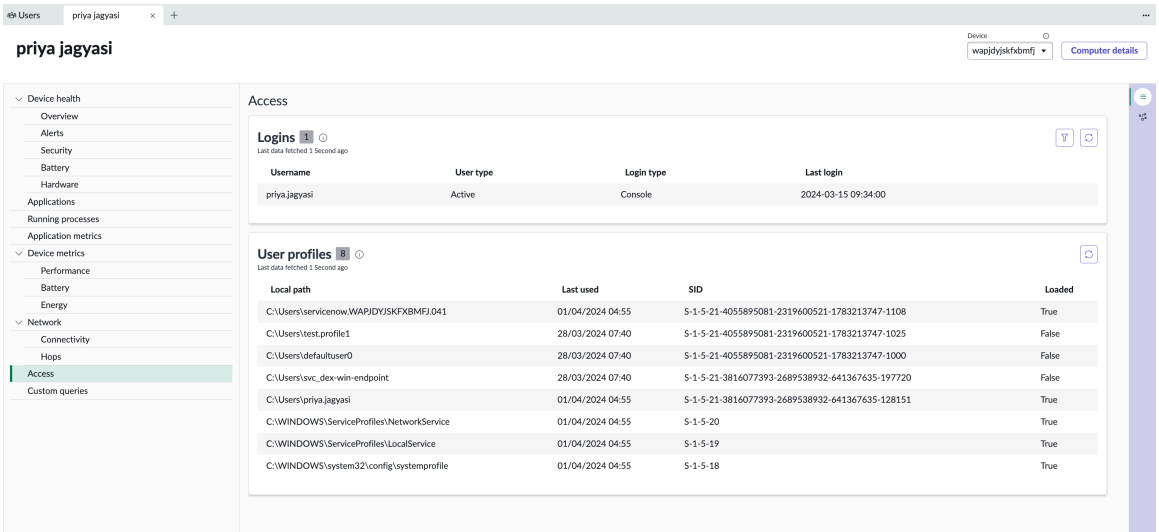
### Access section




For more information on the user logins card, see Access page.

## Users — Custom queries

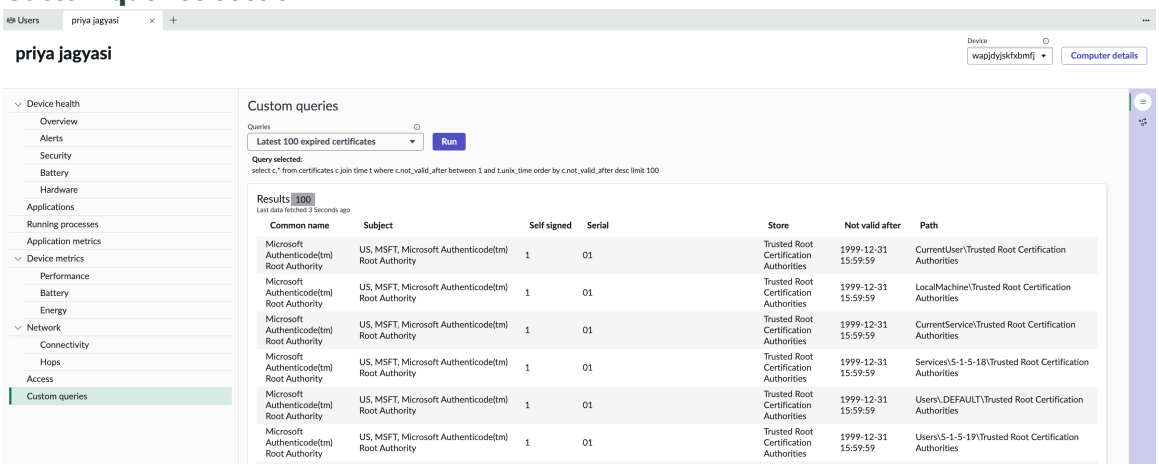
The custom queries access operating system information using SQL, allowing for in-depth system analysis and issue resolution.

Troubleshoot problems or collaborate with administrators by utilizing predefined Operation system instrumentation framework queries (OSQuery) queries or write a new custom query as per requirement.

You have the option to choose a query from the **Queries** list and subsequently select **Run** to obtain the most recent response from the device.

> **Note:**
> Custom queries are stored in the Device Custom Query [dex_ci_device_custom_query] table. When you execute a query, the list exhibits a maximum of 100 entries retrieved from that table. For the complete set of response entries, you can refer to the Device Custom Query Response [dex_ci_device_custom_query_response] table.

### Custom queries section




## Applications page

Manage the active applications in your organization to enhance end-user productivity and engagement. The Application page serves as a central hub, offering visibility into monitored

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applications. Access details such as name of the application, its type, the number of alerts and incidents associated with each of those applications, and impacted users.

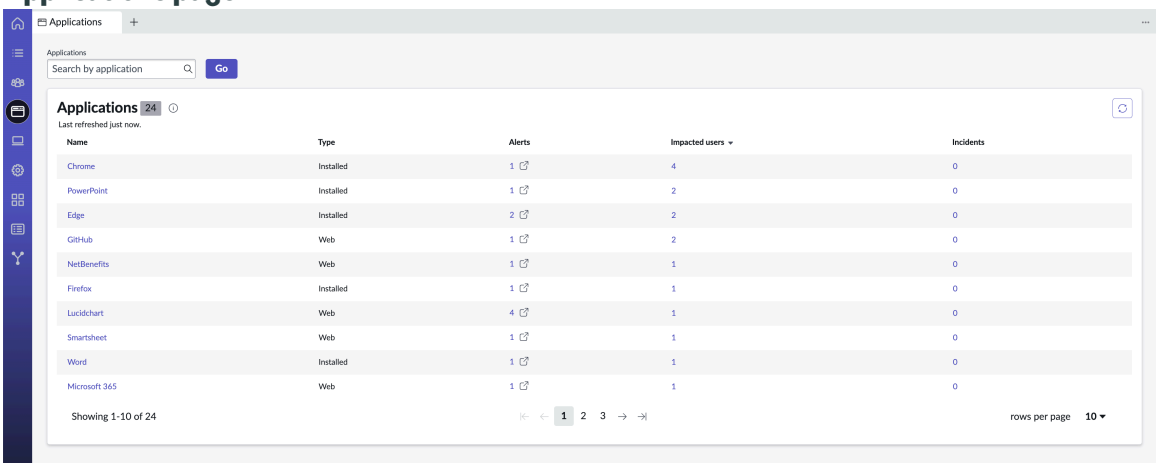
To access the Applications page, navigate to **Workspaces** > **Service Operations Workspace** and from the left pane, select the Applications icon ( ).

To refine your search based on applications, make use of the **Applications** filter. The application data is sorted in a decreasing order based on Incidents.

**Note:**

When you place your cursor over any column name, the additional menu ( ) appears. Select the additional menu and choose the desired filter condition from the drop-down list of the Filter section. Then, enter the string in the following field and select **Apply**. For example, if you want to choose all applications that begin with the letter "M", select the "starts with" option from the drop-down menu. Then, enter "M" in the subsequent field and select **Apply**.

**Applications page**




To know details of any application, select the name of the application. For more details on each field, see Application list.

### Web/SaaS application details page

Enjoy a comprehensive visibility into application performance, device usage and trends, ensuring a positive digital experience.

## Health

Monitor the performance of your application in real-time to know that your application is available and responding to requests. To refine your search based on specific locations, make use of the **Location** filter. By default, the graphs display the latest data from the last 2 hours.

**Note:**

The <time> range of the performance data can cover the past 2 hours, 24 hours, or 15 days, depending on the timeframe you select from the provided drop-down list in the Performance section.

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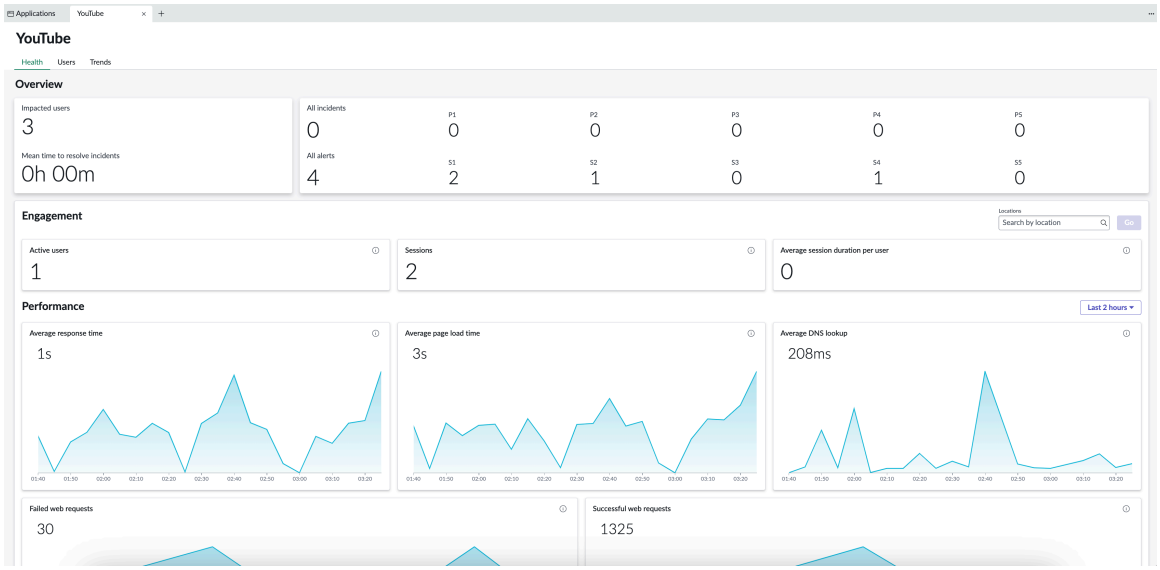
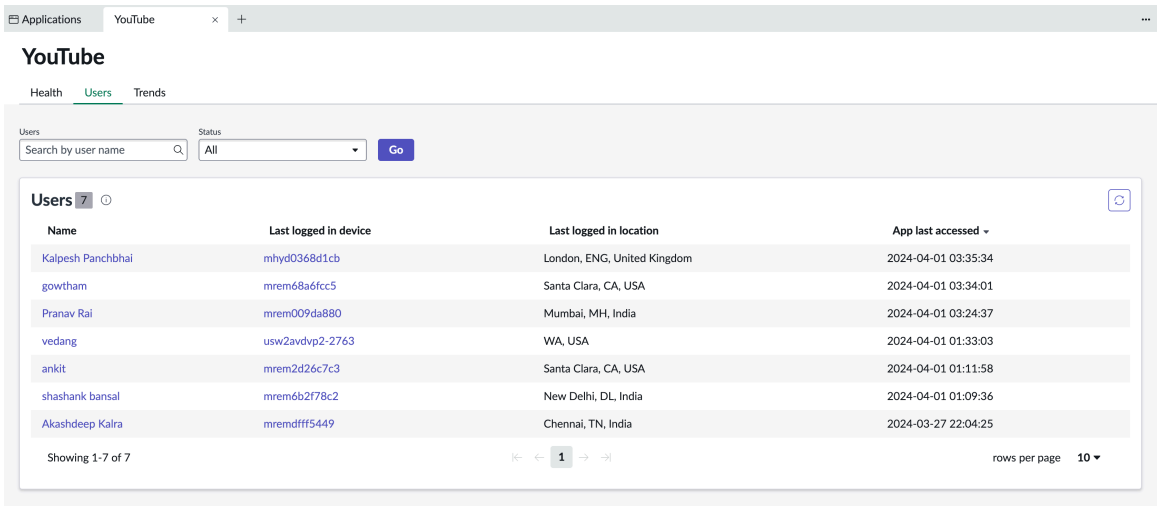



For more information on each card, see Web/SaaS application — Health section.

## Users

Monitor your active users to gain an accurate measure of how many users are engaged with the application. Active users are an important metric to identify trends in user behaviors.

> **Note:**
> The user list displays all system users with Agent Client Collector (ACC) installed on their devices. If a user hasn't utilized the application in the last 3 days, the value of the **App last accessed** field is denoted as **-**. By default, sorting is applied on the **App last accessed** field and data is sorted for the latest 1000 records.




For more information on each field, see Web/SaaS application — Users section.

## Trends

Get a graphical view of your application metrics to see how the value of one or more metrics changes over time. Values along the horizontal axis of the trend report represent the time measurement. Values on the vertical axis represent the changes to the metric being monitored.

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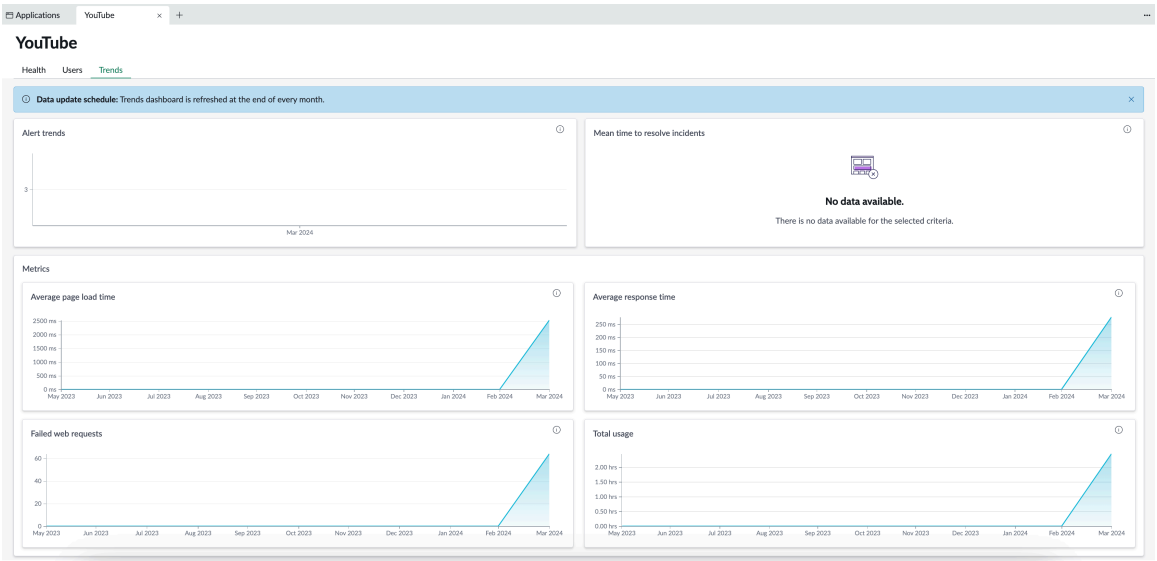



For more information on each card, see Web/SaaS application — Trends section.

### Installed application details page

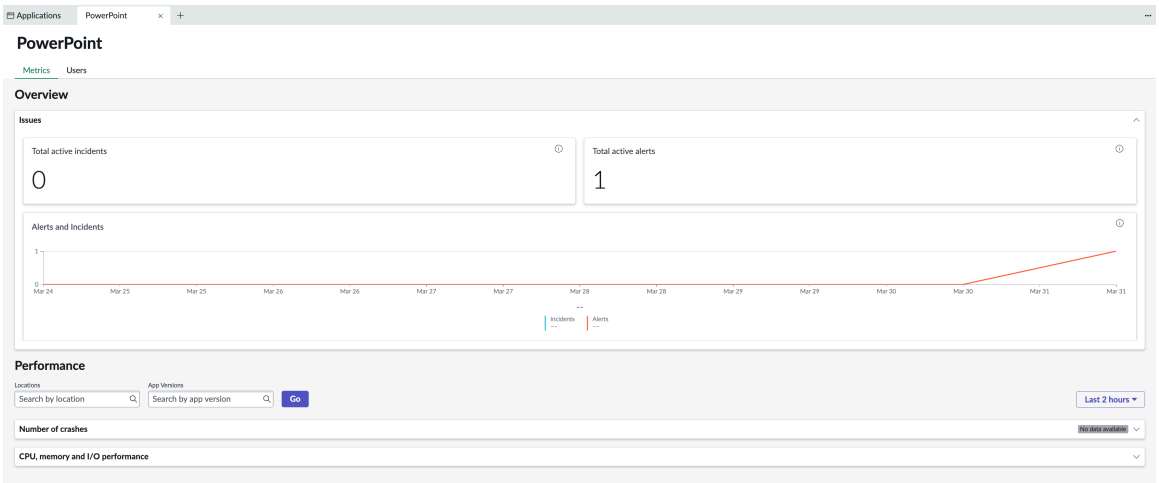
Gain complete insight into application performance, device utilization, and patterns to identify performance issues, optimize device usage, and improve user experience.

## Metrics

The Metrics section focuses on ensuring the smooth functioning of applications by monitoring their real-time health and promptly resolving any potential issues to maintain a seamless user experience. Additionally, it assesses the system's performance in terms of efficiently carrying out its intended tasks and delivering prompt and reliable responses to user requests.

### Overview section

Monitor the health of an application in real time and proactively identify and address potential issues before they impact the user experience.




For more details on the health cards, see Installed application — Overview section.

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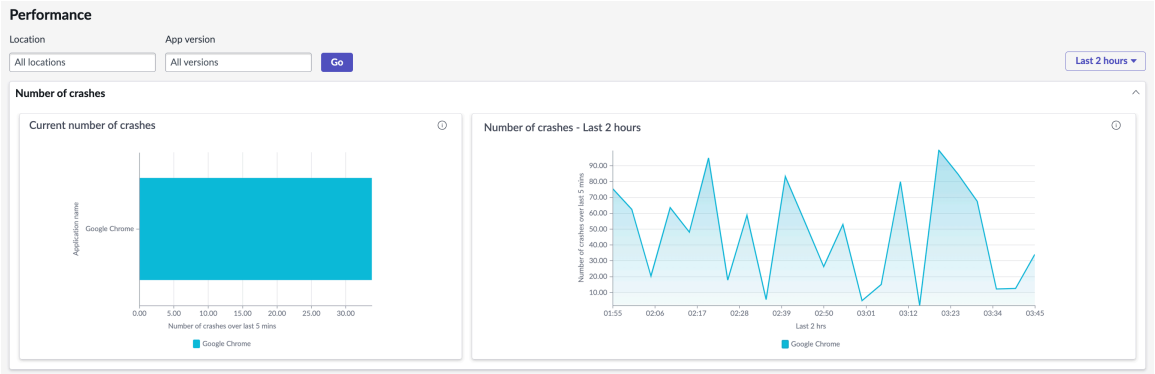
### Performance section

Refine your search based on the **Locations**, or **App version** filter.

> **Note:**
> Access application performance data spanning the past 2 hours, 24 hours, or 15 days by choosing your preferred timeframe from the provided drop-down list.

View the number of crashes of a application over time, reflecting its resilience, sustainability, and reliability.




> **Note:**
> The number of crashes supports the Zoom application as well as applications that emit a window app crash event (event id = 1000) on crashing such as Microsoft OneDrive, Microsoft Teams, Microsoft Excel, Microsoft OneNote, Microsoft PowerPoint, Microsoft Outlook, and Microsoft Word.

For more information on the cards, see Installed application — Number of crashes section.

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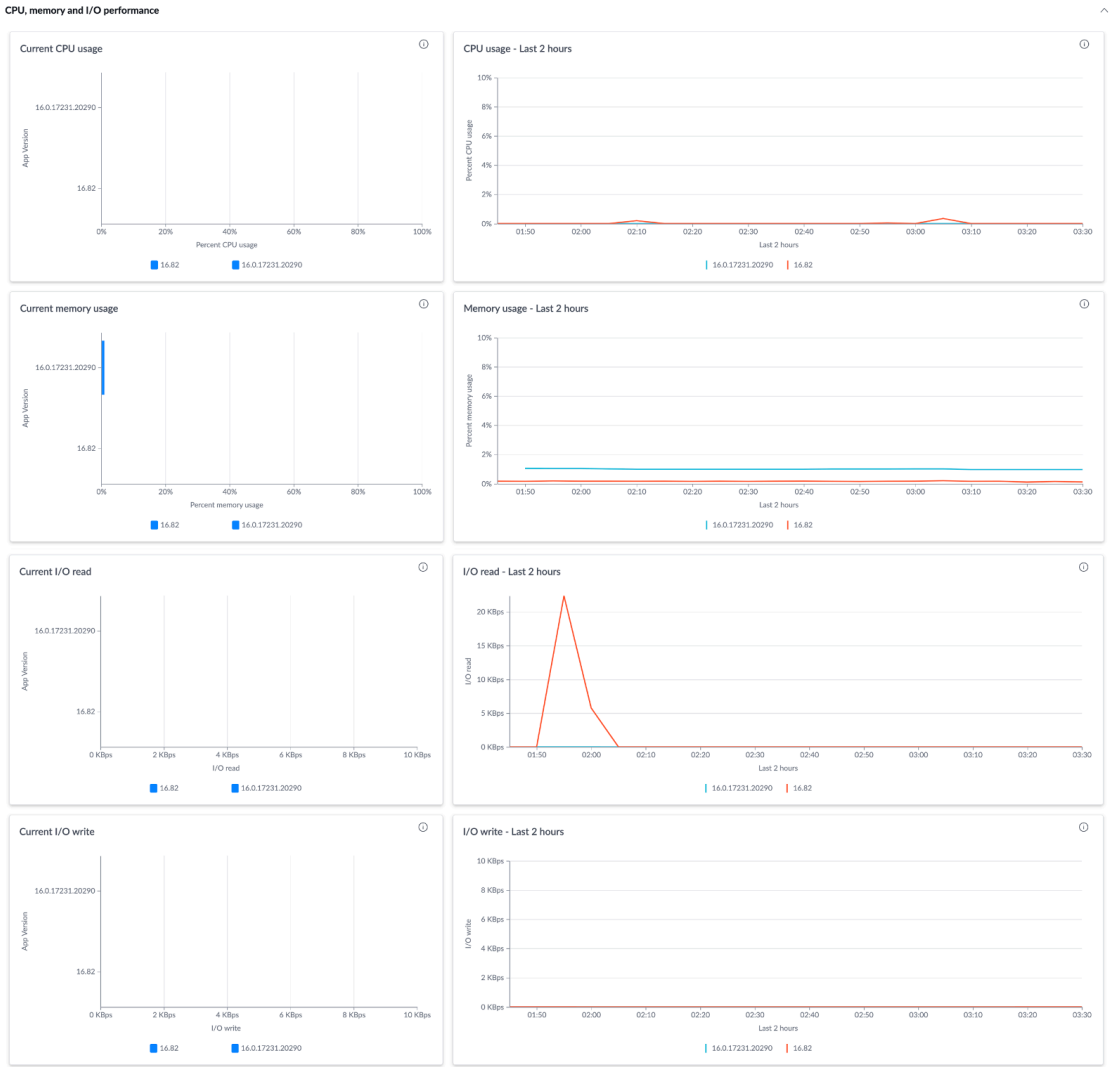
### CPU, memory and I/O performance section

Find out how well your system performs its intended function and how quickly and reliably it responds to user requests.




For more information on the performance cards, see Installed application — CPU, memory and I/O performance section.

## Users

End users can use different devices to connect to an application. Get an overview of the users, the last logged in device and location, total duration of time the user spends interacting with the application on the current day, and last access time of the application. This information can assist in providing troubleshooting and support, optimizing performance, and enhancing security.

Refine your search based on the **Users**, **Locations**, or **App version** filter.

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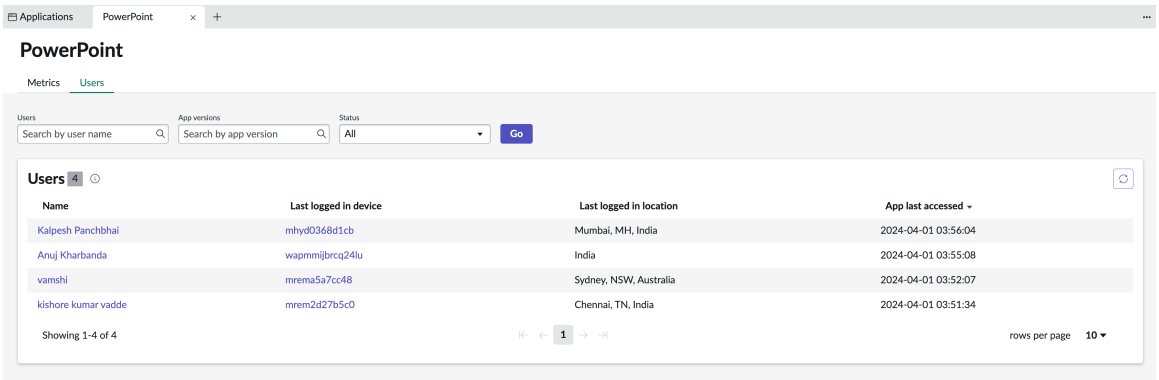
**Note:**
The user list displays all system users with Agent Client Collector (ACC) installed on their devices. If a user hasn't utilized the application in the last 3 days, the value of the **App last accessed** field is denoted as **-**. By default, sorting is applied on the **App last accessed** field and data is sorted for the latest 1000 records. The **App last accessed** field is not applicable to the Mac-installed applications. Therefore, the **App version** drop-down list displays application versions only for Windows.

Selecting the user name takes you to the details page of that user. For detailed information on a user and associated applications, see User details page.

### Users section




For more information on each field, see Installed application — Users section.

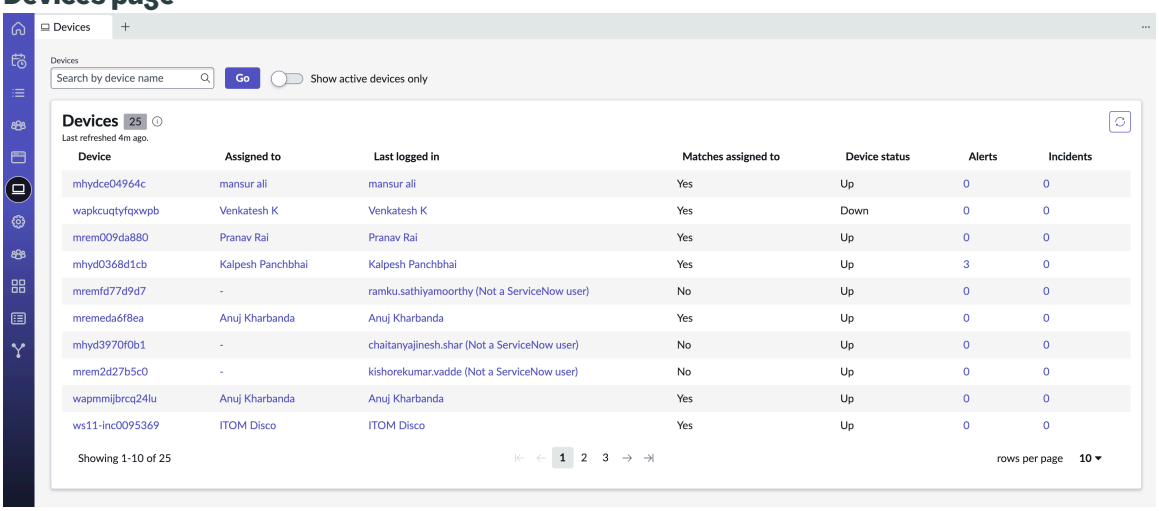
## Devices page

Access the Device page to obtain detailed information on each device, including user assignment status, last login timestamp, matching assignments, device status, active alerts, and incidents, enabling comprehensive device management and improved operational efficiency.

To access the Devices page, navigate to **Self Service** > **Workspace Experience** > **Workspaces** > **Service Operations Workspace** and from the left pane, select the Devices icon ( ).

To refine your search based on devices, make use of the **Devices** filter. To see only active devices, enable the **Show active devices only** toggle switch ( ). Disabling the switch displays all devices.

### Devices page




For more details on each field, see Devices list.

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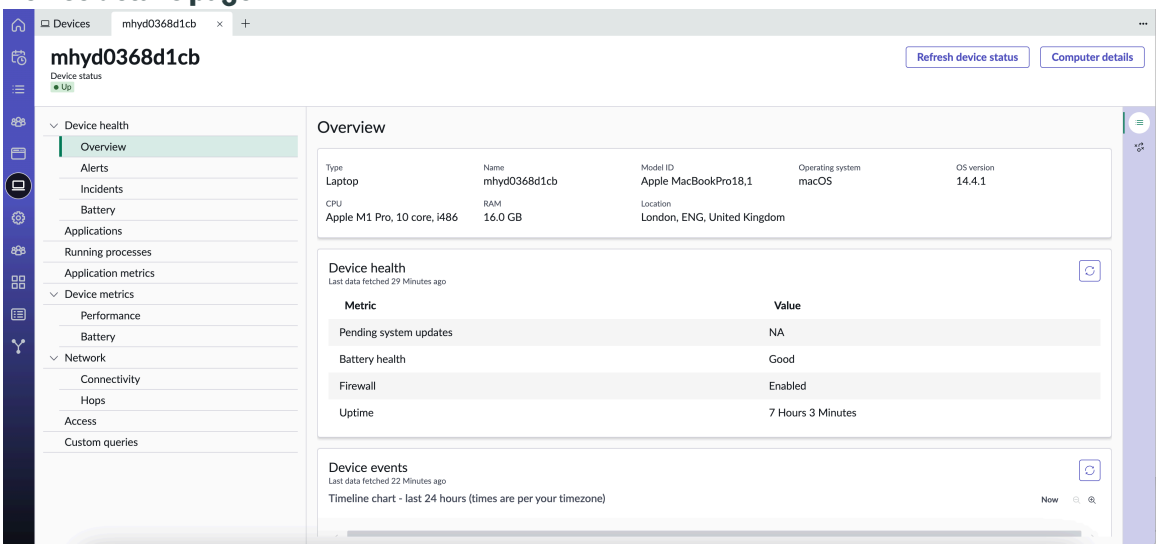
**Note:**
Selecting a device takes you to its detailed page. Similarly, selecting a device on the user details page leads you to specific information about that chosen device. For more details on a user's device, see User details page and related subtopics.

### Device details page

Get a holistic view of their digital environment, encompassing device's performance, software applications, network connectivity, and login details.

Selecting a device directs you to its detailed page. Similarly, choosing a device on the user details page leads to specific information about that selected device. In both cases, you can find details about a user's device from User details page and its related subtopics.

**Device details page**




### DEX Administration page

The Administration page is a crucial component of the DEX Application and Device Health, providing administrators with essential tools to manage and monitor the system.

To access the Administration page, navigate to **Workspaces** > **Service Operations Workspace** and from the left pane, select the Administration icon ( ).

**Note:**
To view the **Administration** tab, you need to have the sn_dex.admin role.

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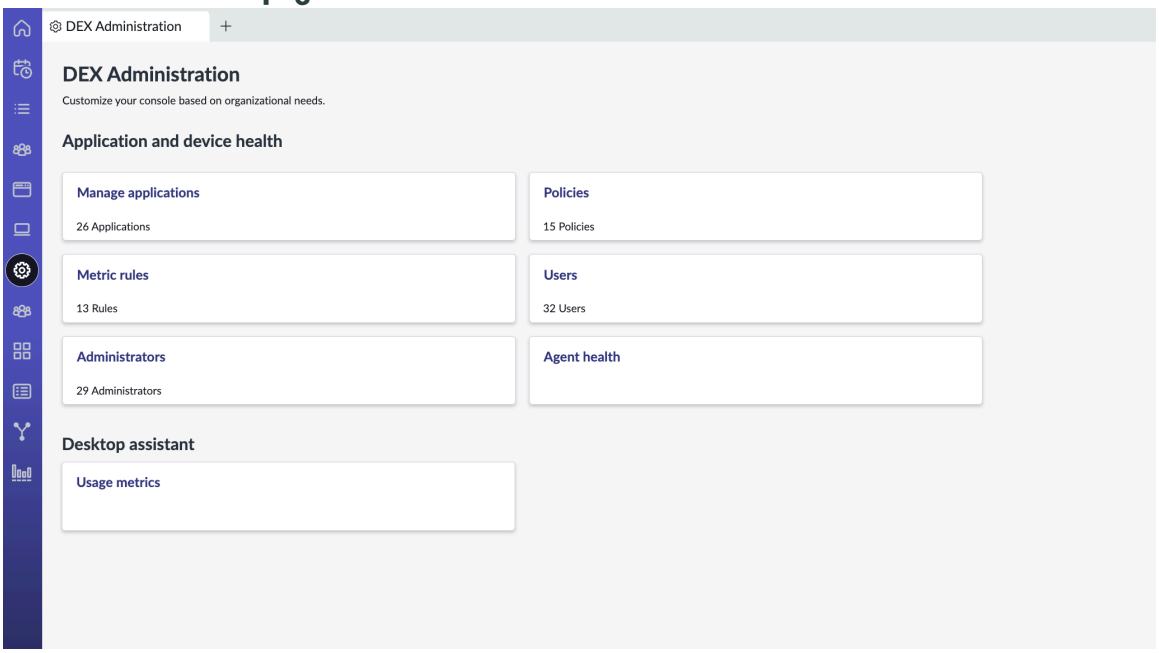
**DEX Administration page**




Monitor and manage applications. Check application policies, user activity, metric rules, and administrative privileges via Policies, Users, and Administrators cards. Track Agent Client Collector installations in Agent Health. For more information on each card, see Administration cards.

View Desktop Assistant usage metrics to keep tabs on your Desktop Assistant's connection status ensuring seamless communication with the ServiceNow instance. For more information on Desktop Assistant, see Exploring DEX Desktop Assistant.

### Open DEX Application and Device Health

DEX Application and Device Health provides proactive visibility to help you understand the end-user experience across your organization and diagnose any negative experiences. With features such as application and user navigation, trend analysis, and other useful metrics, the DEX Application and Device Health enables you to identify the root cause of an issue, rather than just treating the symptoms.

#### Before you begin

Ensure that the DEX plugin [sn_dex] is installed.

Role required: sn_dex.user

#### Procedure

Navigate to **Workspaces** > **Service Operations Workspace**.

#### Result

The Home page icon ( ) is selected by default. For more information, see Home page cards.

### View all active users

View all active users to get an accurate and up-to-date understanding of who is currently active. Get valuable insights into user behavior, device details, and engagement levels and make informed decisions about the application or user engagement strategies.

#### Before you begin

Ensure that the DEX plugin [sn_dex] is installed.

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Role required: sn_dex.user or ITIL

### Procedure

Navigate to **Workspaces** > **Service Operations Workspace** and from the left pane, select the Users icon (  ).
The Users page serves as a comprehensive hub for accessing user-related data, including alerts specific to individual users, devices associated with them, and corresponding location information. To view details of a user, select the name of the user.

## View the support group for an application

View the support group for the application to quickly identify who to contact when you encounter issues. The support group is typically responsible for managing incidents, troubleshooting problems, and providing technical support for the application.

### Before you begin
Ensure that the DEX plugin [sn_dex] is installed.

Role required: sn_dex.user or ITIL

### Procedure

1. Navigate to **Workspaces** > **Service Operations Workspace** and from the left pane, select the Applications icon (  ).
2. Select the application name whose support group you want to view.
   The support group appears in the **Support group** field.

   To edit a support group, change the support group and select **Save**.

## View metrics of an installed application

View and monitor the CPU and memory usage of your applications to optimize performance and ensuring efficient resource allocation.

### Before you begin
Ensure that the DEX plugin [sn_dex] is installed.

Role required: sn_dex.user or ITIL

### Procedure

1. Navigate to **Workspaces** > **Service Operations Workspace** and from the left pane, select the Applications icon (  ).
2. Select the installed application name whose metric information you want to view.
3. Select the **Metrics** tab.
   You can view information on CPU usage, CPU usage trends, memory usage, and memory usage trends. For more information on the metrics, see Installed application details page.

## View metrics of a web application

View metrics of a web application to get a comprehensive view of the performance of the application. Tracking these metrics over time can help you gauge the impact of changes made to the application and monitor its long-term performance.

### Before you begin
Ensure that the DEX plugin [sn_dex] is installed.

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Role required: sn_dex.user or ITIL

### Procedure

1. Navigate to **Workspaces** > **Service Operations Workspace** and from the left pane, select the Applications icon (  ).
2. Select the web application name whose metrics you want to view.
   For more information on the metrics, see Web/SaaS application details page.

## View the details of a user device

View the health of a device to get an overview of its status and identify any potential issues. You can use this information to optimize the device's performance and ensure that it continues to function efficiently.

### Before you begin
Ensure that the DEX plugin [sn_dex] is installed.

Role required: sn_dex.user or ITIL

### Procedure

1. Navigate to **Workspaces** > **Service Operations Workspace** and from the left pane, select the Users icon (  ).
2. Select the user name whose device health information you want to view.
3. From the **Device** drop-down list, select the device for which you want to get details.
   For more information on metrics, see Users — Device health.

## View the domain or URL for a web/SaaS application

View the domain or web address of a web/SaaS application to access the application and use it effectively.

### Before you begin
Ensure that the DEX plugin [sn_dex] is installed.

Role required: sn_dex.user or ITIL

### Procedure

1. Navigate to **Workspaces** > **Service Operations Workspace** and from the left pane, select the DEX Administration icon (  ).
2. Select the **Manage applications** card.
   The list of monitored application appears.
3. Select the application for which you want to view the application URL.
   The URL appears in the **Domain/URL** field.

## View application publisher

View the application publisher to know the organization who has the rights to distribute and support the application.

### Before you begin
Ensure that the DEX plugin [sn_dex] is installed.

Role required: sn_dex.user or ITIL

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### Procedure

1. Navigate to **Workspaces** > **Service Operations Workspace** and from the left pane, select the DEX Administration icon ( ).
2. Select the **Manage applications** card.
   The list of monitored application appears.
3. Select the application for which you want to view the publisher.
   The publisher name appears in the **Publisher** field.

## DEX Application and Device Health reference

Reference topics provide additional information about the cards, lists, and forms that helps you to configure and use DEX Application and Device Health.

### Components installed with DEX

Several types of components are installed with activation of the DEX application [sn_dex] plugin, including user roles and tables.

## Roles installed

### Users and responsibilities

| Role title [name] | Description | Contains roles |
|---|---|---|
| DEX administrator<br><br>[sn_dex.admin] | Responsible for managing user access to DEX, managing the applications that are being monitored, and handling onboarding/offboarding-related tasks. They also troubleshoot any issues that arise within the application. | • sn_dex.user<br>• sn_dex.engineer<br>• agent_client_collector_admin<br>• report_admin |
| DEX engineer<br><br>[sn_dex.engineer] | Responsible for accessing and executing the remedial actions. | sn_dex.user |
| DEX user<br><br>[sn_dex.user] | Responsible for accessing and utilizing the features provided by DEX. | • dependency_views<br>• agent_client_collector_user<br>• itil<br>• mbplus_reader<br>• sam_user<br>• evt_mgmt_user |

## Tables installed

| Table | Description |
|---|---|
| Application<br><br>[dex_application] | Parent table that stores a list of both web/SaaS and Installed applications configured for monitoring on the **Administration** > **Applications** page. |

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| Table | Description |
|---|---|
| Application Installed [dex_application_installed] | Child table that stores a list of all the installed applications configured for monitoring via the **Administration** > **Applications** page. |
| Application Service [dex_application_service] | Child table that stores a list of all the web/SaaS applications configured for monitoring via the **Administration** > **Applications** page. |
| Installed Application [dex_installed_config_app] | Table that stores a list of all the installed applications. |
| Metric Rules [dex_metric_rules] | Table that stores all the DEX metric rules. |
| Alert Metadatas [dex_alert_metadata] | Table that stores data about incoming events from the metric rules. |
| Alert Impacted Users [dex_alert_impacted_users] | Table that stores data about users/devices which are impacted for a given metric rule. |
| Alert Locations [dex_alert_location] | Table that stores data about locations which are impacted for a given metric rule. |

### Home page cards

The Home page cards provide a visual summary of active and impacted users, along with active devices and alerts for monitored applications, facilitating efficient data analysis across various categories.

**Note:**
The graphs display the latest data from the last 2 hours.

### Home page cards

| Cards | Description |
|---|---|
| Alerts | Total number of active alerts. |
| Impacted users | Users who are impacted due to application service or performance failure and an alert is created for the same. |
| Active users | Total number of active users in the last 5 minutes. The graph indicates the trend of last 2 hours.<br>**Note:**<br>The number of active users indicates the popularity and usage of the application. It can be used to track user engagement and retention, and identify opportunities for growth and improvement. |
| Active devices | Total number of active devices in the last 5 minutes. The graph indicates the trend of last 2 hours. |

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To return to the main page, see Home page.

### Application list

The application form provides specifics about an application, including its name and classification as either an installed or web/SaaS-based application, the counts of alerts and incidents, and impacted users.

#### Applications form

| Fields | Description |
|---|---|
| Name | Name of the application. |
| Type | The category of the application - whether it is web/SaaS or installed. |
| Alerts | Total count of alerts in either the **Open**, **Reopen**, or **Flapping** state for an application with source as DEX.<br><br>Clicking on any alert number directs you to the Express list, where you can view detailed information about that specific alert. |
| Impacted users | Users who are impacted by service or performance failure, resulting in the creation of an incident. |
| Incidents | Total count of active incidents for an application. |

To return to the Application page, see Applications page.

### Users list

The users page provides detailed insights into a user's profile, including alert counts, device information, and device locations, enabling efficient monitoring and issue identification.

#### Users page

| Field | Description |
|---|---|
| User | List of all ServiceNow registered or non-registered users, or active users or it can display impacted users based on the option you select in the **Status** filter. |
| Alerts | Total count of alerts for the user. |
| Device | Digital devices like laptops and desktops that users most recently used. |
| Location | Location of the device that the user most recently used. |

To return to the Users page, see Users page.

### Web/SaaS application — Health section

Monitor the health of an application as it enables proactive detection and resolution of issues, helps maintain optimal performance, improves user experience, and ultimately ensures that the application meets its intended purpose.

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### Health of your application

| Cards | Description |
|---|---|
| Overview | |
| Impacted users | Total number of users impacted due to the application service or performance failure and an open incident is created for the same. |
| Mean time to resolve incidents | Mean time to resolve incidents created due to this application. |
| All incidents | Number of open incidents (P1-P5) created for the application. |
| All alerts | Number of open alerts (P1-P5) created for the application. |
| Engagement | |
| Active users | Total number of unique active users who are using the application over the last 2 hours, specifically the latest 5 minutes.<br><br>**Note:**<br>During the selected period, active users are calculated by counting each user uniquely. If a single user is active using multiple devices at the same time, the system counts it as one active user.<br><br>This metric gives you valuable information about the growth and engagement of the application. |
| Sessions | Total number of active user sessions for the application over the last 2 hours, specifically the latest 5 minutes.<br><br>**Note:**<br>Active user sessions is vital for determining the server load. It also helps you to determine the perfect time for server maintenance. |
| Average session duration per user | Average amount of time spent per user in the application over the last 2 hours, specifically the latest 5 minutes.<br><br>It is calculated by dividing total time spent across sessions by the total number of users. |
| Performance | |
| Average response time | Total time taken to respond during the selected time period. |

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**Health of your application (continued)**

| Cards | Description |
|---|---|
| Average page load time | Average amount of time it takes to load the page, from initiation to load completion during the selected time period. |
| Average DNS lookup | Average amount of time it takes for a Domain Name System (DNS) lookup to be completed during the selected time period.<br><br>A lower average DNS lookup time is generally desirable, as it contributes to faster web page loading and improved overall internet performance. |
| Failed web requests | Set of all requests within total requests that either return an Error Code or an HTTP 408 status code or fail to return a Success Code during the selected time period. |
| Successful web requests | Number of time the HTTP requests made by the client (such as a web browser) to a server that result in a positive and expected response. |

To return to the web/SaaS application details page, see Web/SaaS application details page.

### Web/SaaS application — Users section

The user form captures data regarding the user, latest logged in device and location of the device, as well as the date and time of the last access to the application by the user.

**Users and application usage**

| Field | Description |
|---|---|
| Name | Active user who is connected to DEX using their devices. |
| Last logged in device | Digital devices like laptops and desktops that users most recently utilized to access the application. |
| Last logged in location | The geographical position or physical location of the device where the user most recently accessed the application.<br><br>**Note:**<br><br>The device location is important in the event of an outage or emergency situation. When there is an outage or emergency, it is important to be able to quickly locate affected devices and users to provide assistance and support. Device location data can be used to identify the extent and severity of the outage, prioritize restoration efforts, and direct resources to the affected areas. |

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**Users and application usage (continued)**

| Field | Description |
|---|---|
| App last accessed | Date and time when the application was last accessed by the user with respect to a device.<br><br>**Note:**<br>User can access the application using different devices. The **App last accessed** field displays the date and time when user accessed the application. |

To return to the web/SaaS application details page, see Web/SaaS application details page.

### Web/SaaS application — Trends section

The trends form captures various metrics such as alert trends, average page load time, average response time, metrics for failed web requests, total usage and mean time to resolve incidents. This information is essential for evaluating system performance, identifying areas for improvement, and making data-driven decisions.

**Trends**

| Cards | Description |
|---|---|
| Alert trends | Patterns or changes in the frequency and severity of alerts generated by a monitoring application over the last 11 months. |
| Mean time to resolve incidents | Average time taken to resolve an incident. |
| Metrics (For last 11 months) | |
| Average page load time | Option to view the trend of average amount of time it takes to load the page, from initiation to load completion. |
| Average response time | Option to view the trend of the average response time for the application. |
| Failed web requests | Option to view the trend of total number of requests that have failed. |
| Total usage | Option to view the total amount of time spent on the application by all users. |

To return to the web/SaaS application details page, see Web/SaaS application details page.

### Installed application — Overview section

The installed application health section presents details on the total number of active incidents and alerts and also displays patterns in the type of reported issues. This information is crucial for effective incident management, resource allocation, and proactive identification of potential application vulnerabilities.

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### Health of your application

| Cards | Description |
|---|---|
| Total active incidents (DEX) | Number of ongoing issues or problems reported by users. These incidents may include issues with hardware or software, slow system performance, or other technical problems that are affecting their ability to work efficiently.<br><br>**Note:** Tracking the total active incidents can help you to monitor and manage the overall health of DEX. By identifying and addressing these issues quickly, you can minimize the impact of technical issues on business operations. |
| Total active alerts (DEX) | Number of ongoing notifications or warnings related to the performance of DEX. These alerts may include issues with system availability, network connectivity, security threats, or other potential disruptions to business operations.<br><br>**Note:** Tracking the total active alerts in a DEX dashboard can help you to proactively manage and mitigate the impact of these issues on user productivity. By identifying and addressing these alerts quickly, you can ensure that critical systems and applications are functioning as expected, and minimize the impact of technical issues on business operations. |
| Alerts and incidents | Patterns in the type of incidents and alerts that are reported in a particular context over the last 7 days.<br><br>**Note:** By analyzing incidents and alerts trends over time, you can gain insights into the root causes of issues and develop strategies for improving the overall quality of their products or services. |

To return to the Installed application details page, see Installed application details page.

### Installed application — Number of crashes section

View the number of crashes to gauge the application's stability, identify performance trends, and make informed decisions to enhance its reliability and user experience.

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### Number of crashes in your application

| Cards | Description |
|---|---|
| Current number of crashes | Measure of the application's stability and reliability. A lower count indicates a smoother and more dependable device, as it suggests that the application experiences fewer unexpected failures or interruptions.<br>**Note:** The metric supports the Zoom application as well as applications that emit a window app crash event (event id = 1000) on crashing such as Microsoft OneDrive, Microsoft Teams, Microsoft Excel, Microsoft PowerPoint, Microsoft OneNote, Microsoft PowerPoint, Microsoft Outlook, and Microsoft Word. |
| Number of crashes - <time><br>**Note:** The <time> range of the performance data can cover the past 2 hours, 24 hours, or 15 days, depending on the timeframe you select from the provided drop-down list in the Performance section. | Trend of crash count over a specific duration.<br>The trend reflects the application's stability and reliability, with fluctuations indicating changes in performance. |

To return to the Installed application details page, see Installed application details page.

### Installed application — CPU, memory and I/O performance section

The installed application performance section provides information on CPU usage, CPU usage trends, memory usage, and memory usage trends. This information is important for optimizing system performance, resource allocation, capacity planning, and troubleshooting.

### CPU, memory and I/O performance of your application

| Cards | Description |
|---|---|
| Current CPU usage | Amount of processing power consumed by an application in percentage.<br>**Note:** High CPU usage can result in degraded application performance, slower response times, and decreased user satisfaction. Identify performance bottlenecks and take proactive steps to optimize application performance. |
| CPU usage - <time> | Trend of how much processing power is being used to execute the application's instructions |

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**CPU, memory and I/O performance of your application (continued)**

| Cards | Description |
| --- | --- |
| **Note:** The <time> range of the performance data can cover the past 2 hours, 24 hours, or 15 days, depending on the timeframe you select from the provided drop-down list in the Performance section. | and how your system's CPU usage changed over a specified period.<br>**Note:** By tracking CPU usage over time, you can identify potential performance issues and take steps to optimize system resources and improve the overall digital end-user experience. |
| Current memory usage | Amount of memory (RAM) consumed by an application in percentage.<br>**Note:** High memory usage can result in degraded application performance, slower response times, and potentially lead to crashes or system instability. Monitor memory usage to optimize resource allocation and capacity planning, ensuring that applications have sufficient resources to meet user demands. |
| Memory usage - <time><br>**Note:** The <time> range of the performance data can cover the past 2 hours, 24 hours, or 15 days, depending on the timeframe you select from the provided drop-down list in the Performance section. | Trend of how much memory (RAM) your application or system is using over a specific period.<br>**Note:** By optimizing memory usage, you can reduce the risk of downtime, improve application performance, and maximize employee productivity. |
| Current I/O read | Retrieval of data from storage devices, impacting application speed and responsiveness.<br>**Note:** Monitoring I/O read can reveal performance differences between different versions of the app. |

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**CPU, memory and I/O performance of your application (continued)**

| Cards | Description |
|---|---|
| I/O read - <time><br><br>**Note:**<br>The <time> range of the performance data can cover the past 2 hours, 24 hours, or 15 days, depending on the timeframe you select from the provided drop-down list in the Performance section. | Tracks the history of data retrieval operations, providing insights into performance trends and potential bottlenecks. |
| Current I/O write | Process of storing data to storage devices, influencing application performance and data integrity. |
| I/O write - <time><br><br>**Note:**<br>The <time> range of the performance data can cover the past 2 hours, 24 hours, or 15 days, depending on the timeframe you select from the provided drop-down list in the Performance section. | Tracks the history of data storage operations, facilitating performance analysis and data management assessment. |

To return to the Installed application details page, see Installed application details page.

### Installed application — Users section

The installed application user form captures data regarding the active users, the last logged in device, and the location of the user. This information helps with security and access control, as well as providing insights into user behavior and application usage.

**Users and application usage**

| Field | Description |
|---|---|
| Name | Active user who is connected to DEX using their devices. |
| Last logged in device | Digital devices like laptops and desktops that users most recently used. |
| Last logged in location | Location of the device that the user most recently used. |

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**Users and application usage (continued)**

| Field | Description |
|---|---|
| | **Note:**<br>The device location is important in the event of an outage or emergency situation. When there is an outage or emergency, it is important to be able to quickly locate affected devices and users to provide assistance and support. Device location data can be used to identify the extent and severity of the outage, prioritize restoration efforts, and direct resources to the affected areas. |
| App last accessed | Date and time when the application was last accessed by the user with respect to a device.<br>**Note:**<br>User can access the application using different devices. The **App Last accessed** field displays the date and time for a specific device. |

Selecting the user name takes you to the details page of that user. For detailed information on a user and associated applications, see User details page.

To return to the Installed application details page, see Installed application details page.

### Device health page

The health of a device includes critical device specifics like type, name, OS, model, location, CPU, alongside metrics such as device/battery health, last 24-hour device events, OS details, incident and alert details (numbers, descriptions, ownership, timestamps). Monitoring and managing these aspects ensure optimal device performance and timely resolution of any issues.

Some of the crucial information that the Health page offers are:

**User device health — Overview**

| Field | Description |
|---|---|
| Type | Category of the device, such as laptop or desktop computer. |
| Name | Unique name of the device. |
| Model ID | Unique identifier assigned to a specific model of a device for internal tracking, system recognition, or management purposes. |
| CPU | Type of CPU or processor user in the device, such as single-core, dual-core, Quad-core, Hexa-core, Octa-core, and Deca-core processors. |
| RAM | RAM capacity of the device. |
| Operating system | OS that manages and controls the device's hardware and enables the execution of applications, such as Windows or macOS. |

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### User device health — Overview (continued)

| Field | Description |
|---|---|
| OS version | Current operating system version of the device, essential for compatibility, security, and ensuring optimal performance. |
| Location | Physical place where the device is currently located, indicating its position or network address. |
| Last restarted | Most recent time the device was rebooted or restarted. |
| Device health | |
| Metric | Name of the metric used to evaluate specific aspects of a device. Device health is typically measured using metrics such system uptime, outstanding patches, pending software update, the last blue/black screen of death, and application crashes. |
| Device events | |
| Timeline chart | Illustration of events generated by devices within the past 24 hours according to your local timezone.<br><br>The device events of a device can be measured using metrics such as event frequency, event duration, event occurrence patterns, event reliability, and event impact on system performance.<br><br>Choosing any event provides you with the event details. |
| Pending system updates | |
| Title | Name or description of the pending system update. |
| Label | Categorization associated with the pending update. |
| Version | Numerical or alphanumeric identifier of the pending system update. |
| Size | Data size or storage space required for the pending update. |
| Recommended | Indicates whether the pending update is advised for optimal system performance. |
| Action | Recommended action to be taken for the pending system update, such as install or restart. |
| OS details | |
| Metric | Name of the metric used to evaluate specific aspects of an OS. |
| Value | Data associated with a given metric. |

### User device health page — Alerts

| Field | Description |
|---|---|
| Number | Unique identifier assigned to an alert for reference purposes. |
| Description | Summary of the alert, providing details about the nature of the issue. |
| Owned by | Owner of the device. |

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### User device health page — Alerts (continued)

| Field | Description |
|---|---|
| Created | Date and time when the alert was initially reported or recorded. |

The Security section is exclusive to Windows OS.

### User device health page — Security

| Field | Description |
|---|---|
| Volume type | Type of volume that the bitlocker can protect such as Data or Operating System. |
| Protection status | Indicates whether BitLocker currently uses a key protector to encrypt the volume encryption key.<br><br>The Protection status can be **On** or **Off** indicating whether the volume is protected or not. |
| Mount point | Refers to the drive letter or volume path assigned to the BitLocker-protected volume after it has been unlocked. It specifies the location where you can access the decrypted contents of the encrypted volume. For example, a mount point might be something like `C:` or a volume path like `\\?\Volume{guid}\`. |
| Capacity | Storage size of the volume or the drive. |
| Volume status | Indicates whether BitLocker currently protects some, all, or none of the data on the volume.<br><br>Examples: FullyEncrypted, FullyDecrypted, EncryptionInProgress, DecryptionInProgress, EncryptionSuspended. |
| Encryption percentage | Percent of the volume protected by BitLocker. |

### User device health page — Battery

| Field | Description |
|---|---|
| Metric | Name of the metric used to evaluate the battery health of a device. Battery health of a device is typically measured using metrics such as battery capacity, cycle count, and impedance. |
| Value | Data associated with a given metric. |

### User device health page — Hardware

| Field | Description |
|---|---|
| Name | Identification label for the hard drive.<br><br>Example: \\\\.\\PHYSICALDRIVE2. |

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**User device health page — Hardware (continued)**

| Field | Description |
|---|---|
| Status | Current state of the hard drive.<br><br>Example: OK and Error. |
| Description | Additional details or notes about the hard drive. |
| Manufacturer | Company that manufactured the hard drive. |
| Media Loaded | If True, the media for a disk drive is loaded, which means that the device has a readable file system and is accessible. For fixed disk drives, this property will always be TRUE. |
| Model | Manufacturer's model number of the disk drive. |
| Partitions | Number of partitions on this physical disk drive that are recognized by the operating system. |
| Size | Total storage capacity available on the hard drive. |

To return to the device health page, see Users — Device health.

### User applications

View essential details for managing applications such as name, version, type, daily usage, and the last access date and time.

**Users — applications**

| Field | Description |
|---|---|
| Name | Name of the application. |
| Version | Application version for compatibility and updates. |
| Type | Type of the application such as installed or web/SaaS. |
| Todays usage | Duration of application usage on a specific device within a given day.<br><br>Knowing the usage of an application per day can be useful for several reasons. For example, it can help your organization monitor the productivity of the end-users, assess the popularity of an application, identify potential performance issues with the application or the system it runs on, and make informed decisions about software licensing and resource allocation. |
| Last accessed time | Date/time of the most recent access of the application.<br><br>Knowing when an application was last accessed can help identify potential security risks or unauthorized access to an application. It can also provide insights into the performance of the application. If an application hasn't been accessed in a long time, it could indicate that it is no longer needed, users are not using it effectively, or users are experiencing issues with it. |

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To return to the users details page, see User details page and to return to the user's application page, see Users — Applications.

### Running processes metrics page

Observe running process metrics to gain insights into how running processes are performing and identify performance bottlenecks or issues that may be impacting digital experience.

#### User device — Cards and descriptions

| Card | Description |
|---|---|
| CPU usage | Percentage of current CPU utilization indicates the proportion of the CPU's total processing capacity that is currently in use. |
| Idle CPU | Percentage of the CPU's capacity that is not being actively utilized or is in an idle state. |
| Number of processes | Total count of active tasks or processes running on a system at a given time. |
| Memory usage | Amount of computer memory (RAM) currently being utilized by running processes and applications. |

#### User device — Fields and descriptions

| Field | Description |
|---|---|
| Name | Name for the process. |
| CPU usage % | Amount of processing power consumed in percentage for a specific program or process.<br>**Note:** High CPU usage can result in degraded application performance, slower response times, and decreased user satisfaction. Identify performance bottlenecks and take proactive steps to optimize application performance. |
| CPU time in seconds | Exact amount of time that the CPU spends for processing data for a specific program or process.<br>**Note:** By tracking CPU usage over time, your organization can identify potential performance issues and take steps to optimize system resources and improve the overall digital end-user experience. |
| Memory in KB | Amount of memory (RAM) consumed in kilobytes (KB) for a specific program or process. |

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**User device — Fields and descriptions (continued)**

| Field | Description |
|---|---|
| | **Note:** High memory usage can result in degraded application performance, slower response times, and potentially lead to crashes or system instability. Monitor memory usage to optimize resource allocation and capacity planning, ensuring that applications have sufficient resources to meet user demands. |
| PID | Process ID (PID) is a unique numerical identifier assigned to each running process.<br>**Note:** The PID can be used to monitor and manage running processes. The PID can also be used to terminate or kill a specific process if necessary. |
| PPID | Parent Process ID (PPID) is the unique numerical identifier assigned to the parent process of a running process.<br>**Note:** The PPID is useful for process management since it enables administrators to identify the processes that spawned child processes and track the flow of processes in the system. The PPID is also used to manage the resources allocated to a process and ensure that child processes have access to the necessary resources. |

To return to the users details page, see User details page.

### Application metrics page

Access the performance and usage data pertaining to a particular application. This information is critical for evaluating efficiency of the application, identifying bottlenecks and areas for optimization, and making informed decisions to improve its performance.

**User device — Application metrics**

| Cards | Description |
|---|---|
| Response time | Time it takes for a specific application to respond to a user request in milliseconds. |

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**User device — Application metrics (continued)**

| Cards | Description |
| --- | --- |
| (Only web/SaaS applications have this field) | **Note:** A slow response time can result in frustrated users, decreased engagement, and lower productivity, while a fast response time can lead to improved user satisfaction and increased engagement. Therefore, it is essential to track response time as a key application metric and continuously monitor and optimize it to ensure optimal user experience. |
| DNS lookup<br><br>(Only web/SaaS applications have this field) | Time (in milliseconds) it takes for a user's device to resolve a domain name into an IP address.<br><br>**Note:** If DNS lookup determines that there is an error in the mapping of DNS entries on the user's system, the user will be unable to access the internet or the intended website. |
| Page load time<br><br>(Only web/SaaS applications have this field) | Time taken for a web page to fully display its content and become interactive upon a user's request. |
| Failed web requests<br><br>(Only web/SaaS applications have this field) | Instances where requested web content or resources could not be successfully retrieved or loaded by the server.<br><br>**Note:** The failed web requests result provides insights into potential issues affecting web performance. It helps in identifying problems such as server errors, broken links, or network issues that could hinder user experience. Understanding the frequency, type, and reasons behind failed requests helps in troubleshooting, optimizing web infrastructure, and ensuring a smoother browsing experience for users. |
| CPU usage<br><br>(Only installed applications have this field) | Amount of processing power consumed by an application in percentage. |

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**User device — Application metrics (continued)**

| Cards | Description |
|---|---|
| | **Note:** High CPU usage can result in degraded application performance, slower response times, and decreased user satisfaction. Therefore, identify performance bottlenecks and take proactive steps to optimize application performance. |
| Memory usage<br><br>(Only installed applications have this field) | Amount of memory or RAM (Random Access Memory) consumed by an application in percentage.<br><br>**Note:** High memory usage can result in degraded application performance, slower response times, and potentially lead to crashes or system instability. Therefore, monitor memory usage to optimize resource allocation and capacity planning, ensuring that applications have sufficient resources to meet user demands. |
| I/O read<br><br>(Only installed applications have this field) | Process of reading data from storage devices, such as hard drives or solid-state drives, within a computer system.<br><br>**Note:** Excessive I/O read operations can lead to performance bottlenecks, increased latency, and result in slower system response times. Therefore, monitor I/O read activities to ensure that the data retrieval processes do not become a limiting factor for application performance. |
| I/O write<br><br>(Only installed applications have this field) | Process of storing or writing data to storage devices, like hard drives or solid-state drives, within a computer system.<br><br>**Note:** Excessive I/O write operations can also lead to performance bottlenecks, increased latency, and potentially result in slower system response times. Therefore, monitor I/O write activities to ensure that data storage processes do not hinder application performance. |
| Number of crashes | Trend of the application's crashes on the device over the last 2 hours. |

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### User device — Application metrics (continued)

| Cards | Description |
|---|---|
| (Only installed applications have this field) | **Note:** Analyzing this graph enables you to identify potential issues, pinpoint trends, and take proactive measures to enhance the application's reliability and user experience. |

To return to the application metrics main page, see Users — Application Metrics.

### Device metrics page

Access real-time metrics like CPU, memory, disk usage, I/O operations, battery, and energy consumption for insights into system resource utilization, performance, and improvement areas.

### Device metrics — Performance

| Cards | Description |
|---|---|
| CPU usage | Amount of processing power consumed by an application in percentage.<br>**Note:** High CPU usage can result in degraded application performance, slower response times, and decreased user satisfaction. Therefore, identify performance bottlenecks and take proactive steps to optimize application performance. |
| Memory usage | Amount of memory or RAM (Random Access Memory) consumed by an application in percentage.<br>**Note:** High memory usage can result in degraded application performance, slower response times, and potentially lead to crashes or system instability. Therefore, monitor memory usage to optimize resource allocation and capacity planning, ensuring that applications have sufficient resources to meet user demands. |
| Disk usage | Proportion of storage capacity consumed by data and applications on a disk drive, measured in percentage.<br>Elevated disk usage may lead to slower system performance, increased loading times, and potential storage-related issues. Monitoring disk usage is crucial for optimizing storage resources, preventing data bottlenecks, and ensuring efficient data management, contributing to overall system stability and responsiveness. |

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### Device metrics — Performance (continued)

| Cards | Description |
|---|---|
| I/O read & write | Rate at which data is read from or written to a storage device. This metric provides insights into the data transfer speed and efficiency of the storage system. |

### Device metrics — Battery

| Field | Description |
|---|---|
| Battery percentage | Remaining charge percentage of the battery. |

### Device metrics — Energy

| Field | Description |
|---|---|
| Total energy consumption | Overall energy usage, essential for efficient resource management. |
| Energy loss | Wasted energy, crucial for implementing efficiency improvements. |
| CPU energy consumption | Energy usage by the CPU, providing insights for performance optimization. |
| Disk energy consumption | Energy consumed by disk operations, guiding storage efficiency strategies. |
| Network energy consumption | Energy usage in network activities, informing power-saving measures. |
| Display energy consumption | Energy usage by the display, facilitating energy-efficient display settings. |
| SOC energy consumption | Energy consumed by the system-on-chip, aiding in hardware optimization. |
| MBB energy consumption | Energy utilized by mobile broadband, guiding mobile device power management. |
| EMI energy consumption | Energy consumed by electromagnetic interference, crucial for interference reduction. |
| Other energy consumption | Energy usage not covered by specific categories, offering comprehensive insights. |

To return to the main device metrics page, see Users — Device Metrics.

### Network page

Obtain valuable insights into various aspects of a network configuration. This includes information on the network server, WiFi details, wired connection details, and application network hops, allowing user to optimize network performance.

Some of the crucial information that the Network page offers are:

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### Network — Connectivity

| Field | Description |
|---|---|
| Metric name | Name of the metric used to evaluate specific aspects of a network. |
| Value | Data associated with a given metric. |

### Network — Hops

| Field | Description |
|---|---|
| Hop | Specific stop along the path that data packets take as they travel from one network node or router to another on their way to a destination. |
| Domain Name | Name that identifies the network domain on the internet. |
| Address | The IP address assigned to the specific router. |
| RTT1 | Duration in milliseconds (ms) it takes for the first packet to get to a hop and back. |
| RTT2 | Duration in milliseconds (ms) it takes for the second packet to get to a hop and back. |
| RTT3 | Duration in milliseconds (ms) it takes for the third packet to get to a hop and back. |

To return to the main network page, see Users — Network.

## Access page

View essential user login details, including the username, user type, login type, the timestamp of the last login, and the host. By displaying these crucial pieces of information, users can easily identify themselves, understand their assigned user type and login method, and effectively manage their login information.

Some of the crucial information that the Access page offers are:

### User — Access page

| Field | Description |
|---|---|
| Logins | |
| Username | Unique identifier used by a user to access the application. |
| User type | Role assigned to a user based on their level of access or privileges within a system. |
| Login type | Authentication mechanism used by a user to log into a system, such as password-based, multi-factor authentication, or single sign-on. |
| Last login | Date and time indicating the most recent instance when a user successfully accessed the device. |
| User profiles (only for Windows) | |
| Local path | Path to the device onboard storage or filesystem. |

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### User — Access page (continued)

| Field | Description |
|---|---|
| Last used | Date and time when the device was last actively used or accessed for any operation or activity. |
| SID | Unique alphanumeric identifier used to identify devices. |
| Loaded | Indicates whether the device's operating system or software is successfully initialized or started. |

To return to the main access page, see Users — Access.

### Devices list

The Device page provides information on the device, its assigned user, last login, matching assignments, status, active alerts, and incidents.

### Devices form

| Field | Description |
|---|---|
| Device | Actual physical or virtual hardware, such as a laptop or mobile device. |
| Assigned to | Name of the person to whom the device is assigned.<br><br>When the user is not a ServiceNow user, the name appears as "-". |
| Last logged in | Name of the person who had last logged in to the device.<br><br>When the user is not a ServiceNow user, the name appears as "-". |
| Matches assigned to | Indicates whether the device that the user is using to connect to DEX is assigned to the user's name.<br><br>**Note:**<br>The field displays **Yes** when the user is the owner of the device. For shared devices, **Yes** is displayed as the value only when the user is the owner of the device. |
| Device status | Current status of the device such as Up, Down, or Unknown. |
| Alerts | Total count of active alerts for the device. |
| Incidents | Total count of active incidents for the device. |

To return to the main devices page, see Devices page.

### Administration cards

The administration cards provide administrators with the capability to monitor and manage applications, enabling them to add, enable, or disable as necessary. Additionally, it offers insights such as the number of policies applied for compliance, list of DEX users and DEX

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administrators information, metric rule lists, and devices with Agent Client Collector installed for data analysis.

### Administration page cards

| Cards | Description |
|---|---|
| Application and Device Health | |
| Managing applications | Number of application that are currently being monitored. |
| Policies | Number of policies applied for the application. |
| Metric rules | List of DEX metric rules that generate alerts based on conditions and metrics that are defined. |
| Users | Number of users who have access to DEX users, applications and device pages. |
| DEX Administrators | Number of users who have access to the DEX administration pages. |
| Agent health | Number of user devices on which Agent Client Collector is installed.<br><br>Agent health also displays the number of agents that are up and the number that are down. |
| Desktop assistant | |
| Usage metrics | Information on the devices' connection status, login status, and the current running version. For more information, see View Desktop Assistant usage metrics. |

To return to the administration details page, see DEX Administration page.

## Custom application form

With the help of the custom application form, you can add or edit the details of an application to be monitored.

### Add new application form

| Field | Description |
|---|---|
| Application name | Name of the application to monitor.<br><br>When the SAM plugin [com.snc.samp] is installed, the **Application name** field changes into a drop-down list that references the [samp_sw_product] table. If you can't find an application in the drop-down list, you can add it by selecting **+ New custom software** and saving it with the application name and publisher. |

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**Add new application form (continued)**

| Field | Description |
|---|---|
| Publisher | Company who has the rights to distribute and support the application. |
| + New custom software | When the SAM plugin [com.snc.samp] is installed, the **Application name** field changes into a drop-down list that references the [samp_sw_product] table. If you can't find an application in the drop-down list, you can add it by selecting **+ New custom software** and saving it with the application name and publisher. |
| Support group | Teams to help users resolve any issues or challenges they may be experiencing with the application. In the event of a service disruption or other incident, the support group is responsible for managing the incident and restoring service as quickly as possible. |
| Choose an application type:<br>• This is a web/SaaS (.com) application<br>• This is an installed (.exe, .app) application | Option to select between web/SaaS or installed application. |
| Domain/URL<br><br>(This field appears only when you select web/SaaS (.com) application.) | Web address that is used to launch the application and access its features and functions. |
| • Windows: Primary process name (ex. process.exe)<br>• Windows: Secondary processes separated by a comma<br>• macOS: Primary process name (ex. process.app)<br>• macOS: Secondary processes separated by a comma<br><br>(These fields appear only when you select installed application.) | • **Windows: Primary process name (ex. process.exe)**: Unique identifier to the primary running instance of the windows application.<br>• **Windows: Secondary processes separated by a comma**: Unique identifier to the secondary running instance of the windows application.<br>• **macOS: Primary process name (ex. process.app)**: Unique identifier to the primary running instance of the macOS application.<br>• **macOS: Secondary processes separated by a comma**: Unique identifier to the secondary or more running instance of the macOS application. |
| Web Endpoint Connection<br><br>(This field appears only when you select installed application.) | Comma-separated list of domains used for measuring network latency. Example: company.zoom.us, company.outlook.com.<br><br>**Note:**<br>Typically, you fill in this field for the applications you've installed that connect to the cloud. |

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**Add new application form (continued)**

| Field | Description |
|---|---|
| Upload a logo<br><br>(This field appears only for an existing application.) | Link to upload or edit the logo of an application. |
| Monitoring<br><br>(This field does not appear when you are onboarding Application and Device Health.) | Slider to toggle the monitoring status for the application, allowing users to enable or disable it.<br><br>For the applications that you want to monitor, ensure that the monitoring toggle switch ( ) is enabled. |

To return to the onboarding topic, see Onboard for DEX Application and Device Health or to return to the page where you can add custom application, see Add a new application to monitor.

### Metric rules page

The metric rules page shows information about a specific rule, including its name, CI type, application name, alert severities, and alert status.

**Metric rules — Fields and Descriptions**

| Field | Description |
|---|---|
| Name | Name of the metric rule. |
| Type | Type of the CI type such as Saas/web, installed, or device to which the metric rule is applied. |
| Application | Application name to which the metric rule is applied.<br><br>If the CI type is Device, then the application name is marked as N/A. |
| Alert severities | Level of urgency or importance assigned to the alert. |
| Status | Current state of the alert rule, indicating whether it is active or inactive. |
| Updated | Date and time when the metric rule is last updated. |

To return to the metric rules page, see Metric rules.

## DEX Content Playbook

DEX Content Playbook offers content to facilitate the monitoring of applications and devices, as well as providing support for application remediation.

Monitoring involves monitoring and measuring the performance and availability of applications to ensure a positive digital experience for end-users. DEX Content Playbook typically includes web/SaaS or installed application monitoring, user device health monitoring, remediations, as well as diagnostic actions for users to run on their connected devices for troubleshooting.

DEX Content Playbook fetches historical or latest metrics of devices and applications.

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**Note:**
The historical data for an application or device is the information that is kept in the MetricBase database for the past 7 days, while the latest data pertains to the most recent information available.

To know the policies, check definitions, and actions provided by the playbook, see DEX Content Playbook reference. To get this content for Application and Device Health, you must Install DEX Content Playbook.

#### Exploring DEX Content Playbook

The DEX Content Playbook facilitates monitoring and provides support for applications and devices, offering assistance for application remediation across both Mac and Windows systems. The playbook includes policies and checks for metrics and subsequent actions required for both operating systems.

To know the policies, check definitions, and actions provided by the playbook, see DEX Content Playbook reference. To get this content for Application and Device Health, you must Install DEX Content Playbook.

#### Configuring DEX Content Playbook

Provides information about how you can install the DEX Content Playbook application [sn_dex_content] plugin.

## Configuration overview

This section provides details on how to install the DEX Content Playbook [sn_dex_content] plugin and also provides a link to the application listing to learn about the dependencies, licensing, and subscription requirements, as well as checks release compatibility.

**Note:**

To fetch the complete playbook data for a Windows device, the Agent Client Collector (ACC) must run as a local system account. For more details on how to set up the ACC service as a local system account, see Run Agent Client Collector as local system account.

#### Install DEX Content Playbook

You can install the DEX Content Playbook application [sn_dex_content] if you have the admin role.

### Before you begin

- Ensure that the application and all of its associated ServiceNow Store applications have valid ServiceNow entitlements. For more information, see Get entitlement for a ServiceNow product or application.
- Review the DEX Content Playbook application listing in the ServiceNow Store for information on dependencies, licensing or subscription requirements, and release compatibility.

Role required: sn_dex.admin

### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the DEX Content Playbook application [sn_dex_content] using the filter criteria and search bar.

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You can search for the application by its name or ID. If you cannot find the application, you might have to request it from the ServiceNow Store.

In the list next to the **Install** button, the versions that are available to you are displayed.

3. Select a version from the list and select **Install**.

   In the Install dialog box that is displayed, any dependencies that are installed along with your application are listed.

4. If you're prompted, follow the links to the ServiceNow Store to get any additional entitlements for dependencies.
5. **Optional:** If demo data is available and you want to install it, select the **Load demo data** check box.
   Demo data comprises the sample records that describe application features for the common use cases. Load the demo data when you first install the application on a development or test instance.

   **Important:**
   If you don't load the demo data during installation, it's unavailable to load later.

6. Select **Install**.

### Run Agent Client Collector as local system account

To fetch the complete playbook content data for a Windows device, the Agent Client Collector (ACC) must run as a local system account.

#### Before you begin

Role required: sn_dex.admin

#### Procedure

1. From the Windows task bar, navigate to **Services** > **Run as administrator**.
2. Open the Agent Client Collector service and click the **Log On** tab.

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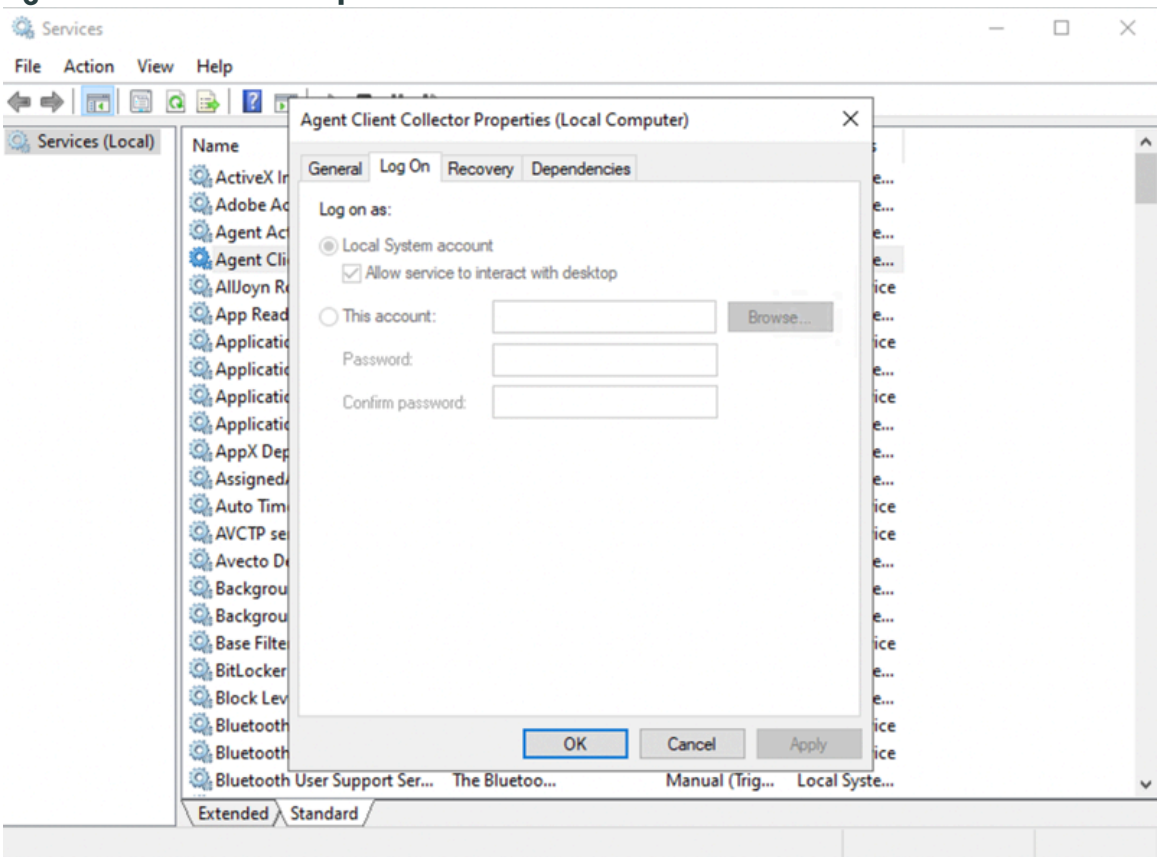
3. Select **Local System account** and click **Apply**.

**Agent Client Collector Properties window**




## DEX Content Playbook reference

Reference topics provide additional information about policies and check definitions provided by DEX Content Playbook.

## DEX policies for Mac

Policies for Mac are guidelines and rules to ensure that the application is used in a consistent, secure, and compliant manner. DEX policies help organizations to reduce the risk of data breaches, improve data quality and accuracy, and optimize application performance and availability.

For macOS systems, to retrieve the entire data, include the subsequent content to /etc/sudoers.

For Agent version 3.4.0 or earlier:

```
_servicenow ALL=NOPASSWD:
 SETENV: /
Library/Caches/servicenow/agent-client-collector/osquery/bin/osq
ueryi *, /usr/bin/mdls, /usr/bin/log, /bin/kill, /bin/launchctl
Defaults:_servicenow !requiretty
```

For Agent version 3.4.1 or later:

```
_servicenow ALL=NOPASSWD: SETENV: /Library/Application\
 Support/servicenow/agent-client-collector/cache/osquery/bin/osq
ueryi *, /usr/bin/mdls, /usr/bin/log, /bin/kill, /bin/launchctl
Defaults:_servicenow !requiretty
```

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**Note:**
The historical data for an application or device is the information that is kept in the MetricBase database for the past 7 days, while the latest data pertains to the most recent information available.

## Policies for Mac — Application

DEX provides the following policies for applications.

| Policy Name | Description | Check Instances | Frequency | Historical/ Latest | Check Instance Parameters |
|---|---|---|---|---|---|
| DEX Mac Apps Metrics | This policy collects the application metrics in the Mac device and sends metric data to Metric Base. | os.mac.check-app-historical | 5 mins | Historical | cpu_usage, memory_usage, uptime, io_usage_read, io_usage_write, is_running, last_access_time, crashes |

## Policies for Mac — Device

DEX provides the following policies for devices.

| Policy Name | Description | Check Instances | Frequency | Historical/Latest | Check Instance Parameters |
|---|---|---|---|---|---|
| DEX Mac Device Metrics | This policy collects Mac device metrics and sends the metric data to the ServiceNow instance. | os.mac.check-system-metrics-latest | 24 hours | Latest | uptime, logged_in, firewall_enabled, session_details, disk_details, os_details, cpu_details, battery_details, device_details, network_details, pending_updates, device_events,cpu_usage, memory_details,os_setup_details,last |
| DEX Mac Device Metrics | This policy collects Mac device metrics and sends the metric data to MetricBase. | os.mac.check-system-metrics-historical | 5 mins | Historical | disk_usage, io_usage_write, io_usage_read, memory_usage, cpu_usage, memory_details, uptime, crashes, battery_charge_percentage,wifi_trans |
| DEX Mac Device Metrics | This policy collects data for running Mac processes and sends | os.mac.check-process-data | 24 hours | N/A | N/A |

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| Policy Name | Description | Check Instances | Frequency | Historical/Latest | Check Instance Parameters |
|---|---|---|---|---|---|
| | the data to the ServiceNow instance. | | | | |
| DEX Mac Device Metrics | This policy collects Mac device metrics and sends the metric data to the ServiceNow instance. | os.mac.check-sys-compliance-historical | 5 minutes | Historical | N/A |
| DEX Mac Device Metrics | This policy collects Mac device metrics and sends the metric data to the ServiceNow instance. | os.mac.check-sys-compliance-latest | 24 Hours | Latest | N/A |
| DEX Mac Device Metrics | This policy collects Mac device metrics and sends the metric data to the ServiceNow instance.<br>**Note:** If the previous check runs for more than five minutes, the current check will get skipped. | os.mac.check-energy-consum-historical | 5 minutes | Historical | energy_consumption |
| DEX Mac Device Metrics | This policy collects Mac device metrics and sends | os.mac.check-system-metrics-historical | 30 minutes | Historical | vpn_details |

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| Policy Name | Description | Check Instances | Frequency | Historical/Latest | Check Instance Parameters |
|---|---|---|---|---|---|
| | the metric data to the ServiceNow instance. | | | | |

**Note:**
If you upgrade the Content Playbook plugin on an instance and encounter unexpected policy update issues, see the Troubleshooting: Policy update issues post DEX plugin upgrade [KB1586917] article in the Now Support Knowledge Base.

### DEX policies for Windows

Policies for Windows are guidelines and rules to ensure that the application is used in a consistent, secure, and compliant manner. DEX policies help organizations to reduce the risk of data breaches, improve data quality and accuracy, and optimize application performance and availability.

To fetch the complete playbook data for a Windows device, the Agent Client Collector (ACC) must run as a local system account. For more details on how to set up the ACC service as a local system account, see Run Agent Client Collector as local system account.

**Note:**
The historical data for an application or device is the information that is kept in the MetricBase database for the past 7 days, while the latest data pertains to the most recent information available.

## Policies for Windows — Application

DEX provides the following policies for applications.

| Policy Name | Description | Check Instances | Frequency | Historical/ Latest | Check Instance Parameters |
|---|---|---|---|---|---|
| DEX Windows Apps Metrics | This policy collects the application metrics in the Windows device and sends metric data to Metric Base. | os.win.check-app-historical | 5 mins | Historical | cpu_usage, memory_usage, uptime, last_access_time, crashes, io_usage_read, io_usage_write, is_running |

## Policies for Windows — Device

DEX provides the following policies for devices.

| Policy Name | Description | Check Instances | Frequency | Historical/ Latest | Check Instance Parameters |
|---|---|---|---|---|---|
| DEX Windows | This policy collects Windows | os.win.check-system- | 24 hours | Latest | uptime, logged_in,antivirus_enabled, firewall_enabled, |

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| Policy Name | Description | Check Instances | Frequency | Historical/ Latest | Check Instance Parameters |
|---|---|---|---|---|---|
| Device Metrics | device metrics and sends metric data to ServiceNow Instance. | metrics-latest | | | disk_details, device_details, battery_details, bsod_details, cpu_details, os_details, power_plan, stability_index, pending_updates, network_details, bitlocker_details, user_profiles, antimalware_details, hard_drive_status, peripheral_devices_details, device_events |
| DEX Windows Device Metrics | This policy collects Windows device metrics and sends metric data to MetricBase. | os.win.check-system-metrics-historical | 5 mins | Historical | disk_usage,io_usage_write, io_usage_read, memory_usage, cpu_usage,battery_charge_percentage energy_consumption |
| DEX Windows Device Metrics | This policy collects Windows running processes data and sends data to ServiceNow Instance. | os.win.check-process-data | 6 hours | N/A | N/A |

**Note:**
If you upgrade the Content Playbook plugin on an instance and encounter unexpected policy update issues, see the Troubleshooting: Policy update issues post DEX plugin upgrade [KB1586917] article in the Now Support Knowledge Base.

### DEX check definitions for Mac

Check definitions for Mac are predetermined sets of rules and criteria that assess the performance, security, and compliance of Mac devices. These checks can cover various aspects such as CPU usage, memory usage, battery details, and firewall status.

For macOS systems, to retrieve the entire data, include subsequent content to /etc/sudoers.

For Agent version 3.4.0 or earlier:

```
_servicenow ALL=NOPASSWD:
 SETENV: /
Library/Caches/servicenow/agent-client-collector/osquery/bin/osq
ueryi *, /usr/bin/mdls, /usr/bin/log, /bin/kill, /bin/launchctl
Defaults:_servicenow !requiretty
```

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For Agent version 3.4.1 or later:

```
_servicenow ALL=NOPASSWD: SETENV: /Library/Application\
 Support/servicenow/agent-client-collector/cache/osquery/bin/osq
ueryi *, /usr/bin/mdls, /usr/bin/log, /bin/kill, /bin/launchctl
 Defaults:_servicenow !requiretty
```

**Note:**
You have the ability to configure the check definitions and associated retrievable data. Some of the listed check definitions may retrieve data that contains or is considered personal information.

## Check definitions — Application (Metrics)

DEX offers the following check definitions that are accessible solely when the application is running, with the exception of os.mac.check-app-version, os.mac.check-app-is-installed, os.mac.check-app-last-access-time, and os.mac.check-app-last-updated check definitions, which are accessible even when the application is not running. In the check definition parameters:

- appName = application name. Example, Webex.
- appSysId= sys id of the application.
- primaryProcess = list of primary process for the application separated by a pipe symbol ( | ). The first process which exists on the endpoint device will be given priority. Example1: Webex.app. Example 2: Microsoft Teams.app | Microsoft Teams Classic.app.

  **Note:**
  If the primary process for the Teams application is Microsoft Teams.app on one end-point device, while on another end-point device, it is Microsoft Teams classic.app, then when determining priority based on process availability on the endpoint device, the process that is present first on the endpoint device is given precedence.

- secondaryProcesses = list of secondary processes for the application separated by a pipe symbol ( | ). Example, Cisco WebEx Start.app | webexmtaV2.app.

| Check definition name | Check definition parameters | Description |
|---|---|---|
| os.mac.check-app-cpu-usage | • --appName=<application name><br>• --primaryProcess=<primary process name><br>• --secondaryProcesses=<list of secondary processes separated by a pipe symbol><br>• --appSysId=<sys id of the application> | Checks the amount of CPU resources being used by the application. |
| os.mac.check-app-memory-usage | • --appName=<application name><br>• --primaryProcess=<primary process name> | Checks the amount of memory resources being used by the application. |

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| Check definition name | Check definition parameters | Description |
|---|---|---|
| | • --secondaryProcesses=<list of secondary processes separated by a pipe symbol><br>• --appSysId=<sys id of the application> | |
| os.mac.check-app-listening-ports | • --appName=<application name><br>• --primaryProcess=<primary process name><br>• --secondaryProcesses=<list of secondary processes separated by a pipe symbol><br>• --appSysId=<sys id of the application> | Retrieves the port numbers that are open and through which incoming network traffic can reach the application. |
| os.mac.check-app-last-updated | • --appName=<application name><br>• --primaryProcess=<primary process name><br>• --secondaryProcesses=<list of secondary processes separated by a pipe symbol><br>• --appSysId=<sys id of the application> | Checks the time and date of the latest application update installation.<br>**Note:** This check definition does not require the application to be in a running state. |
| os.mac.check-app-version | • --appName=<application name><br>• --primaryProcess=<primary process name><br>• --secondaryProcesses=<list of secondary processes separated by a pipe symbol><br>• --appSysId=<sys id of the application> | Retrieves the version number of the application.<br>**Note:**<br>• This check definition does not require the application to be in a running state.<br>• If an application does not have a version, the check definition returns the string "unversioned" for that application. |

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| Check definition name | Check definition parameters | Description |
|---|---|---|
| os.mac.check-app-is-installed | • --appName=<application name><br>• --primaryProcess=<primary process name><br>• --secondaryProcesses=<list of secondary processes separated by a pipe symbol><br>• --appSysId=<sys id of the application> | Checks if the application is installed or not on the device.<br>**Note:** This check definition does not require the application to be in a running state. |
| os.mac.check-app-is-running | • --appName=<application name><br>• --primaryProcess=<primary process name><br>• --secondaryProcesses=<list of secondary processes separated by a pipe symbol><br>• --appSysId=<sys id of the application> | Checks whether the application is currently in a running state or not. |
| os.mac.check-app-uptime | • --appName=<application name><br>• --primaryProcess=<primary process name><br>• --secondaryProcesses=<list of secondary processes separated by a pipe symbol><br>• --appSysId=<sys id of the application> | Checks the uptime of the given application. |

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| Check definition name | Check definition parameters | Description |
|---|---|---|
| os.mac.check-app-last-access-time | • --appName=<application name><br>• --primaryProcess=<primary process name><br>• --secondaryProcesses=<list of secondary processes separated by a pipe symbol><br>• --appSysId=<sys id of the application> | Checks the most recent time when the application was executed or run.<br>**Note:**<br>• This check definition does not require the application to be in a running state.<br>• If the application has not been run by the user within the last 7 days, the last access time will be empty. |
| os.mac.check-app-io-usage-read | • --appName=<application name><br>• --primaryProcess=<primary process name><br>• --secondaryProcesses=<list of secondary processes separated by a pipe symbol><br>• --appSysId=<sys id of the application> | Checks the application's usage of Read I/O (Input/Output) operations. |
| os.mac.check-app-io-usage-write | • --appName=<application name><br>• --primaryProcess=<primary process name><br>• --secondaryProcesses=<list of secondary processes separated by a pipe symbol><br>• --appSysId=<sys id of the application> | Checks the application's usage of Write I/O (Input/Output) operations. |
| os.mac.check-app-domain-network-latency | • --appName=<application name><br>• --primaryProcess=<primary process name><br>• --secondaryProcesses=<list of secondary processes separated by a pipe symbol> | Fetches network latency of the application domain. |

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| Check definition name | Check definition parameters | Description |
|---|---|---|
| | • --appSysId=<sys id of the application><br>• --domain=<domain of the application> | |
| os.mac.check-app-crashes | • --appName=<application name><br>• --primaryProcess=<primary process name><br>• --secondaryProcesses=<list of secondary processes separated by a pipe symbol><br>• --appSysId=<sys id of the application> | Fetches number of crashes and crash details of the application. |

| Check definition name | Description |
|---|---|
| os.mac.check-system-cpu-usage | Checks the CPU utilization. |
| os.mac.check-system-cpu-details | Retrieves the CPU name, number of physical and logical cores, and architecture information. |
| os.mac.check-system-memory-usage | Checks system memory utilization. |
| os.mac.check-system-last-access-time | Checks the last time the current device was accessed.<br>**Note:** This check definition works on locked and unlocked devices. |
| os.mac.check-system-uptime | Checks the amount of time elapsed since the system was last booted. |
| os.mac.check-system-time | Checks the current time in Coordinated Universal Time (UTC) using Unix timestamp. |
| os.mac.check-system-device-crashes | Retrieves details of different crashes on your device.<br>**Note:** This check fetches Kernel Panics present in the device logs in the last five minutes. |
| os.mac.check-system-device-details | Retrieves the type, model, and serial number of the chassis. |
| os.mac.check-system-device-events | Retrieves the details of events that occurred on the device during the specified time interval. Events for Mac include: last boot, |

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| Check definition name | Description |
|---|---|
| | logged-in users, installed software, updated software, added users, and reset passwords. |
| os.mac.check-system-disk-details | Retrieves disk details such as total space, used space, and free space in bytes. |
| os.mac.check-system-disk-io-usage-read | Retrieves disk bytes read per second. |
| os.mac.check-system-disk-io-usage-write | Retrieves disk bytes written per second. |
| os.mac.check-system-disk-usage | Retrieves the disk used space as a percentage of the total space. |
| os.mac.check-system-os-details | Retrieves the name, version, platform, architecture, and installation date of the operating system. |
| os.mac.check-system-net-bytes-incoming | Retrieves the incoming network bytes per second across all network devices. |
| os.mac.check-system-net-bytes-outgoing | Retrieves the outgoing network bytes per second across all network devices. |
| os.mac.check-system-logged-in-users | Retrieves the detail of users currently logged in to the device. |
| os.mac.check-system-session-details | Retrieves the session time of currently logged in users in minutes. |
| os.mac.check-system-network-details | Retrieves the network details, including Ethernet, Wi-Fi, and other relevant information. |
| os.mac.check-system-battery-details | Retrieves battery-related data, including the remaining battery percentage, the designed voltage, the estimated run time, and the battery's maximum capacity.<br>**Note:**<br>• This check definition doesn't apply to virtual machines (VMs) or desktops because they don't have batteries.<br>• If current capacity is greater than designed capacity, the battery is rounded off to 100%. |
| os.mac.check-system-battery-charge-percentage | Retrieves the charge percentage of batteries present on the device.<br>**Note:**<br>• This check definition doesn't apply to virtual machines (VMs) or desktops because they don't have batteries.<br>• If current capacity is greater than designed capacity, the battery is rounded off to 100%. |

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| Check definition name | Description |
|---|---|
| os.mac.check-system-firewall-enabled | Checks if the operating system firewall is active and enabled. |
| os.mac.check-system-pending-updates | Checks the status of pending software updates. |
| os.mac.check-system-admin-users | Retrieves all user accounts with local administrative privileges. |
| os.mac.check-system-reboot-details | Retrieves the reboot details for the device. |
| os.mac.check-system-os-setup-details | Retrieves the approximate OS age for the device. |
| os.mac.check-system-compliance-details | Retrieves the system's compliance details. This includes the list of all configured apps and metric values that are non-compliant, and calculates a compliance rating based on that.<br>**Note:**<br>• This check definition provides the following details:<br>○ **Condition for app to be said as compliant**: Every process mentioned in primary process should be running.<br>○ **Condition for metric value to be said as compliant**: Value should be matching with the configured expected value.<br>• The score is then calculated using this formula: Score = ( Complaint Application + Compliant metric value) / (Total Applications and metric value - Failed Ones) *100 |
| os.mac.check-system-vpn-details | Get the VPN details for your device. |
| os.mac.check-system-energy-consumption | Gets Energy consumed by Mac machine in coming 5minutess. |

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| Check definition name | Description |
|---|---|
| | **Note:**<br>The important details of this check defintion is listed below:<br>• /usr/bin/powermetrics needs to be added to sudo Permissions.<br>• The check will take approximately five minutes to get completed as it is calculating energy consumed in the coming five minutes<br>• This check defintion will not work if agent is installed with rosetta enabled on M1, M2, M3 machines. |
| os.mac.check-system-power-consumption | Gets Power consumption for mac device. |

## Check definitions — Diagnostic Actions

DEX provides the following types of check definitions for Diagnostic actions.

| Check definition name | Check definition parameters | Description |
|---|---|---|
| os.mac.check-app-process-ids | --process_name=<process name> | Retrieves the Process IDs (PIDs) of both the parent and all the child processes associated with the application. |
| os.mac.check-process-cpu | N/A | Retrieves a list of all running processes along with their CPU usage percentage, CPU time, Process ID (PID), Parent Process ID (PPID), and name. |
| os.mac.check-process-memory | N/A | Retrieves a list of all running processes along with their memory usage in kilobytes (KB), Process ID (PID), Parent Process ID (PPID), and name. |
| os.mac.check-process-data | N/A | Retrieves the CPU usage, memory usage, and disk usage of all currently running processes. |
| os.mac.check-process-disk | N/A | Retrieves a list of all running processes along with their disk usage in Bytes, Process ID (PID), Parent Process ID (PPID), and name. |
| os.mac.check-traceroute | --url=<url> | Retrieves the IP address, domain name and round-trip time (RTT) for each network hop. |

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| Check definition name | Check definition parameters | Description |
|---|---|---|
| | --max_hops = <default value is 65><br><br>--timeout = <default value is 5> | |
| os.mac.check-ping-test | --url=<url> | Sends a ping request to the provided URL and returns the connectivity status, indicating whether the URL is currently reachable or not. |

## Check definitions — Remedial Actions

DEX provides the following types of check definitions for Remedial actions.

| Check definition name | Check definition parameters | Description |
|---|---|---|
| os.mac.action-kill-process | --pid=<process id><br>OR<br><br>--process_name=<executable file name><br><br>**Note:** The process ID takes priority over the application name. | Terminates a running process or multiple processes specified by their Process ID (PID) or executable (.app) file name. |
| os.mac.action-restart-service | --service_name=<service name> | Restarts logged user services that take a service name as input to the system. |

### DEX check definitions for Windows

Check definitions for Windows are predetermined sets of rules and criteria that assess the performance, security, and compliance of Windows devices. These checks can cover various aspects such as CPU usage, memory usage, IO usage, firewall status, network tests, network bytes, and logged-in users.

To fetch the complete playbook data for a Windows device, the Agent Client Collector (ACC) must run as a local system account. For more details on how to set up the ACC service as a local system account, see Run Agent Client Collector as local system account.

**Note:**
You have the ability to configure the check definitions and associated retrievable data. Some of the listed check definitions may retrieve data that contains or is considered personal information.

## Check definitions — Application (Metrics)

DEX offers the following check definitions that are accessible solely when the application is running, with the exception of os.win.check-app-crash-rate and os.win.check-app-last-access-time check definitions, which are accessible even when the application is not running. In the check definition parameters:

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- appName = application name. Example, Zoom.
- appSysId= sys id of the application.
- primaryProcess = list of primary process for the application separated by a pipe symbol (|). The first process which exists on the endpoint device will be given priority. Example1: chrome.exe. Example 2: teams.exe|msteams.exe.

> **Note:**
> If the primary process for the Teams application in Windows 10 is teams.exe, while in Windows 11, it is msteams.exe, then when determining priority based on process availability on the endpoint device, the process that is present first on the endpoint device is given precedence.

- secondaryProcesses = list of secondary processes for the application separated by a pipe symbol (|). Example, cpthost.exe|cptservice.exe.

| Check definition name | Check definition parameters | Description |
|---|---|---|
| os.win.check-app-cpu-usage | • --appName=<application name><br>• --primaryProcess=<primary process name><br>• --secondaryProcesses=<list of secondary processes separated by a pipe symbol><br>• --appSysId=<sys id of the application> | Checks the amount of CPU resources being used by the application. |
| os.win.check-app-memory-usage | • --appName=<application name><br>• --primaryProcess=<primary process name><br>• --secondaryProcesses=<list of secondary processes separated by a pipe symbol><br>• --appSysId=<sys id of the application> | Checks the amount of memory used by the application. |

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| Check definition name | Check definition parameters | Description |
| --- | --- | --- |
| os.win.check-app-last-access-time | • --appName=<application name><br>• --primaryProcess=<primary process name><br>• --secondaryProcesses=<list of secondary processes separated by a pipe symbol><br>• --appSysId=<sys id of the application> | Checks the most recent time when the application was executed or run.<br>**Note:**<br>• This check definition doesn't require the application to be in a running state.<br>• If the application hasn't been run within the last 7 days, the last access time is empty.<br>• If the application's process path changes within 7 days (which can occur during app updates), the last access time is empty until you run the app again.<br>• To modify the 7-day retention policy, you can change the registry path in the following way:<br>○ Registry Key: "HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Session Manager\BAM"<br>○ Registry Name: "UserSettingsLifetimeMs"<br>○ Registry Type: REG_DWORD (32-bit value)<br>○ Registry Value: Duration in milliseconds |
| os.win.check-app-last-updated | • --appName=<application name><br>• --primaryProcess=<primary process name><br>• --secondaryProcesses=<list of secondary processes | Checks the time and date of the latest application update installation. |

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| Check definition name | Check definition parameters | Description |
|---|---|---|
| | separated by a pipe symbol><br>• --appSysId=<sys id of the application> | |
| os.win.check-app-crash-rate | • --appName=<application name><br>• --primaryProcess=<primary process name><br>• --secondaryProcesses=<list of secondary processes separated by a pipe symbol><br>• --appSysId=<sys id of the application> | Retrieves crash rate of the application.<br>This check definition supports:<br>• Applications that emit a window app crash event (event id = 1000) on crashing such as Microsoft OneDrive, Microsoft Teams, Microsoft Excel, Microsoft OneNote, Microsoft PowerPoint, Microsoft Outlook, Microsoft Word.<br>• Other supported applications include Zoom and Slack. Crash rate is fetched based on crash logs inside the respective app folders. These crash rates are susceptible to changes in application's log path in future versions of these apps<br>**Note:** This check definition doesn't require the application to be running. |
| os.win.check-app-uptime | • --appName=<application name><br>• --primaryProcess=<primary process name><br>• --secondaryProcesses=<list of secondary processes separated by a pipe symbol><br>• --appSysId=<sys id of the application> | Checks the uptime of the given application. |

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| Check definition name | Check definition parameters | Description |
|---|---|---|
| os.win.check-app-incoming-network-bytes | • --appName=<application name><br>• --primaryProcess=<primary process name><br>• --secondaryProcesses=<list of secondary processes separated by a pipe symbol><br>• --appSysId=<sys id of the application><br>• sleep_time =<Duration of time from now for which you need to calculate the average incoming network byte/sec> | Retrieves the incoming network bytes of an application for IPv4 and IPv6 networks. |
| os.win.check-app-outgoing-network-bytes | • --appName=<application name><br>• --primaryProcess=<primary process name><br>• --secondaryProcesses=<list of secondary processes separated by a pipe symbol><br>• --appSysId=<sys id of the application><br>• sleep_time =<Duration of time from now for which you need to calculate the average incoming network byte/sec> | Retrieves the outgoing network bytes of an application for IPv4 and IPv6 networks. |
| os.win.check-app-domain-network-details | • --appName=<application name><br>• --primaryProcess=<primary process name><br>• --secondaryProcesses=<list of secondary processes separated by a pipe symbol><br>• --appSysId=<sys id of the application><br>• domain=<Domain of the application> | Retrieves the network latency, packet loss, and jitter for installed application domain. |

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| Check definition name | Check definition parameters | Description |
|---|---|---|
| os.win.check-app-domain-network-route-details | • --appName=<application name><br>• --primaryProcess=<primary process name><br>• --secondaryProcesses=<list of secondary processes separated by a pipe symbol><br>• --appSysId=<sys id of the application><br>• domain=<Domain of the application> | Retrieves the complete network route details for application domain. |
| os.win.check-app-sccm | N/A | Fetches application specific metrics for the App - Microsoft System Center Configuration Manager. |

## Check definitions — Device (Metrics)

DEX provides the following types of check definitions for device.

| Check definition name | Description |
|---|---|
| os.win.check-system-cpu-usage | Checks the current CPU utilization. |
| os.win.check-system-cpu-details | Retrieves the CPU id, CPU name, number of physical and logical cores, and architecture information. |
| os.win.check-system-memory-usage | Checks the current system memory utilization. |
| os.win.check-system-last-access-time | Checks the last time the current device was accessed.<br>**Note:** This check definition works on locked and unlocked devices. The first time this check definition runs, the events are captured and an error message is produced due to no data. |
| os.win.check-system-uptime | Checks the time elapsed since the last boot of the system. |
| os.win.check-system-disk-io-usage-read | Retrieves disk bytes read per second. |
| os.win.check-system-disk-io-usage-write | Retrieves disk bytes written according to second. |
| os.win.check-system-energy-consumption | Retrieves the energy consumption values for CPU, SoC, display, disk, network, MBB, EMI, other, total, and loss of a Windows device in milliwatt-hours. |

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| Check definition name | Description |
|---|---|
| | **Note:** This check definition isn't compatible with virtual machines that don't have energy sensors.<br><br>Unlike other check definitions that retrieve latest data, this check definition retrieves the sum of last 5 minutes of data. |
| os.win.check-system-time | Checks the current time in Coordinated Universal Time (UTC) using UNIX timestamp. |
| os.win.check-system-power-plan | Retrieves the name of the active power plan. |
| os.win.check-system-os-details | Retrieves the name, version, platform, architecture, and installation date of the operating system. |
| os.win.check-system-device-crashes | Retrieves details of different crashes on your device.<br><br>**Note:** This check definition supports BSOD that emits system events with event ids = 41,1001. |
| os.win.check-system-device-events | Retrieves the details of events that occurred on the device during the specified time interval. Events for Windows include: last boot and logged-in users. |
| os.win.check-system-disk-usage | Retrieves the disk used space as a percentage of the total space. |
| os.win.check-system-battery-details | Retrieves battery-related data, including the remaining battery percentage, the designed voltage, the estimated run time, and the battery's maximum capacity.<br><br>**Note:**<br>• This check definition doesn't apply to virtual machines (VMs) or desktops because they don't have batteries.<br>• If current capacity is greater than designed capacity, the battery is rounded off to 100%. |
| os.win.check-system-network-details | Retrieves the network details, including Ethernet, Wi-Fi, and other relevant information. |
| os.win.check-system-logged-in-users | Checks the login user ID of the users who are currently logged in to the device. |
| os.win.check-system-power-consumption | Retrieves the power consumption of the device in milliwatt. |

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| Check definition name | Description |
| --- | --- |
| | **Note:** This check definition is exclusively compatible with physical machines and doesn't support virtual machines (VMs). |
| os.win.check-system-admin-users | Retrieves all user accounts with local administrative privileges. |
| os.win.check-system-bsod | Retrieves the count, message, ID, level, and time of Blue Screen of Death (BSOD) occurrences.<br>**Note:** This check definition supports BSOD that emits system events with event ids = 1001. |
| os.win.check-system-firewall-enabled | Checks if the operating system firewall is active and enabled. |
| os.win.check-system-antimalware-details | Retrieves the details of the anti-malware software on the device. |
| os.win.check-system-reboot-details | Retrieves the reboot duration in seconds and the last reboot timestamp (in UNIX epoch time).<br>**Note:** The displayed values might not accurately reflect cases where system reboots were interrupted, such as during system updates, power loss, or manual intervention. |
| os.win.check-system-os-setup-details | Retrieves the approximate OS age for the device. |
| os.win.check-system-network-adapter-details | Retrieves the network adapter details for the device. |
| os.win.check-system-network-connection-profiles | Retrieves the network connection profile details for the device.<br>**Note:** This check definition retrieves the network type which can be used to check the vpn status. |
| os.win.check-system-compliance-details | Retrieves the system's compliance details. This includes the list of all configured apps and metric values that are non-compliant, and calculates a compliance rating based on that. |

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| Check definition name | Description |
|---|---|
| | **Note:**<br>• This check definition provides the following details:<br>○ **Condition for app to be said as compliant**: Every process mentioned in primary process should be running.<br>○ **Condition for metric value to be said as compliant**: Value should be matching with the configured expected value.<br>• The score is then calculated using this formula: Score = ( Complaint Application + Compliant metric value) / (Total Applications and metric value - Failed Ones) *100 |
| os.win.check-system-battery-charge-percentage | Retrieves the battery charge percentage on windows device.<br>**Note:**<br>If current capacity is greater than designed capacity, the battery is rounded off to 100%. |
| os.win.check-system-windows-registry | Retrieves the windows registry data. |
| os.win.check-system-memory-details | Retrieves the system memory details like and virtual memory details. |
| os.win.check-system-bios-details | Retrieves the System Bios details. |
| os.win.check-system-executables | Fetches all the executables (*.exe) present on windows machine. |

## Check definitions — Diagnostic Actions

DEX provides the following types of check definitions for Diagnostic actions.

| Check definition name | Check definition parameters | Description |
|---|---|---|
| Diagnostic action | | |
| os.win.check-app-process-ids | --process_name=<process name> | Retrieves the Process IDs (PIDs) of both the parent and all the child processes associated with the application. |
| os.win.check-dns-lookup-test | --url=<url> | Conducts a DNS lookup test on the provided URL and returns the IP address. |

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| Check definition name | Check definition parameters | Description |
|---|---|---|
| os.win.check-http-test | --url=<http url> | Conducts an HTTP test on the provided URL and returns the status code of the response. |
| os.win.check-ping-test | --url=<url> | Sends a ping request to the provided URL and returns the connectivity status, indicating whether the URL is currently reachable or not. |
| os.win.check-process-cpu | N/A | Retrieves a list of all running processes along with their CPU usage percentage, CPU time, Process ID (PID), Parent Process ID (PPID), and name. |
| os.win.check-process-memory | N/A | Retrieves a list of all running processes along with their memory usage in kilobytes (KB), Process ID (PID), Parent Process ID (PPID), and name. |
| os.win.check-process-data | N/A | Retrieves the CPU usage, memory usage, and disk usage of all currently running processes. |
| os.win.check-process-disk | N/A | Retrieves a list of all running processes along with their disk usage in Bytes, Process ID (PID), Parent Process ID (PPID), and name. |
| os.win.check-rssi-value | N/A | Retrieves the Received Signal Strength Indicator (RSSI) value for the currently connected WiFi interface.<br><br>RSSI indicates the signal strength between the wireless access point (AP) and the device, with higher RSSI values indicating stronger signal strength.<br><br>**Note:** This check definition cannot be applied to a virtual machine. |
| os.win.check-traceroute | --url=<url><br><br>--max_hops = <default value is 30> | Retrieves the IP address, domain name and round-trip time (RTT) for each network hop. |

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| Check definition name | Check definition parameters | Description |
|---|---|---|
| | --timeout = <default value is 4> | |

### Check definitions — Remedial Actions

DEX provides the following types of check definitions for Remedial actions.

| Check definition name | Check definition parameters | Description |
|---|---|---|
| os.win.action-kill-process | --pid=<process id><br>OR<br>--process_name=<list of comma separated executable file names><br>**Note:** The process ID takes priority over the application name. | Terminates a running process or multiple processes specified by their Process ID (PID) or a list of executable (.exe) file names. |
| os.win.action-restart-service | --service_name=<service name> | Restarts logged user services that take a service name as input to the system. |
| os.win.action-flush-dns-cache | N/A | Flushes DNS cache on a Windows device. |
| os.win.action-clear-browser-cache | --auto_close = <true/false><br>**Note:** When auto close is enabled, while clearing the browser cache, the browser is closed and vice versa.<br>--browsers = <List of comma separated browsers> | Clears cache of the supported browsers such as Google Chrome,Mozilla Firefox, and Microsoft Edge.<br>**Note:** Before executing this definition check, ensure that you save your browser work. |

## DEX Desktop Assistant

The DEX Desktop Assistant is a desktop application that enables employees to seamlessly incorporate ServiceNow functionalities into their daily workflow, providing convenient access to monitor local applications, requests, and perform network tests. With Virtual Agent, you can get answers to your questions quickly and seamlessly, without having to wait on hold or speak to a representative over the phone.

To set up Desktop Assistant, see Configuring DEX Desktop Assistant and to monitor device connection status, track user logins and logouts, and stay updated on the current version, see Desktop Assistant usage metrics.

To know the system requirement for Desktop Assistant, see DEX system requirements.

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## Exploring DEX Desktop Assistant

Desktop Assistant simplifies the process of integrating ServiceNow functionalities into your daily workflow by providing easy access to monitor local applications, requests, and to conduct network tests, enabling for seamless tracking and management of your work.

## DEX Desktop Assistant overview

Desktop Assistant is a versatile product designed to streamline your work environment with user-friendly features. It simplifies workflow through effortless content searches, quick service request submissions, and convenient access to frequently used applications. The Virtual Agent offers instant chat-based support, while real-time notifications keep you informed about system events.

Acting as a centralized hub, it provides a comprehensive view of requests, and device health. Additionally, it enables internet connection testing and offers a usage metrics dashboard for seamless communication with ServiceNow instance. In essence, Desktop Assistant aims to enhance efficiency, keep users informed, and optimize the overall digital experience.

## DEX Desktop Assistant benefits

- Simplifies integration of functionalities into daily workflow.
- Provides easy access to monitor local applications, requests, and conduct network tests.
- Enables seamless tracking and management of work.
- Keeps you informed and engaged with timely updates and notifications about important events and activities.
- Facilitates quick and easy access to answers without waiting on hold or talking on the phone.
- Offers a smooth and efficient way to retrieve information needed for tasks and inquiries.

## DEX Desktop Assistant use cases

For examples of how different people in your organization would use Desktop Assistant, see these use cases.

### Users and responsibilities

| User | Responsibilities |
|---|---|
| Desktop Assistant administrator<br><br>[sn_dex_desktop.admin] | Responsible for managing configurations and resolving any issues that may arise within the application. |
| Desktop Assistant user<br><br>[sn_dex_desktop.user] | Responsible for using Desktop Assistant. User does not have the ability to configure any items within the application. |

To get started with Desktop Assistant, see Configuring DEX Desktop Assistant.

## Configuring DEX Desktop Assistant

Customize or create a personalized Home page on Desktop Assistant by configuring its settings to divide it into sections and add cards to those sections, which can help you access applications more efficiently.

Only a Desktop Assistant administrator [sn_dex_desktop.admin] can configure the application.

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To setup Desktop Assistant and begin exploring the features, you need to perform the following steps.

1. Install DEX Desktop Assistant
2. Download and install Desktop Assistant

Refer to the OAuth documentation for instructions on configuring the SSO provider in the instance.

**Note:**
If you run into any problems with Desktop Assistant, you can troubleshoot by accessing the logs at these locations:

- Mac: `Users/[username]/Library/Application Support/desktop_assistant_app/logs`
- Windows: `Users\[username]\AppData\Roaming\desktop_assistant_app\logs`

### Install DEX Desktop Assistant

You can install the Desktop Assistant application [sn_dex_desktop] if you have the admin role.

#### Before you begin

- Ensure that the application and all of its associated ServiceNow Store applications have valid ServiceNow entitlements. For more information, see Get entitlement for a ServiceNow product or application.
- Review the DEX Desktop Assistant application listing in the ServiceNow Store for information on dependencies, licensing or subscription requirements, and release compatibility.
- Ensure that your old version of the app is not running during the installation process if you upgrade to a newer version of Desktop Assistant.

Role required: admin

#### About this task

The following items are installed with Desktop Assistant:

- Roles
- Tables

For more information, see Components installed with Desktop Assistant.

#### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the Desktop Assistant application [sn_dex_desktop] using the filter criteria and search bar.

   You can search for the application by its name or ID. If you cannot find the application, you might have to request it from the ServiceNow Store.

   In the list next to the **Install** button, the versions that are available to you are displayed.
3. Select a version from the list and select **Install**.

   In the Install dialog box that is displayed, any dependencies that are installed along with your application are listed.

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4. If you're prompted, follow the links to the ServiceNow Store to get any additional entitlements for dependencies.
5. **Optional:** If demo data is available and you want to install it, select the **Load demo data** check box.
   Demo data comprises the sample records that describe application features for the common use cases. Load the demo data when you first install the application on a development or test instance.

   **Important:**
   If you don't load the demo data during installation, it's unavailable to load later.

6. Select **Install**.

### Download and install Desktop Assistant

Download and install Desktop Assistant by using operating system-specific installer commands, Desktop Assistant installers, or endpoint management solutions.

#### Before you begin

Make sure that you have installed the Digital End-User Experience application. For more information, see Install Digital End-User Experience.

**Note:**
You can install Desktop Assistant on 75000 devices for each instance.

Role required: sn_dex_desktop.admin

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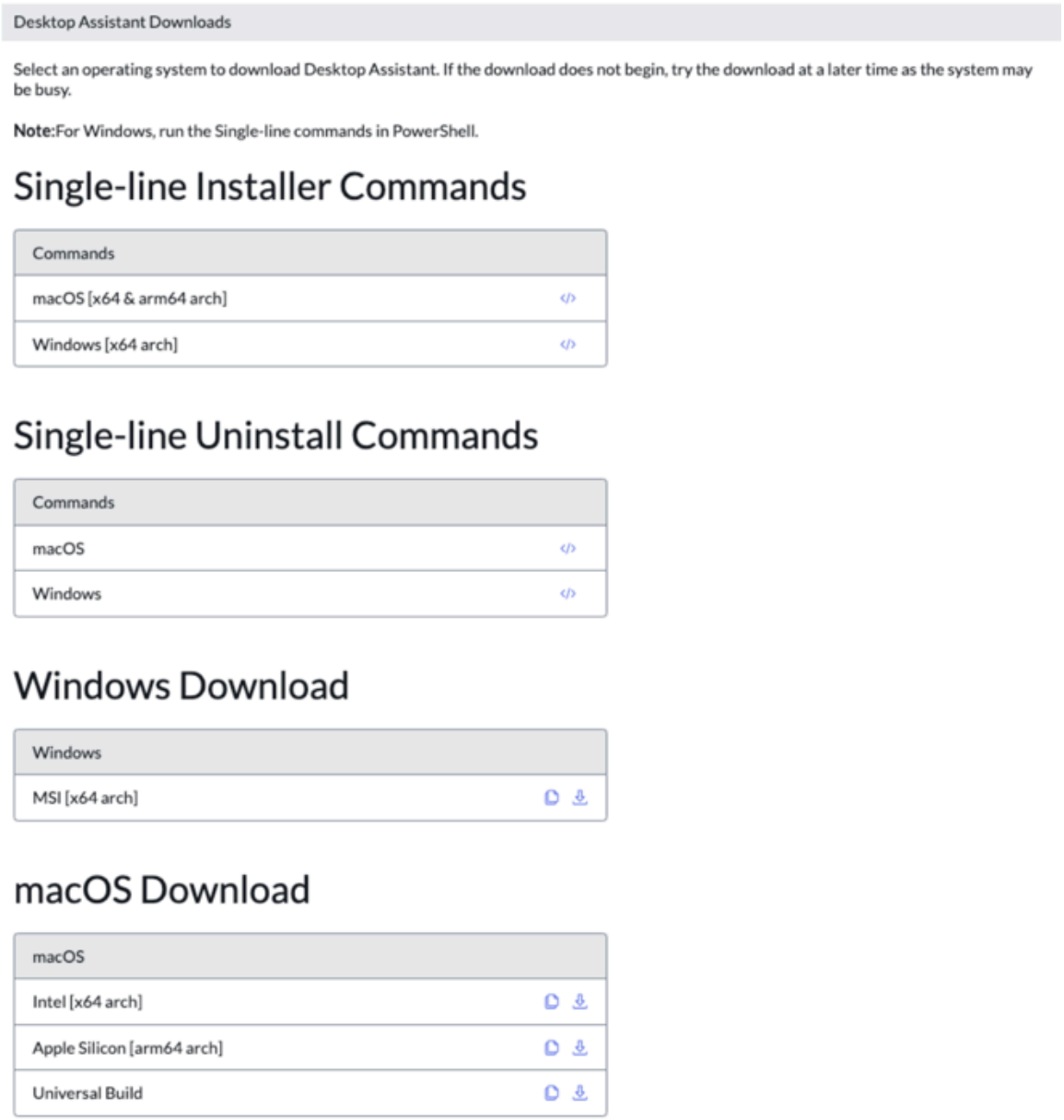
### Procedure

1. Navigate to **All** > **Desktop Assistant** > **Deployment** > **Installer and Uninstaller**.




2. Download and install Desktop Assistant by using installer commands, Desktop Assistant installers, or endpoint management solutions.
   - Download and install Desktop Assistant by executing OS-specific single-line installer commands.

     **Note:**
     You must have administrator privileges to run the single-line installer commands.

     a. Select the copy command icon (</>) to copy the command or script to execute.

     b. On your computer, open Terminal.app (macOS) or run PowerShell (Windows) as administrator.

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c. Paste the command and press Enter.

d. When prompted for a password, enter your active directory password and press Enter.

Desktop Assistant is installed, and the instance URL from the installer is automatically populated in the **Instance URL** field of the Desktop Assistant login page.

- Download and install Desktop Assistant by using the Desktop Assistant installer specific to your operating system.

  a. For Windows devices, see Download Desktop Assistant for Windows.

  b. For macOS devices, see Download Desktop Assistant for Mac.

- Install Desktop Assistant on multiple devices using endpoint management solutions such as Jamf and Microsoft Endpoint Configuration Manager (MECM).

  **Note:**
  You must have administrator privileges to install Desktop Assistant on multiple devices using endpoint management solutions.

  a. Log in to your ServiceNow instance and download Desktop Assistant.

  b. Deploy the Desktop Assistant file on multiple devices using an endpoint management solution.

  c. Update the Desktop Assistant instance URL for all the devices on which you have installed Desktop Assistant.

  For more information, see Update instance URL in the Desktop Assistant configuration file.

3. To obtain Desktop Assistant on your Windows or Mac device, execute the steps detailed in either Download Desktop Assistant for Windows or Download Desktop Assistant for Mac.

### Result
Desktop Assistant is downloaded and installed.

### Download Desktop Assistant for Windows

Download the Desktop Assistant installer on your Windows device to install the Desktop Assistant application.

### Before you begin
Role required: sn_dex_desktop.admin

### Procedure

1. Navigate to **All** > **Desktop Assistant** > **Deployment** > **Installer and Uninstaller**.
2. In the Windows Download section of the Desktop Assistant Downloads page, select the download icon ( ) for the **MSI [x64 arch]** installer.
   The `Desktop_Assistant_<Version>.msi` file is downloaded to your computer.
3. Double-click the setup file and follow the steps in the installation wizard to complete the installation.

### Result
Desktop Assistant is installed. You see the Desktop Assistant application on the Start Menu and the Desktop Assistant icon ( ) on the system tray.

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When you install Desktop Assistant by using the installer, the instance URL field on the login page is not populated automatically. As a system administrator, you can update the instance URL in the Desktop Assistant configuration file. For more information, see Update instance URL in the Desktop Assistant configuration file.

**Note:**
Only the system administrator must update the configuration file or make changes to it while deploying Desktop Assistant on devices.

### Download Desktop Assistant for Mac

Download the Desktop Assistant installer on your macOS device to install the Desktop Assistant application.

#### Before you begin

Role required: sn_dex_desktop.admin

#### Procedure

1. Navigate to **All** > **Desktop Assistant** > **Deployment** > **Installer and Uninstaller**.
2. In the macOS Download section of the Desktop Assistant Downloads page, select the download icon ( ) for the installer you want to download.
   - For macOS devices with Intel chips: Select the **Intel [x64 arch]** installer.
   - For macOS devices with Apple Silicon chips: Select the **Apple Silicon [x64 arch]** installer.
   - For macOS devices with either Intel or Apple Silicon chips: Select the **Universal Build** installer.

   The installer is downloaded to your computer.
3. Double-click and open the downloaded installer file.
   - For macOS devices with Intel chips: Open the `.x64.pkg` file.
   - For macOS devices with Apple Silicon chips: Open the `-arm64.pkg` file.
   - For macOS devices with either Intel or Apple Silicon chips: Open the `-universal.pkg` file.
4. On the installation wizard, select **Continue** to proceed with the installation.
5. Select the destination folder and then select **Continue**.

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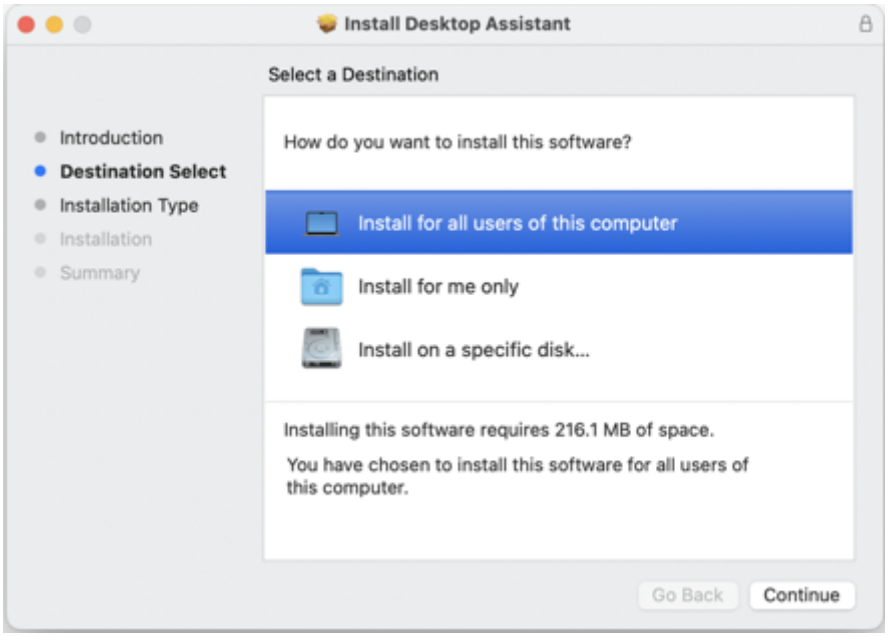
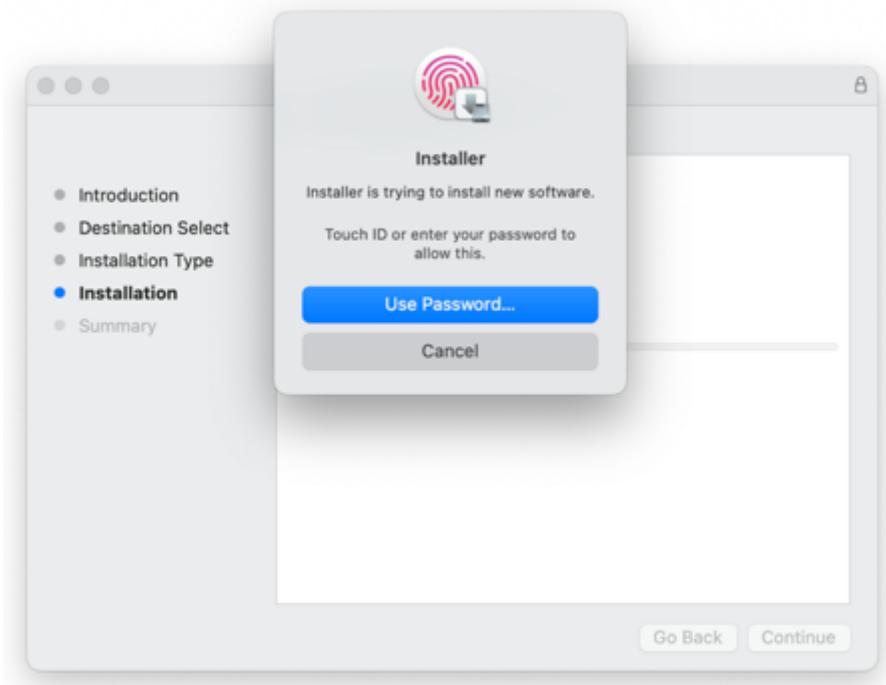



6. In Installation Type, select **Install**.
7. When prompted for a password, select **Use Password**, enter your password, and then select **Continue**.




## Result

The Desktop Assistant application is installed on your macOS device.

When you install Desktop Assistant by using the installer, the instance URL field on the login page is not populated automatically. As a system administrator, you can update the instance URL in the Desktop Assistant configuration file. For more information, see Update instance URL in the Desktop Assistant configuration file.

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**Note:**
Only the system administrator must update the configuration file or make changes to it while deploying Desktop Assistant on devices.

### Update instance URL in the Desktop Assistant configuration file

Update the instance URL in the Desktop Assistant configuration file to automatically populate the Desktop Assistant login page instance URL on devices on which it is installed.

#### Before you begin
Role required: admin

**Note:**
Only the system administrator must update the configuration file or make changes to it while deploying Desktop Assistant on devices.

Desktop Assistant users can update the instance URL when logging in to the application. For more information, see Open Desktop Assistant.

#### Procedure

1. On your computer, navigate to the folder that contains the `settings.json` file.
   - On Windows devices: Navigate to the `C:\Users\user_name\AppData\Roaming\desktop_assistant_app` folder.
   - On macOS devices: Navigate to the `Users/user_name/Library/Application Support/desktop_assistant_app` folder.

     **Note:**
     If you don't see a folder, use Command+Shift+period (.) key to show hidden folders.
2. Find and open the `settings.json` file.
3. Enter the Desktop Assistant instance URL in the *`instanceURL`* field of the JSON file.
4. Save and close the JSON file.

### Configure OAuth details

Edit OAuth field values, as required.

#### Before you begin
Ensure you have set up the SSO provider and configure it in the instance to ensure its functionality.

Role required: sn_dex_desktop.admin

#### Procedure

1. In your instance, navigate to **System OAuth** > **Application Registry**.
2. From the list, select **Desktop Assistant**.

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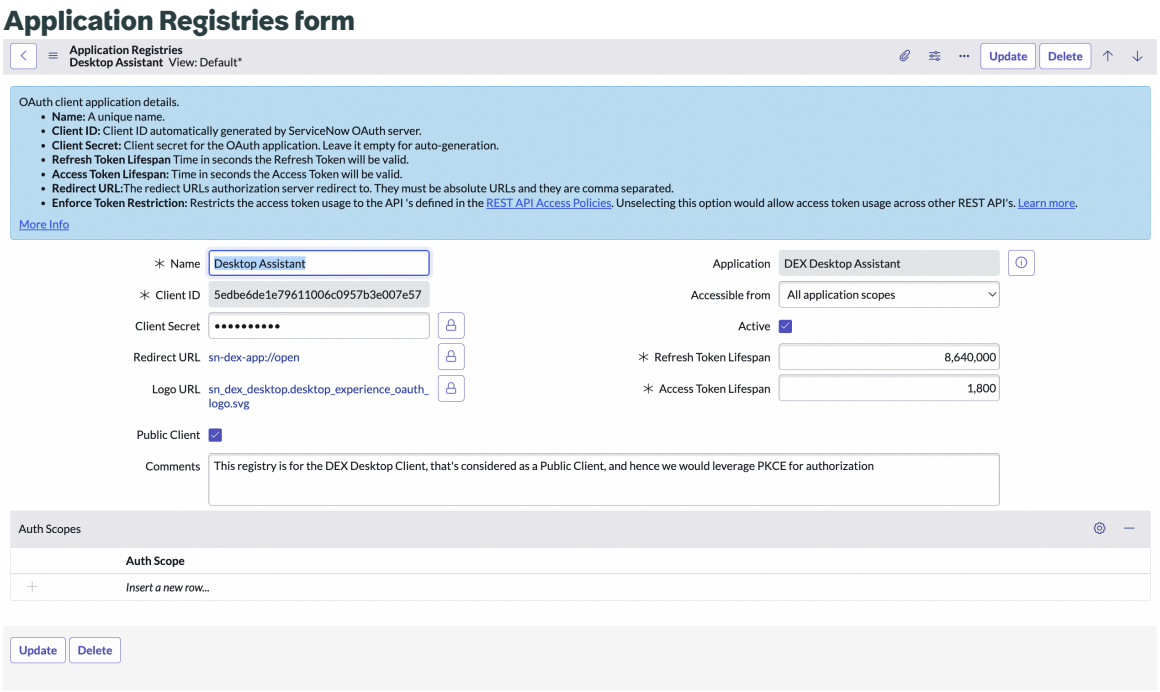


3. On the form, edit the required fields.
   To know about each field and their corresponding descriptions, see Application Registries form.
4. Select **Update**.

### Result
The OAuth client application details are updated.

## Uninstall DEX Desktop Assistant

Remove Desktop Assistant effortlessly using single-line uninstaller commands for a clean system.

### Before you begin
Ensure you have administrator privileges for the operating system to run the one-liner script.

Role required: sn_dex_desktop.admin

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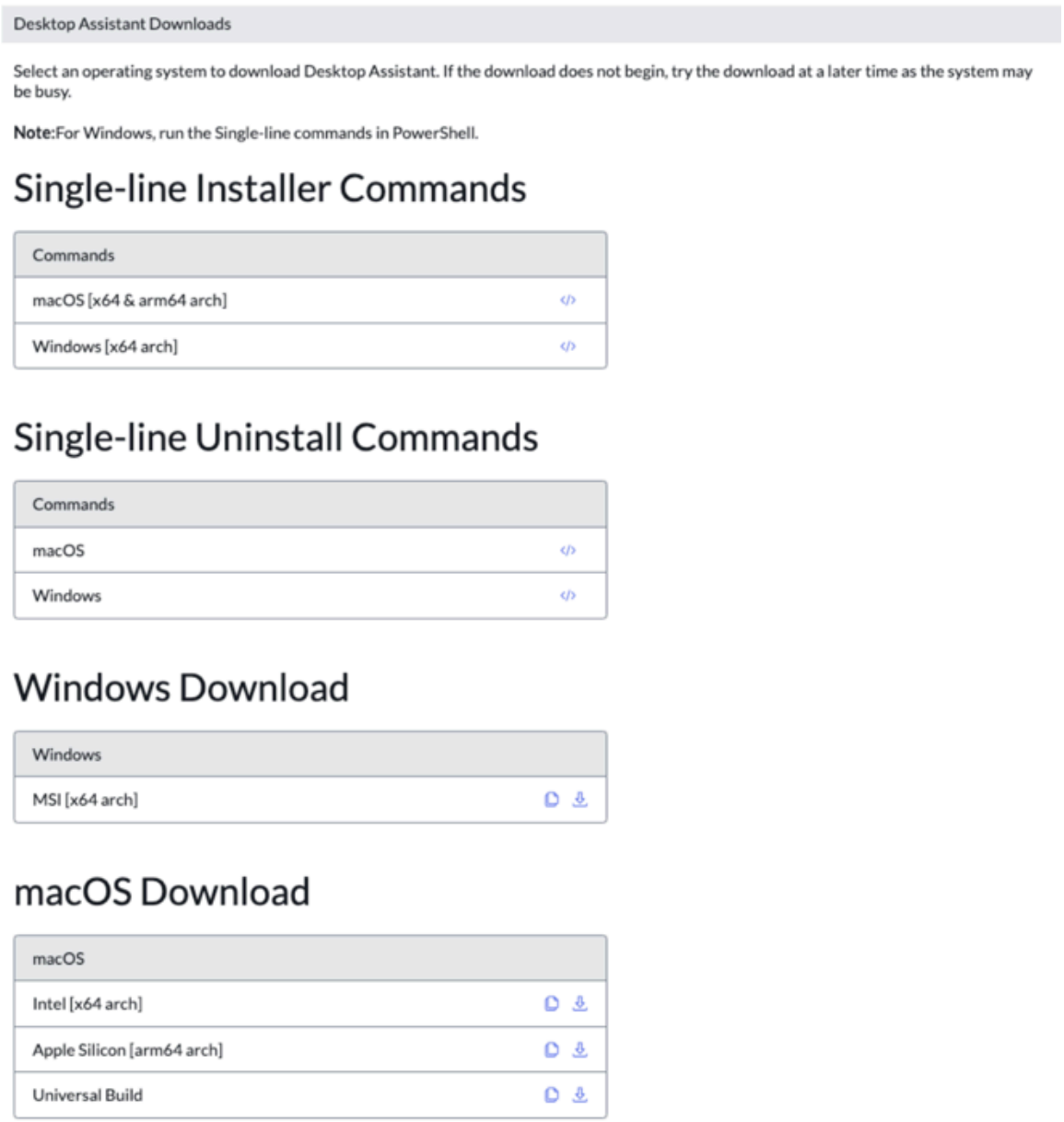
### Procedure

**1.** Navigate to *Desktop Assistant* > **Deployment** > **Installer and Uninstaller**.




**2.** Under the Single-line Uninstall Commands section, perform the following steps:

- **a.** Select the command icon (</>) to copy the command or script to execute.
- **b.** On your system, open Terminal.app (Mac) or PowerShell (Windows).
- **c.** Paste the command and press Enter.
- **d.** When prompted for a password, enter your active directory password and press Enter.

### Result

The Desktop Assistant app is uninstalled.

## Change Home page title and description

Change the title and description of the Home page, as required.

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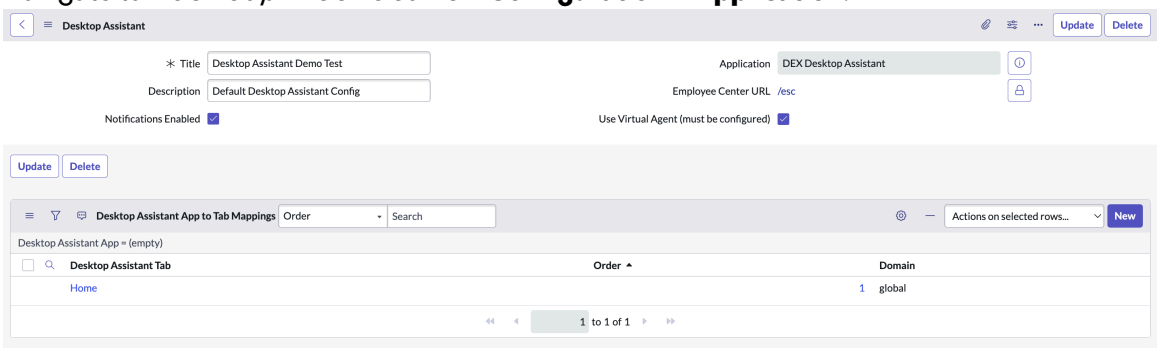
### Before you begin

Ensure that both the DEX Desktop Assistant plugin [sn_dex_desktop] plugin and the Desktop Assistant application have been installed. For more information, see Install DEX Desktop Assistant and Download and install Desktop Assistant.

Role required: sn_dex_desktop.admin

### Procedure

1. Navigate to *Desktop Assistant* > **Configuration** > **Application**.




2. On the form, edit the required fields.

| Field | Description |
|---|---|
| Title | Title of the Home page. |
| Description | Brief overview of the content and purpose of the product. |
| Employee Center URL | URL to the Employee Center where employees can access important resources, information, and tools related to their work. |
| Notifications Enabled | Option to enable or disable the notification bell icon. |
| Use Virtual Agent (must be configured) | Option to enable or disable the chat icon. |

3. Select **Update**.

### Result

The Home page information is updated.

## Enable notifications

Stay informed and engaged by receiving timely updates and notifications about important events and activities within the system.

### Before you begin

Role required: sn_dex_desktop.admin

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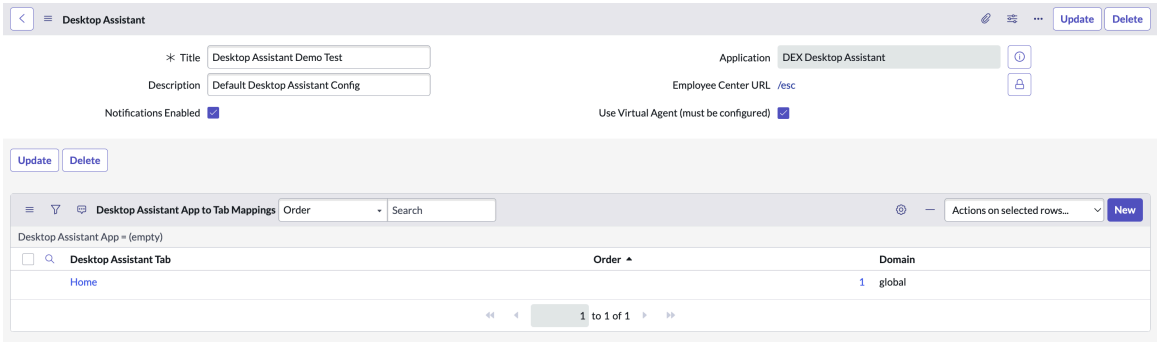
## Procedure

1. Navigate to *Desktop Assistant* > **Configuration** > **Application**.




2. On the Desktop Assistant page, select **Notifications Enabled**.
3. Select **Update**.

## Result

The notifications bell icon ( ) appears on the Desktop Assistant header.

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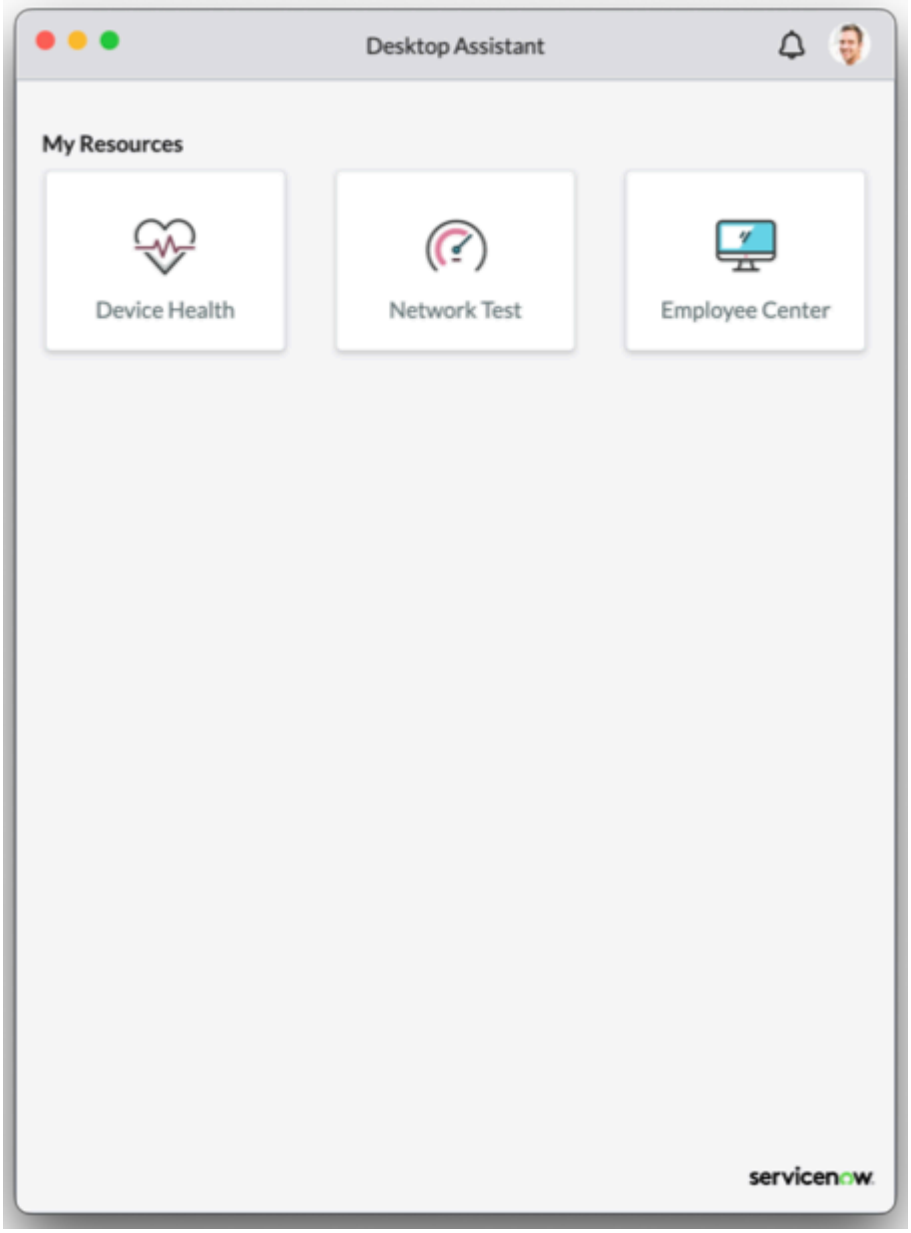


To view notifications and stay up-to-date with important information and events, see View notifications.

### Enable Virtual Agent or chat

Enable Virtual Agent so that you can find solutions to your inquiries quickly and seamlessly, without having to wait on hold or speak to a representative over the phone.

## Before you begin

Ensure you have installed the Glide Virtual Agent plugin [com.glide.cs.chatbot] and the plugin is active.

Role required: sn_dex_desktop.admin

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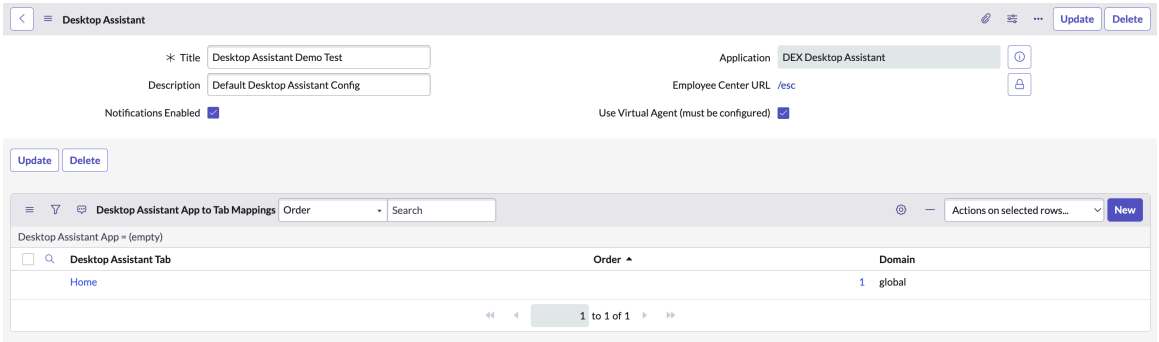
## Procedure

1. Navigate to *Desktop Assistant* > **Configuration** > **Application**.




2. On the Desktop Assistant page, select **Use Virtual Agent (must be configured)**.
   For information on how to configure Virtual Agent, see Configuring Virtual Agent.
3. Select **Update**.

## Result

The virtual agent or chat icon ( ) appears on the Desktop Assistant header.

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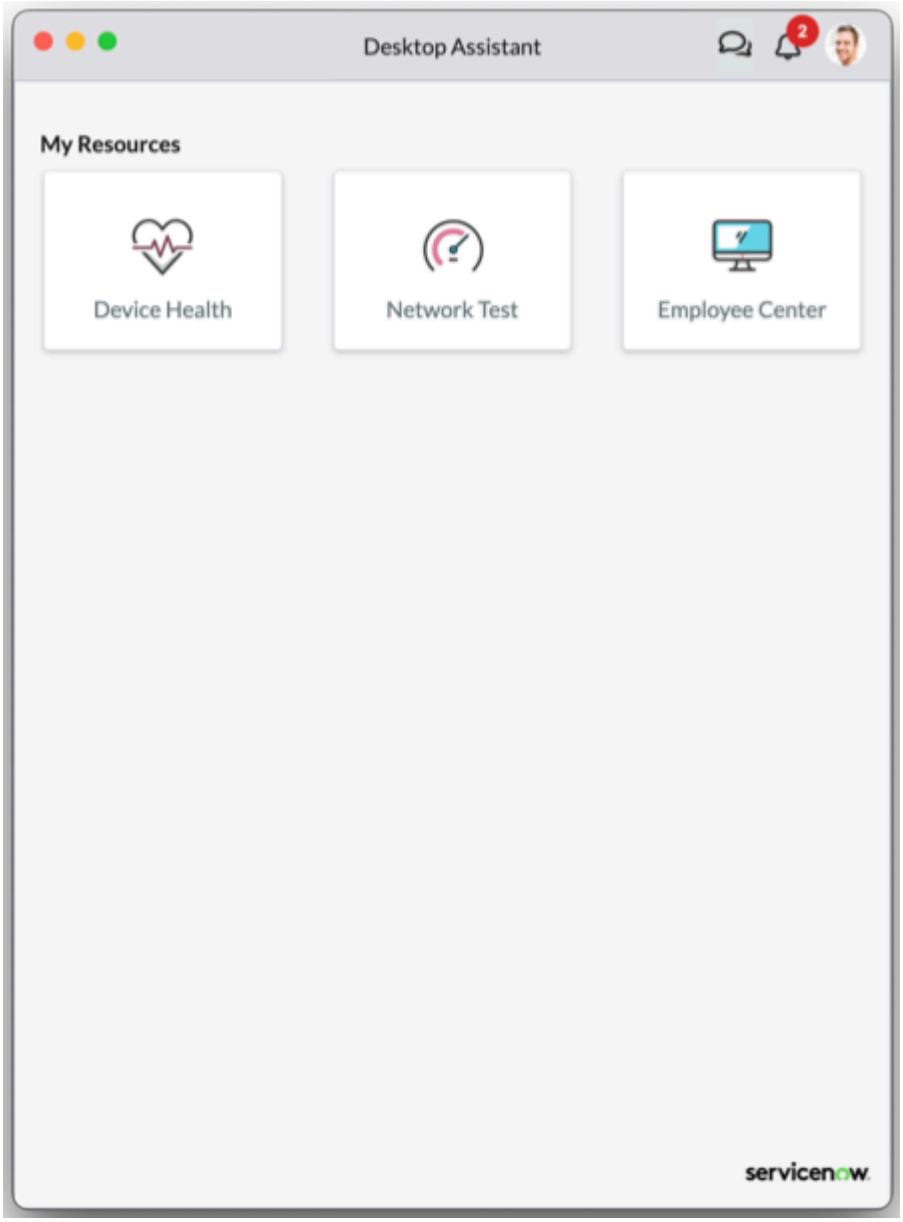
**Desktop Assistant with Virtual Agent icon**




To open the chat window, select the virtual agent or chat icon ( ).

The chat window opens.

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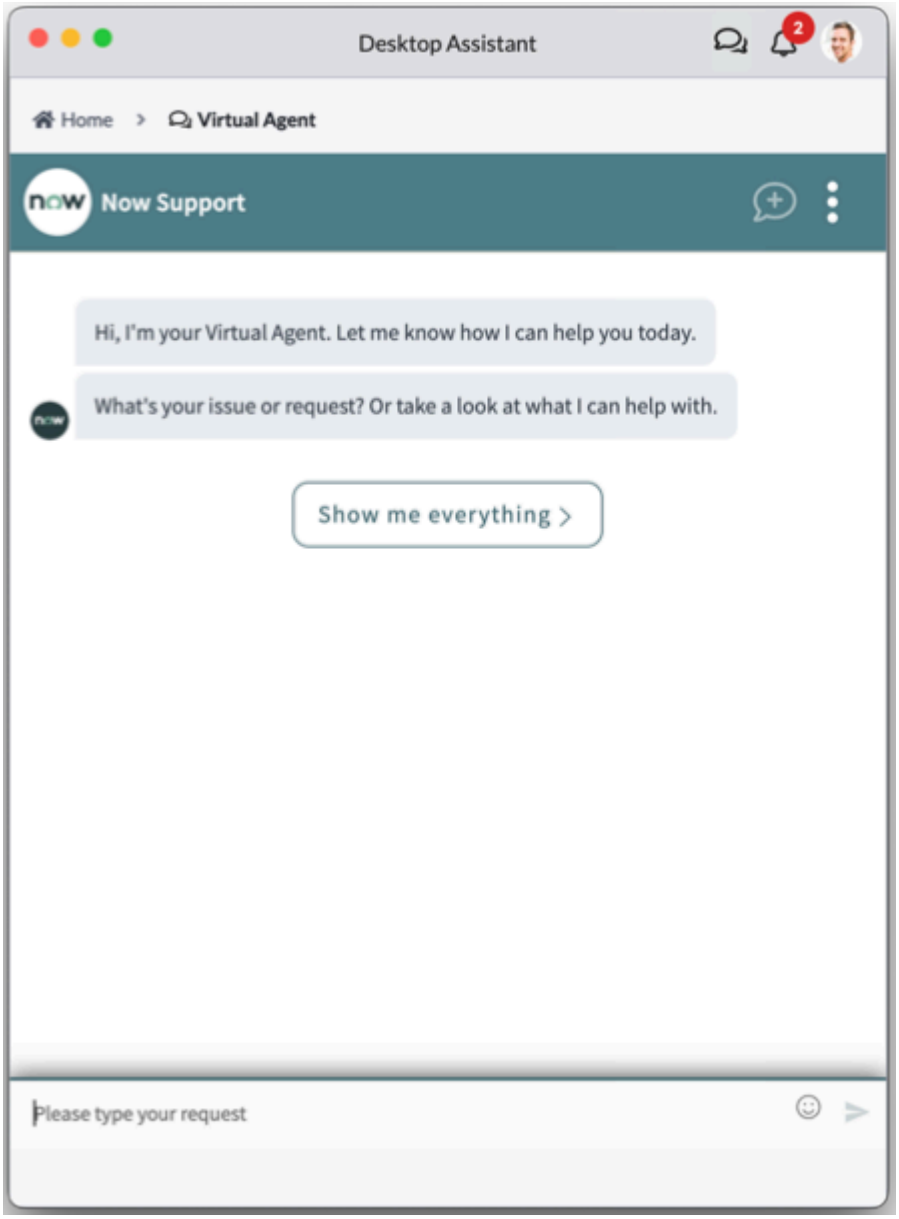


**Note:**
To configure the chat branding, see Set up your Virtual Agent bot's branding.

### Create a Records View card

Create a records view card so that you have direct access to view the list of records in a target table.

### Before you begin

Ensure that both the DEX Desktop Assistant plugin [sn_dex_desktop] plugin and the Desktop Assistant application have been installed. For more information, see Install DEX Desktop Assistant and Download and install Desktop Assistant.

Role required: sn_dex_desktop.admin

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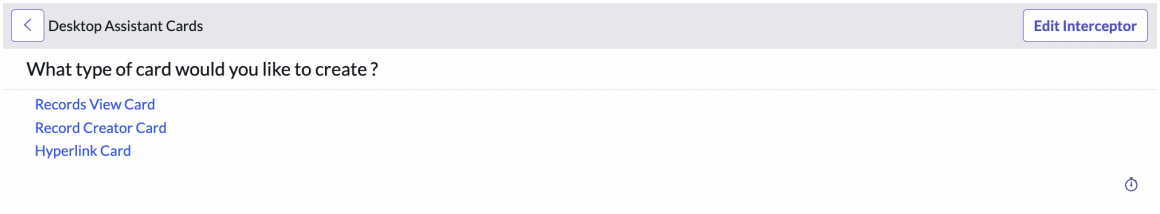
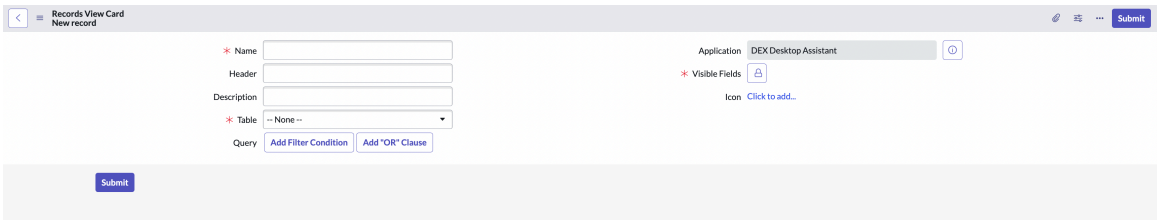
### Procedure

1. Navigate to *Desktop Assistant* > **Configuration** > **New card**.




2. Select **Records View Card**.




3. On the form, fill in the fields.
   To know about each fields and their corresponding descriptions, see Create a Records View card.
4. Select **Submit**.

### Result
A new records view card is created.

### What to do next
Map the card to the section under which it should appear. For more information, see Map a card to a section.

## Create a Record Creator card

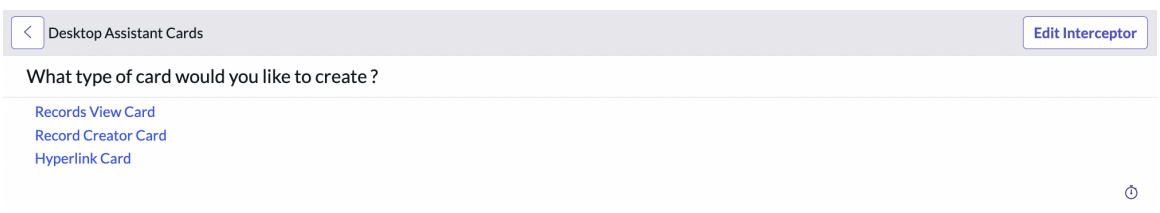
Create a record creator card that enables you to create a record rather than view.

### Before you begin
Ensure that both the DEX Desktop Assistant plugin [sn_dex_desktop] plugin and the Desktop Assistant application have been installed. For more information, see Install DEX Desktop Assistant and Download and install Desktop Assistant.

Role required: sn_dex_desktop.admin

### Procedure

1. Navigate to *Desktop Assistant* > **Configuration** > **New card**.




2. Select **Record Creator Card**.

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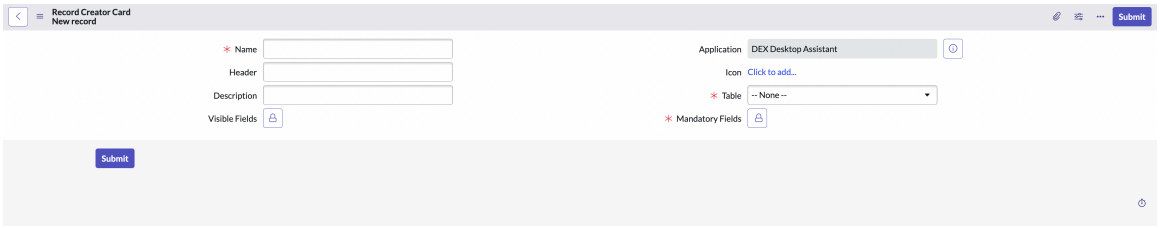



3. On the form, fill in the fields.
   To know about the each fields and their corresponding descriptions, see Record Creator card form.
4. Select **Submit**.

### Result
A new record creator card is created.

### What to do next
Map the card to the section under which it should appear. For more information, see Map a card to a section.

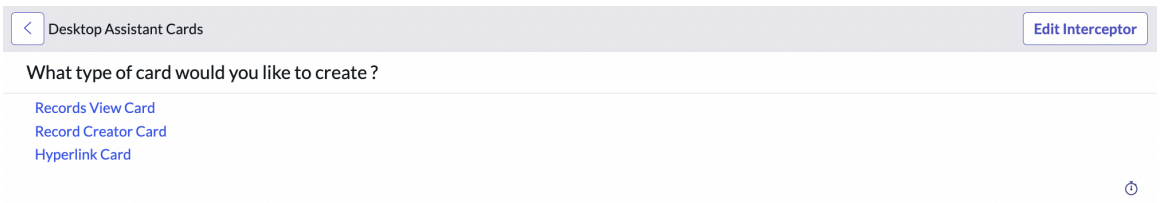
## Create a Hyperlink card

Create a hyperlink card so that you have direct access to a targeted site, page, or records.

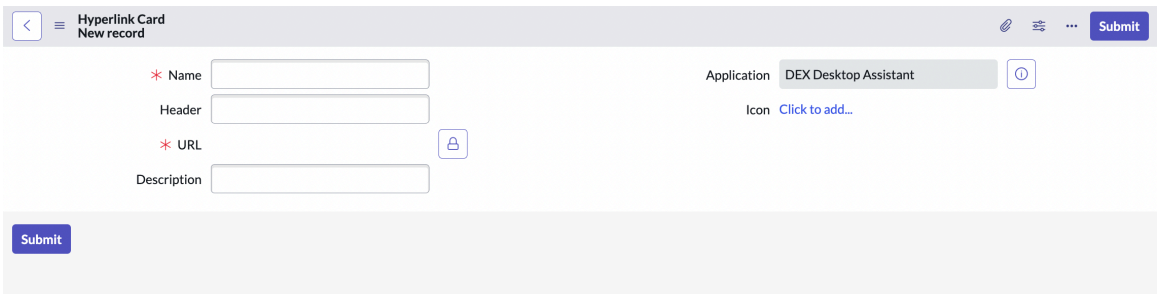
### Before you begin
Ensure that both the DEX Desktop Assistant plugin [sn_dex_desktop] plugin and the Desktop Assistant application have been installed. For more information, see Install DEX Desktop Assistant and Download and install Desktop Assistant.

Role required: sn_dex_desktop.admin

### Procedure
1. Navigate to *Desktop Assistant* > **Configuration** > **New card**.




2. Select **Hyperlink Card**.




3. On the form, fill in the fields.

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To know about each fields and their corresponding descriptions, see Hyperlink card form.

4. Select **Submit**.

### Result
A new hyperlink card is created.

### What to do next
Map the card to the section under which it should appear. For more information, see Map a card to a section.

## Map a card to a section

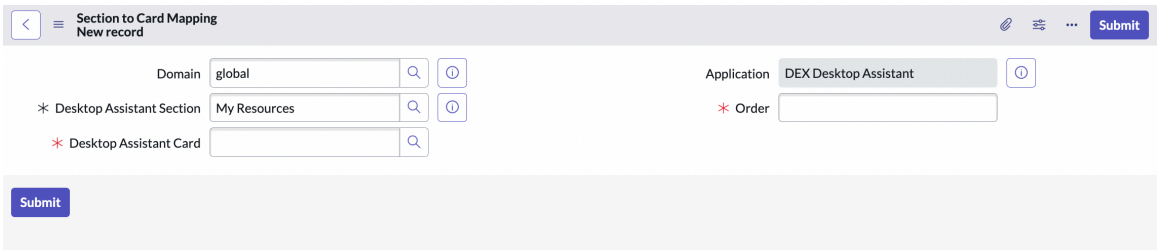
Map the card to the section under which it must appear.

### Before you begin
Ensure that both the DEX Desktop Assistant plugin [sn_dex_desktop] plugin and the Desktop Assistant application have been installed. For more information, see Install DEX Desktop Assistant and Download and install Desktop Assistant.

Role required: sn_dex_desktop.admin

### About this task
By default, Desktop Assistant provides: My Resources.

### Procedure
1. Navigate to *Desktop Assistant* > **Configuration** > **<section_name>**.
2. In the Section to Card Mappings section, select **New**.




3. In the *Desktop Assistant* **Card** field, select the card you have created.
4. In the **Order** field, select an order number for the card.
   The order number is the sequence in which the card is positioned in the section.
5. Select **Submit**.

### Result
The card is displayed under the specific section that you have selected.

## Delete a card from the Home page

Delete a card when you no longer need it.

### Before you begin
Role required: sn_dex_desktop.admin

### Procedure
1. Navigate to *Desktop Assistant* > **Configuration** > **Home**.
2. Select the home page name from which you want to remove the card.

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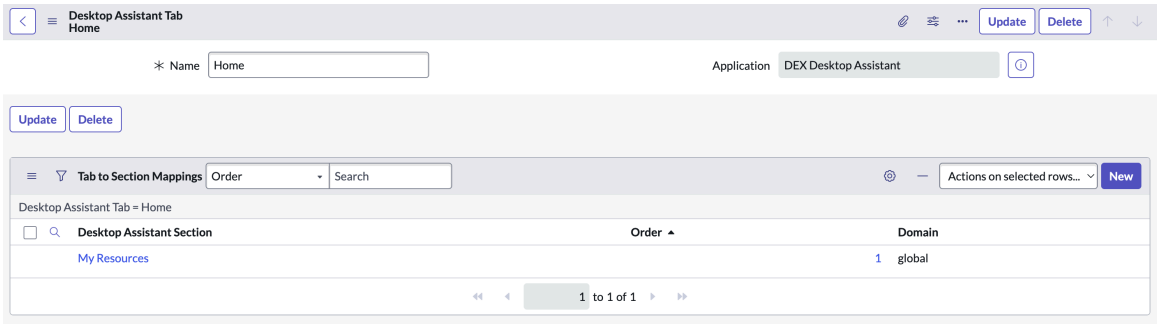
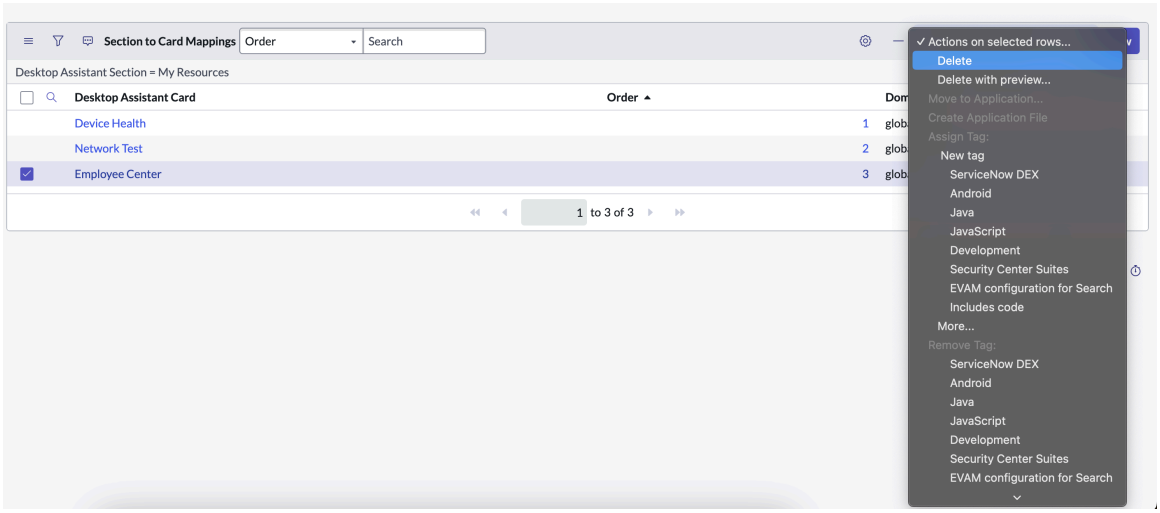
3. Under *Desktop Assistant* **Section**, select the section name under which the card is positioned.




4. From the *Desktop Assistant* **Card** column, select the check box that appears before the name of the card that you want to remove.
5. From the Actions on selected rows drop-down list, select **Delete**.




6. In the Confirmation window, select **Delete**.

### Result
The card is deleted.

## Add a section in the Home page

Add a section so that you can organize related cards under that section for easy navigation.

### Before you begin
Ensure that both the DEX Desktop Assistant plugin [sn_dex_desktop] plugin and the Desktop Assistant application have been installed. For more information, see Install DEX Desktop Assistant and Download and install Desktop Assistant.

Role required: sn_dex_desktop.admin

### Procedure
1. Navigate to *Desktop Assistant* > **Configuration** > **Home**.
2. Select the name of the home page for which you want to add a section.
3. In the Tab to Sections Mappings section, select **New**.

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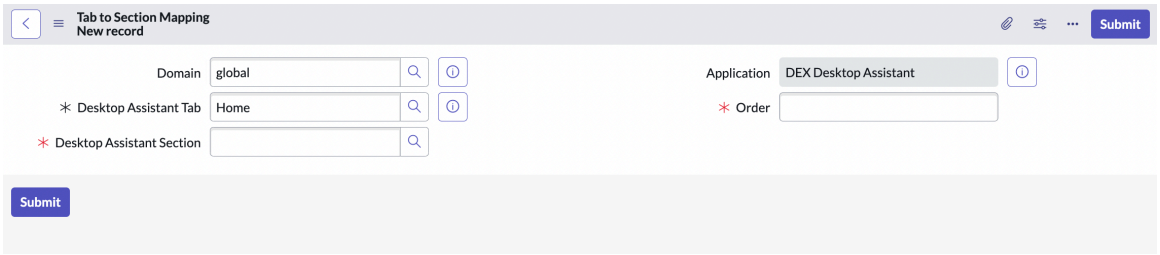


4. Perform any of the following actions:
   - If you want to select an already existing section, perform the following steps:
     a. In the *Desktop Assistant* **Section** field, select the magnifying glass icon ( ).
     b. Select the section name and select **Submit**.

        The section is created on the Desktop Assistant home page.
   - If you want to create a new section, perform the following steps:
     a. In the *Desktop Assistant* **Section** field, select the magnifying glass icon ( ) and then select **New**.
     b. In the **Name** field, enter the name of the section.
     c. Select **Submit**.

        You are directed to the Tab to Section Mapping page where you can see the section name in the *Desktop Assistant* **Section** field.

     d. Select **Submit**.

### Result
The section is created on the *Desktop Assistant* home page.

## Delete a section from the Home page

Delete a section when you no longer need it in.

### Before you begin
Role required: sn_dex_desktop.admin

### Procedure
1. Navigate to *Desktop Assistant* > **Configuration** > **Home**.
2. Under *Desktop Assistant* Section, select the check box that appears before the name of the section that you want to remove.
3. From the Actions on selected rows drop-down list, select **Delete**.

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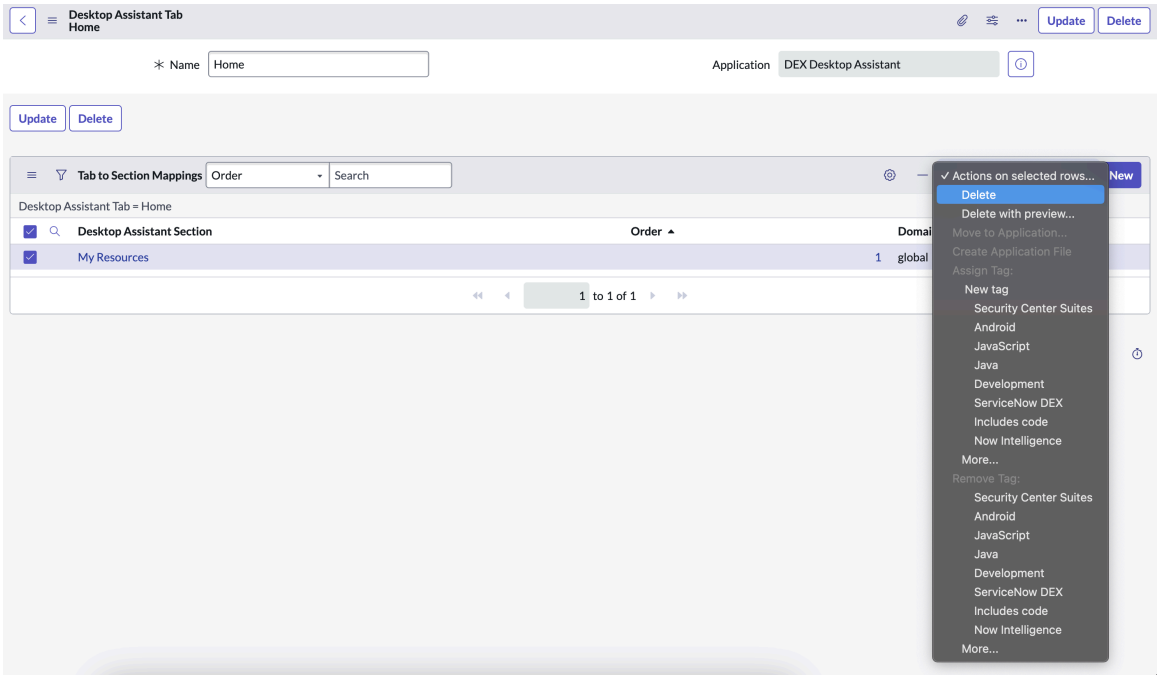


4. In the Confirmation window, select **Delete**.

### Result
The section is removed from the home page.

## View Desktop Assistant usage metrics

Track the connection status of your device, user login status, and application version, ensuring seamless communication with the ServiceNow instance.

### Before you begin
Ensure that both the DEX Desktop Assistant plugin [sn_dex_desktop] plugin and the Desktop Assistant application have been installed. For more information, see Install DEX Desktop Assistant and Download and install Desktop Assistant.

Role required: sn_dex_desktop.admin

### Procedure

Navigate to *Desktop Assistant* > **Usage metrics**.

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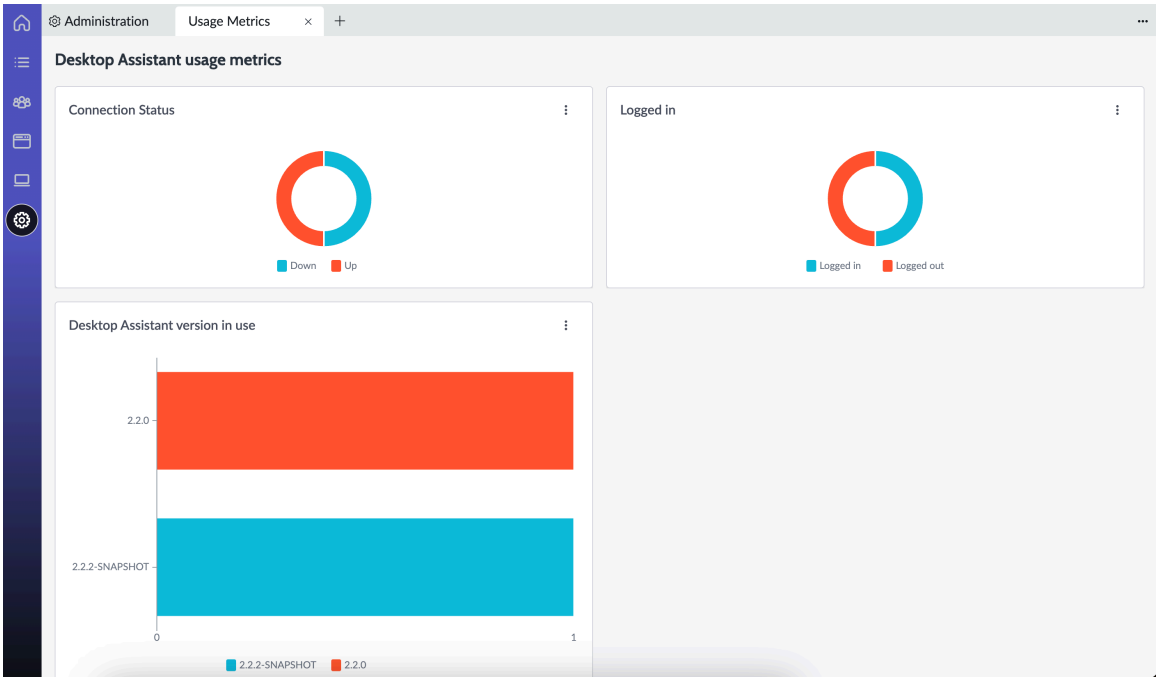


**Note:**
Data pertaining to any user who remains inactive for 15 days is not displayed on the dashboard. For information on each cards, see Desktop Assistant usage metrics.

## Using DEX Desktop Assistant

DEX Desktop Assistant provides you with a quick access to some of the popular apps and services. It gives access to your requests, device health, outages, local applications, and also helps you to perform network tests.

**Note:**
If you run into any problems with Desktop Assistant, you can troubleshoot by accessing the logs at these locations:

- Mac: `Users/[username]/Library/Application Support/desktop_assistant_app/logs`
- Windows: `Users\[username]\AppData\Roaming\desktop_assistant_app\logs`

### Accessing Desktop Assistant

Get insights across different Desktop Assistant features by exploring components within the application.

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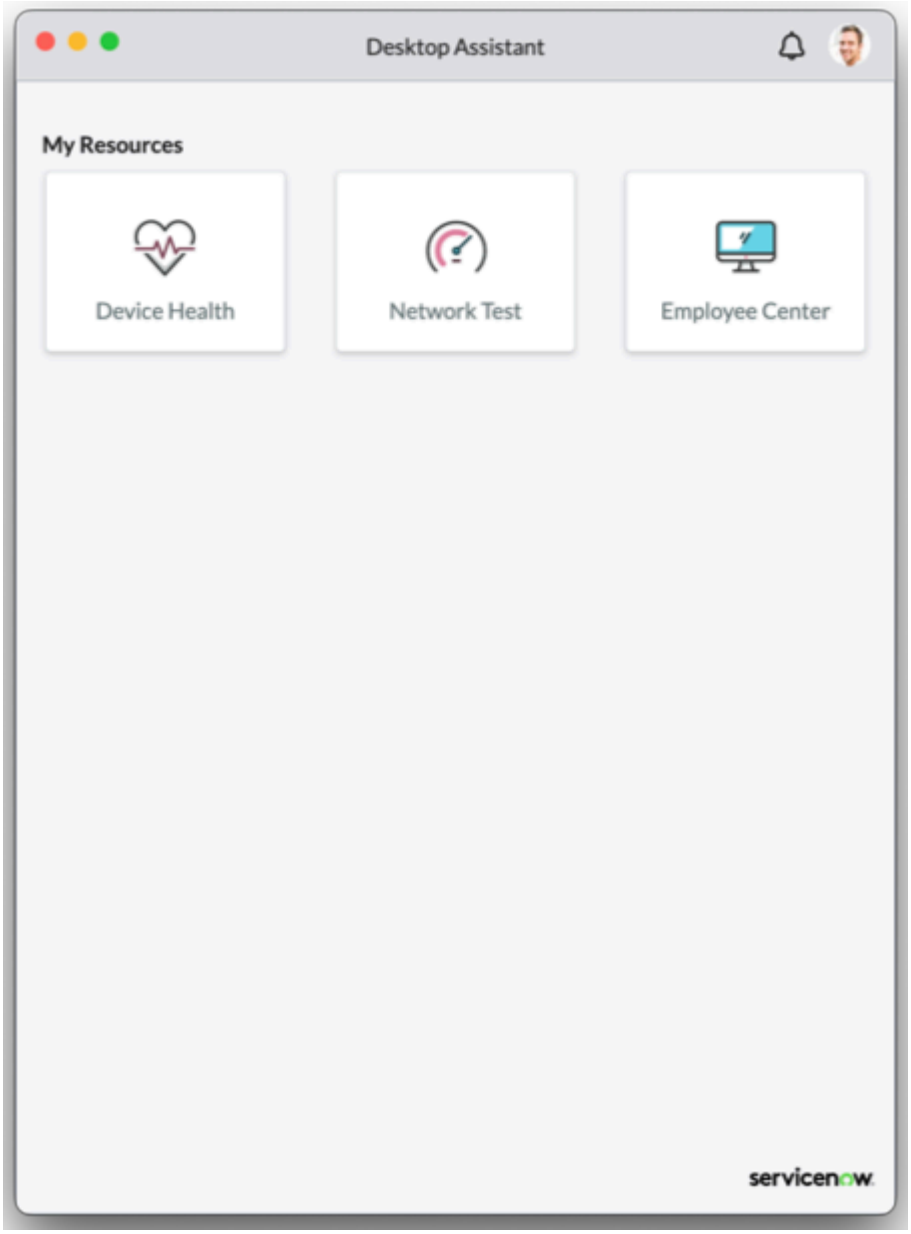
### Desktop Assistant Home page




### Home page components

| Components | Description |
|---|---|
| Header | Header includes the name of the home page, the notification icon and the user icon. The notification bell icon ( ) displays a small red dot with number to indicate the number of new notifications. The user's profile icon ( ) is the user log off icon. |
| Sections | Sections make it easy for you to search for items by arranging items sequentially and in logical groups. By default, ServiceNow provides My Resources.<br><br>Desktop Assistant administrator can configure the section. For more information, see Add a section in the Home page. |

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**Home page components (continued)**

| Components | Description |
| --- | --- |
| Cards | Application shortcuts that help you to access applications quickly.<br><br>Desktop Assistant administrator can add or remove cards from any section. For more information, see Create a Hyperlink card or Delete a card from the Home page. |

### Open Desktop Assistant

Open or log in to Desktop Assistant to get an easy access to ServiceNow functionalities such as your applications, system activity, your requests, network speed of your system, and Employee Center.

## Before you begin

Ensure that both the DEX Desktop Assistant plugin [sn_dex_desktop] plugin and the Desktop Assistant application have been installed. For more information, see Install DEX Desktop Assistant and Download and install Desktop Assistant.

Role required: sn_dex_desktop.user or sn_dex_desktop.admin

## About this task

If you see the `Incompatibility application version detected` message, contact the administrator.

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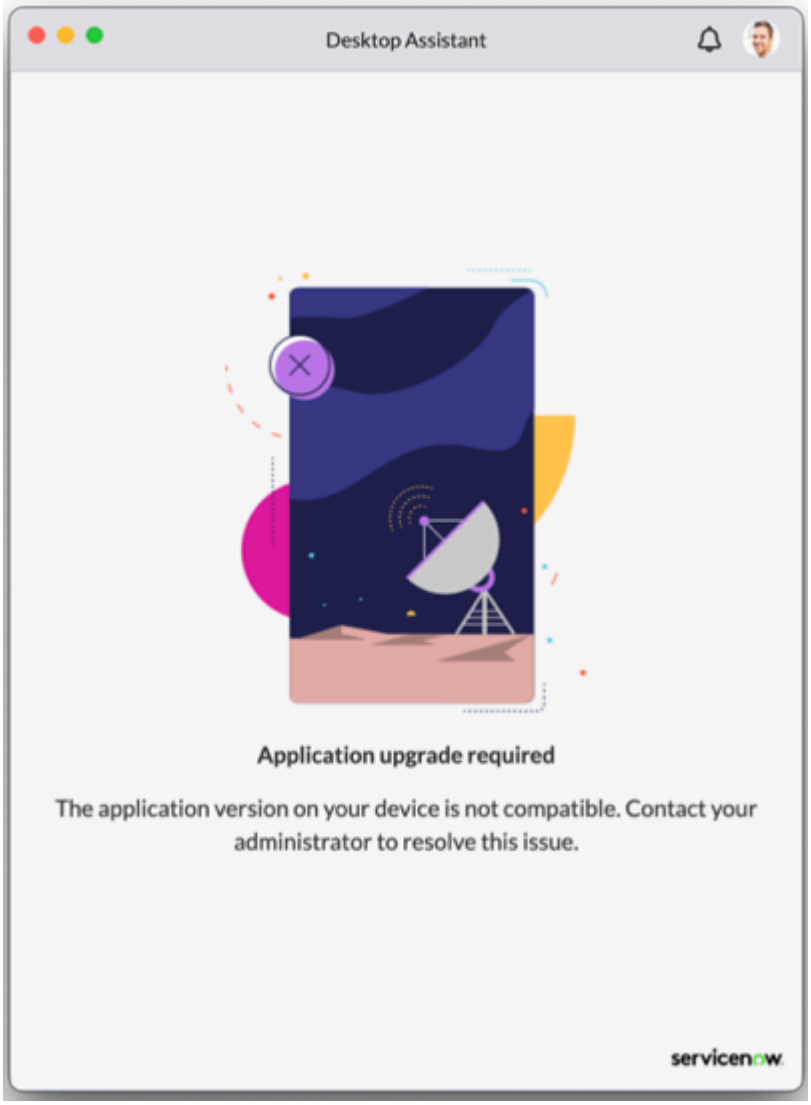


**Note:**
The administrator should navigate to Install DEX Desktop Assistant on their instance and use one of the provided methods to install the latest version of Desktop Assistant.

### Procedure

1. From your system tray, right-click the Desktop Assistant icon ( ) and then select **Open**.

   The Desktop Assistant login window appears.

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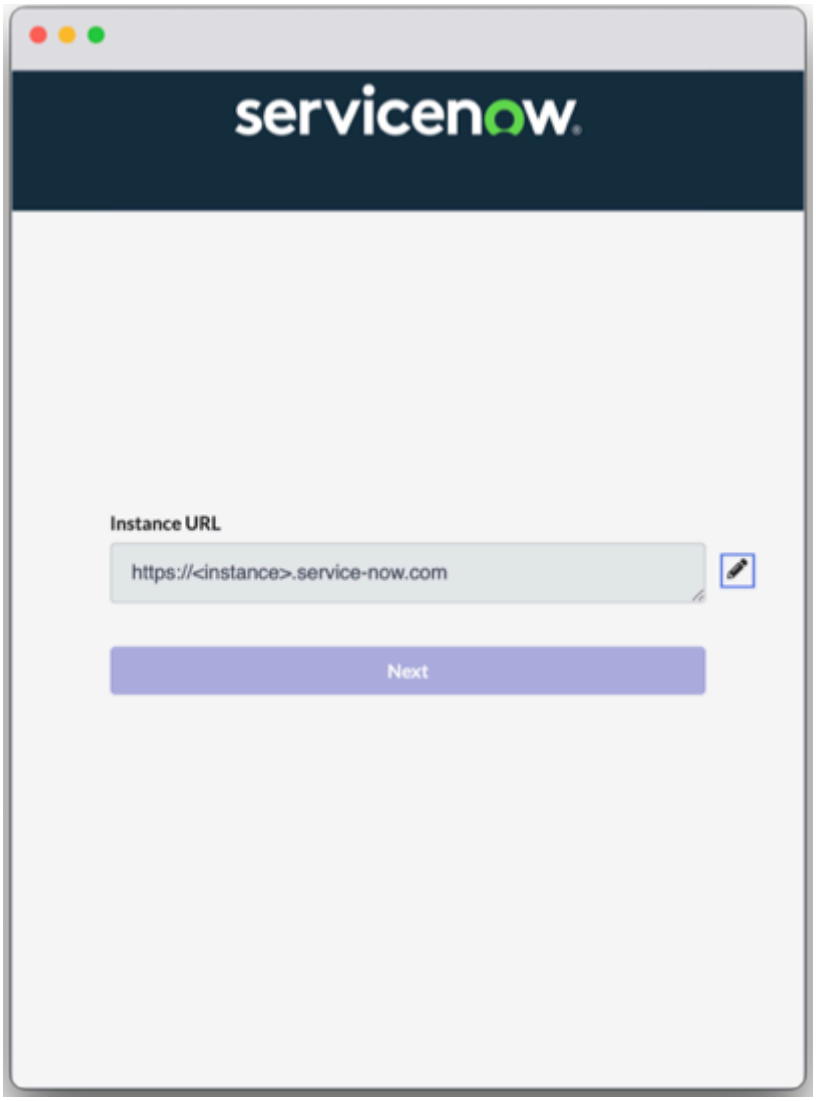


2. In the **Instance URL** field, enter the ServiceNow instance URL.
3. Click **Next**.
   The authentication window opens.

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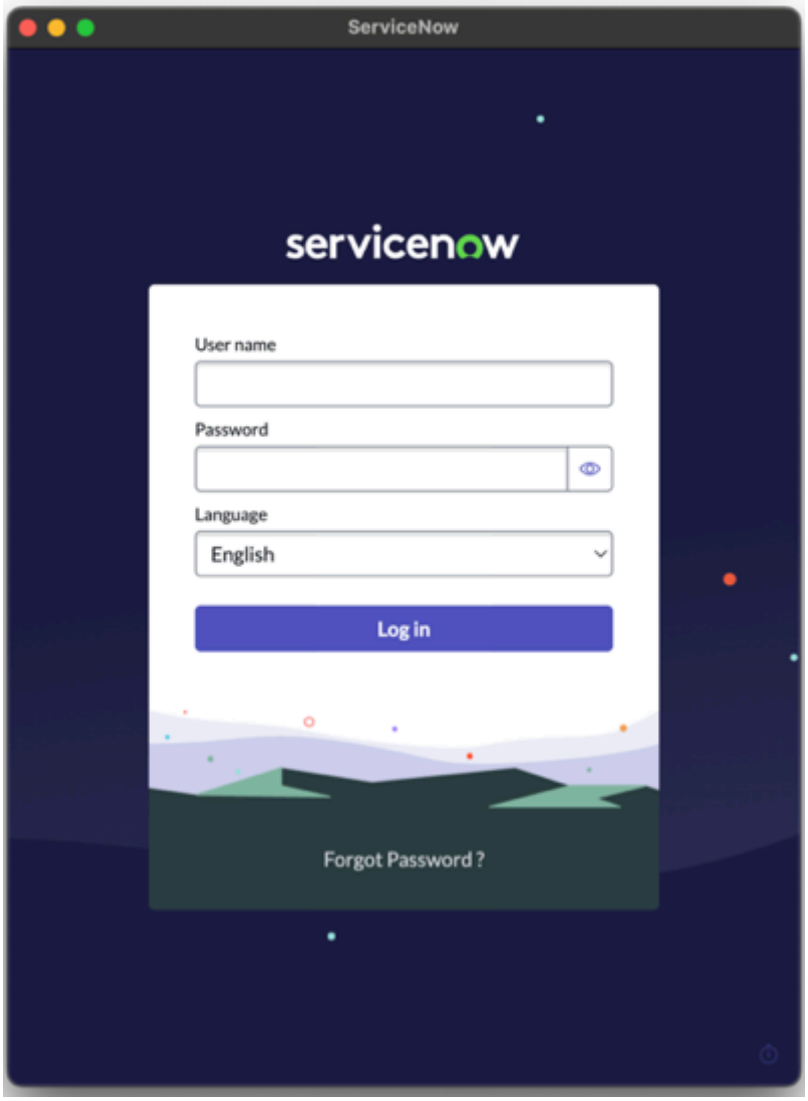


If you can't remember your login details, use the **Forgot password?** feature to reset your password.

4. Perform any one of the following actions to login:
   - When you do not have Single Sign-On (SSO):
     - In the **Username** and **Password** field, enter the username and password for the instance.
     - Click **Log in**.
     - Allow Desktop Assistant to connect to your ServiceNow account by clicking **Allow**.

       The Desktop Assistant Home page opens.

       **Note:**
       To have a SSO login, you should set up the SSO provider and configure SSO in the instance. To know more about configuring SSO, see Configure OAuth details.

   - When you have Single Sign-On (SSO):

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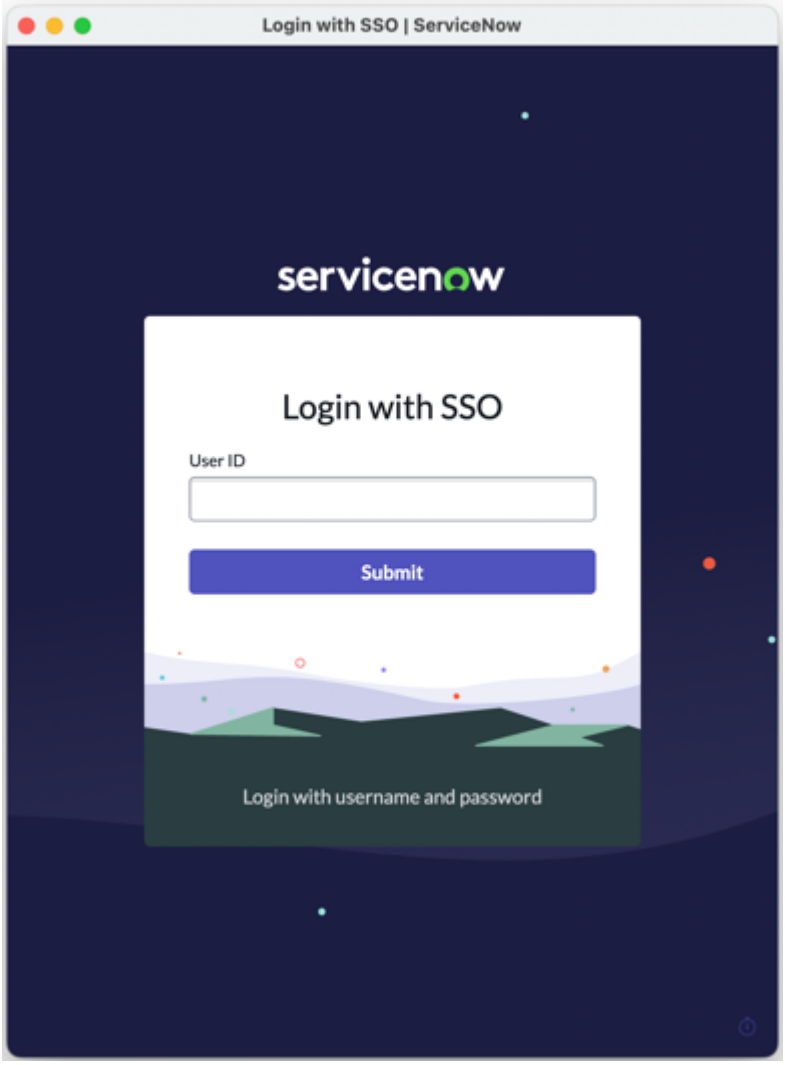
- Click the **Login with SSO** link.




- In the **User ID** field, enter the your user ID.
- Click **Submit**.

  You are redirected to the SSO login screen.

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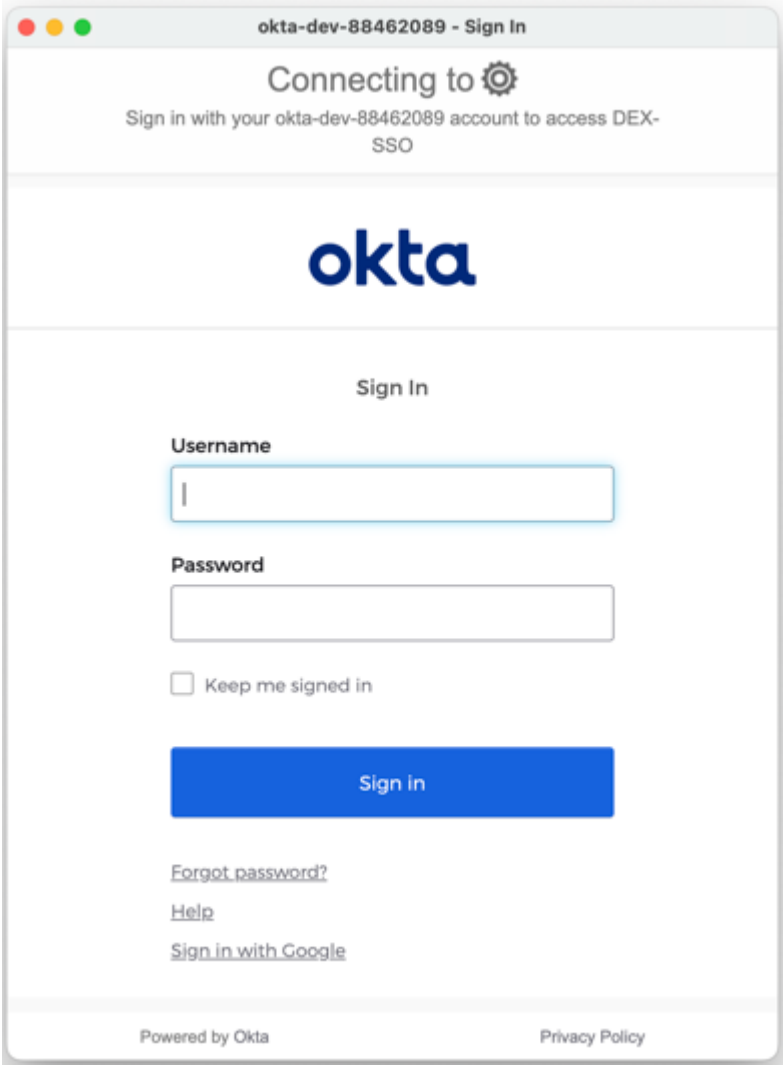


- In the **Username** and **Password** field, enter your username and password.
- Click **Sign in**.
- Allow Desktop Assistant to connect to your ServiceNow account by clicking **Allow**.

### Result
The Desktop Assistant Home page opens.

## View notifications

Stay up-to-date with important information and events in real-time.

### Before you begin
Ensure that both the DEX Desktop Assistant plugin [sn_dex_desktop] plugin and the Desktop Assistant application have been installed. For more information, see Install DEX Desktop Assistant and Download and install Desktop Assistant.

Role required: sn_dex_desktop.user or sn_dex_desktop.admin

### About this task
Notifications initiated by users themselves are not displayed in the Desktop Assistant application.

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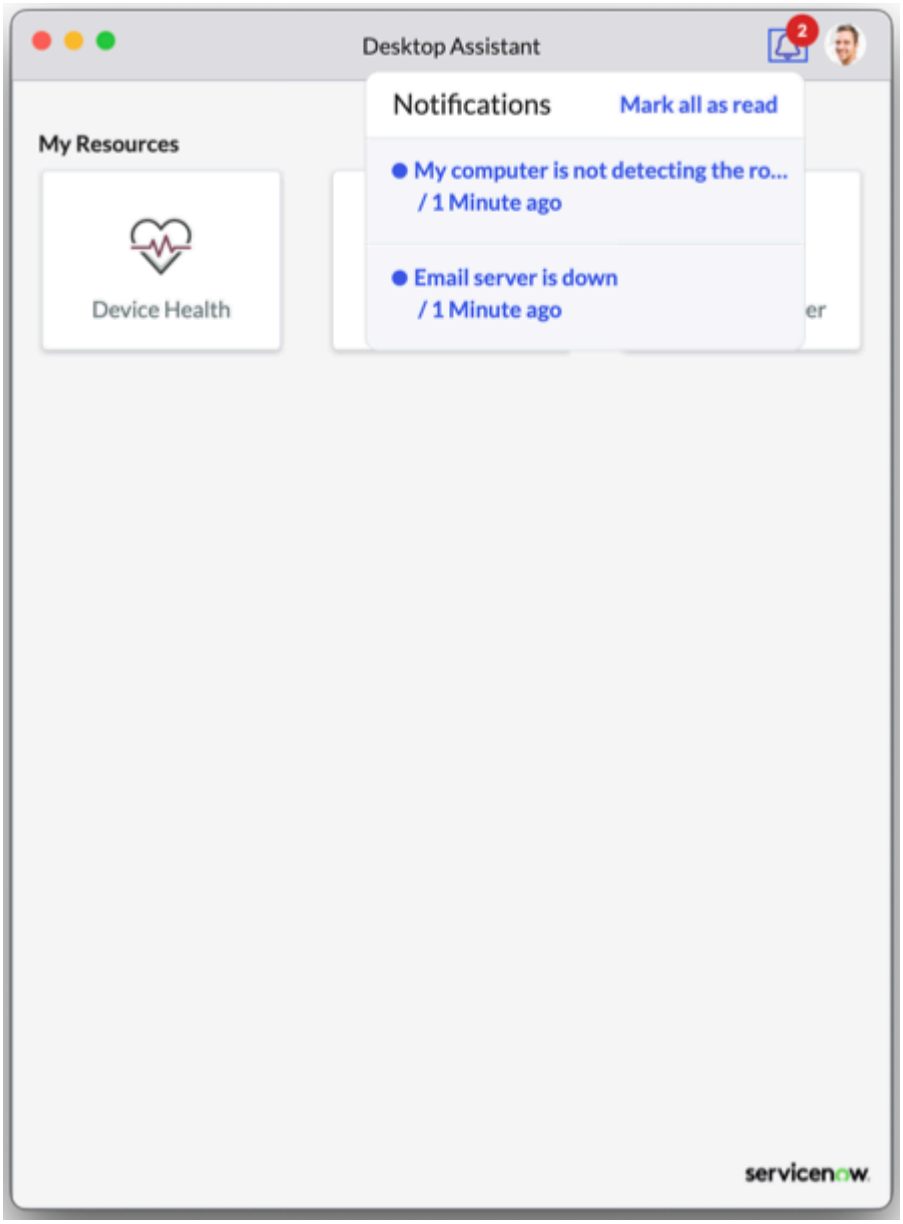
### Procedure

On the Desktop Assistant home page, click the notifications bell icon ( ).

A red dot with number on the bell icon indicates the number of new notifications. When you click the notification bell icon , a drop-down list appears displaying the list of notifications.

**Desktop Assistant notifications list**




**Note:**
For a specific logged-in user, the Desktop Assistant application retrieves notifications from the [sys_notification] table that are configured for the Next Experience route. For more information on how to create next experience notifications, see Create custom notifications in Next Experience .

### Open Virtual Agent or Chat in Desktop Assistant

Open Virtual Agent to access convenient chat-based support, where you can quickly find answers to your questions.

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### Before you begin

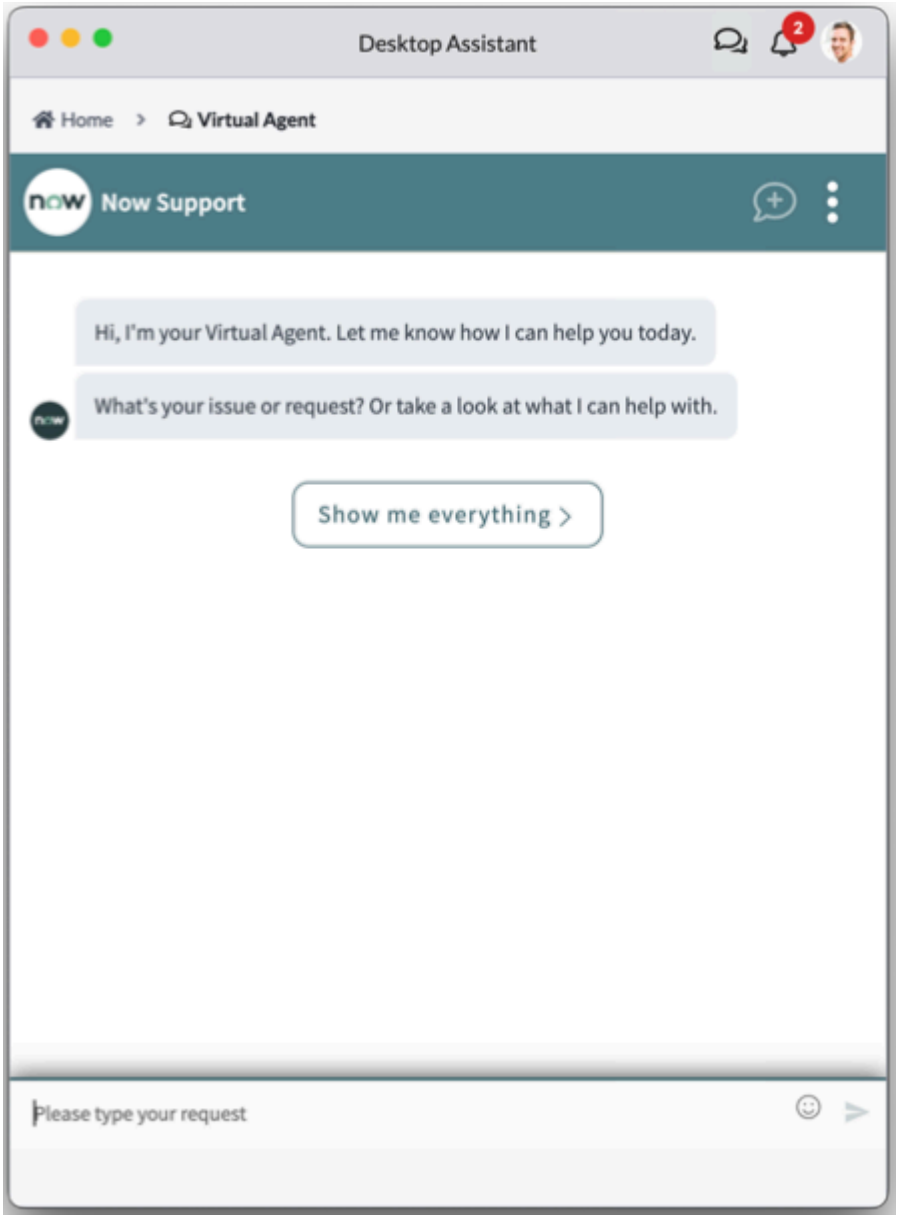
Ensure that both the DEX Desktop Assistant plugin [sn_dex_desktop] plugin and the Desktop Assistant application have been installed. For more information, see Install DEX Desktop Assistant and Download and install Desktop Assistant.

Role required: sn_dex_desktop.user or sn_dex_desktop.admin

### Procedure

On the Desktop Assistant home page, click the virtual agent or chat icon ( ) appears that on the Desktop Assistant header.

The chat window opens.




To get a response, enter your question in the **Please type your request** field and press Enter. To customize the topics that must be displayed and available on the **Show me everything** window, see Getting started with Virtual Agent Designer.

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### View device health

View information on battery health, storage space, top 5 applications by CPU and memory usage in the last hour, and the last computer restart.

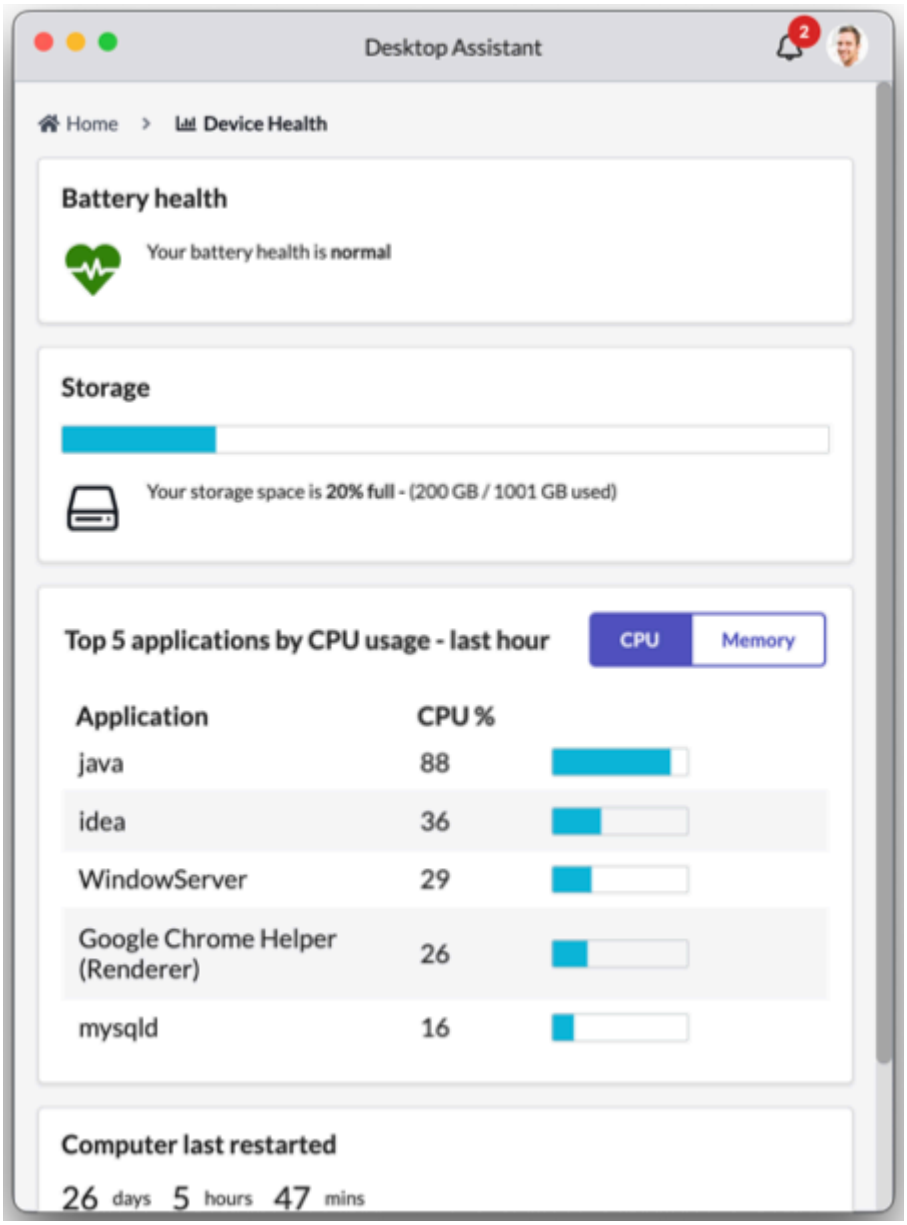
## Before you begin

Ensure that both the DEX Desktop Assistant plugin [sn_dex_desktop] plugin and the Desktop Assistant application have been installed. For more information, see Install DEX Desktop Assistant and Download and install Desktop Assistant.

Role required: sn_dex_desktop.user or sn_dex_desktop.admin

## Procedure

On the Desktop Assistant home page, click the **Device Health** card.




For more information on system activities, click **Open Activity Monitor**.

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**Note:**
On Windows, battery health information is not displayed, and you can find more details on system activities by clicking **Open Task Manager**.

### Test the internet connection of your system

Conduct an internet speed test to evaluate the performance of your internet service. If it seems like your internet is slower than it should be, running a speed test is the quickest way to find out if something is wrong on your end, or if the problem is with your internet service provider.

#### Before you begin

Ensure that both the DEX Desktop Assistant plugin [sn_dex_desktop] plugin and the Desktop Assistant application have been installed. For more information, see Install DEX Desktop Assistant and Download and install Desktop Assistant.

Role required: sn_dex_desktop.user or sn_dex_desktop.admin

#### Procedure

1. On the Desktop Assistant home page, click the **Network Test** card.
   The Network test page opens.

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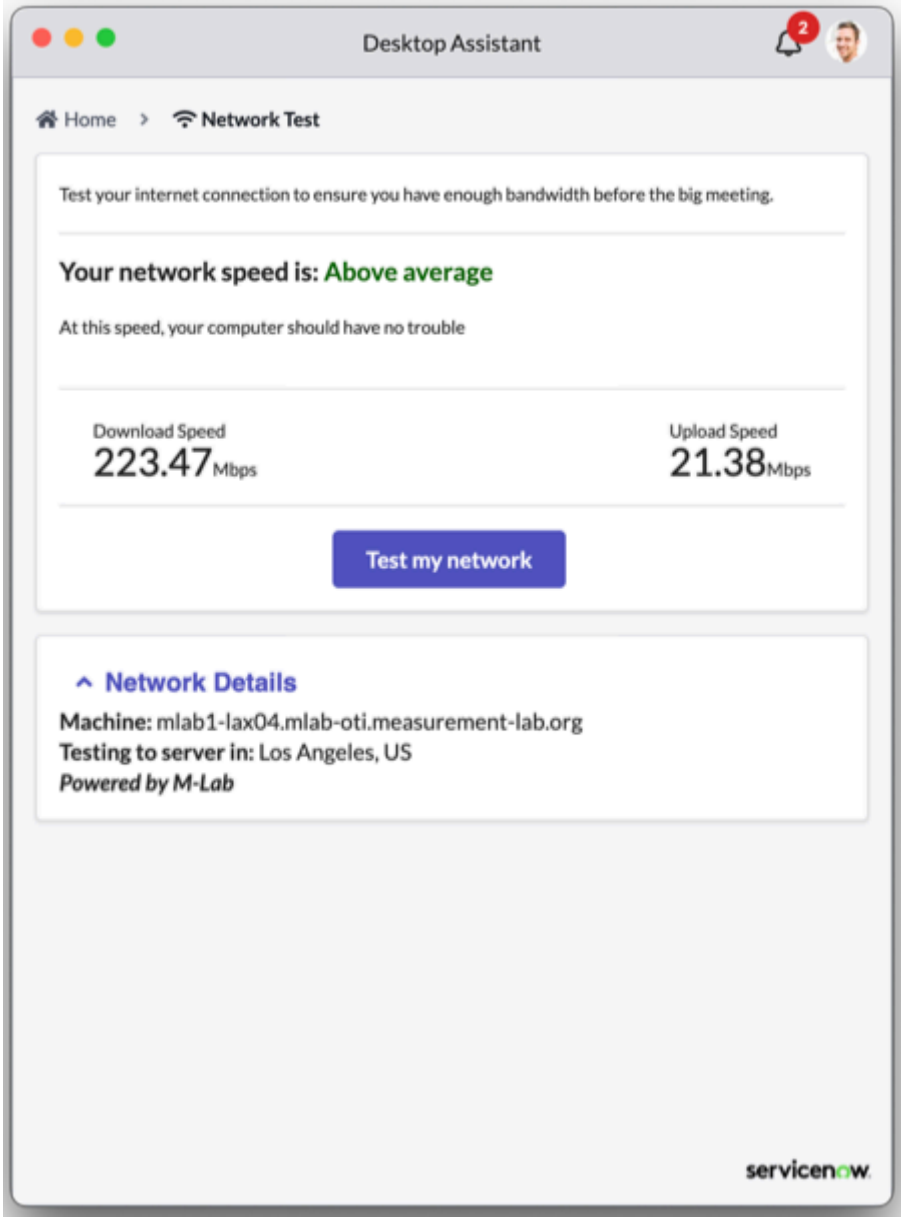


2. Click **Test my network**.

   The test provides the network speed (download and upload speed) of the device where the Desktop Assistant is installed. Under the Network Details section, you can find the machine name and the server details.

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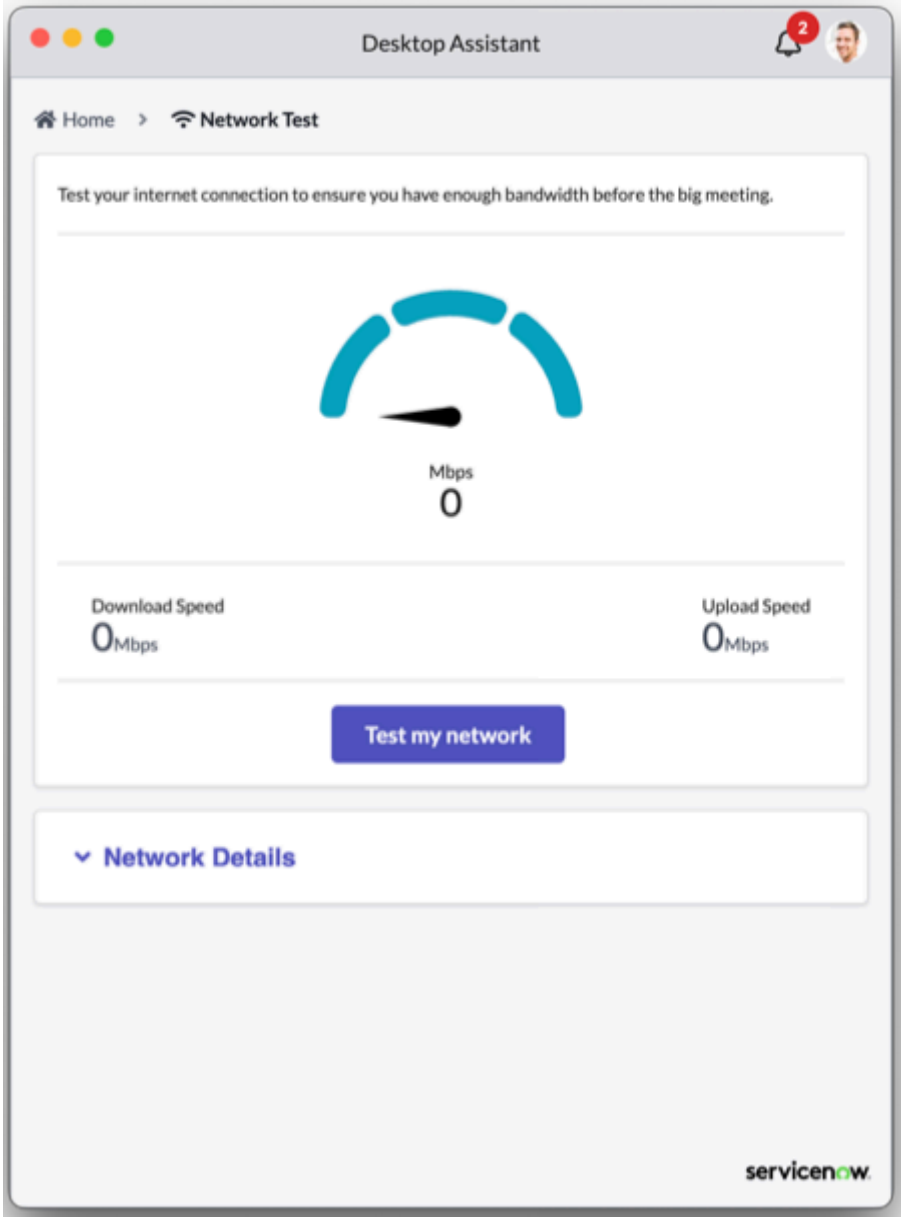


If the network speed is below average, you can check the details for the troubleshooting steps.

### Open Employee Center

Open Employee Center to get a single, unified portal to find information, get help, and request the services you need.

## Before you begin

Ensure that both the DEX Desktop Assistant plugin [sn_dex_desktop] plugin and the Desktop Assistant application have been installed. For more information, see Install DEX Desktop Assistant and Download and install Desktop Assistant.

You must also map the Employee Center card to the Employee Center portal of your organization.

Role required: sn_dex_desktop.user or sn_dex_desktop.admin

## Procedure

On the Desktop Assistant home page, click the **Employee Center** card.

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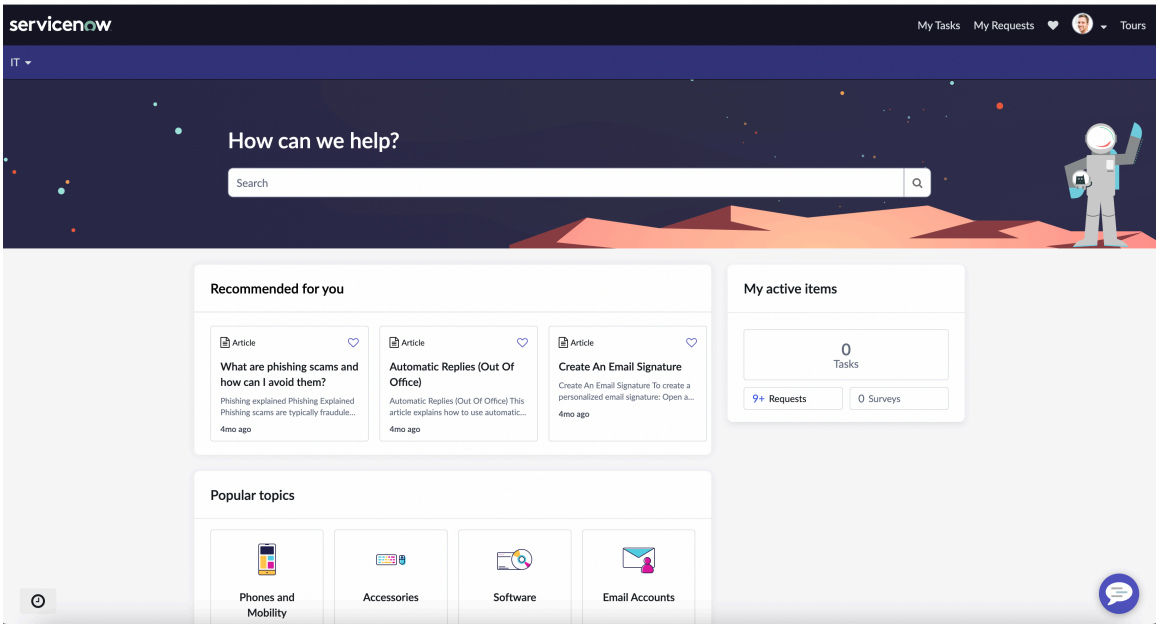
The Employee Center page opens.




## DEX Desktop Assistant reference

Reference topics provide additional information about forms and dashboard that you use to configure and administer Desktop Assistant.

### Desktop Assistant usage metrics

Usage metrics dashboard enables you to monitor the connection status of your device, user login status, application version, and the number of incidents created using the Desktop Assistant application, ensuring smooth communication with the ServiceNow instance.

#### Desktop Assistant usage metrics dashboard

| Cards | Description | Source table |
|---|---|---|
| Connection Status | Shows whether the device is currently connected to a ServiceNow instance.<br><br>**Note:** If a user remains inactive for 6 hours, their connection status is considered as "down", even if they're still logged in but not active.<br><br>This information helps you troubleshoot connectivity issues and ensure that the device is able to access the resources it needs. | DEX Desktop Assistant<br><br>[sn_dex_desktop_exp] |
| Logged in | Indicates whether a user is currently logged in to the | DEX Desktop Assistant |

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**Desktop Assistant usage metrics dashboard (continued)**

| Cards | Description | Source table |
|---|---|---|
| | device or not. The login status of a user is updated when they either log in or log out.<br><br>This information helps you determine whether the device is currently in use or not and track user activity over time. | [sn_dex_desktop_exp] |
| Desktop Assistant Version in use | Displays the current version of Desktop Assistant running on user devices.<br><br>This information can help you ensure that the application is up to date and identify any potential compatibility issues with the OS or other applications. | DEX Desktop Assistant<br><br>[sn_dex_desktop_exp] |

To return to the usage metrics page or the administration page, where you can access usage metrics, see View Desktop Assistant usage metrics or DEX Administration page.

### Components installed with Desktop Assistant

Several types of components are installed with activation of the Desktop Assistant [sn_dex_desktop] plugin, including user roles and tables.

## Roles installed

| Role title [name] | Description | Contains roles |
|---|---|---|
| Desktop Assistant administrator<br><br>[sn_dex_desktop.admin] | Responsible for managing configurations and resolving any issues that may arise within the application. | sn_dex_desktop.user |
| Desktop Assistant user<br><br>[sn_dex_desktop.user] | Responsible for using Desktop Assistant. They do not have the ability to configure any items within the application. | • sn_incident_read<br>• sn_change_read |

## Tables installed

| Table | Description |
|---|---|
| Desktop Assistant<br><br>[sn_dex_desktop_app] | Registry of the application.<br><br>Administrators can go to this table to update the title of Desktop Assistant. |

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| Table | Description |
|---|---|
| Desktop Assistant Card<br>[sn_dex_desktop_app_card] | Records the card that is shown on Desktop Assistant. This is a base table for all card types. |
| Desktop Assistant Section<br>[sn_dex_desktop_app_section] | Defines a section of the UI that acts as a container for the cards. |
| Desktop Assistant Tab<br>[sn_dex_desktop_app_tab] | Defines different tabs that are present on the UI app, where each tab contains multiple sections. |
| Desktop Assistant App to Tab Mapping<br>[sn_dex_desktop_app_to_tab_mapping] | Records a mapping between application and tabs. |
| Desktop Assistant Installation<br>[sn_dex_desktop_exp] | Records information about installation and usage of the Desktop Assistant application. |
| Hyperlink Card<br>[sn_dex_desktop_hyperlink_card] | Card type to define hyperlinks. |
| Records View Card<br>[sn_dex_desktop_records_view_card] | Card type to define what records to view. |
| Record Creator Card<br>[sn_dex_desktop_record_creator_card] | Card type to define record creator with intended fields. |
| Section to Card Mapping<br>[sn_dex_desktop_section_to_card_mapping] | Specifies all the cards in the given section. |
| Tab to Section Mapping<br>[sn_dex_desktop_tab_to_section_mapping] | Specifies all the sections with in a page in a tab content. |

To return to the installation page, see Install DEX Desktop Assistant.

### Records View cards form

The Records View cards form presents elaborate data on the form's fields and their corresponding descriptions.

You must have the Desktop Assistant administrator [sn_dex_desktop.admin] role to access the form.

#### Records View card form fields and description

| Field | Description |
|---|---|
| Name | Unique name for the card title. |
| Header | Unique name for individual pages in the card. |

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**Records View card form fields and description (continued)**

| Field | Description |
|---|---|
| | When you select a card, it takes you to the details page. The name in the **Header** field appears as the header or title of that detailed page. |
| Description | Short description of the card. |
| Table | Table from which you want to pull the data to display. |
| Query | Filter conditions to display the data. |
| Application | Scope of the application. |
| Visible Fields | Fields from the selected table that should appear on the card details page.<br><br>Use the Unlock Visible Fields icon (  ) and under the **Available** section, select the fields to be visible and then select the right arrow icon (  ) to move it to the **Selected** section. You can also use the up arrow icon (  ) or the down arrow icon (  ) to customize the column position.<br><br>When you have added all the required fields, select the lock visible fields icon (  ) to ensure these fields are always visible on the form, regardless of any changes made to the form. |
| Icon | Image that appears on the card.<br><br>Use the **Click to add** link and select **Choose File** to select an image from your system. |

To return to the records view card page, see Create a Records View card.

### Record Creator card form

The Record Creator Card form presents elaborate description on the fields that you use to create a record rather than view.

You must have the Desktop Assistant administrator [sn_dex_desktop.admin] role to access the form.

**Records Creator Cards form fields and description**

| Field | Description |
|---|---|
| Name | Unique name for the card title. |
| Header | Unique name for individual pages in the card.<br><br>When you select a card, it takes you to the details page. The name in the **Header** field appears as the header or title of that detailed page. |
| Description | Short description of the card. |
| Visible Fields | Fields from the selected table that should appear on the card details page. |

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**Records Creator Cards form fields and description (continued)**

| Field | Description |
|---|---|
| | Use the Unlock Visible Fields icon ( ) and under the **Available** section, select the fields to be visible and then select the right arrow icon ( ) to move it to the **Selected** section. You can also use the up arrow icon ( ) or the down arrow icon ( ) to customize the column position.<br><br>When you have added all the required fields, select the lock visible fields icon ( ) to ensure these fields are always visible on the form, regardless of any changes made to the form. |
| Application | Scope of the application. |
| Icon | Image that appears on the card.<br><br>Use the **Click to add** link and select **Choose File** to select an image from your system. |
| Table | Table from which you want to pull the data to display. |
| Mandatory Fields | Fields from the selected table that are mandatory in the card details page.<br><br>Use the Unlock Visible Fields icon ( ) and under the **Available** section, select the mandatory fields and then select the right arrow icon ( ) to move it to the **Selected**section. You can also use the up arrow icon ( ) or the down arrow icon ( ) to customize the column position.<br><br>When you have added all the required fields, select the lock visible fields icon ( ) to ensure these fields are always visible on the form, regardless of any changes made to the form. |

To return to the record creator card page, see Create a Record Creator card.

### Hyperlink card form

The Hyperlink form presents elaborate data on the form's fields and their corresponding descriptions.

You must have the Desktop Assistant administrator [sn_dex_desktop.admin] role to access the form.

**Hyperlink Cards form fields and description**

| Field | Description |
|---|---|
| Name | Unique name for the card title. |
| Header | Unique name for individual pages in the card. |

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**Hyperlink Cards form fields and description (continued)**

| Field | Description |
|---|---|
| | When you select a card, it takes you to the details page. The name in the **Header** field appears as the header or title of that detailed page. |
| URL | URL of the site or page that opens when you select the card.<br>**Note:**<br>There are two options for the URL:<br>• Relative URL: "/esc" launches in reference to the current instance.<br>• Public URL: Needs a full name with protocol such as https://www.servicenow.com/.<br>Use the Unlock Visible Fields icon ( ) and under the **Available** section, select the fields to be visible and then select the right arrow icon ( ) to move it to the **Selected** section. You can also use the up arrow icon ( ) or the down arrow icon ( ) to customize the column position. |
| Description | Short description of the card. |
| Icon | Image that appears on the card.<br>Use the **Click to add** link and select **Choose File** to select an image from your system. |

To return to the hyperlink card page, see Create a Hyperlink card.

### Application Registries form

The Application Registries form presents elaborate data on the form's fields and their corresponding descriptions.

You must have the Desktop Assistant administrator [sn_dex_desktop.admin] role to access the form.

**Application registries form fields and description**

| Field | Description |
|---|---|
| Name | Name of the application. |
| Client ID | Unique identifier for your application that is issued by the service provider. |
| Client Secret | Secret key that is used to authenticate your application with the service provider's API. |
| Redirect URL | URIs that the service provider should redirect the user to after authentication is complete. This is where your application receives the authorization code or access token. |
| Logo URL | URL of your application's logo image. |

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**Application registries form fields and description (continued)**

| Field | Description |
|---|---|
| Public Client | Option to indicate whether the application is publicly accessible. Examples of public clients include mobile apps, web applications, and JavaScript-based applications. |
| Comments | Additional context or information about a particular request or response. |
| Application | Client application that is requesting authorization to access a protected resource or service on behalf of a user. |
| Accessible from | IP addresses or domains that are authorized to access your OAuth client.<br><br>When you register your OAuth client with a service provider, you may be required to provide a list of IP addresses or domains that are allowed to make requests to the service provider's API on behalf of your client. |
| Active | Status of an access token.<br><br>When you grant your application permission to access your resources using OAuth, the service provider issues an access token that your application uses to make API requests. |
| Refresh Token Lifespan | The duration of a user's session before requiring reauthentication in your application. |
| Access Token Lifespan | Refers to the period of time during which an access token is considered valid for use by an application. |
| Default Grant type | Refers to the default method used by an OAuth 2.0 authorization server to grant access tokens to client applications. |

To return to the oauth details page, see Configure OAuth details.

# Digital Portfolio Management

Manage and maintain all your solutions (services, service offerings, business applications, and application services) from a single location using the ServiceNow® Digital Portfolio Management (DPM) Workspace. DPM pulls in data from across the ServiceNow platform so you see impacts in the context of solutions that you own or care about.

https://player.vimeo.com/video/995348445?badge=0&autopause=0&player_id=0&app_id=58479

This video provides an overview to manage your service-related data in the DPM Workspace using the plan, build, run life cycle.

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## Get started

| | |
|---|---|
| Explore<br>  <br>Learn about the Digital Portfolio Management (DPM) Workspace concepts and features. | Configure<br>  <br>Configure the DPM Workspace environment, tools, and user access. |
| Get started<br>  <br>Get started with the DPM Workspace and manage your solutions. | Work with portfolios<br>  <br>Work with personal and enterprise portfolios in the DPM Workspace. |
| Work with solution data<br>  <br>Work with solution data in DPM. | Reference<br>  <br>Get information about the DPM Workspace administration. |

### Troubleshoot and get help

- Explore resources in the Digital Portfolio Management Toolkit in the ServiceNow Community
- Search the Known Error Portal for known error articles
- Contact Customer Service and Support

# Exploring Digital Portfolio Management

Learn about the Digital Portfolio Management (DPM) Workspace features and benefits to manage all of your solutions in one place. Solutions in the context of DPM are services, service offerings, business applications, and application services.

## Digital Portfolio Management overview

The DPM Workspace is one of several configurable workspaces that ServiceNow provides. For information about workspaces, see the following topics.

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- List of workspaces
- Open a Configurable Workspace experience in UI Builder

The DPM Workspace enables you to:

- View and manage all your solutions in a central workspace through the full life cycle of plan, build, run, and optimize.
- Use key performance indicator (KPI) groups to track how each solution is performing.
- Drill down to the details of each solution to see the impacts.

## Digital Portfolio Management users

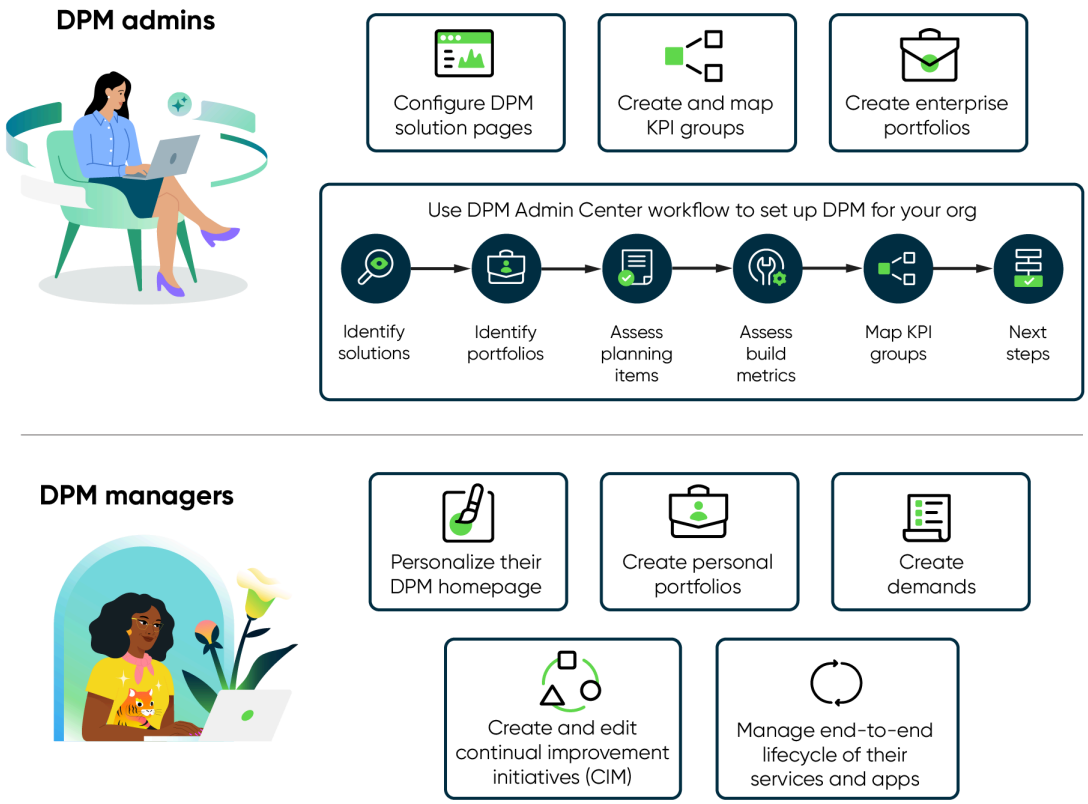
### Users

| User | Description |
|---|---|
| DPM admin | The DPM admin role sets up the DPM Workspace environment, including the tabs that show, key performance indicator (KPI) groups and thresholds, and integrations with other ServiceNow and third party applications. |
| DPM manager | The DPM manager role works in the DPM Workspace environment to view all solutions and their KPI metrics. |

## Digital Portfolio Management workflow

Both DPM admins and DPM managers benefit from working in the DPM Workspace.

### DPM Workspace overview

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- With a DPM admin role, you can:
  - Configure DPM Workspace solution pages.
  - Create and map key performance indicator (KPI) groups.
  - Create enterprise portfolios.
  - Use the DPM Admin Center guided walk-through to:
    - Identify solutions to configure
    - Identify portfolios
    - Assess planning items
    - Assess build metrics
    - Map KPI groups
    - Learn about the next steps that you can take
- With a DPM manager role, you can:
  - Personalize your DPM Workspace homepage.
  - Create and manage personal portfolios.
  - Create demands and continual improvement initiatives (CIM).
  - Manage the end-to-end life cycle of your services and applications.

## Digital Portfolio Management benefits

The Digital Portfolio Management Workspace provides several benefits to help you manage the life cycle of services, service offerings, business applications, and application services.

### Digital Portfolio Management benefits

| Benefit | Feature | Users |
|---|---|---|
| Manage the full life cycle of your services in the plan-build-run framework to visualize your services and to plan for them in the future. | Digital Portfolio Management life-cycle management | DPM manager |
| Align with the Common Service Data Model (CSDM) to get a holistic view of your IT landscape. | Apply the CSDM guidelines to Digital Portfolio Management | DPM admin |
| View all services, service offerings, application services, and business applications in personal portfolios and enterprise portfolios. | Work with portfolios in Digital Portfolio Management | DPM manager to view solutions.<br><br>DPM admin to create enterprise portfolios. |
| View and set up key performance indicator (KPI) groups for services, service offerings, application services, and business applications. | KPI groups in Digital Portfolio Management | DPM manager to view KPI groups and metrics.<br><br>DPM admin to set up and adjust KPI groups. |

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**Digital Portfolio Management benefits (continued)**

| Benefit | Feature | Users |
|---|---|---|
| Integrate with the ServiceNow® Strategic Planning application to see the roadmap of services, their performance levels, and to view a comprehensive roadmap. | Vie service and service offering details | DPM manager |
| See service impacts such as critical incidents, outages, changes, risks, and audits. You can also see when other teams are mitigating such impacts. | View business application details | DPM manager |
| See DevOps Change Workspace data for business application details on accelerate metrics and flow metrics. | DevOps value stream metrics in Digital Portfolio Management | DPM manager to view DevOps data.<br><br>DPM admin to turn on the DevOps system property.<br><br>See Configure the Digital Portfolio Management experience. |
| Integrate with Process Mining to see the status of solution KPI metrics, and adjust as needed. | Configure Digital Portfolio Management to integrate with Process Mining | DPM manager to view Process Mining data.<br><br>Process Mining analyst to enable the system property.<br><br>See Process Mining components for Digital Portfolio Management. |

## What to explore next

To learn more about configuring and using DPM, see:

- Configuring Digital Portfolio Management
- Getting started with Digital Portfolio Management
- Work with portfolios in Digital Portfolio Management
- Work with solution data in Digital Portfolio Management
- Digital Portfolio Management reference

## Digital Portfolio Management Workspace homepage

The Digital Portfolio Management (DPM) homepage is the starting point where you navigate to all aspects of your solutions and portfolios. You're encouraged to personalize your Digital Portfolio Management (DPM) homepage so you can view and track the solutions that matter to you most.

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## DPM Workspace overview

The DPM homepage (  ) is the central area where you see the status of all your solutions. To access DPM, log in to your provided ServiceNow instance and then select **Workspaces > Digital Portfolio Management**. When you first log in to the DPM Workspace, the system uses certain fields to generate a set of default solution cards that display on your homepage. After you personalize your homepage, the system remembers your updates in the *dpm_home_page_item* table so that next time you log in to the workspace, your personalized homepage displays. For information on the first login solution cards, see Digital Portfolio Management homepage default solution cards.

The homepage includes the following main areas.

- A personalized message that welcomes you and a link to an overview video about DPM.
- A Current status section that contains solution cards with solutions that you're associated with based on system-defined fields. You're encouraged to personalize the solutions in this section. The layout enables you to see a holistic picture of all solutions you care about.

  **Tip:**
  If you don't see any solution cards (an empty state), select **Add items** to add solutions to your homepage.

- Solution cards list needs attention attributes, which vary depending on the type of solution. At a glance, you can see each attribute name and the number of times it affects the solution. Also, the color and status icon determine if the needs attention attribute marks the solution as good, moderate, or critical.

  **Note:**
  The data on each solution card reflects current data at the time that you view the page.

  Refresh the page (  ) to update the data.

- Fields to enable you to search, filter, and personalize what you see on your DPM Workspace homepage. For more information, see Personalize the Digital Portfolio Management Workspace homepage.
- A Personal portfolios section that shows personal portfolios that you recently visited in DPM. You can also select the link to go to the personal portfolios page.
- An Enterprise portfolios section that shows enterprise portfolios that you recently visited in DPM. You can also select the link to go to the enterprise portfolios page.
- A Recently viewed section that shows items that you recently visited in DPM.

## Current status solution cards

You're encouraged to personalize the Current status section to see those solutions that matter to you most. Each solution card provides you with detailed information about your solutions. See the image and corresponding numbers for more information.

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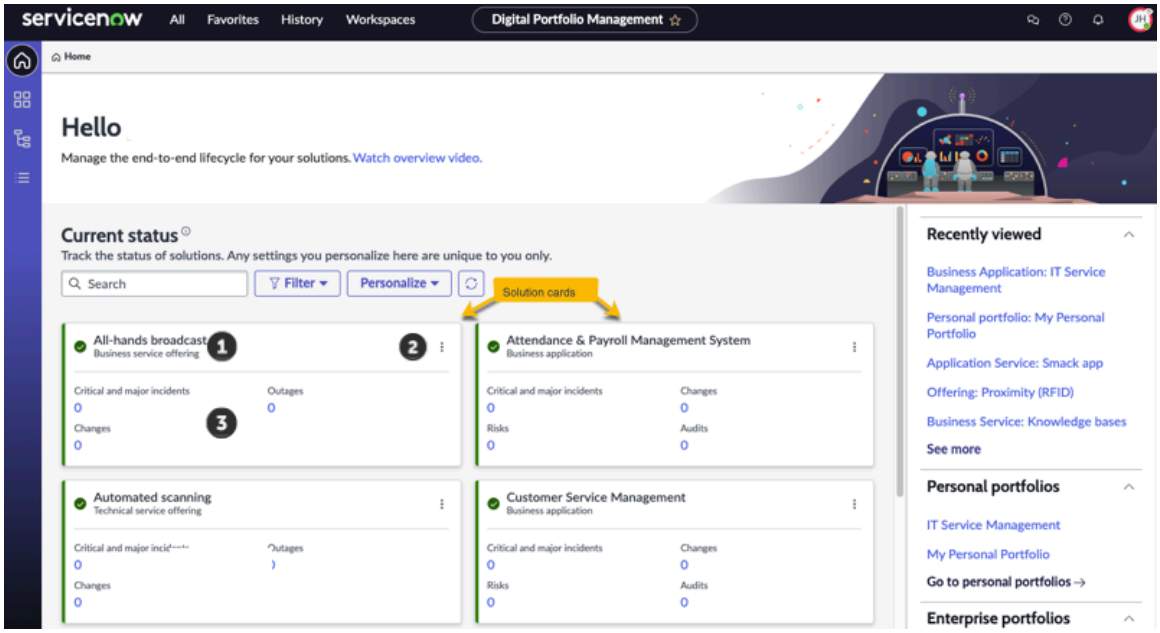


1. Solution name and type (service, service offering, business application, or application service).
2. Actions menu ⋮ to view the solution's details, its relationship map, or remove the item from your homepage. For more information, see Personalize the Digital Portfolio Management Workspace homepage.
3. Needs attention attributes that determine the status of each card. Needs attention attributes differ based on the solution type.

## Needs attention default thresholds

DPM comes with default thresholds for Needs attention attributes. You're encouraged to personalize the thresholds to define your metrics for good, moderate, and severe. See Personalize the Digital Portfolio Management Workspace homepage.

### Needs attention default thresholds

| Color | Symbol | Meaning | Default threshold |
|---|---|---|---|
| Green | ✓ | Good | No value (empty) |
| Orange | ! | Moderate | • Critical incidents: Empty<br>• Outages: Empty<br>• Changes: Empty<br>• Alerts: 3<br>• Risks: 1<br>• Audits: Empty |
| Red | ⚠ | Severe | • Critical incidents: 1<br>• Outages: 1<br>• Changes: Empty<br>• Alerts: 10 |

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**Needs attention default thresholds (continued)**

| Color | Symbol | Meaning | Default threshold |
|---|---|---|---|
| | | | • Risks: 3<br>• Audits: Empty |

## Browser support for workspaces

**Important:**
Due to significant performance issues, ServiceNow recommends that customers migrate away from Internet Explorer 11. For more information, refer to KB0683275.

**Related topics**

Digital Portfolio Management homepage default solution cards

Personalize the Digital Portfolio Management Workspace homepage

List of workspaces

## Digital Portfolio Management life-cycle management

The Digital Portfolio Management (DPM) Workspace enables you to work in the plan-build-run life-cycle model. You can manage solutions that you own and view solutions that may have an impact on services or products that you care about.

The DPM plan-build-run life cycle surfaces data from other ServiceNow® products in a central location. To view data and take basic actions in the DPM experience, you must install the plugins and roles. For more information, see Digital Portfolio Management related applications and data sources.

Listen to an overview of the DPM team, the application, and how it works for solution owners in the plan-build-run life cycle.

Digital Portfolio Management overview.

The life-cycle management phases come standard with DPM but all records are fully configurable to match how you work. For information on how Admins can control the configuration in DPM, see Configure the Digital Portfolio Management experience. For information about other configurations, see UI Builder.

**Life-cycle management phases in DPM**

| Plan | Build | Run |
|---|---|---|
| Plan within the context of your solutions (services, applications, or products). | Track the progress of work being delivered for your solutions, including epics and stories in the current sprint. | Monitor critical key performance indicator (KPI) results and operational performance of your solutions. |

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### Life-cycle management phases in DPM (continued)

| Plan | Build | Run |
|---|---|---|
| • View the roadmap and roadmap dependencies (launches Strategic Planning).<br>• View the backlog and rearrange each planning type to prioritize and move some into the pipeline.<br>• View the summary of what's been planned for the solution:<br>  ○ Review ideas and their state, and promote new ideas.<br>  ○ See demands within the solution's planning organization and hierarchy.<br>  ○ View projects and improvement initiatives. | • View the status of current projects.<br>  ○ View active projects with percent complete metrics (with a color grid and a list view).<br>  ○ See projects that are overdue or have missed key milestones.<br>  ○ View projects with critical issues.<br>  ○ Assess how teams are delivering on the volume of work.<br>• View changes and improvement initiatives:<br>  ○ View status with a color grid and a list view.<br>  ○ See what's overdue by month.<br>  ○ View upcoming changes.<br>  ○ View change backlog growth in the last 30 days.<br>• View DevOps information for business applications:<br>  ○ View flow metrics from DevOps Insights to view details on epics, bugs, stories, and works in progress in the context of your business applications.<br>  ○ View accelerate metrics from the DevOps Change workspace to manage scrum and waterfall development | • View a performance snapshot and details of your solutions using Performance Analytics indicators.<br>**Note:** If you have a standard license for Performance Analytics, then you see historical data (the last 6 months), and you can't edit the Performance Analytics indicators. See KB1637474 for information about KPI results on DPM pages.<br>  ○ Gauge performance against commitments.<br>  ○ See the availability of the solution as a percentage.<br>  ○ See the number of new incidents.<br>  ○ View the number of subscribers.<br>  ○ See the customer satisfaction score.<br>  ○ View child offering breakdowns.<br>• Receive alerts to current and ongoing impacts.<br>• View business application deployments:<br>  ○ Assess hardware and software models and technology risk using data from ServiceNow® Governance, Risk, and Compliance.<br>  ○ Confirm risk conformance and act on risk remediation tasks.<br>  ○ View accelerate metrics from the DevOps Change Workspace to manage scrum and waterfall development and to gain visibility |

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**Life-cycle management phases in DPM (continued)**

| Plan | Build | Run |
|---|---|---|
| | and to gain visibility into your software development life cycle.<br><br>**Note:** To view DevOps accelerate metrics and flow metrics in DPM, admins must enable the DevOps system property. See Configure the Digital Portfolio Management experience for more information. | into your software development life cycle.<br><br>**Note:** To view DevOps accelerate metrics in DPM, admins must enable the DevOps system property. See Configure the Digital Portfolio Management experience for more information. |

**Related topics**

- Vie service and service offering details
- View business application details
- View application service details

### Vie service and service offering details

View information about services and service offerings that may impact your solutions. Each Digital Portfolio Management (DPM) page presents the life-cycle phase information in tabs — Plan, Build, Run, and Info.

## Status of services and service offerings

When viewing the service and service offering details in DPM, the **Phase** and **Status** of each item is listed on the workspace view and on the list view.

When viewing details of a service or service offering that's retired, an alert banner along the top of the workspace view states that it's retired. In the list view, the Phase is listed as **Retired**, the life-cycle stage is **End of Life**, and the life-cycle stage status is **Retired**.

**Important:**
If your organization transitioned from the traditional Service Portfolio Management fields to the CSDM life-cycle fields, then the field names differ from this document. For more information, see Apply the CSDM guidelines to Digital Portfolio Management.

Services and service offerings display information in DPM via the Plan, Build, Run, and Info tabs. If your organization opts to inactivate one or more of the tabs, then the inactivated tabs aren't visible to you. For example, if your organization doesn't work on planning activities and they inactivate the Plan tab, then the Plan tab isn't visible for you. For more information on how Admins can hide or show tabs, see Configure the Digital Portfolio Management experience.

Keep in mind that what you are able to see in DPM depends on what your product license permits from the source application. See Digital Portfolio Management related applications and data sources for the required installations and plugins to see each data element.

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**Note:**
The Strategic Planning Workspace (formerly known as Alignment Planner Workspace) is a pro version. The Portfolio Planning Workspace is available for users with a Strategic Portfolio Management (SPM) standard license.

## Plan tab

### Service and service offering Plan tab

| Section | Description |
|---|---|
| **Roadmap and backlog** | • When selected, see roadmap details in the Strategic Planning or Portfolio Planning Workspace.<br>• When selected, see backlog information in a shared service support planning backlog list. |
| **Summary** | Summary cards for the service or service offering. You can select each card to go to a list of the items.<br>• Total ideas<br>• Approved demands<br>• Project starting in the next 30 days<br>• New improvement initiatives |
| **Demands** | Total number of demands on the service or service offering. The number of demands is in a gray box.<br>You can select a demand record to view its details, including tasks, stakeholders, requirements, risks, and more.<br>You can also create demands on your service or service offerings. See Create demand from Digital Portfolio Management. |

## Build tab

### Service and service offering Build tab

| Section | Description |
|---|---|
| **Roadmap** | When selected, view roadmap details in the Strategic Planning or Portfolio Planning Workspace. |
| **Projects** | Project information related to the service or service offering.<br>• A donut graph shows the active projects by current status. You can hover over each status of the donut to see its number of projects and percentage. You can also select each status to access a list of the projects records in that status.<br>• A bar graph shows projects overdue by month. You can hover over each status of the bar graph to see the month, year, and the number of projects. You can also select each bar to access a list of the projects for that month. |

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### Service and service offering Build tab (continued)

| Section | Description |
|---|---|
| | • A set of cards enable you to select the number (count) to see a list of projects for the service or service offering.<br>  ○ Projects with status work in progress<br>  ○ Projects with missed key milestones<br>  ○ Projects with critical issues<br><br>**Active projects**<br><br>Total number of active projects on the service or service offering. The number of active projects is in a gray box. Select an active project record to view its details, including project tasks, agile phase, stories, epics, and more. |
| **Changes** | **Change graphs**<br><br>• A donut graph shows the changes by status:<br>  ○ New<br>  ○ Assess<br>  ○ Authorize<br>  ○ Scheduled<br>  ○ Implement<br>  ○ Review<br>  ○ Closed<br>  ○ Canceled<br>• A bar graph shows changes overdue by month.<br>• A spark line graph shows upcoming changes this week.<br>• A bar graph shows the change backlog growth in the last 30 days. |
| **Improvement initiatives** | • A donut graph shows the changes by state:<br>  ○ New<br>  ○ In Progress<br>  ○ Monitor/Review<br>  ○ Closed<br>• A bar graph shows the improvement initiatives overdue by month.<br>• A card enables you to select the number (count) of overdue tasks for the service or service offering.<br>• A bar graph shows the improvement initiatives that were closed in the last 30 days.<br><br>**Active improvement initiatives** |

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**Service and service offering Build tab (continued)**

| Section | Description |
|---|---|
| | The total number of active improvement initiatives on the service or service offering. The number of active improvement initiatives is in the gray box. You can select an active improvement initiative for its details, including its Continual Improvement Management (CIM) phase, CIM tasks, impacted key performance indicators (KPIs), and approvers. |

## Run tab

Some of the fields on the Run tab are different for services and for service offerings, as noted in the following table. See KB1637474 for more information about KPI results on DPM pages.

**Service and service offering Run tab**

| Section | Description |
|---|---|
| **Service performance** or **Offering performance** | The Performance snapshot KPI group that comes with the base system. The indicators typically show availability, open incidents, and new requests. Each indicator has an information icon ( ) that when selected, provides a tooltip description for that indicator.<br><br>For information on KPIs that come with the base system, see KPI groups installed with Digital Portfolio Management.<br><br>Admins can modify KPI groups, create KPIs, and create KPI group mappings so you may see more than the Performance snapshot on the Run tab. For information, see Create KPI groups and mappings in Digital Portfolio Management.<br><br>For information on configuring KPIs, see Configure KPIs in Digital Portfolio Management with service availability example. |
| **Offering breakdown** (services only) | List of the offering breakdowns for the service, including each offering's:<br>• Availability<br>• Open incidents<br>• Incidents not updated for 5 days<br>• New requests |
| **Application service dependences** (service offerings only) | List of the application services that the service offering depends on. The number of application services is in a gray box. You can select an application service for its details. For more information, see View application service details. |
| **Commitments** (service offerings only) | Information about the service offering availability commitments such as the commitment name, type, and target. |

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**Service and service offering Run tab (continued)**

| Section | Description |
|---|---|
| **SLA commitments** (service offerings only) | Information about the service level agreement (SLA) commitments for the service offering. |

## Info tab

The Info tab provides general information about the service or service offering. Some of the fields are different for services and for service offerings, as noted in the following table. You can't edit the fields in the Info tab.

**Service and service offering Info tab**

| Section | Description |
|---|---|
| **Service description** or **Service offering description** | Description of the service or the service offering. |
| **General Info** | General information about the service or the service offering.<br>• Service portfolio<br>• Taxonomy node<br>• Service classification (business or technical)<br>• Phase and Status (if using the Service Portfolio Management fields) or<br>• Stage and Status (if using the CSDM life-cycle fields)<br>• Consumer type<br>• Last review date<br>• Start and end dates |
| **Personal portfolios** | The personal portfolios for the service or offering. The number of personal portfolios is in a gray box. Select a personal portfolio for its details. |
| **Subscribers** | General information about the subscribers on the service or service offering. You can select each card for detailed subscriber information on the following:<br>• Locations<br>• Departments<br>• Groups<br>• Companies<br>• Individual users |

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**Service and service offering Info tab (continued)**

| Section | Description |
|---|---|
| **Price** (service offerings only) | General price information about the service offering, like price model, unit, cost, and description. |
| **Offering commitments** (service offerings only) | The service commitment for the offering, for example, 95% 24x7. The number of the commitments is in a gray box. Select a commitment for its details. |
| **Offerings** (services only) | The offerings for the service. The number of service offerings is in a gray box. Select an offering for details. |
| **Service scope** (services only) | • The business case criticality for the service. Criticality levels are:<br>**1.** Most critical<br>**2.** Somewhat critical<br>**3.** Less critical<br>**4.** Not critical<br>• The business capabilities for the service. The number of business capabilities is in a gray box. Select a business capability for details. |
| **Service Contracts** (for services) or **Contracts** (for service offerings) | The list of contracts for the service or the service offering. If available, you can select a contract for its details. |

## Needs attention panel icons

The Needs attention panel includes the following icons for services and service offerings:

- Needs attention icon ( ) to show or hide the Needs attention panel. For information on needs attention values, see Work with Needs attention panels in Digital Portfolio Management.
- Contacts icon ( ) to view team members and teams for the record.
- Catalog items icon ( ) to search for catalog items on a service or a service offering record.
- Knowledge articles icon ( ) to search for related knowledge articles.
- Attachments icon ( ) to view and add attachments to the record.

### Related topics

Work with Needs attention panels in Digital Portfolio Management

### View business application details

View information about business applications that may impact your solutions. Each Digital Portfolio Management (DPM) page presents the business application life-cycle phase information in tabs — Plan, Build, Run, Risk, and Info.

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## Status of business applications

When viewing the business application details in DPM, the **Status** of each item is listed on the workspace view and on the list view.

When viewing details of a business application that's retired, an alert banner along the top of the workspace informs you. In the list view, the **Life Cycle Stage** is **End of Life** and the **Life Cycle Stage Status** is **Retired**.

**Important:**
If your organization transitioned from the traditional Service Portfolio Management fields to the CSDM life-cycle fields, then the field names differ from this document. For more information, see Apply the CSDM guidelines to Digital Portfolio Management.

Business application information is displayed in DPM via the Plan, Build, Run, Risk, and Info tabs. If your organization opts to inactivate one or more of the tabs, then the inactivated tabs aren't visible to you. For example, if your organization doesn't work on planning activities and they inactivate the Plan tab, then the Plan tab isn't visible for you. For more information on how Admins can hide or show tabs, see Configure the Digital Portfolio Management experience.

Keep in mind that what you are able to see in DPM depends on what your product license permits from the source application. See Digital Portfolio Management related applications and data sources for the required installations and plugins to see each data element.

**Note:**
The Strategic Planning Workspace (formerly known as Alignment Planner Workspace) is a pro version. The Portfolio Planning Workspace is available for users with a Strategic Portfolio Management (SPM) standard license.

## Plan tab

### Business application Plan tab

| Section | Description |
|---|---|
| **Roadmap and backlog** | • When selected, see roadmap details in the Strategic Planning or the Portfolio Planning Workspace.<br>• When selected, see backlog information in a shared service support planning backlog list. |
| **Summary** | Summary cards for the business application. You can select each card to go to a list of the items.<br>• Total ideas<br>• Approved demands<br>• Project starting in 30 days<br>• Planned epics |
| **Demands** | Total number of demands on the business application. The number of demands is in a gray box.<br>You can select a demand record to view its details, including tasks, stakeholders, requirements, risks, and more. |

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**Business application Plan tab (continued)**

| Section | Description |
|---|---|
| | You can also create demands on your service or service offerings. See Create demand from Digital Portfolio Management. |

## Build tab

**Business application Build tab without the DevOps system property enabled**

| Section | Description |
|---|---|
| **Roadmap** | When selected, see roadmap details in the Strategic Planning or the Portfolio Planning Workspace. |
| **Projects** | Project information related to the service or service offering.<br>• A donut graph shows the active projects by current status. You can hover over each status of the donut to see its number of projects and percentage. You can also select each status to access a list of the projects records in that status.<br>• A bar graph shows projects overdue by month. You can hover over each status of the bar graph to see the month, year, and the number of projects. You can also select each bar to access a list of the projects for that month.<br>• A set of cards enable you to select the number (count) to see a list of projects for the service or service offering.<br>  ○ Projects with status work in progress<br>  ○ Projects with missed key milestones<br>  ○ Projects with critical issues<br>**Note:**<br>Both the Active projects by current status and the Projects overdue by month graphs include the following:<br>• Project updates that are directly related to the business application.<br>• Project updates of the related application services that roll up to the business application.<br>**Active projects**<br>Total number of active projects on the service or service offering. The number of active projects is in a gray box. Select an active project record to view its details. |
| **Epics** | Epic cards provide the count of each of the following for the business application. You can select a card to go to a list of the items.<br>• Epics in backlog that are ready<br>• Epics in progress |
| **Stories** | Story cards provide the count of each of the following for your business application. You can select a card to go to a list of the items. |

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**Business application Build tab without the DevOps system property enabled (continued)**

| Section | Description |
|---|---|
| | • Stories in backlog that are ready<br>• Stories in progress<br>• Blocked stories |
| **Sprints** | Current sprints related to the business application. The number of sprints is in a gray box. You can select a sprint to see its details. |
| **Releases** | Current releases related to the business application. The number of current releases is in a gray box. You can select a current release to see its scrum release details. |
| **Changes** | **Change graphs**<br>• A donut graph shows the changes by status:<br>  ○ New<br>  ○ Assess<br>  ○ Authorize<br>  ○ Scheduled<br>  ○ Implement<br>  ○ Review<br>  ○ Closed<br>  ○ Canceled<br>• A bar graph shows the changes overdue by month. |

## Build tab with DevOps enabled

After a DPM Admin enables the DevOps system property, you can see the flow metrics and accelerate metrics on the Build tab. The epics, stories, sprints, and releases don't show when DevOps is enabled. For Admin instructions to turn on or off the DevOps system property, see Configure the Digital Portfolio Management experience.

**Business application Build tab with the DevOps system property enabled**

| Section | Description |
|---|---|
| **Roadmap** | When selected, see roadmap details in the Strategic Planning or the Portfolio Planning Workspace. |
| **Projects** | Project information related to the service or service offering. |

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**Business application Build tab with the DevOps system property enabled (continued)**

| Section | Description |
|---|---|
| | • A donut graph shows the active projects by current status. You can hover over each status of the donut to see its number of projects and percentage. You can also select each status to access a list of the projects records in that status.<br>• A bar graph shows projects overdue by month. You can hover over each status of the bar graph to see the month, year, and the number of projects. You can also select each bar to access a list of the projects for that month.<br>• A set of cards enable you to select the number (count) to see a list of projects for the service or service offering.<br>  ○ Projects with status work in progress<br>  ○ Projects with missed key milestones<br>  ○ Projects with critical issues<br><br>**Note:**<br>Both the Active projects by current status and the Projects overdue by month graphs include the following:<br>  • Project updates that are directly related to the business application.<br>  • Project updates of the related application services that roll up to the business application.<br><br>**Active projects**<br><br>Total number of active projects on the service or service offering. The number of active projects is in a gray box. Select an active project record to view its details. |
| **Changes** | **Change graphs**<br><br>• A donut graph shows the changes by status:<br>  ○ New<br>  ○ Assess<br>  ○ Authorize<br>  ○ Scheduled<br>  ○ Implement<br>  ○ Review<br>  ○ Closed<br>  ○ Canceled<br>• A bar graph shows the changes overdue by month. |
| **Flow metrics** | Overview of the DevOps Change Workspace flow metric information related to the business application. You can also select **View Flow metrics in DevOps** to go to the DevOps Change Workspace, Flow metrics tab.<br><br>The following flow metrics are in number of days, donut reports, and graphs: |

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**Business application Build tab with the DevOps system property enabled (continued)**

| Section | Description |
|---|---|
| | • Average flow time for epics (last 30 days)<br>• Average flow time for epic and feature<br>• Average number of bugs and stories (last 30 days)<br>• Distribution of bugs and stories<br>• Work in progress cycle time for epics (last 30 days)<br>• Work in progress cycle time for stories (last 30 days)<br>• Work in progress cycle time for bugs (last 30 days)<br>• Work in progress items (count plotted weekly) |
| **Accelerate metrics** | Overview of the DevOps Change Workspace accelerate metric information related to the business application. You can also select **View Accelerate metrics in DevOps** to go to the DevOps Change Workspace, Accelerate metrics tab.<br>The following accelerate metrics are shown in number of days and graphs:<br>• Average lead time for deployment (last 30 days)<br>• Commit to deploy lead time (plotted daily for last 6 months)<br>• Average deployment frequency (last 30 days)<br>• Production deployment frequency (plotted daily for last 6 months) |

## Run tab

See KB1637474 for more information about KPI results on DPM pages.

**Business application Run tab without the DevOps system property enabled**

| Section | Description |
|---|---|
| **Business application performance** | Performance details about the business application. You can select a card indicator in each section to view its details. Each indicator has an information icon ( ) that when selected, provides a tooltip description for that indicator.<br>**Portfolio success metrics**<br>• Availability<br>• Incidents with a breached SLA<br>• Incidents caused by changes<br>• Successful changes<br>**Business application performance**<br>• Number of incidents<br>• Number of problems<br>• Number of changes |

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**Business application Run tab without the DevOps system property enabled (continued)**

| Section | Description |
|---|---|
| | Each of these indicators also includes records when:<br>• The record references an application service that is related to the business application, and<br>• The record directly references the business application. |
| **Application service breakdown** | Key performance indicator (KPI) group breakdown grid that shows the lowest ordered KPI group mapped (or inherited) by the business application. |

## Run tab with DevOps enabled

After a DPM Admin enables the DevOps system property, you can see the accelerate metrics on the Run tab. For Admin instructions to turn on or off the DevOps system property, see Configure the Digital Portfolio Management experience.

See KB1637474 for more information about KPI results on DPM pages.

**Business application Run tab with the DevOps system property enabled**

| Section | Description |
|---|---|
| **Business application performance** | Performance details about the business application. You can select a card indicator in each section to view its details. Each indicator has an information icon (  ) that when selected, provides a tooltip description for that indicator.<br>**Portfolio success metrics**<br>• Availability<br>• Incidents with a breached SLA<br>• Incidents caused by changes<br>• Successful changes<br>**Business application performance**<br>• Number of incidents<br>• Number of problems<br>• Number of changes<br>Each of these indicators also includes records when:<br>• The record references an application service that is related to the business application, and<br>• The record directly references the business application. |
| **Application service breakdown** | Key performance indicator (KPI) group breakdown grid that shows the lowest ordered KPI group mapped (or inherited) by the business application. |
| **Accelerate metrics** | The following accelerate metrics are shown in number of days and graphs. The DevOps system property must be enabled for this data to show. |

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**Business application Run tab with the DevOps system property enabled (continued)**

| Section | Description |
|---|---|
| | • Average mean time to restore (last 30 days)<br>• Mean time to restore from incidents caused by change<br>• Average change failure rate (last 30 days)<br>• Change failure rate over time |

## Risk tab

**Business application Risk tab**

| Section | Description |
|---|---|
| **Governance, Risk, and Compliance** | Information about risks related to the business application. You can select a card to see its details.<br><br>Risk summary<br>• Risk rating (low, medium, or high)<br>• Risk count (number)<br><br>Compliance summary<br>• Controls out of compliance (count)<br>• Attestations count (number)<br>• Total controls count (number)<br><br>Engagements<br>• Total engagements (count)<br>• In progress engagements (count)<br><br>Issues & tasks<br>• Total issues (count)<br>• Risk response task (count)<br>• Remediation task (count) |
| **Technology lifecycle risk** | The technology lifecycle risk for the business application with software and hardware models presented in donut reports and lists. |

**Note:**
To see the technology lifecycle risk information, you must have the Technology Portfolio Management plugin [sn_apm_tpm] installed. The [sn_apm_tpm] plugin has two dependency plugins:

- Application Portfolio Management [com.snc.apn]
- Software Asset Management [com.snc.sams]

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## Info tab

The Info tab provides general information about the business application. You can't edit fields in the Info tab.

### Business application Info tab

| Section | Description |
|---|---|
| **Application description** | Description of the business application. |
| **General Info** | General information about the business application.<br>• Enterprise portfolio<br>• Taxonomy node<br>• Department<br>• Business unit<br>• Application family<br>• Application category<br>• Architecture type<br>• Status<br>• Lifecycle stage<br>• Lifecycle stage status<br>• Install type<br>• User base count<br>• Active user count |
| **Personal portfolios** | The personal portfolios that contain the business application. The number of the personal portfolios is in a gray box. You can select a personal portfolio to view its details. |
| **Business capabilities** and **Application services** | Cards that show the number of business capabilities and application services that are related to the business application. You can select each card to go to a list of each item respectively. |
| **Contract** | General information about the contract related to the business application:<br>• Vendor<br>• Support vendor<br>• Contract end date |
| **Additional information** | Cards that show the number of the following additional information related to the business application. You can select each card to go to a list of the items. |

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**Business application Info tab (continued)**

| Section | Description |
|---|---|
| | • Business Unit Strategy<br>• Goals<br>• Information objects |

## Needs attention panel icons

The Needs attention panel includes the following icons for business applications:

- Needs attention icon ( ) to show or hide the Needs attention panel.
- Contacts icon ( ) to view team members and teams for the record.
- Attachments icon ( ) to view and add attachments to the record.

### Related topics

Enterprise portfolios

Create enterprise portfolios in Digital Portfolio Management

### View application service details

View information about application services that may impact your solutions. Each Digital Portfolio Management (DPM) page presents the application service life-cycle phase information in tabs, primarily Run and Info. The Risk tab displays when you have the Technology Portfolio Management plugin [sn_apm_tpm] installed.

As you view the following tables, keep in mind that what you are able to see in DPM depends on what your product license permits from the source application. See Digital Portfolio Management related applications and data sources for the required installs and plugins to see each data element.

## KPI groups for application services

If your organization uses the enterprise portfolio module with the latest enterprise portfolio tables, then an application service rolls up to its related business application. This enables you to create a portfolio with business applications that will have the application services. You could also create a separate portfolio for application services which contains the application service. In both cases, the application services inherit KPI groups from both portfolios.

- An application service can be in a business application portfolio because:
  - Application services roll up to business applications.
  - Run data from the application service shows at the business application level.
- An application service can be added to an application-type portfolio.

Since application services can be in two different types of portfolios, the application service inherits KPI groups from two different places. See the table for how KPI groups work in the following use cases.

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### KPI groups for portfolios

| View | KPIs shown | Conditions |
|---|---|---|
| Enterprise portfolio application service preview | The inherited KPI groups from the enterprise portfolio.<br><br>If there isn't an enterprise portfolio KPI group, then an empty state is shown. | The application service enterprise portfolio type contains application services and isn't linked to a business application type.<br><br>You can link an application service to a business application enterprise portfolio type using cmdb_rel_ci. The parent should be a business application and the supporting item should be an application service. The required relationship is *Consumes: Consumed by*. |
| Application services detail page (Run tab) from an enterprise portfolio | • All inherited KPI groups display, regardless from where you navigated.<br>• Also, the KPI groups added directly to that application service display. | Application service is added and its parent enterprise portfolio is mapped with its KPI group type. |
| Application service from a personal portfolio or from a list | All KPI groups | No conditions. |

## Run tab

See KB1637474 for more information about KPI results on DPM pages.

### Application service Run tab

| Section | Description |
|---|---|
| **Application service performance** | Performance details about the application service. You can select the graphs and cards for each section to view more details. Each indicator has an information icon ( ) that when selected, provides a tooltip description for that indicator.The following KPI groups and indicators are in this section.<br>• **Portfolio success metrics**<br>  ○ Availability<br>  ○ Incidents with a breached service level agreement (SLA) |

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**Application service Run tab (continued)**

| Section | Description |
|---|---|
| | ○ Incidents caused by changes<br>○ Successful changes<br>• **Business application performance**<br>○ Number of incidents<br>○ Number of problems<br>○ Number of changes<br>• **Service health**<br>○ Critical incidents<br>○ Critical alerts<br>○ Closed changes<br>• **Service impact**<br>○ Impacted rate<br>○ Critical severity over time<br>• **Alert trends**<br>○ Incidents caused by alerts<br>○ Alerts by severity<br>• **Availability insights**<br>○ Availability<br>○ Unplanned outages<br>○ Average outage duration |
| **Commitments** | Commitment data for the application service. You can select a commitment to view its details. |
| **Service reliability management** (with sn_sow_srm plugin installed) | Service reliability management information data for the application service. To see reliability indicators, the sn_sow_srm plugin must be installed. You can select a reliability indicator to view its details. |
| **Offerings that depend on this application service** | A list of the offerings that depend on this application service. The number of offerings is in a gray box. Select an offering for its details.<br><br>For information on offering details, see Vie service and service offering details. |

## Risk tab

To see the Risk tab, you must have the Technology Portfolio Management plugin [sn_apm_tpm] installed. The Risk tab displays the Technology Lifecycle Risk for the application service with software and hardware models presented in donut reports and lists.

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**Note:**
The Technology Portfolio Management plugin [sn_apm_tpm] has two dependency plugins:

- Application Portfolio Management [com.snc.apn]
- Software Asset Management [com.snc.sams]

## Info tab

The Info tab provides general information about the application service. You can't edit the fields in the Info tab.

### Application service Info tab

| Section | Description |
|---|---|
| **Application service description** | Description about the application service. |
| **General Info** | General information about the application service.<br>• Business criticality<br>• Version<br>• Environment<br>• Operational status<br>• Managed by group<br>• Support group<br>• Approval group<br>• Change group |
| **Personal portfolios** | The personal portfolios for the application service. The number of personal portfolios is in a gray box. Select a personal portfolio for its details. |
| **Application service commitments** | The service commitments for the application service. The number of commitments is in a gray box. Select a commitment for its details. |
| **Software and hardware models** | The software and hardware models for the application service. The number of each is in a gray box. Select a software or hardware model for its details. |
| **Relationships** | The configuration items (CIs) for the application service. The number of CIs is in a gray box. Select a CI for its details. |

## Needs attention panel icons

The Needs attention panel includes the following icons for application services:

- Needs attention icon (  ) to show or hide the Needs attention panel.
- Contacts icon (  ) to view team members and teams for the record.
- Attachments icon (  ) to view and add attachments to the record.

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**Related topics**

- Enterprise portfolios
- Create enterprise portfolios in Digital Portfolio Management
- Work with Needs attention panels in Digital Portfolio Management

## KPI groups in Digital Portfolio Management

Define and configure the key performance indicator (KPI) groups in DPM that matter most to you. When you associate KPI groups with your services and applications, you can analyze their performance in a centralized area.

https://player.vimeo.com/video/1022208039?h=78848fb963&badge=0&autopause=0&player_id=0&app_id=58479

With KPI groups, you can analyze the performance of each solution in several ways:

- See a detailed description of a KPI indicator by selecting ⓘ on the KPI indicator card.
- Drill down to view trends and historical performance on vendors, a KPI group, or an individual KPI.
- Select a supporting KPI to see its related record details.
- View and drill down into the KPI spark lines to see more details. When you select a chart value, the result is filtered to display the details of the value that you selected. If you select the whole chart (not a value), then the KPI details page displays.
- See the latest (or last) KPI score when the **Latest score** system property (*sn_dpm.kpi_groups.show_latest_score*) is enabled.

  View KPI group data in the way that most interests you. Admins can update the system property anytime so you can view KPI group data by the latest score or by the aggregate score. When an admin enables the Latest score system property, the following shows in the DPM:

  - Last collected score for a KPI indicator in all KPI groups in DPM, without an aggregation layer (by sum or by average).
  - Last collected scores for all values in each KPI breakdown grid.
  - Last 30 days of scores for trends and time series visualizations. You can set different time rangers per KPI.
  - The date the score was collected (shows on each KPI indicator card).

  **Note:**
  Starting with the June 2024 release of DPM, the latest score system property is set to true for new and zBoot customers. If not applicable, then the DPM admin can enable the latest score system property by navigating to **All** > **Digital Portfolio Management** > **Administration** > **KPI groups properties**. For more admin information, see Configure the Digital Portfolio Management experience.

  When you access KPI drill down information in DPM, the system adds a timestamp at the end of the URL in the browser address field. The timestamp is in milliseconds and is based off epoch time.

The DPM base system comes with KPI groups that provide valuable indicators to evaluate overall performance and individual metrics for services and other solutions. You can also create your own KPI groups but you're encouraged to explore the base system options.

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## KPI groups for enterprise portfolios

Two KPI groups enable flexible reporting on solutions in enterprise portfolios.

- **Enterprise portfolio**

  The enterprise portfolio KPI group [*Portfolio success metrics*] enables you to map to any enterprise portfolio type to view its portfolio performance. You can track availability, mean time to resolve (MMTR), incidents caused by changes, and successful changes. You can see these performance metrics when you view the details of any enterprise portfolio.

- **Business applications**

  The business application KPI group type [*Business application performance*] enables you to track the number of incidents, problems, and changes for a business application. You can see these performance metrics in the **Run** tab of a business application on the DPM Workspace.

  **Important:**
  You must map the business application performance KPI group to your business applications to show the data on the **Run** tab.

**Note:**
The business application performance KPI group replaces the metrics used prior to the Utah release. Since you can create and edit KPI groups and map them to business applications, it provides more flexibility to configure your reporting. You don't need to edit the page in UIB to change the metrics.

## KPI groups for application services

KPI groups aren't inherited for application services, but you can do the following with the *Availability insights* KPI group for application services:

- View and assess the availability for application services that you own or are responsible for.
- Map the Availability insights KPI group to one-to-many applications services.
- View availability commitments and commitment performance on the Run tab of your application service.
- View all commitments listed on the Info tab of the application service.

**Related topics**

Navigate portfolio types in Digital Portfolio Management

KPI groups installed with Digital Portfolio Management

Create KPI groups and mappings in Digital Portfolio Management

Configure KPIs in Digital Portfolio Management with service availability example

## DevOps value stream metrics in Digital Portfolio Management

View key metrics related to the performance of your solutions in Digital Portfolio Management (DPM). If you manage your solutions in a DevOps model, then you can view DevOps data for your business applications as well as link to the DevOps Change Workspace directly from DPM.

Key metrics help you evaluate the impact on the performance of work being done on your solutions. View DevOps value stream metrics in the context of your business applications in DPM, for example, mean time to restore from changes, change failure rates, and lead time. You can also access the DevOps Change Workspace directly from your business applications in

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DPM to make data-driven decisions. Accelerate metrics are displayed on both the **Build** tab and the **Run** tab so that you can view the data in the context of your business applications for each phase. You can see flow metrics data on the **Build** tab of your business applications.

**Note:**
To view DevOps accelerate metrics and flow metrics in DPM, admins must enable the DevOps system property. See Configure the Digital Portfolio Management experience for more information.

On the **Build** tab of your business applications, view the following data in numeric forms and in charts:

- Accelerate metrics
  - Average lead time to deploy over the last 30 days
  - Commit to deploy lead time
  - Average deployment frequency over the last 30 days
  - Production deployments frequency
- Flow metrics
  - Average flow time for epics
  - Average flow time for epics and features
  - Average number of bugs and stories
  - Distribution of bugs and stories
  - Work in progress cycle time for epics, stories, and bugs (each has their own widget)
  - Work in progress items

On the **Run** tab of your business applications, view the following accelerate metrics data in numeric form and in charts:

- Average mean time to restore from incident caused by changes (over the last 30 days)
- Mean time to restore from incidents caused by changes, broken out by DevOps changes and non- DevOps changes

  **Note:**
  Non- DevOps changes are other changes listed on the Change table.

- Average change failure rates over the last 30 days
- Change failure rate over time, broken out by DevOps changes and non- DevOps changes
- Mean time to restore

## Configuring Digital Portfolio Management

Enable the Digital Portfolio Management (DPM) Workspace and configure the settings for your organization. Set it up to show data so you can monitor services, service offerings, business applications, and application services. All configuration tasks require the DPM admin role [sn_dpm.dpm_admin].

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## Using guided setup to implement Digital Portfolio Management (DPM)

Guided setup provides a sequence of tasks that help you configure the DPM Workspace on your ServiceNow instance. To open the guided setup for DPM, navigate to **All** > **Digital Portfolio Management** > **DPM Admin Center**.

For more information, see Use the Admin Center in Digital Portfolio Management.

**Note:**
The DPM Workspace uses the taxonomy structures from the Service Portfolio Management application. For more information, see Service Portfolio Management taxonomy.

## Configuration overview

Configuring the DPM Workspace involves setting up environments, tools, and user access. To configure, you must have the DPM admin role [sn_dpm.dpm_admin]. You perform most of these configuration tasks in each instance that you're using.

1. Activate Digital Portfolio Management.

   You can activate DPM by searching for it on the ServiceNow® Store.

2. Use the Admin Center in Digital Portfolio Management.

   Use the DPM Admin Center for a guided walk-through to do the following configuration tasks.

   a. Identify the solutions that are ready to configure for the organization. Solutions could be services, service offerings, business applications, and application services.
   b. Identify the service portfolios or the enterprise portfolios that are ready to configure for the organization.
   c. Assess planning items for the plan portion of the solution life cycle. If your organization doesn't use the planning portion of the life cycle, then follow the prompts to remove the plan view for the organization.
   d. Assess build metrics to show a solution's performance in the build portion of the solution life cycle.
   e. Map key performance indicator (KPI) groups to track the performance of the solutions.

3. Apply the CSDM guidelines to Digital Portfolio Management.

   Service data relates to each other using different applications and in different ways. DPM references the Common Service Data Model (CSDM) to bring service-related data together in a single view.

Even though you can return to the DPM Admin Center at any time to update configuration settings, you can also complete most of the following configuration tasks independently.

## Activate Digital Portfolio Management

The Digital Portfolio Management plugin is available from the ServiceNow® ServiceNow Store.

### Before you begin

Role required: sn_dpm.dpm_admin

### About this task

When you install the Digital Portfolio Management (DPM) application from the ServiceNow Store, it automatically installs the necessary plugins. For a list of other application plugins that you

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must install to surface other application data in DPM, see Digital Portfolio Management related applications and data sources.

### Procedure

1. Navigate to **System Application** > **All Available Applications** > **All**.
2. Find the plugin.
   Use the filter criteria and search bar to search by name or by ID. If you can't find the plugin you want, see Request a plugin .
3. Select **Install**, and then in the Activate Plugin dialog box, select **Activate**.

## Use the Admin Center in Digital Portfolio Management

The Admin Center in Digital Portfolio Management (DPM) provides administrators a guided walk-through to set up and configure the DPM Workspace for the organization. The provided information and configuration prompts enable visibility into the end-to-end service and application life-cycle.

With a DPM admin role [sn_dpm.dpm_admin], access the DPM Admin Center to set up and configure the DPM experience for the organization. The Admin Center provides easy to follow setup steps and includes tooltips and links to resources, plugins, and configuration tables.

**Note:**
An administrator [admin] must install plugins.

## Access the DPM Admin Center

To access the DPM Admin Center, you must have the DPM Admin role [sn_dpm.dpm_admin].

**Note:**
Demo data users that come with the base system have been assigned the Admin role [sn_dpm.dpm_admin]. You can impersonate one of the demo data users to test the Admin Center.

Navigate to **All** > **Digital Portfolio Management** > **DPM Admin Center**.

The Admin Center has two tabs: **Overview** and **Settings**.

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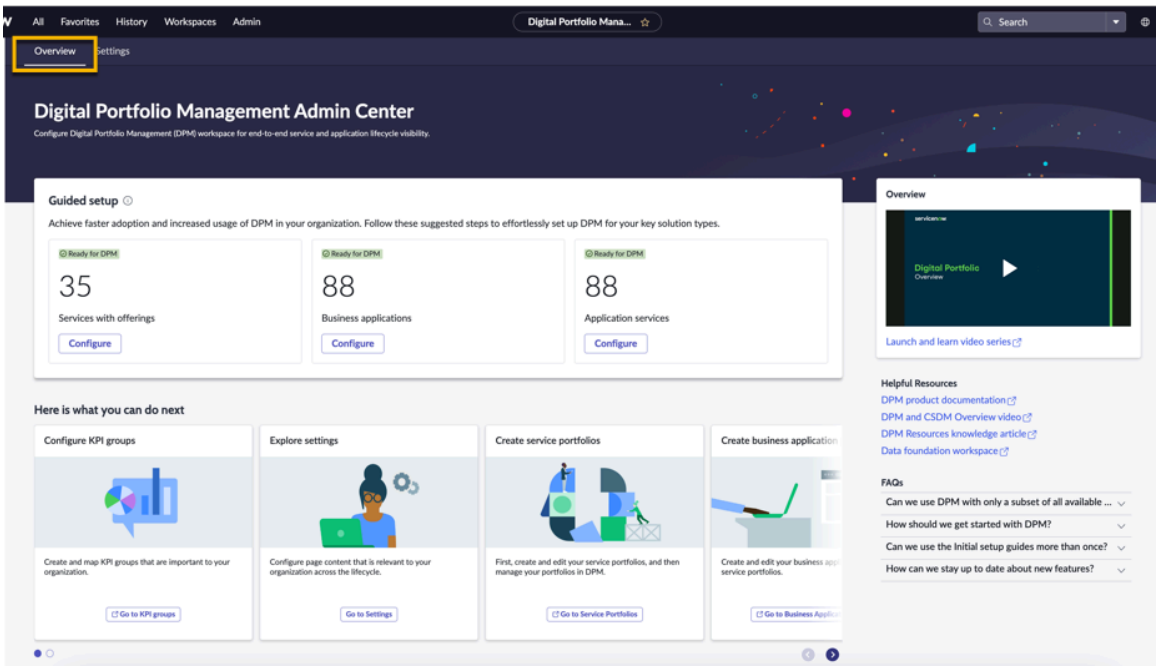
## Overview tab




The **Overview** tab enables you to do the following:

- Follow the guided setup to configure services with offerings, business applications, and application services.
- Configure key performance indicator (KPI) groups.
- Explore the settings.
- Create and review service portfolios.
- Create and review business application portfolios.
- Access helpful resources for more information.

## Navigate the configuration steps

- Select **Configure** on a solution card from the **Overview** tab.
- Follow the guided walk-though. Each step has its own prompts, instructions, and conditions to set up your data in the DPM Workspace.

> **Note:**
>
> When you see the information icon (ⓘ) next to a step heading, select it to view more information about that step.

### DPM Admin Center configuration steps for solutions

| Services with offerings | Business applications | Application services |
|---|---|---|
| **1.** Identify solutions | **1.** Identify solutions | **1.** Identify solutions |
| **2.** Identify portfolios | **2.** Identify portfolios | **2.** Identify portfolios |
| **3.** Assess planning items | **3.** Assess planning items | **3.** Map KPI groups |

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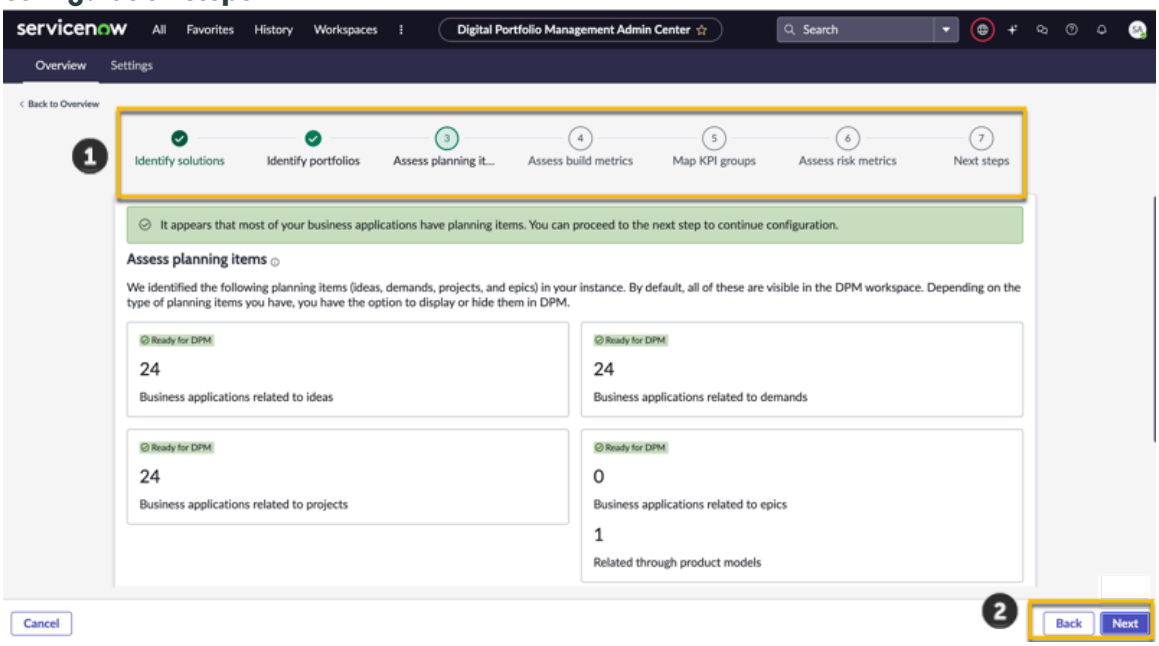
| Services with offerings | Business applications | Application services |
|---|---|---|
| **4.** Assess build metrics<br>**5.** Map KPI groups<br>**6.** Next steps | **4.** Assess build metrics<br>**5.** Map KPI groups<br>**6.** Assess risk metrics<br>**7.** Next steps | **4.** Assess risk metrics<br>**5.** Next steps |

- Navigate through the setup steps in one of two ways.
  1. Select the step number and title to perform the configuration for that step.

     A completed step shows a check mark instead of a number.
  2. Select **Next** to move to the next step and **Back** to return to the previous step.

**Example DPM Admin Center navigation using the business applications configuration steps**




You can navigate to any step at any time to update the configuration settings.

**Important:**
If you see an empty screen while configuring, you most likely don't have access for that action. To resolve access issues, contact your administrator.

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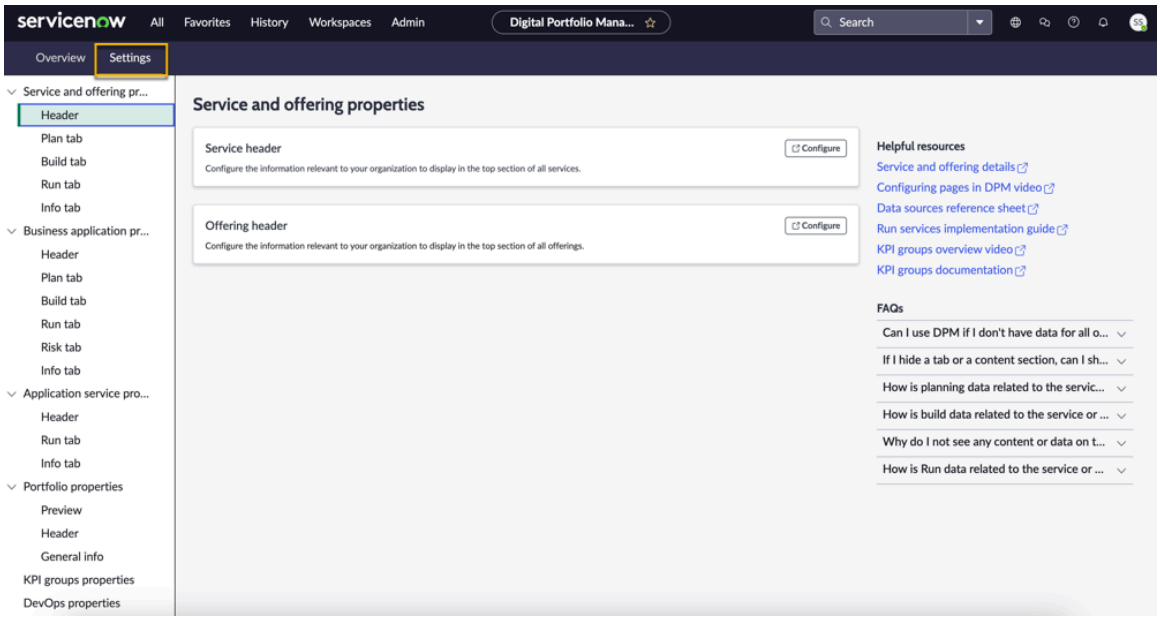
## Settings tab




The **Settings** tab enables you to do the following for solutions (services, service offerings, business applications, and application services):

- Configure the following for each solution page.
  - Personal portfolio solution cards
  - Header fields
  - Plan fields
  - Build fields
  - Run fields
  - Risk fields
  - Portfolio properties
  - General information fields on the Info tab
  - KPI group properties
  - DevOps properties
- Show or hide the Plan, Build, Run, and Info tabs.
- Show or hide fields from each of the main tabs.
- Access resources for additional help.

## More options in the DPM Admin Center

### Configure page headers in the DPM Admin Center

Configure the page header fields for your solutions in the DPM Admin Center. Your configuration determines how the header fields are displayed in the DPM Workspace.

**Before you begin**
Role required: sn_dpm.dpm_admin

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### About this task

Each solution displays header information for that solution. For example, for a service, the header information may display the owner name, the consumer type, the phase, the status, and the business criticality. You can configure the header information to best suit the needs of your organization. The DPM Admin Center enables you to configure the header information for the following solutions:

- Services and service offerings (both business and technical)
- Business applications
- Application services
- Service portfolios and taxonomies
- Enterprise portfolios and taxonomies

### Procedure

1. Navigate to **All** > **Digital Portfolio Management** > **DPM Admin Center** > **Settings**.
2. Select **Header** for the solution that you want to configure the header information.
3. Select **Configure**.
   You may get a text banner that requires you to select a link to edit the record.
4. Review the field names in the **Secondary Values** tab.
   The field names represent the information displayed on the solution header in the DPM Workspace.
5. Configure the fields from the list view.
   You can do some minor configuring in the list view.
   - You can set the **Active** value to true or false. After a field is set to false, it doesn't display on the solution header in the DPM Workspace.
   - You can change the order that the active fields display on the solution header in the DPM Workspace.
6. Configure the fields individually.
   - Select a field to configure. You may get a text banner that requires you to select a link to edit the record.
   - Review or change the information.

**Secondary Values**

| Field | Description | Editable |
|---|---|---|
| Table | The table name for the item. | No |
| Field | The field name for the item that displays in the DPM Workspace. | Yes |
| Order | The order that the item displays on the solution header in the DPM Workspace. | Yes |
| Application | The application for the item. | No |
| Workspace | The workspace for the item. | No |
| Active | The flag that determines if the item displays (or not) on the solution header of the DPM Workspace. | Yes |
| Conditions | Configuration options where you can set conditions for the item. | Yes |

7. Select **Update**.

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### Configure the Info tab in the DPM Admin Center

Configure the general information fields for your solutions in the DPM Admin Center. Your configuration determines how the fields are displayed in the **General info** section of the **Info** tab in the DPM Workspace.

## Before you begin

Role required: sn_dpm.dpm_admin

## About this task

Each solution has an **Info** tab that displays general information about the solution. For example, for a service, the **Info** tab **General info** section may display the associated service portfolio, the taxonomy node, the service classification (technical or business), the phase, the status, and more. You can configure the **General info** section to best suit the needs of your organization. The DPM Admin Center enables you to configure the **General info** fields for the following solutions:

- Services and service offerings (both business and technical)
- Business applications
- Application services
- Service portfolios and taxonomies
- Enterprise portfolios and taxonomies

## Procedure

1. Navigate to **All** > **Digital Portfolio Management** > **DPM Admin Center** > **Settings**.
2. Select the **Info** tab for the solution that you want to configure the **General info** fields.

   **Note:**
   For the **Portfolio properties** option, select **General info**.

3. Select **Configure**.
   You may get a text banner that requires you to select a link to edit the record.
4. Review the field names in the **Secondary Values** tab.
   The field names represent the information displayed in the **General info** section of the **Info** tab in the DPM Workspace.
5. Configure the fields from the list view.
   You can do some minor configuring in the list view to affect the **General info** display in a solution's **Info** tab.
   - You can set the **Active** value to true or false. After a field is set to false, it doesn't display in the **General info** section.
   - You can change the order in which the active fields are displayed in the **General info** section.
6. Configure the fields individually.
   - Select a field to configure. You may get a text banner that requires you to select a link to edit the record.
   - Review or change the information.

### Secondary Values

| Field | Description | Editable |
|---|---|---|
| Table | The table name for the item. | No |

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| Field | Description | Editable |
|---|---|---|
| Field | The field name for the item that displays on the **General info** section of the DPM Workspace. | Yes |
| Order | The order that the item displays on the **General info** section of the DPM Workspace. | Yes |
| Application | The application for the item. | No |
| Workspace | The workspace for the item. | No |
| Active | The flag that determines if the item displays (or not) on the **General info** section of the **Info** tab in the DPM Workspace. | Yes |
| Conditions | Configuration options where you can set conditions for the item. | Yes |

7. Select **Update**.

### Configure personal portfolio solution cards in the DPM Admin Center

Configure the fields that display on the personal portfolio solution cards in the DPM Admin Center. Your configuration determines the fields that display on each solution card in the DPM Workspace.

#### Before you begin
Role required: sn_dpm.dpm_admin

#### About this task
You can configure the personal portfolio solution card fields to display information on the DPM Workspace homepage:

#### Procedure
1. Navigate to **All** > **Digital Portfolio Management** > **DPM Admin Center** > **Settings**.
2. Open **Portfolio properties** and then select **Solution Cards**.
   You have the option to configure the following types of solution cards:
   - Service
   - Business service
   - Technical service
   - Service offering
   - Business application
   - Application service
3. Select **Configure** for the card that you want to configure.
   You must be in the correct application scope to edit the record. If you're in a different scope, then a text banner displays for you to select a link to edit the record.
4. Review the field names in the **Secondary Values** tab.
   The field names represent the information displayed on the personal portfolio card in the DPM Workspace.
5. Configure the fields from the list view.
   You can do some minor configuring in the list view.

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- You can set the **Active** value to true or false. After a field is set to false, it doesn't display on the solution header in the DPM Workspace.
- You can change the order that the active fields display on the solution header in the DPM Workspace.

6. Configure the fields individually.
   - Select a field to configure. You must be in the correct application scope to edit the record. If you're in a different scope, then a text banner displays for you to select a link to edit the record.
   - Review or change the information.

**Secondary Values**

| Field | Description | Editable |
|---|---|---|
| Table | The table name for the item. | No |
| Field | The field name for the item that displays in the DPM Workspace. | Yes |
| Order | The order that the item displays on the solution header in the DPM Workspace. | Yes |
| Application | The application for the item. | No |
| Workspace | The workspace for the item. | No |
| Active | The flag that determines if the item displays (or not) on the solution header of the DPM Workspace. | Yes |
| Conditions | Configuration options where you can set conditions for the item. | Yes |

7. Select **Update**.

## Apply the CSDM guidelines to Digital Portfolio Management

Service data relates to each other using different applications and in different ways. Digital Portfolio Management (DPM) references the Common Service Data Model (CSDM) framework to bring service-related data together in a single view.

DPM enables you to organize service data in logical sequences that make sense for your business. You can see details about your own services as well as services that you don't own but may impact your business.

**Tip:**
For information about the CSDM, see Implementing the CSDM framework in stages.

## Personal portfolios and CSDM

See how DPM aligns with the CSDM framework to provide a holistic view of your IT landscape.

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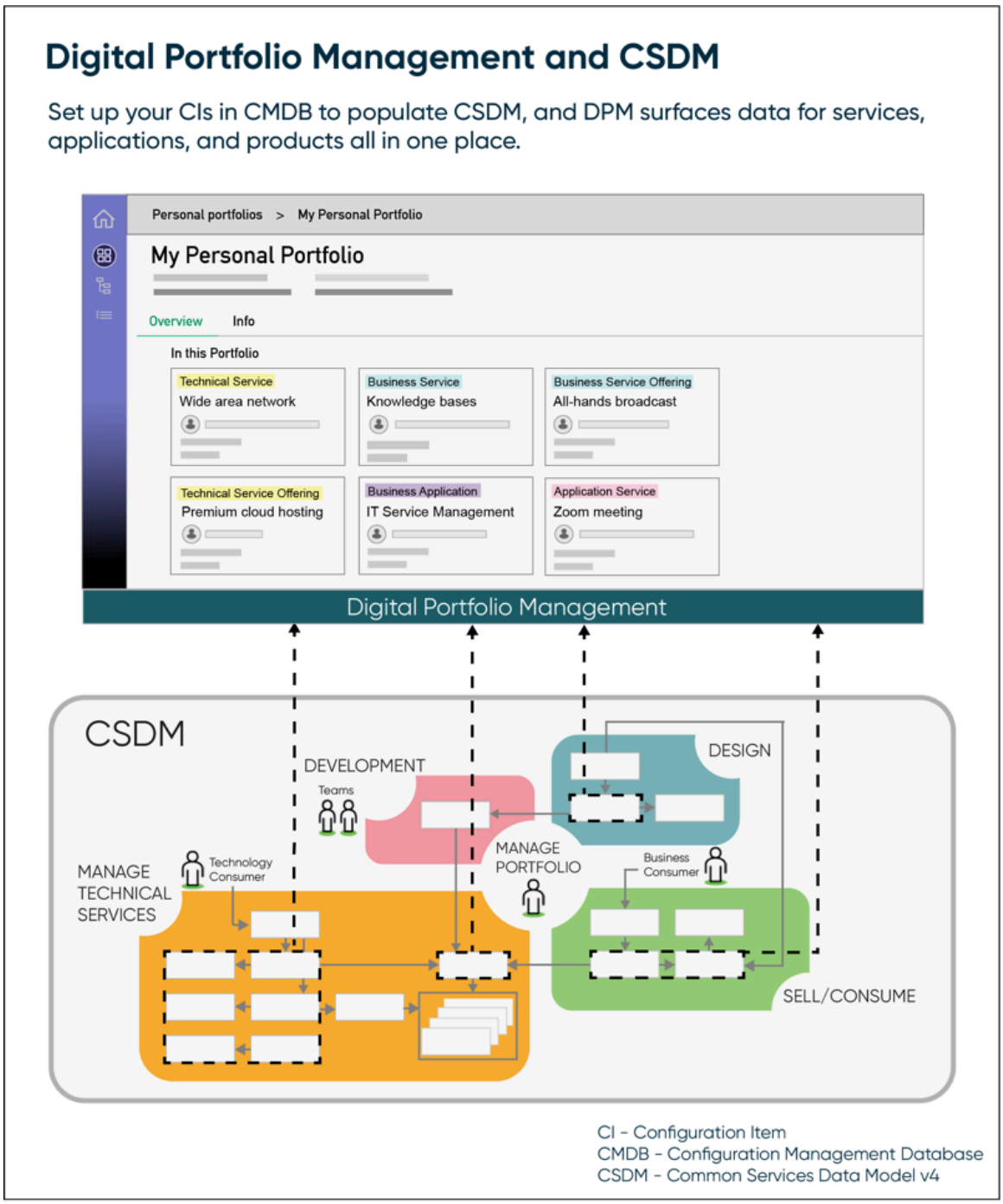
**DPM and CSDM**




## CSDM life-cycle fields for business and technical services

Service portfolios viewed in DPM display the phase (or stage) field and the status field in the header of each business and technical service and service offering. The field values come from the service table [cmdb_ci_service].

The following comparison shows the differences from the traditional Service Portfolio Management phase and status fields to the CSDM life-cycle stage and status fields.

These fields also display when you use the Performance Analytics (PA) indicators.

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**Service table [cmdb_ci_service] mapping of Service Portfolio Management and CSDM**

| Service Portfolio Management Phase and Status field names | CSDM life-cycle Stage and life-cycle Status field names |
|---|---|
| Pipeline \| Requirements | Ideation \| Under evaluation |
| Pipeline \| Definition | Ideation \| Under evaluation |
| Pipeline \| Analysis | Ideation \| Under evaluation |
| Pipeline \| Approved | Ideation \| Under evaluation |
| Pipeline\| Chartered | Design \| Chartered |
| Catalog\| Design | Design \| Design |
| Catalog \| Development | Design \| Design |
| Catalog \| Build/Test/Release | Deploy \| Test |
| Catalog \| Operational | Operational \| In-use |
| Catalog \| Retiring | Operational \| Pending Retirement |
| Retired \| Retired | End of life \| Retired |
| Retired \| Obsolete | End of life \| Obsolete |

## CSDM relationships in DPM

To confirm that you see the data that you want in DPM, you must establish the correct CSDM relationships.

How you establish relationships between your solutions and configuration items (CIs) varies depending on your situation. For more information, see CI relationships in the CSDM.

**Related topics**

- CSDM terms for Digital Portfolio Management
- Implementing the CSDM framework in stages

### CSDM terms for Digital Portfolio Management

Because both ServiceNow® products of Digital Portfolio Management (DPM) and Service Portfolio Management closely align with the Common Service Data Model (CSDM), it's helpful to know the common terms when working in these applications.

**Common CSDM terms used in DPM and Service Portfolio Management**

| Term | Definition | Notes |
|---|---|---|
| Portfolio | Collection of services, products, projects, or applications. | Used to manage like items together for a business. Portfolios may be grouped by objective, capabilities, organization, like projects or services. |
| Business capability | High-level capability that an organization requires to execute its business model or fulfill its mission. | Typically described in the context of performing one or more specific tasks to achieve business outcomes. For example, demand management or financial planning. |

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**Common CSDM terms used in DPM and Service Portfolio Management (continued)**

| Term | Definition | Notes |
|---|---|---|
| Service | Means of delivering value to customers by facilitating outcomes customers want to achieve without the ownership of specific costs and risks. | Typically has three aspects:<br>• Interaction<br>• Offering<br>• Service system<br><br>ServiceNow provides three base service types:<br>• Business<br>• Technical<br>• Application<br><br>Customers can extend the base types to align with the service types in their organization. |
| Business service | A service type that is published to business users and it typically underpins one or more business capabilities. | Typically orderable by business users. Business users are able to select the desired offering and service commitment levels via the ServiceNow® Service Catalog. For example, procurement, shipping, and finance. |
| Technical service | A service type that is published to service owners and typically underpins a business or application service. | Typically orderable by service owners. Service owners are able to select the desired offering and service commitment levels via the Service Catalog. For example, computers, storage, and networks). |
| Application service | A service type that is a logical representation of a deployed application stack. | Examples of application services are hosting, data backup, and recovery.<br><br>**Note:**<br>There is not a 1-to-1 relationship between application and application services. |
| Application | Any deployed program, module, or group of programs that is designed to provide specific functionality on a computer infrastructure. | Defines behavior and has specific functionality associated with it. Applications are typically discoverable functionality, like Apache Web Server. |
| Business Application | Represents all software and infrastructure environments (dev, test, prod) configured to provide functionality. | Used to increase productivity and perform other business functions accurately. For example, Dell Online. |
| Service catalog | Provides consumable view of available products, services, service commitment options, and offerings. | Helps manage what services a user may have access to. Also, catalogs are the initiation point for access to available services. For example, IT services catalog. |

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**Common CSDM terms used in DPM and Service Portfolio Management (continued)**

| Term | Definition | Notes |
|---|---|---|
| Service offering | A stratification of a service into capability, availability, pricing, and packaging options. | Different levels of performance and features for a given service can be made available. For example, ITSM Standard and ITSM Pro. |
| Service commitment | Defines service delivery obligations agreed to between the consumer and the provider. | Often manifested in the form of contracts such as service level agreements, operational level agreements, and underpinning contracts. Service commitments include specific performance characteristics that differentiate one offering from another. |
| Configuration item (CI) | Physical and logical components of an infrastructure that are currently or soon will be under configuration management. | May be a single module such as a server, database, or router or a more complex item, such as a complete system. For example, a web server, database, or infrastructure. |
| Asset | An item whose financial value is tracked. | Many assets are CIs and vice versa, but that is not always the case. Assets have a life cycle with financial considerations, for example, Microsoft Office 365. |
| Operating model | An abstract and ideally visual representation (model) of how an organization delivers value to its customers or beneficiaries. | Typically represents the various elements of how an organization operates. It usually incorporates strategy positions such as the innovation model, degree of intelligent automation, industry alignment, provider delivery models, and the business expectations of IT. |

## Integrate Digital Portfolio Management with other ServiceNow applications

Bring in data from other ServiceNow applications to see a comprehensive view of your solutions in the Digital Portfolio Management (DPM) Workspace. You can see data for services and service offerings, for business applications, and for application services.

### View service and service offering data in Digital Portfolio Management

See service and service offering data in the context of your solutions in the Digital Portfolio Management (DPM) Workspace.

The following image shows the service and service offering data views when you integrate the stated applications with your DPM Workspace.

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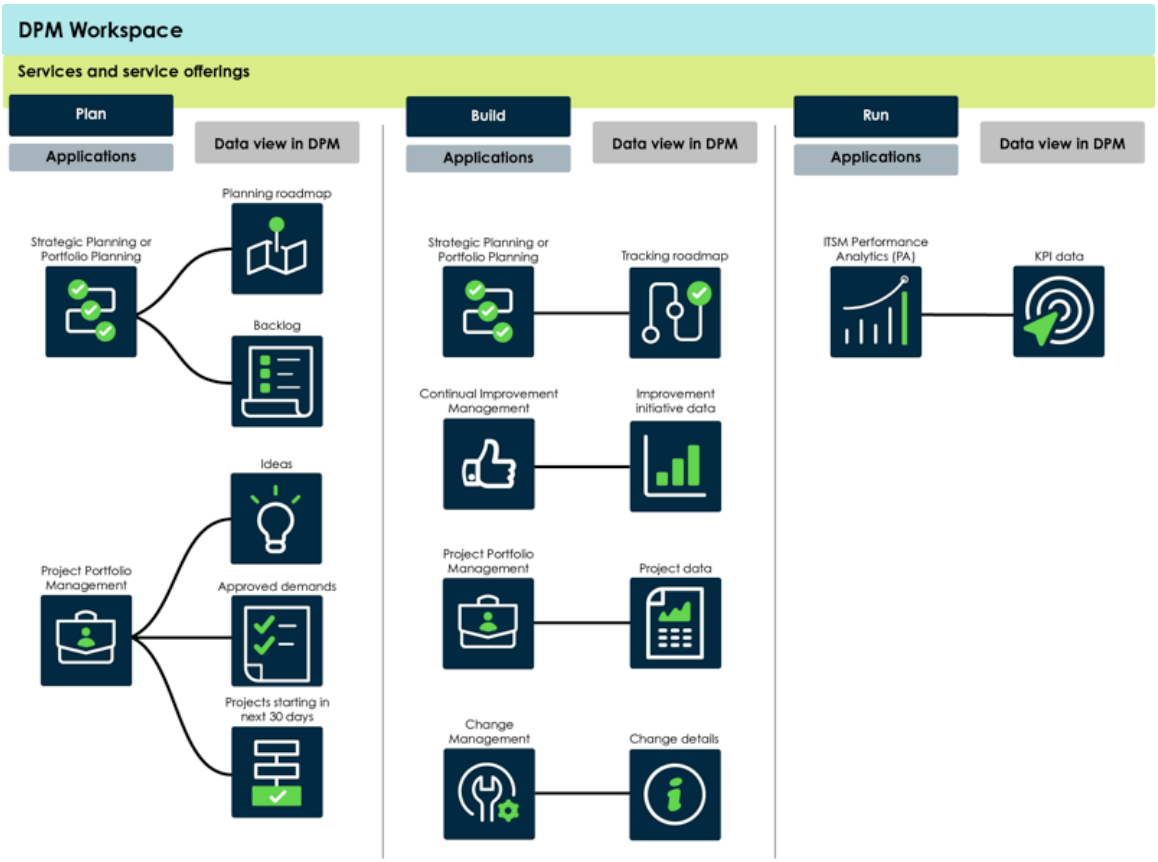


The following table explains the data views in the image. For more information, see Vie service and service offering details.

**DPM Workspace integrations for services and service offerings**

| Life cycle tab in DPM | Application | Data view in DPM |
|---|---|---|
| **Plan** | Strategic Planning or Portfolio Planning | Planning roadmap<br>Backlog |
| | Project Portfolio Management | Ideas<br>Approved demands<br>Projects starting in the next 30 days |
| **Build** | Strategic Planning or Portfolio Planning | Tracking roadmap |
| | Continual Improvement Management | Improvement initiative data<br>• Initiatives by status<br>• Overdue initiatives by month |

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**DPM Workspace integrations for services and service offerings (continued)**

| Life cycle tab in DPM | Application | Data view in DPM |
|---|---|---|
| | | • Overdue tasks<br>• Improvement initiatives closed in the last 30 days |
| | Project Portfolio Management | Project data<br>• Active project list<br>• Projects overdue by month<br>• Projects by status<br>• Projects with missed milestones<br>• Projects with critical issues |
| | Change Management | Change record details<br>• Current status<br>• Changes overdue by month<br>• Upcoming changes in the week<br>• Change backlog growth over 30 days |
| **Run** | ITSM Performance Analytics (PA) | Key performance indicator (KPI) data that comes with the base system. The following list a few but for more information, see KPI groups installed with Digital Portfolio Management.<br>• Availability<br>• New incidents<br>• Mean time to resolve<br>• New requests<br>• Changes |

**Related topics**

Digital Portfolio Management life-cycle management

Vie service and service offering details

### View business application data in Digital Portfolio Management

See business application data in the context of your solutions in the Digital Portfolio Management (DPM) Workspace.

The following image shows the business application data views when you integrate the stated applications with your DPM Workspace.

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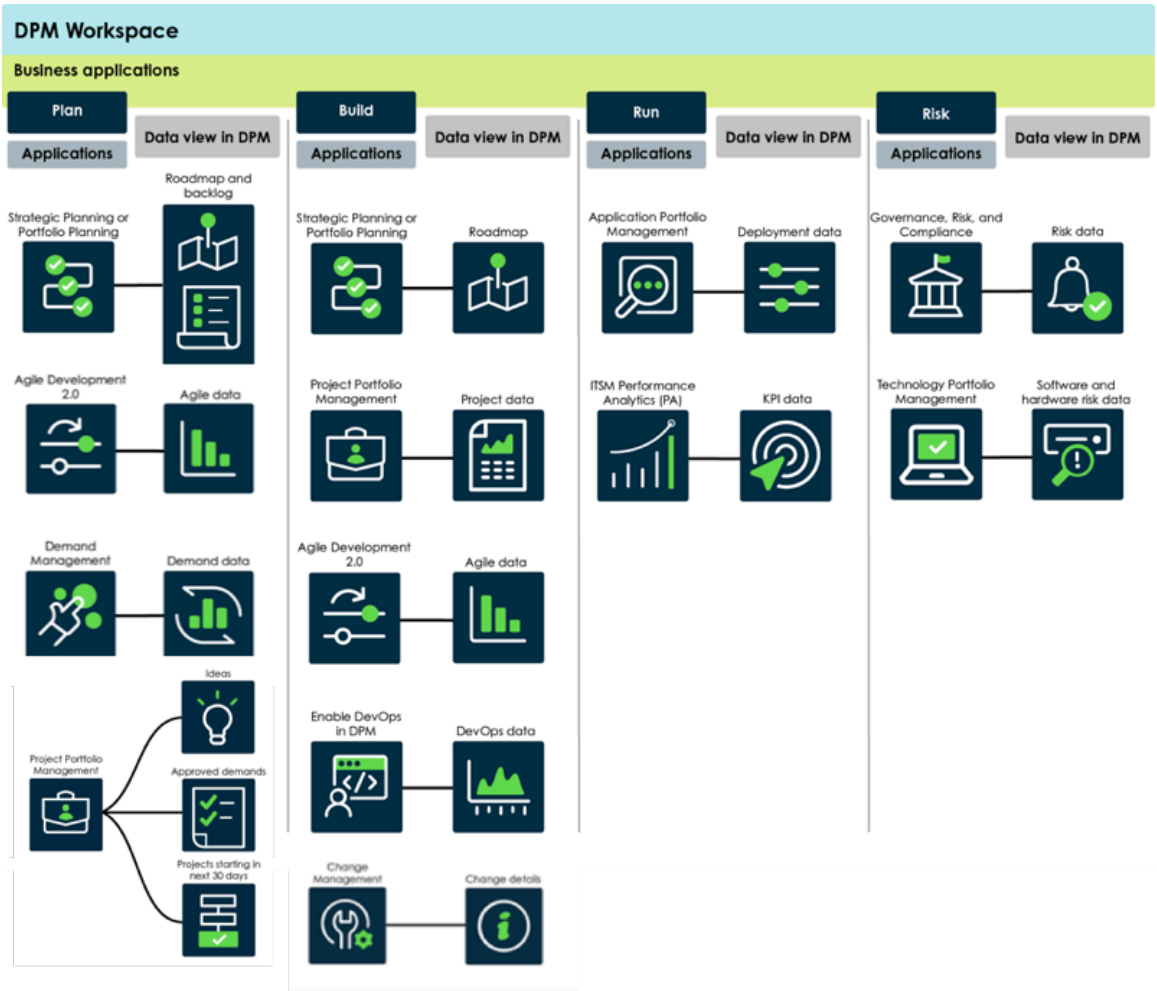


The following table explains the data views in the image. For more information, see View business application details.

### DPM Workspace integrations for business applications

| Life cycle tab in DPM | Application | Data view in DPM |
|---|---|---|
| **Plan** | Strategic Planning or Portfolio Planning | Roadmap and backlog |
| | Agile Development 2.0 | Agile data like epics and stories |
| | Demand Management | Demand data |
| | Project Portfolio Management | Ideas<br>Approved demands<br>Projects starting in the next 30 days |
| **Build** | Strategic Planning or Portfolio Planning | Roadmap |

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**DPM Workspace integrations for business applications (continued)**

| Life cycle tab in DPM | Application | Data view in DPM |
|---|---|---|
| | Project Portfolio Management | Project data |
| | Agile Development 2.0 | Agile data like epics and stories |
| | Change Management | Change record details<br>• Current status<br>• Changes overdue by month<br>• Upcoming changes in the week<br>• Change backlog growth over 30 days |
| | Enable DevOps in DPM | DevOps data |
| **Run** | Application Portfolio Management (APM) | Deployment data |
| | ITSM Performance Analytics (PA) | Key performance indicator (KPI) data that comes with the base system. The following list a few but for more information, see KPI groups installed with Digital Portfolio Management.<br>• Availability<br>• New incidents<br>• Mean time to resolve<br>• New requests<br>• Changes |
| **Risk** | Governance, Risk, and Compliance (GRC) | Risk data related to your business applications |
| | Technology Portfolio Management (TPM) | Software and hardware risk data |

**Related topics**

- Digital Portfolio Management life-cycle management
- View business application details

### View application service data in Digital Portfolio Management

See application service data in the context of your solutions in the Digital Portfolio Management (DPM) Workspace.

The following image shows the application service data views when you integrate the stated applications with your DPM Workspace.

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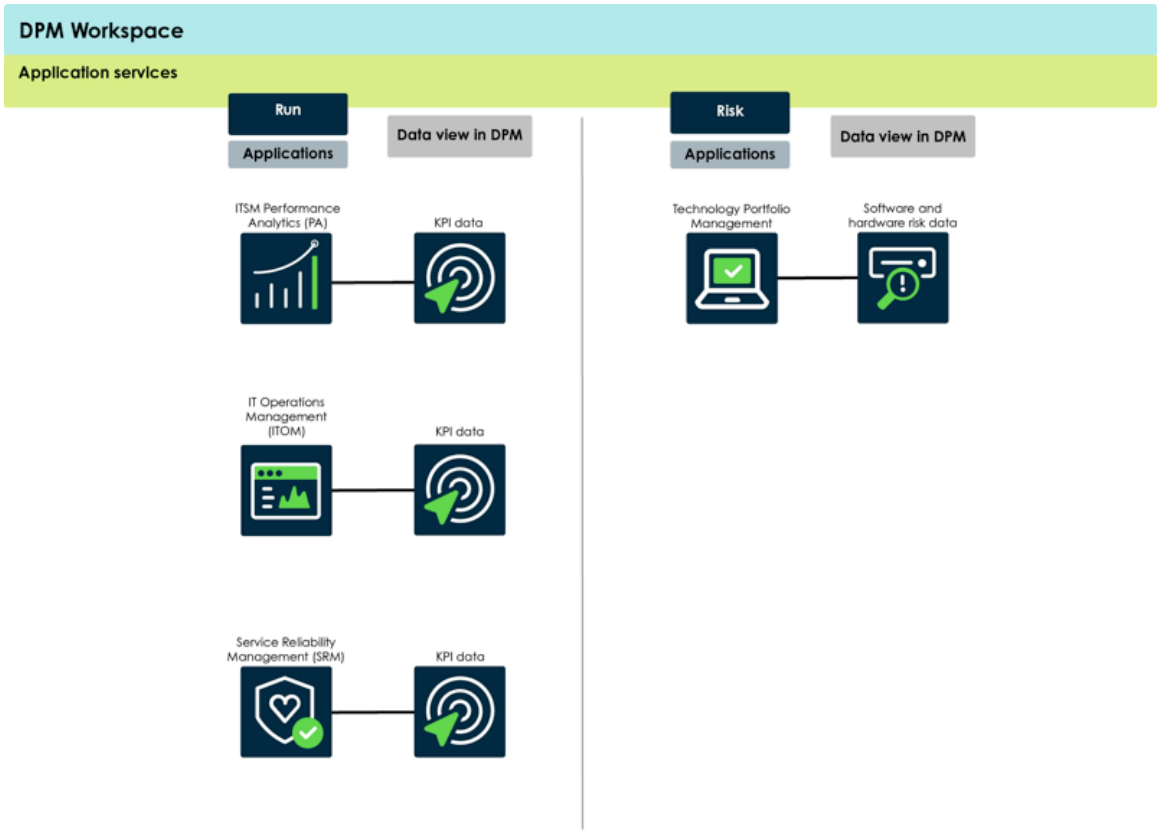


The following table explains the data views in the image. For more information, see View application service details.

**DPM Workspace integrations for application services**

| Life cycle tab in DPM | Application | Data view in DPM |
|---|---|---|
| **Run** | ITSM Performance Analytics (PA)<br><br>IT Operations Management (ITOM)<br><br>Site Reliability Metrics (SRM) | Key performance indicator (KPI) data from PA that comes with the base system. The following list a few but for more information, see KPI groups installed with Digital Portfolio Management.<br>• Availability<br>• New incidents<br>• Mean time to resolve<br>• New requests<br>• Changes<br><br>For additional KPI data, see KPI Details. |
| **Risk** | Technology Portfolio Management (TPM) | Software and hardware risk data |

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**Related topics**

Digital Portfolio Management life-cycle management

View application service details

## Configure KPI groups in Digital Portfolio Management

Configure key performance indicator (KPI) groups in Digital Portfolio Management (DPM) to surface performance information in the context of your organization's solutions.

https://player.vimeo.com/video/1022212851?h=c6e80e1d83&badge=0&autopause=0&player_id=0&app_id=58479

With a DPM admin role [sn_dpm.dpm_admin], you can define and configure the key performance indicator (KPI) groups in DPM. With KPI groups, your organization can analyze the performance of services, offerings, business services, and application services in a centralized area.

**Important:**
KPI data in DPM comes from portfolios in the Service Portfolio Management application. The Service Offering Metric Data [service_offering_metric_data] table along with the following four indicators have been deprecated in the Utah release:

- Average SLA Achievement [ServiceOffering.MetricData.SLA.Daily]
- Average Customer Satisfaction [ServiceOffering.MetricData.CSAT.Daily]
- Average Availability [ServiceOffering.MetricData.Availability.Daily]
- Average Request Activity [ServiceOffering.MetricData.Activity.Daily]

Therefore, if you have the Service Portfolio Management standard portfolio (the most recent version), then the metric data from the legacy indicators are no longer available. For more information, see Service Portfolio Management portfolios.

### Create KPI groups and mappings in Digital Portfolio Management

Create key performance indicator (KPI) groups and mappings in Digital Portfolio Management (DPM) to monitor the overall health and progress of all your services and offerings.

#### Before you begin

- Plugins required: sn_dpm, com.sn_team_perf, and com.snc.service_portfolio
- Role required: sn_dpm.dpm_admin

#### About this task

Create KPI groups and associate each group's type with its corresponding record. Here are the record types:

- Service portfolios
- Taxonomy nodes
- Services
- Offerings
- Application services
- Business applications
- Enterprise portfolios
- Enterprise taxonomy nodes

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In addition to creating your own KPI groups, you can use and configure the KPI groups that come with the base DPM application. For details, see KPI groups in Digital Portfolio Management.

This procedure includes the following tasks:

1. Create a KPI group.
2. Add indicators to a KPI group.
3. Create a KPI group mapping.

### Procedure

1. Create a KPI group.
   a. Navigate to **All** > **Digital Portfolio Management** > **KPI Groups**.
   b. Select **New**.
   c. On the form, fill in the fields.

**KPI Group form**

| Field | Description |
|---|---|
| Name | The name of the KPI group. |
| Description | The description of the KPI group. |
| Type | The type that you want to create:<br>▪ Service portfolios<br>▪ Taxonomy nodes<br>▪ Services<br>▪ Offerings<br>▪ Application services<br>**Note:** The type must correlate to the record. For example, you can only associate a service portfolio type to a portfolio record. You can only associate an offering type to an offering record. |
| Order | Determines the page layout of the KPI groups in the Digital Portfolio Management workspace. |

   d. Select **Submit**

**Tip:** You can also create a KPI group by copying an existing KPI group. For more information, see Copy a KPI group to create a new KPI group in Digital Portfolio Management.

2. Add indicators to a KPI group.
   a. Navigate to **All** > **Digital Portfolio Management** > **KPI Groups**.
   b. Select the KPI group that you want to add indicators to.
   c. On the **KPIs** tab, select **New**.
   d. On the form, fill in the fields.

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**KPIs form**

| Field | Description |
|---|---|
| KPI Group | KPI group to add indicators. |
| KPI | KPI indicator that you want to measure. |
| Label | Name of the KPI indicator. You can edit the label. |
| Parent KPI | Parent KPI, if this KPI is a supporting KPI. |
| Display Aggregate | KPI display aggregate: Average or Sum.<br>**Note:** This field applies when the latest score property [sn_dpm.kpi_groups.show_latest_score] is false. For information, see Configure the Digital Portfolio Management experience. |
| Order | Page layout of the KPI groups in the Digital Portfolio Management workspace. |
| Description | The description of the indicator. For more information on KPI results, see KB1123710. |
| Chart type | The chart type for the KPI group. The options are:<br>▪ **Single score**<br>▪ **Time series: Line**<br>▪ **Time series: Column**<br>▪ **Time series: Area**<br>▪ **Time series: Spline**<br>▪ **Time series: Step line**<br>▪ **Group By**<br>**Note:** The **Group By** option enables you to select the results breakdown. For example, incidents by priority. |

**e.** Select **Submit**.

**3.** Create a KPI group mapping.

**a.** Navigate to **All** > **Digital Portfolio Management** > **KPI Group Mappings**.

**Note:** You can also map a KPI group by navigating to **All** > **Digital Portfolio Management** > **KPI Groups**. Select a KPI group to view, and then select the **KPI Group Mappings** tab.

**b.** Select **New**.

**c.** On the form, fill in the fields.

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### KPI Group Mapping form

| Field | Description |
|---|---|
| KPI Group | KPI group name to add the mapping. |
| Mapping | Mapping type associated with the KPI group. Depending on which KPI Group you select, one of the following displays as the Mapping field.<br>▪ Service portfolio<br>▪ Taxonomy node<br>▪ Service<br>▪ Offering<br>▪ Application service<br>▪ Business application<br>▪ Enterprise portfolio<br>▪ Enterprise taxonomy node |

**d.** Select **Submit**.

**Related topics**

Configure KPI groups in Digital Portfolio Management

Configure KPIs in Digital Portfolio Management with service availability example

## Configure KPIs in Digital Portfolio Management with service availability example

Configure key performance indicators (KPIs) in Digital Portfolio Management (DPM) to surface performance information in the context of your solutions. This procedure uses the example of configuring service availability to display the availability score in the Run life-cycle phase.

### Before you begin

- Plugins required: sn_team_perf_kpi_group and com.snc.service_portfolio
- Role required: sn_dpm.dpm_admin

### About this task

As a user with the sn_dpm.dpm_admin role, you can configure KPIs to display in DPM. This task uses the Outage and Availability KPI group to show how to configure the service availability KPI.

**Note:**
You must have Service Portfolio Management premium subscription to perform this task. This premium subscription automatically installs if you have DPM installed.

For general information about KPI groups, see KPI groups in Digital Portfolio Management.

To create KPI groups, see Create KPI groups, mappings, and visualizations.

This procedure includes the following tasks:

1. Create the KPI group mapping.
2. Create the service commitment.

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3. Associate the service commitment to the service offering.
4. Create an outage for the service offering.
5. Run the data collection job and verify.
6. Ensure that the KPI displays in DPM.

### Procedure

1. Create the KPI group mapping.
   The mapping you create sets up the service offering that you want to view availability.
   a. Navigate to **Digital Portfolio Management Workspace** > **KPI Group Mappings**.
   b. Select **New**.
   c. On the form, fill in the fields.

#### KPI Group Mapping form

| Field | Description |
|---|---|
| KPI Group | KPI group name to add the mapping. For this example, map to the Outage and Availability KPI group. This mapping may already be done as part of the base DPM system. |
| ▪ Service portfolio<br>▪ Taxonomy node<br>▪ Service<br>▪ Offering<br>▪ Application service | Mapping that you want to associate with this KPI group. The fields that are displayed depend on the type of KPI group that you selected. For this example, the mapping is **Offering**. |

   d. Select **Submit**.
2. Create the service commitment.
   For this example, select a service portfolio that you want to configure the service availability KPI. You can select a personal portfolio or an enterprise portfolio.
   a. Navigate to **All** > **Service Portfolio Management** > **Commitments**.
   b. Select **New** to set up availability data.
   c. On the form, fill in the fields.

#### Commitment form

| Field | Description |
|---|---|
| Name | Commitment name. |
| Type | Type of commitment. The **Availability** type sets up availability data. |
| Percentage available | Percentage that the commitment is available. For example, 90%. |

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| Field | Description |
|---|---|
| Schedule | Duration that the commitment is available. For example, 24 x 7 sets the commitment for every day. |
| Time zone | Time zone for the commitment. |
| Description | Description of the commitment. |

**d.** Select **Submit**.

**3.** Associate the service commitment to the service offering.

**a.** Navigate to **All** > **Service Portfolio Management** > **Service commitment**.

**Note:**
If the plugin is not installed, then enter the table name in the filter navigator: **service_offering_commitment.list**, and then press **Enter**.

**b.** Select **New**.

**c.** On the form, fill in the fields.

**Service commitments form**

| Field | Description |
|---|---|
| Service offering | The service offering associated with the service commitment. |
| Service commitment | The service commitment associated to the service offering. |

**d.** Select **Submit**.

**4.** Create an outage for the service offering.
Set the service availability for the past seven days prior to creating the outage record.

**a.** Navigate to **All** > **Service Portfolio Management** > **Outages**.

**b.** Select **New**.

**c.** On the form, fill in the fields.

**Outage form**

| Field | Description |
|---|---|
| Number | System-generated number for the outage record. |
| Configuration Item | The service offering associated with the outage. |
| Begin | The start date of the outage. |
| End | The end date of the outage. |

**d.** Select **Submit**.

**Note:**
The outage that you create for the service offering also generates a service availability record for the service offering.

**5.** Run the data collection job and verify.

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The job collects data from all Performance Analytics indicators on the scheduled jobs list. This step also provides you with verification steps to ensure that the job ran successfully.

a. Navigate to **All** > **System Definition** > **Scheduled Jobs**.

b. In the Name column, search for **SPM Data Collection job for PA**.

c. Select **edit**.

d. Ensure that the **Relative start** is set to the number of days to collect data (default is **1**).

e. Select **Execute now**.

f. Refresh the screen to see your job log on the **Job Logs** tab. Review the created date and ensure that the **State** is **Collected**.

g. Open the **Indicators** tab and under the Name column, search for the **SPM Availability** indicator.

h. Select **SPM Availability**, and then select **edit**.

i. On the form, open the SPM Availability indicator record to verify that you created the job successfully.

j. Select the **Show Analytics Hub** related link to verify that the availability score is displayed for the offering. If several values are displayed, then search for the offering name to verify that you set the availability score properly for that offering.

6. Ensure that the KPI is displayed in DPM.

a. Navigate to **Workspace** > **Digital Portfolio Management**.

b. Find the service portfolio that has the availability KPI that you created.

- If you created the availability KPI for a personal portfolio, then open the personal portfolio card that has the availability KPI.
- If you created the availability KPI for an enterprise portfolio, then use the enterprise portfolio tree structure to find the service offering record.

c. On the **Run** tab, ensure that the Performance snapshot Availability card displays the correct percentage value.

### Related topics

Create KPI groups and mappings in Digital Portfolio Management

## Copy a KPI group to create a new KPI group in Digital Portfolio Management

Create a new key performance indicator (KPI) group by copying an existing KPI group in Digital Portfolio Management (DPM). All the KPI records, supporting KPIs, and mappings of the KPI group are copied as well. After you copy the KPI group, you can modify all aspects of it so the new group best fits your needs.

### Before you begin

Role required: sn_dpm.dpm_admin

### About this task

This procedure uses the KPI groups **Copy** button. To see the **Copy** button on the KPI groups page, you must have the Team Performance [sn_team_perf] plugin activated.

### Procedure

1. Navigate to **All** > **Digital Portfolio Management** > **KPI groups**.
2. Open the KPI group in the list that you want to copy.
3. Select **Copy**.

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You can update the KPI group after you copy it, as specified in Step 5.

4. Return to the KPI group list to find the copied KPI group.
   The copied KPI group name is the same as the one that you copied with *Copy of* in the front of the name.
5. Open the copied KPI group.
   You can change the name, description, and order. You can also change the supporting KPIs and the KPI group mappings.
6. **Optional:** Delete a KPI group.
   When you delete a KPI group, you delete the KPIs, supporting KPIs, and mappings of the KPI group. There are a few ways that you can delete your copied KPI group (or any KPI group):
   - Select **Delete** while viewing the KPI group (it's next to **Copy**).
   - Select the box next to the KPI group name in the KPI group list, and then navigate to **Actions on selected rows** > **Delete**.

### Update KPIs in Digital Portfolio Management

You can update the key performance indicator (KPI) fields in Digital Portfolio Management (DPM). The KPI data is shown in the DPM Workspace.

#### Before you begin

Role required: sn_dpm.dpm_admin

#### About this task

This procedure accesses KPIs via the KPI group in DPM. To see a list of all KPI indicators without the context of its parent KPI group, enter `sn_team_perf_kpi_group_m2m_pa_indicators.list` in the Filter navigator, and then press **Enter**.

#### Procedure

1. Navigate to **All** > **Digital Portfolio Management** > **KPI Groups**.
2. Open a KPI group to view its details.
3. On the KPIs related list (tab), select the item in the **Label** column to open it.

   **Note:**
   Be sure to select the item in the **Label** column and not in the **KPI** column.

4. On the form, update the fields.

**KPI fields**

| Field | Description |
|---|---|
| KPI Group | Name of the KPI group. |
| KPI | Name of the Performance Analytics (PA) indicator.<br>**Note:** The KPI field pulls information from the Indicator table [pa_indicators]. |
| Label | The KPI label shown in the DPM Workspace. |
| Parent KPI | The Parent KPI for the KPI. |

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| Field | Description |
| --- | --- |
| Display aggregate | The method for how KPIs are displayed in the DPM Workspace. The entry can be Average or Sum.<br><br>**Note:**<br>This field applies when the latest score property [sn_dpm.kpi_groups.show_latest_score] is set to false. For information, see Configure the Digital Portfolio Management experience. |
| Order | The order the KPI is displayed within the KPI group. |
| Description | The description of the KPI.<br><br>In the DPM Workspace, selecting the tooltip on the KPI card reveals the description. You access the KPI cards in the following areas:<br>○ On the Run tab for services, service offerings, business applications, and application services.<br>○ On the Overview tab for portfolios and taxonomy nodes.<br>For more information on the data shown in KPI charts and graphs, see KB1123710. |
| Chart type | The chart type for the KPI group. The options are:<br>○ **Single score**<br>○ **Time series: Line**<br>○ **Time series: Column**<br>○ **Time series: Area**<br>○ **Time series: Spline**<br>○ **Time series: Step line**<br>○ **Group By**<br><br>**Note:**<br>The **Group By** option enables you to select the results breakdown. For example, incidents by priority. |
| Time range | The time range for the KPI to display.<br>○ Last 7 days<br>○ Last 30 days<br>○ Last 90 days<br>○ Last 180 days |
| Active flag | The flag that determines if the KPI displays in the KPI group. KPI groups can display in several places in the DPM Workspace — The enterprise portfolio page, the Overview tab of portfolios and nodes, and the Run tab of services and offerings, business applications, and application services. The flag for all KPIs that come with the base system is set to active. As an admin, you can clear the flag so it's inactive. |

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| Field | Description |
| --- | --- |
| | ○ When checked, the flag is active and the KPI displays in the KPI group.<br>○ When cleared, the flag is inactive and the KPI doesn't display in the KPI group.<br>**Important:** Two KPIs can use the same indicator. If both indicators are in a KPI group that is displayed, then both show the same indicator in the KPI groups. If one KPI is set to inactive, then that one is hidden from display, but the other one still displays. |

5. Select **Update**.

**Related topics**

KPI groups in Digital Portfolio Management

## Configure Needs attention panels in Digital Portfolio Management

Each solution page in Digital Portfolio Management (DPM) has a Needs attention panel with items that need attention in the context of the page. You can configure the Needs attention attributes to meet your organization's needs.

### Before you begin

Role required: sn_dpm.dpm_admin

### About this task

Configurable Needs attention panels and its attributes table were introduced in the Utah Store release, November 2023. The following are general guidelines but for more Admin configuration steps, see KB1519343.

Default thresholds apply to the DPM Workspace homepage. Solutions use the default attributes and thresholds from the attributes table until users decide to personalize their DPM Workspace homepage experience. See Personalize the Digital Portfolio Management Workspace homepage.

### Procedure

1. Navigate to **All** > **Digital Portfolio Management** > **Needs attention** > **Needs attention attributes**.
   The Needs attention attributes display in a table — Critical incidents, Outages, Changes, Alerts, Risks, Audits, and Critical problems.

   **Note:** To see Critical problems in the Needs attention panel, you must be using the DPM August 2024 release or a later release.

2. **Optional:** Use the Personalize List icon ( ) to add the following column fields to the table.
   - Name
   - Description
   - Solution type
   - Order

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- Active
- Show on homepage
- Show on needs attention
- Threshold for moderate
- Threshold for severe

3. Update the field settings.

| Column field | Setting |
| --- | --- |
| Order | ○ The order of the attributes on the user's homepage solution cards.<br>○ The order of the attributes when the user personalizes the **Edit status conditions** on the homepage.<br>**Note:** When editing the status conditions, the first four attributes of each type display. You can select the drop-down list to select different status conditions. |
| ○ Active<br>○ Show on homepage<br>○ Show on needs attention | Set to true or false. If set to true, then the logged-in user can choose to show the attribute on their homepage solution cards and then personalize the thresholds for that attribute. |
| ○ Threshold for moderate<br>○ Threshold for severe | Change the number from the default threshold to the threshold that you want to set for each attribute.<br>**Note:** If a threshold is set to zero (0), then that attribute field is empty. |

**Related topics**

Work with Needs attention panels in Digital Portfolio Management

## Configure the Digital Portfolio Management experience

If your organization doesn't use certain modules or life-cycle phases in Digital Portfolio Management (DPM), then configure the experience by hiding those elements from user views.

### Before you begin

Role required: sn_dpm.dpm_admin

### About this task

Configure the user experience without having to use the UI Builder application. As a DPM admin, you can:

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- Hide entire tabs, certain sections of a tab, and solutions types (for example, business applications) from user views. After a tab or solution type is hidden, that item is also hidden in searches and filters.
- Hide available item types — services, technical services, business services, application services, service offerings, and business applications.
- Enable system properties to show:
  - Standard Needs attention panels.

    **Note:**
    Standard Needs attention panels are set to true for new customers. Existing customers must enable the system property. For more information, see Work with Needs attention panels in Digital Portfolio Management.

  - Latest (or last) key performance indicator (KPI) scores. When enabled, KPIs no longer display as a sum or average across a date range. This feature is only available with the Utah release and later.
  - DevOps data. For more information, see DevOps value stream metrics in Digital Portfolio Management.

**Note:**
You can enable and disable these configurations at any time.

See configuring DPM user views in action.

https://player.vimeo.com/video/1022258649?h=1f96ee0b3c&badge=0&autopause=0&player_id=0&app_id=58479

**Configuration options in DPM**

| Services and offerings | Business applications | Application services | KPI latest score | DevOps data |
|---|---|---|---|---|
| Hide the following tabs:<br>• **Plan**<br>• **Build**<br>• **Run**<br><br>Hide the following sections from the **Plan** tab:<br>• Demands<br>• Backlog<br>• Roadmap<br><br>Hide the following sections from the **Build** tab: | Hide the following tabs:<br>• **Plan**<br>• **Build**<br>• **Run**<br>• **Risk**<br><br>Hide the following sections from the **Plan** tab:<br>• Demands<br>• Backlog<br>• Roadmap<br><br>Hide the following | Hide the **Run** tab. | Enable the **Latest score** option to show the latest or last KPI score. When enabled, KPIs won't show as a sum or average across a date range. | Enable the **DevOps properties** option to show DevOps data such as flow metrics and accelerate metrics in DPM. |

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**Configuration options in DPM (continued)**

| Services and offerings | Business applications | Application services | KPI latest score | DevOps data |
|---|---|---|---|---|
| • Roadmap<br>• Projects<br>• Changes<br>• Improvement initiatives<br><br>By default, DevOps data are hidden on the **Run** tab. Enable the DevOps system property for users to see DevOps accelerated metrics on the **Run** tab. | sections from the **Build** tab:<br>• Roadmap<br>• Projects<br>• DevOps flow metrics<br>• DevOps accelerated metrics<br><br>By default, DevOps data are hidden on the **Build** tab. Enable the DevOps system property for users to see flow metrics and accelerated metrics on the **Build** tab. | | | |

## Procedure

1. Navigate to **All** > **Digital Portfolio Management** > **Administration**.
2. Select the menu item that you want to configure for users.
   - **Application service properties**
   - **Business application properties**
   - **Service and offering properties**
   - **DevOps properties**
   - **KPI groups properties** (option to set the Latest score system property)
   - **Available item types** (go to Step 6)
3. If applicable, follow the provided instructions to edit the selected record. For some properties, there's a link for you to select.
4. Follow the provided instructions to edit each configuration.
5. Select **Save**.
6. **Optional:** Hide or show available item types.
   - Navigate to **All** > **Digital Portfolio Management** > **Administration** > **Available item types**.
   - In the **Active** column, set the item type to `false` (to hide) or to `true` (to show). When a solution type is hidden, that solution is omitted from the following areas:
     - The auto-generated solution card results.
     - The personalization options of add and remove items.

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- The set status conditions when updating thresholds.
- On the page filters.

**Related topics**

UI Builder

## Relate business capabilities to view in Digital Portfolio Management

You can relate business capabilities for a service or for a business application to see them in the Digital Portfolio Management (DPM) Workspace.

### Before you begin

Role required: sn_dpm.dpm_admin

### About this task

There are two conditions to create a CI relationship in DPM.

1. The business capability must be created.
2. The business capability must be related to a service.

You can create a business capability by navigating to **All** > **CSDM** > **Design** > **Business Capability**. For information about configuration item (CI) relationships, see Create or edit a CI relationship.

### Procedure

1. Confirm the business capability name and the solution name that you want to relate.
2. Create the CI relationship.

   a. Enter `cmdb_rel_ci.list` in the filter navigator, and then press **Enter**.

   b. Select **New**.

   c. On the form, fill in the fields.

| Field | Description |
|---|---|
| Parent | The business capability that is to be related to the service or business application. Use the search icon ( ) to select the business capability. |
| Type | The type of CI relationship. Use the search icon ( ) to select **Provided By:: Provides**. |
| Child | The service or business application to be related to the business capability. Use the search icon ( ). |

   d. **Submit**.

3. Confirm the CI relationship.
   You can confirm the CI relationship in one of two ways:
   - On the business capability record, in the Related Items section.
   - In the DPM Workspace, on the Info tab of a service or business application.

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**Related topics**

Vie service and service offering details

View business application details

## Configure Digital Portfolio Management to integrate with Process Mining

Use Process Mining in Digital Portfolio Management (DPM) to see the status of a key performance indicators (KPI) on your solutions, and adjust as needed.

Process Mining enables you to analyze and address KPI outputs for your solutions in DPM.

Administrators must complete a few steps to set up Process Mining.

## Set up Process Mining in DPM

In general, to use Process Mining in DPM, you access the KPI group and select **Initiate Process Mining**. To see that option, administrators with the dpm_admin role must do the following.

1. Install the ITSM Process Mining Content Pack from the ServiceNow Store. The content pack provides the following project insights and system property for Process Mining in DPM:
   - Team performance
   - Process Mining
   - System property *sn_dpm.enable.po.dpm*
2. Set the system property *sn_dpm.enable.po.dpm* to true. By default, the system property is set to false. Admins [sn_dpm.dpm_admin] must set the system property to true.
   a. Navigate to **All** > **Digital Portfolio Management** > **Administration** > **Settings**.
   b. Enter ***enable** in the **System Properties Name** search field, and then press **Enter**.
   c. Verify that the system property *sn_dpm.enable.po.dpm* is set to true. If not, then select it, and set the Value field to true (you may get a text banner that provides a link to edit the record).
   d. Select **Update**.

The primary role to use Process Mining is Process Mining Analyst [process_optimization_analyst]. For details about properties, roles, and scheduled jobs, see Process Mining components for Digital Portfolio Management.

## Create Process Mining projects for KPI groups in Digital Portfolio Management

Create Process Mining projects for each key performance indicator (KPI) group in Digital Portfolio Management (DPM) to see KPI performance and analyze anomalies.

### Before you begin

- Role required: sn_process_optimization_analyst
- Enable Process Mining

### About this task

Use Process Mining to analyze and improve KPI performance in DPM.

The KPI assignment group manager must have the required role to create Process Mining projects for their KPI groups: Process Mining analyst [sn_process_optimization_analyst].

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For information about properties, roles, and scheduled jobs, see Process Mining components for Digital Portfolio Management.

Several project templates come with the base DPM system:

- Incident
- Problems
- Changes
- Requests

If you want different templates, then your administrator must create them on the tables that correspond to what you want to see insights for. For information on creating templates, see Create Process Mining templates.

A scheduled job runs to remine the projects when additional data is added so that you get the most updated insights for your projects.

### Procedure

1. Mine the project to create Process Mining projects for each KPI group.

   a. Navigate to **All** > **Digital Portfolio Management** > **KPI Groups**.

   b. Open a KPI group that you want to mine for.

   c. Select **Initiate Process Mining**.

   After you select **Initiate Process Mining**, a project is created in the background for each KPI table in the KPI group. If you're using a formula indicator for Process Mining, you can select any indicator source that is used in the formula.

   **Note:**
   The system property *sn_dpm.enable.po.dpm* must be enabled. For more information, see Configure Digital Portfolio Management to integrate with Process Mining.

2. **Optional:** Open the project and check the mining.
   If you don't want users to filter on retired projects, then make sure the project definition status is set to Retired.

   a. To find the project, navigate to **All** > **Digital Portfolio Management** > **DPM Projects**.

   b. Check the mining state by opening the project and selecting **Generate model (Full)**.

3. **Optional:** Remine the KPI group again if you added additional assignment groups to the KPI group after you did the process mining.

   a. In the Assignment Group related list for the selected KPI group, select **Edit**.

   b. Add the desired assignment group to the KPI group.
   A process is automatically created for the assignment group. If you add an assignment group to the KPI group, then the assignment group is updated in the filter condition. If you remove any assignment group, then it's removed from the project filter condition. An informational message is displayed when an assignment group is added to the KPI group only if the KPI group is already mined.

4. See the Process Mining insights and variations for selected KPI records.

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a. Open the DPM Workspace.

b. Select the enterprise portfolios icon (  ), and then open an enterprise portfolio.

c. Select **View Details**.

d. Select an incident KPI single score.
On the KPI drill down page, select the **Process analysis** tab to see the insights and variations for the selected KPI records. By default, the data shown is from the last 30 days.

**Related topics**

Configure Digital Portfolio Management to integrate with Process Mining

Process Mining components for Digital Portfolio Management

# Getting started with Digital Portfolio Management

The Digital Portfolio Management (DPM) Workspace is a unified environment to view all your services, service offerings, business applications, and application services. With the proper access, you can also view details and edit the solutions without having to leave the DPM experience.

## Getting started with the DPM Workspace

https://player.vimeo.com/video/974352474?badge=0&autopause=0&player_id=0&app_id=58479

This video provides getting started steps to use the DPM Workspace.

## Perform tasks and customize views

The DPM Workspace provides basic roles to create personal portfolios. To see portfolio details, you must install the proper plugins and roles from the products that you want to view.

For example, viewing and editing roadmaps comes from the Strategic Planning application. If you want to see roadmaps in the context of your service or service offering while in the DPM experience, then you must install the plugins and roles for Strategic Planning.

Also, DPM enables administrators to customize user views by hiding certain tabs and tab sections (even roadmaps as mentioned in the previous example). For more information, see Configure the Digital Portfolio Management experience.

To learn about the plugins and roles required to view data from other ServiceNow applications in the DPM experience, see Digital Portfolio Management related applications and data sources.

**Note:**
In the DPM experience, the data you pull in from other applications is limited to the license that you have from the other applications. For example, if you have a standard license for Strategic Planning, then you see standard Strategic Planning data in DPM. Likewise, if you have a pro license for Strategic Planning, then you see pro Strategic Planning data in the DPM experience.

The DPM base roles and plugins enable some actions like create demand and improvement initiatives. To make more substantial actions or edits, you must have the proper access control list (ACL) permissions from the applications that you want to work with in DPM.

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# Personalize the Digital Portfolio Management Workspace homepage

Personalize your Digital Portfolio Management (DPM) Workspace homepage to meet your needs. You can edit the status conditions of each solution, add solutions, search for solutions, and filter solutions by status and by type.

## Before you begin

Role required: sn_dpm.dpm_manager

## About this task

You can personalize your homepage (  ) to set the attributes and thresholds that you want to track on your solutions. After you personalize your status conditions, the system will no longer use the default attributes and thresholds that come with the base DPM system. Instead, your personalizations are saved in your user preference record (*dpm_home_page_item_list*) to provide you with the homepage view that you want to see.

You can also customize your personal view by using the search and filter options on the homepage.

## Procedure

1. Navigate to the **Digital Portfolio Management Workspace**.
2. Personalize the homepage.
   - Select **Personalize**.
   - Select the option to personalize your solution cards.
     - Select **Edit status conditions** to set your own thresholds for Needs attention attributes on business applications, services/offerings, and application services on your homepage. For default values, see Digital Portfolio Management Workspace homepage.
     - Select **Add items** to add business applications, services/offerings, and application services to your homepage.
     - Select **Remove items** to remove business applications, services/offerings, and application services from your homepage.

       **Tip:**
       If there aren't any items in your homepage when you login, then select **Add items** to add solutions to your homepage. For the limit on the number of solution cards you can have on your homepage, see Digital Portfolio Management homepage default solution cards.
3. Search for a solution on the homepage.
   In the **Search** field, enter any part of the solution name that you want to find. For example, to find all solutions pertaining to knowledge bases, enter `knowledge` in the **Search** field. Your search term must contain part of a solution name. You can't search for a solution owner's name.
4. Filter the solution list on the homepage.

   Select **Filter** to filter all the solutions by status or by type. The status options are severe, moderate, and good. For information on the status meanings, see Digital Portfolio Management Workspace homepage (Needs attention default thresholds section).

   The type options to filter are:
   - Services
   - Technical services

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- Technical service offerings
- Business services
- Business service offerings
- Business applications
- Application services

**Related topics**

Digital Portfolio Management Workspace homepage

Digital Portfolio Management homepage default solution cards

## Create custom record views

Create a UX custom form view to show any record for a given table in Digital Portfolio Management (DPM).

### Before you begin

Role required: sn_dpm.dpm_admin

### About this task

Create a UX custom form view to determine the view to show for a given table in DPM.

**Note:**
Clear the cache to see the change results of this procedure.

### Procedure

1. Navigate to **All** > **Now Experience Framework** > **Configuration Settings** > **UX Form View Rules**.
2. Select **New**.
3. On the form, fill in the fields.

**View rule form**

| Field Set | Description |
|---|---|
| Name | Unique name of the custom form view. |
| Table | Table name associated with the custom form view.<br>**Tip:**<br>Enter a key word like service or offering. |
| View | The custom UI view. You can select default or workspace, or new. |
| Application | The application for the view rule. This field should default to the application that you're in. |

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| Field Set | Description |
|---|---|
| Execution Order | The order in which your view displays. |

4. Select **Submit**.

## Navigate portfolio types in Digital Portfolio Management

Navigate three types of enterprise portfolios in the Digital Portfolio Management (DPM) application — service, business applications, and application service. Even though you can view service enterprise portfolios in DPM, they're created using Service Portfolio Management tables. Enterprise portfolios for business applications and application service are created from enterprise portfolio tables.

Enterprise portfolios are structured in a nesting content tree format so you can easily navigate each type of enterprise portfolio. Access Enterprise portfolios using the Enterprise portfolio icon (  ). For more information about accessing enterprise portfolios, see Navigate enterprise portfolios in Digital Portfolio Management.

Each type of enterprise portfolio offers unique data pertinent to its type.

## Service portfolios

Service enterprise portfolios are created from Service Portfolio Management tables. The DPM Workspace displays service portfolios in a nested content tree with the taxonomy node, and then the services that are in the service portfolio.

### Portfolio structure for services

| Section | Description |
|---|---|
| Taxonomy node | • The first level in the content tree under the service enterprise portfolio.<br>• The following information is provided for the taxonomy node:<br>  ○ Header with a short description, owned by name, and total subscribers.<br>  ○ Performance snapshot metrics for availability, open incidents, incidents not updated for 5 days, and new requests.<br>  ○ Needs attention cards for critical incidents, outages, and changes.<br>• The **View details** link provides the following information about the taxonomy node.<br>  ○ Header with the service portfolio name, manager name, and total subscribers.<br>  ○ **Overview** tab with performance snapshot metrics and the breakdown of services in the category.<br>  **Note:** DPM versions prior to 2.2.15 may have duplicate services showing in the Service breakdown section. For information, see KB1123710.<br>  ○ **Taxonomy node** tab with all the taxonomy nodes related to the portfolio.<br>  ○ **Services** tab that lists all services in the portfolio, with their parent, classification (business or technical), phase, status, criticality, and owned |

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**Portfolio structure for services (continued)**

| Section | Description |
|---|---|
| | by name. You can also select **Create business service** or **Create technical service** to perform those tasks in Service Builder.<br>○ **Info** tab with a description and general information about the taxonomy node.<br>○ **Needs attention** panel that lists critical incidents, outages, and changes. |
| Service and service offering | • The next two levels in the content tree under the taxonomy node. Services and service offerings can be either technical or business.<br>• The header:<br>○ Short description.<br>○ Owned by name.<br>○ Delivery manager name.<br>○ Total subscribers.<br>○ Phase (if using CSDM fields, then life-cycle Stage)<br>○ Status (if using CSDM fields, then life-cycle Status)<br>**Note:** For information about CSDM life-cycle field names, see Apply the CSDM guidelines to Digital Portfolio Management.<br>• The performance snapshot metrics for availability, open incidents, incidents not updated for 5 days, and new requests.<br>• The Needs attention cards for critical incidents,outages, and changes.<br>• The **More menu** icon ( ⋮ ) enables you to:<br>○ Add the service or service offering to a personal portfolio. For more information, see Create a personal portfolio in Digital Portfolio Management.<br>○ Add the service to your DPM homepage. For more information, see Digital Portfolio Management Workspace homepage.<br>○ Edit the service or service offering in Service Builder. For more information, see Create a service in Service Builder.<br>• The **View details** link launches the service or service offering details. For more information, see the Service and service offerings section in Digital Portfolio Management related applications and data sources. |

## Business application portfolios

Business application enterprise portfolios are created using the enterprise portfolio tables. The DPM Workspace displays enterprise portfolios in a nested content tree starting with the enterprise taxonomy node at the top level (there could be more than one). After the top node, it lists the business applications that are in the enterprise portfolio. Here's an example of a business application enterprise portfolio content tree.

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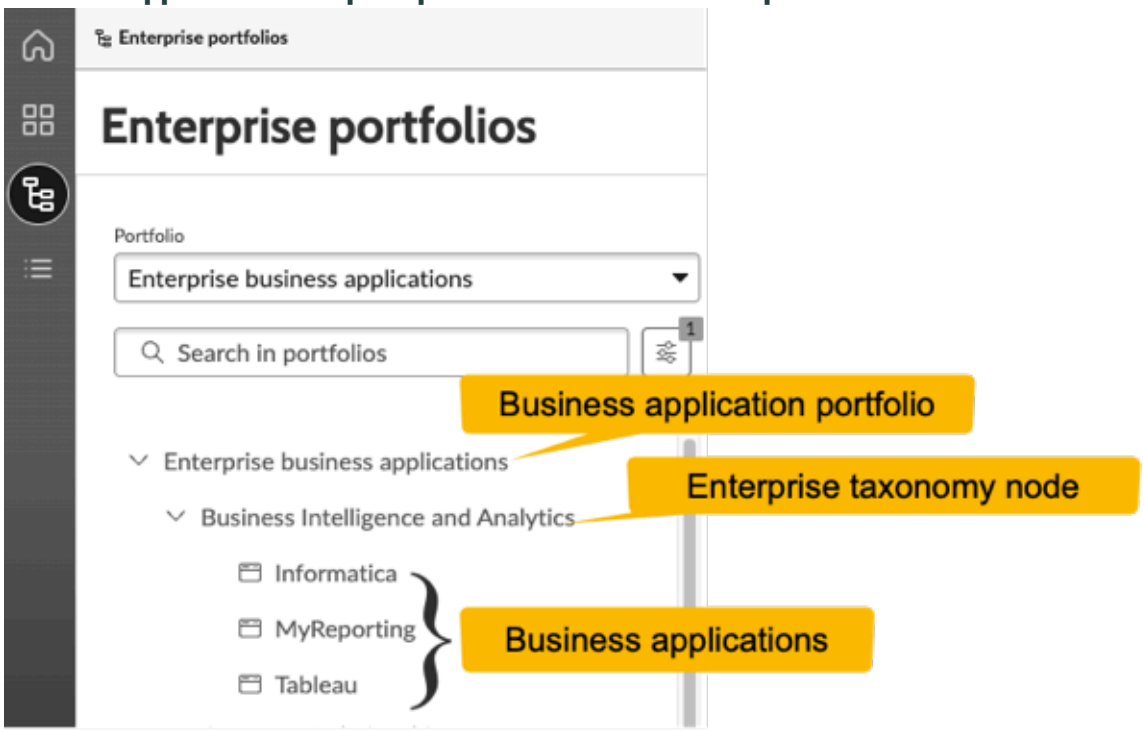
**Business application enterprise portfolio content tree example**




**Important:**
The image shows the **Portfolio** field as Enterprise business applications. To select a different type of enterprise portfolio from the one you're in, delete the value in the **Portfolio** field, and then select the field (again) to see the other portfolio types (service, business, or application service).

**Portfolio structure for business application**

| Section | Description |
|---|---|
| Enterprise taxonomy node | • The first level in the content tree under the business application enterprise portfolio. Could contain a second or third level if it has child enterprise taxonomy nodes.<br>• The header:<br>  ○ Short description.<br>  ○ Owned by name.<br>  ○ Managed by name.<br>  ○ Total subscribers<br>• The portfolio success metrics for availability, incidents with a breached service level agreement (SLA), incidents caused by changes, and successful changes.<br>• Needs attention cards for critical incidents, outages, changes,alerts, risks, and audits.<br>• The **View details** link provides the following information about the enterprise taxonomy node. |

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**Portfolio structure for business application (continued)**

| Section | Description |
|---|---|
| | ○ Header with the Owned by name and the Managed by name.<br>○ **Overview** tab with portfolio success metrics and the breakdown of business applications in the enterprise taxonomy node.<br>○ **Taxonomy nodes** tab that lists all the related taxonomy nodes.<br>○ **Business applications** tab with a list of the business applications that are in the enterprise taxonomy node.<br>○ **Info** tab with a description and general information about the enterprise taxonomy node.<br>○ **Needs attention** panel that lists critical incidents, outages, changes, alerts, risks, and audits, for the enterprise taxonomy node. |
| Business application | • The next level in the content tree under the enterprise taxonomy node.<br>• The header:<br>○ Short description.<br>○ Application owner name.<br>○ Business owner name.<br>○ Total subscribers.<br>○ Status.<br>The Overall risk is empty.<br>• The portfolio success metrics for availability, incidents with a breached SLA, incidents caused by changes, and successful changes.<br>• The Needs attention cards for critical incidents, changes, risks, and audits.<br>• The **More menu** icon ( ⋮ ) enables you to add the business application to a personal portfolio. For more information, see Create a personal portfolio in Digital Portfolio Management.<br>• The **View details** link launches the business application details. For more information, see the Business applications section in Digital Portfolio Management related applications and data sources. |

## Application service portfolios

Application service enterprise portfolios are created using the enterprise portfolio tables. The information in application service portfolios is similar to that of business application portfolios with some differences that pertain to application services.

For information about KPI groups in application service portfolios, see View application service details.

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### Portfolio structure for application service

| Section | Description |
|---|---|
| Enterprise taxonomy node | • The first level in the content tree under the application service enterprise portfolio. Could contain a second or third level if it has child enterprise taxonomy nodes.<br>• The header:<br>  ○ Short description.<br>  ○ Owned by name.<br>  ○ Managed by name.<br>  ○ Total subscribers.<br>• The portfolio success metrics for availability, mean days to resolve (MTTR), incidents caused by changes, and successful changes.<br>• The Needs attention cards for critical incidents, outages, changes, alerts, risks, and audits.<br>• The **View details** link provides the following information about the enterprise taxonomy node.<br>  ○ Header with the Owned by name and the Managed by name.<br>  ○ **Overview** tab with portfolio success metrics and the breakdown of application services in the enterprise taxonomy node.<br>  ○ **Application services** tab with a list of the application services that are in the enterprise taxonomy node.<br>  ○ **Info** tab with a description and general information about the enterprise taxonomy node.<br>  ○ **Needs attention** panel that lists critical incidents, outages, changes, alerts, risks, and audits for the enterprise taxonomy node. |
| Application service | • The next level in the content tree under the enterprise taxonomy node.<br>• The header:<br>  ○ Short description.<br>  ○ Owned by name.<br>  ○ Managed by name.<br>  ○ Operational status.<br>  The Overall risk is empty.<br>• The portfolio success metrics for availability, incidents with a breached SLA, incidents caused by changes, and successful changes.<br>• The Needs attention cards for critical incidents, changes, outages, risks, and alerts. |

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**Portfolio structure for application service (continued)**

| Section | Description |
| --- | --- |
| | • The **More menu** icon ( ) enables you to add the application service to a personal portfolio. For more information, see Create a personal portfolio in Digital Portfolio Management.<br>• The **View details** link launches the application service details. For information on what this screen includes, see the Application services section in Digital Portfolio Management related applications and data sources. |

**Related topics**

Enterprise portfolios

Navigate enterprise portfolios in Digital Portfolio Management

# Work with portfolios in Digital Portfolio Management

You can create and organize personal portfolios to see several solutions in one place. Administrators create enterprise portfolios. The service-type enterprise portfolios are created using Service Portfolio Management tables. Business application and application service portfolios are created using enterprise portfolio tables.

## Personal portfolios

Personal portfolios contain data from services, offerings, business applications, and application services into one space for you to view and report on. You can see how each item is progressing according to the assigned roadmap and evaluate its performance based on key performance indicators (KPIs) that interest you.

### Personal portfolios overview

With a DPM manager role [sn_dpm.dpm_manager], you can see the personal portfolios that you created and those portfolios that are shared with you. When you create a personal portfolio, you pull in solution data from service and business applications, services, and service offerings into one space for you to view. You don't have to own any of the items that you pull in to create a personal portfolio. You can view how each item is progressing according to the assigned roadmap and evaluate its performance based on key performance indicators (KPIs) that interest you. You can also view a relationship map, as well as summaries, and current issues.

You can share a personal portfolio that you created with individuals or with a group. To share with a group, the group must have the DPM [dpm_manager] role. To assign the DPM manager role to groups, see Roles for Digital Portfolio Management.

You may be interested in services that your solutions depend on, for example, an outage or a delay in a service. Personal portfolios surface the information so that you don't have to check on the service status in its respective ServiceNow application.

### Filtering personal portfolios

When you open a personal portfolio, a list of solution cards display with items that are in the portfolio. The displayed cards depend on what is in the personal portfolio. If there are too many items to view, you can select **All items** to filter the cards to display.

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The following list provides all the possible solution types that you can filter on by selecting **All items**. If you don't have one or more of these solution types in your personal portfolio, then that solution type won't show up in the filter list.

- All services
- All offerings
- Technical services
- Technical service offerings
- Business services
- Business services offerings
- Application services

## Editing personal portfolios

To edit a solution that you open from the personal portfolio, you must have edit access based on the access control list (ACL) for each solution that makes up the portfolio. For example, if you're assigned a service editor role and you own a specific service and offering, then you can edit those specific records that you open from the personal portfolio. But if you don’t have those access rights, then you can only view the services and offerings in the personal portfolio and see KPIs.

**Tip:**
With a DPM admin role [sn_dpm.dpm_admin], you can hide certain tabs and tab sections of solutions in a personal portfolio. For more information, see Configure the Digital Portfolio Management experience.

**Related topics**

Create a personal portfolio in Digital Portfolio Management

View relationship maps in Digital Portfolio Management

Personal and enterprise portfolio reference

### Create a personal portfolio in Digital Portfolio Management

Create a personal portfolio using the Digital Portfolio Management (DPM) application. DPM enables you to create, edit, and share personalized, unstructured portfolios of the services and applications that you own or don't own but care about.

**Before you begin**
Role required: sn_dpm.dpm_manager

**About this task**
DPM supports services, service offerings, business applications, and application services so you can populate your personal portfolios with any of these items. Each item type is tagged and color-coded as you drill into your personal portfolio.

- View personal portfolios that you created and those portfolios that are shared with you.
- Assign editors and viewers for the personal portfolios that you created.
- Edit your personal portfolio anytime when you want to add or remove solutions (business services, technical services, offerings, business applications, and application services).
- See all items that need attention, view their details to learn more, and take action if you have proper permissions according to the item's access control list (ACL).

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As you navigate the DPM landscape, you may find services, offerings, business applications, and application services that interest you. You can add those solutions to your personal portfolio immediately, without having to return to the personal portfolio menu. You can also share your personal portfolio with individuals and with groups.

### Procedure

1. Navigate to **Workspaces** > **Digital Portfolio Management**.
2. Select the personal portfolios icon (  ).
3. Select **Create personal portfolio**.
4. On the form, fill in the fields.

**New personal portfolio form**

| Field | Description |
|---|---|
| Name | The name for the personal portfolio. |
| Owned by | The owner name of the personal portfolio. |
| Description | A clear description that makes sense to others that share this portfolio. |
| Add collaborators | ○ Editors are users or groups that you select to edit the personal portfolio.<br>○ Viewers are users or groups that you select to view the personal portfolio. |

**Note:**
You can only edit each item within a personal portfolio if you have edit access based on the ACL for each item that makes up the portfolio. For groups to edit or view personal portfolios, the group must have the DPM manager [dpm_manager] role. See Roles for Digital Portfolio Management.

5. Select **Next**.
6. Add business applications, services, service offerings, and application services to your personal portfolio.
   - Select each tabbed item to find the solution that you want to add to your personal portfolio, or **Search** to find items. You can search for a solution title or an owner name to find all items owned by that name.
   - Select the items that you want to add, and then select **Add selected items** to add them to your personal portfolio.

   **Note:**
   Review each tab. Your search term may show results in one or more of the three tabs: **Business applications**, **Services/Offerings**, or **Application services**.

7. Select **Review portfolio (total)**.
   The Portfolio details provide two cards. One with a summary that contains the personal portfolio name, description, and owner name and one with the list of collaborators.
8. Review the items in your personal portfolio and then select **Create**.
   To add more items, select **Back**.

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**Note:**
If you select **Back**, review each tab to confirm your selections.

9. **Optional: Edit** or **Share** your personal portfolio.
   When you edit a personal portfolio, only those solutions that aren't already in the personal portfolio are in the selection list to add. **Share** gives you the option to share your personal portfolio with individuals, with groups, or with a combination of both.

**Related topics**

Personal portfolios

Personal and enterprise portfolio reference

## Enterprise portfolios

Admins create enterprise portfolios for business applications and application services using the enterprise portfolio tables. You can view enterprise portfolios for services as they're created with the Service Portfolio Management tables. Enterprise portfolios are structured in a nesting tree format to navigate service-related items and taxonomy nodes.

https://player.vimeo.com/video/1022205557?h=0df9f9affe&badge=0&autopause=0&player_id=0&app_id=58479

Enterprise Portfolios enable you to roll up key metrics through each level of the portfolio taxonomy. You can see the overall performance at the node and portfolio levels. Breakdowns of key metrics enable you to see which areas of the portfolio are contributing to good or poor performance.

Similar to personal portfolios, you can see performance snapshot information in enterprise portfolios. You don't have to own any solutions to view enterprise portfolios.

Admins create enterprise portfolios. For more information, see Create enterprise portfolios in Digital Portfolio Management.

## Types of enterprise portfolios

You can create, view, and search across three different types of enterprise portfolios in DPM:

- Service portfolios (view only)
- Business application portfolios
- Application service portfolios

Each enterprise portfolio type is clearly marked when you search for an enterprise portfolio. For information about for each type, see Navigate portfolio types in Digital Portfolio Management.

**Note:**
Even though service portfolios are visible in DPM, they're still created using Service Portfolio Management tables. Use the enterprise portfolio tables to create business application portfolios and application service portfolios.

## Life-cycle stages

You can filter an enterprise portfolio by life-cycle stage. Service portfolios and business application portfolios include the following life-cycle stages:

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- Pre-operational — The solution doesn’t yet have operational data.
- Operational — The solution has operational data.
- Retired — The solution is no longer operational and isn't tracking new data, so data isn’t up to date.

The life-cycle stages for Application service portfolios are Operational or Retired.

## Needs attention details

When viewing an enterprise portfolio, you can see the Needs attention details broken out by tabs at the bottom of the portfolio view. For example, in a business application portfolio, the Needs attention tabs include critical incidents, problems, outages, alerts, and tech risks.

Admins can show or hide business applications in a portfolio based on its life-cycle stage. For more information, see Configure the Digital Portfolio Management experience.

### Related topics

Navigate enterprise portfolios in Digital Portfolio Management

Create enterprise portfolios in Digital Portfolio Management

## Navigate enterprise portfolios in Digital Portfolio Management

You can work with three types of enterprise portfolios in the Digital Portfolio Management (DPM) Workspace — service, business application, and application service. Even though you can view service enterprise portfolios in DPM, they're created with Service Portfolio Management tables. Enterprise portfolios for business applications and application services are created with the enterprise portfolio tables.

### Before you begin

Role required: sn_dpm.dpm_manager

### About this task

Using enterprise portfolios, you can view traditional service portfolios created from the Service Portfolio Management tables. You can also view portfolios for business applications and application services that are created with enterprise portfolio tables. The search function in the Digital Portfolio Management experience enables you to search across all enterprise portfolios to find the one you seek. You can view a performance snapshot of key performance indicators (KPIs) like availability, new incidents, subscribers, and customer satisfaction scores.

You can also see items that need attention and select parts of the portfolio to see more details.

### Procedure

1. Navigate to **Workspaces** > **Digital Portfolio Management**.
2. Select the enterprise portfolios icon (  ).
3. Select the **Portfolio** search field.
   Different types of portfolios are displayed in groupings — Service portfolios, Business application portfolios, and Application service portfolios.
4. Select a portfolio from one of the groupings.
   After you select a portfolio, a list of Enterprise taxonomy nodes are nested in a tree structure, at the top level.
5. Select an Enterprise taxonomy node that interests you, and then select **View Details**.
   The details of the Enterprise taxonomy node include several tabs — Generally an overview, a tab (or two) for the type of portfolio you selected, and a general information tab. To learn

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more about enterprise portfolio screens, see Navigate portfolio types in Digital Portfolio Management.

6. Follow the breadcrumb path to return to the tree structure of the enterprise portfolio.
7. Expand the Enterprise taxonomy node to see its child nodes, and then its solutions (services, business applications, or application services).
   Selecting each item in the tree structure displays high-level information of that item. All child nodes and solutions have their own **View details** option. To learn more about enterprise portfolio screens, see Navigate portfolio types in Digital Portfolio Management.
8. View information about a different type of enterprise portfolio.

> **Important:**
> To select a different type of enterprise portfolio from the one you're in, you must delete the value in the **Portfolio** field. When the **Portfolio** field is empty, then select it (again) to see the other portfolio types. For example, if you're navigating a service portfolio and want to see to a business portfolio, you must delete the name of the service portfolio in the **Portfolio** field. After you delete it, select the **Portfolio** field (again) to see the other enterprise portfolio options (service, business, or application service).

**Related topics**

Enterprise portfolios

Navigate portfolio types in Digital Portfolio Management

Create enterprise portfolios in Digital Portfolio Management

### Create enterprise portfolios in Digital Portfolio Management

Admins create enterprise portfolios for business applications and application services. Enterprise portfolios are structured in a nesting tree format to navigate service-related items and taxonomy nodes. Similar to personal portfolios, you can see metrics to assess the portfolio performance.

#### Before you begin

- Plugin required: enterprise portfolios
- Role required: sn_dpm.dpm_admin

#### About this task

Create enterprise portfolios to monitor business applications and application services. Enterprise Portfolios enable you to roll up key metrics through each level of the portfolio taxonomy. You can see the overall performance at the node and portfolio levels. A breakdown of key metrics enables you to see which areas of the portfolio are contributing to good or to poor performance.

For overview information, see Enterprise portfolios. For more detailed information, see Navigate portfolio types in Digital Portfolio Management.

#### Procedure

1. Navigate to **All** > **Digital Portfolio Management** > **DPM Enterprise Portfolios** > **Create new**.
2. On the form, fill in the fields.

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**Create Enterprise Portfolio form**

| Field | Description |
|---|---|
| Name | Portfolio name in the **Enterprise portfolios** tab of the DPM Workspace. |
| Short description | Short description of the portfolio in the header area of the DPM Workspace. |
| Description | Description of the portfolio in the service header in the DPM Workspace. |
| Portfolio type | The type of enterprise portfolio.<br>○ Business Application Portfolio<br>○ Application Service Portfolio |
| Portfolio owner | Name that is responsible for the portfolio. |
| Portfolio manager | Name that manages the portfolio. |
| Portfolio Stakeholders | Individuals or groups that have an interest in the enterprise portfolio. |

3. **Submit** the enterprise portfolio.

   After you submit, access the portfolio by navigating to **All** > **Digital Portfolio Management** > **DPM Enterprise Portfolios**, and then selecting the type (Business Application or Application Service).

**Related topics**

Enterprise portfolios

Navigate enterprise portfolios in Digital Portfolio Management

# Work with solution data in Digital Portfolio Management

After you create and organize personal portfolios and review the available enterprise portfolios, you can do several actions with the DPM manager role to monitor the progress of solutions.

## Work with Needs attention panels in Digital Portfolio Management

Digital Portfolio Management (DPM) enables you to view items that need attention in the context of your solutions. Categories in each Needs attention panel differ based on the solution type. You may not act on an item that needs attention, but you can see its status and severity to make data-driven decisions about your solutions.

Each DPM Workspace page has a Needs attention panel that presents items that need attention in the context of the page. You can search items that need attention on the DPM home page but it's more useful to search while viewing a portfolio or a solution.

**Important:**
This topic applies to Standard Needs attention panels.

Standard Needs attention panels were introduced in the Utah release (May 2023). The Standard version is more flexible than its legacy counterpart. The Standard system property is set to true by default. Existing customers can set it to false to return to the former Needs attention

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functionality. There isn't a limit to changing the value from true to false (and back). New customers can't set the system property to false, so they'll only see the Standard version.

### Standard Needs attention panels system property

Admins update the system property with the DPM admin [sn_dpm.dpm_admin] role.

- Navigate to **All** > **Digital Portfolio Management** > **Administration** > **Settings**.
- Enter `*needs` in the **System Properties Name** search field, and then press **Enter**.
- Select the system property [sn_dpm.standard_needs_attention].
- Release the record to edit it, and then set the property to false or true.
- Select **Update**.

### Problems option in the Needs attention panel

To see problems in the Needs attention panel, you must be using the DPM August 2024 release or a later release.

You can identify problems on the following solutions.

- Services and service offerings. Problems are related to the service offering via the service offering record on the form, impacted services related list, and on the affected CIs related list. Problems are then rolled up to the parent service and should be deduplicated at the parent service level.
- Business applications. Problems are related to the application service via the configuration item field on the form. Problems are then rolled up from the application service to the business application and should be deduplicated at the parent service level.
- Application services. Problems are related to the application service via the configuration item field on the form.

### Application service considerations

Prior to the November 2024 Store release, you could see the records of incidents, problems, and changes in the Needs attention panel only if the application service is added to the Configuration item field of a related item (for example, to an incident record).

As of the November 2024 Store release, items or records are reflected in the Needs attention panel when an incident, problem, or change includes the application service in the Impacted services or the Affected CIs related list, in addition to the Configuration item field.

After the application services are added to the Configuration item field, Impacted services, or the Affected CIs related list, you can see them under the Needs attention section in the base level (application service). The data also rolls up to the following levels in the DPM Workspace:

- Business application
- Taxonomy node
- Portfolio

Also, after the application services are added, the data is rolled up in the following areas when you:

- Select **View details** on any affected solution page.
- View the Run tab of any solution page to view the KPI indicators.

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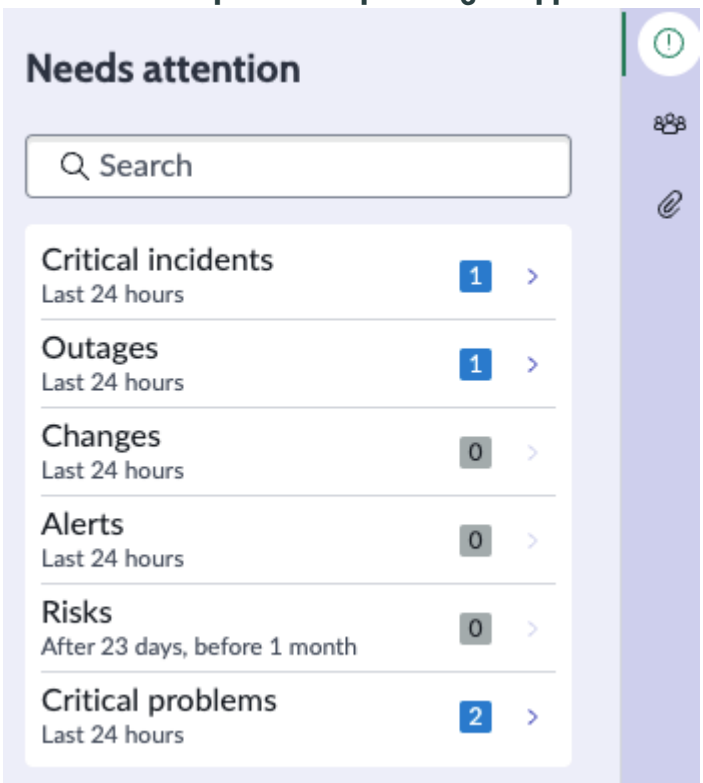
This functionality applies to enterprise business application portfolios, enterprise application service portfolios, and to any business application or application service added to your personal portfolios.

## Panel attributes and icons

Even though the Needs attention panel categories differ for each portfolio and solution, the basic navigation is the same. All panels enable you to search, see a list of Needs attention cards, paginate through the cards, and drill down to a record from the card list.

**Needs attention panel example using an application service**




- Each Needs attention category includes a number that indicates the number of items in that category. If there are no Needs attention items in a category, then the number is zero (0).
- Select the forward arrow (>) next to a number in the category to see a list of record cards that need attention. From the card list, you can select a card to access its record. You can also go back by selecting the Needs attention back arrow (<).
- The Needs attention **Search** field enables you to enter a number, a part of a word, or a whole word to find Needs attention items that contain your search criteria. After you view and open a record that needs attention, you can return to the **Search** field. Your search criteria remain in the **Search** field until you clear the field.

  The following table shows the Needs attention panel icons that display for each solution type.

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**Needs attention panel icons per solution type**

| Solution type | Needs attention panel icons |
| --- | --- |
| Services and service offerings | ○ Needs attention icon (  ) to show or hide the Needs attention panels. This toggle isn't on the DPM Workspace home page.<br>○ Contacts icon (  ) to view team members and the all the teams that support the service offering.<br>○ Knowledge articles icon(  ) to search for related knowledge articles.<br>○ Attachments icon (  ) to view and add attachments to the record.<br>○ Catalog items icon (  ) to search for catalog items on a service or service offering record. |
| Business applications and application services | ○ Needs attention icon (  ) to show or hide the Needs attention panels. This toggle isn't on the DPM Workspace home page.<br>○ Contacts icon (  ) to view team members and all the teams that support the business application or the application service.<br>○ Attachments icon (  ) to view and add attachments to the record. |

## Service considerations

- A record is linked to the offering and rolled up to the service. You can see incidents, outages, and changes when the incident is linked directly to the service (not to the offering).
- An incident, outage, or change can impact multiple offerings.
- A record is first displayed on the offering, and then it's rolled up to the parent service.
- An incident displays once (not twice) if two offerings are added to an incident and they roll up to the same service.

## Service offering considerations

Critical incidents, outages, and changes are linked to the offering to display in the Needs attention panel when the offering is:

- Listed in the service offering field on the incident record or the change record.
- Included in the affected services or the affected CI related lists, or both.
- Rolled up to the parent service level when an incident or change is related to an offering (via a related list or directly on the form).

**Note:**
By default, you see critical incidents. To see critical and major incidents, the Major Incident Management plugin [com.snc.incident.mim] must be installed.

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## Panel options per DPM solution

Records included on each DPM solution page are the ones created "today."

### Needs attention panels for each DPM solution page

| Services and service offerings | Application services | Business applications |
|---|---|---|
| • Critical and major incidents<br>• Outages<br>• Changes<br><br>For new and zBoot customers, all the above plus Audit and Risks. | • Critical and major incidents<br>• Outages<br>• Changes<br>• Alerts<br>• Risks<br><br>For new and zBoot customers, all the above plus Audits. | • Critical and major incidents<br>• Changes<br>• Risks<br>• Audits |

**Note:**

To see Risk data, you must have the Technology Portfolio Management plugin installed [sn_apm_tpm]. This plugin has two dependency plugins:

- Application Portfolio Management [com.snc.apn]
- Software Asset Management [com.snc.sams]

**Related topics**

Configure Needs attention panels in Digital Portfolio Management

## View relationship maps in Digital Portfolio Management

View a relationship map in Digital Portfolio Management (DPM) to see all relationships that make up a given solution. DPM uses the ServiceNow Unified Map to display a graphical hierarchical map based on the CMDB.

## Access a relationship map

While in a DPM solution (business application, application service, service, or service offering), select **View relationships**.

The Unified Map displays with the selected solution at the top, indicating it's the highest level in the map. Branched from the highest level are other relationships that make up the highest level solution.

## Navigate a relationship map

For details on the Unified Map panels and navigation, see Unified Map.

On the map page, use the panels for more information about the mapped solutions.

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- Select to view a summary of the selected solution.
- Select to view contact information for team members and teams that are associated with the selected solution.
- Select to view all current issues in the context of the selected solution, for example, critical incidents, current outages, or critical alerts.

**Note:**
The options change for the current issues depending on the solution type.

- Select to see the application services associated with the selected solution.

## Create demand from Digital Portfolio Management

Create demand from the Digital Portfolio Management (DPM) Workspace. DPM enables you to create demand for any business or technical services that you own.

### Before you begin

For the required plugins to create a demand in Digital Portfolio Management, see the Demand Management area of Digital Portfolio Management related applications and data sources.

Role required: sn_dpm.dpm_manager

### About this task

You can manage and create demands for services or service offerings that you own, right in the workspace without having to go to the service or offering's native application.

### Procedure

1. Navigate to **All** > **Digital Portfolio Management** > **Digital Portfolio Management Workspace** > **Personal Portfolios**
2. To create demand, select a business or technical service.
3. From the list, select the **Create** option and then select **Demand**.
4. On the form, fill in the fields.
   For more details on demand entries, see Create a demand.

**Create demand form**

| Field Set | Description |
|---|---|
| Dates | Start and end dates for the demand. |
| Details | The details fields change, depending on the type of service that you are creating demand for. Follow the prompts to complete each field entry. |
| Business case | The business case fields change, depending on the type of service that you are creating demand for. Follow the prompts to complete each field entry. |
| Financials | Cost information, return on investment (ROI), and planned benefit. |
| Assessment data | Impact and risk of the proposed demand. |

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| Field Set | Description |
|---|---|
| Demand | Owner and organization information to assign to the demand. |

5. **Save** the demand.

   The service **Plan** tab shows the new demand.

## Create an improvement initiative from Digital Portfolio Management

Create an improvement initiative from the Digital Portfolio Management (DPM) Workspace. DPM enables you to create an improvement initiative for any business or technical services that you own.

### Before you begin

For the required plugins to create improvement initiatives in Digital Portfolio Management, see the Continual Improvement Management area of Digital Portfolio Management related applications and data sources.

Role required: sn_dpm.dpm_manager

### About this task

You can manage and create improvement initiatives for services or service offerings that you own, right in the workspace without having to go to the service or offering's native application.

### Procedure

1. Navigate to **All** > **Digital Portfolio Management** > **Digital Portfolio Management Workspace** > **Personal Portfolios**.
2. To create an improvement initiative, select a business or technical service.
3. From the list, select the **Create** option and then select **Improvement initiative**.
4. On the form, fill in the fields.
   For details on the improvement initiative process, see Create an improvement request.

#### Improvement Initiative form

| Field | Description |
|---|---|
| Number | Unique number for the improvement initiative. |
| Business service | Business service where you created the improvement initiative from in DPM. |
| Service offering | Service offering where you created the improvement initiative from in DPM. |
| Business Process | Business offering where you created the improvement initiative from in DPM. |
| CIM Coordinator | The Continual Improvement Management coordinator. |

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| Field | Description |
| --- | --- |
| Approver Group | Continual Improvement Management approvers for the improvement initiative. |
| Strategies | Continual Improvement Management assigned automation and effort reduction for the improvement initiative. |
| State | State of the improvement initiative. This field is read only. For descriptions, see Continual Improvement Management reference<br>○ New<br>○ Accepted<br>○ Assess<br>○ Approved<br>○ In Progress<br>○ Review<br>○ Closed<br>○ Canceled |
| Priority | Priority of the improvement initiative. This field is read only.<br>○ 1 - Critical<br>○ 2 - High<br>○ 3 - Moderate<br>○ 4 - Low<br>○ 5 - Planning |
| Effort estimate | The level of effort for the improvement initiative. This field is read only.<br>○ Small<br>○ Medium<br>○ Large<br>○ Extra Large |
| Benefits | Level of benefit expected from the improvement initiative. This field is read only.<br>○ Low<br>○ Medium<br>○ High |

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| Field | Description |
| --- | --- |
| Percent complete | Percentage complete for the improvement initiative. |
| Short description | Short description of the improvement initiative. |
| Business justification | Elaboration of the short description to include rationale and research conducted. |

### Goals tab

| Field | Description |
| --- | --- |
| Success measurement method | Performance Analytics (PA) Indicator. Automated entry. |
| Improvement KPI | State the key performance indicator (KPI) for the improvement initiative. |
| Base value | Percentage value, not to exceed 100%. |
| Percentage improvement | Percentage value, not to exceed 100%. |
| Target value | Percentage value, not to exceed 100%. |
| Target review date | Expected date the improvement initiative is reviewed. |
| Expected outcomes | Description of expected outcomes that support the provided KPI. |

### Details tab

| Field | Description |
| --- | --- |
| Requested for | Name of the person creating the improvement initiative. |
| Type | The type of improvement initiative:<br>○ People<br>○ Process<br>○ Technology |

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| Field | Description |
| --- | --- |
| Watch list | Others that are watching this improvement initiative. |
| Parent initiative | The parent initiative if there is one. |

### Schedule tab

| Field | Description |
| --- | --- |
| Planned start date | Planned date to start the improvement initiative. |
| Planned end date | Planned date to end the improvement initiative. |
| Actual start date | Actual start date of the improvement initiative. |
| Actual end date | Actual end date of the improvement initiative. |

### Notes tab

| Field | Description |
| --- | --- |
| Additional comments | Customer visible comments on the improvement initiative. |
| Work notes | Any notes that you want to add to the improvement initiative (these notes are not customer visible). |

5. **Save** the improvement initiative.

## List modules

List modules in Digital Portfolio Management (DPM) provide information that may or may not be in personal portfolios or enterprise portfolios. You don't have to own solutions to view or create list modules.

The list module in the DPM Workspace includes two tabs - **Lists** and **My Lists**. The following categories are in the **Lists** tab, each with the options of **Owned by me** and **All**.

- Services
- Offerings
- Business applications
- Application services

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- Demands
- Projects
- Contracts

When you select **All** for a given category, you see all the records for that category, even if you don't own them. Like any list of records, you can sort, filter, and change the columns in view. You can also add them to your own personal list, called **My Lists**.

Create a personal list by adding any records that interest you, like service offerings, roadmaps, projects, demands, ideas, contracts, incidents, team members, or teams. When you create a list, you can start it from an existing list or create your own list. After you create a list, you see them in the **My Lists** tab in the list module. After you create more than one list, you can select **Reorder** to help you organize your lists.

**Related topics**

Work with lists in Digital Portfolio Management

## Work with lists in Digital Portfolio Management

Work with lists in the Digital Portfolio Management Workspace. Lists enable you to view service and application information that is not in a personal portfolio or an enterprise portfolio.

### Before you begin

Role required: sn_dpm.dpm_manager

### About this task

Use the **List** tab in Digital Portfolio Management (DPM), to view lists of services, service offerings, business applications, application services, demands, projects, and contracts. You can view the solutions that you own as well as the solutions that you don't own. You can also create custom lists to see any items that interest you like services, incidents, and users. The table column names in lists change depending on the type of list that you create. You can also send a link to a specific list item and add or hide columns from your list view.

### Procedure

1. Navigate to **All** > **Digital Portfolio Management** > **Digital Portfolio Management Workspace**.
2. Select the list icon ( ).
3. View a list.

   The Lists tab contains lists of all available solutions in your DPM Workspace.

   - Select the **Lists** tab to view existing lists.

     Select **Owned by me** to see the lists that you own or select **All** to see all the solutions in your DPM Workspace (for example, all services).

   - Select the **My Lists** tab to view the lists that you created.
4. **Optional:** Create a list.
   a. In the **My Lists** tab, select **Add new List**.
   b. In the New Lists window, select an option — **Start from existing** or **Create your own**.

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- If you select **Start from existing**, then select an existing list from the **List Name** field. Depending on the list name that you select, you can opt to keep or remove the list columns and adjust the filters. When finished, select **Create**.
- If you select **Create your own**, then complete the **List Name** field. In the **Select Source** field, select the source for your list. Depending on the type that you select, you can opt to keep or remove the list columns and adjust the filters. When finished, select **Create**.

5. **Optional:** Update a list.
   - Select **Refresh List** (  ) to refresh the list results.
   - Select **List Actions** (  ) to edit the list columns and to save the list.
   - Select **Show filter panel** (  ) to add or remove filters for the list.
   - Select **Export** to export the displayed list.
   - Select **New** to create a list.
6. **Optional:** Share a list.
   - Navigate to the list that you want to share.
   - Copy the browser address (URL) of the list that you want to share.
   - Paste that copied address in your sharing application (email or internal messaging system) to share it with others.

     (Optional) The copied link contains a unique list ID so when selected, it goes directly to the list that you want to share.

# Digital Portfolio Management reference

Reference topics provide additional information about administering Digital Portfolio Management (DPM).

## Roles for Digital Portfolio Management

Several types of components are installed with Digital Portfolio Management (DPM) when you activate the application from the ServiceNow® ServiceNow Store. DPM has two roles - admin and user.

## Roles installed with DPM

There are two roles for DPM.

- The DPM admin [sn_dpm.dpm_admin] role configures the DPM Workspace for users. The DPM admin role can create, retrieve, update, and delete (CRUD) all personal portfolios created by anyone. The DPM admin role can also assign the DPM manager role to groups so a personal portfolio owner can select groups to view or edit personal portfolios.
- The DPM manager [sn_dpm.dpm_manager] role is the end user of the DPM Workspace. The DPM manager role can only CRUD personal portfolios that they create.

See the following table for information about each role.

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### DPM roles

| Role title [name] | Description | Contains roles |
|---|---|---|
| DPM admin [sn_dpm.dpm_admin] | • View all DPM system properties and admin pages.<br>• Update all DPM system properties.<br>**Note:** The DPM Admin role can't CRUD service portfolios unless they have the appropriate service portfolio admin or manager roles from Service Portfolio Management.<br>• Use Key performance indicator (KPI) functions:<br>  ○ View KPI group tables for KPI groups and KPI group mappings.<br>  ○ Create KPI groups.<br>  ○ Update and delete all KPI groups.<br>  ○ Map KPI groups. | • sn_dpm.dpm_manager<br>• sn_ep.enterprise_portfolio_admin (can CRUD enterprise portfolios that are created using the enterprise portfolio tables).<br>**Important:** The DPM admin only gets this role if you install the enterprise portfolio plugin. After you install the plugin:<br>  ○ The DPM admin role inherits the enterprise portfolio admin role.<br>  ○ The DPM manager role inherits the enterprise portfolio viewer role. |
| DPM Manager [sn_dpm.dpm_manager] | • Retrieve and update personal portfolios that they're editors of.<br>• Retrieve personal portfolios that they're viewers of.<br>• Read all available data in the DPM Workspace.<br>• Create demands.<br>• Create Continual Improvement Management (CIM) items.<br>• Update roadmaps.<br>• View KPIs in the DPM Workspace. | • sn_devops.viewer<br>• cmdb_read<br>• sn_team_perf.team_performance_user<br>• service_viewer<br>• sn_ep.enterprise_portfolio_viewer |

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**DPM roles (continued)**

| Role title [name] | Description | Contains roles |
|---|---|---|
| | **Note:** The DPM manager can't view or map KPI groups in the ServiceNow AI Platform but users with the service_editor, service_admin, or service_author roles can map KPI groups to their services.<br>• Functions that the DPM manager can't do:<br>○ Edit services, offerings, business applications, or application services.<br>○ Edit and update relationships to services, offerings, business applications, or application services.<br>○ Create or edit a service in Service Builder.<br>**Note:** Service Builder buttons are hidden for the DPM manager role unless the user has the correct role that provides edit access to a particular solution. | |

## Assign the DPM manager role to groups

To edit a personal portfolio, a group must have the DPM manager role.

To assign the DPM manager role to a group, the admin does the following:

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1. Enter `dpm_personal_portfolio.list` in the Filter navigator.
2. Open the personal portfolio record that you want to assign the DPM manager role.
3. Select **Edit user groups**, and then search for the user groups to add to the DPM manager role.
4. Repeat the previous step for **View user groups** if you want to add the DPM manager role to the groups that view personal portfolios.
5. Select **Update**.

## Tables installed with DPM

### Tables installed with Digital Portfolio Management

| Table | Description |
|---|---|
| dpm_available_item_type | Stores records for each type in a personal portfolio. |
| dpm_navigation_history | Stores records for navigating each type in a personal portfolio. |
| dpm_personal_portfolio | Stores records for each created personal portfolio. |
| dpm_personal_portfolio_item | Stores records for all types that are in a personal portfolio. |
| dpm_unified_backlog | Stores records for backlog information in a personal portfolio. |
| sn_dpm_kpi_group_m2m_spm_nodes | Stores records for key performance indicator (KPI) group nodes from Service Portfolio Management. |
| sn_dpm_kpi_group_m2m_viz_config | Stores records for KPIs grouped by data visualization. |
| sn_team_perf_kpi_group | Stores records for KPIs grouped by team performance. |

**Related topics**

Activate Digital Portfolio Management

## Digital Portfolio Management homepage default solution cards

Digital Portfolio Management uses certain fields to auto-generate a set of default solution cards to display on your DPM homepage. After you add or remove solutions from your homepage, DPM remembers your updates and displays your personalized solutions cards instead of the auto-generated set.

## DPM homepage overview

Each time that you log in to the DPM Workspace, the system uses certain fields to display a set of default solution cards. You can use the personalize option to add or remove solutions to your homepage. For more information, see Personalize the Digital Portfolio Management Workspace homepage.

After you add or remove solutions, the DPM system remembers your updates in the *dpm_home_page_item* table so that next time you log in to the DPM Workspace, your

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personalized homepage displays. The system no longer generates a set of default solution cards for you.

**Note:**
Each time you access the DPM homepage, the solution card data refreshes, whether you have the auto-generated default solution set or a personalized solution card set.

## System properties for number of solution cards

Two system properties determine the number of solutions cards on your DPM homepage.

**System properties for solution limits on the DPM homepage**

| System property | Description | Solution type | Default limit |
|---|---|---|---|
| dpm.homepage.cmdb_ci_service_limit | The query limit when auto-generating services, service offerings, and application services for your DPM homepage. | cmdb_ci_service | 750 |
| dpm.homepage.cmdb_ci_business_app_limit | The query limit when auto-generating business applications for your DPM homepage. | cmdb_ci_business_app | 250 |

These two system properties derive the overall limit on the DPM homepage of 1000. Even after you personalize your DPM homepage, the total number of solutions on your homepage can't exceed 1000.

You can personalize your DPM homepage to adjust the solution card count. For example, you can have 1000 services and zero business applications but the total number of solutions on the DPM homepage can't exceed 1000.

**Important:**
An administrator with the sn_dpm.dpm_admin role can change the system property limits to more than 1000 solutions on the DPM homepage. However, raising the limit may negatively impact system performance.

## Default solution card fields

The DPM application uses certain fields to auto-generate a set of default solution cards to display when you first login to DPM (before you personalize).

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| Solution | Solution record name | Fields used for default solution cards |
|---|---|---|
| Service | • cmdb_ci_service<br>• cmdb_ci_service_business<br>• cmdb_ci_service_technical | • Owned by<br>• Delivery manager<br>• Delegate<br>• Business relationship manager<br>• Business contact<br>• Managed by |
| Service offering | service_offering | • Owned by<br>• Delivery manager<br>• Delegate<br>• Business contact<br>• Managed by |
| Business application | cmdb_ci_business_app | • IT application owner<br>• Business owner<br>• Portfolio manager |
| Application service | cmdb_ci_service_auto including dynamic configuration item (CI) groups | • Owned by<br>• Managed by |

## Personal and enterprise portfolio reference

Use suggestions and tips for creating and organizing portfolios in Digital Portfolio Management (DPM)

This DPM Academy series video provides tips for creating and organizing personal and enterprise portfolios. Tips and suggestions for personal and enterprise portfolios in DPM. Approximately 16 minutes long.

## KPI groups installed with Digital Portfolio Management

Digital Portfolio Management (DPM) enables you to view standard key performance indicator (KPI) groups that are included with the base system. You can also configure KPIs with the sn_dpm.dpm_admin role.

Admins view the back-end details of KPI groups by navigating to **Digital Portfolio Management** > **All** > **KPI Groups**.

In addition to viewing the KPIs that come with the base DPM system, you can also configure them. For more information, see Configure KPIs in Digital Portfolio Management.

To see the latest score of KPIs, enable the latest score system property. For more information on this system property, see KPI groups in Digital Portfolio Management.

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### DPM base system KPI groups

| KPI Group | Type | Contains KPIs | Supporting KPIs |
|---|---|---|---|
| Business application performance | Business applications | • Number of incidents<br>• Number of problems<br>• Number of changes | No supporting KPIs |
| Performance snapshot<br>and<br>Service metrics | Service Portfolios<br>and<br>Services | Availability | • Outages<br>• Average outage duration |
| | | Open incidents | • P1 Incidents (sum)<br>• MTTR (average time to resolve)<br>• Incident Customer satisfaction score (CSAT) (average)<br>• Incidents with breached service level agreements (SLA) (sum)<br>• Incidents not updated for 5 days (sum)<br>• Incidents not updated for 30 days (sum) |
| | | Incidents not updated for 5 days (for Performance Snapshot). | No supporting KPIs |
| | | Mean time to resolve (MTTR) (for Service metrics) | Average time to resolve all incidents that are P1 to P5. |
| | | New requests | No supporting KPIs |
| Outage and Availability | Offerings | Total outage minutes | • Unplanned outage minutes (sum)<br>• Degraded outage minutes (sum)<br>• Planned outage minutes (sum)<br>• New emergency changes (sum) |

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### DPM base system KPI groups (continued)

| KPI Group | Type | Contains KPIs | Supporting KPIs |
|---|---|---|---|
| | | Availability | • Unplanned outages (sum)<br>• Average outage duration (average)<br>• Degraded outages (sum)<br>• Planned outages (sum) |
| Incidents | Offerings | New incidents | • P1 to P4 incidents (average)<br>• Incidents caused by change (average) |
| | | Incidents not updated for 5 days | No supporting KPIs |
| | | Incidents with a breached service level agreement (SLA) | No supporting KPIs |
| | | Incidents by priority | No supporting KPIs |
| Changes | Offerings | Open changes | • High risk changes<br>• High priority changes<br>• Overdue changes |
| | | New changes | No supporting KPIs |
| Problems | Offerings | • New problems<br>• Problems by priority | • P1 (critical)<br>• P2 (high)<br>• P3 (moderate)<br>• P4 (low)<br>• P5 (planning) |
| Catalog Activity | Offerings | Service requests | • RITMs closed incomplete (average)<br>• Average time to close (average)<br>• RITMs closed complete (average)<br>• RITMs closed skipped (average) |

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**DPM base system KPI groups (continued)**

| KPI Group | Type | Contains KPIs | Supporting KPIs |
|---|---|---|---|
| | | Requests by catalog item | • Catalog activity by item (sum)<br>• Average time to close by item (average) |
| Service health | Application services | Critical incidents | • P1 incidents (sum)<br>• P2 incidents (sum)<br>• MTTR (average) |
| | | Closed changes | • Emergency changes (sum)<br>• High risk changes (sum) |
| Availability insights | Application services | Availability | • Unplanned outages (sum)<br>• Degraded outages (sum)<br>• Planned outages (sum) |
| | | Unplanned outages | New emergency changes |
| | | Average outage duration | No supporting KPIs |
| Portfolio success metrics | Enterprise portfolios | • Availability<br>• Incidents with a breached SLA<br>• Incidents caused by changes<br>• Successful changes | No supporting KPIs |
| Service CSAT | Services | • Average CSAT<br>• CSAT ratings | Average CSAT is 5 rating (highest) to 1 rating (lowest) |

**Note:**
To view more details, select the KPI number. KPI charts aren't selectable.

## Digital Portfolio Management related applications and data sources

Digital Portfolio Management (DPM) enables you to use related applications to view and edit service details in the plan-build-run life cycle. All related applications are optional, so they aren't required to use the DPM experience.

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## Data Sources

By design, DPM offers a broad reach of data sources to give you a high-level view of information that impacts your solutions. Its data sources reach across hundreds of data elements across more than 70 tables, as well as many indicators. This expansive reach gives you a broad perspective of items that may influence your solutions.

DPM has three main data sources:

- Record and field lookups, either in direct configuration in UIB or in data brokers. The lookups are listed in the data sources Excel file that you can download from KB1123710.
- Needs attention attributes are from data brokers. For more information, see KB1519343.
- Performance Analytics indicators, data collection jobs, and key performance indicator (KPI) groups.

For an overview on how DPM aligns with the Common Service Data Model (CSDM), see Apply the CSDM guidelines to Digital Portfolio Management.

To view details on the Digital Portfolio Management data sources including data elements, source tables, fields, and required plugins, see KB1123710, and select the option to **Download the Data Sources Excel File**.

## Enterprise portfolios

Since the Utah release, you can install the enterprise portfolio plugin [enterprise portfolio] that's available as part of the core ServiceNow AI Platform. Installing the plugin installs two new roles:

- The enterprise portfolio admin [sn_ep.enterprise_portfolio_admin] can create, read, update, and delete (CRUD) enterprise portfolios.
- The enterprise portfolio viewer [sn_ep.enterprise_portfolio_viewer] can read enterprise portfolios.

  Installing the enterprise portfolio plugin results in the following:

  - The DPM admin role inherits the enterprise portfolio admin role.
  - The DPM manager role inherits the enterprise portfolio viewer role.

## Services and service offerings

**Note:**
Your data view in DPM is the same as what your product license permits from the application that you pull data from (standard or pro).

### DPM related applications for services and service offerings

| To see in DPM | Required installs | Required roles | Use cases |
|---|---|---|---|
| • Contextual side panel<br>• Needs attention | There are no special installs required to use the contextual side panel or to see items that need attention. | DPM Manager [sn_dpm.dpm_manager] | • Use the contextual sid to navigate to portfolio modules in DPM.<br>• See items that need a based on criticality. |

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**DPM related applications for services and service offerings (continued)**

| To see in DPM | Required installs | Required roles | Use cases |
|---|---|---|---|
| Plan tab | To see roadmap data:<br>Install the plugin for Strategic Planning: com.sn_align_ws<br>To see improvement initiatives:<br>Install the plugin for ServiceNow® Continual Improvement Management com.sn_cim<br>To see demand data:<br>Install plugins for Demand Management: idea_core, dmn_demand, and pm_project | For Strategic Planning:<br>• sn.align_ws<br>• sn_align_core. apw_user<br>• sn_align_core.apw_admin<br>• sn_roadmap_plng.roadmap_editor<br>For Continual Improvement Management and demands:<br>DPM Manager [sn_dpm.dpm_manager] | • Select **View roadmap** Strategic Planning to v roadmap details in the the selected service o offering.<br>• You can edit roadmap sn_roadmap_plng.roa role.<br>• Use Continual Improve Management to see ic improve processes ac services and service o<br>• Create demands on yo and service offerings i |
| Build tab | To see roadmap data:<br>Install the plugin for Strategic Planning: com.sn_align_ws<br>To see project data:<br>Install the plugin for Project Portfolio Management com.snc.financial_planning_pmo<br>To see changes:<br>No required install. Change data is standard with IT Service Management (ITSM).<br>To see improvement initiatives:<br>Install the plugin for Continual Improvement Management com.sn_cim | For Strategic Planning:<br>• sn.align_ws<br>• sn_align_core. apw_user<br>• sn_align_core.apw_admin<br>• sn_roadmap_plng.roadmap_editor<br>For PPM, Changes, and Continual Improvement Management:<br>DPM Manager [sn_dpm.dpm_manager] | • Select **View roadmap** have Strategic Plannin you. You can view roa in the context of the se service or service offe<br>• Edit roadmaps with th sn_roadmap_plng.roa role.<br>• See project data that r your services or servic<br>• Select any of the char to view details about c records that may impa services or service off<br>• Use Continual Improve Management to see ic improve processes ac services and service o |
| Run tab | The key performance indicator (KPI) group [sn_team_perf_kpi_group] is automatically installed for you to see performance data:<br>The Performance snapshot indicator sources come from Performance Analytics: | • DPM Manager [sn_dpm.dpm_manager] to view KPIs<br>• DPM Admin [sn_dpm.dpm_admin] to create KPIs | View the Performance sn group that includes the supporting KPIs:<br>• Service availability<br>• New incidents on the s<br>• Subscribers of the ser<br>• Service customer satis score |

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### DPM related applications for services and service offerings (continued)

| To see in DPM | Required installs | Required roles | Use cases |
|---|---|---|---|
| | • serviceoffering.availability.daily<br>• incidents.open<br>• incidents.resolved<br>• [DPM]requests.new<br><br>See KB1160281 for important criteria to see performance data. | | View additional KPI grou service offerings:<br>• Outages and availabil<br>• Incidents<br>• Changes<br>• Problems<br>• Catalog activity<br><br>View availability and ser agreements (SLA) comm reporting. |
| Info tab | No special installs required. | DPM Manager [sn_dpm.dpm_manager] | View general information service and service offe |

## Business applications

**Note:**
Your data view in DPM is the same as what your product license permits from the application that you pull data from (standard or pro).

### DPM related applications for business applications

| To see in DPM | Required installs | Required roles | Use cases |
|---|---|---|---|
| • Contextual side panel<br>• Needs attention | To see audits, install the plugin for Audit Management (sn_audit)<br><br>To see technical risks, install the plugin for Technology Portfolio Management: sn_apm_tpm. This plugin has two dependency plugins:<br>• Application Portfolio Management (com.snc.apm)<br>• Software Asset Management (com.snc.sams) | DPM Manager [sn_dpm.dpm_manager] | • Use the contextual sid to navigate to portfolio modules in DPM.<br>• See items that need a based on criticality. |
| Plan tab | To see roadmap data:<br><br>Install the plugin for Strategic Planning: com.sn_align_ws<br><br>To see improvement initiatives:<br><br>Install the plugin for Continual Improvement Management com.sn_cim | For Strategic Planning:<br><br>• sn.align_ws<br>• sn_align_core. apw_user<br>• sn_align_core.apw_admin<br>• sn_roadmap_plng.roadmap_editor | • Select **View roadmap** Strategic Planning to v roadmap details in the the selected business<br>• You can edit roadmap sn_roadmap_plng.roa role.<br>• Use Continual Improve Management to see ic |

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**DPM related applications for business applications (continued)**

| To see in DPM | Required installs | Required roles | Use cases |
|---|---|---|---|
| | To see demand data:<br><br>Install plugins for Demand Management: idea_core, dmn_demand, and pm_project | For Continual Improvement Management and demands:<br><br>DPM Manager [sn_dpm.dpm_manager] | improve processes ac<br>business applications<br>• Create demands on y<br>applications in DPM. |
| Build tab | To see roadmap data:<br><br>Install the plugin for Strategic Planning: com.sn_align_ws<br><br>To see project data:<br><br>Install the plugin for Project Portfolio Management (PPM): com.snc.financial_planning_pmo<br><br>To see agile data:<br><br>Install the plugin for Agile Development: com.snc.sdlc.agile.2.<br><br>To see changes:<br><br>No required install. Change data is standard with IT Service Management (ITSM).<br><br>To see flow metrics and accelerate metrics:<br><br>Enable DevOps for DPM (see Configure the Digital Portfolio Management experience)<br>• To see details in the DevOps Change Workspace, select **View DevOps Insights** from the Flow metrics section.<br>• To see details in the DevOps Change Workspace, select **View Accelerate metrics in DevOps** from the Accelerate metrics section. | For Strategic Planning:<br>• sn.align_ws<br>• sn_align_core. apw_user<br>• sn_align_core.apw_admin<br>• sn_roadmap_plng.roadmap_editor<br><br>For PPM, Changes, and Agile Development:<br><br>DPM Manager [sn_dpm.dpm_manager] | • Select **View roadmap** to launch Strategic Pla launches for you. You roadmap details in the the selected business<br>• Edit roadmaps with th sn_roadmap_plng.roa role.<br>• See project data that r your business applica<br>• View data from Agile D to view details on epic sprints, and releases i context of the selecte application.<br>• Manage scrum and wa development in DPM visibility into your soft development life cycle<br>• Select any of the char to view details about c records that may impa business applications |
| Run tab | Install the plugin for Application Portfolio Management (APM):<br><br>com.snc.apm<br><br>To see accelerate metrics: | • DPM Manager [sn_dpm.dpm_manager] to view KPIs<br>• DPM Admin [sn_dpm.dpm_admin] to create KPIs | View the Performance s which includes the follo metrics:<br>• Number of incidents<br>• Number of problems |

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**DPM related applications for business applications (continued)**

| To see in DPM | Required installs | Required roles | Use cases |
|---|---|---|---|
| | Enable DevOps for DPM<br><br>**Note:** To see details in the DevOps Change Workspace, select **View Accelerate metrics in DevOps** from the Accelerate metrics section. | | • Number of changes<br>• Total change hours<br><br>View deployments data:<br>• Deployments breakdo<br>• Deployment hardware software models (tech data)<br><br>**Note:** Technology Portfolio Management data c APM. |
| Risk tab | Install plugins for Governance, Risk, and Compliance and ServiceNow® Risk Management:<br>• com.sn_risk<br>• com.snc.governance<br>• sn.grc.common<br>• com.snc.risk_asmt<br>• com.snc.grc_risk_dep<br>• com.snc.grc.common<br>• com.snc.grc_policy_dep<br><br>Install the plugin for ServiceNow® Audit Management (sn_audit) | DPM Manager [sn_dpm.dpm_manager] | View risks related to you applications. |
| Info tab | No special installs required. | DPM Manager [sn_dpm.dpm_manager] | View general information business applicaton. |

## Application services

**Note:** Your data view in DPM is the same as what your product license permits from the application that you pull data from (standard or pro).

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### DPM related applications for application services

| To see in DPM | Required installs | Required roles | Use cases |
|---|---|---|---|
| Needs attention | To see alerts and alert data, install the plugin for Event Management (com.glide.platform_ml)<br><br>To see technical risks, install the plugin for Technology Portfolio Management: sn_apm_tpm. This plugin has two dependency plugins:<br>• Application Portfolio Management (com.snc.apm)<br>• Software Asset Management (com.snc.sams) | DPM Manager [sn_dpm.dpm_manager] | See items that need attention, including alerts and technical risk information. |
| Run tab | To see reliability indicators, install the plugin for Site Reliability Metrics:<br><br>sn_srm<br><br>To see alerts and alert data, install the plugin for Event Management (com.glide.platform_ml) | • DPM Manager [sn_dpm.dpm_manager] to view KPIs<br>• DPM Admin [sn_dpm.dpm_admin] to create KPIs | View the following information:<br><br>View application service performance<br>• Service health<br>• Service impact<br>• Alert trends<br><br>View site reliability management<br>• Number of reliability indicators<br>• Description of reliability indicators<br><br>View offerings that depend on this application service<br>• Number of reliability offerings<br>• Drill down to offering to see the related records<br><br>View technology risk |

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**DPM related applications for application services (continued)**

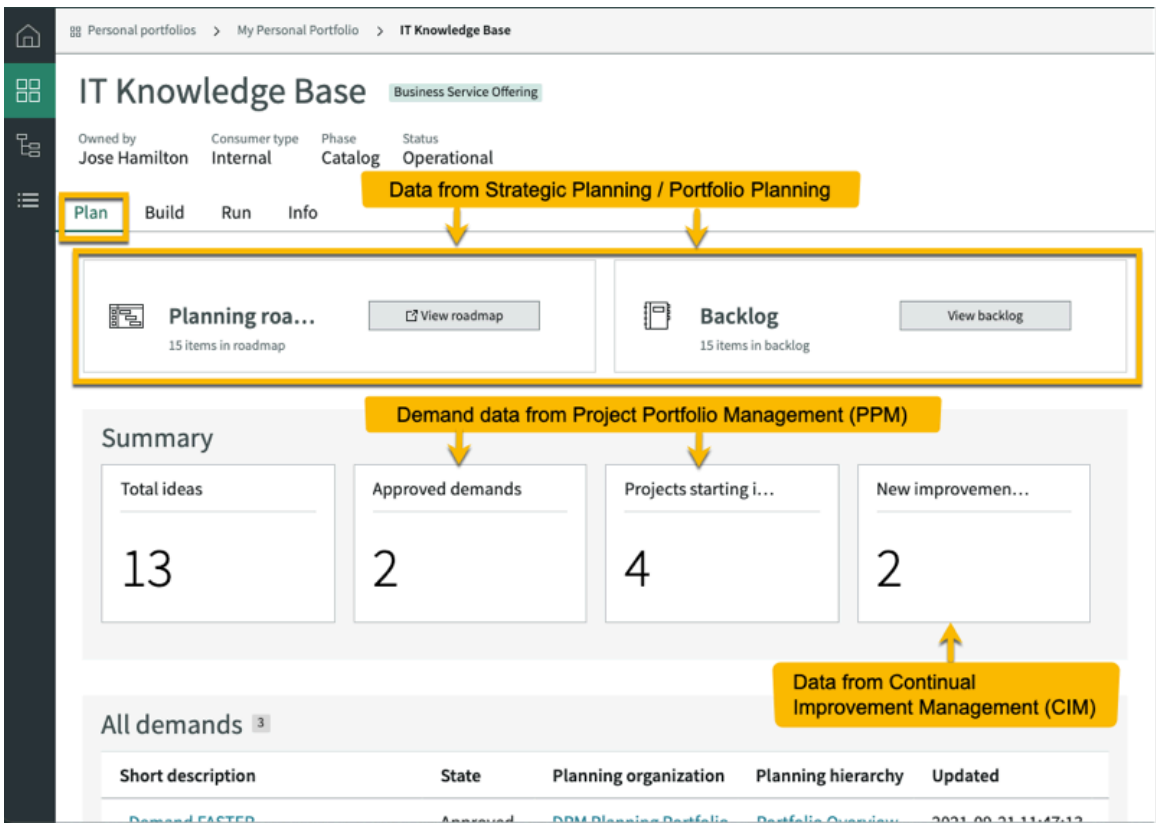
| To see in DPM | Required installs | Required roles | Use cases |
|---|---|---|---|
| | | | • Software models by:<br>• Hardware models<br>• Drilling down in each model to see the related records |
| Info tab | No special installs required. | DPM Manager [sn_dpm.dpm_manager] | View general information about the application service. |

## Examples

## Example: Plan data sources for services and service offerings

**Note:**
Your data view in DPM is the same as what your product license permits from the application that you pull data from (standard or pro).

Strategic Planning (formerly known as Alignment Planner Workspace) is a pro version. Portfolio Planning is available for users with a Strategic Portfolio Management (SPM) standard license.

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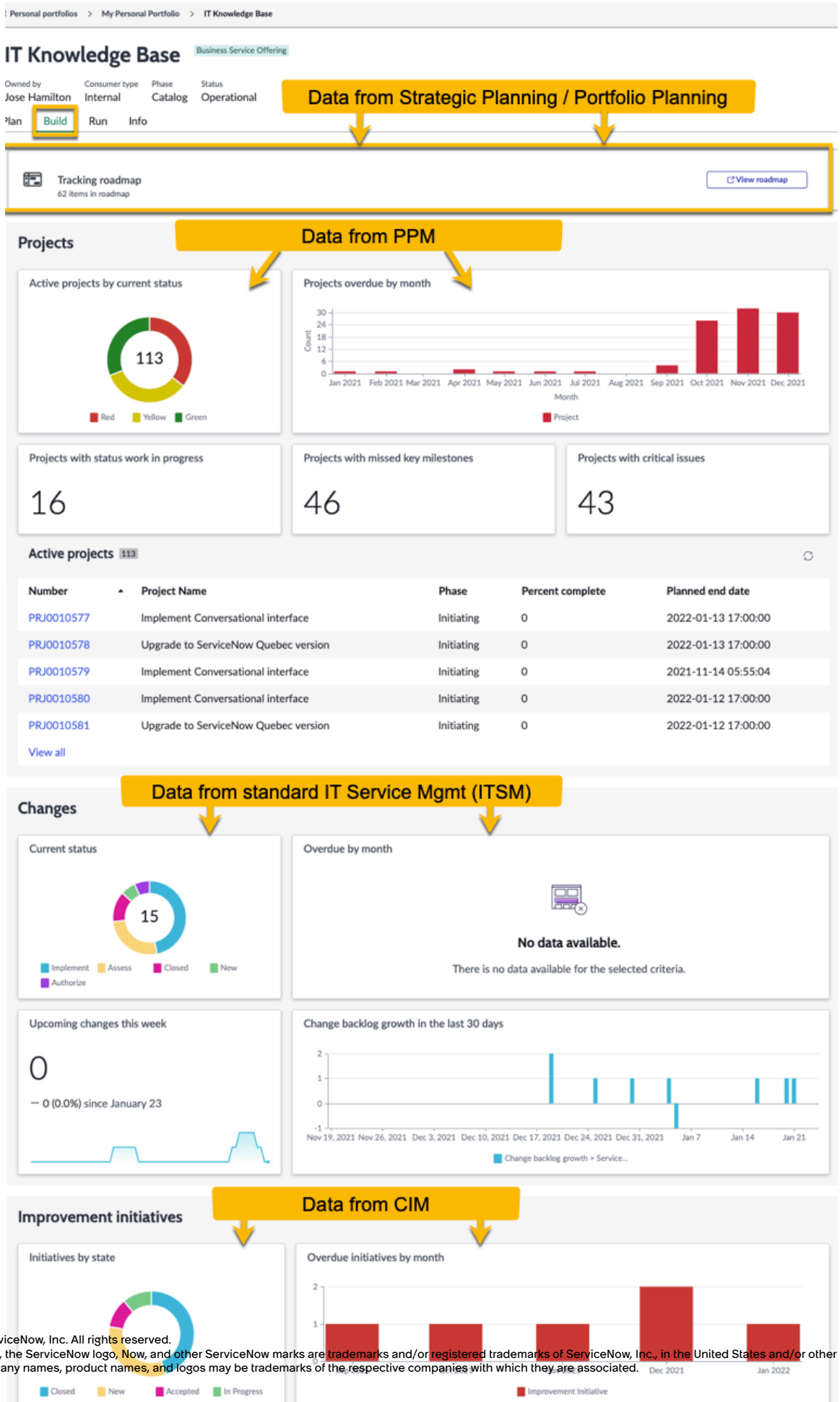
# Example: Build data sources for services and service offerings

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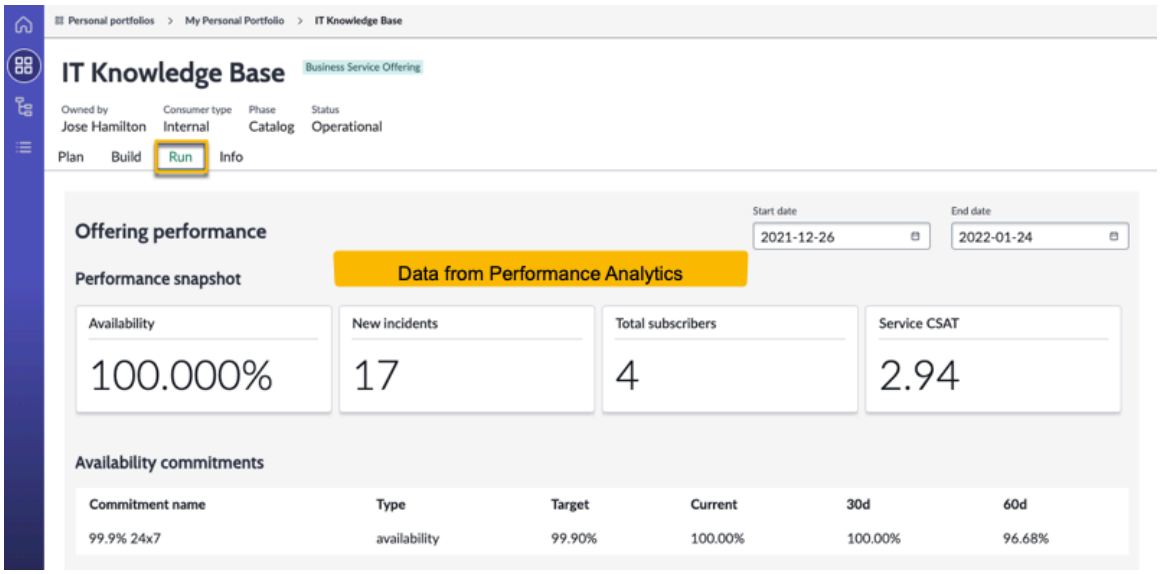
## Example: Run data sources for services and service offerings




## Process Mining components for Digital Portfolio Management

Admins must install the ITSM Process Mining Content Pack from the ServiceNow® Store to get the insights and system property for Process Mining in Digital Portfolio Management (DPM). Use Process Mining to analyze and improve key performance indicator (KPI) outputs in DPM.

## Properties

| Property | Description |
|---|---|
| sn_dpm.enable.po.dpm | Enables you to use Process Mining with DPM.<br>• **Type:** true \| false<br>• **Default value:** false |
| sn_itsm_dpm.po_mining.run_frequency | Time interval to remine Process Mining projects. You must run the Process Mining scheduled job in DPM to mine the data. You can run it again only at the set interval. If you run the job earlier, it won't remine the data.<br>• **Type:** integer<br>• **Default value:** 7 days |

## Roles

| Role title [name] | Description | Contains roles |
|---|---|---|
| Process Mining Analyst [sn_process_optimization_analyst] | Create and share Process Mining projects. | sn_process_optimization_viewer |

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### Scheduled jobs

Navigate to **All** > **System Definition** > **Scheduled jobs**.

| Name | Description |
|---|---|
| Process Mining - DPM Remine Projects | Automatically runs once daily. You can run this job on demand when additional data is added to a project so that you get the up-to-date process insights for your projects. The job remines data based on the frequency set in the *dpm.po_mining.run_frequency* property. |

**Related topics**

Configure Digital Portfolio Management to integrate with Process Mining

Create Process Mining projects for KPI groups in Digital Portfolio Management

### Domain separation and Digital Portfolio Management

Domain separation is supported in Digital Portfolio Management. Domain separation enables you to separate data, processes, and administrative tasks into logical groupings called domains. You can control several aspects of this separation, including which users can see and access data.

### Support level Standard

- Includes Basic level support.
- Business logic: The service provider (SP) creates or modifies processes per customer. The use cases reflect proper use of the application by multiple SP customers in a single instance.
- The instance owner must configure the minimum viable product (MVP) business logic and data parameters per tenant as expected for the specific application.

Sample use case: An admin must be able to make comments required when a record closes for one tenant, but not for another.

For more information on support levels, see Application support for domain separation.

The Digital Portfolio Management application uses Performance Analytics to collect data and provides domain separation support.

### Request Digital Portfolio Management Domain Separation

The Domain Support - Domain Extensions Installer plugin (com.glide.domain.msp_extensions.installer) must be activated by ServiceNow personnel. After this plugin has been activated, as an administrator, you can activate the Performance Analytics - Domain Support plugin (com.snc.pa.domain_support).

The Performance Analytics - Domain Support plugin (com.snc.pa.domain_support) must be activated to enable the features for Digital Portfolio Management.

## ITSM Virtual Agent

You can use ITSM Virtual Agent to support and scale your IT organization. With ITSM Virtual Agent, your technicians can address more challenging IT-related user requests and incidents.

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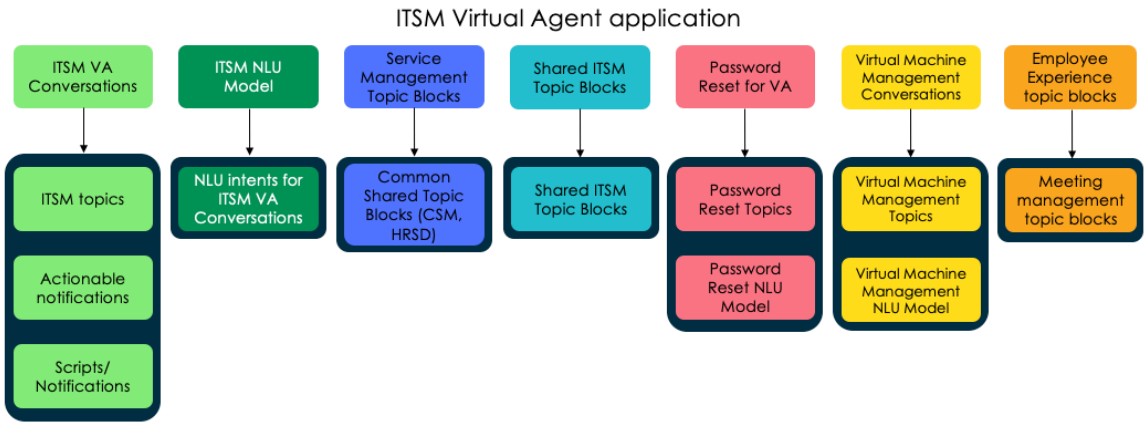
## Request apps on the Store

Visit the ServiceNow Store website to view all the available apps and for information about submitting requests to the store. For cumulative release notes information for all released apps, see the ServiceNow Store version history release notes.

## About ITSM Virtual Agent

ITSM Virtual Agent helps you automate employee workflows by addressing common IT-related queries immediately. At any time during a virtual conversation, a user can request to interact with a live IT technician.

ITSM Virtual Agent includes pre-built topic conversations that cover common IT interactions. These conversations run in the web chat client and are also available in supported ITSM Virtual Agent messaging integrations.




Conversations between Virtual Agent and the user accomplish an IT goal. The information exchanged during the conversation flow, such as user inputs and Virtual Agent responses, enables Virtual Agent to fulfill a request or help complete a task.

ITSM Virtual Agent integrates with ServiceNow® Integration Hub and Flow Designer. Some topics may require specific spokes to be installed.

For more information about Virtual Agent features, see Virtual Agent.

## Languages supported for NLU services on the ITSM Virtual Agent

In addition to English, ITSM Virtual Agent supports the following languages for NLU:

- German
- French
- French (Canadian)
- Korean
- Spanish
- Brazilian Portuguese
- Japanese
- Italian
- Dutch
- Chinese (Simplified)

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For details about NLU, see Natural Language Understanding in Virtual Agent.

The ITSM Virtual Agent topics re-factored with `gs.getMessageLang()` provide you the improved operations on the ITSM Virtual Agent by utilizing and displaying all the messages in the bot conversations in your preferred language. The `gs.getMessageLang` method checks the UI Message table [sys_ui_message] for the translated version of the text in the language provided using the `vaContext.getRequesterLang()` variable.

### Edge Encryption for ITSM Virtual Agent

Edge encryption provides you with direct control over your data security. Encryption and key management are performed on your intranet between your browser and your ServiceNow® instance. For details about edge encryption, see Edge Encryption for ITSM Virtual Agent within ITSM.

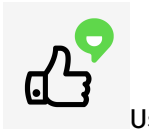
## Exploring ITSM Virtual Agent

The ServiceNow ITSM Virtual Agent provides assistance through conversations within an intelligent messaging interface.

### ITSM Virtual Agent overview

Empower your IT technicians to concentrate on more challenging, demanding user requests and incidents by deflecting the most common, simpler incidents to a virtual agent. ITSM Virtual Agent enhances both the IT technician experience and the employee experience by addressing IT-related queries immediately.

### Virtual Agent benefits

| | |
|---|---|
|  User Satisfaction | **User satisfaction**<br>Provide better self-service by helping users and customers get what they need quickly with always-on, omni-channel experiences. Enable your users to get immediate help, day or night. Boost user and customer satisfaction by offering a personalized Virtual Agent experience, whereby user information is remembered and applied during the conversation. |
|  | **Increased productivity**<br>Deliver great experiences for your users, as well as your agents and technicians, by deflecting tickets and reducing call volumes. Drive productivity by providing a virtual agent on familiar channels, such as Slack, Microsoft Teams, Facebook Messenger, and Workplace. |
|  | **Automation support**<br>Scale your support organizations and free your agents and technicians to focus on more complex user issues by automating common support tasks. |
|  | **Empowered service owners**<br>Enable service owners to deliver and refine AI capabilities quickly without data science expertise. |

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## Components

### Natural Language Understanding

You can use Natural Language Understanding (NLU) for all your ITSM Virtual Agent topic conversation flows. ITSM Virtual Agent uses NLU to comprehend word meanings, recognize word contexts, and infer user or system actions.

You can decide whether you want ITSM Virtual Agent to use only keywords, which result in quicker time-to-value in the short term. Or you can choose to use NLU, which results in a better employee experience in the long term.

ITSM Virtual Agent and the ITSM NLU Model for Virtual Agent Conversations are available from the ServiceNow Store. Visit the ServiceNow Store website to view all the available apps and for information about submitting requests to the store. For cumulative release notes information for all released apps, see the ServiceNow Store version history release notes.

The ITSM NLU Model for Virtual Agent Conversations provides pre-built NLU entities, intents, and utterances. Some of the provided intents and utterances include:

- Escalate Ticket topic:
  - Raise incident INC0010023 ticket priority to higher level
  - Raise the priority on my open ticket
- Check Outages and Service Degradations topics:
  - Are there currently any reported company-wide issues?
  - Is there an outage?
- Email Setup topic
  - I want to set up email on my mobile device
  - How do I set up company email on my phone?

Enable NLU on the ITSM Virtual Agent application and republish your existing conversations to optimize user experience with the NLU feature.

### ITSM Virtual Agent automatic notifications

Virtual Agent proactively informs you about the status of your incidents and requests. Managers are alerted when they have approvals.

#### ITSM Virtual Agent notification defined on the Task [task] table

These notifications are used by fulfillers and employees. The **Task type** filter on the Task table enables automatic status notification when the value is **Incident** or **Requested item**. When the state of the incident or requested item task changes, a Virtual Agent message is sent to the user.

#### ITSM Virtual Agent notification defined on the Approval [sysapproval_approver] table

These notifications are used by request management or knowledge management. When an approval is submitted, an automatic Virtual Agent message is sent to the approver alerting them of the approval request.

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# Setting up ITSM Virtual Agent

Set up the ITSM Virtual Agent features and components that you need to provide support to your employees, IT teams, and customers.

ITSM Virtual Agent topics must be activated and published before your employees can use them. By default, the base system provides topics as inactive and unpublished. To view, duplicate, preview, or publish ITSM topics in the Virtual Agent Designer, see Getting started with Virtual Agent Designer.

## Set up ITSM Virtual Agent

You can create and publish conversation topics in Virtual Agent Designer if you have administrator roles.

### Before you begin

Role required: admin

### About this task

Virtual Agent must be activated before you can use the ITSM Virtual Agent topic conversations. Users with the admin roles can activate Glide Virtual Agent [com.glide.cs.chatbot].

Install ITSM Virtual Agent and the ITSM NLU Model for Virtual Agent Conversations by requesting them from the ServiceNow Store. Visit the ServiceNow Store website to view all the available apps and for information about submitting requests to the store. For cumulative release notes information for all released apps, see the ServiceNow Store version history release notes.

Topics must be activated and published before your employees can use them. By default, the base system provides topics as inactive and unpublished. To view, duplicate, preview, or publish ITSM topics in the Virtual Agent Designer, see Getting started with Virtual Agent Designer.

### Procedure

1. Activate the Glide Virtual Agent plugin (com.glide.cs.chatbot).
2. Install ITSM Virtual Agent by requesting it from the ServiceNow Store.
3. Review the ITSM-related conversation topics in Virtual Agent Designer.
4. Configure Natural Language Understanding (NLU) in Virtual Agent.

   ITSM Virtual Agent topics use ServiceNow NLU models. The English NLU models are activated by default. If you are using other languages, you must activate those NLU models manually. For details, see Multilingual model management.
5. Publish the ITSM Virtual Agent topics and their corresponding NLU models in Virtual Agent Designer.

   Publishing them in Virtual Agent Designer lets users run the conversations in your Virtual Agent support client.

   **Note:**
   You can't edit the provided topics. You can duplicate a provided topic and then edit it. You can also create additional topics. For complete details about activating and publishing conversation topics, see Getting started with Virtual Agent Designer.
6. To test an active, published conversation topic, select the topic to test in Virtual Agent Designer and select **Test**.

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## Set up the Local Admin Access topic

Administrators and users with the Virtual_agent_admin role can install and activate the Agent Client Collector Spoke plugin. Developers can update scripts and configure commands as needed for their organization.

### Before you begin

Role required: virtual_agent_admin or admin

### Procedure

1. Install the Agent Client Collector Spoke plugin on the instance according to the Agent Client Collector installation instructions.
2. Update the sudoers file of the macOS devices with the following entry.
   This process allows the ServiceNow user to run the grant_admin_access script in sudo mode and bypass password requirements.

```
_servicenow ALL=
 SETENV: /
Library/Caches/servicenow/agent-client-collector/admin-access-m
ac/bin/grant_admin_access.sh *
Defaults:_servicenow !requiretty
Defaults exempt_group += _servicenow
```

3. Activate the Agent Client Collector plugin (admin-access-mac), after validating the attached payload with your internal IT team.
4. Configure the following commands as needed for your organization.
   ACC Check Definition: `check-admin-access`, `grant-admin-access`
5. Duplicate and activate the Local Admin Access topic in the ITSM scope.
   To view, duplicate, preview, or publish IT Service Management topics in the Virtual Agent Designer, see Getting started with Virtual Agent Designer.

## Set up actionable notifications for ITSM Virtual Agent

Administrators and users with the virtual_agent_admin role can enable system notifications, trigger Flow Designer flows for actionable notifications topics, and activate notifications in Virtual Agent.

### Before you begin

Role required: admin or virtual_agent_admin

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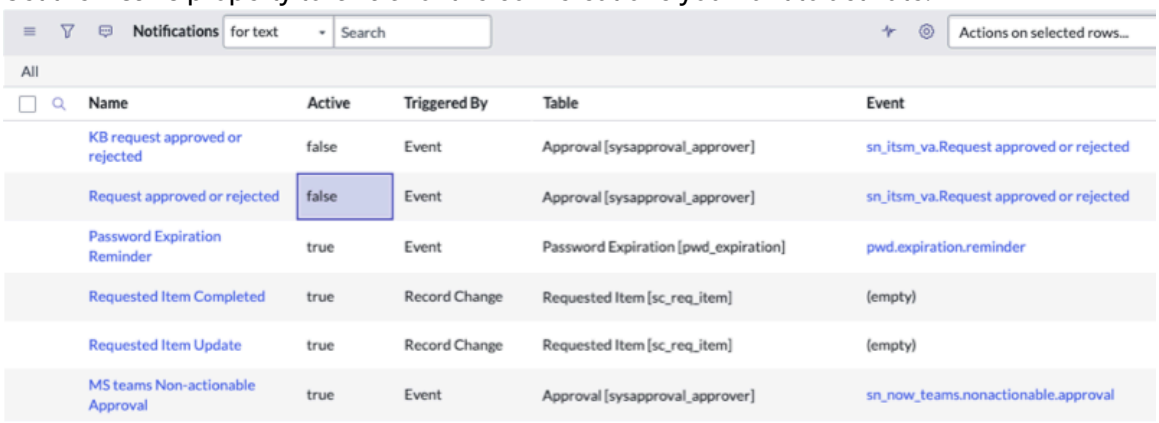
### Procedure

1. Enable system notifications.

   a. Navigate to **All** > **System Notification** > **Provider** > **Notifications**.

   b. Set the **Active** property to *true* for the conversations you want to activate.




| Name | Active | Triggered By | Table | Event |
|---|---|---|---|---|
| KB request approved or rejected | false | Event | Approval [sysapproval_approver] | sn_itsm_va.Request approved or rejected |
| Request approved or rejected | false | Event | Approval [sysapproval_approver] | sn_itsm_va.Request approved or rejected |
| Password Expiration Reminder | true | Event | Password Expiration [pwd_expiration] | pwd.expiration.reminder |
| Requested Item Completed | true | Record Change | Requested Item [sc_req_item] | (empty) |
| Requested Item Update | true | Record Change | Requested Item [sc_req_item] | (empty) |
| MS teams Non-actionable Approval | true | Event | Approval [sysapproval_approver] | sn_now_teams.nonactionable.approval |

2. Activate Flow Designer flows for specific actionable notifications ITSM Virtual Agent conversations.

   These topics are inactive by default. For complete details about activating flows, refer to Activate a flow.

   The following flows for actionable notifications must be activated if you want to use them with Actionable Notifications:

   - ITSM Actionable Notifications trigger flow - Approval Reminder
   - ITSM Actionable Notifications trigger flow - Incident commented
   - ITSM Actionable Notifications trigger flow - Software Installation

   a. Select the flow you would like to activate in Flow Designer.

   b. Select **Activate**.

3. Enable notifications in Virtual Agent.

## Set up Issue Auto Resolution for ITSM Virtual Agent

Users with the virtual_agent_admin or admin role can configure Virtual Agent settings to indicate discoverable topics, set business rules, and more.

### Before you begin

Role required: admin or virtual_agent_admin

- Activate Virtual Agent to use Virtual Agent as a response channel.
- Set up ITSM Virtual Agent

  Install the ITSM Virtual Agent Conversations app, which includes the ITSM NLU Model for Virtual Agent Conversations. Request this app from the ServiceNow Store. Visit the ServiceNow Store website to view all the available apps and for information about submitting requests to the store. For cumulative release notes information for all released apps, see the ServiceNow Store version history release notes.

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### About this task

Most of the Issue Auto Resolution functionality is included with the Glide Virtual Agent (com.glide.cs.chatbot) plugin. More functionality is available in the ITSM Virtual Agent Conversations Store App. Issue Auto Resolution is automatically enabled.

### Procedure

1. Train the Machine Learning model.
   Train the Issue Auto Resolution Machine Learning model before activating the Auto Resolution Configuration record.

   **Note:**
   The query on the Incident table must have the minimum number of records that you specify in the *glide.platform_ml.api.min_agent_zero_records* system property to train the model. The default value of this property is 300000 and should not be increased because training the model can fail with more than 300,000 records. Ensure that the conditions that you specify in the Auto Resolution configuration record return less than 300,000 records before you click **Train**. For more information about predictive intelligence properties, see Predictive Intelligence properties.

   a. Navigate to **All** > **Conversational Interfaces** > **Settings** > **Virtual Agent**.

   b. Under ITSM Virtual Agent (IAR), click **View Settings**.

   c. Select the target table.

   d. Under the **Details** tab, go to the Machine Learning Model section.

   e. Click **Train**.
   The **Training Progress** field displays the percentage of training complete and updates whenever the form is refreshed.

   f. When the **Training Status** field displays `Solution Complete`, select the *Active* property.

   g. **Optional:** Set a **Retrain Frequency** to define how often the Machine Learning model automatically retrains.
   Users with the admin or virtual_agent_admin role can also manually retrain the model at any time.

2. **Optional:** Change any mappings for Issue Auto Resolution intents to matched ITSM Virtual Agent topics.

   a. Navigate to **All** > **Conversational Interfaces** > **Settings** > **Virtual Agent**.

   b. Under **Issue Auto Resolution (IAR)**, select **View Settings**.

   c. Select the target table.

   d. Under the **Auto Resolution Intent Topic Maps** tab, view the default mappings for the intents and matched topics and select the topic to change.
   You can modify mappings, but only supported Issue Auto Resolution intents and active Virtual Agent topics are available for mapping.

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These records are inactive by default. To use them, duplicate the template topics to create and publish them. After associating the intent to the topic of choice, make the intent topic map active.

e. For a given Issue Auto Resolution intent, double-click the corresponding **Matched topic**, select a different topic, and select **Save**.

### Enabling dialog intelligence

Enable support for dialog intelligence in ITSM Virtual Agent to let the Virtual Agent dynamically react to user utterances and modifications during your conversation.

The IT Service Management topics leverage the latest platform Dialog Acts enhancements by changing the toggle from node-level to the topic-level. The Dialog Acts enhancement is enabled for all the topics available in Virtual Agent and Virtual Machine applications.

For more information about Dialog Acts enhancements on the ServiceNow AI Platform, see Dialog Acts for Virtual Agent.

## Using ITSM Virtual Agent pre-built topics

ITSM Virtual Agent includes several pre-built topic conversations designed to help your users complete common IT-related tasks, such as resetting a password and creating an incident.

Once installed, ITSM Virtual Agent pre-built topics are read only and have **(Template)** after the name. To use them, duplicate the topic in the ITSM Virtual Agent conversation scope and rename it according to your company's naming conventions. Natural Language Understanding (NLU) models are used to identify and trigger the action that a user wants to perform.

The ITSM Virtual Agent pre-built topic conversations are organized in several topic categories. Use the following table to find the topics that fit your needs.

**Note:**
Some pre-built topics require additional paid plugins.

| I want to | Using this ITSM topic category | Available pre-built topics |
|---|---|---|
| Resolve issues as an ITSM professional with the itil role | ITSM Fulfiller | • Create Change Request<br>• Create Problem<br>• Identify Available Change Windows<br>• Identify Scheduled Changes<br>• Resolve Incident |

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| I want to | Using this ITSM topic category | Available pre-built topics |
|---|---|---|
| | | • Update Assigned Task<br>• Update Change Request |
| Automate common IT-related issues, such as email setup, VPN connectivity, and conference room problems | ITSM IT Issues | • Collaboration Applications<br>• Email Issues<br>• Email Setup<br>• Guest WiFi Access<br>• Hardware Issues<br>• Local Admin Access<br>• Meeting Room Issues<br>• Printer Issues<br>• Repository Access<br>• RSA Token<br>• Troubleshoot Slow Computer<br>• VPN Connectivity |
| Give users to access IT-related information, such as IT ticket management, verify assigned equipment, and service disruptions | ITSM Self-Service | • Book Conference Room EXO<br>• Book Conference Room OnPrem<br>• Check IT Ticket Status<br>• Escalate IT Ticket<br>• Get Password Reset Link |

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| I want to | Using this ITSM topic category | Available pre-built topics |
|---|---|---|
| | | • Get Zoom Meeting Recording<br>• My Assigned Equipment<br>• Open IT Ticket<br>• Open IT Ticket 2.0<br>• Process Approval<br>• Report IT Issue<br>• Service Disruptions<br>• Set OOO reply Exchange Online<br>• Set OOO reply Exchange Server<br>• Submit a request<br>• Walk-up Check-in<br>• Windows 365 Cloud PC |
| Automate Citrix connections | ITSM Self-Service (with Citrix integration) | • Reset Citrix Sessions<br>• Provision Citrix Desktop/ Apps |
| Automate user password management | Password Reset for Virtual Agent application | • Change Password<br>• Reset Password<br>• Unlock Account |

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| I want to | Using this ITSM topic category | Available pre-built topics |
| --- | --- | --- |
| Manage Microsoft Office 365 groups | ITSM Self-Service (with Microsoft Office 365 integration) | • Add Owner to Office 365 Group<br>• Add User to Office 365 Group<br>• Create Office 365 Group<br>• Get Office 365 Group Details<br>• Remove Office 365 group Owner<br>• Remove Office 365 group Users |
| Manage Microsoft Active Directory groups | ITSM Self-Service (with Microsoft Active Directory integration) | • Add User to AD Group<br>• Create AD Distribution Group<br>• Remove User from AD Group<br>• Show My AD Group Membership |
| Automate meeting invitations in Microsoft Exchange Online | ITSM Self-Service (with Microsoft Exchange Online integration) | • Manage Meetings EXO v1.0<br>• Manage Meetings EXO |
| Automate meeting invitations in Microsoft Exchange Server | ITSM Self-Service (with Microsoft Exchange Server integration) | Manage Meetings EXS |

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| I want to | Using this ITSM topic category | Available pre-built topics |
|---|---|---|
| Manage virtual machines | Cloud VMs | • Describe Virtual Machine<br>• Manage Virtual Machine<br>• Provision Virtual Machine<br>• Start Virtual Machine<br>• Start Virtual Machine CAI<br>• Stop Virtual Machine<br>• Stop Virtual Machine CAI |
| Create a standard welcome greeting and a conversation closing, as well as user feedback and surveys | Setup Topics | Dynamic Greeting Topic |

## IT Issues pre-built topics for ITSM Virtual Agent

IT Issues topic conversations are designed to automate common IT-related issues, such as email setup, VPN connectivity, and conference room problems.

## Collaboration Applications

Users can use Virtual Agent to troubleshoot common issues with collaboration software, such as Cisco Webex, Zoom, and Microsoft Teams. This topic uses topic blocks that can be customized for your environment. If the user isn't satisfied with the static help content for the issue they're facing, they can perform an AI search or Contextual search. The type of search is dictated by the system property *sn_itsm_va.fallback_search_option*.

This topic uses the following topic blocks:

- Contextual Search
- Create Incident
- Troubleshoot Cisco Webex
- Troubleshoot Microsoft Teams
- Troubleshoot Zoom

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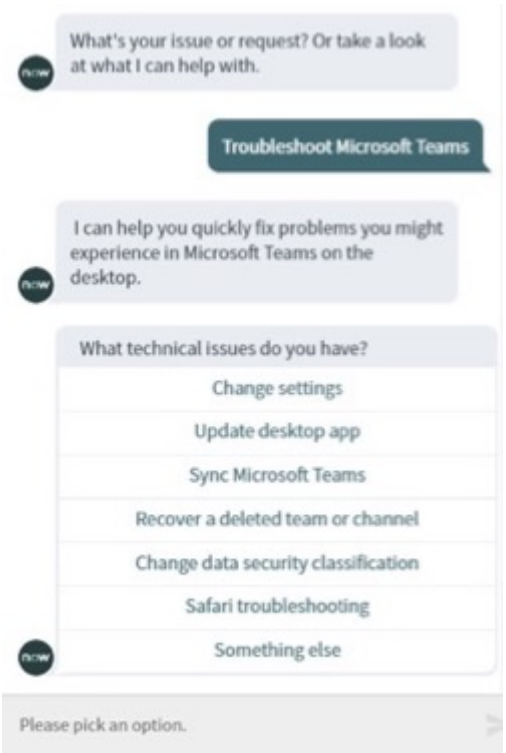
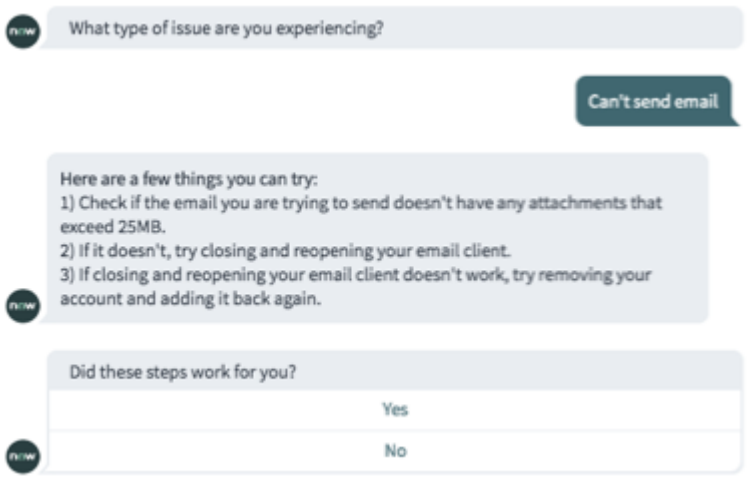



## Email Issues

Users can request help with email problems, such as issues sending and receiving email or problems with the email client.




## Email Setup

Users can request help with email access or setting up an email account accessible by computer or phone. Users can also request help with configuring email or setting up web mail.

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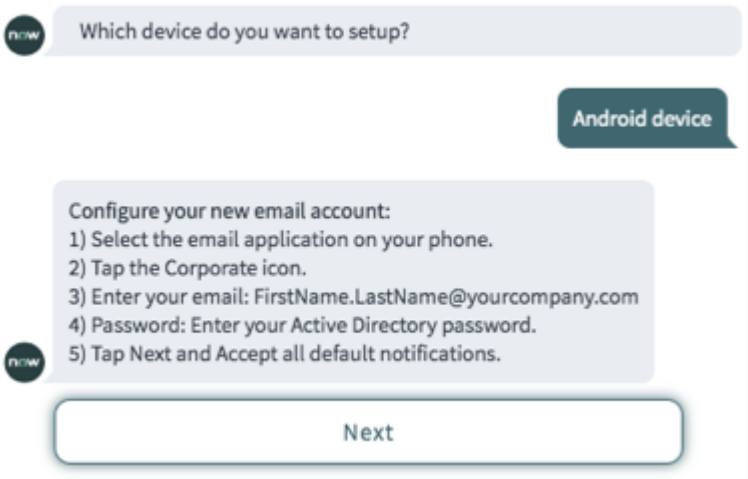
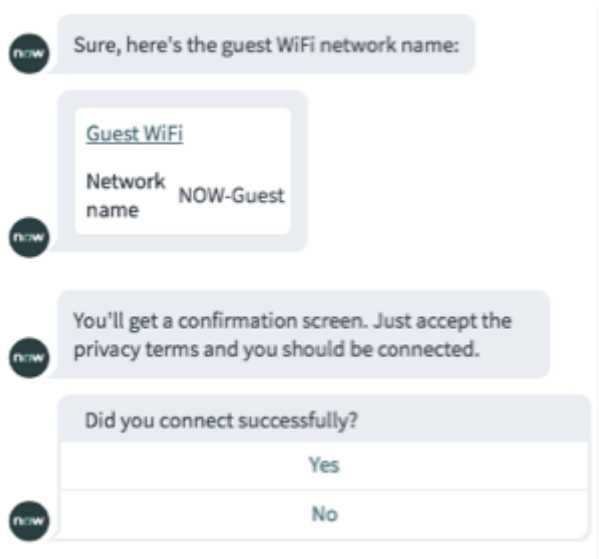



## Guest WiFi Access

Guests to your company can obtain WiFi access.




## Hardware Issues

Users can troubleshoot specific hardware issues.

This topic uses the following topic blocks:

- Contextual Search
- Create Incident

## Local Admin Access

Users can request and gain admin rights and permission to install or access software and other admin-related items within your system.

Virtual Agent grants admin access and removes the access for all users on the device after the designated time period (except users listed in DEFAULT_ADMIN_USERS).

When the user requests help with admin access, Virtual Agent asks the user to select the device they would like admin privileges for.

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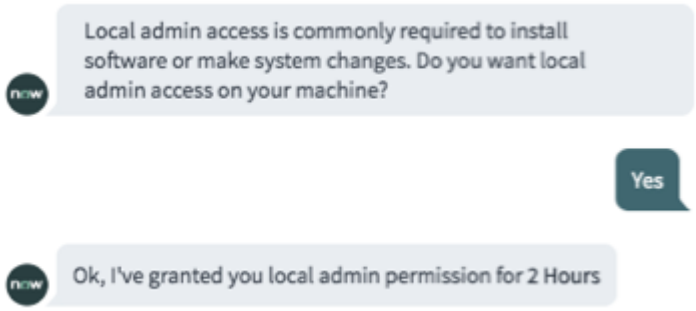
Requirements:

- Agent Client Collector spoke (com.sn.acc.spoke)
- Applies to macOS users only

  If the user selects another operating system, Virtual Agent provides relevant KB articles.



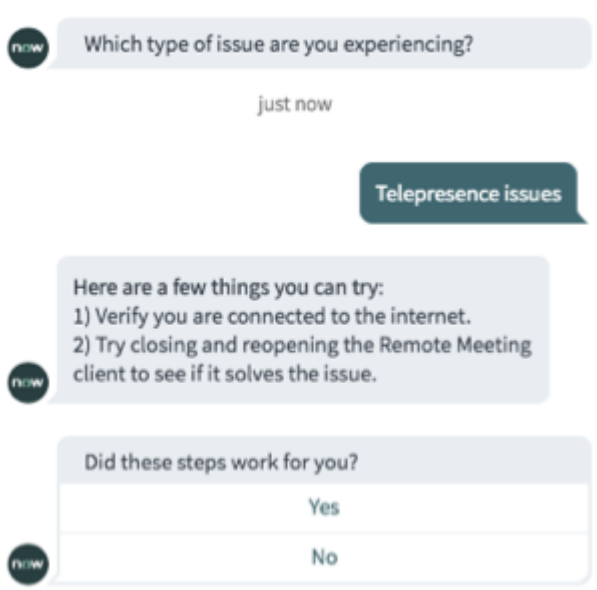

To set up and use the Local Admin Access topic, refer to Set up the Local Admin Access topic.

## Meeting Room Issues

Users can request help with meeting room issues, such as conferencing problems, sound issues, display, connectivity, sharing, and more.

This topic uses the following topic blocks:

- Contextual Search
- Create Incident




## Printer Issues

Users can request help with issues associated with a printer, such as no ink, printer not working, or connectivity problems. This topic can be used with Issue Auto Resolution.

This topic uses the following topic blocks:

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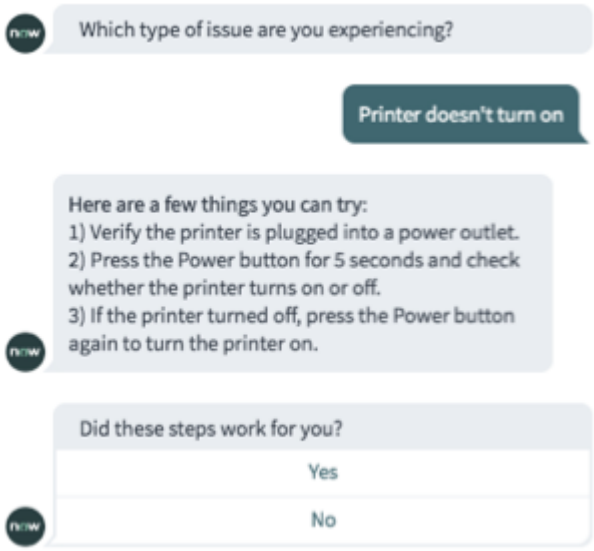
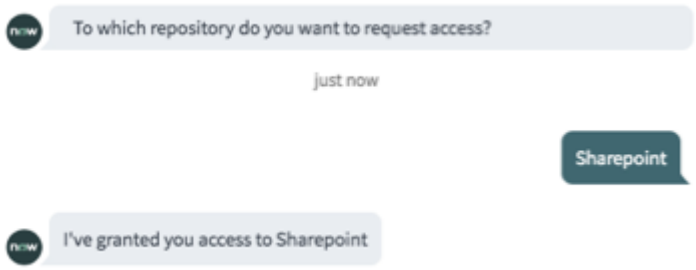
- Contextual Search
- Create Incident




## Repository Access

Users can request and gain access to a data repository manually, or choose from preloaded available repositories.

This topic uses the Create Incident topic block.




## RSA Token

Users can request an RSA token or report a problem with an RSA token. Users can also request help with the setup of an RSA token.

This topic uses the following topic blocks:

- Contextual Search
- Create Incident

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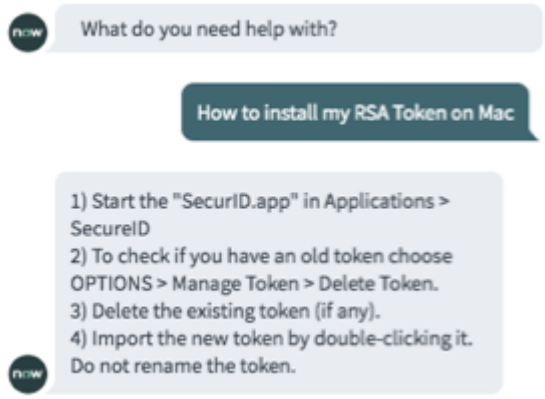
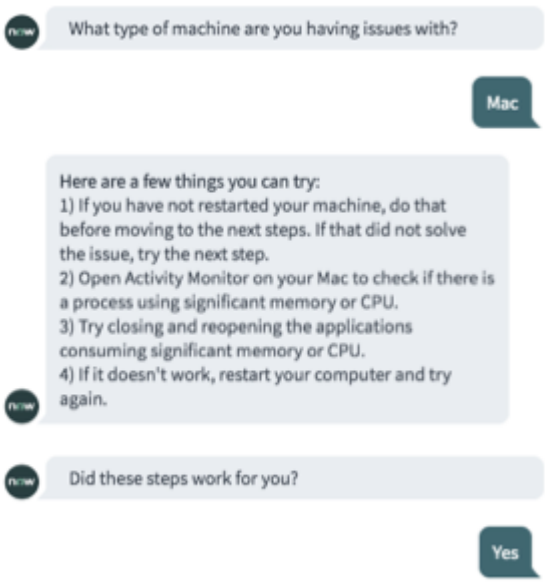



## Troubleshoot Slow Computer

Users can request help associated with a slow computer, such as low RAM.

This topic uses the following topic blocks:

- Contextual Search
- Create Incident




## VPN Connectivity

Users can request help with connecting to VPN or setting up VPN to access business systems from remote locations.

This topic uses the following topic blocks:

- Contextual Search
- Create Incident

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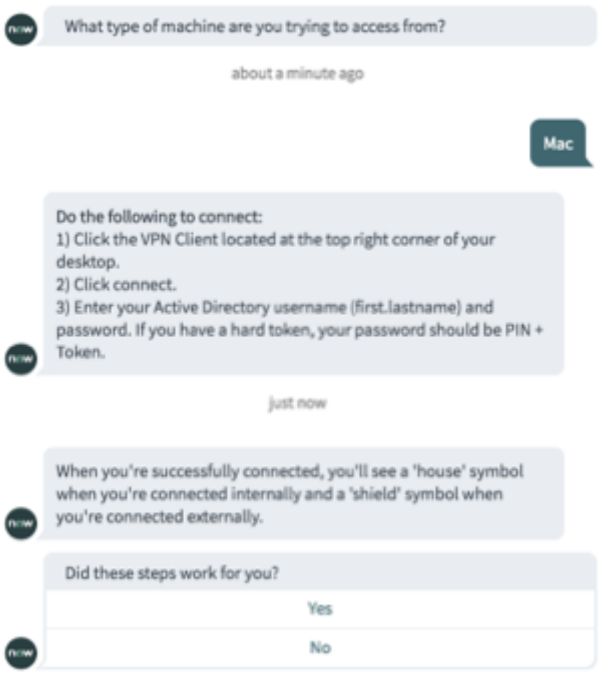


## Self-Service pre-built topics for ITSM Virtual Agent

Self-Service topic conversations are designed to give users to access IT-related information, such as open or check IT ticket status, verify assigned equipment, and Knowledge Base search.

## Book Conference Room EXO

Users can book a conference room in Microsoft Exchange Online using Virtual Agent.

Requirement: Microsoft Exchange Online spoke (sn_ex_online_spke)

This topic uses the Create Incident topic block.

Basic flow:

1. User selects a city for the meeting.

   The city must be configured as a room resource.

2. User selects number of attendees and start date and time.
3. User selects meeting duration.

   By default, the minimum duration is 30 minutes.

4. Virtual Agent provides a list of available rooms.

   Room availability lookup is done in batches of 10 rooms. Five rooms are displayed at a time, with pagination through the lookup results.

5. User provides a meeting subject and can send the invitation to attendees if the user provides email addresses.
6. User confirms meeting details, and the request is submitted.

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## Book Conference Room OnPrem

Users can book a conference room in on-premises Microsoft Exchange Server using Virtual Agent.

Requirement: Microsoft Exchange Server spoke (sn_exchange_spoke)

This topic uses the Create Incident topic block.

Basic flow:

1. User selects a city for the meeting.

   The city must be configured as a room resource.

2. User selects number of attendees and start date and time.
3. User selects meeting duration.

   By default, the minimum duration is 30 minutes.

4. Virtual Agent provides a list of available rooms.

   Room availability lookup is done in batches of 50 rooms. Five rooms are displayed at a time, with pagination through the lookup results.

5. User provides a meeting subject and can send the invitation to attendees if the user provides email addresses.
6. User confirms meeting details, and the request is submitted.

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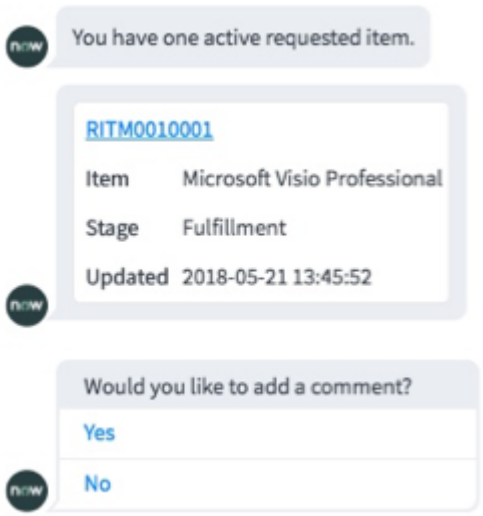
## Check IT Ticket Status

Users can check the status of active IT tickets (incidents or requests). When a user asks about a ticket status, Virtual Agent responds with a list of all active tickets for that user. Each ticket includes a link to the incident or request, the item, the status (**Stage**), and when it was updated.

Users can add comments and also ask to chat with a live agent.




## Escalate IT Ticket

Users can raise the urgency of an IT ticket for a faster resolution. Escalating a ticket priority requires choosing the incident and verifying the escalation. Users must provide a justification to escalate the incident. Virtual Agent escalates the incident to the next urgency level, for example, from low to medium, or from medium to high. If an incident is already at high-level urgency, Virtual Agent alerts the user to this and asks if the user would like to add a comment to help expedite resolution.

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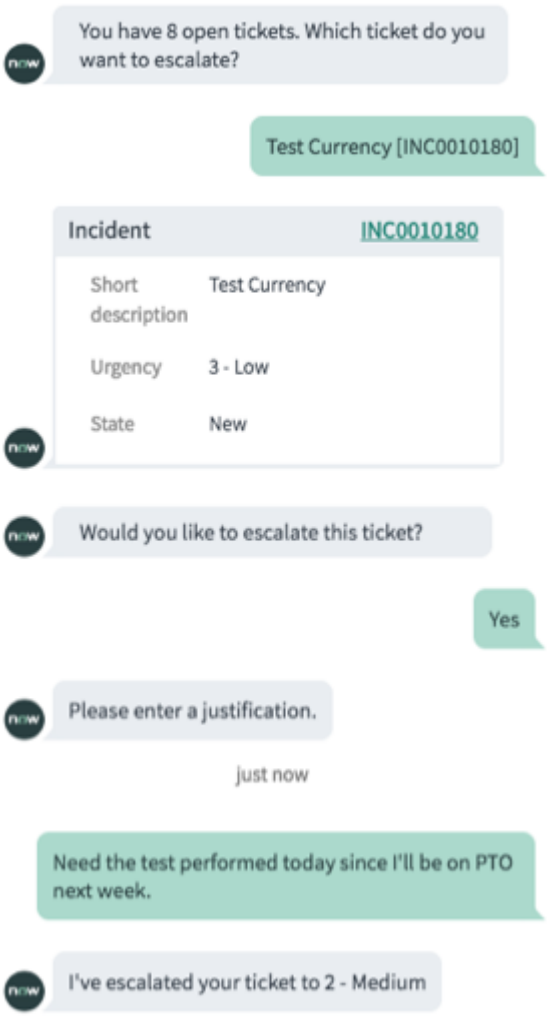


## Get Password Reset Link (deprecated)

This topic is deprecated. Use Reset Password instead.

Users can access a password reset link when system lockout occurs or when passwords are forgotten. When a user enters keywords related to password reset, Virtual Agent provides a link to the password reset process. If a user is not authenticated in the system, Virtual Agent requests the user's email address. If a user is not enrolled in Password Reset, Virtual Agent provides a link to **Password Enrollment**.

> **Note:**
> An admin must properly configure the password reset process with a valid verification type for this topic to work as described. For details, see Configure your Password Reset process.

## Get Zoom Meeting Recording

Users can get a recording of a Zoom meeting that they hosted in Microsoft Exchange Online.

Requirements:

- Microsoft Exchange Online spoke (com.sn.msexchange.spoke)
- Zoom spoke (com.sn.zoom.spoke)

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- User email address must be configured in the User [sys_user] table
- User email address must match the address in Microsoft Exchange Online and Zoom

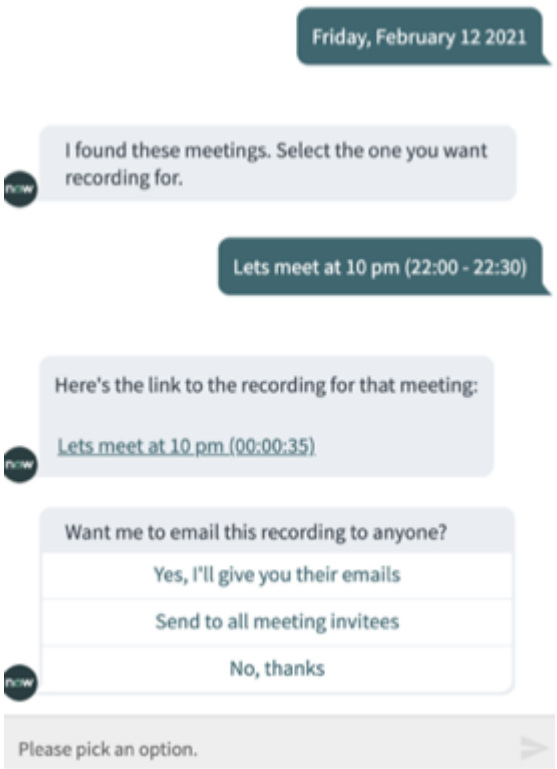
This topic uses the Create Incident topic block.

Basic flow:

1. User enters when the meeting took place.
2. Virtual Agent returns a list of possible meetings.
3. User selects the desired meeting.
4. Virtual Agent sends a link to the recording.

   If the recording has a passcode enabled, the email includes the passcode.

   The user can also share the recording with the meeting invitees or to a list of emails. If the host shares the meeting link, recipients receive an email notification.




## My Assigned Equipment

Users can view a list of all assigned equipment, such as laptops, mobile phones, and monitors. Clicking an item link provides additional details about the asset. Users can also create an asset-related incident directly within the conversation. Opening an incident from this conversation initiates the Open IT Ticket conversation topic by using the Create Incident topic block.

This topic uses the following topic blocks:

- Contextual Search
- Create Incident

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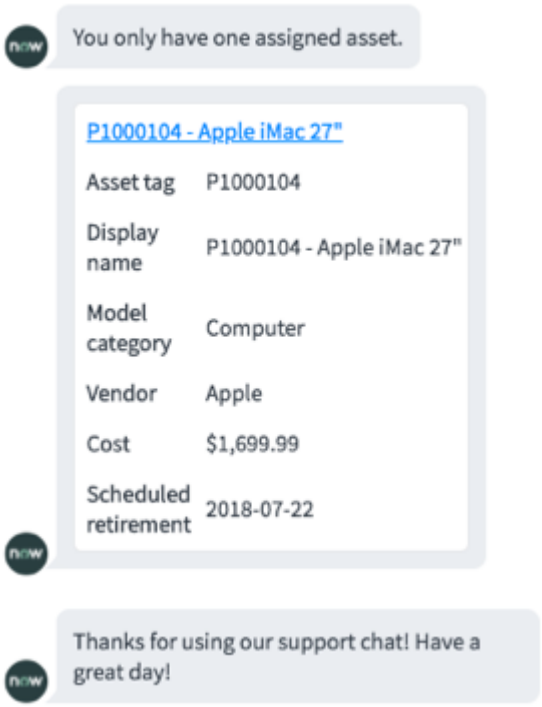


## Open IT Ticket (deprecated)

This topic is deprecated. Use Open IT Ticket 2.0 instead.

**Note:**
This conversation topic is refactored to use the Create Incident topic block.

Users can open an incident or access relevant knowledge base articles to resolve an issue. After typing keywords, such as `open ticket` or `incident`, Virtual Agent prompts the user to enter a short description of the issue. Virtual Agent returns links to relevant knowledge base articles and asks if an article resolved the issue. If it did not, Virtual Agent asks for the urgency of the issue and creates an incident, providing a link to the actual incident.

This topic uses the following topic blocks:

- Contextual Search
- Create Incident

When creating an incident, if you also want to create an associated Universal Request and display the Universal Request card in Virtual Agent instead of the incident, the Universal Request plugin (com.snc.universal_request) must be active, and the **Create Universal Request with incident** system property (*`com.snc.create_universal_request_with_incident`*) must be set to **Yes** (the default is Yes).

**Note:**
Locate the property within the **Incident Properties** module, in the **Incident VA Conversation** category. Users with the itil_admin role have read and write permissions.

## Open IT Ticket 2.0

This topic is recommended to create an IT incident. Users can leverage machine-learning algorithms with application logic for predicting similar open tickets. Prevent users from opening duplicate incidents by finding similar incidents and asking if the user wants to add comments to the similar incident.

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Requirement: Predictive Intelligence for Incident plugin (com.snc.incident.ml)

This topic uses the following topic blocks:

- Add Comments-Similar Incident
- Contextual Search
- Create Incident

This topic was formerly called Intelligent Open IT Ticket. Both the Open IT Ticket and Report IT issue topics have been deprecated and replaced with this topic. If you have been using any of these three topics directly prior to the ITSM Virtual Agent Conversations version 5.6 release, the deprecated topic name will display in the portal and must be updated. To update to the new template, navigate to **All** > **Conversational Interfaces** > **Virtual Agent** > **Designer**. Duplicate the Open IT Ticket 2.0 topic, save it, and then select **Publish**.

## Process Approval

Users with the approver_user role can access active approval requests. Virtual Agent returns all active approvals as a list. Users click an approval to access the actual approval record to approve or reject.

## Service Disruptions

Users can access all known outage information. When a user asks if a particular system is down, Virtual Agent returns a list of links displaying planned or unplanned outages and any system degradations. Users can click the links for more detailed information about a specific outage or degradation, as well as click **Show more** when additional outages are known.




## Set OOO reply Exchange Server

Users can set an automatic out-of-office reply for Microsoft Exchange Server using Virtual Agent. The user selects the start and end time using their current local time zone. This topic recognizes date-range entities and intents. The message is hard-coded and is the same for internal and external recipients.

Requirement: Microsoft Exchange Server spoke (sn_exchange_spoke)

This topic uses the Create Incident topic block.

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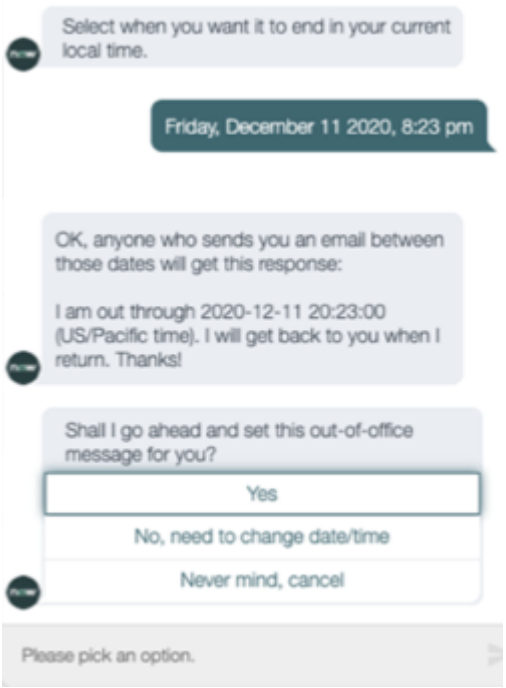


## Submit a request (deprecated)

**Note:**
While you can use the Submit a request topic to search for and request catalog items, the recommended method is to use the Fallback setup topic.

Users can submit a request by choosing from all available options. For example, when a user is requesting an item, the Virtual Agent prompts the user to enter a search keyword. After the user enters the keyword, Virtual Agent responds with available choices in a carousel view.

This topic uses the following Service Catalog topic blocks:

- Request Catalog Item
- Search Catalog Item

## Walk-up Check-in

Users can check into a ServiceNow® Walk-up Experience location and secure a place in the queue, or they can schedule an appointment at a walk-up location for themselves. Users can also schedule an appointment on behalf of someone else.

Requirement: Walk-up Experience plugin (com.snc.walkup)

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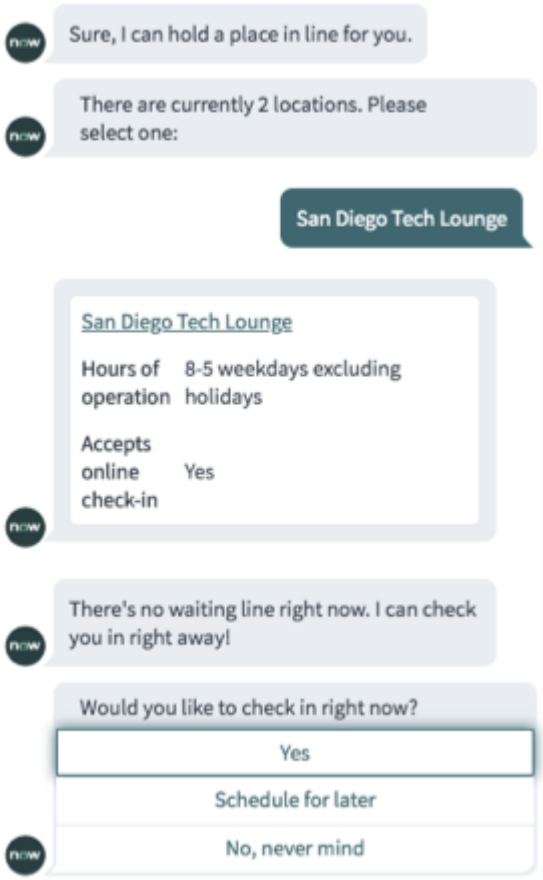


Virtual Agent Academy: Get service faster with Virtual Agent and Walk-Up Experience (video from the Virtual Agent Academy)

## Windows 365 Cloud PC

Users can request a Microsoft 365 Cloud PC for themselves through a Virtual Agent conversation. The provisioning is reviewed by the user's manager.

Requirements:

- Microsoft Azure Active Directory spoke (com.sn.azure_ad.spoke)
- Integration with the Microsoft service via ServiceNow® Integration Hub and Flow Designer

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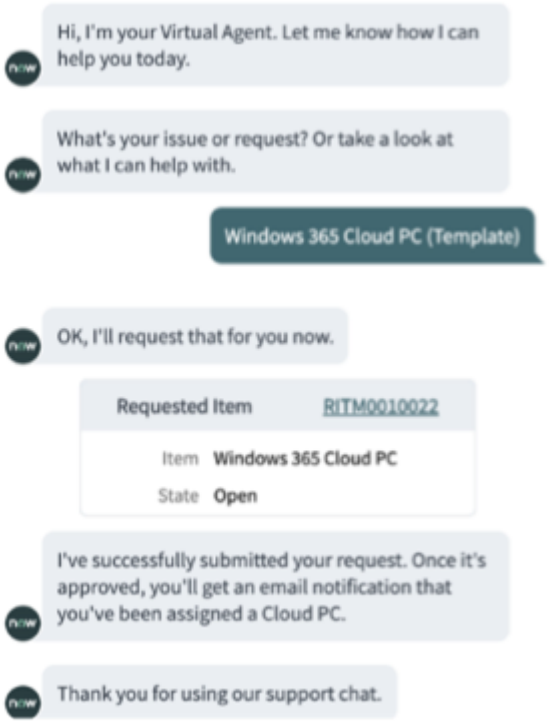


## Citrix session pre-built topics for ITSM Virtual Agent

Users can reset any Citrix desktop or application session using Virtual Agent conversation flows. Users can also provision a Citrix desktop or application.

Natural Language Understanding (NLU) is used to identify and trigger the Citrix action that a user wants to perform.

Requirement: Citrix IT Service Management Connector (x_cion_citrix_it_s)

Learn how the Citrix ITSM plug-in for ServiceNow can help your team easily deliver a first class experience to your end users, provide a new level of end user self-service, and free up valuable time for your IT team to focus on higher impact work.

## Provision Citrix Desktop/Apps

Virtual Agent can provision a Citrix desktop or an application directly from a conversation. The user selects the session type. When requesting a desktop, Virtual Agent asks for the OS and returns the requested item details.

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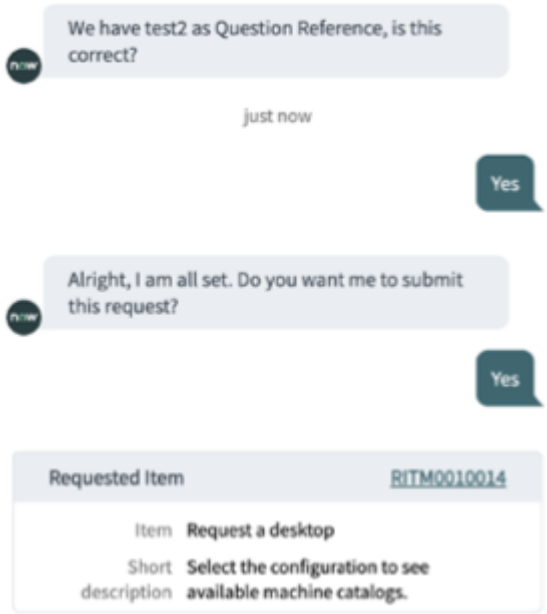
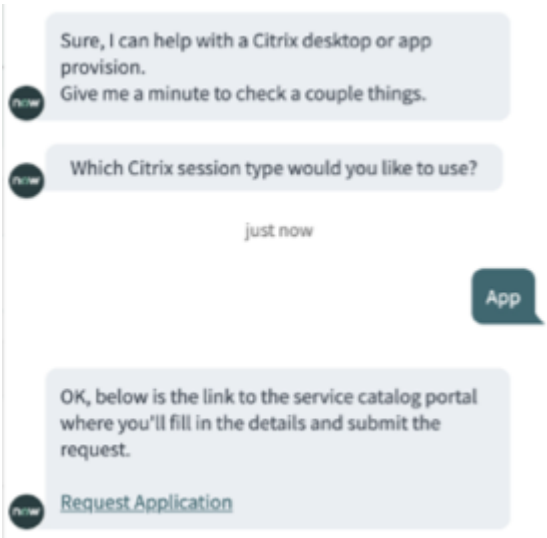



When requesting an application, Virtual Agent sends a link to the Service Portal, where the user can submit the request.




Virtual Agent sends an actionable notification to the user to inform them once the desktop or application has been provisioned, or if the provisioning was unsuccessful.

This topic uses the Request Catalog Item Service Catalog topic block.

## Reset Citrix Sessions

Virtual Agent provides a list of possible sessions to reset, and the user can choose to reset an individual session or all sessions at once.

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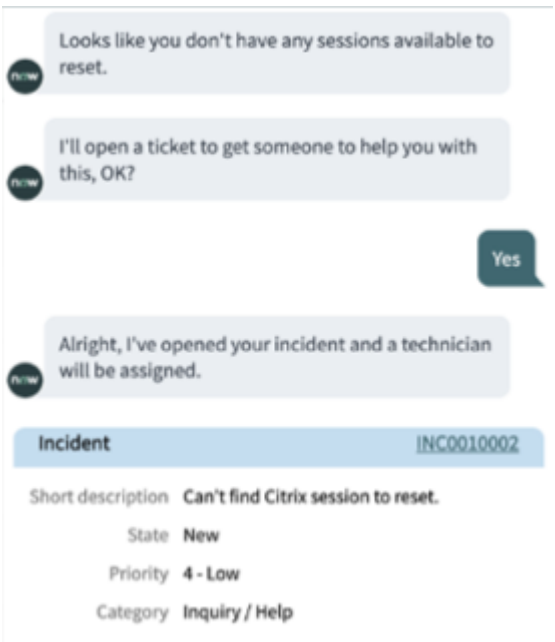
If the user does not have any sessions available to reset, Virtual Agent can open an Incident on behalf of the user.




This topic uses the Create Incident topic block.

## Password management topics for ITSM Virtual Agent

End users can perform password reset, password change, and account unlock actions using Virtual Agent conversations.

End users can initiate a password management conversation with Virtual Agent by entering the keywords `Reset`, `Change`, `Unlock`, or `Password`.

Users who are not logged in can perform the Reset Password and Unlock Account actions. Users who are logged in can perform the Change Password, Reset Password, and Unlock Password actions.

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Requirements:

- Password Reset (com.glideapp.password_reset) plugin
- Password Reset Virtual Agent Conversations (com.snc.password_reset.virtual_agent) plugin

**Note:**
In order for the password reset process to be available in Virtual Agent, ensure that you selected the **Enabled on Virtual Agent** check box in the Password Reset process configuration page.

For more information about the password reset process, see Password Reset for Virtual Agent.

## Verification options for password reset in Virtual Agent conversations

The following identity verification options are supported in Virtual Agent conversations. Custom verifications are not supported in Virtual Agent.

- Personal data verification: User provides specific pieces of personal data.
- Google Authenticator verification: User enters the generated code from the Google service Authenticator mobile app.
- SMS code verification: User enters the code received via mobile text message.
- Email code verification: User enters the code received via email.
- Security question verification: User enters the configured security question answers.

For more information, see Configure your Password Reset process.

## Change Password

Users can request to change their user password.

This topic uses the Display Password Reset URLs topic block.

Basic flow:

1. Virtual Agent asks the user to input their current password.
2. If the current password matches, the user can enter a new password.
3. Virtual Agent displays the password rules.
4. If the user provides a password that meets the password requirements, Virtual Agent updates the password.
5. If the user does not enter a valid password, the user must reenter the password.

## Reset Password

Users can request to reset their user password.

This topic uses the Display Password Reset URLs topic block.

Basic flow:

1. Virtual Agent sends identity verification information to the end user, based on the password reset process configuration.
2. If the user successfully verifies their identity with the given inputs, Virtual Agent provides the reset steps.
3. Virtual Agent displays the password rules.

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4. The user enters a new password, adhering to the password rules.
5. If the password does not meet the criteria, Virtual Agent prompts the user to reenter the password.
6. Once the password meets the criteria, Virtual Agent resets the password.

### Unlock Account

Users can request to verify their locked user account.

This topic uses the Display Password Reset URLs topic block.

Basic flow:

1. Virtual Agent sends identity verification information to the end user, based on the password reset process configuration.
2. If the user successfully verifies their identity with the given inputs, Virtual Agent provides the verification information.
3. Once the user has been identified and verified, Virtual Agent unlocks the user's account.

## Microsoft Office 365 Group pre-built topics for ITSM Virtual Agent

ITSM Virtual Agent  helps you manage Microsoft Office 365 Groups using actions in conversation flows.

Natural Language Understanding (NLU) is used to identify and trigger the Microsoft Office 365 Group action that a user wants to perform.

Requirement: Microsoft Azure AD spoke (com.sn.azure_ad.spoke) plugin

**Note:**
If the Microsoft Office 365 topics are duplicated in a different scope than ITSM VA Conversations, script logic can be affected and cause errors.

### Add Owner to Office 365 Group

Group Owners can add other users as Group Owners by providing the group name and the user email addresses to add.

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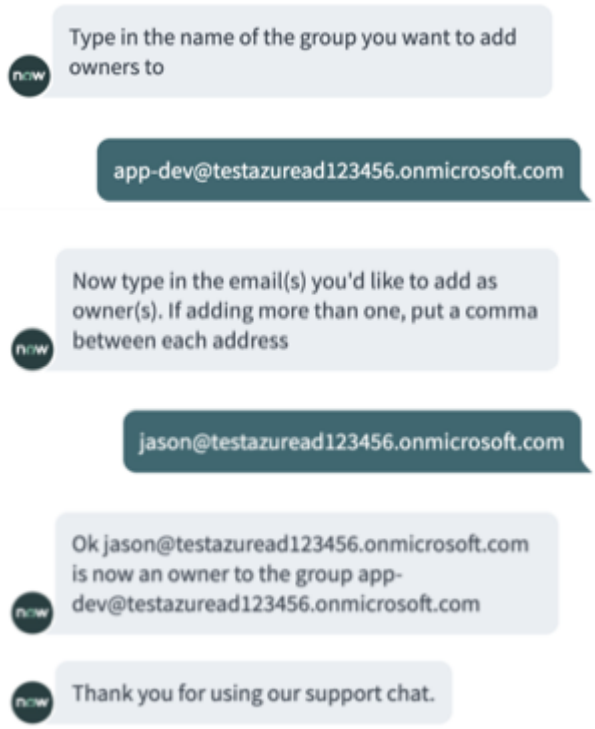
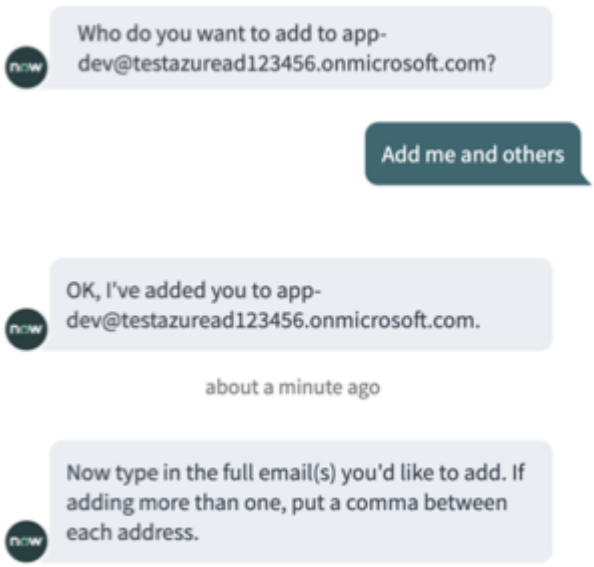



## Add User to Office 365 Group

Group owners can add themselves or other users to a Microsoft Office 365 group by providing the group name and the email address of one or more users to add.

This topic uses the Create Incident topic block.




## Create Office 365 Group

Users can create a group in Microsoft Office 365 by providing the following information:

- Group privacy
- Group email alias
- Outlook display name

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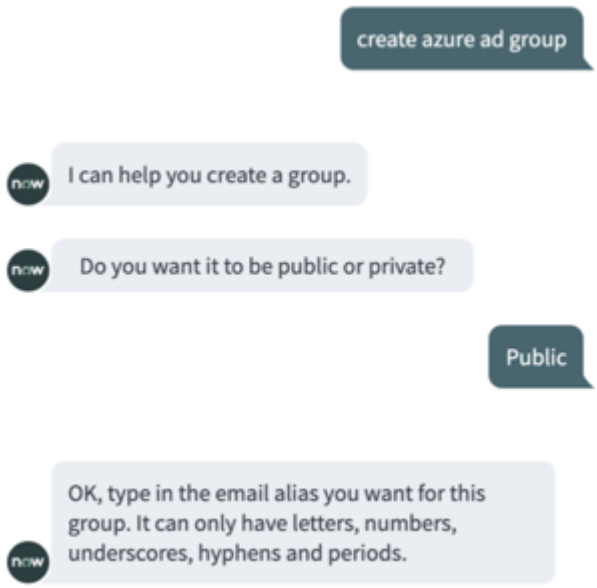
- Group description
- Owners and members (optional)

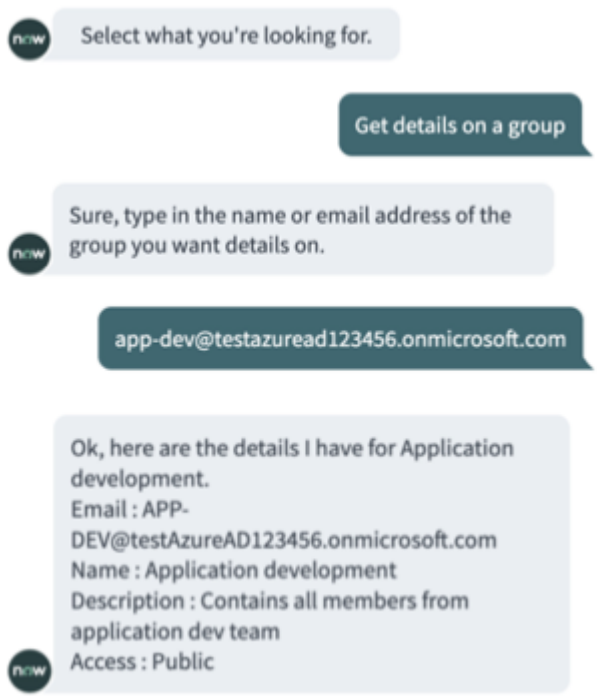
The current user is automatically added as the Group Owner, along with any other specified users.

This topic uses the Create Incident topic block.




## Get Office 365 Group Details

Group members can get group details by providing the name or email of the group.

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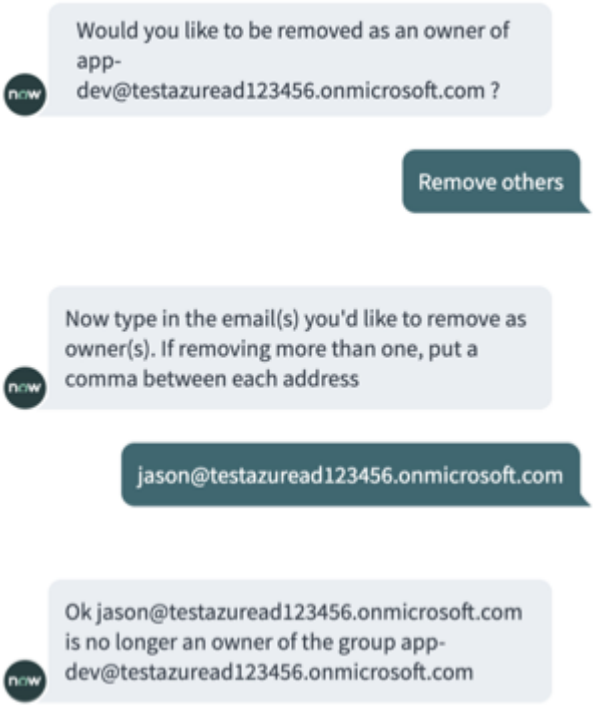
## Remove Office 365 group Owner

Group Owners can remove themselves or other Group Owners by providing the group name and the user email addresses to remove.

This topic uses the Create Incident topic block.




## Remove Office 365 group Users

Users can remove themselves from a Microsoft Azure AD group. Group owners can remove other users from a group. Provide the group name and user email addresses to remove.

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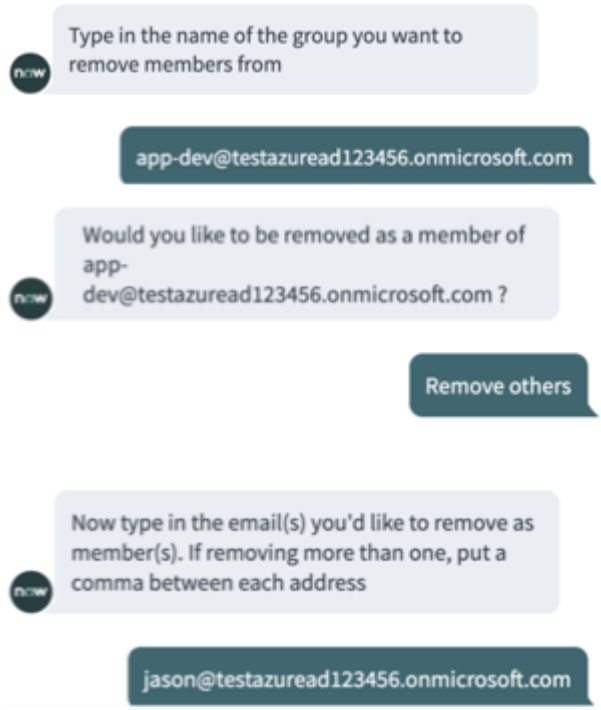


## Microsoft Active Directory pre-built topics for ITSM Virtual Agent

ITSM Virtual Agent  helps you manage Microsoft Active Directory distribution lists using actions in conversation flows.

Natural Language Understanding (NLU) is used to identify and trigger the Microsoft Active Directory Group action that a user wants to perform.

Requirement: Microsoft AD spoke for Integration Hub (com.sn.ad.spoke) plugin

**Note:**
If the Microsoft Active Directory topics are duplicated in a different scope than ITSM Virtual Agent conversations, script logic can be affected and cause errors.

### Add User to AD Group

Group owners can add themselves or other users to a Microsoft Active Directory Group distribution list by providing the group name and the email address or username of one or more users to add.

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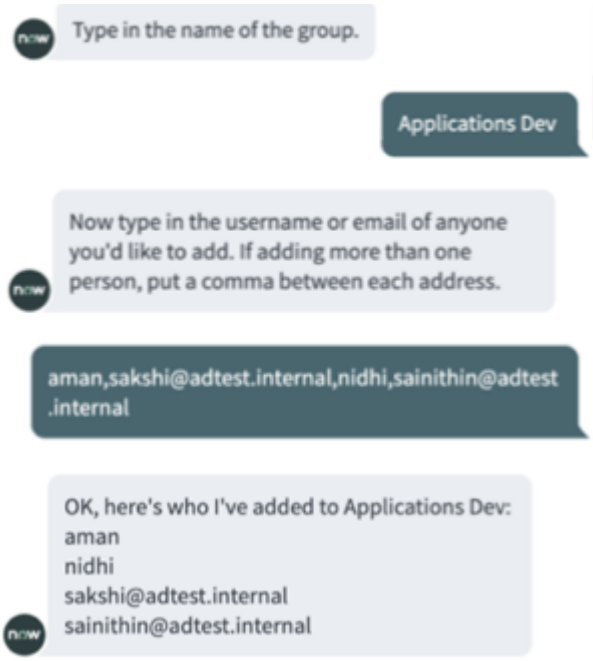


## Create AD Distribution Group

Users can create a Microsoft Active Directory distribution list by providing the following information:

- Group name
- Group description
- Members (optional)

The current user is automatically added as the group owner. Distribution lists are always public.

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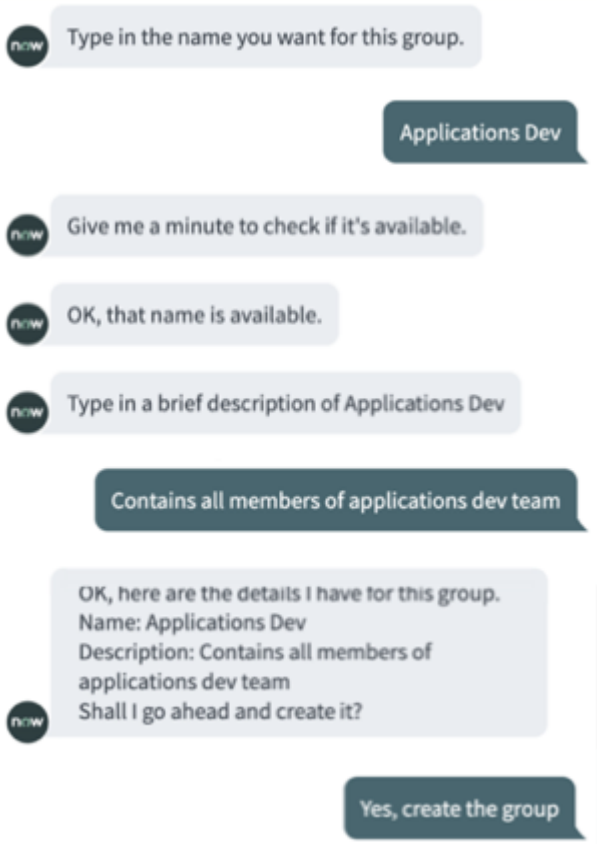
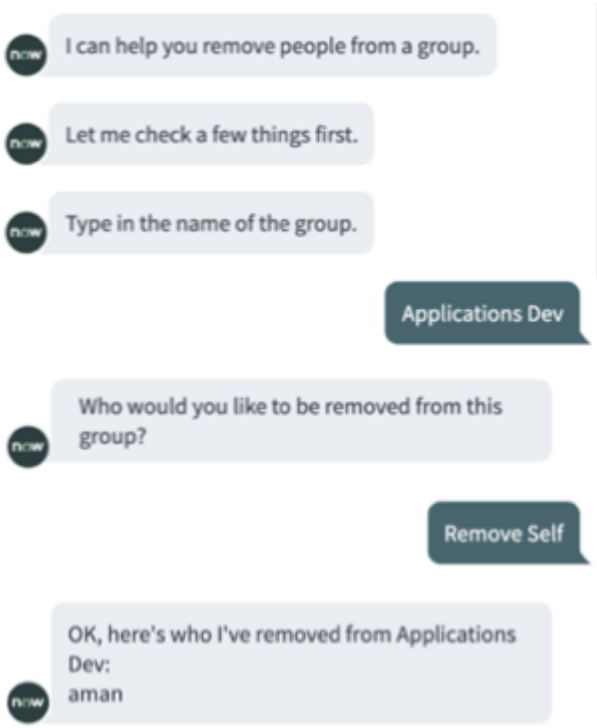



## Remove User from AD Group

Users can remove themselves from a Microsoft Active Directory Group distribution list. Group owners can remove other users from a group. Provide the group name and username or email addresses to remove.

This topic uses the Create Incident topic block.

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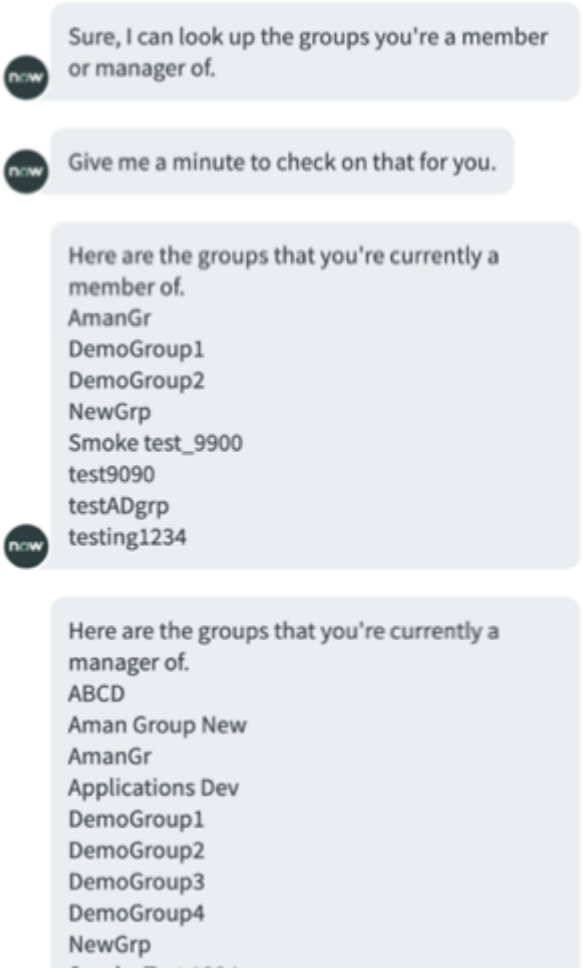
### Show My AD Group Membership

Group members can see a list of the Microsoft Active Directory distribution lists of which they are currently a member or manager.

This topic uses the Create Incident topic block.




## Microsoft Exchange Online meeting management pre-built topic for ITSM Virtual Agent

ITSM Virtual Agent helps you manage meetings in Microsoft Exchange Online. Using the Manage Meetings EXO topic, you can schedule, reschedule, and cancel a meeting.

### Manage Meetings EXO v1.0

Natural Language Understanding (NLU) is used to identify and trigger the meeting action that a user wants to perform. Users can schedule, reschedule, or cancel a meeting.

Requirements:

- Microsoft Exchange Online spoke (sn_ex_online_spke)
- Email addresses for meeting attendees must be configured in the User [sys_user] table to be added to meeting invites
- Some actions can use the Microsoft Teams Communication spoke (sn_msteams_com_spk) to send meeting links to Microsoft Teams
- Some actions can use the Cisco Webex Teams spoke (sn_cisco_teams_spk)

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- Some actions can use the Zoom spoke(com.sn.zoom.spoke) to add meeting links
- This topic uses the Employee Experience VA topic blocks

**Note:**
If this topic is duplicated in a different scope than ITSM Virtual Agent Conversations, script logic can be affected and cause errors. This topic must be duplicated in the ITSM Virtual Agent Conversations scope.

Basic flow for scheduling a meeting:

1. User enters the email addresses for all attendees, the meeting time, and the meeting duration.
2. Virtual Agent provides a list of available meeting times, based on the calendars of the invitees.
3. User enters the meeting subject and description.
4. User can choose the type of meeting: virtual/online, conference room, or hybrid.

   If the spokes are enabled on the instance, the user can add a meeting link for Microsoft Teams, Webex, or Zoom.
5. Virtual Agent returns the meeting link (if applicable) and the meeting details.
6. User confirms that Virtual Agent should schedule the meeting.
7. Once the user confirms, Virtual Agent sends the email invitations and schedules the meeting.

**Note:**
The user can also schedule a meeting through Virtual Agent using the Microsoft Teams service.

Basic flow for canceling a meeting:

1. User enters the start and end date and time of the original meeting.
2. Virtual Agent returns a list of potential meetings to cancel.
3. User selects the desired meeting or can choose to cancel all meetings during the specified duration.
4. Virtual Agent cancels all specified meetings and sends the user a confirmation email.

Basic flow for rescheduling a meeting:

1. User enters the original meeting date.
2. Virtual Agent returns a list of potential meetings to reschedule.
3. User selects the desired meeting.
4. User enters a new meeting time.
5. Virtual Agent confirms that the meeting has been rescheduled.
6. User can reschedule additional meetings, if desired.

## Manage Meetings EXO (deprecated)

This topic is deprecated. Use Manage Meetings EXO v1.0 instead.

Requirements:

- Microsoft Exchange Online spoke
- Email addresses for meeting attendees must be configured in the User [sys_user] table to be added to meeting invites

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- Some actions can use the Zoom spoke(com.sn.zoom.spoke) to add meeting links
- Some actions can use the Microsoft Teams Communication spoke (sn_msteams_com_spk) to send meeting links to Microsoft Teams

**Note:**
If this topic is duplicated in a different scope than ITSM Virtual Agent Conversations, script logic can be affected and cause errors. This topic must be duplicated in the ITSM Virtual Agent Conversations scope.

Basic flow for scheduling a meeting:

1. User enters the email addresses for all attendees, the meeting time, and the meeting duration.
2. Virtual Agent provides a list of available meeting times, based on the calendars of the invitees.
3. User enters the meeting subject and description.
4. If the admin configured the script variable **default_collaboration_software** and the appropriate spoke is enabled on the instance, the user can add a Zoom link or a Microsoft Teams link.
5. Virtual Agent returns the meeting link (if applicable) and the meeting details.
6. User confirms that Virtual Agent should schedule the meeting.
7. Once the user confirms, Virtual Agent sends the email invitations and schedules the meeting.

**Note:**
The user can also schedule a meeting through Virtual Agent using the Microsoft Teams service.

Basic flow for canceling a meeting:

1. User enters the start and end date and time of the original meeting.
2. Virtual Agent returns a list of potential meetings to cancel.
3. User selects the desired meeting or can choose to cancel all meetings during the specified duration.
4. Virtual Agent cancels all specified meetings and sends the user a confirmation email.

Basic flow for rescheduling a meeting:

1. User enters the original meeting date.
2. Virtual Agent returns a list of potential meetings to reschedule.
3. User selects the desired meeting.
4. User enters a new meeting time.
5. Virtual Agent confirms that the meeting has been rescheduled.
6. User can reschedule additional meetings, if desired.

## Microsoft Exchange Server meeting management pre-built topics for ITSM Virtual Agent

ITSM Virtual Agent helps you manage meetings in Microsoft Exchange Server. Using the Manage Meetings EXS topic, you can schedule, reschedule, and cancel a meeting.

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## Manage Meetings EXS

Natural Language Understanding (NLU) is used to identify and trigger the meeting action that a user wants to perform. Users can schedule, reschedule, or cancel a meeting.

Requirements:

- Microsoft Exchange Server spoke (sn_exchange_spoke)
- Email addresses for meeting attendees must be configured in the User [sys_user] table to be added to meeting invites
- Some topics can use the Zoom spoke to add meeting links

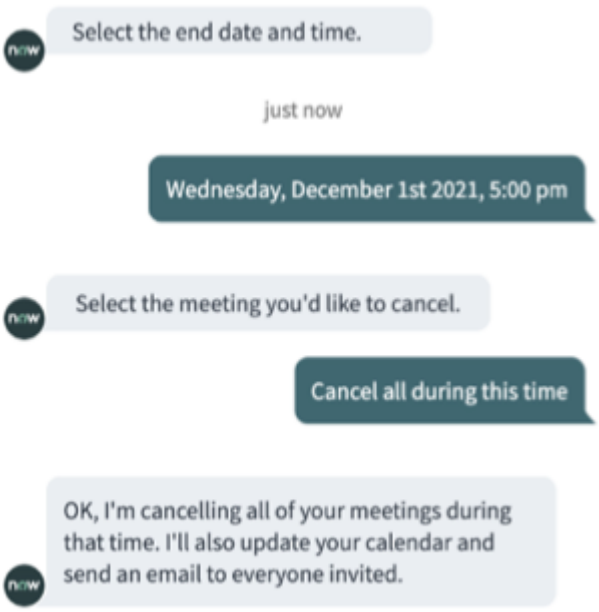
**Note:**
If these topics are duplicated in a different scope than ITSM Virtual Agent Conversations, script logic can be affected and cause errors. This topic must be duplicated in the ITSM Virtual Agent Conversations scope.

## Manage Meetings EXS: Cancel a meeting

Users can send a message to Virtual Agent requesting to cancel a meeting, or users can select the desired template and select **Cancel Meeting**.

Basic flow:

1. User enters the start and end date and time of the original meeting.
2. Virtual Agent returns a list of potential meetings to cancel.
3. User selects the desired meeting or can choose to cancel all meetings during the specified duration.
4. Virtual Agent cancels the meetings, sends an email to all attendees, and updates the calendar.




## Manage Meetings EXS: Reschedule a meeting

Users can send a message to Virtual Agent requesting to reschedule a meeting, or the user can select the desired template and select **Reschedule Meeting**.

Basic flow:

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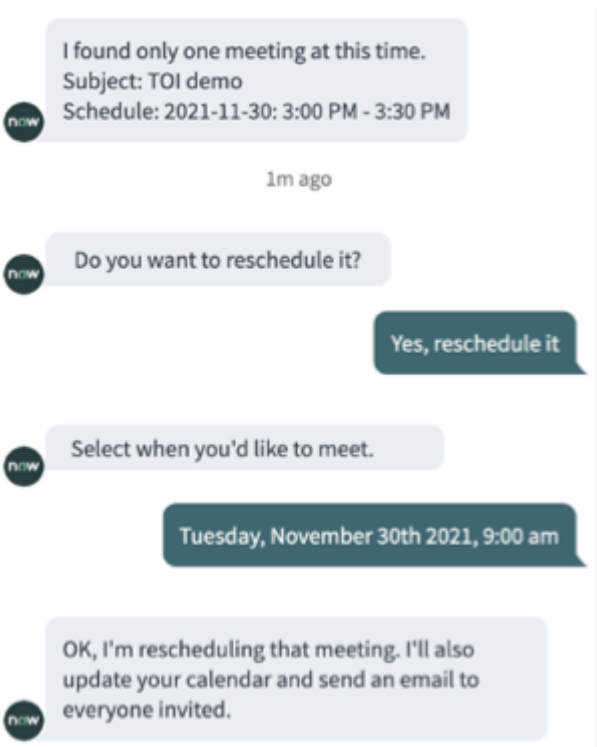
1. User enters the original meeting date.
2. Virtual Agent returns a list of potential meetings to reschedule.
3. User selects the desired meeting.
4. User enters a new meeting time.
5. Virtual Agent reschedules the meeting, emails the attendees, and updates the calendar.

Virtual Agent reschedules the meeting, emails the attendees, and updates the calendar.




## Manage Meetings EXS: Schedule a meeting

Users can send a message to Virtual Agent requesting to schedule a meeting, or the user can select the desired template and select **Set up Meeting**.

Basic flow:

1. User enters the email addresses for all attendees, the meeting time, and the meeting duration.
2. Virtual Agent provides a list of available meeting times, based on the calendars of the invitees.
3. User enters the meeting subject and description.
4. Virtual Agent returns the meeting details.
5. User confirms that Virtual Agent should schedule the meeting.
6. Once the user confirms, Virtual Agent sends the email invitations and schedules the meeting.

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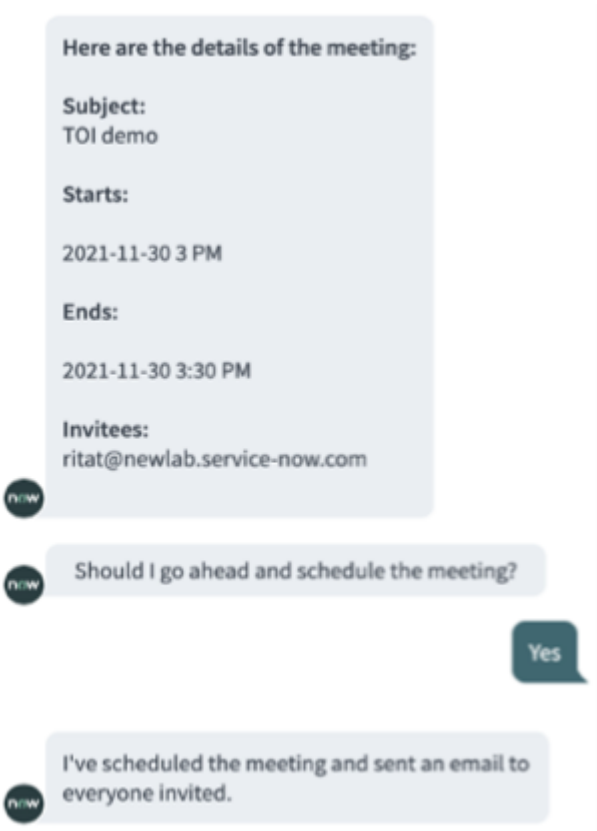


## Virtual machine pre-built topics for ITSM Virtual Agent

ITSM Virtual Agent helps you manage a virtual machine (VM) using conversation flows. With this conversation flow, you can start, stop, terminate, describe, and provision a virtual machine.

There are two categories of virtual machine management topics:

**Topics that support AWS and Azure providers**

Topics that are labeled **CAI** use the Cloud Access Interface to take action on virtual machines provisioned on AWS and Azure. The user must have the sn_managevm_va.cai_vm_user role to perform these actions. The Virtual Agent admin can set the script variable *`max_records`* (default value=100) to denote the number of records to be fetched from Azure in a single REST API call. The script variable *`carousel_entries_threshold`* denotes the number of records the carousel input shows. If the number of records are greater than the specified value, a reference choice list is shown to the user.

Cloud Provisioning and Governance is not required to describe, start, stop, and terminate a VM for AWS and Azure. You can perform the following actions with the Cloud Access Interface (CAI) topics for Virtual Agent:

- Start a Virtual Machine CAI
- Stop a Virtual Machine CAI
- Terminate a Virtual Machine CAI
- Describe a Virtual Machine CAI

**Topics that use the Cloud Provisioning and Governance plugin (com.snc.cloud.mgmt)**

The following topics integrate with Cloud Provisioning and Governance (required):

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- Manage Virtual Machine
- Provision Virtual Machine

## Describe Virtual Machine CAI

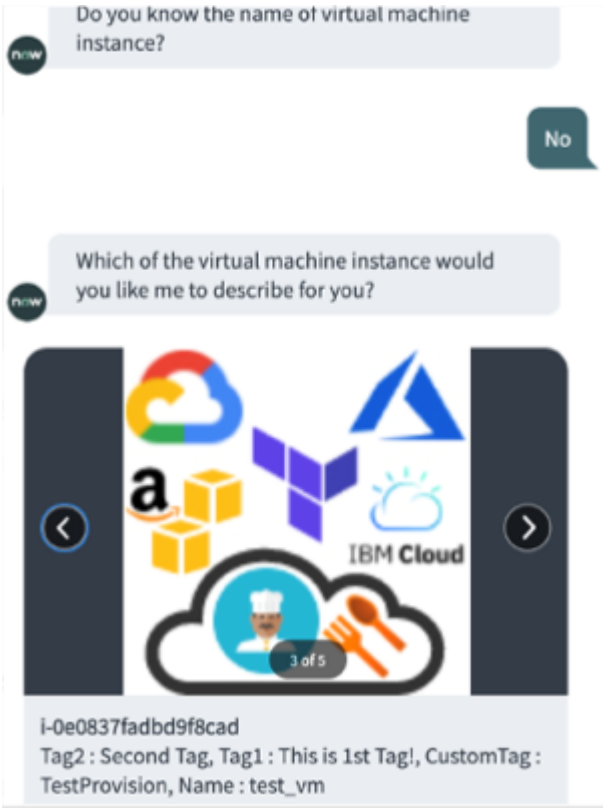
Users can see details of any assigned VM instance associated with the credential set up by the system administrator. If AWS encounters an error, Virtual Agent asks the user to create an incident for further investigation.

Returned details include Provider, Region, and Instance ID. The user can specify which VM to describe, or Virtual Agent can provide a list of available VM instances and the user can select the desired VM to describe.

Requirement: User must have the sn_managevm_va.cai_vm_user role to perform these actions.

This topic uses the following topic blocks:

- Virtual Machine Operation AWS
- Virtual Machine Operation Azure




## Manage Virtual Machine

This topic calls the appropriate topic block (describe, start, stop, and terminate) to complete an end-to-end fulfillment of the request.

This topic calls the appropriate topic block (describe, start, stop, and terminate) to complete an end-to-end fulfillment of the request. This pre-built topic is read-only. Duplicate the topic in the Virtual Machine Management for Virtual Agent scope and activate it to use the conversation flow.

Requirement: Cloud Provisioning and Governance plugin (com.snc.cloud.mgmt)

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This topic uses the following topic blocks:

- Describe Virtual Machine
- Start Virtual Machine
- Stop Virtual Machine
- Terminate Virtual Machine

## Provision Virtual Machine

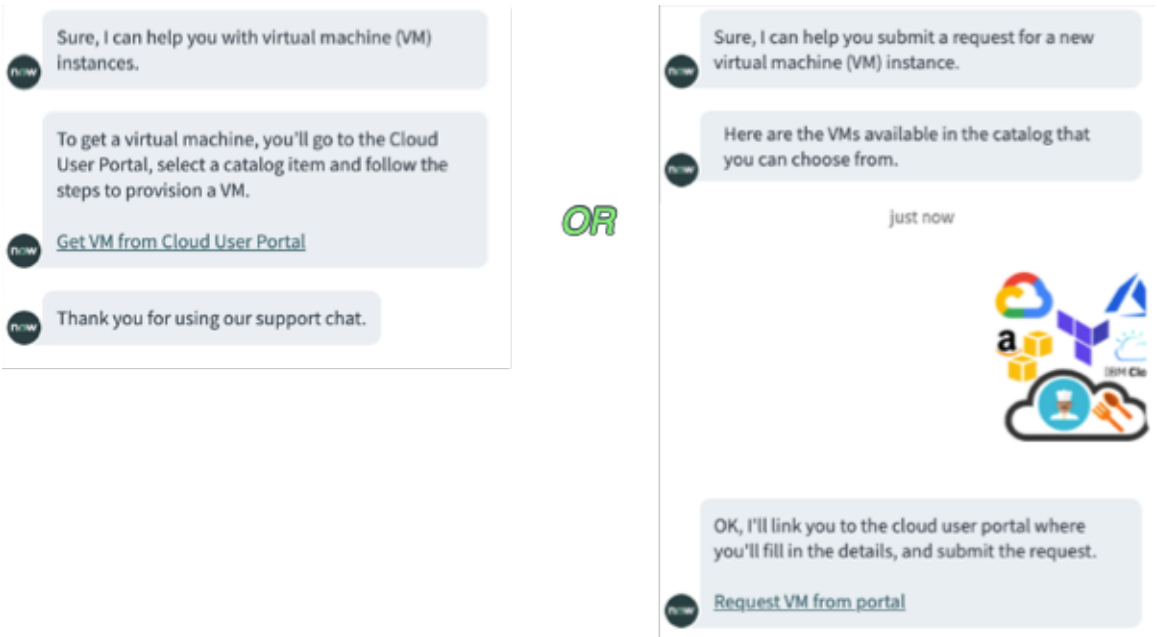
Users can request a new VM in a Virtual Agent conversation. Virtual Agent sends a link to the Cloud User Portal to submit the catalog item.

Requirement: Cloud Provisioning and Governance plugin (com.snc.cloud.mgmt)

Basic flow:

1. User requests a virtual machine.
2. Virtual Agent does one of the following:
   - Provides a link to the Cloud User Portal, along with instructions for requesting a VM from the catalog.
   - Displays items in the VM catalog that are assigned to the user.

     If the user can't find the desired catalog item, the user can either go directly to the Cloud User Portal or end the conversation.




## Start Virtual Machine CAI

Users can start any assigned virtual machine instance associated with their credentials set up by the system administrator. If AWS encounters an error, Virtual Agent asks the user to create an incident for further investigation.

Requirement: User must have the sn_managevm_va.cai_vm_user role to perform these actions.

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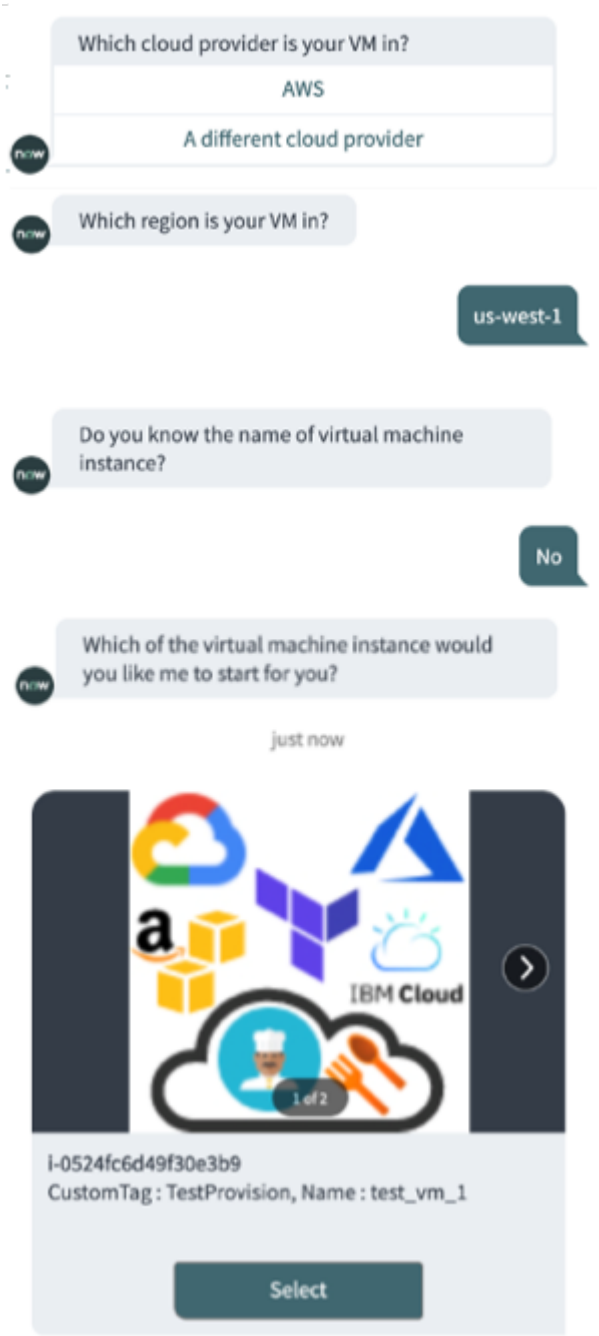
- Virtual Machine Operation AWS
- Virtual Machine Operation Azure

Basic flow:

1. User specifies which VM to start, or Virtual Agent provides a list of available VM instances for the user to choose from.
2. Virtual Agent sends the user an actionable notification when the requested VM starts.
3. User can choose to see details, request additional instructions to log in to the virtual machine, or skip the notification.

   Virtual Agent also notifies the user if the operation was unsuccessful.

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## Stop Virtual Machine CAI

Users can stop any assigned VM instance associated with the credentials set up by the system administrator. If AWS encounters an error, Virtual Agent asks the user to create an incident for further investigation.

Requirement: User must have the sn_managevm_va.cai_vm_user role to perform these actions.

This topic uses the following topic blocks:

- Virtual Machine Operation AWS
- Virtual Machine Operation Azure

Basic flow:

1. User specifies which VM to stop, or Virtual Agent provides a list of available VM instances for the user to choose from.
2. Virtual Agent sends the user an actionable notification when the requested VM stops.
3. User can choose to see details, request additional instructions to log in to the virtual machine, or skip the notification.

   Virtual Agent also notifies the user if the operation was unsuccessful.




## Terminate Virtual Machine CAI

Users can terminate any assigned virtual machine instance associated with the credential set up by the system administrator. Because termination is a permanent action, Virtual Agent displays the VM details and asks for confirmation. If AWS encounters an error, Virtual Agent asks the user to create an incident for further investigation.

Requirement: User must have the sn_managevm_va.cai_vm_user role to perform these actions.

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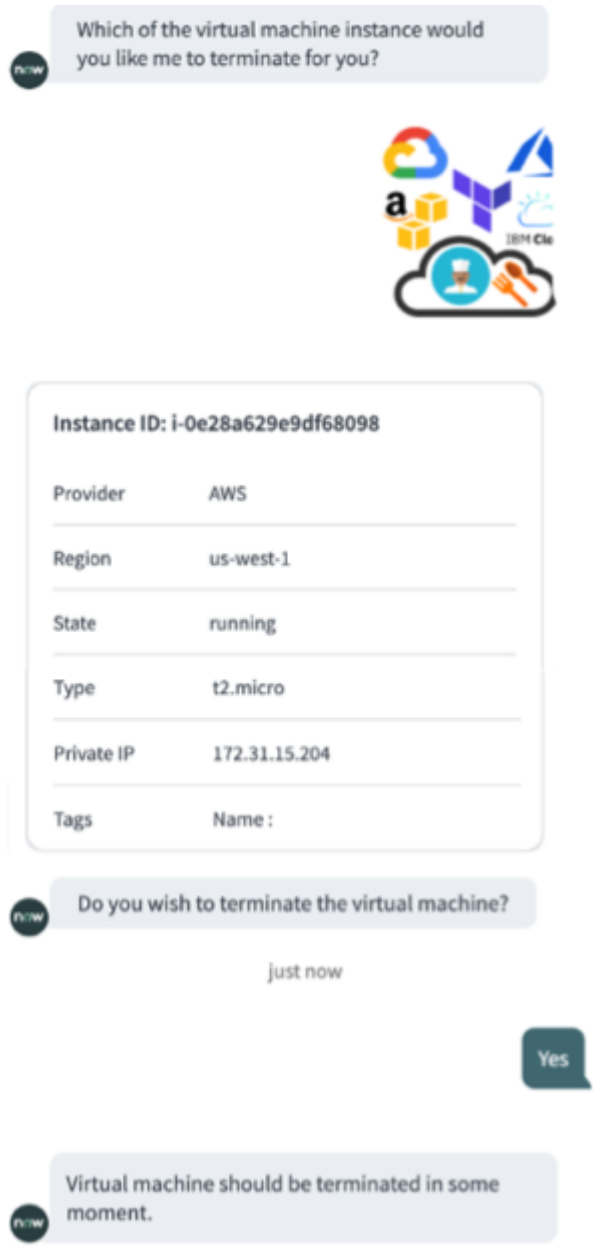
This topic uses the following topic blocks:

- Virtual Machine Operation AWS
- Virtual Machine Operation Azure




## Pre-built setup topics for Virtual Agent

Use pre-built setup topics to create a standard welcome greeting and a conversation closing. In addition, setup topics can provide user feedback and surveys, as well as error handling.

For more information about setup topics, see Setting up chat experiences for Virtual Agent users.

For a complete list of setup topics that are included with Virtual Agent, see Working with setup topics.

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### Dynamic Greeting Topic

Users receive a dynamic, time-based greeting at the beginning of a conversation from a virtual agent. The greeting includes addressing the user by first name with the time of day, referencing any incident or request the user may have open, and mentioning outage information if an outage is occurring or planned. For example:

"Good morning, John. You currently have [x] incidents and [x] requests open. We are aware of [outage] with [service] that began at [start time]".

When the end time is known, the virtual agent includes the message:

"The [outage] is planned to end at [end time]".

**Note:**
If there are no incidents, requests, or outages these messages do not display.

The dynamic greeting is followed by the standard greeting, which asks the user to enter information.

For more information about configuring the greeting setup topic, see Change the Virtual Agent greeting messages in the Greeting setup topic.

## Fulfiller pre-built topics for ITSM Virtual Agent

Fulfiller topic conversations are designed specifically for ITSM professionals with the itil role. These pre-built topics include resolving an incident, creating a problem, and updating data in the system.

### Create Change Request

Users with the itil role can create change requests using their client of choice, such as Slack. Users indicate the type of change request (**Normal**, **Standard**, or **Emergency**). Change type definitions are provided by the virtual agent.

For normal and emergency change requests, Virtual Agent prompts the user to enter the following criteria:

- Short description
- Justification
- Configuration item
- Assignment group
- Planned start date
- Planned end date

For standard change requests, Virtual Agent sends a carousel link to a catalog of standard change items. After the user selects an item, Virtual Agent provides a link to open the associated category page to request the change.

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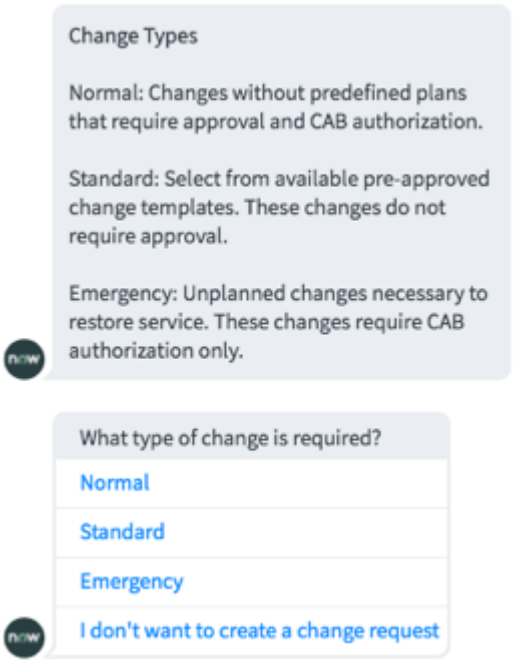


## Create Problem

Users with the itil role can create problem records. Users provide a description of the problem and specify the urgency and the impact of the problem. Users must know and enter the associated problematic configuration item as well.

## Identify Available Change Windows

Users with the itil role can check the next available change window for a configuration item. For example, you can determine the next available change window for a specific asset assigned to a user, regarding maintenance or black-out calendars. Users must enter the configuration item to check, such as `PROmonitor`, and then select a planned start and end date and time.

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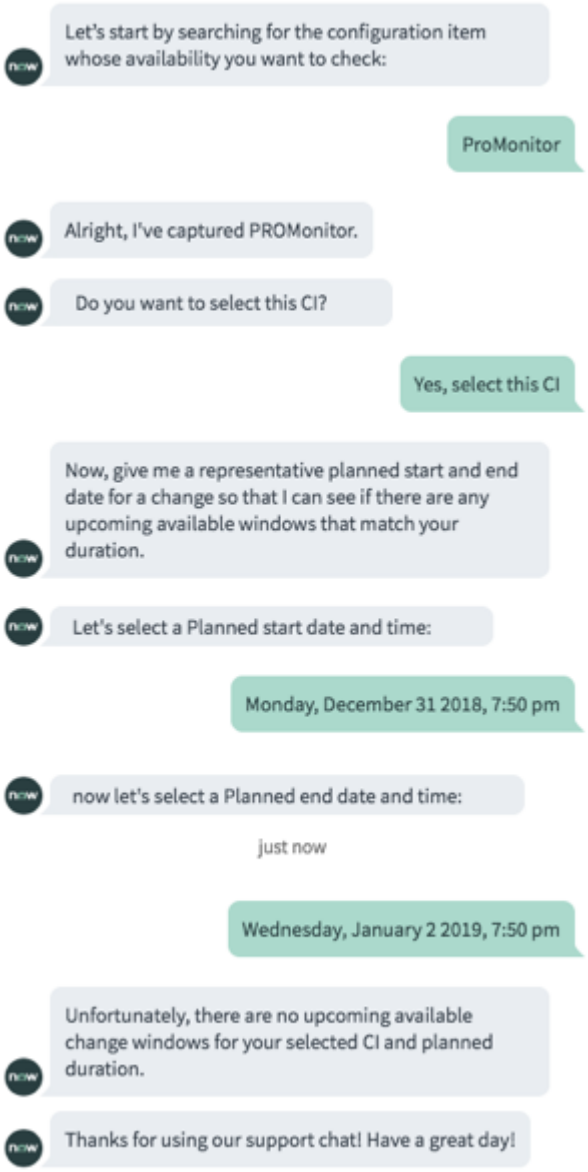


## Identify Scheduled Changes

Users with the itil role can find upcoming change requests for a specific configuration item (CI). To see the change requests, users must type in the name of the configuration item that contains the changes.

## Resolve Incident

Users with the itil role can resolve an incident through support chat by providing a close code, for example, **Solved (Permanently)** or **Solved (Workaround)**, and resolution notes.

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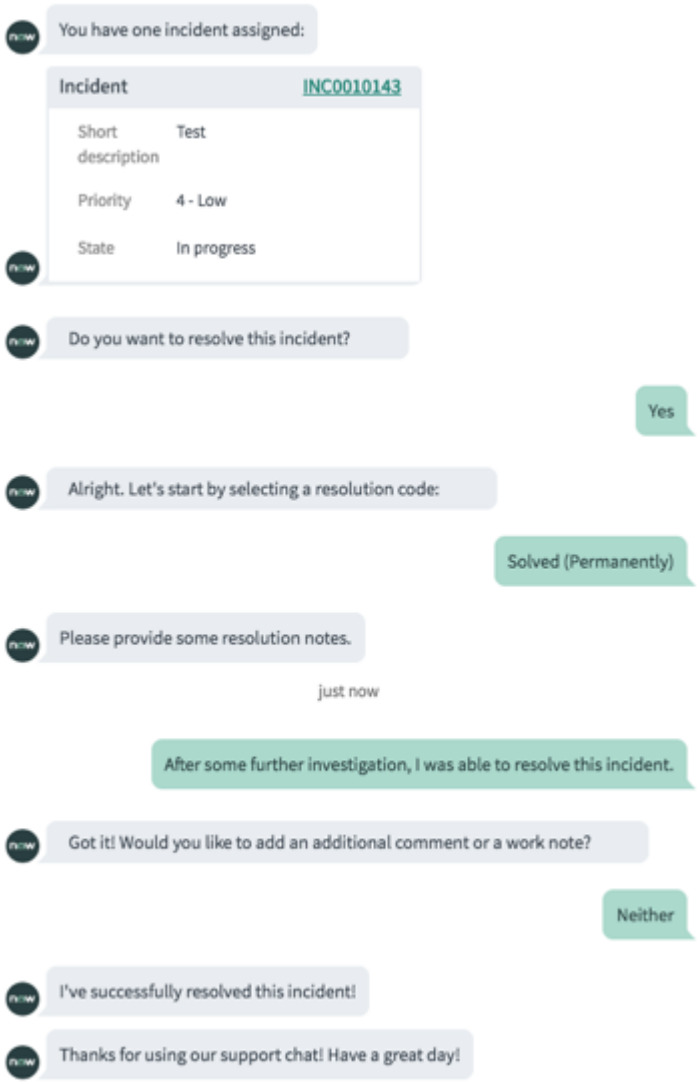


## Update Assigned Task

Users with the itil role can update comments or work notes in assigned tasks. When a user wants to update a task, the virtual agent returns a list of all assigned tasks and asks which task the user wants to update. Users can select a single listed task to update or select **All** to load and update all assigned tasks. The virtual agent then asks if the user wants to add a comment, a work note, or both. Optionally, users can cancel the update.

## Update Change Request

Users with the itil role can update the actual start and end time of a change, as well as move it to work in progress or closed states.

## Reusable ITSM Virtual Agent pre-built topic blocks

Reuse topic blocks to perform common functions in ITSM Virtual Agent conversations, such as creating an incident or performing a search.

Use the **Type** list on the Topics page in Virtual Agent Designer to sort by **Topic Blocks**. For detailed information about topic blocks, see Maximizing code reuse with topic blocks.

ITSM Virtual Agent provides the following pre-built topic blocks and templates.

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**Note:**
Many of these topic blocks are available with the Service Management Virtual Agent Topic Blocks plugin (com.glideapp.cs.sm_topic_blocks). For more information about plugins, see ServiceNow Plugins

## Contextual Search

### Contextual Search topic block input and output parameters

| Name | Description |
|---|---|
| Input parameters | |
| context | The sys_id of a Search Context (cxs_context_config) record. Defines what sources are included in the search. For example, sources can include the knowledge base or community. |
| query | The search keyword entered by a user during a virtual agent conversation. |
| portal | The portal from which the conversation initiated, such as a service portal or human resources portal.<br><br>This portal is the URL suffix, such as sp, esc, csm, and hr, from which the search results open. |
| kb_knowledge_base | The sys_id of a Knowledge Base (kb_knowledge_base) record.<br><br>Within context, search only these knowledge base articles. |
| Output parameters | |
| results_returned | True if search results are found, otherwise false. |
| results_helpful | True if user responds that search results are helpful, otherwise false. |

## Create Incident

This topic block initiates the **Open IT Ticket** conversation topic.

### Create Incident topic block input and output parameters

| Name | Description |
|---|---|
| Input parameters | |
| caller | The name of the user creating an Incident (incident) record. |
| short_description | The short description entered in the Incident (incident) record. |
| urgency | The urgency level indicated in the Incident (incident) record. |
| description | The description entered in the Incident (incident) record. |
| cmdb_ci | CMDB configuration item. |
| Output parameters | |
| created_incident_sys_id | The return sys_id of a newly created incident. |

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## Create MS Teams Meeting Link (deprecated)

This topic block is deprecated. Use Get MS Teams Meeting Link instead.

Users can request a Microsoft Teams meeting link using Virtual Agent. This topic block can be included in other topics. By default, this topic block runs in silent mode, and the output messages are not displayed.

Requirement: Microsoft Teams Communication spoke (sn_msteams_com_spk) plugin

## Create Zoom Meeting Link

For more actions, the Zoom Meeting Actions topic block is also available.

Users can request a Zoom meeting link using Virtual Agent. This topic block can be included in other topics. By default, this topic block runs in silent mode, and the output messages are not displayed.

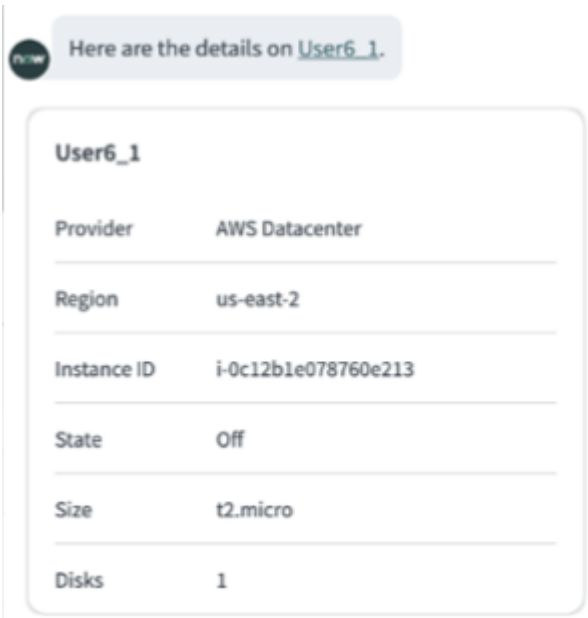
Requirement: Zoom spoke(com.sn.zoom.spoke) plugin

## Describe Virtual Machine

Users can get details on any assigned virtual machine (VM) instance using the Manage Virtual Machine topic in Virtual Agent. Details include Provider, Region, Instance ID, and so forth.

Basic flow:

1. User specifies which VM to describe, or Virtual Agent provides a list of available VM instances for the user to choose from.
2. Virtual Agent provides the requested virtual machine details.
3. To get additional details, users can select the link provided, which redirects them to the Cloud User Portal.

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**Describe Virtual Machine topic block input and output parameters**

| Name | Description |
|---|---|
| Input parameter:<br><br>vm_name | Name of the virtual machine instance. |
| Input parameter:<br><br>vm_sys_id | Sys ID of the virtual machine instance in the cmdb_ci_vm_instance table. |
| Output parameter:<br><br>incident_short_description | Short description for the Incident record, if one is recorded. |

## Display Password Reset URLs

If Password Reset is enabled on Virtual Agent, and the user has been authenticated, this topic block returns a password reset link. If Password Reset is not enabled, the user is directed to the service desk.

This topic block as one input parameter: *`unlock_account`*. If the user has been authenticated, the value is *`true`*. Otherwise, the value is *`false`*.

For more information, see Password Reset for Virtual Agent.

This topic block has one input parameter: *`unlock_account`*. If the user has been authenticated, the value is *`true`*. Otherwise, the value is *`false`*.

## Request Catalog Item

For information about this topic block, see Service Catalog topic blocks in Virtual Agent.

## Search Catalog Item

For information about this topic block, see Service Catalog topic blocks in Virtual Agent.

## Start Virtual Machine

Users can start any assigned VM instance using the Manage Virtual Machine topic. If the VM is already on or in a state where it cannot be started, Virtual Agent notifies the user.

Basic flow:

1. User specifies which VM to start, or Virtual Agent provides a list of available VM instances for the user to choose from.
2. Virtual Agent sends the user an actionable notification when the requested VM starts.

   Virtual Agent also notifies the user if the operation was unsuccessful.
3. User can choose to see details, request additional instructions to log in to the virtual machine, or skip the notification.
4. If the user requests additional login instructions, Virtual Agent provides these instructions and the user can confirm if the login was successful.

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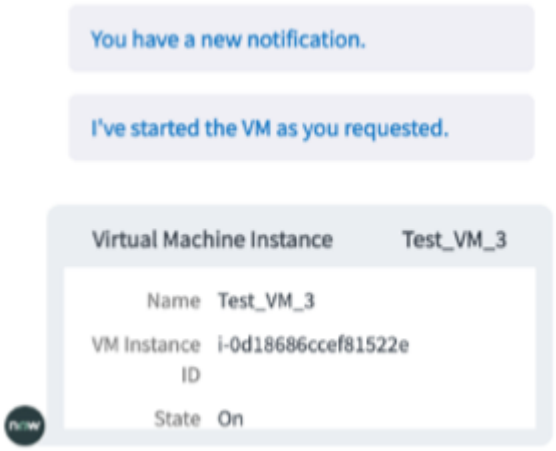


**Start Virtual Machine topic block input and output parameters**

| Name | Description |
|---|---|
| Input parameter:<br><br>vm_name | Name of the virtual machine instance. |
| Output parameter:<br><br>incident_short_description | Short description for the Incident record, if one is recorded. |

## Stop Virtual Machine

Users can stop any assigned VM instance using the Manage Virtual Machine topic. If the VM is already off or is in a state where it cannot be stopped, Virtual Agent notifies the user.

Basic flow:

1. User specifies which VM to stop, or Virtual Agent provides a list of available VM instances for the user to choose from.
2. Virtual Agent sends the user an actionable notification when the requested VM has stopped.

   Virtual Agent also notifies the user if the operation was unsuccessful.
3. User can choose to see details or skip the notification.

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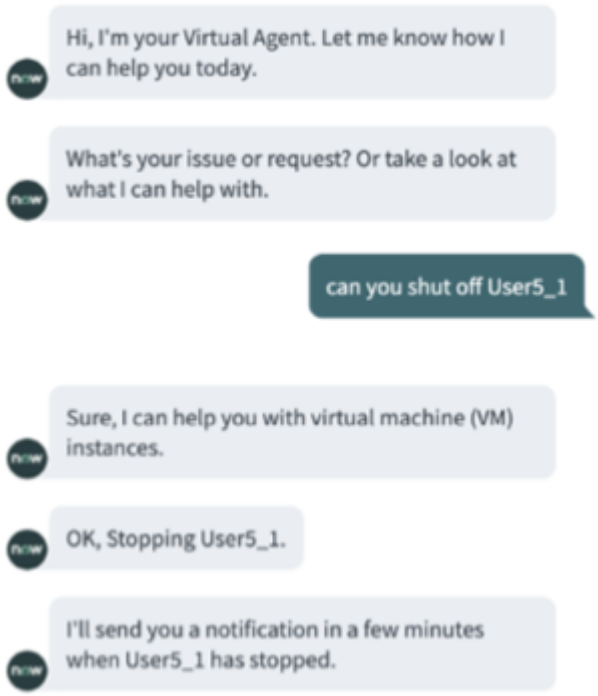


**Stop Virtual Machine topic block input and output parameters**

| Name | Description |
|---|---|
| Input parameter:<br><br>vm_name | Name of the virtual machine instance. |
| Output parameter:<br><br>incident_short_description | Short description for the Incident record, if one is recorded. |

## Terminate Virtual Machine

Users can terminate any assigned virtual machine (VM) instance using the Manage Virtual Machine topic. If the VM is already terminated or is in a state where it cannot be terminated, Virtual Agent notifies the user.

Basic flow:

1. User specifies which VM to terminate, or Virtual Agent provides a list of available VM instances for the user to choose from.
2. Virtual Agent provides the details of the requested VM to terminate.
3. Terminating a virtual machine is a permanent action, so the user must confirm the operation to continue.
4. Virtual Agent sends the user an actionable notification when the requested virtual machine has been terminated.

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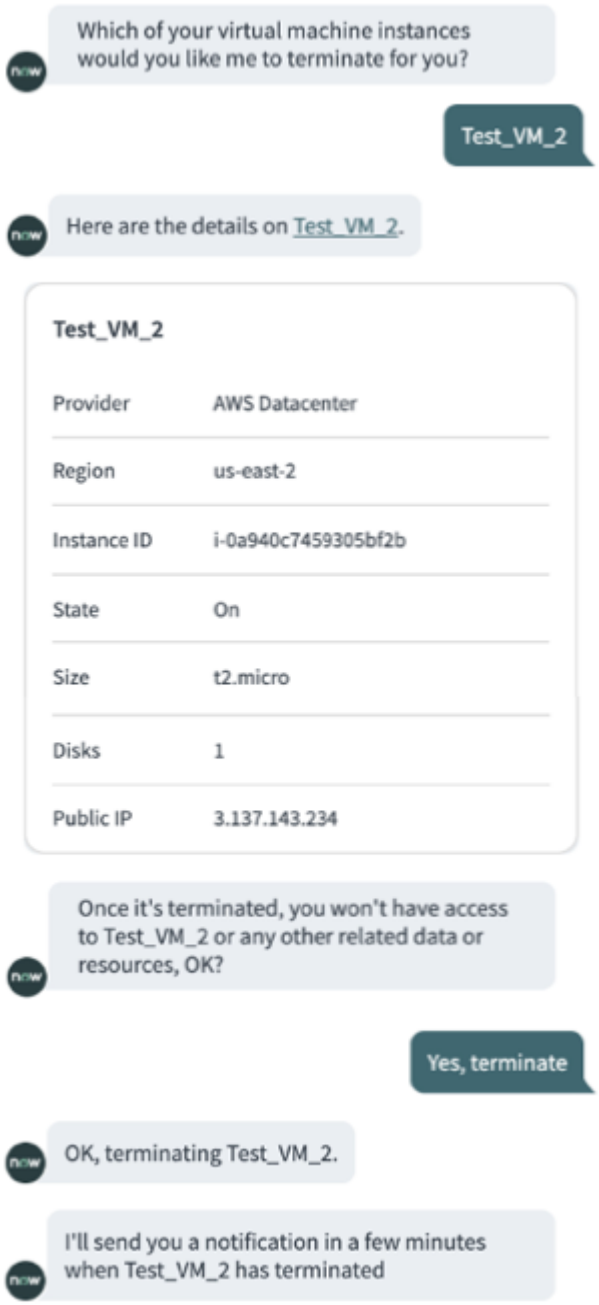


### Terminate Virtual Machine topic block input and output parameters

| Name | Description |
|---|---|
| Input parameter:<br><br>vm_name | Name of the virtual machine instance. |
| Output parameter:<br><br>incident_short_description | Short description for the Incident record, if one is recorded. |

## Troubleshoot Cisco Webex

Users can find a solution for common Webex issues. This topic block is used in the Collaboration Applications topic.

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If the user is not satisfied with the static help content for the issue, the fallback is AI search or contextual search. The type of search is dictated by the system property *sn_itsm_va.fallback_search_option*.

#### Troubleshoot Cisco Webex topic block input and output parameters

| Name | Description |
|---|---|
| Input parameter | |
| issue | The user application issue. |
| Output parameter | |
| user_query | Problem string used for search fallback. |

## Troubleshoot Microsoft Teams

Users can find a solution for common Microsoft Teams issues. This topic block is used in the Collaboration Applications topic.

If the user is not satisfied with the static help content for the issue, the fallback is AI search or contextual search. The type of search is dictated by the system property *sn_itsm_va.fallback_search_option*.

#### Troubleshoot Microsoft Teams topic block input and output parameters

| Name | Description |
|---|---|
| Input parameter | |
| issue | The user application issue. |
| Output parameter | |
| user_query | Problem string used for search fallback. |

## Troubleshoot Zoom

Users can find a solution for common Zoom issues. This topic block is used in the Collaboration Applications topic.

If the user is not satisfied with the static help content for the issue, the fallback is AI search or contextual search. The type of search is dictated by the system property *sn_itsm_va.fallback_search_option*.

#### Troubleshoot Zoom topic block input and output parameters

| Name | Description |
|---|---|
| Input parameter | |
| issue | The user application issue. |
| Output parameters | |
| user_query | Problem string used for search fallback. |
| ticket_description | Problem string used to create an IT ticket. |

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## Virtual Machine Operation AWS

Users can use the Cloud Access Interface to take action on virtual machines provisioned on Amazon AWS. The user must have the sn_managevm_va.cai_vm_user role.

This topic block is used in the virtual machine management CAI pre-built topics. Available actions include Stop, Start, Terminate, or Describe the virtual machine.

## Virtual Machine Operation Azure

Users can use the Cloud Access Interface to take action on virtual machines provisioned on Microsoft Azure. The user must have the sn_managevm_va.cai_vm_user role.

This topic block is used in the virtual machine management CAI pre-built topics. Available actions include Stop, Start, Terminate, or Describe the virtual machine.

### Employee Experience topic blocks

ITSM Virtual Agent helps you manage meetings in Microsoft Exchange Online. Using the Manage Meetings EXO v1.0 topic, you can schedule, reschedule, and cancel a meeting.

Use the **Category** list on the Topics page in Virtual Agent Designer to sort by **Self Service** to view all Employee Experience topics blocks.

For detailed information about topic blocks, see Maximizing code reuse with topic blocks.

## Cancel Meeting EXO

Users can send a message to Virtual Agent requesting to cancel a meeting.

#### Cancel a Meeting EXO topic block input and output parameters

| Name | Description |
|---|---|
| Input parameters | |
| Start Date Time | Start date and time of the meeting in UTC. |
| End Date Time | End date and time of the meeting in UTC. |
| Output parameters | |
| status | Returns a cancel status for the meeting. |
| status_code | Returns one of the following status codes for the meeting:<br>• MEETING_CANCELLED<br>• TECHNICAL_ISSUE<br>• INFORMATION_PROVIDED |

## Conference Room Availability

Users can choose an available conference room for their meeting.

#### Conference Room Availability topic block input and output parameters

| Name | Description |
|---|---|
| Input parameters | |

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**Conference Room Availability topic block input and output parameters (continued)**

| Name | Description |
|---|---|
| Room Location | Location of the conference room. |
| Room Capacity | Number of people the conference room holds. |
| Start Date Time | Start date and time of the meeting in UTC. |
| Duration | Duration of the meeting in minutes. Values increment by 15 minute segments, from *15* to *1440* (1 day). |
| Output parameters | |
| selected_room_info | Name of the selected conference room. |
| booking_info | JSON string denoting additional booking information (location, start time, and duration of meeting). |
| status | Returns the status for the meeting. |
| status_code | Returns one of the following status codes for the meeting:<br>• NO_EMAIL_FOUND<br>• TECHNICAL_ISSUE<br>• INVALID_SCHEDULE_INFO<br>• INVALID_EMAIL<br>• NO_ROOMS_AVAILABLE<br>• ROOMS_SELECTED<br>• ROOMS_VIEWED |

## Get MS Teams Meeting Link

If the Microsoft Teams Communication spoke (sn_msteams_com_spk) is installed on the instance, users can send a Microsoft Teams meeting link with their invitation.

**Get MS Teams Meeting Link topic block input and output parameters**

| Name | Description |
|---|---|
| Input parameters | |
| email_id | Email address of the meeting organizer. |
| meeting_subject | Subject of the meeting. |
| silent_mode | Determines whether the topic block produces a message output. When the value is *true*, the topic block doesn't produce an output message. |
| service_user_azure | Service account Azure ID for the user. This will be used to initiate the meeting in Microsoft Teams meetings. Use a script variable to pass the user ID. |
| Output parameters | |
| url | Microsoft Teams meeting URL. |

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**Get MS Teams Meeting Link topic block input and output parameters (continued)**

| Name | Description |
|---|---|
| meeting_id | Microsoft Teams meeting ID. |
| output_status | Indicates whether the action was successfully completed. |
| output_error_message | Error message indicating that the meeting link didn't get generated. |

## Reschedule a Meeting EXO

Users can send a message to Virtual Agent requesting to reschedule a meeting, or the user can select the desired template and select **Reschedule Meeting**.

**Reschedule a Meeting EXO topic block input and output parameters**

| Name | Description |
|---|---|
| Input parameters | |
| Start Date Time | Current start date and time of the meeting in UTC. |
| End Date Time | Current end date and time of the meeting in UTC. |
| Rescheduled Date | New date and time of the meeting in UTC. |
| Duration | Duration of the meeting in minutes. Values increment by 15 minute segments, from *15* to *1440* (1 day). |
| Output parameters | |
| status | Returns a rescheduled status for the meeting. |
| status_code | Returns one of the following status codes for the meeting:<br>• MEETING_RESCHEDULED<br>• TECHNICAL_ISSUE<br>• INFORMATION_PROVIDED |

## Schedule a Meeting EXO

Users can send a message to Virtual Agent requesting to schedule a meeting, or the user can select the desired template and select **Set up meeting**.

**Schedule a Meeting EXO topic block input and output parameters**

| Name | Description |
|---|---|
| Input parameters | |
| Attendees | Email addresses of the people invited to the meeting. Multiple attendee email addresses are separated by a comma. |
| Subject | Subject of the meeting. |
| Meeting Date | Start date of the meeting in the user's time zone. |

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**Schedule a Meeting EXO topic block input and output parameters (continued)**

| Name | Description |
|---|---|
| Meeting Time | Time of day for the meeting in minutes.<br>For example, for 11:26 pm, the value is *1406*. |
| Duration | Duration of the meeting in minutes. Values increment by 15 minute segments, from *15* to *1440* (1 day). |
| Resource Type | Resources required for the meeting. Values include:<br>• *Virtual*: Requires conferencing software, such as Zoom.<br>• *Conference*: Requires a room to be booked.<br>• *Hybrid*: Requires both conferencing software and a room.<br>• *None*: No additional resources required. |
| Meeting Application | Conferencing software tool for the meeting. Values include:<br>• *Teams*<br>• *Webex*<br>• *Zoom*<br>• *None* |
| Body | Meeting agenda. |
| Service User Azure ID | Service account Azure ID for the user in Microsoft Teams meetings. |
| Output parameters | |
| event_id | ID for the scheduled meeting. |
| status | Returns the status for the meeting. |
| status_code | Returns one of the following status codes for the meeting:<br>• MEETING_SCHEDULED<br>• TECHNICAL_ISSUE<br>• NO_MEETING_SELECTED |

## Webex Meeting Actions

If the Cisco Webex Teams spoke (sn_cisco_teams_spk) is installed on the instance, users can send a Webex meeting link with their invitation.

**Webex Meeting Actions topic block input and output parameters**

| Name | Description |
|---|---|
| Input parameters | |
| Action | The Webex action for the meeting. Values include: |

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**Webex Meeting Actions topic block input and output parameters (continued)**

| Name | Description |
|---|---|
| | • *Schedule*<br>• *Reschedule*<br>• *Cancel* |
| Start Date Time | Current start date and time of the meeting in UTC. |
| Duration | Duration of the meeting in minutes. Values increment by 15 minute segments, from *15* to *1440* (1 day). |
| User ID | Email address or user ID of the meeting organizer. |
| Meeting subject | Subject of the meeting. |
| Agenda | Meeting agenda. |
| Meeting URL | Join URL for the virtual meeting. |
| Meeting Invitees | Email addresses of the invited users, separated by commas. |
| Output parameters | |
| meeting_url | Join URL for the virtual meeting. |
| output_status | Returns the status for the meeting. |
| status_code | Returns one of the following status codes for the meeting:<br>• SCHEDULE_ACTION_SUCCESSFUL<br>• RESCHEDULE_ACTION_SUCCESSFUL<br>• CANCEL_ACTION_SUCCESSFUL<br>• SCHEDULE_ACTION_FAILED<br>• RESCHEDULE_ACTION_FAILED<br>• CANCEL_ACTION_FAILED<br>• INVALID_PAYLOAD<br>• INVALID_EMAIL<br>• MEETING_ID_MISSING |

## Zoom Meeting Actions

If the Zoom spoke(com.sn.zoom.spoke) is installed on the instance, users can send a Zoom meeting link with their invitation.

**Zoom Meeting Actions topic block input and output parameters**

| Name | Description |
|---|---|
| Input parameters | |

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**Zoom Meeting Actions topic block input and output parameters (continued)**

| Name | Description |
|---|---|
| Action | Zoom action for the meeting. Values are:<br>• Schedule<br>• Reschedule<br>• Cancel |
| User ID | Account user's ID or email address. |
| Start date time | Current start date and time of the meeting in UTC. |
| Duration | Duration of the meeting in minutes. Values increment by 15 minute segments, from *15* to *1440* (1 day). |
| Meeting subject | Subject of the meeting. |
| Agenda | Meeting agenda. |
| Meeting ID | Unique Zoom ID assigned to the virtual meeting. |
| Output parameters | |
| output_status | Returns the status for the meeting. |
| status_code | Returns one of the following status codes for the meeting:<br>• SCHEDULE_ACTION_SUCCESSFUL<br>• RESCHEDULE_ACTION_SUCCESSFUL<br>• CANCEL_ACTION_SUCCESSFUL<br>• SCHEDULE_ACTION_FAILED<br>• RESCHEDULE_ACTION_FAILED<br>• CANCEL_ACTION_FAILED<br>• INVALID_PAYLOAD<br>• INVALID_EMAIL<br>• MEETING_ID_MISSING |
| meeting_url | Join URL for the virtual meeting. |

## Using ITSM Virtual Agent pre-built LLM topics

ITSM Virtual Agent includes pre-built LLM topic conversations designed to help your users complete the common IT-related tasks such as checking the IT ticket status and pending approvals.

The ITSM Virtual Agent pre-built LLM topics are read only and have **(Template)** as the suffix in their name. To use them, duplicate the LLM topic in the ITSM Virtual Agent conversation scope and rename it according to your company's naming conventions. Large Language Models (LLM) are used to identify and trigger the action that a user wants to perform.

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### Check IT Ticket Status

You can check the status of your IT ticket using the LLM based Virtual Agent topic. Once the conversation is initiated, it progresses by collecting data about your ticket with one question at a time.

### Pending Approvals

You can check the pending approvals that you will need to take action upon. The LLM-based Virtual Agent topics communicates to identify the number of pending approvals and asks you to pick those to be processed. You can either Approve or Reject your tickets by picking the list numbers provided to you by the Virtual Agent.

## ITSM Virtual Agent pre-built actionable notifications

Send interactive messages to an employee through Virtual Agent, based on pending tasks or alerts. Deflect some of the most common ITSM incidents to ITSM Virtual Agent, reduce incident volume to Service Desk, and help employees discover ITSM Virtual Agent as a resolution channel.

### Actionable notifications

Actionable notifications are interactive messages that Virtual Agent sends to the end user when the user takes certain actions on non-conversational service channels. These notifications have buttons that enable the recipient to perform certain actions, such as adding a comment or requesting a live agent. When you create an actionable notification, you associate an action with a published Virtual Agent topic, a scriptable action, or a flow action that handles the action to be performed. For example, Virtual Agent can send a notification when an employee submits an incident through email or the ServiceNow® Service Portal, if there are any updates or actions needed from the employee. Employees can resolve the incident directly in the Virtual Agent conversation, without involving a live agent.

Admin or Virtual Agent admin (virtual_agent_admin) users activate notifications and the ITSM Virtual Agent Conversation topics.

To create your own custom notifications, see Configuring Virtual Agent notifications.

### Pre-built ITSM actionable notifications

The following pre-built notifications are available for ITSM Virtual Agent. You must activate these notifications in Flow Designer before you can use them. For details, see Set up actionable notifications for ITSM Virtual Agent.

| I want to | Pre-built notifications |
|---|---|
| Notify users of changes to their incidents | Actionable notifications for incidents in ITSM Virtual Agent |
| Notify users of changes to their Service Catalog requests | Actionable notifications for Service Catalog requests in ITSM Virtual Agent |
| Notify users of approvals for change requests or KB articles | Actionable notifications for approvals in ITSM Virtual Agent |
| Notify users when their password is about to expire | Actionable notifications for Password Reset for Virtual Agent |

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| I want to | Pre-built notifications |
| --- | --- |
| Notify users of changes to virtual machines | Actionable notifications for virtual machines in ITSM Virtual Agent |
| Notify users when Virtual Agent finds a topic that can resolve the end user's issue | Actionable notifications for Issue Auto Resolution in ITSM Virtual Agent |

**Related topics**

Issue Auto Resolution for ITSM Virtual Agent

## Actionable notifications for incidents in ITSM Virtual Agent

Notify employees of pending tasks and incident alerts with notifications from ITSM Virtual Agent.

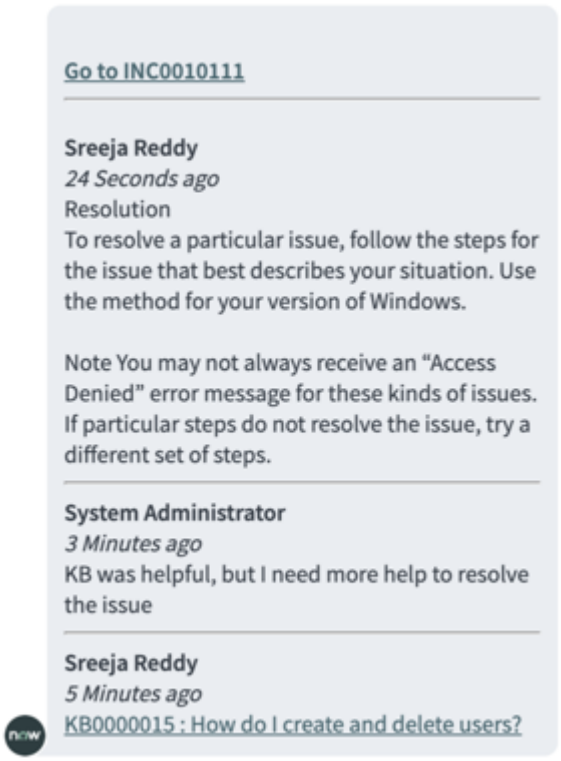
You must activate notifications in Flow Designer in order to use them. For details, see Set up actionable notifications for ITSM Virtual Agent.

### Incident commented

End users are notified whenever someone adds a comment to their incident. The end user can choose to view comments, resolve the incident, or skip the notification.

If the end user selects **View Comments**, Virtual Agent displays the three most recent comments on the incident.

After viewing the most recent comments, the end user can choose to add their own comments and images.

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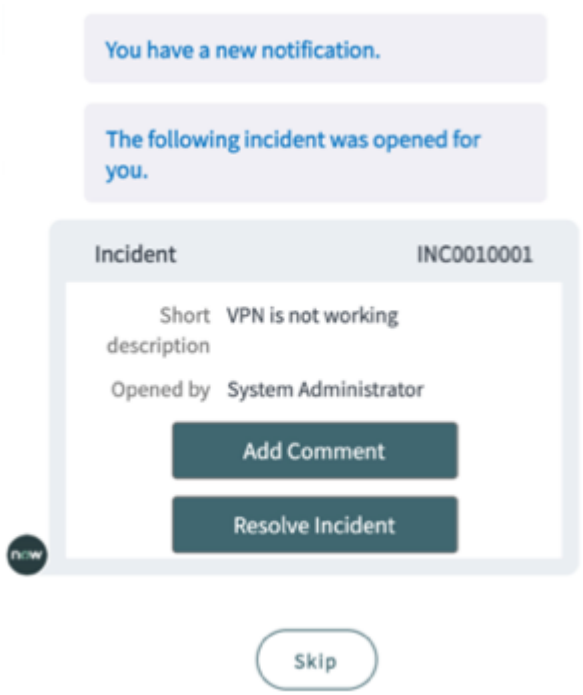
## Incident on behalf of caller

End users receive this notification whenever someone opens an incident on their behalf. The end user can choose to add a comment to the incident, resolve the incident, or skip the notification.

If the end user selects **Add Comment**, Virtual Agent provides a URL to the incident and the end user can enter comments directly into the chat.

If the end user selects **Resolve Incident**, Virtual Agent resolves the incident and provides the incident URL.




## Incident resolved

End users receive this notification whenever someone other than the end user resolves one of their incidents. The end user can choose to close the incident, mark the incident unresolved, or skip the notification.

If the end user chooses to mark the incident unresolved, Virtual Agent offers to add comments from the end user directly through the chat and reopens the incident.

If the end user chooses to close the incident, Virtual Agent closes the incident and provides the incident URL.

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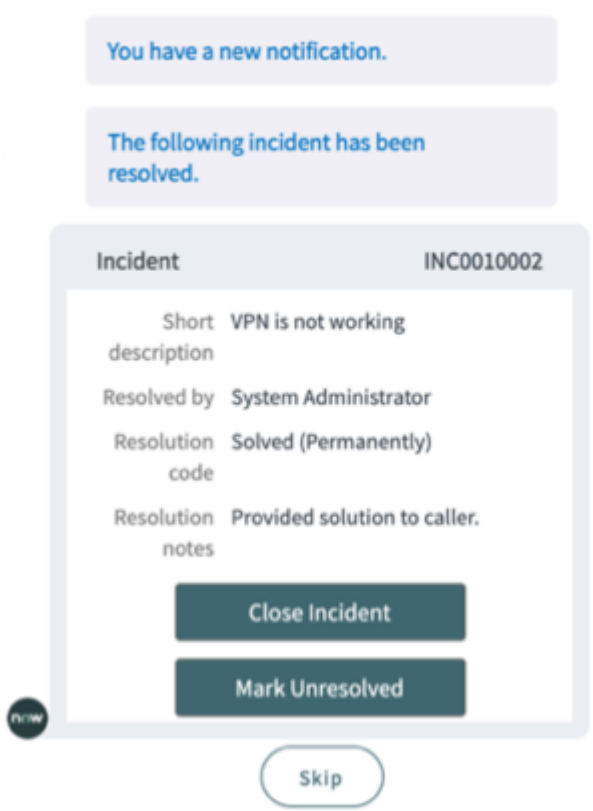


## Incident Update

End users receive this notification whenever someone updates their incident. The end user can choose to add a comment to the incident, resolve the incident, or skip the notification.

## KB attached to incident (deprecated)

End users receive this notification from Virtual Agent when a Knowledge Base article is attached to their incident. The end user can choose to view the article, resolve the incident, or skip the notification.

If the end user chooses to view the article, Virtual Agent displays a snippet and a link to the complete article.

The end user can also give feedback and add comments to the incident.

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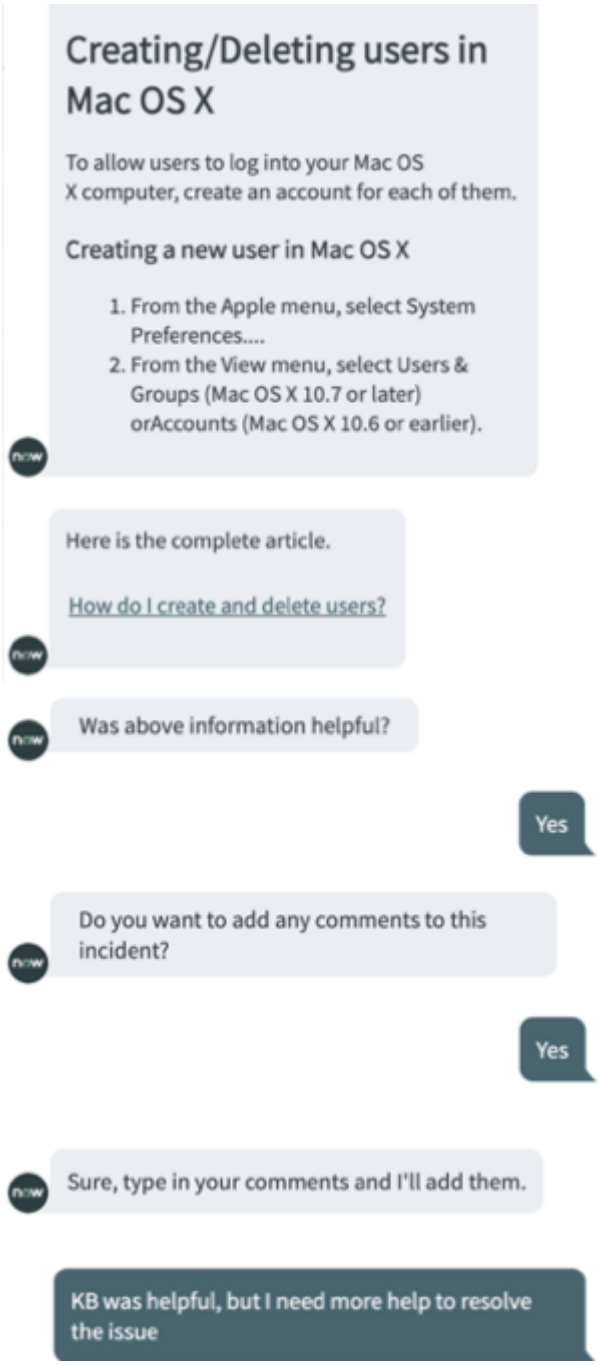


## Actionable notifications for Service Catalog requests in ITSM Virtual Agent

Notify employees of Service Catalog tasks and alerts with notifications from ITSM Virtual Agent.

You must activate these notifications in Flow Designer. For details, see Set up actionable notifications for ITSM Virtual Agent.

## Citrix provision notification

End users are notified whenever a change occurs to a Citrix session or application. For information about pre-built topics for Citrix, see Citrix session pre-built topics for ITSM Virtual Agent.

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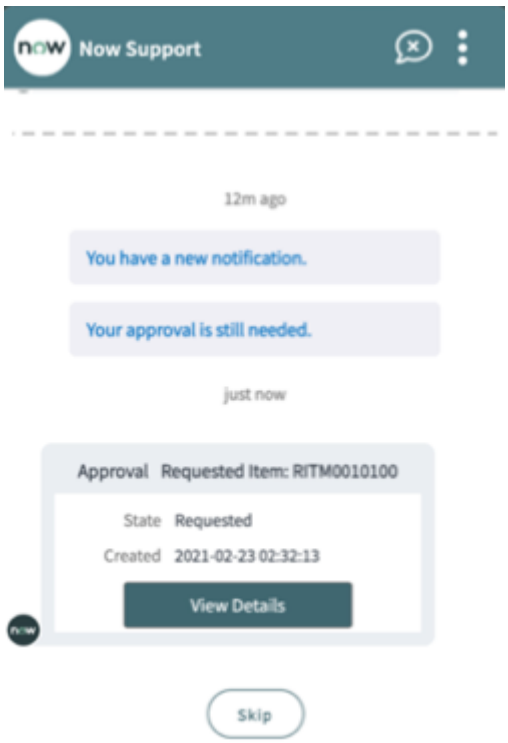
## Request approved or rejected

Virtual Agent sends a notification to the requester of a generic Service Catalog request. The requester can choose to view the details or skip the notification.

## Requested Item approval reminder

Virtual Agent sends a notification to the approver of a Service Catalog request. The approver can choose to view the request details or skip the notification.

Approvers can approve or reject the request directly in the chat. Approvers can also add comments to rejected requests directly in the chat.




## Requested item commented

Virtual Agent sends a notification to employees who have requested Service Catalog items when a new comment is added to the request. Requesters can choose to view the comment or skip the notification.

If the requester selects **View Comment**, Virtual Agent displays the three most recent comments and the requester can choose to add their own comment.

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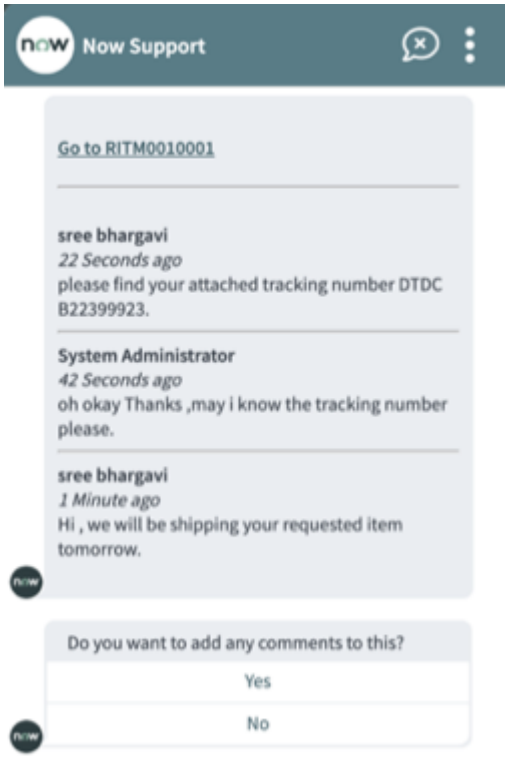
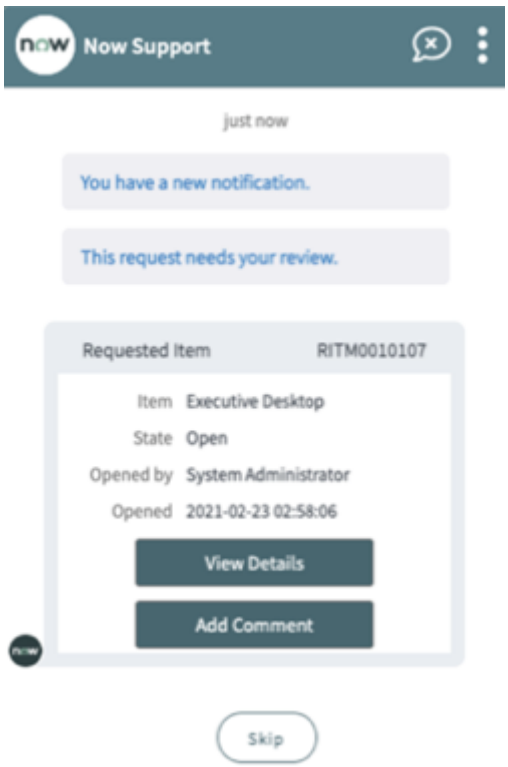



The requester enters a comment and Virtual Agent adds the new comment directly from the chat.

## Requested item on behalf of requester

Virtual Agent sends a notification to an end user when a Service Catalog request is opened on the end user's behalf. The requester can choose to view request details, add comments directly in the chat, or skip the notification.

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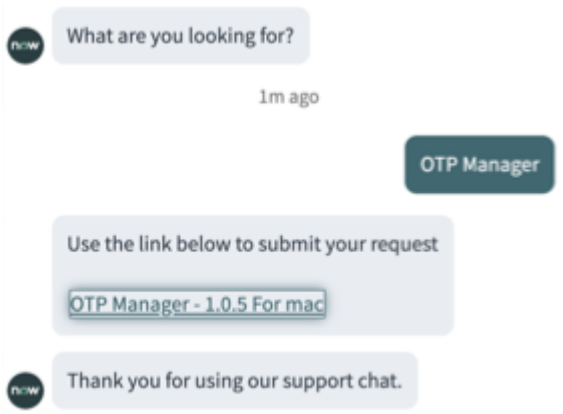
## Requested Item Update

Virtual Agent sends a notification to the requester of a Service Catalog request any time the state changes. The requester can choose to view the details or skip the notification.

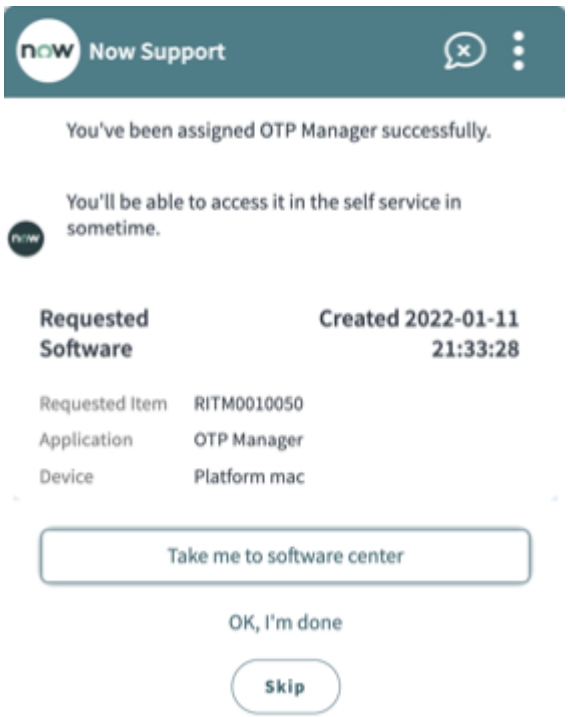
## Software Installation

End users (requesters) can submit a request for software from the Software Catalog by selecting the link displayed under **Use the link below to submit your request**.




When the submitted request is approved, Virtual Agent sends an actionable notification to the end user letting them know that the software has been assigned and will be available soon.

**Note:**
End users must be using Client Software Distribution.




The requester can do the following:

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- See details about the software request by selecting **Take me to the software center**.
- See a list of relevant Knowledge Base (KB) articles, if any, by selecting **OK, I'm done**.

  By default, Virtual Agent displays the articles included in the sc_2_kb table. An admin can define which table is used by changing the value of the *sn_itsm_va.cat_item_related_kb* system property.

## Actionable notifications for approvals in ITSM Virtual Agent

Notify employees of approvals for requests with notifications from ITSM Virtual Agent.

You must activate notifications in Flow Designer in order to use them. For details, see Set up actionable notifications for ITSM Virtual Agent.

Some of the default actionable notifications in ITSM Virtual Agent that need approvals are as follows:

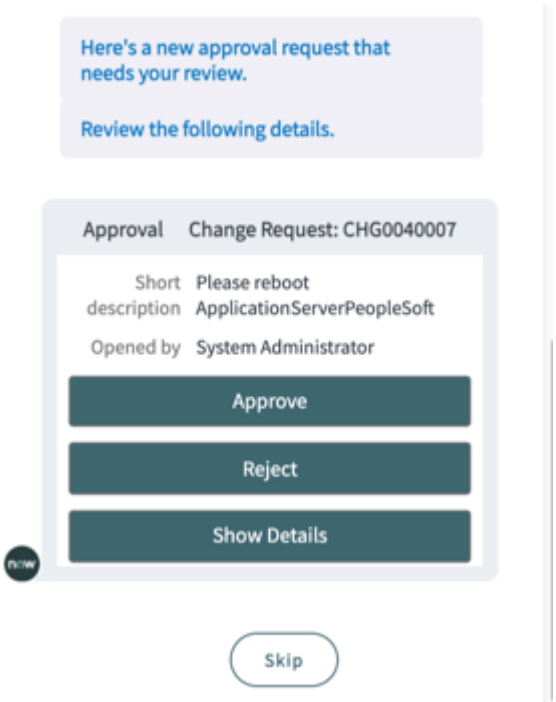
### Approval request for requested items

Virtual Agent sends a notification to the approver of a Service Catalog item request. The approver can choose to view the request details or skip the notification.

Approvers can approve or reject the request directly in the chat. Approvers can also add comments to rejected requests directly in the chat.

### Approval request for requests

When an approval for a change is requested, Virtual Agent sends a notification to the end user who made the change request. The end user can be either the requester or the approver. Virtual Agent sends the notification to the end user, as applicable, who can then approve or reject the request, see details, or skip the notification.




The fields shown below are the default fields for any task table (the **Show Details** field is not configured for the Task extended table).

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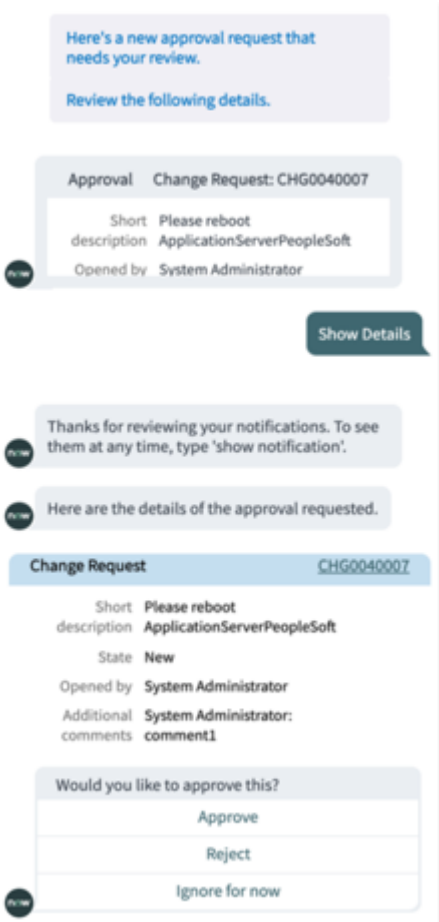


The fields below are the fields configured in the _show_approval_details_ topic (the **Show Details** field is configured for the Task extended table). Admin users can configure these fields by duplicating the topic and editing the approval_default_task_fields script variable within the topic.

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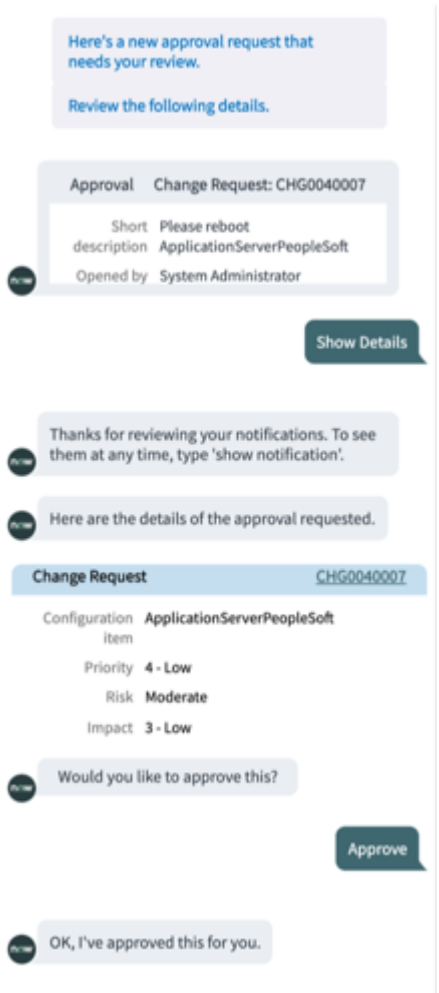
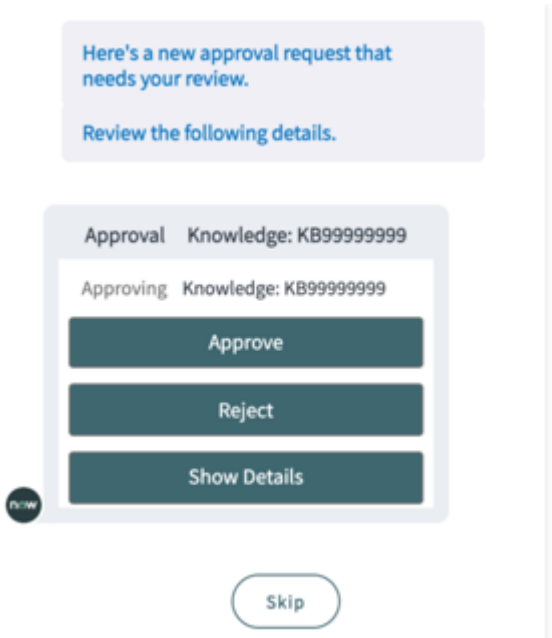



## KB request approved or rejected

Virtual Agent sends a notification when an approval for a knowledge article is requested. End users approve or reject the request, see details, or skip the notification.

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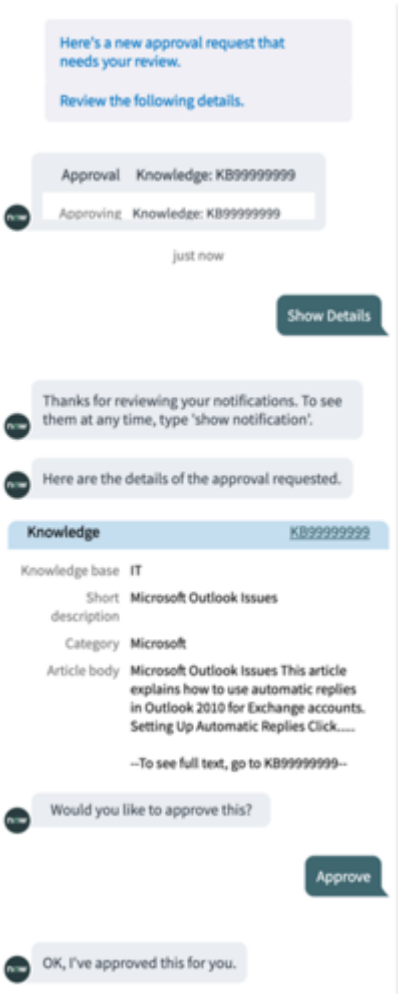
The fields shown here are the fields configured in the _show_approval_details_ topic. Admin users can configure these fields by duplicating the topic and editing the approval_default_task_fields script variable within the topic.




For non-task tables, when no fields are configured in the _show_approval_details_ topic, a message displays with a link to the record being reviewed.

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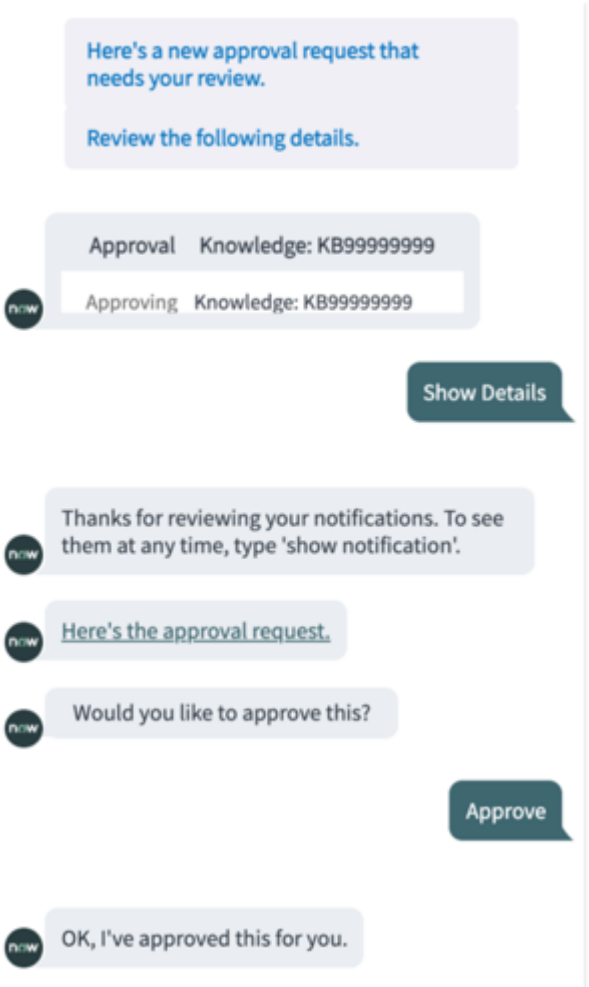


## Other approval

Virtual Agent sends a notification to the approver when a non-task record (such as a Knowledge Base article) needs approval. The approver can choose to view the request details or skip the notification.

## Request approval reminder

Virtual Agent sends a notification to remind the approver of a pending Service Catalog request. The approver can choose to view the request details or skip the notification.

## Request approved or rejected

Virtual Agent sends a notification to the requester of a Service Catalog item when their request has been approved or rejected. The requester can choose to view the request details or skip the notification.

## Task approval

Virtual Agent notifies the approver about a newly created task that needs review and approval.

This notification is not applicable for tasks such as Change or Standard Change. It is also not applicable to Requests (sc_requests) and Requested Items (sc_req_item).

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## Actionable notifications for Password Reset for Virtual Agent

Use Virtual Agent to notify employees when their password is about to expire.

You must activate this notification in Flow Designer. For details, see Set up actionable notifications for ITSM Virtual Agent.

### Password Expiration Reminder

Virtual Agent notifies the user when their password is about to expire. Users can reset passwords and unlock accounts even if they are not logged in. When users are logged in, they can perform all actions, such as changing passwords. After changing or resetting a password, the user can't change or reset the password for the next 24 hours.

For more information about configuring password expiration, see Configure password expiration reminder.

## Actionable notifications for virtual machines in ITSM Virtual Agent

Notify users when a change is made to a virtual machine (VM) instance.

You must activate notifications in Flow Designer in order to use them. For details, see Set up actionable notifications for ITSM Virtual Agent.

### Start VM failure

End users are notified when a change made to a virtual machine instance has failed. For example, the virtual machine failed to start or stop. For information about pre-built topics for virtual machines, see Virtual machine pre-built topics for ITSM Virtual Agent.

### Start VM Success

End users are notified when a change made to a virtual machine instance has been successful. For example, the virtual machine successfully started or stopped. For information about pre-built topics for virtual machines, see Virtual machine pre-built topics for ITSM Virtual Agent.

## Actionable notifications for Issue Auto Resolution in ITSM Virtual Agent

Notify employees when Virtual Agent finds a topic that matches the end user's intent.

Issue Auto Resolution sends actionable notifications through Virtual Agent directly to the end user on their preferred chat channel when the machine-learning model finds a topic that matches the end user's intent. Issue Auto Resolution must be enabled, and the end user must be subscribed to notifications.

Actionable notifications contain buttons that the end user can select. Each button is mapped to a topic that is enabled for Issue Auto Resolution. Based on the end user's selections, different aspects of Issue Auto Resolution execute, according to the logic of the matched topic.

For more information about Issue Auto Resolution, see Using Issue Auto Resolution and Issue Auto Resolution for ITSM Virtual Agent.

**Note:**
You must activate notifications in Flow Designer in order to use them. For details, see Set up actionable notifications for ITSM Virtual Agent.

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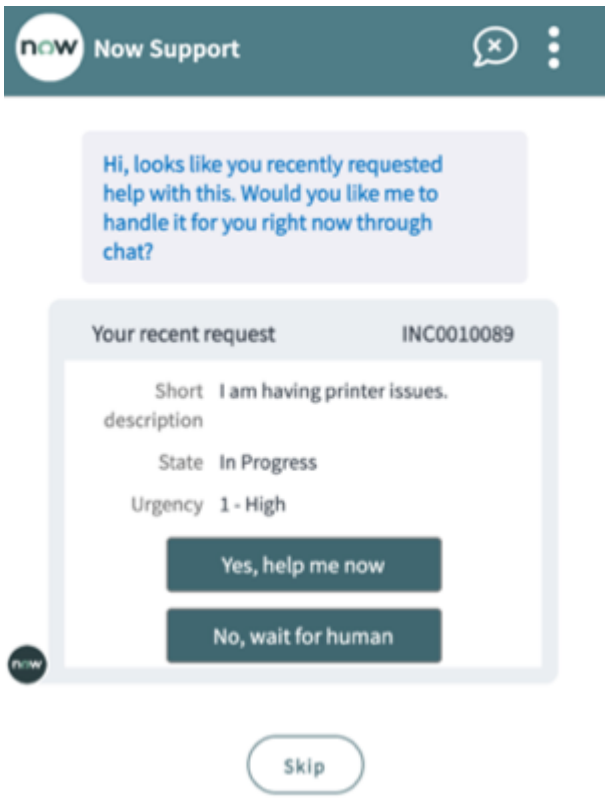
## Issue Auto Resolution

End users receive this notification when an incident is created and the incident short description relates to an existing Issue Auto Resolution topic intent. The end user can choose to accept the Virtual Agent assistance, wait for a human agent, or skip the notification.




If the end user accepts the Virtual Agent assistance, the matched Issue Auto Resolution topic runs and Virtual Agent provides suggestions to resolve the issue.

After Virtual Agent provides suggestions to resolve the issue, the end user can indicate if these suggestions were successful and can choose to close the ticket or to leave it open. If the end user chooses to leave the ticket open, Virtual Agent assigns the ticket to a live agent.

## Issue Auto Resolution Reminder

End users receive this notification to remind them that virtual assistance has been found to help them. The end user can choose to accept the Virtual Agent assistance, wait for a human agent, or skip the notification.

## Issue Auto Resolution for ITSM Virtual Agent

Proactively deflect common ITSM incidents to ITSM Virtual Agent. Initiate a conversation with an end user after they submit an incident through a non-conversational service channel, if an existing ITSM Virtual Agent conversation can resolve the issue.

## Understanding Issue Auto Resolution

Issue Auto Resolution uses ITSM Virtual Agent to proactively resolve incidents through a conversation on the user's preferred chat channel. The Issue Auto Resolution flow follows these steps:

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- When an end user creates an incident through a non-conversation service channel, such as ServiceNow® Service Portal or email, the Natural Language Understanding (NLU) model checks for a matching intent that has Issue Auto Resolution enabled.
- If a matching intent and topic are found, Issue Auto Resolution sends an actionable notification to the end user on their existing chat channel. The user can accept or decline assistance.
- If the end user accepts the assistance, Issue Auto Resolution invokes the matched ITSM Virtual Agent conversation to resolve the incident.
- When the conversation completes, the user can indicate if the conversation resolved the incident and can choose to keep the ticket open or to close it.
- When there are no matching Issue Auto Resolution intents found, AI Search is enabled as fallback along with added intents. For more information, see Enabling AI Search in Issue Auto Resolution.

## When an incident is unassigned from Issue Auto Resolution

An incident is unassigned from Issue Auto Resolution and is routed to an agent when any of the following conditions apply:

- The matched intent doesn't have a matching topic in the same domain as that of the incident.
- The matched topic doesn't have Issue Auto Resolution enabled.
- The end user has not subscribed to notifications.
- The end user declines, ignores, or abandons the Virtual Agent conversation.
- The matched topic didn't resolve the issue.

## When an incident is assigned from Issue Auto Resolution

An incident is assigned from Issue Auto Resolution and is routed to a Virtual Agent when an intent to topic is matched for the incident.

You must ensure that you check the SLAs and Notifications to see if they trigger the **Assigned to is EMPTY** condition to avoid issues with SLAs and Notifications setup on the instance against the incident table.

Update your SLAs and Notifications trigger condition either to **Assigned to is EMPTY** or ensure that the **Assigned to** field is set to **Virtual Agent**.

## Issue Auto Resolution dashboard

The Issue Auto Resolution dashboard provides metrics for the effectiveness of incident deflection, based on Virtual Agent conversations. This dashboard is only accessible to users with the admin role, the virtual_agent_admin role, the chat_analytics_viewer role, or the iar_admin role. The dashboard tracks both the usage of Issue Auto Resolution and the rate of successful incident resolutions. Users can see which tasks are deflected to Issue Auto Resolution and the overall success of Issue Auto Resolution through the following ServiceNow® Performance Analytics KPIs:

- Number of tasks solved by Issue Auto Resolution
- Number of notifications ignored by requester.
- Number of tasks not solved by Issue Auto Resolution to which the requester responded.

To view the dashboard, navigate to **All** > **Conversational Interfaces** > **Conversational Analytics** > **Virtual Agent Dashboard**. Select the **Issue Auto-Resolution** tab to view analytics.

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This tab also provides detailed visualizations on intent and topic matching performed for auto-resolution. For more information, see Issue Auto Resolution tab.

## Issue Auto Resolution Intent Analytics dashboard

The Intent Analytics dashboard provides reports on intent prediction efficiency and other metrics that occur before launching the Issue Auto Resolution topic. This dashboard is accessible only to users with the admin, virtual_agent_admin, or iar_admin role. Intent Analytics and Reports are based on context records and are generated from the context data to do the following:

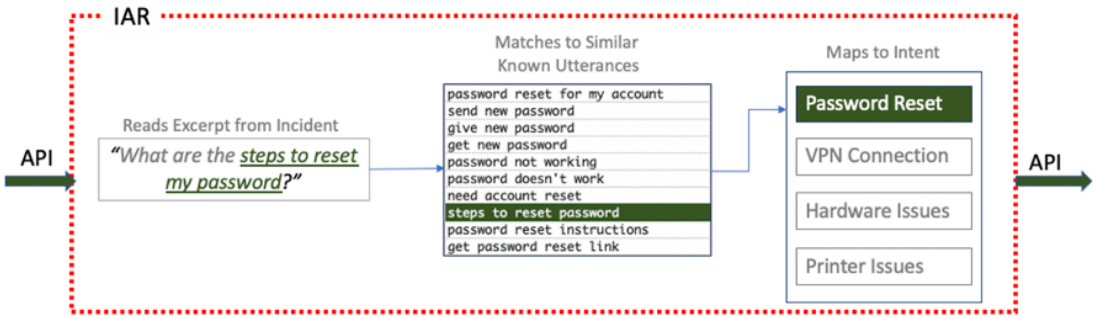
- Measure the efficiency of the Machine Learning API (NLU).
- Measure if Issue Auto Resolution successfully resolved the task.

To view the dashboard, navigate to **All** > **Conversational Interfaces** > **Incident Auto-Resolution** > **Intent Analytics**.

## Natural Language Understanding and Issue Auto Resolution

Issue Auto Resolution uses NLU to identify Virtual Agent topics that match intents submitted by users. Intent matching is determined by the **incident Description** and **Short Description** fields. Intents must meet the required minimum confidence threshold to be considered a match.

### Issue Auto Resolution NLU integration




To view, train, or retrain the NLU model, see Train and test your model in Virtual Agent Designer.

**Note:**
Issue Auto Resolution must be activated and ITSM Virtual Agent must be installed to access the NLU models. To learn more, see Set up Issue Auto Resolution for ITSM Virtual Agent.

## About actionable notifications

Actionable notifications are interactive messages that Virtual Agent sends to the end user on their preferred chat channel. Issue Auto Resolution sends an actionable notification when the machine learning model finds a topic that matches the user's intent and the user is subscribed to notifications. Actionable notifications contain buttons that the user can select. Each button is mapped to an Issue Auto Resolution topic. Based on the user's selections, different aspects of Issue Auto Resolution execute, according to the logic of the matched topic. For more information on how actionable notifications work and how they're delivered to recipients, see Configuring Virtual Agent notifications.

## ITSM Virtual Agent topics for Issue Auto Resolution

Users with the admin or virtual_agent_admin role can choose a subset of pre-built topics to be available for Issue Auto Resolution. The following ITSM Virtual Agent intents are supported by

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Issue Auto Resolution by default and some of the IAR intents are mapped to ITSM topics by default.

**Intent to topic mappings supported by IAR**

| Intents | Mapped topics |
|---|---|
| CollaborationSoftwareIssues | n/a |
| HardwareRequest | n/a |
| HardwareIssues | Hardware Issues (Template) |
| LocalAdminAccess | Local Admin Access (Template) |
| SoftwareAccessRequest | n/a |
| SoftwareInstall | n/a |
| RSAToken | n/a |
| VPNConnectivity | VPN Connectivity (Template) |
| EmailIssues | Email Issues (Template) |
| RepositoryAccess | Repository Access (Template) |
| PrinterIssues | Printer Issues (Template) |
| ManageDistributionList | n/a |
| ResetPassword | Reset Password (Template) |
| MACHINE_GENERATED | n/a |

The default intents and matched topics are listed in the **Auto Resolution Intent Topic Maps** tab. Users with the admin or virtual_agent_admin role can create their own custom topics to use, instead of the included pre-built topics. These custom topics must be mapped to a supported intent in the **Auto Resolution Intent Topic Maps** for Auto Resolution Configuration.

## Issue Auto-resolution tuning

Tune the default IAR intents in the NLU Workbench before returning to the Issue Auto Resolution Admin Console and publish them. For more information, see Issue Auto Resolution Tuning in NLU.

**Related topics**

Using Virtual Agent for Issue Auto Resolution

### Enabling AI Search in Issue Auto Resolution

You can enable AI Search as a fallback mechanism in Issue Auto Resolution when there are no matching intents found for the incident.

## Applying AI Search for Issue Auto Resolution Configuration

When there are no intent matches found for Issue Auto Resolution, AI Search can be applied for the fallback capability. To use AI Search as fallback:

- Open the Auto-Resolution Configuration record.
- Navigate to the **AI Search** tab.
- Select the **Apply AI Search** check box to enable fallback.

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You can see the following AI Search settings from the IAR configuration record which will be used when there are no intent matches for the topic.

- **EVAM definition**: The entity view action mapper definition is set to **Virtual Agent Search** by default.
- **Search application**: The default application for AI Search fallback is set to **Service Portal default Search Application**.
- **AI Search display topic**: The AI Search display topic that is provided by default is the **IAR - AI Search** topic.
- **Search results portal**: The default portal for AI Search fallback is set to the **Service Portal**.

To support AI Search fallback, ITSM Virtual Agent provides the following intent to topic mappings.

### Intent to Topic Maps

| Auto-resolution intent | Matched topic |
|---|---|
| RepositoryAccess | Repository Access (Template) |
| Emailissues | Email Issues (Template) |
| RSAToken | RSA Token (Template) |
| LocalAdminAccess | Local Admin Access (Template) |
| CollaborationSoftwareIssues | Collaboration Applications (Template) |

Whenever you try to create an incident using Email or Self-service as the channel that triggers IAR, you will receive the relevant recommendations.

There are three types for recommendations, KBs, Catalogs, and VA Topics. For example, if you create an incident and check for its email notifications, you will be shown various

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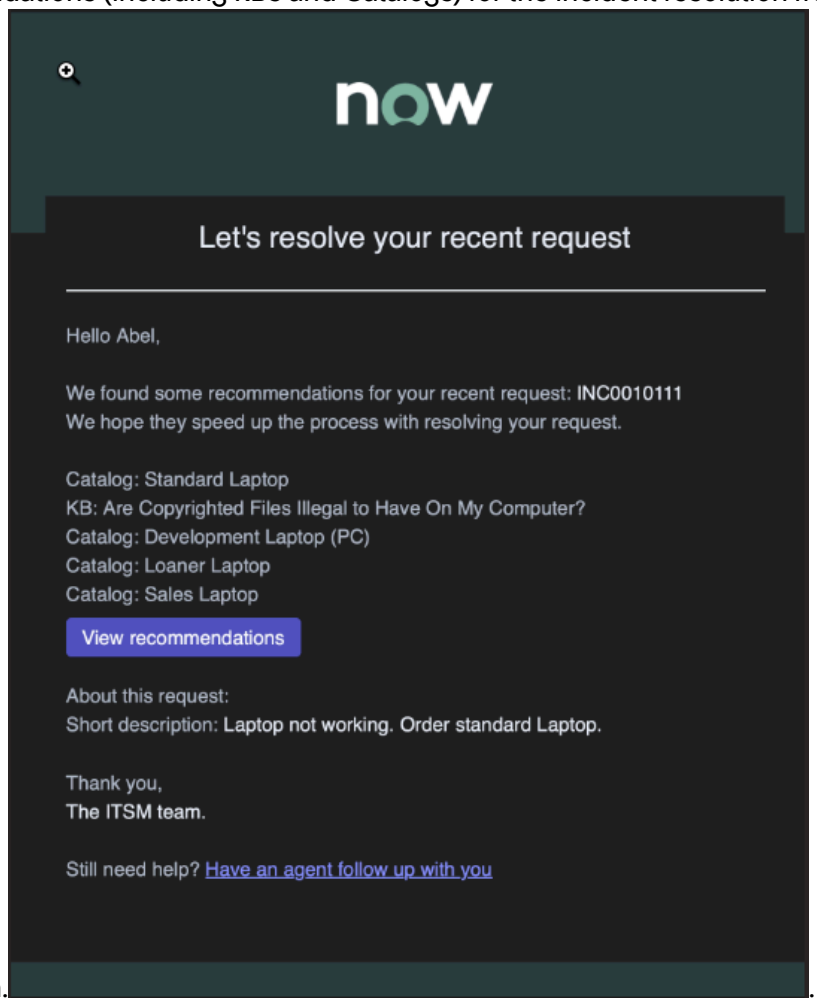
recommendations (including KBs and Catalogs) for the incident resolution from Issue Auto Resolution.




In case there is a matched VA topic from the intent to topic mapping, in that case, you will not receive the KB and Catalog recommendations, but the

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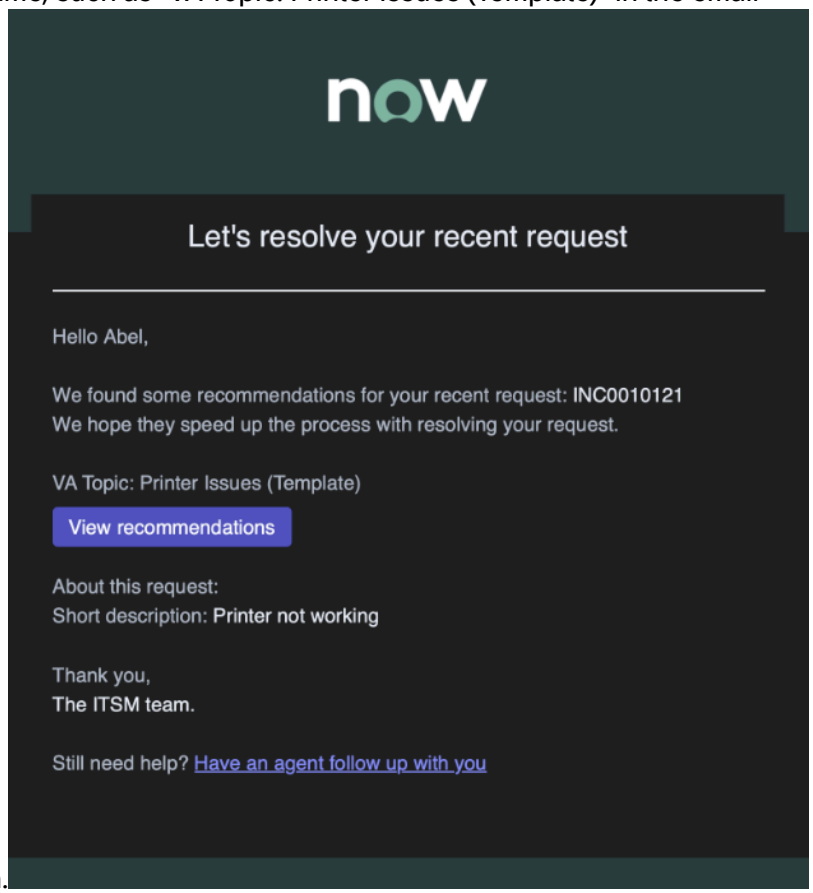
VA topic name, such as "VA Topic: Printer Issues (Template)" in the email notification.




Once you click **View recommendations** from your email notification, you will be directed to the Service Portal incident which now has a **Recommendations** tab from where you can read the KB and mark the recommendation as helpful and resolve it.

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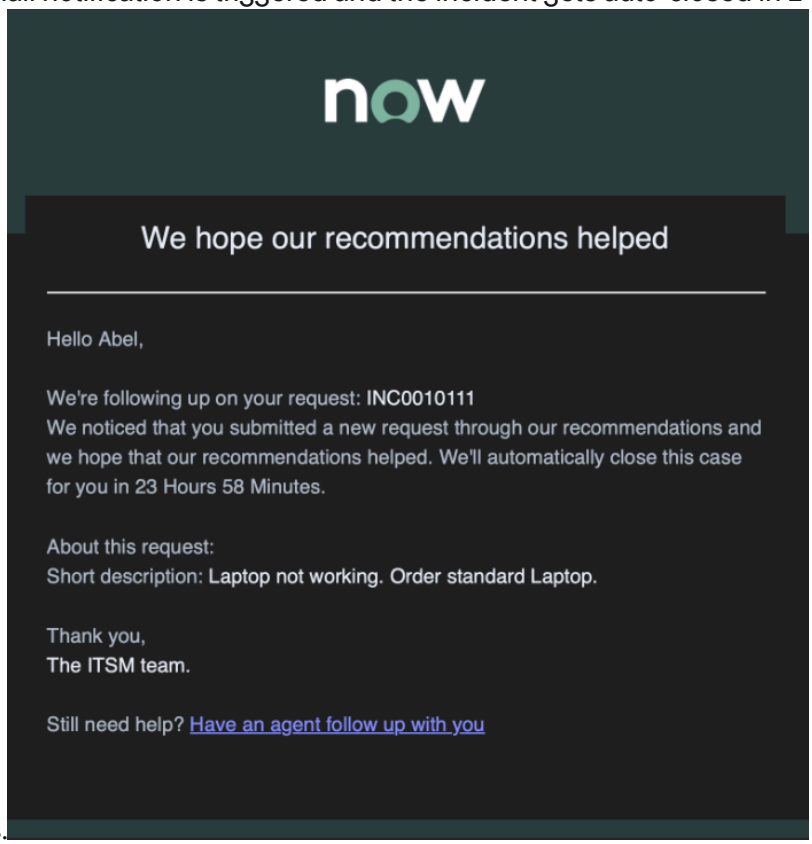
**Note:**
In case the recommendations have a catalog item as the recommended option and you create the catalog request from the Recommendations tab, an email notification is triggered and the incident gets auto-closed in 24 hours.




## Tracking deflections in ITSM Virtual Agent

You can use the pre-built deflection topics and topic blocks in Virtual Agent conversations to track the incidents that ITSM Virtual Agent helped to resolve.

A deflection happens when ITSM Virtual Agent resolves an issue for you. By asking you relevant questions, ITSM Virtual Agent can create an incident in the correct assignment group. As a result, you might not need to create an incident, or need the assistance of a live agent.

Deflection tracking uses the topics and topic blocks created in Virtual Agent Designer and is enabled by default. For more information, see Tracking deflections using deflection topic blocks.

By default, ITSM Virtual Agent includes pre-built deflection configurations in the base system. You can use the deflection configurations in the base system or customize them, as needed. For more information, see Create deflection configurations and patterns.

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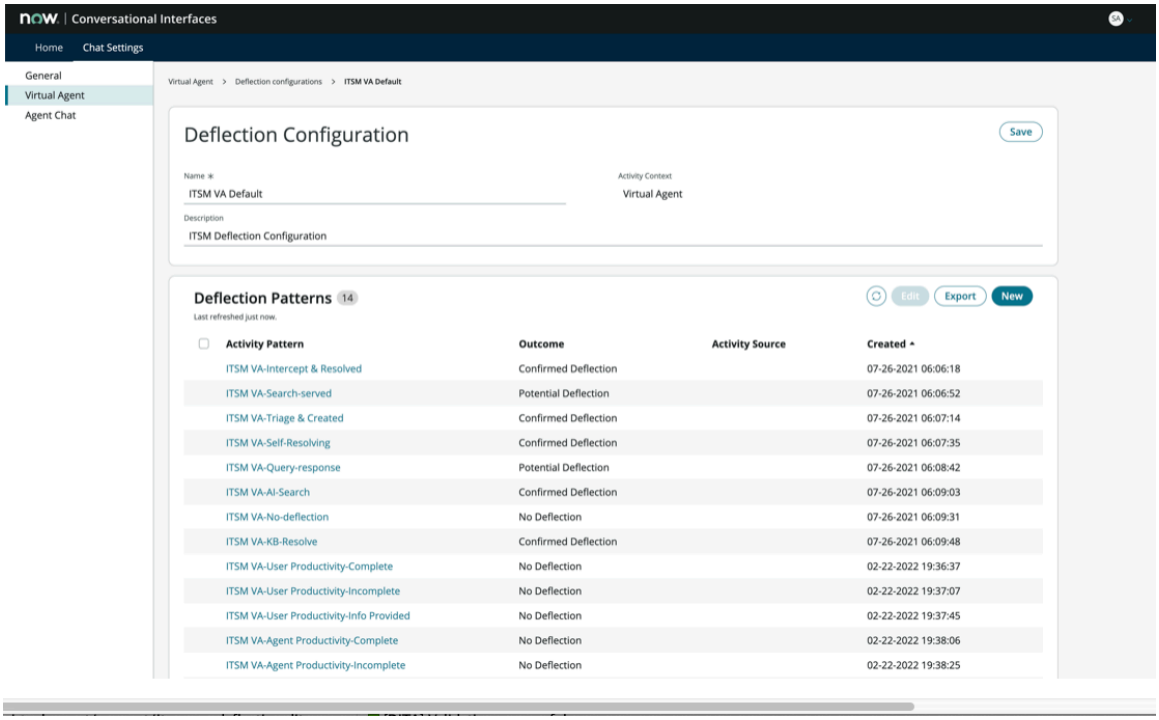


The pre-built deflection patterns in the base system are described in the following table.

| Deflection pattern name | Description | Outcome |
|---|---|---|
| ITSM VA-Self-Resolving | Virtual Agent completes a task with or without filing a task record for ITSM. For example, Virtual Agent adds a user to a distribution list. | Confirmed deflection |
| ITSM VA-Triage & Created | Virtual Agent filed and created a task record based on end-user input. Creating this task record shortens the time to resolution. | Confirmed deflection |
| ITSM VA-KB-Resolve | User resolved the issue by using the Knowledge Base (KB) articles displayed. | Confirmed deflection |
| ITSM VA-Intercept & Resolved | Virtual Agent intercepted an end user-created incident, and helped to resolve and close it. For example, Virtual Agent resolves and closes the incident with Issue Auto-Resolution (IAR). | Confirmed deflection |
| ITSM VA-Search-served | Virtual Agent shows the search results based on the user's IT service needs. | Potential deflection |
| ITSM VA-AI-Search | Virtual Agent uses the AI Search results to provide support. | Confirmed deflection |

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| Deflection pattern name | Description | Outcome |
|---|---|---|
| ITSM VA-Query-response | Virtual Agent responds to a customer query. It's unclear whether the response was helpful. | Potential deflection |
| ITSM VA-No-deflection | Virtual Agent is unable to assist the user. | No deflection |
| ITSM VA-User Productivity-Complete | User completes a task using Virtual Agent. This pattern tracks those completed tasks that saved time and improved productivity. | No deflection |
| ITSM VA-User Productivity-Info Provided | User was provided information that might be helpful to them. | No deflection |
| ITSM VA-User Productivity-Incomplete | User wasn't able to complete a task using Virtual Agent. | No deflection |
| ITSM VA-Agent Productivity-Complete | Agent (fulfiller) was able to complete a task using Virtual Agent as a service channel. This pattern tracks those completed tasks that saved time and improved productivity. | No deflection |
| ITSM VA-Agent Productivity-Info Provided | Agent (fulfiller) was provided information that might be helpful to them. | No deflection |
| ITSM VA-Agent Productivity-Incomplete | Agent (fulfiller) wasn't able to complete a task using Virtual Agent as a service channel. | No deflection |

The deflection metrics are generated and stored in the Deflection Metric [ssa_deflection_metric] table. To view the deflection metrics for each deflection pattern, you can choose one of the following methods:

- Navigate to the Deflection Metrics module in the Self-Service Analytics framework.

  **Note:**
  The Self-Service Analytics framework requires the Self-Service Analytics Core plugin (com.snc.self_service_analytics_core).

  For more information, see Activate Self-Service Analytics.

- Use the **Overview** tab of the Conversational Analytics Dashboard.

  For more information about this dashboard, see Conversational Analytics Dashboard.

## ITSM Virtual Agent Lite

Access a pre-built subset of ITSM Virtual Agent features to quickly and easily implement a virtual agent for your end users. ITSM Virtual Agent Lite offers an introductory collection of conversation topics for IT support.

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### Understanding ITSM Virtual Agent Lite

ITSM Virtual Agent Lite enables you to use a limited version of Virtual Agent. The available keyword-based conversations run in the web chat client and also in the messaging applications, such as Slack, Microsoft Teams, Workplace by Facebook, and Facebook Messenger.

### ITSM Virtual Agent Lite topic category and conversations

Topic conversations run in the web chat client and also in supported ITSM Virtual Agent messaging integrations. Get familiar with Virtual Agent technology to improve your ITSM self-service experience with a streamlined conversational interface.

The ITSM Virtual Agent Lite pre-built, read-only topic conversation templates are contained in the **ITSM Self Service Lite** Virtual Agent Designer category. The following conversation topic templates are ready for you to publish and use:

- Check Ticket Status
- Report an Issue

## Setting up ITSM Virtual Agent Lite

Setup ITSM Virtual Agent Lite using to use the read-only, pre-built conversation topics for your most common ITSM self-service cases. For example, you can connect your users with a virtual agent to check ticket status, search the knowledge base, and report an issue.

### Before you begin

Role required: admin or virtual_agent_admin

### About this task

Virtual Agent Lite is a subset of the features available in Virtual Agent. Virtual Agent Lite is automatically activated. You don't need a subscription for Virtual Agent Lite.

Users with the admin or virtual_agent_admin role can activate the required plugins:

- ITSM Virtual Agent Conversation Topics Lite (com.snc.itsm.virtualagent.lite) plugin

  Activates the read-only conversation topics for basic ITSM self-service.

- The Service Management Virtual Agent Core (com.glideapp.sm_va_core) plugin

  Provides core functionality for Service Management Virtual Agent. This plugin is automatically activated with the ITSM Virtual Agent Conversation Topics Lite plugin.

### Procedure

1. Activate the ITSM Virtual Agent Conversation Topics Lite (com.snc.itsm.virtualagent.lite) plugin to access the pre-built ITSM Virtual Agent Lite conversation topics.
2. Review the **ITSM Self Service Lite** read-only conversation topics in Virtual Agent Designer.
   a. Navigate to **All** > **Conversational Interfaces** > **Virtual Agent** > **Designer**.
   b. In the **Category** drop-down box, select **ITSM Self Service Lite**.
3. Select an available topic to open it.
   The conversation topic template opens in Virtual Agent Designer.
4. Select **Inactive** in the header bar, and slide the toggle switch to **Active**.

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**Note:**
Deactivate a topic by selecting **Active** and sliding the toggle switch to the inactive position.

5. Select **Publish** to publish the topic.

**Note:**
For details about activating and publishing conversation topics, see Getting started with Virtual Agent Designer.

6. Test an active, published conversation topic, by selecting the topic you want to test in Virtual Agent Designer and selecting **Test**.

### ITSM Virtual Agent Lite pre-built topics

ITSM Virtual Agent Lite includes several pre-built, read-only topic conversations you can use to set up a virtual agent for your end users.

### ITSM Virtual Agent Lite topics

**Check Ticket Status**

Users can check the status of active IT tickets (incidents or requests). When a user asks about a ticket status, the virtual agent responds with a list of all active tickets for that user. Each ticket includes a link to the incident or request, the item, the status (**Stage**), and when it was updated.

**Report an Issue**

Users can create incidents using a Record Producer.

## Walk-up Experience

With the ServiceNow® Walk-up Experience application you can create and manage an on-site IT walk-up venue where requests and issues are fulfilled and solved by experienced and skilled agents in person or remotely. You can configure Walk-up Experience to serve all users in your organization by using an inclusive branding, such as Tech Lounge, Service Center, or Genius Bar.

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**Explore**

- Exploring Walk-up Experience
- Utilizing a Walk-up Contact Channel for IT and Beyond (includes Whitepaper: Walk-up Experience)
- Virtual Agent Academy: Get service faster with

**Set up**

Activate Walk-up Experience

**Administer**

- Configure the Walk-up Experience portal
- Create or modify Walk-up Experience notifications
- Create or modify Walk-up Experience schedules
- Create or modify a Walk-up Experience stockroom

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Virtual Agent and Walk-Up Experience
- Domain separation and the Walk-up Experience application

- Create or modify Walk-up Experience locations
- Create or modify a Walk-up Experience customer satisfaction survey

| Use | Develop | Troubleshoot and get help |
| --- | --- | --- |
| • Manage Walk-up Experience interactions manually<br>• View Walk-up Experience location stockroom and assets<br>• Walk-up Experience dashboard overview | • Developer training<br>• Developer documentation<br>• Installed with Walk-up Experience | • Ask or answer questions in the Walk-up Experience community<br>• Search the Known Error Portal for known error articles<br>• Contact Customer Service and Support |

# Exploring Walk-up Experience

Walk-up Experience enables you to create and manage an on-site support channel where requests and issues are resolved and fulfilled by experienced agents, in-person and in real time.

## Exploring Walk-up Experience

Walk-up Experience aims to delight users and significantly improve their satisfaction with the services provided. Walk-up Experience enhances the productivity of the agents serving the requesters through in-person or remote support.

Employees and business guests can get real-time, in-person or remote help with their issues and device requests.

The main purpose of a walk-up service center is to support and resolve the common, everyday routine a service desk may come across. These functions can be, a request for a new mouse or keyboard, unlocking an account, or help in setting up software on a mobile device. Common branding names for your walk-up center can be, “Tech Lounge,” “Service Center,” or “Genius Bar”.

## Key features

Every employee or a guest can check in and get support at an established walk-up service center.

**Requesters**

Requesters can access the Walk-up Experience application in several ways.

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- Online and via mobile device:
  - Quickly check in online to the nearest available walk-up venue via a pre-built check-in widget on the Service Portal using your laptop, tablet, or mobile phone.

    **Note:**
    Geolocation interfaces with the Walk-up Experience application to automatically route you to the nearest walk-up queue. You can always change the location, if desired.

    Geolocation uses browsers or mobile device coordinates to determine location. If geolocation is blocked on the browser, Walk-up Experience defaults to Latitude/Longitude criteria in the user profile or mobile device.

  - View hours of operation, the estimated wait time, and your position in the queue at the check-in location via the **Walk-up Status** widget on the Service Portal. You can also access the online Walk-up Experience check in from this widget.

    **Note:**
    The **Walk-up Status** widget must be configured to appear on the Service Portal.

  - View upcoming walk-up appointments and current queue position by location using the Now® Mobile application **Services** tab on your mobile device. **Tech Lounge visits** appears if there is associated data. If no data exists, the section is hidden.

    **Note:**
    Requires activation of the ServiceNow Mobile Request Native Application Screens and Applet Launcher plugin (com.glide.mobile-employee). See Mobile plugins and upgrades for more information. This plugin enables the Service Catalog functionality by default.

  - Schedule appointments for support and receive appointment reminders, as well as cancel or reschedule appointments from links in the reminder or from the online check-in interface.
  - Schedule only one appointment per walk-up location queue at a time.

    **Note:**
    Even with a scheduled appointment, you can still check into a walk-up location queue online or in person onsite.

  - Schedule appointments on behalf of others who need IT support, such as executives or direct reports.

    **Note:**
    Configuration is necessary to make this available to the **Appointment delegation group** of users, such as executive assistants. This is configured in the Walk-up Location Queue (wu_location_queue) table.

  - Receive notifications via email or your mobile device when your request is assigned to an IT support fulfiller, when you are close to next in line to be helped, and when your walk-up request has been closed or abandoned, should you decide not to attend the queue.

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- View your Walk-up Experience appointments in your primary calendar with Microsoft Office 365 Outlook calendar integration. When you make an appointment, modify it, or cancel it, your calendar is sent invites to an appointment and any updates.

  **Note:**
  This feature is only available when Microsoft Office 365 Outlook is the hosted calendar service.

- Add your online Walk-up Experience appointment to a calendar of your choice with iCalendar. Click a link in the portal to download an iCalendar file containing appointment details, including appointment location.

- Onsite at the Walk-up Experience location:
  - Check into a queue at the physical walk-up location by manually entering either your name or email or by scanning an employee badge.

    **Note:**
    The badge scanning feature requires activation and configuration. Refer to Badge Reader Integration for Walk-up Experience.

  - Observe queue activities on a large monitor that displays both walk-in requesters and those with appointments.
  - View the monitor displaying how many people are currently in the queue, guest positions in the queue, who is being helped, and estimated wait times.
  - Hear an audio sound emitted from the on-site walk-up location large monitor when a new person moves to the top of the queue for service.
  - Answer an available single-question survey which captures your user sentiment after a visit.
- After-hours support — Get support even when a walk-up queue is closed. An IT support phone number is displayed on the check-in device, along with a link to create an incident in real time.

### Agents

The IT organization uses the Walk-up Experience application to meet the demand of urgent IT issues and requests.

- Walk-up Experience IT technicians manage daily operations at the walk-up queue locations. They resolve IT-related issues, support mobile devices and laptops, and fulfill requests for software and hardware consumables.
- The agents can accept and close Walk-up Experience interactions through the Agent Workspace interface. Agent Workspace contains a personal inbox where walk-up interactions, if configured in Advanced Work Assignment, are automatically pushed for assignment.
- Agents can manage all aspects of Walk-up Experience fulfillment using Agent Workspace. Based on their capacity, and if records are on-hold, they can work on multiple transactions at the same time and promote interactions to incidents or requests, or access associated stockroom consumables.
- Technicians can view and accept scheduled appointments in their Agent Workspace personal inbox. Appointments are routed to the inbox according to agent availability. Alternatively, agents can pick and choose appointments manually.

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- If necessary, technicians can work with anyone in the queue at any time. Technicians can manually assign themselves to a walk-up interaction, by accepting the interaction from a list of unassigned interactions in Agent Workspace.
- Agents can use the Agent Assist feature to expedite incident resolution.

**Managers**

IT managers supervise the walk-up location technicians and oversee daily operations.

- Walk-up managers can observe and capture operational and performance data by monitoring the walk-up dashboard.
- Walk-up managers can use the application to increase IT customer satisfaction, ensure and confirm stockroom inventory is available, provide customer service in a timely manner, and report performance data to upper management.

**Administrators**

Configure and maintain walk-up related systems, such as the walk-up location branding and text, queue locations and schedules, appointments, advanced work assignments, and notifications, CSAT surveys, and associated stockrooms.

Access the pre-built **Walk-up online check-in Experience** widget for use in your Service Portal. Make minor label changes directly in the widget without the need to customize through code.

Enable Walk-up Experience Microsoft Office 365 calendar integration. When users make an appointment, modify it, or cancel it, the Outlook calendar is sent invites to an appointment and any updates. For more information about this feature, refer to Walk-up Experience Microsoft Office 365 calendar integration.

**Note:**
This feature is only available when Microsoft Office 365 Outlook is the hosted calendar service.

## Advantages

Your entire organization benefits by using the application in the following ways:

**Improves employee access to IT professionals**

Employees access IT services in real time by visiting a walk-up location. Employees can also schedule appointments to visit the walk-up location at a convenient future time. This saves time for everyone and results in greater productivity. The agents get direct access to user devices so that employees can return to work faster.

**Tracks interactions and performance**

IT managers use the Walk-up Experience dashboard to analyze and understand the work IT technicians are performing to support the company.

**Integrates with other services**

Technicians can manage Walk-up Experience interactions from the Agent Workspace interface.

Walk-up technicians can create traditional incidents when issues cannot be resolved at the walk-up location directly in Agent Workspace.

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If a requested item is not available at an associated stockroom, walk-up technicians can create a request by ordering from the Service Catalog directly in Agent Workspace.

CSAT surveys are available at the walk-up queue and emailed to walk-up customers after an interaction is closed to capture customer-service sentiments.

### Devices required to deliver Walk-up Experience

The Walk-up Experience application depends on several types of devices to deliver functionality. Users can check into an online walk-up queue using a desktop or laptop computer, tablet, or mobile phone. Onsite walk-up location users can check into the queue by scanning an employee badge or with a provided, typically stationary, tablet. The following guidance describes what devices are needed and function best for each Walk-up Experience feature:

- Online check-in and appointment scheduling: Desktop or laptop computer, tablet, or mobile phone.
- Onsite check-in: Tablet is recommended, but also works on desktop.
- Onsite queue: Large flatscreen TV. This feature is designed for larger display devices, such as a TV monitor. It is not supported on a tablet.
- Onsite CSAT survey: Tablet is recommended, but also works on desktop.
- Onsite badge reader: Badge scanning integration. For complete details, refer to Badge Reader Integration for Walk-up Experience.

**Note:**
To optimize the experience for Apple iOS-based tablet devices, save the opened Check-in and CSAT survey tabs to the homepage of the device. When clicked from the homepage, they will open in full screen.

## Domain separation and the Walk-up Experience application

This is an overview of domain separation as it pertains to the Walk-up Experience application and how it relates to Service Portal pages, interaction queues, and configurations. Domain separation enables you to separate data, processes, and administrative tasks into logical groupings called domains. You can control several aspects of this separation, including which users can see and access data.

### Support level: Basic

- Business logic: Ensure that data goes into the proper domain for the application's service provider use cases.
- The application supports domain separation at run time. The domain separation includes separation from the user interface, cache keys, reporting, rollups, and aggregations.
- The owner of the instance must set up the application to function across multiple tenants.

Sample use case: When a service provider (SP) uses chat to respond to a tenant-customer's message, the customer must be able to see the SP's response.

For more information on support levels, see Application support for domain separation.

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## Walk-up Experience overview

Domain separation in the Walk-up Experience application is supported at the basic level. However, the application depends on the Service Portal, which is not supported for domain separation. Domain separation pertains to the Walk-up Experience application in the following ways:

- Walk-up location queues support domain separation in order to define which end users can access each location queue.
- The Interaction table supports standard domain separation for data security. Interaction tickets are opened for a specific domain.
- Walk-up location queues and interactions support domain separation. Therefore, the agents also work within a domain-separated environment when addressing interaction tickets associated with a location queue.
- Management and administration configurations reside in the walk-up location queue records. Therefore, those configurations are available to the respective domain managers and admins.
- While the Service Portal pages are not domain separated, the Walk-up Experience application's portal pages retrieve data within the user's specific domain. Therefore, those pages can be reused across different service portals designed and configured for separate domains. The admins must build each portal themselves.
- The **Domain** field is available on the wu_location_queue table. Setting domain here ensures that the users only see queues that are a part of their domains during online check-in.
- For Advanced Work Assignment routing to operate, each wu_location_queue must include a work item routing condition which explicitly adds a reference to the domain the queue is part of.

> **Note:**
> The appointment booking feature is not domain separated. Since Appointment [itil_appointment] table data is not domain separated, list views could reveal data across domains.

## How domain separation works in the Walk-up Experience application

For this application to be most effective, walk-up administrators should configure walk-up locations accordingly. This is done by configuring the `wu_location_queue` record to meet the needs of requesters. Each domain configured to the location queue record has its own set of rules. The same applies to other tables within the Walk-up application as well.

> **Note:**
> Elements of the Service Portal platform such as settings, portals and widgets cannot be domain separated. However, the data within the widgets displays based on how the domain is configured. The recommended approach is to set up separate portals for each MSP customer.

The elements of Service Portal that are used as part of the walk-up experience are as follows:

- Portal (Walk-up)
- Pages ( `walkup_online_checkin, walkup_queue_on_site, walkup_home, walkup_survey, walkup_check_in` )
- Theme (Walk-up theme)
- Widgets (Online check-in experience, walk-up queue on site, walk-up check-in, walk-up exit survey, walk-up home, walk-up schedule)

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To learn more, see Domain separation and Service Portal.

For data separation, the Walk-up Experience application uses the domain of the walk-up requester to determine in which domain the requester data should be placed.

- Requesters can check in only in locations for which they have visibility.
- Requesters are able to select the reasons that belong only to their own domain.
- Interaction records are created in the Requester's domain.

The application uses the domain of the walk-up agent or admin to determine which records are visible to the agent.

- By domain separation rules, Agents can work only on interactions that are visible to them.
- The agents are able to configure only walk-up location records that belong to their domain, are in the global domain, or have the parent-child hierarchy.
- The same visibility rules apply for the Many to Many `[wu_m2m_location_queue_reason]` table that controls the mapping between a location and the reason.
- The walk-up contexts records also have domain separation support. Thereby ensuring that the agents are able to view detailed information of the Requester only for the records that are visible by domain separation rules.

### Walk-up Experience domain-separated tables

As part of the Walk-up Experience, records in the following tables can be domain separated.

- Walk-up location queues `[wu_location_queue]`
- Walk-up reasons for visit `[wu_reason]`
- Walk-up reasons `[wu_m2m_location_queue_reason]`
- Walk-up contexts `[wu_context]`
- Interactions `[interaction]`

**Related topics**

Domain separation for service providers

## Walk-up Experience portal security and access

Security is built into the application to prevent end-user facing devices at the Walk-up Experience on-site portal from offering elevated role privileges to users. The Walk-up Experience on-site portal is accessed by an account containing only the sn_walkup.walkup_login role.

### Understanding Walk-up Experience portal security

Activate the Explicit Role (com.glide.explicit_roles) plugin to assign users security roles, either snc_internal or snc_external. This plugin was introduced in the ServiceNow AI Platform Paris release. With the Quebec release, for new installations, Walk-up Experience added a dependency on this plugin to explicitly set the Walk-up Experience user as an external user.

When upgrading Walk-up Experience installations prior to Rome, the Walk-up Experience user is assigned snc_internal instead of snc_external. This is because the Explicit Role plugin assigns all users, including Walk-up Experience users, to snc_internal. Walk-up Experience cannot remove

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snc_internal during upgrade. For new installations of Walk-up Experience, this process works automatically.

**Note:**
Refer to Explicit Role plugin for details about the plugin and Explicit Roles for more information about this upgrade process.

### Access to Walk-up Experience

Agents opening up the on-site Walk-up location for business, or joining the support team during operation hours, access the user record account with sn_walkup.walkup_login role to log into the Walk-up Experience portal. Internal and external users can access the on-site Walk-up Experience portal via a check-in device, typically a tablet, to enter a queue. Internal, authenticated users can also access an online queue check-in via desktop or mobile device.

### Important information for upgrading Walk-up Experience to Washington DC

The Explicit Role (com.glide.explicit_roles) plugin was introduced in the ServiceNow AI Platform Paris release. When installed, users are assigned security roles, either snc_internal or snc_external. With the Washington DC, release Walk-up Experience has added a dependency on this plugin to explicitly set the Walk-up Experience user as an external user.

When upgrading Walk-up Experience to Washington DC, the Walk-up Experience user is assigned snc_internal instead of snc_external. This is because the Explicit Role plugin assigns all users, including the Walk-up Experience user, to snc_internal. Walk-up Experience cannot remove snc_internal during upgrade. For new installs of Walk-up Experience, this process works without issue because the Explicit Role plugin installs first, assigns all users to snc_internal, then the Walk-up Experience user account is created with the snc_external role already assigned.

**Note:**
Refer to Explicit Role plugin for complete details about the plugin and ServiceNow AI Platform explicit roles.

After upgrading to Washington DC, you need to remove the snc_internal role from the Walk-up Experience user account, or any users created to log into the Walk-up Experience kiosk. Then you need to add the snc_external role to the users. This process is not necessary for upgrades after Washington DC.

**Note:**
Refer to Explicit Roles for complete details about this process.

## Walk-up Experience administration

Walk-up Experience users with the sn_walkup.walkup_admin role and administrators can activate and configure the application to meet specific requirements.

You can configure appointments, decide when to send notifications to users, establish and configure physical queue locations and operating schedules, integrate with CSAT surveys, and associate stockrooms with queue locations. You can also customize your Walk-up Experience portal with a unique logo and branding.

### Activate Walk-up Experience

You can activate the Walk-up Experience plugin (com.snc.walkup) if you have the admin role. This plugin includes demo data.

**Before you begin**
Role required: admin

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### About this task

The Walk-up Experience application is for pre-built support lounges. The application enables your organization to set up a walk-up contact channel to support online and on-site queue check-in.

The Interaction Logging, Routing, and Queuing (com.glide.interaction) plugin are activated with the Walk-up Experience plugin (com.snc.walkup). The following plugins must also be activated in order to use the Walk-up Experience application:

- Asset Management (com.snc.asset_management)
- Service Portal (com.glide.service-portal)

To activate Walk-up Experience Badge Reader Integration and for more information about this feature, refer to Badge Reader Integration for Walk-up Experience.

For enhanced security, activate the Explicit Role (com.glide.explicit_roles) plugin. The walk-up user is assigned snc_external automatically. This plugin was introduced in the ServiceNow AI Platform Paris release.

**Note:**
Refer to Explicit Role plugin for details about the plugin and Explicit Roles for more information about this upgrade process.

### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.
3. Select **Install** to start the installation process.

   **Note:**
   When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

   You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

#### Related topics

List of plugins (Washington DC)

#### Installed with Walk-up Experience

Several types of components are installed with activation of the Walk-up Experience plugin, including tables and user roles.

**Note:**
The Application Files table lists the components that are installed with this application. For instructions on how to access this table, see Find components installed with an application.

Demo data is available for this feature.

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### Roles installed

| Role title [name] | Description | Contains roles |
|---|---|---|
| Walk-up login<br><br>[sn_walkup.walkup_login] | Used to log into the onsite Walk-up Experience portal when needed. For example, at the beginning of the work day for an agent.<br><br>**Note:**<br>This role is assigned to a user record for purposes of logging into the check-in device, typically a tablet, at the on-site Walk-up Experience portal. It is not an actual human being with an assigned role, but an account used to log into the on-site portal devices. The user record can be assigned only this role in order to access the onsite Walk-up Experience portal. The user record account cannot contain any other associated roles. For security reasons, the Walk-up Experience portal cannot be accessed using the admin role. | None |
| Walk-up technician<br><br>[sn_walkup.walkup_technician] | Works at the Walk-up Experience location to fulfill customer demands, such as IT-related issues and requests. | • itil<br>• interaction_agent<br>• workspace_agent<br>• awa_agent<br>• sn_apptmnt_booking.appointment_booking_ |
| Walk-up manager<br><br>[sn_walkup.walkup_manager] | Manages the technicians at the Walk-up Experience location.<br><br>Access the Walk-up Experience Dashboard to oversee and monitor operations and performance. | • itil<br>• sn_walkup.walkup_technician<br>• sn_apptmnt_booking.appointment_booking_ |

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### Roles installed (continued)

| Role title [name] | Description | Contains roles |
|---|---|---|
| Walk-up administrator<br><br>[sn_walkup.walkup_admin] | Administers and configures Walk-up Experience modules. | • itil<br>• sn_walkup.walkup_manager<br>• inventory_admin<br>• schedule_admin<br>• sp_admin<br>• sn_apptmnt_booking.appointment_booking_<br>• awa_admin |

### Tables installed

| Table | Description |
|---|---|
| Walk-up Reason for Visit<br><br>[wu_reason] | Record used to define various common reasons why a user needs walk-up support. |
| Walk-up context<br><br>[wu_context] | Record used to configure an online check-in channel for requesters to join a walk-up queue before physically arriving at the walk-up location. Identifies a walk-up requester and the description of the associated interaction. |
| Walk-up Location Queue<br><br>[wu_location_queue] | Record used to configure a walk-up location. Extends the Queue [awa_queue] table. |
| Walk-up Reason<br><br>[wu_m2m_location_queue_reason] | Record used to set the order a particular visit reason should be prioritized at a walk-up location. |
| Walk-up Appointment<br><br>[wu_appointment] | Record used to configure scheduled appointments. Extends the Task [task] table. |

## Quick start tests for Walk-up Experience

Validate that Walk-up Experience still works after you make any configuration change such as apply an upgrade or develop an application. Copy and customize these quick start tests to pass when using your instance-specific data.

Walk-up Experience quick start tests require activating the Walk-up Experience plugin (com.snc.walkup) and loading demo data.

### Walk-up Experience - Tests test suite

| Test | Description | Release version |
|---|---|---|
| Create a location | Ensure users with the Walk-up administrator | Orlando |

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**Walk-up Experience - Tests test suite (continued)**

| Test | Description | Release version |
|---|---|---|
| | [sn_walkup.walkup_admin] role can access all existing walk-up queues, create new queue locations, and configure queues appropriately. | |
| Onsite checkin (ITIL User) | Verify that users with the ITIL role can check into an onsite queue location. | Orlando |
| Onsite checkin (ESS User) | Verify that users with the ESS role can check into an onsite queue location. | Orlando |
| Onsite checkin (Guest) | Verify that guest users can check into an onsite queue location. | Orlando |

**Related topics**

Quick start tests

## Configuring Walk-up Experience

Customize your Walk-up Experience portal and configure appointments, notifications, walk-up venue locations, associated stockrooms, customer satisfaction surveys, and hours of operation to meet your required needs.

Walk-up Experience includes associated notifications to alert requesters when the location is closed or when an interaction is assigned to an agent. Pre-built customer satisfaction surveys capture user sentiment about the experience. Also included are several configurable tables for customizing your walk-up portal and service center experience. You can configure and specify the following features for your experience:

- Configure an online check-in channel for requesters to join a walk-up queue before physically arriving at the walk-up location.
- Access the pre-built **Walk-up online check-in Experience** widget for use in your Service Portal. Make minor label changes directly in the widget without customizing through the code.
- Configure the physical walk-up location queue information to manage and administer the walk-up service centers.
- Establish walk-up locations, set hours of operation, enable online check-in, determine assignment groups, associate stockrooms, as well as design the queue time display and position notification system.
- Configure reasons for visits to a walk-up queue by location.
- Add a logo and brand your portal and walk-up location to fit your style.
- Access location-specific branding elements, such as logo images, for walk-up queues. These configuration options are found in the Walk-up Location Queue [wu_location_queue] table.

The following applications are included in the **Administration** module of the Walk-up Experience navigation bar:

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### Walk-up Experience administration applications

| Application | Description |
|---|---|
| Portal Configurations | Create and modify custom Walk-up Experience online and on-site service portals. |
| Notifications | Access and configure alerts that keep requesters and agents informed of events that concern them. |
| Appointment Configurations | Create service configurations for individual walk-up queue locations. You can configure schedules, number of appointments allowed per day, how far in the future requesters can book appointments, and more. |
| Walk-up Locations | Create walk-up location queues with custom schedules, assignment groups, average wait time, and more. |
| Schedules | View, create, or modify walk-up venue schedules, such as 8-5 weekdays, and associate them to the walk-up location queues. |
| Walk-up Stockrooms | Establish walk-up venue stockrooms by location and specify available consumables. |
| Surveys | Access customer satisfaction surveys and enable public access to the surveys, set survey trigger conditions, and view requester responses. |

## Configure the Walk-up Experience portal

Create engaging walk-up center service portals featuring your logo, portal theme, desired catalog, links to a knowledge base and social community, and more.

### Before you begin

Walk-up Experience includes a complete base-system **Walk-up Portal** with theme. The **Walk-up Portal** pages are meant to be used as built. You can create custom portal pages to meet your needs by copying the portal pages and associated widgets and making changes to the copies. You can configure both an online check-in portal and a physical check-in portal for your walk-up locations.

There are several ways to configure the Walk-up service portal:

- **Service Portal** application: Modular user interface framework for quick and easy building and customization of application portals.
- Service Portal Walk-up form: Requires CSS and HTML experience.

Role required: sn_walkup.walkup_admin or admin

### Procedure

1. To configure the Walk-up service portal using the **Service Portal** application, navigate to **All** > **Service Portal** > **Service Portal Configuration**.
2. To customize the base-system walk-up portal with your unique branding, title, logo, theme colors, layout, properties, widgets, and more, or to create a new walk-up portal, refer to Service Portal for detailed information.
3. Alternatively, to configure the Walk-up service portal using the Service Portal Walk-up form, navigate to **All** > **Walk-up Experience** > **Administration** > **Portal Configurations**.
4. In the Service Portals list, select **Walk-up**.
5. Click the form menu icon and select **Configure** > **Form Design**.

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6. In the form designer header drop-down list, select or search for any of the configurable walk-up forms to customize your portal appearance.

| Option | Description |
|---|---|
| **Walk-up context [wu_context]** | Online check-in channel for requesters to join a walk-up queue before physically arriving at the walk-up location. Identifies a walk-up re quester and the description of the associated interaction. |
| **Walk-up Location Queue [wu_location_ queue]** | Physical walk-up location interaction queue to manage and administer the service cen ter. You can establish walk-up locations, set hours of operation, enable online check-in, de termine assignment groups, associate stock rooms, as well as design the queue time dis play and position notification system. |
| **Walk-up Reason [wu_m2m_location_ queue_reason]** | Reasons why a requester needs walk-up sup port. |
| **Walk-up Reason for Visit [wu_reason]** | Order in which reasons for a visit should be prioritized at a walk-up location. |

You can modify the form content to meet your portal requirements. For more details, refer to Form configuration .

### Enable Self-Service online check-in for Walk-up Experience

Show or hide the Walk-up Experience online **Walk-up Check-in** module under **Self-Service** in the application navigator. You can enable or disable the module using the basic platform menu or module enablement process.

#### Before you begin
Role required: sn_walkup.walkup_admin or admin

#### About this task
The Walk-up Experience online **Walk-up Check-in** module is disabled (hidden) by default and does not appear under the **Self-Service** menu until enabled.

#### Procedure

1. Navigate to **All** > **System Definition** > **Application Menus**.
2. Click **All** in the conditions breadcrumbs to display both active and inactive application menus. This action removes the default filter condition.
3. Search by **Title** for the **Self-Service** application menu.
   Search yields the itil_self_service and mobile_self_service menu applications. You can enable (show) the **Walk-up Check-in** module for each menu application.
4. Click the **Self-Service** menu application with the **Name: itil_self_service**.
   The application menu Self-Service record opens and the Modules related list shows the modules that appear in the application navigator.
5. Search by **Title** for the **Walk-up Check-in** module.
6. Click **Walk-up Check-in**.
   The **Walk-up Check-in** module record opens.
7. In the **Visibility** tab, click **Active** to enable the **Walk-up Check-in** module.

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Active is **true** for the module. Alternatively, you can enable the module from the **Applications Menus Self-Service** Modules related list:

a. Double-click the **Active** field beside the **Walk-up Check-in** module name in the Modules related list.

b. Set **Active** to **true** (show) or **false** (hide).

8. Click **Update**.
   When you change application menus or modules, the application navigator automatically refreshes to display the changes.
9. To enable the **Walk-up Check-in** module to display under **Self-Service** on the mobile application, click **Walk-up Check-in** in the Mobile Modules related list.
10. Click the **Active** field to enable the module for mobile devices.
11. Click **Update**.

### Configure Walk-up Experience online check-in icon to appear on Service Portal

Requesters can check into a walk-up location online via the Service Portal. You can edit the Service Portal Home page to replace the general IT **Get Help** support icon link with the Walk-up Experience online check-in support icon link.

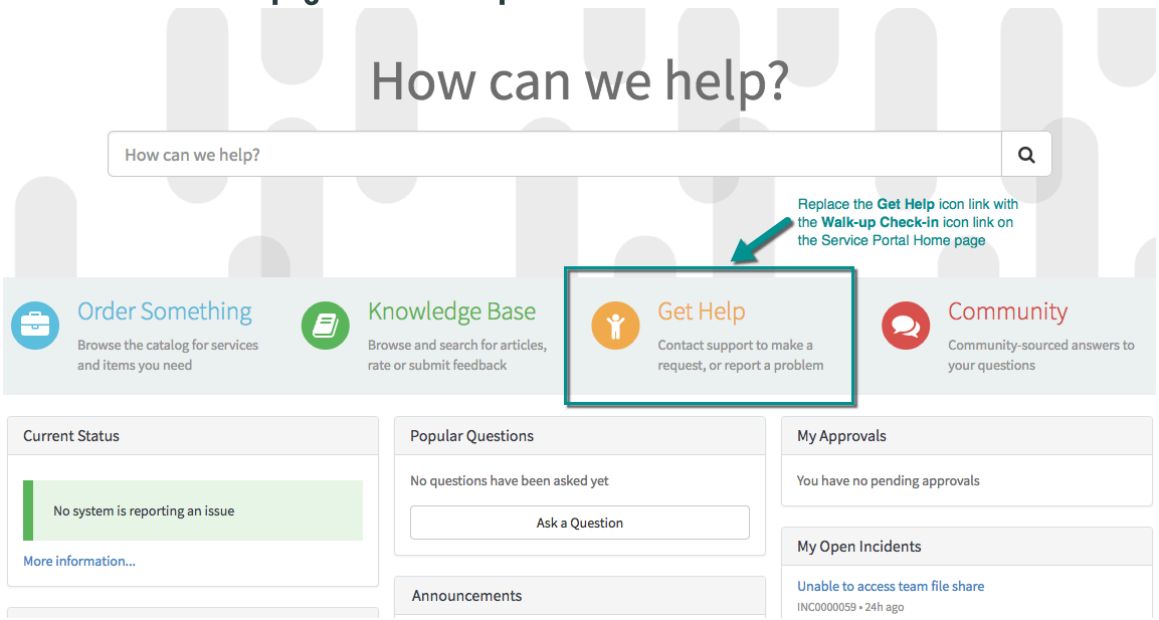
#### Before you begin

Service Portal for Enterprise Service Management (com.glide.service-portal.esm) must be activated.
Role required: sp_admin or admin

#### About this task

To replace the Get Help icon link with the Walk-up Check-in icon link on the Service Portal Home page, access Service Portal Designer. Alternatively, you can add a new container to the Service Portal for the Walk-up Check-in icon link, so that the Get Help icon link remains.

**Service Portal Home page with Get Help icon link**




#### Procedure

1. Navigate to **All** > **Service Portal** > **Service Portal Configuration**.
2. Click the **Designer** tile on the configuration page.

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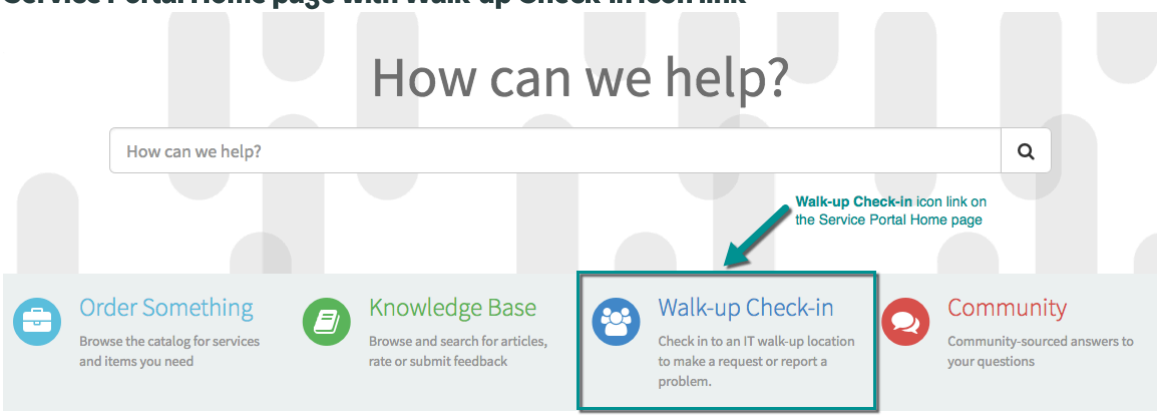
3. Select the **Service Portal** index page to edit.
4. Ensure you are in edit mode by verifying that **Edit** is highlighted as active in the Service Portal Designer banner.
   In edit mode, you can add a new container for the Walk-up Check-in icon link or edit an existing container, depending on where you want to place the icon link.
5. To edit an existing container, select the **Get Help** icon link container.
6. Click the edit icon in the upper right corner.
7. Edit the form fields with the following data and presentation details.

| Fields | Configuration input |
|---|---|
| Data | |
| Type | Select **Page** to embed the walkup_online_checkin page with widget on the icon link. |
| Page | Select **walkup_online checkin**. |
| Presentation | |
| Title | Enter `Walk-up Check-in`. |
| Short description | Enter details about the icon link, that you want displayed, such as `Check in to an IT walk-up location to make a request or report a problem.` |
| Bootstrap color | Select **Default**. |
| Bootstrap class name | Enter a class name or leave this field empty. |
| Glyph | Select a glyph or you can select the empty glyph to bypass this field. |
| Template | Select **Circle Icon**. |

8. Click **Save**.
   The Service Portal Home page opens in edit mode. The online Walk-up Check-in icon link with your selected glyph image and description displays in place of the former **Get Help** icon link.

**Service Portal Home page with Walk-up Check-in icon link**




9. Navigate to **Service Portal** > **Service Portal Home** to verify and test the newly created Walk-up Check-in icon link.

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10. To add the Walk-up Check-in icon link to a new container, refer to Create and edit a page using the Service Portal Designer.
11. Edit the container form fields with the same data and presentation information as detailed above in the form configuration input descriptions and follow the remaining relevant steps.

### Configure Walk-up Experience service channel

Configure the Walk-up Experience service channel to meet the needs of your walk-up agents and how they are assigned to and manage interactions in Agent Workspace.

#### Before you begin
Role required: sn_walkup.walkup_admin or admin

#### About this task
The Walk-up Experience service channel is viewed and configured through Advanced Work Assignment. You can modify default values and conditions as desired.

#### Procedure
1. Navigate to **All** > **Advanced Work Assignment** > **Service Channels**.
2. Select **Walk-up** to open the Walk-up Experience service channel.
3. Refer to Configure a service channel for detailed information regarding the Service Channel Walk-up form values and conditions.
   For more information regarding Advanced Work Assignment service channels, including configuring capacity and utilization, inbox layout, and overriding agent capacity for selected agents, refer to Service channels.

### Create or modify Walk-up Experience notifications

Create and use Walk-up Experience notifications to keep requesters informed of queue events that concern them. The system can notify users by email, SMS text message, or push notification to a mobile device.

#### Before you begin
Role required: sn_walkup.walkup_admin or admin

#### About this task
Walk-up Experience includes several base-system notifications that you can use or customize to notify walk-up requesters about specific information and interactions, including:

#### Walk-up Experience notifications

| Notification | Description |
|---|---|
| Walk-up Abandoned | Notifies when a walk-up interaction is closed. |
| Walk-up Threshold Notification | Notifies visitors when they are close to being next in line for support. |
| Walk-up Assigned | Notifies when an interaction is assigned to a technician. |
| Walk-up Closed | Notifies when a walk-up location is closed. |

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### Procedure

1. To view Walk-up Experience notifications, navigate to **Walk-up Experience** > **Administration** > **Notifications**.
2. Click an available walk-up notification to view basic properties, as well as information about when to send it, who will receive it, and what the notification will contain.
3. To modify a walk-up notification, edit any of the form fields.
4. To create a new walk-up email or push notification, click **New** and refer to Create an email notification or Create a push message .
   For complete information regarding using the System Notification application, refer to Notifications .

## Create or modify Walk-up Experience schedules

Once you know the hours of operation for your Walk-up Experience location, you can either access the base-system default schedules or create new schedules to associate with your walk-up location.

### Before you begin

Role required: admin or sn_walkup.walkup_admin

### Procedure

1. To view and use a base-system default schedule in the Walk-up Experience application, navigate to **Walk-up Experience** > **Administration** > **Schedules**.
   You can view all available base-system default schedules, such as **8-5 weekdays excluding holidays**.
2. To modify an existing base-system schedule, click the schedule name, otherwise click **New** to create a schedule if none of the default schedules apply for your walk-up location.
3. Complete the Schedule New record form or modify fields on an existing form.
   To complete this process and for detailed information on creating, modifying, and using schedules in the system, including a definition of all form fields, refer to Schedules .

## Walk-up Experience appointment booking

With the Walk-up Experience appointment booking feature, walk-up users can view available appointment windows, make a selection, and book an appointment for a walk-up location using online **Walk-up Check-in** feature. Walk-up agents can also book appointments on behalf of customers.

Create appointment windows for walk-up queue locations enabling requesters to book service appointments.

The Appointment Booking plugin (com.snc.appointment_booking) must be activated to use the application. Activating the plugin adds the Appointment Booking menu to the application navigator and the following modules:

- **Appointment Booking Configuration**: Use this module to create an appointment booking configuration for an application and then configurations for each service within that application.
- **Appointment Bookings**: Use this module to view a list of appointments that have been booked for services. This list includes the work orders associated with each appointment.

Appointment booking requires configuration at both the application level, in this case, Walk-up Experience, and at the walk-up queue service level, represented by the actual location of the walk-up queue.

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The Walk-up Experience application configuration contains settings that apply to all of the service locations within the application that support appointment booking.

A service configuration is required for each of the walk-up queue locations within the application that offer scheduled appointments. A service configuration includes settings that apply only to that specific walk-up queue service location.

**Note:**
Both the application configuration and the service configuration must be active to book appointments.

For detailed information about the **Appointment Booking** application, refer to Managing appointments in Field Service Management.

### Walk-up Experience appointment booking administration

Create or modify the Walk-up Experience **Appointment Booking** feature.

Administrators can create, modify, and enable the Walk-up Experience application configuration. Appointment booking administrators (appointment_booking_admin) can create, modify, and enable configurations for service locations within the Walk-up Experience application.

Walk-up Experience is an application level configuration provided with the base system appointment booking feature. You can include as many service level configurations as needed. The service level configurations apply to the individual walk-up queue locations that exist. Administrators can modify these configurations as needed or use them as examples to create new configurations.

For more information on appointment booking administration, see Administer appointment booking

### Enable Walk-up Experience appointment booking

Enable or disable the appointment booking feature for Walk-up Experience as well as for the individual walk-up service locations available to requesters.

#### Before you begin
Role required: sn_walkup.walkup_admin or admin

#### About this task
The Appointment Booking plugin (com.snc.appointment_booking) must be activated to use the application.
When appointment booking is enabled, the **Schedule an appointment** tab appears on the online check-in page. The requesters can choose a reason for the appointment and select a date a time from current available appointments.

#### Procedure

1. Navigate to **All** > **Appointment Booking** > **Appointment Booking Configuration**.
2. Select **Walk-up Experience**.
   The **Walk-up Experience** configuration is provided with the base system **Appointment Booking** feature.
3. Click **Active** to enable appointment booking for the Walk-up Experience application.
4. In the Appointment Booking Service Configuration related list, select the name of a service.
   For Walk-up Experience, a service is defined by the physical location of a walk-up queue. Every walk-up queue associated with your application is a service that needs to be configured for appointment booking.
   The Appointment Booking Service Configuration form for the selected service opens.

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5. Select **Active** to set the field to true.
6. Select **Update**.

### Walk-up Experience appointment booking configuration

Create or modify appointment booking configurations for the Walk-up Experience. You can view or modify the Walk-up Experience application appointment booking configuration and create or modify related service appointment configurations.

The base system Walk-up Experience application includes a default appointment booking configuration that can be modified. By default, the information stored in the Walk-up Experience application appointment booking configuration applies to all services within that application. Services within the Walk-up Experience application are defined as the actual walk-up queue locations. You can create new appointment booking service configurations for the Walk-up Experience application or modify existing configurations.

For example, you may want to configure one walk-up queue to accept appointment booking every day from Monday to Friday, but for another queue, you only want appointment booking available on Monday, Wednesday, and Friday. By configuring appointment booking at the service level, you can achieve this goal.

Specific Walk-up Experience set-up criteria for appointment booking include the following configurations:

- Define different appointment schedules and time windows per queue location.
- Define the time window in which you want to support appointments. For example, 15 minutes now_V. 30 minutes.
- Define the time window capacity. For example, the maximum number of appointments per time window.

### View or modify a Walk-up Experience appointment booking configuration

View the base system default appointment booking application configuration to determine if the criteria meets your walk-up appointment booking needs. You can modify the application configuration to uniquely manage appointment booking for your experience. The information stored in the Walk-up Experience appointment booking application configuration applies to all the services within the application.

#### Before you begin

Role required: sn_walkup.walkup_admin or admin

#### About this task

The **Walk-up Experience** configuration is provided with the **Appointment Booking** feature.

#### Procedure

1. Navigate to **All** > **Appointment Booking** > **Appointment Booking Configuration**.
2. To view the **Walk-up Experience** configuration, select the configuration name.
3. In the Appointment Booking Configuration form, view or modify the following fields as needed.

#### Appointment booking configuration

| Field | Description |
|---|---|
| Name | Name of the application configuration. |

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| Field | Description |
|---|---|
| Task Table | Table where appointments are created for the tasks. The field is automatically populated with Walk-up Appointment [wu_appointment] table for configuring **Walk-up Experience**. |
| Availability Method | Option to determine the appointment availability.<br>○ **Number of appointments per slot**: Define a specific number of appointments per time slot. Use this availability method if the task assignment method is set to **manually**. This is the default setting.<br>○ **Scripted**: Use this configuration setting to determine availability if the task assignment method is set to **using auto assignment** or **dynamic scheduling**. |
| Advanced Calendar view for Portal | Option to display advanced view of the calendar for booking an appointment. |
| Active | Option to activate the application configuration and enable appointment booking. |
| Auto acceptance | If the application configuration setting for **Process lifecycle** is set to **task-driven**, an agent must accept or reject an assigned task. Enable the **Auto acceptance** check box to override this configuration setting for appointment booking. |
| Portal View | Displays available appointments for a single day or for a week on the online **Self Service Walk-up Check-in** portal or from the **Service Portal** if the walk-up icon is configured there. |

4. Select **Submit**.

### Create a record producer to capture Walk-up Experience appointment records

Capture Walk-up Experience appointment records by creating unique record producers for your individual walk-up locations. The Appointment Booking Service Configuration form contains required fields that refer to variables in the associated record producer.

#### Before you begin
Role required: appointment_booking_admin or admin

#### About this task
In order to properly configure your walk-up location services for appointment booking, you must first create a unique record producer for each walk-up location. You must also add variable sets to the record producer. By creating the unique record producer with appropriate variable sets, you can capture all your walk-up appointment records for each location.

#### Procedure
1. Navigate to **All** > **Service Catalog** > **Record Producers**.
2. Click **New** to open the Record Producer New Record form.
3. Provide a unique name for the record producer in the **Name** field.
4. Search for and select **Walk-up Appointment [wu_appointment]** in the **Table name** field.
5. Provide a short description for added detail.
6. Click **Submit**.
7. Return to the Record Producers list and search for your newly created record producer.

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8. Click to open your newly created record producer.
9. Scroll down the form and click to open the Variable Sets tab.
10. Select **Edit** to add the appropriate variable sets to the record producer.
11. Select and add the following variable sets to the record producer using the add button: *sn_appointment_variable_set* and *sn_walkup_variable_set*.
12. Click **Save**.

### Create or modify a Walk-up Experience appointment booking service configuration

Create or modify appointment booking configurations for Walk-up Experience services. A service is defined as the actual physical location of a walk-up queue. The information stored in the Walk-up Experience application configuration applies to all services, or queue locations, within the application.

#### Before you begin

Role required: appointment_booking_admin or admin

#### About this task

To use the appointment booking feature, administrators must create a configuration for each service, or queue location, that is available to walk-up customers. Service configurations are created within the **Walk-up Experience** application configuration, as part of the **Appointment Booking** application.

#### Procedure

1. Navigate to **All** > **Appointment Booking** > **Appointment Booking Configuration**.
2. Select **Walk-up Experience**.
3. Create or modify Appointment Booking Configuration.
   - To create configuration for appointment booking, select **New.**
   - To modify an existing configuration, select the configuration from the list.
4. On the form, fill in the fields.

#### Appointment booking service configuration fields

| Field | Description |
|---|---|
| Active | Option to enable appointment booking for the service.<br>**Note:**<br>If inactive, customers cannot schedule appointments for the service but can still create work orders. |
| Enable day level configuration | Option to configure the schedule at a day level. For more information, see Configure day-level appointment booking. |
| General Information | |
| Name | Name of the service configuration. |
| Configuration | Name of the appointment booking configuration to which this service belongs. |
| Availability table | Table used to calculate appointment availability. For Walk-up Experience, choose Walk-up Appointment [wu_appointment]. |

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| Field | Description |
|---|---|
| Holiday Schedule | Holiday schedule to use when determining availability. Appointment booking evaluates the holiday schedule when determining the number of available appointments and excludes any day in the schedule that is set to **Exclude**. Select the lookup icon and select a schedule from the Schedules list.<br><br>**Note:**<br>Holiday schedules are useful when the assignment method for tasks is set to **manually**, which does not consider agent schedules. |
| Catalog Information | |
| Catalog item | The service in the service catalog for which this appointment booking configuration is being created. The catalog item must exist in the service catalog. Select the lookup icon and select the associated service from the Record Producers list.<br><br>You must create a record producer for each walk-up service location. Refer to Create a record producer to capture Walk-up Experience appointment records.<br><br>If you're using appointment booking with work orders, create a work order template before you configure appointment booking. |
| Location | The field on the record provider that determines the appointment location.<br><br>**Note:**<br>Ensure the **Location** field on both this form and the Walk-up Location Queue (wu_location_queue) form are configured in alignment. Walk-up Experience contains the *location* reference variable, which is a Location (cmn_location) record. Selecting **Location** from the search list icon ensures that you're aligning with the same time zone as the walk-up location you are configuring for. When you select **Location**, the online appointment scheduling calendar displays in the requester time zone. If this field is kept empty or if the requester preference for the instance is not configured to have an associated time zone, the appointment scheduling calendar defaults to display in the requester time zone.<br><br>If a requester in Europe has User preferences for **Time zone** configured for **Europe/Brussels** and the Appointment Booking Configuration for the **Location** field is set to a cmn_location with the time zone **US/Pacific**, then the appointment scheduling calendar will display in the US/Pacific time zone.<br><br>When a requester creates an appointment, the system defaults to use the schedule associated with the Walk-up Location Queue (wu_location_queue), regardless of the **Location** field value of this record producer. |
| Timezone | Time zone used for the location. Select **Appointment location** from the drop-down list. |
| Appointment is mandatory | Option for enabling the feature to make it mandatory for a requester to create an appointment when requesting this service. |

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| Field | Description |
|---|---|
| | ○ If selected, the **Appointment** field appears on the record producer, and the requester selects an available appointment before submitting the service request.<br>○ If not selected, the requester can submit the service request without selecting an appointment. |
| User contact | The field on the record producer that determines who the appointment is being created for. Set this field to **Contact**. This is a reference field that looks for a sys_user variable on the record producer. |
| Booking | |
| Appointments per window | Number of available appointments for each configured appointment time slot. This number determines the number of available appointments that are displayed on the Select Appointment window. Enter a number in this field if the assignment method for tasks is set to **manually**. If set to either **using auto-assignment** or **using dynamic scheduling**, this setting does not apply, unless a location is not provided. Then the configuration defaults to the number of appointments per window. |
| Lead time | Number of hours or days from the current time after which an appointment can be booked for this service. Define the lead time in hours or days. The default is four hours. |
| Future bookable max days | Number of days in advance of the current day for which an appointment can be booked for this service. The default is 14 days. |
| Reschedule / Cancel by time | Number of hours or days prior to an appointment start time that are required for an appointment to be canceled or rescheduled. If a requester attempts to cancel or reschedule an appointment within this number of hours, the **Cancel** button is not available. Define the time in hours or days. The default is four hours. |
| Appointments | |
| Appointment window | Duration of the appointment window.<br>**Note:**<br>Allow enough time for the work to be started and completed within this window. |
| Work duration | Time required to complete all tasks created by the record producer. This duration is set for a task when it is created. Used to determine availability. The default is one hour. |
| Travel duration (round trip) | Estimated value of the average travel time required (round trip) for the agent performing the task. Set the value to 0 because the work is performed on site and travel time is not needed. |
| Daily Schedule | |
| Bookable days | Days of the week for which appointments can be booked. The default is Monday through Friday. Bookable days should reflect the appointment schedule. |

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| Field | Description |
|---|---|
| | **Note:** Appointment schedules are separate from the walk-up queue location schedule but should be the same days and hours as the walk-up queue location schedule. |
| Daily start time | Start of the work day and the earliest start time for an appointment window. The default is 9:00. |
| Daily end time | End of the work day and the latest end time for an appointment window. The default is 18:00 PM. |
| Include daily break | Option to schedule a break for each bookable day, then select the break start and end times. You can define one break which applies to all days. |
| Appointment booking preview | Option to provide a preview of the appointment windows and times based on the selected start and end times, break time, and appointment window. |

5. Select **Submit**.

### Configure day-level appointment booking

Create or modify different schedules at a day level when booking appointments for a service. The appointments can be scheduled for different slots such as morning, afternoon, and evening.

## Before you begin

Role required: admin

## Procedure

1. Navigate to **All** > **Appointment Booking** > **Appointment Booking Configuration**.
2. Select **Walk-up Experience**.
3. In the Appointment Booking Service Configuration related list, select a service configuration for which you want to configure the appointment schedules.
4. Select **Enable Advanced Configuration**.
5. In the Appointment Booking Day Configuration related list, click **New**.
6. On the form, fill in the fields.

### Appointment Booking Day Configuration form

| | |
|---|---|
| Name | Name of the day level configuration, such as Morning, Afternoon, or Evening |
| Active | Option to indicate if the appointment slot is active or not. |
| Start date | Start date of the appointment booking window |
| End date | End date of the appointment booking window |
| Daily start time | Start of the work day and the earliest start time for an appointment window. The field is automatically set to 9a.m. |

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| | |
|---|---|
| Daily end time | End of the work day and the latest end time for an appointment window. The default is 6p.m. |
| Service configuration | Name of the service configuration for which you are scheduling configurations at a day level, such as Point-of-Sale Installation. |
| Work duration | Time required to complete all tasks created by the record producer. This duration is set for a task when it is created. Used to determine availability. The default is 1 hour. |
| Travel duration (round trip) | Estimated value of the average travel time required (round trip) for the agent performing the task. Used to determine availability. The default is 15 minutes. |
| Appointment window | Duration of the appointment window.<br>**Note:**<br>Allow enough time for the work to be started and completed within this window. |
| Appointments per window | Number of available appointments for each configured appointment time slot. This number determines the number of available appointments that are displayed on the Select Appointment window. Enter a number in this field if the assignment method for tasks is set to manually. If set to either using auto-assignment or using dynamic scheduling, this setting does not apply, unless a location is not provided. Then the configuration defaults to the number of appointments per window. |
| Include daily break | Option to schedule a break for each bookable day. Set the break start and end times. You can also define one break which applies to all days. |
| Appointment booking preview | Provides a preview of the appointment windows and times based on the selected start and end times, break time, and appointment window. |

7. Select **Submit**.

### Configure daily schedules for Walk-up Experience appointment booking

Define hours of operation and daily schedules for booking an appointment at your Walk-up Experience location.

#### Before you begin

Role required: appointment_booking_admin or admin

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### About this task

Create a unique appointment booking schedule for each day of the week or for specific days of the week. For example, you can set the appointment booking availability schedule to run from 9:00am to 5:00pm, Monday, Wednesday, and Friday. The Tuesday and Thursday appointment availability schedule can run from 9:00am to 12:00pm. You can completely remove appointment booking for a specific day of the week, for example, Friday.

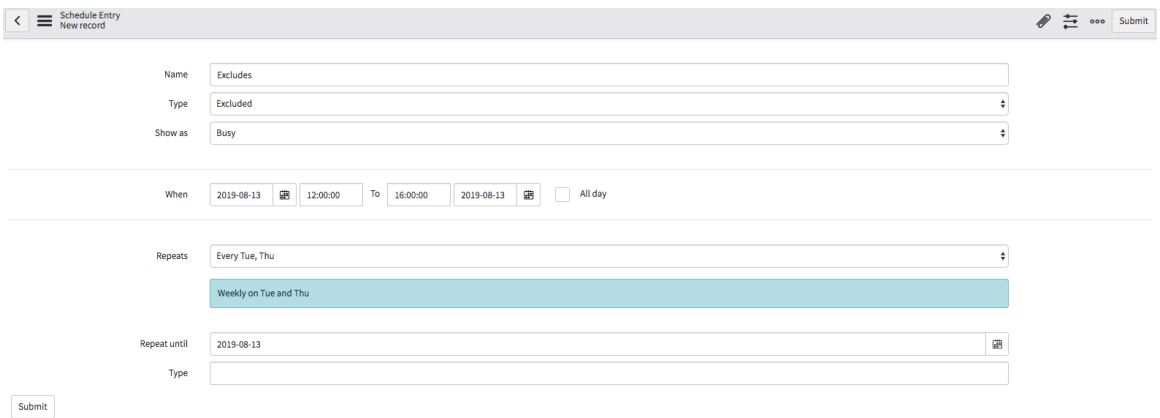
**Note:**
To specify unique daily booking schedules, while using your associated appointment booking configuration, create new Schedule Entries to exclude the hours appointment booking is not available.

### Procedure

1. Navigate to **All** > **Walk-up Experience** > **Administration** > **Schedules**.
2. Select the schedule you use, for example, the **8-5 weekdays excluding holidays** schedule.
3. In the Schedule Entries related list, select **New**.
4. Name the new record **Excludes** and fill in the form to create a unique daily booking schedule for Tuesday and Thursday appointments.

**Schedule Entry Excludes configuration fields**

| Field | Description |
|---|---|
| Name | Name of the record. For example, name the record **Excludes** to indicate the hours excluded from appointment booking. |
| Type | Choose **Excluded** as the type. |
| Show as | Choose **Busy** as the reason for the exclusion. |
| When | Indicate the date to begin using this booking availability schedule. Also indicate the time to exclude booking availability for this date. For example, the hours of 12:00pm through 5:00pm. |
| Repeats | Indicate the recurrence for this availability schedule. For example, **Weekly on Tue and Thu**. |
| Repeat until | Specify how long you want this availability schedule to run by selecting an end date. |




5. Select **Submit**.

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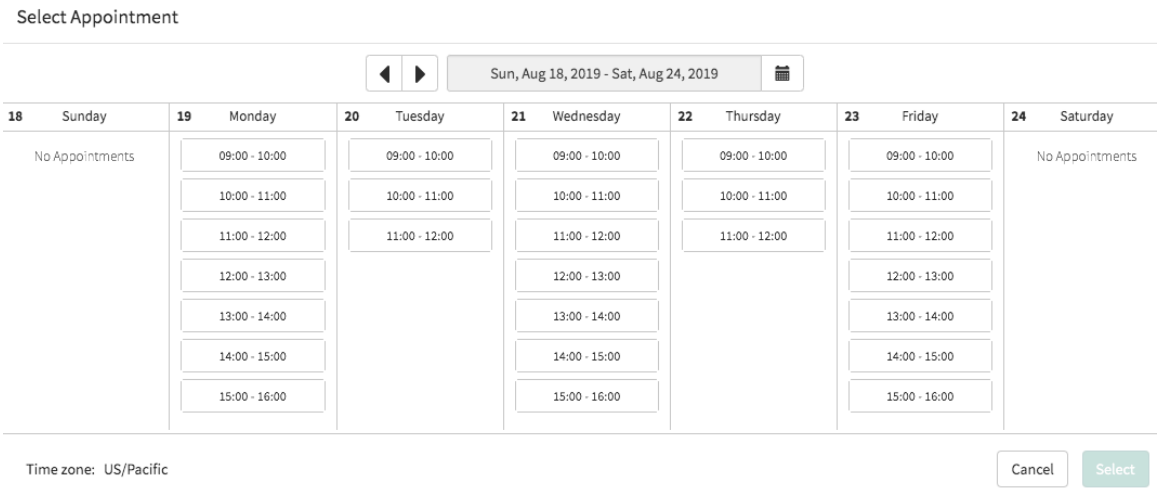
6. To verify that Tuesday and Thursday appointment booking is only available from 9:00am to 12:00am, navigate to your online Walk-up Check-in application.
   If configured for view, You can access the online Walk-up Check-in application from the **Service Portal Home** page or under **Self-Service** in the left navigation bar.
7. Select the walk-up location for which you are verifying the schedule.
8. Select **Schedule an appointment** and select a reason for the visit.
9. Select a date for the appointment.
   The **Select Appointment** window displays the first available appointment, by week and day.
10. Determine that appointments are only available on Tuesdays and Thursdays from 9:00am to 12:00pm.




## Configure excluded hours for Walk-up Experience appointment booking

Using the **Appointment Booking** application, you can specify excluded appointment hours in the schedule for your Walk-up Experience location.

### Before you begin

Role required: appointment_booking_admin or admin

### About this task

Configure your Walk-up Experience location to exclude certain hours of operation from users scheduling appointments. For example, you can set the appointment booking availability schedule to run from 8:00 a.m. to 5:00 p.m., Monday through Thursday. On Friday, you can schedule the appointment booking availability from 8:00 a.m. to 2:00 p.m. You can also completely remove appointment booking for a specific day of the week, for example, Mondays or Friday.

Reconfigure the **Holiday Schedule** field on the Appointment Booking Service Configuration form for your walk-up location to use a custom **Off hours schedule** instead of the default holidays schedule.

### Procedure

1. To create a schedule to exclude your unavailable appointment booking hours, navigate to **Walk-up Experience** > **Administration** > **Schedules**.
2. Select **New.**
3. Provide a name for your schedule, for example, `Off hours schedule`.
4. Add a description, if desired.

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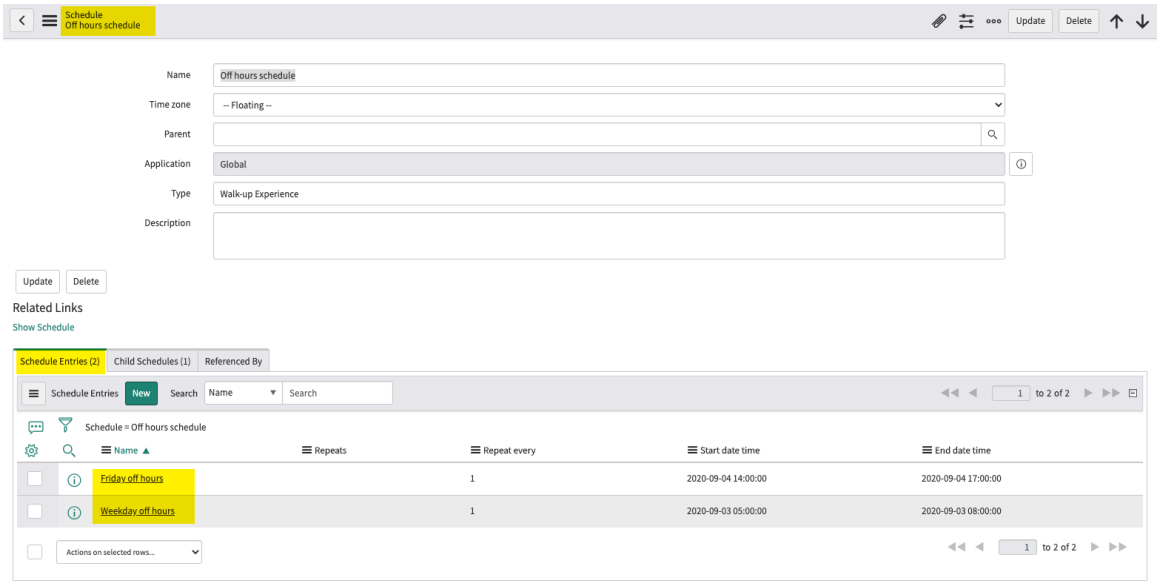
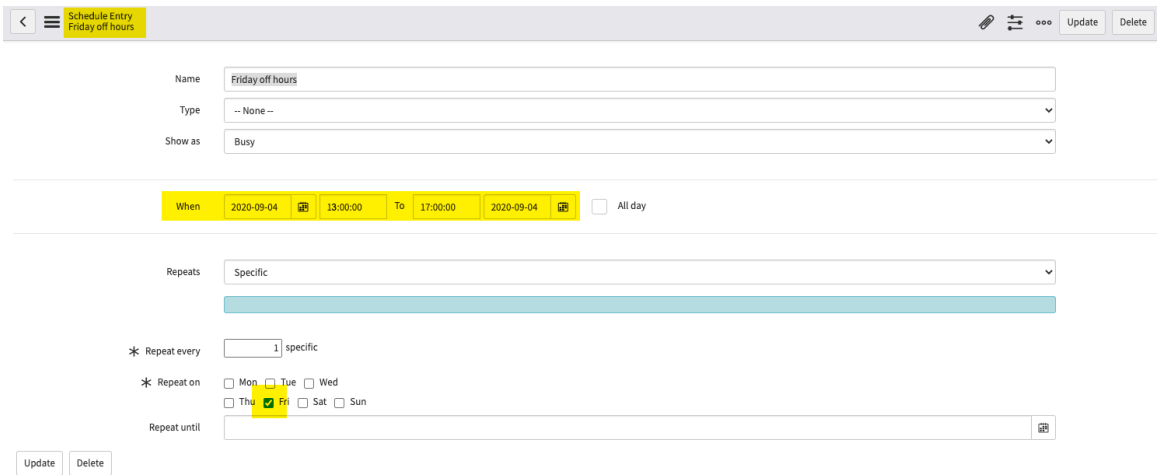
5. Select **Submit**.
6. In the **Schedules** list, search by **Name** for the new **Off hours schedule** record.
7. Select **Off hours schedule** to open the record.
   Use the Schedule Entries related list to create two separate excluded hours schedule entries, one for **Friday off hours** and one for **Weekday off hours**.




8. Select **New** in the Schedule Entries related list to create **Friday off hours**.

   You will configure Fridays to exclude all appointments after 1:00 p.m.




9. Select **Update** to save your changes.
10. Add the **U.S. Holidays** default off-hour schedule as a child schedule to the **Off hours schedule**.

    a. Click the Child Schedules related list.

    b. Click **Edit** and use the slush bucket to move the **U.S. Holidays** schedule into the **Child Schedules List** for the **Off hours schedule**.
    Adding the **U.S. Holidays** schedule as a child ensures that all holidays are excluded from appointment booking and overrides the **Off hours schedule** configurations for holidays.

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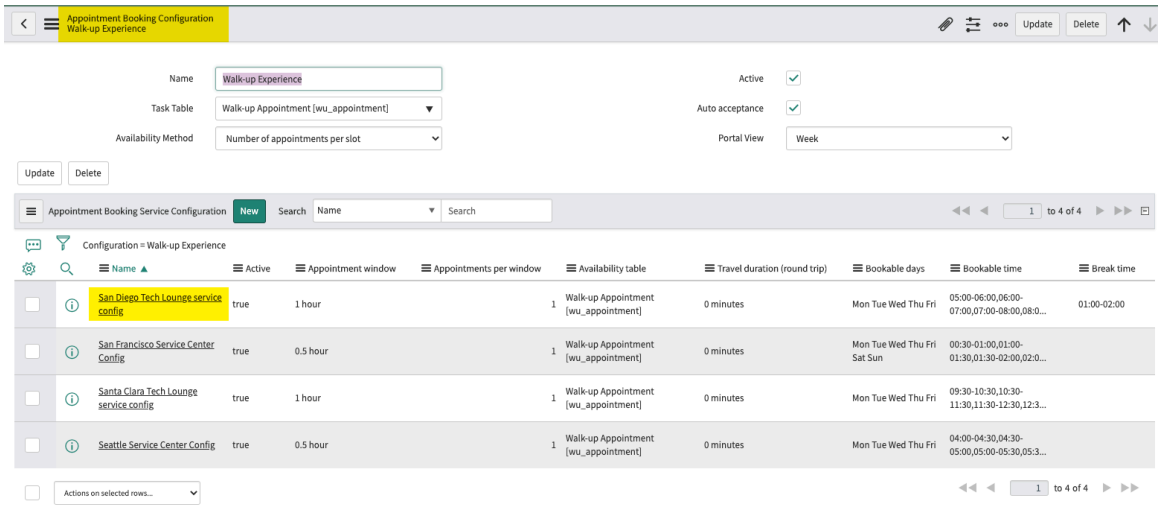
**Note:**
The **U.S. Holidays** schedule is the default off-hours schedule for the United States. Default off-hours schedules will differ depending on your location.

**c.** Click **Save**.

**11.** Click **Update** to save the **Off hours schedule** record.

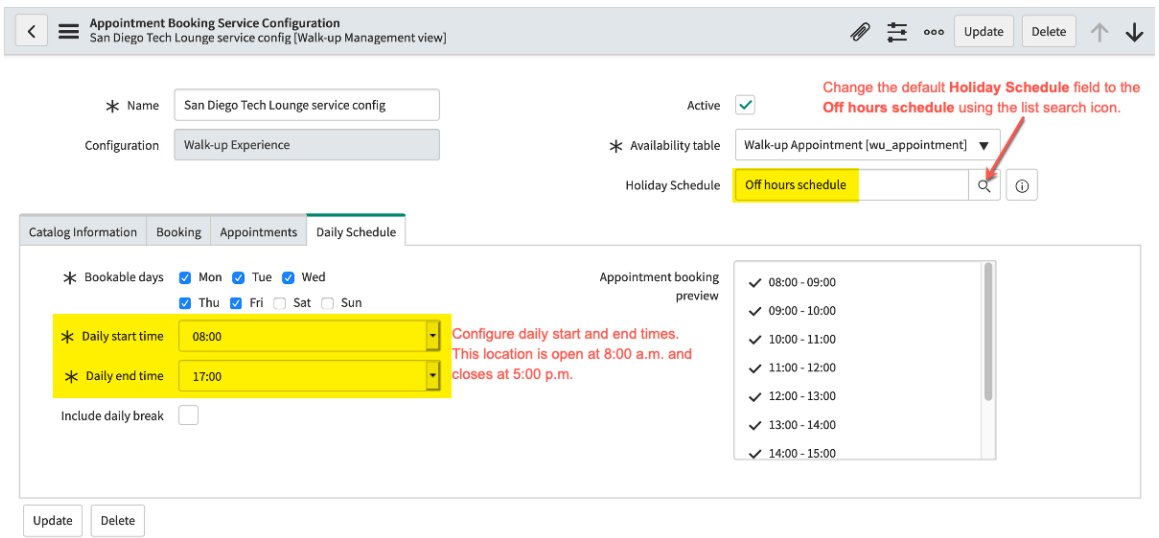
**12.** Next, to configure your walk-up location to use the **Off hours schedule**, navigate to **Appointment Booking** > **Appointment Booking Configuration**.

**13.** Select **Walk-up Experience** and then the walk-up location you want to reconfigure, for example, San Diego Tech Lounge.




**14.** In the **Holiday Schedule** field, change the default, base system schedule value to **Off hours schedule**, using the list search icon.

**15.** Click the **Daily Schedule** tab to configure the daily start and end times for the walk-up location. For this location, the hours of operation begin at 8:00 a.m. and end at 5:00 p.m. (17:00), Monday through Friday.




**16.** Select **Update** to save your changes.

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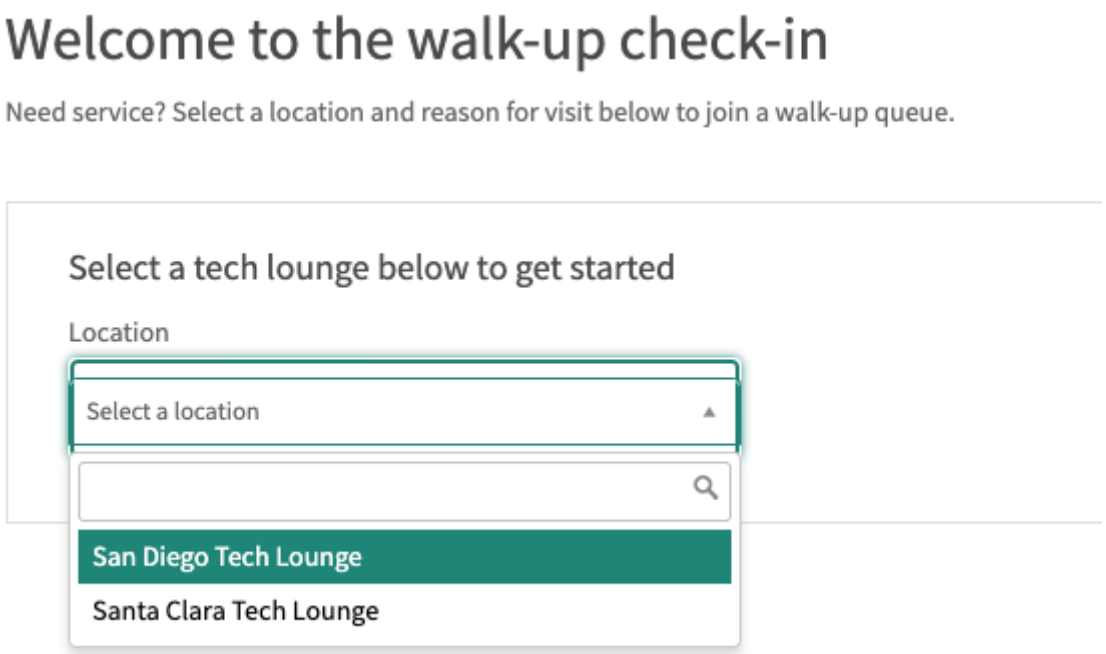
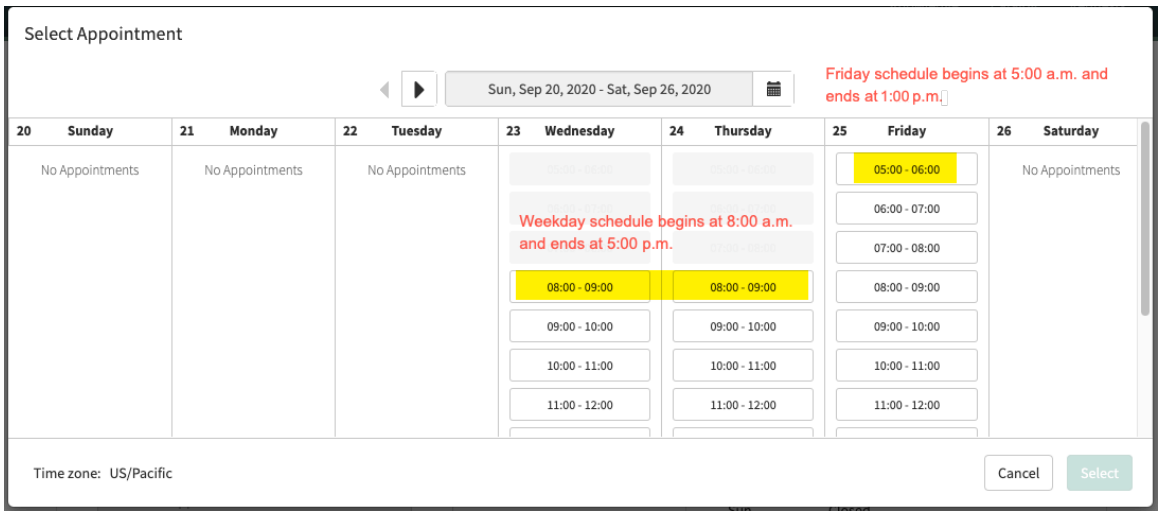
17. To verify the hours you want excluded from appointment booking are unavailable, navigate to **Self-Service** > **Walk-up Check-in**.
18. Select the walk-up location with the excluded hours you want to verify.




19. Select **Schedule an appointment**.
20. Click the calendar icon to view the available appointment times for the walk-up location. The appointment schedule reflects the excluded hours you configured by using the **Off hours schedule**. Scroll down in the **Select Appointment** window to view the end times.




## Activate and configure appointment booking reminders for Walk-up Experience

Configure scheduled appointment reminders for Walk-up Experience users. Reminders ensure users attend appointments in a timely manner or reschedule or cancel an appointment if they can no longer attend.

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### Before you begin
Role required: sn_walkup.walkup_admin or admin

### About this task
To operate appointment booking reminders, activate the **Appointment Booking Reminders** Scheduled Job, since it is not active by default. In addition, the **Appointment reminder** field does not appear on the **Appointment Booking Service Configuration** form by default. You must add it to the form and configure reminders. Reminders are inactive unless a configuration is set.

### Procedure
1. Navigate to **System Definition** > **Scheduled Jobs**.
2. Search for **Appointment Booking Reminders** by name and select to open.
3. Click the **Active** field to activate the scheduled job.
4. Click **Update**.
5. To add the **Appointment reminder** field to the **Appointment Booking Service Configuration** form, navigate to **Walk-up Experience** > **Administration** > **Appointment Configurations**.
6. Select a Walk-up Experience service configuration from the list.
7. Click the menu button ( ) and scroll to **Configure** > **Form Layout**.
8. Select **Appointment reminder** from the **Available** list and move it to the **Selected** list using the add button.
9. Select **Save**.
   The **Appointment Booking Service Configuration** form is displayed with the **Appointment reminder** field.
10. To configure an appointment reminder, choose time, in hours, from the **Appointment reminder** field drop-down list.
    The time represents the time before a scheduled appointment that you want to send a reminder. For example, a reminder is sent, two hours before a scheduled appointment.
11. Select **Update** to add the appointment reminder configuration.

#### Variable time slots for appointment booking

Variable time slots, such as work duration and dates, for appointments can be configured and booked based on the reason for a location. The reason can be an issue or request.

This feature enables you to do the following:

- Configure variable time slots for booking an appointment based on the different reason for a location by creating advanced configurations and service configuration rules.

  **Note:**
  The service configuration rules and the advanced configurations must not overlap each other.

- Communicate to the customers about the availability of the agents for a location.
- Manage the walk-up locations and resources more effectively and efficiently.

To enable this feature, select the **Enable advanced configurations** check box on the Appointment Booking Service Configuration form.

You can create multiple advance configurations for a service configuration rule.

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## Configure variable time slots for appointment booking

Configure variable time slots for appointment booking in a walk-up location by defining rules and configurations.

### Before you begin

Role required: appointment_booking_admin or admin

### About this task

To use the appointment booking feature, administrators must create a configuration for each service or queue location that is available to walk-up customers. Service configurations are created within the Walk-up Experience application configuration, as part of the Appointment Booking application.

### Procedure

1. Navigate to **All** > **Walk-up Experience** > **Administration** > **Appointment Configurations**.
2. Create or modify Appointment Booking Configuration.
   - To create a new configuration for appointment booking, select **New**.
   - To modify an existing configuration, select the configuration from the list.

   **Note:**
   For more information on creating or modifying appointment booking configuration for Walk-up Experience and field-related information, see Create or modify a Walk-up Experience appointment booking service configuration.

3. Select the **Enable advanced configurations** check box.
   The **Advance Configurations** and **Service Configuration Rules** tabs appear in the related list of the Appointment Booking Service Configuration form.
4. Click the **Service Configuration Rules** tab, and create or modify an existing rule.
   - To create a new rule, click **New**.
   - To modify an existing rule, select the configuration from the list.
5. On the Service Configuration Rule form, fill in the fields and click **Submit**.
   For more information on the fields, see Create appointment booking service configuration rules.

   **Note:**
   The **Task Table** and **Task Conditions** fields are not applicable for Walk-up Experience.

6. Click the **Advance Configurations** tab, and create or modify a configuration.
   - To create a new configuration, click **New**.
   - To modify an existing configuration, select the configuration from the list.
7. On the **Advance Configurations** form, fill in the fields and click **Submit**.
   For more information on the fields, see Create appointment booking advanced configuration.
8. Click **Submit**.

### What to do next

You must map the defined advance configurations with the defined service configuration rule for a location. Use the Reasons for Visit related list on the Walk-up Location Queue form. For more information, see Create or modify Walk-up Experience locations.

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### Create or modify a Walk-up Experience stockroom

Create stockrooms and assign assets and groups specifically for your walk-up location. Walk-up stockrooms contain common assets that visitors to the walk-up location will typically request, such as a computer mouse, monitors, and cables. The walk-up location stockroom should be easily accessible to your walk-up location for fast request fulfillment.

#### Before you begin

Role required: sn_walkup.walkup_admin, asset_user, inventory_user, or admin

#### About this task

Stockrooms are separate, standalone entities in the Asset Management application.

#### Procedure

1. To view walk-up location stockrooms, navigate to **Walk-up Experience** > **Administration** > **Walk-up Stockrooms**.
2. To modify an existing walk-up stockroom, click the stockroom name, otherwise click **New** to create a stockroom.
3. Complete the Stockroom New record [Walk-up view] form or modify fields on an existing form.

| Fields | Description |
|---|---|
| Name | Display name and unique identifier of the stockroom. |
| Assignment group | Group that primarily uses the stockroom. |
| External | Whether this stockroom is managed internally (check box is cleared) or is managed externally by a third party (check box is selected). |
| Location | Physical location (address) of the stockroom. |
| Type | Type of stockroom. Chose **Walk-up** to create a walk-up stockroom. |
| Manager | Person in charge of the stockroom. Receives restocking notifications and requests for the stockroom stock rules. |

For more information on creating or modifying a stockroom, and adding and managing stockroom assets, refer to Stockrooms .

### Configuring maximum multiple appointments

Enhance Walk-up Experience service experience by helping requesters to book multiple appointments simultaneously. You can configure the location to accept multiple bookings and also decide the maximum number of appointments a requester can book at a location.

Only one appointment could be booked by a requester with Walk-up Experience appointment booking feature. The requesters could not book any follow-up appointments. For example, requester has scheduled a laptop drop-off appointment and wants to schedule a pick-up appointment in advance.

With enhanced appointment booking feature, the requesters can now book multiple appointments simultaneously.

Scheduling multiple appointments, the requesters and the agents can maintain the context of the service request. To reduce back and forth communication and resolve issues seamlessly, the agents can also book multiple appointments on behalf of the requester.

#### Implementation

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- **Administrators:** The administrators can decide and configure the maximum number of appointments a requester can book for a particular location. For example, at Santa Clara tech lounge location, set up the maximum number of appointments as 2. The requester can only schedule two appointments in advance. If maximum number of appointments per user is changed or modified, existing appointments are not affected. The change is applied to all future appointment bookings. To configure and set the maximum number of appointments at a location, see Create or modify Walk-up Experience locations.
- **Agents:**To book a walk-up appointment on behalf of the requesters when incident resolution requires requesters for a follow-up visit, see Create an appointment through incident
- **Requesters:**To book multiple appointments and plan walk-up visits in advance, see Plan your visit.

### Configure appointment type

Support requesters in-person and virtually and assist them through remote appointment.

A walk-up location can support in-person visits of a requester or support the requester virtually.

Extend services to your employees working remotely with the new Walk-up appointment booking type as **remote**. With the new remote appointment type, you can manage crowding at the location, support work from home and hybrid work model effortlessly. Integrate MS Teams to connect to the agents and the requesters and maintain the conversation context.

- **Administrators:** The administrators can set a location as remote, in-person, or both. To configure appointment type for a location, see Create or modify Walk-up Experience locations.
- **Agents:** The agents are notified whether the interaction is remote or in-person. They can start a conversation with the requester on Microsoft Teams and bring over the context from Microsoft Teams chat to walk-up interaction.
- **Requesters:**The requesters can choose if they want to be served remotely by selecting appointment type as remote while scheduling an appointment. For more details, see Plan your visit. They can still get their issues resolved by visiting the location.

### Create a kiosk at a location

Create a kiosk to provide specialized services to the requesters. Support a Walk-up location with multiple kiosks to address issues of the requesters seamlessly.

## Before you begin

Role required: admin

## About this task

A kiosk refers to a platform specifically catering to a particular service you have to offer to the requesters. The kiosks are an efficient way to offer services to the requesters to resolve their issues. You can set up multiple kiosks at a walk-up location depending on various business processes. For example, financial organizations, hospitals, IT companies can use kiosks as an alias to agents.

## Procedure

1. Navigate to **All** > **Walk-up Experience** > **Administration** > **Walk-up Locations**.
2. Select a location from the list of Walk-up locations for which you want to create or add a kiosk.
3. On the Walk-up Location Kiosks related list, select **New**.
4. On the Walk-up Location Kiosk form, fill in the fields.

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#### Walk-up Location Kiosk

| Field | Description |
|---|---|
| Name | Unique name of the kiosk. |
| Description | Details describing the services provided at the kiosk. |
| Active | Option to make the kiosk active for the location. |
| Location queue | Location where you want to create a kiosk. The field is automatically populated with the current location. You can create the kiosk for another location by selecting different locations from the look-up list. |

5. Select **Submit**.

### Create or modify Walk-up Experience locations

Create or customize the predefined Walk-up Experience location. Walk-up Experience locations contain all the information about the walk-up support venue. You can define the way each location or support venue works.

## Before you begin

Role required: sn_walkup.walkup_admin, sn_walkup.walkup_manager, or admin

## About this task

You can configure walk-up locations for work schedules, appointment bookings, assignment groups, and associate stockrooms. Set up management and administrative rules for your walk-up location. Specify reasons-for-visit options and configure how interactions display for each walk-up location.

## Procedure

1. Navigate to **All** > **Walk-up Experience** > **Administration** > **Walk-up Locations**.
2. To create or modify an existing walk-up location, do one of the following:
   - To create a new walk-up location, click **New**.
   - To modify an existing location, select the walk-up location from the list.
3. On the form, fill in the fields.

#### Configure Walk-up location form

| Fields | Description |
|---|---|
| Name | Name of the location. For example, `Santa Clara tech lounge`. |
| Description | Description of the location. |
| Schedule | Schedule of work operation days and hours that the walk-up location follows. |
| Appointment Booking | Appointment booking plan for the walk-up location. For more details, see Booking walk-up appointment. |

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| Fields | Description |
|---|---|
| Service channel | Service channel that the agents work on. Select the **Walk-up** service channel. |
| Define condition here | Option to route work items to a queue using a condition. |
| Condition mode | Condition modes to define the routing of work items. The available options are as follows:<br>○ **Simple**<br>○ **Advanced**<br>This field appears only when the option **Define condition here** is selected. |
| Work item routing condition | Condition that defines who provides customer support at a walk-up location. Location is determined by physical address.<br>This field appears only when **Simple** is selected from the **Condition mode** field. |
| Active | Option to set the walk-up location as active. |
| Enable away state | Option to set the location in a non-operational or closed state. |
| Away message | Display message to indicate that the location is temporarily closed for the specified time. The message is specified for work hours other than the scheduled closed times. |
| Stockroom | Stockroom that supplies assets to the location. |
| Location | Physical address of the location. |
| Location image | Picture of the location. For example, a picture of the city, building, or work-desks of the walk-up location. |

4. Select the **Management** tab and fill in the fields.

### Walk-up Management tab

| Fields | Description |
|---|---|
| Position notification | Queue position at which a requester is sent a notification. For example, if the position notification is set to **3**, the requester receives a notification that is third in line to be assisted. |
| Last check-in | Last available check-in time in minutes. For example, 30 minutes before closing. |
| Enable online check-in | Option to set this location for online checking in. Allow requesters to check in to the location remotely from a laptop or mobile phone. |
| Enable kiosk | Option to enable the kiosk feature at the location. |
| Show kiosk | Option to show the kiosk on the portal and on the on-site display monitor. |
| Enable appointment delegation | Option to enable agents and requesters to book an appointment on behalf of someone else. |

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| Fields | Description |
| --- | --- |
| Appointment delegation group | Group of people who can book an appointment on behalf of the requester or agent. Add a new group of requesters if an appropriate group does not exist.<br><br>This field appears only when the **Enable appointment delegation** field is selected. |
| Maximum appointments per user | Maximum number of appointments that a requester can book at a location. This field is automatically set to 1.<br><br>**Note:**<br>If maximum number of appointments per user is changed or modified, existing appointments are not affected. The change is applied to all future appointment bookings. |
| Name configuration | Option to display the information of the requesters on the on-site queue display monitor and on the online check-in screen. You can display the names in any of the following manners:<br><br>○ First name (by default)<br>○ First name and last name<br>○ First name with initials of last name |
| Appointment routing time | Time defined, in minutes, to route the work item to an agent prior to an appointment. |
| Hold time | Time defined, in minutes, that you want to put an interaction on hold before attempting to route it again to an agent. For example, if this field is set to **5**, then the interaction is put on hold for 5 minutes before rerouting it to the other agent. |
| Show estimated wait time | Option to display the estimated wait time for a requester in walk-up queues.<br><br>The wait time is calculated from the average wait time of the queue and how many requesters are currently in the queue. All estimated wait times are rounded to the nearest whole minute.<br><br>The estimated wait time calculation requires the use of the Advanced Work Assignment queueing system to calculate the average wait time.<br><br>Estimated wait times are displayed at the following places:<br><br>○ Online check-in.<br>○ On-site check-in and on-site queue display monitor.<br>○ **Status** widget on the Service Portal |
| Audio Playback | Specify when the audio confirmation will play. For example, when a requester checks into an on-site queue or checks in online or both, the audio is played. This field is automatically set to **None**. |
| Audio File | Audio to play for the following walk-up queue conditions: |

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| Fields | Description |
|---|---|
| | ○ When a requester checks into a queue, audio is played from the actual check-in location, typically a stationary laptop.<br>○ When a new requester moves up in the queue, audio is played from the queue display monitor.<br>○ When a requester makes an appointment online, audio is played from the device of the requester.<br>The base-system default file is `walkup_checkin.mp3`.<br>**Note:**<br>Only mp3 file formats are supported across all browsers.<br>You may need to provide additional browser permissions to use an audio file on the Safari browser. |

5. Click the **Administration** tab and fill in the fields.

**Walk-up Administration tab**

| Fields | Description |
|---|---|
| Queue time display | Choice to display the time on the on-site display monitor. Choices are as follows:<br>○ None: If you do not want any display.<br>○ Check-in time: The check-in time of the requester.<br>○ Time waited. Time remaining for the requester to check in. |
| Queue message | Welcome message to display on the on-site display monitor of the location. |
| Check-in greeting | Greeting message to guide the requester to sign into the queue at the designated check-in monitor. |
| Closed message | Message to inform the requesters that the location is closed as it is outside the hours of operation. |
| Closed phone number | Contact phone number for requesters to reach out to, when the location is closed. |
| Closed phone number label | Label defined for the contact information. For example, `IT Support`, `Customer Support`, or `HR Support`. |
| Closed record producer | Mode of reaching out to the service providers when the location is closed. For example, if the option is set to **Create Incident**, the requesters are redirected to create incidents. |
| Badge Check-in Reason | Reason for checking into a walk-up location. This field is automatically set to **Other**.<br>**Note:**<br>Badge scan check-in is not an authentication mechanism. |

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| Fields | Description |
|---|---|
| Badge Check-in reason description | Description of the reason for checking in. This field is automatically set to **Walk-up badge scan check-in**.<br>**Note:**<br>Badge scan check-in is not an authentication mechanism. |
| Closed image | Picture or an image indicating that the walk-up location is closed. The image is displayed on the on-site display monitor. |
| Maximum search results | Number of search results to provide for contextual searches. |
| Contextual search config | Context that the requesters use while checking in or booking an appointment. |
| Appointment type | Option to set the type of appointment the requesters can book for the location. The following options are available.<br>○ In-person<br>○ Remote<br>○ Both |
| Enable unregistered user entry | Option to allow requesters who do not have a user name in the system to check into the location for support. For example, such requesters can be non-employees who are guests visiting the location. |
| Enable lookup user entry | Option to enable requesters to quickly see their names on the list when they start typing. |
| Enable technician info | Option to display the names of the agents on the monitor at the location. |
| Enable technician avatar | Option to display the avatar of the agent on the wall monitor at the location. |
| Enable badge check-in notification | Option to show a notification when a requester checks into a queue using a badge scanner. |
| Header logo | Option to add a header logo. The header logo is location-specific. If no logo is specified, by default, the Walk-up Portal logo is used. |
| Queue logo | Option to add a logo for the designated on-site display monitor. Design this logo to work with a black background. If no logo is specified for the queue, then the Header logo is used by default. If no Header logo is specified, the Walk-up Portal logo is used. |

6. Right-click in the form header and select **Save**.
   The following tabs appear:

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- **Interactions**: View interactions or configure how the walk-up interactions list is displayed.
- **Walk-up Appointments**: View appointments or configure how the Walk-up appointments list is displayed.
- **Reasons for Visit**: View, modify, or create a reason for visit.

  **Note:**
  For configuring variable time slots feature in Walk-up Experience, you must use this tab for mapping the advance configurations with the service configuration rule. For more information, see Configure variable time slots for appointment booking.

- **Walk-up Location Kiosks**: Modify or create a kiosk for the location.
- **Assignment Eligibility**: View, modify, or create an assignment rule for your walk-up locations.

  Assignment rules are configured in the Advanced Work Assignment application.

- **Work Item Sort Order**: View, modify, or create a work order for your walk-up locations.
- **Location Queues Badge Readers**: View, modify, or add a badge reader for your walk-up locations.

**7.** To save the new or modified walk-up location, Select **Update**.

### Skill-based routing in Walk-up Experience

Route work items to assigned groups. Use skill-based routing to ensure that the right work goes to the right agent depending on the walk-up reasons.

Identify skills for a specific set of conditions defined for walk-up reasons. Use business rules to automatically add the skills to those types of work items. In the Walk-up Experience application, the work items get automatically assigned to the right agents based on the skills.

- When a new walk-up interaction is opened trough the check-in portal or booking an appointment, Advanced Work Assignment routes the interactions to agents who have the skill set required to address the reason for interaction.
- The administrators must activate **Skill determination for interaction** BR on interaction table for Advanced Work Assignment to route interactions based on the agent's skills.
- New interactions opened after the set up are routed to the available agent with the respective skills.
- If an agent is unavailable and the interaction does not need any mandatory skills, the walk-up task is routed based on the assignment rule associated with the location.

For more information, see Skills Management

### Routing walk-up tasks to skilled agents

Use business rules to automatically route walk-up tasks to the agents based on their skill set.

#### Before you begin

Set up metadata in **All Skills**, **Group Skills**, and **User Skills**tables before configuring walk-up locations for skill-based routing. For more information, Configuring Skills Management.

Role required: admin

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### Procedure

1. Navigate to **All** > **Walk-up Experience** > **Administration** > **Walk-up Locations**.
2. Select the location to add skills of the agents.
3. In the related list, select **Reasons for Visit**.
4. Select a reason to associate the skills.
5. On the **Walk-up Skills for Reasons** related list, select **New**.
6. On the form, fill in the fields.

#### Walk-up Skills

| Fields | Description |
|---|---|
| Active | Option to make the skill active. |
| Skill | Skill required for the selected walk-up reason. |
| Mandatory | Option to make the skill mandatory. If the skill is set as mandatory, the walk-up task will not be routed to any agent who does not have that particular skill. |
| Walk-up Reason | Reason for which a requester needs help. |

7. Select **Submit**

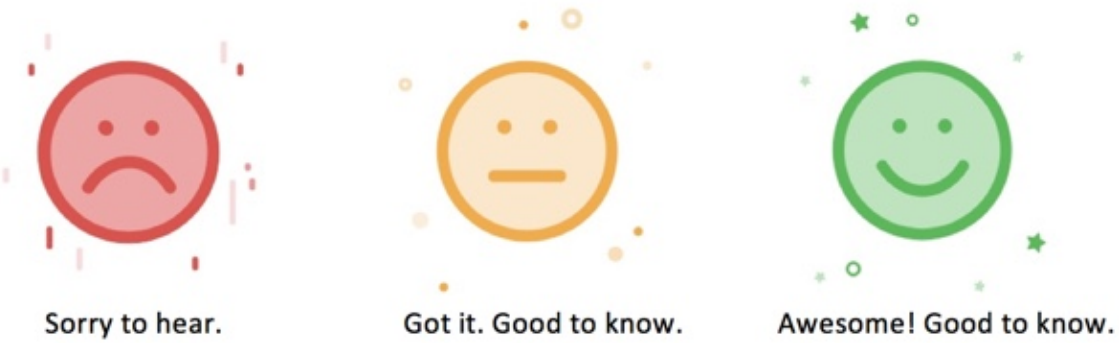
#### Walk-up Experience customer satisfaction surveys

With Walk-up Experience surveys, requesters can rate their satisfaction with walk-up location interactions and provide feedback to improve the Walk-up Experience application.

Two base-system predefined Walk-up Experience surveys are provided:

- **Walk-up CSAT survey**: On-site one-click sentiment-analysis survey where the requester can quickly rate the service based on a 1 to 3 scale, where 1 is a negative experience and 3 is a positive experience. The survey uses an image scale of three faces with different sentiments (sad, neutral, and smiling).

#### Walk-up survey




- **Walk-up Experience Satisfaction Survey**: A survey link is sent via email when walk-up interactions are closed. It uses sentiment analysis for the overall experience, wait-time experience, agent experience, agent professionalism, and additional comments. This survey is based on a 1 to 5 numeric rating scale, where 1 is very unsatisfied and 5 is very satisfied.

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Walk-up administrators and managers can modify these surveys and the associated trigger conditions. Managers and administrators can review responses by question and see a scorecard for each survey on the **Walk-up Experience Dashboard** module. Requester feedback is used to improve the performance of walk-up interactions.

For more information about working with surveys, sentiment analysis, trigger conditions, and survey questions, see Exploring Assessments and Surveys.

### Create or modify a Walk-up Experience customer satisfaction survey

Improve your **Walk-up Experience** operations and customer service by using surveys and monitoring survey results. Walk-up surveys capture important information from users about the interaction experience provided to them at the venue.

#### Before you begin
Role required: sn_walkup.walkup_admin, sn_walkup.walkup_manager, or admin

#### About this task
Creating a new customer satisfaction survey requires that you first define a new survey and then use the Survey Designer to design, configure, and make it available to the requesters.

#### Procedure

1. To view and use a base-system predefined survey in the Walk-up Experience application, navigate to **Walk-up Experience** > **Administration** > **Surveys**.
2. To modify an existing walk-up survey, click the survey name, otherwise navigate to **Survey** > **View Surveys** and click **New** to define a new survey if none of the base-system surveys are optimal for your walk-up location.
3. To modify or complete the form, refer to Modify a survey definition.

### Remove a Walk-up Experience location

If you permanently close down a physical Walk-up Experience location, you can also remove the location from the Walk-up Location Queues table.

#### Before you begin
Role required: sn_walkup.walkup_admin or admin

#### Procedure

1. Navigate to **All** > > **Administration** > **Walk-up Locations**.
2. Click the name of the walk-up location you want to remove to open the location queue record.
3. Click **Delete** in the form header.
   A confirmation pop-up appears ensuring you want to delete the record.
4. When the confirmation pop-up asks if you want to delete the record, click **Delete**.
   The Walk-up Experience location queue is removed from the application.

## Badge Reader Integration for Walk-up Experience

Improve Walk-up Experience user satisfaction by using the Badge Reader Integration application at your on-site walk-up queue locations. Walk-up Experience users can scan an employee badge to check in to a queue, rather than entering credentials.

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## Badge Reader Integration for Walk-up Experience on-site queue locations

Badge Reader Integration is a pre-built, domain-separated, base-system application. The application enables your Walk-up Experience users to simply scan an employee badge to join an on-site walk-up queue. Scanning a badge eliminates the need for users to look up a name or email to join a queue. Administrators can easily configure the badge scanning integration for use with Walk-up Experience.

By providing an enhanced, easier, and faster Walk-up Experience check-in process, the use of on-site walk-up location queues can increase and overall user satisfaction can improve. Users receive an on-screen confirmation and an audio alert after a successful check-in to a walk-up queue.

The Badge scanning integration requires activation of the Badge Reader Integration plugin (com.snc.badge_reader). The plugin enables applications, such as Walk-up Experience, to integrate with badge reader hardware. Badge Reader Integration administration requires the Badge Admin role (sn_badge.badge_admin).

**Note:**
Badge Reader Integration is not an authentication mechanism.

## Walk-up Experience Badge Reader Integration components

The badge reader hardware and integration client are physically located at a walk-up queue location. The Badge Reader Integration application provides a generic, reusable REST API used by the badge integration clients. Walk-up Experience uses the Badge Reader Integration application as a soft dependency.

Walk-up Experience implementers install the badge reader hardware on a new computer at each on-site walk-up queue location. The hardware replaces any existing tablets used for on-site check-in.

The following are important associated components.

**Associated components in badge reader**

| Component | Description |
|---|---|
| Badge number | Employee badge number. |
| Facility code | Unique facility or site code encoded into each card that identifies the organization. |
| Human Interface Device (HID) | Protocol for interfacing with user interface devices via USB. |
| Physical Access Control Services (PACS) | Method used to protect the security of a physical environment by setting authorization and authentication rules. |
| Badge reader client | Client for the badge reader. Acceptable platforms include macOS and Linux. |
| Badge reader plugin | The Badge Reader Integration plugin (com.snc.badge_reader) is at no additional cost. |

## Badge Reader Integration modules

Badge admins can access several application modules.

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| Module | Description |
| --- | --- |
| Downloads | Badge Reader Integration client for download to your system. |
| Badge Readers | Configuration module for defining and activating your badge reader devices. |
| Badge Event Handlers | Configuration module for defining what action to take when a badge is scanned by a badge reader device.<br><br>The script entered is the code executed when a badge is scanned.<br><br>These records are typically delivered as part of the application-specific badge reader integrations. |
| User Badges | Configuration module for associating users with user badges.<br><br>Configuration requires associating a sys_user with a unique badge number and facility code. |
| Badge Scan Logs | View-only module to monitor badge reader error events. |
| User Badge Configuration | Configuration module for defining the table from where the user ID and badge ID mapping information is retrieved. |

## Badge Reader Integration security

The Badge Reader Integration application is not an authentication mechanism. It provides a quicker, more convenient way for users to check into a walk-up queue. It is meant for use within the existing security perimeter at the facility. The application does not integrate with existing access control software at the facility.

## Activate Badge Reader Integration

You can activate the Badge Reader Integration plugin (com.snc.badge_reader) if you have the Badge sn_badge.badge_admin role.

### Before you begin

Role required: sn_badge.badge_admin

### About this task

The Badge Reader Integration application is a framework enabling other applications, such as Walk-up Experience, to integrate with badge reader hardware. Administrators configure and manage badge reader clients and integrations by linking badge scanners to walk-up locations and ensuring there is mapping between badge ID numbers and the reader.

Developers can extend the badge scanning framework to trigger actions in other applications based on a badge scan event. The Badge Reader Integration application does not require customization, but is customizable to respond to unique badge system hardware.

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### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.

3. Select **Install** to start the installation process.

   **Note:**
   When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

   You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

#### Installed with Badge Reader Integration

Several types of components are installed with activation of the Badge Reader Integration plugin, including tables and user roles.

**Note:**
The Application Files table lists the components that are installed with this application. For instructions on how to access this table, see Find components installed with an application.

Demo data is available for this feature.

#### Roles installed

| Role title [name] | Description | Contains roles |
|---|---|---|
| Badge admin<br><br>[sn_badge.badge_admin] | Used to administer badge reader integrations. | None |

#### Tables installed

| Table | Description |
|---|---|
| User Badge<br><br>[sn_badge_user_badge] | Record used to configure a user badge, associating a user to a badge number and facility code. |
| Badge Event Handler<br><br>[sn_badge_event_handler] | Record used to configure actions associated with a badge scan event. Stores an event handler script that can be mapped to a badge reader.<br><br>Extends the Application File table. |
| Badge Scan Log | Record used to log all badge reader error events. |

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**Tables installed (continued)**

| Table | Description |
|---|---|
| [sn_badge_scan_log] | |
| Badge Reader<br><br>[sn_badge_badge_reader] | Record used to configure badge reader devices.<br><br>Extends the Task table. |

## Walk-up Experience Badge Reader Integration setup and configuration

Badge Reader Integration set up and configuration enables your on-site Walk-up Experience users to scan a badge to quickly check into the queue.

The Walk-up Experience (com.snc.walkup) and Badge Reader Integration (com.snc.badge_reader) plugins must be activated before you set up and configure the integration. Refer to Activate Walk-up Experience and Activate Badge Reader Integration for details regarding activation.

Badge Reader Integration is automatically activated with Walk-up Experience via a conditional plugin.

Set up and configuration entails the following stages:

- Client software: Download the client executable file and install on your system.
- Badge reader device: Configure the badge reader device and register it manually or via an assisted process.
- Approval: Request and receiving device activation approval.
- Walk-up Experience application: Configure Walk-up Experience to integrate with a badge reader device.

### Create or modify Badge Reader Integration event handlers

Configure actions associated with a badge scan event and define the code to execute when a badge is scanned.

#### Before you begin

Role required: sn_badge.badge_admin

#### About this task

Using the **Badge Event Handlers** module you can map badge event handlers to multiple badge readers. For example, you may have a badge reader at your San Diego, CA walk-up location and another badge reader at your Santa Clara, CA location. Both of these badge readers can be mapped to the same Walk-up Badge Reader event.

Badge Event Handler records are delivered as part of the Walk-up Experience application-specific badge reader integrations.

**Note:**

The code entered in the **Script** field of the Badge Event Handler form is executed using a GlideScopedEvaluator in the BadgeScanProcessor.

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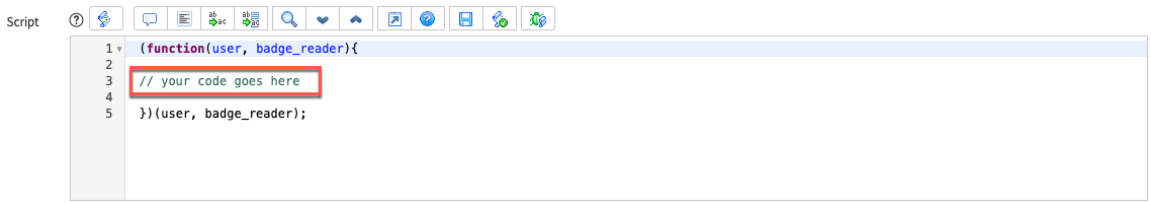
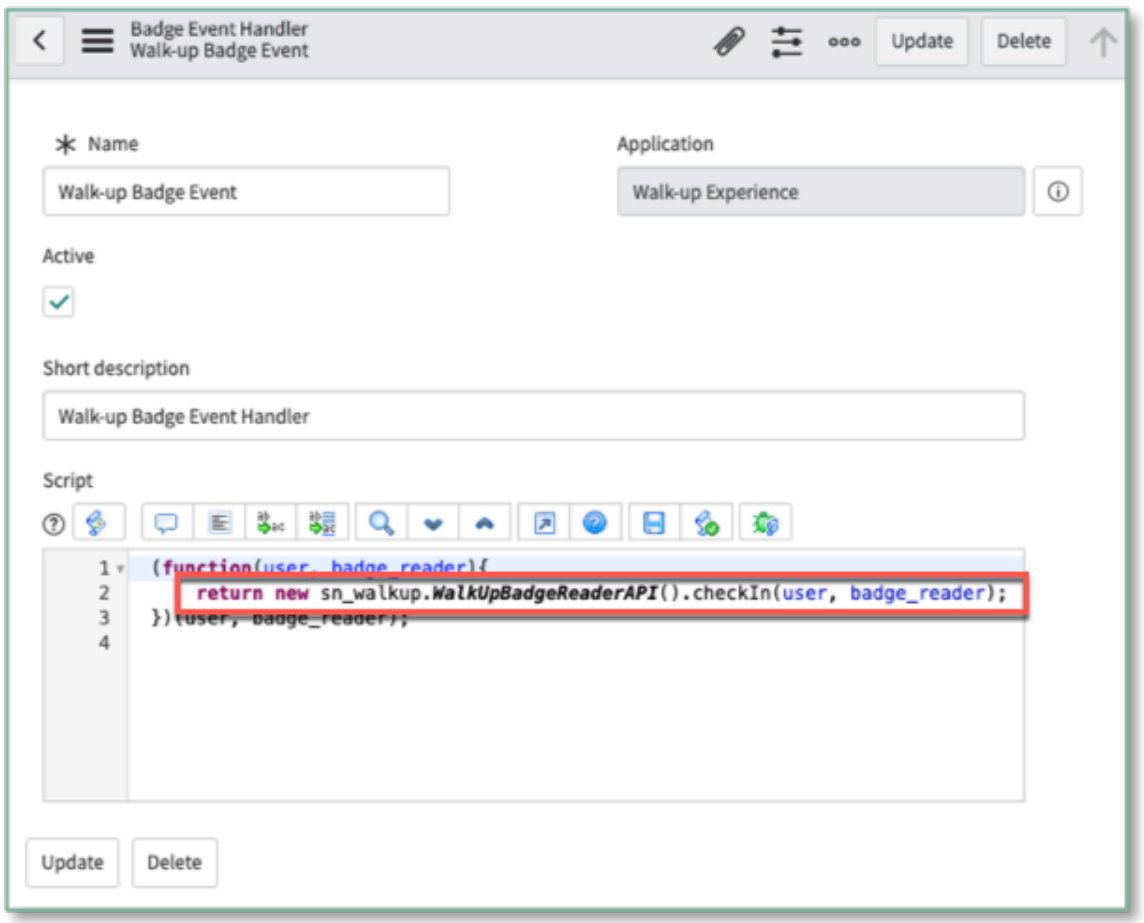
## Procedure

1. Navigate to **All** > **Badge Reader Integration** > **Badge Event Handlers**.
   The Badge Event Handlers list appears and displays any existing badge event handlers.
2. To modify an existing badge event handler, click on the name.
   Otherwise, to create a new badge event handler, click **New**.
3. Enter a name for the badge event handler in the **Name** field.
   For example, `Walk-up Badge Event`.
4. Enter details in the **Short description** field, if desired.
5. Enter code after `// your code goes here` in the **Script** field.




**Note:**
The **Application** field is set to **Global** until you enter the code specifying Walk-up Experience application in the **Script** field and save or submit the record.

6. Click **Submit** to create the record.

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### Use Badge Reader Client to define and register a badge reader device

Use the Badge Reader Client to create a badge reader device for registration in your system. Registering your badge reader enables you to make it operational at your Walk-up Experience on-site queue.

## Before you begin

Role required: sn_badge.badge_admin

## About this task

There are two ways to register a badge reader device:

- Assisted method, through the **Badge Reader Client**. You must create your own custom badge reader client software to integrate with the badge reader.
- Manually, through the ServiceNow AI Platform®. Refer to Manually define and register a badge reader device for details on this procedure.

The **Badge Reader Client** assisted registration method creates an initial Badge Reader record. When a badge is scanned using the badge reader client, this method automatically populates the **Device Identifier** field in the record with the badge reader device serial number.

Automatic population of the **Device Identifier** field saves you time from looking for the badge reader device serial number to add to the Badge Reader record.

To register your badge reader device with **Badge Reader Client** assistance, first you need to configure system properties to enable badge scan registration and disable the badge access token. The following System Properties must be configured:

- **sn_badge.enable_scan_registration**: Disabled by default. When set to **True**, this property enables n_badge.badge_admins to quickly register badge reader devices by scanning a badge.
- **sn_badge.disable_access_token**: Enabled by default. This property disables the access token requirement for the Badge Reader Integration API.

## Procedure

1. Navigate to **All** > **System Properties** > **All Properties**.
2. Search by **Name** for the properties by typing `sn_badge`.
3. Click **sn_badge.enable_scan_registration** to open the system property record.
   The property is set to **False** by default.
4. Change the property **Value** field to **True** and click **Update**.
5. Click **sn_badge.disable_access_token** to open the system property record.
   The property is set to **False** by default.
6. Change the property **Value** field to **True** and click **Update**.
7. Create and then run your own badge reader client.
8. Swipe the badge admin's badge on the badge reader to register.
9. The badge reader client performs a REST API call to api/sn_badge/v1/reader/scan with the device identifier and the card data.
10. Navigate to **Badge Reader Integration** > **Badge Readers** to view the newly created record.
11. Provide a name for the badge reader in the **Name** field.

    For example, `Building B Tech Lounge Badge Reader`.

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**Note:**
The **Status** field is read only and indicates **New** when configuring a new badge reader. The field indicates **Activated** when a badge reader is approved for activation. If a badge reader is deactivated, the field indicates **Deactivated**.

12. Specify a **Badge Event Handler** using the search list icon.

**Note:**
If no badge event handlers are available to select, create a new Badge Event Handler record. For details about this process, refer to Create or modify Badge Reader Integration event handlers.

13. Verify that the **Device Identifier** and **Secret Key** fields are populated.
The Device Identifier uniquely identifies the badge reader hardware. The client defaults to using the badge reader device serial number. The value entered must match the device serial number received from the client software application.
14. Populate the non-mandatory **Short description** and **Location** form fields if desired.
15. Select **Submit** to register the badge reader.

### Manually define and register a badge reader device

Manually create a badge reader device for registration in your system. Registering your badge reader enables you to make it operational at your Walk-up Experience on-site queue.

#### Before you begin
Role required: sn_badge.badge_admin

#### About this task
There are two ways to define and register a badge reader device:

- Manually through the ServiceNow AI Platform®.
- As an assisted method through the **Badge Reader Client**. Refer to Use Badge Reader Client to define and register a badge reader device for details on this procedure.

#### Procedure

1. To manually register your badge reader device, navigate to **Badge Reader Integration** > **Badge Readers**.
2. Click **New**.
3. In the **Name** field, specify a name for the badge reader.
For example, `Building B Tech Lounge Badge Reader`.

**Note:**
The **Status** field is read-only. This field is set to New when configuring a new badge reader. The field is in the Activated state when a badge reader is approved for activation. If a badge reader is deactivated, the field is set to Deactivated.

4. Select a **Badge Event Handler**.

**Note:**
If no badge event handlers are available to select, create a new Badge Event Handler record. For details about this process, refer to Create or modify Badge Reader Integration event handlers.

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5. Specify the **Device Identifier**.
   The Device Identifier uniquely identifies the badge reader hardware. The client defaults to using the badge reader device serial number. The value entered must match the device serial number received from the client software application.

   **Note:**
   The **Secret Key** field is automatically populated when you create the badge reader record.

6. Select **User Badge Configuration**.
   The badge reader uses this mapping configuration to retrieve the user ID from the badge ID when the requester scans their badge to check in to a location.

   **Note:**
   By default, a user badge configuration is available to select. For more information on defining a new user badge configuration, see Define a user badge configuration.

7. **Optional:** Specify the non-mandatory **Short description** and **Location** form fields if desired.
8. Register the badge reader by selecting **Submit**.

### Define a user badge configuration

Define the table from where the user ID and Badge ID mapping information is retrieved.

#### Before you begin
Role required: badge_admin

#### About this task
The user ID and badge ID mapping configuration is used to retrieve the user ID of the user from the badge ID when requesters scan their badges to the badge reader for check-in into a location. You can define multiple configurations for mapping.

#### Procedure

1. Navigate to **All** > **Badge Reader Integration** > **User Badge Configuration**.
2. Click **New**.
3. On the form, fill in the fields.

**User Badge Configuration form**

| Field | Description |
|---|---|
| Name | Name of the configuration. |
| Table Name | The table that has the mapping information on the user ID and badge ID. Select this table from the list. |
| User Field | User ID of the requester. |
| Badge Field | The entity to which the user badge is linked. Select this entity from the list. |
| Facility Code Field | Unique facility or site code that is encoded into each card. The code identifies the organization. |

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| Field | Description |
| --- | --- |
| Active | Option to activate the configuration. This option is selected by default. |

4. Click **Submit**.

### Result
The mapping configuration is created. You can select this mapping configuration in the Badge Reader form to retrieve the user ID from the badge ID based on this mapping configuration.

## Request activation approval for a badge reader device

Request activation approval for your badge reader device. Badge Reader Integration will not trigger event handlers until the badge reader is activated. Badge reader device approval and activation is granted by users with the itil role.

### Before you begin
Role required: sn_badge.badge_admin

### About this task
When you request activation approval, via the Badge Reader record, you initiate the device registration workflow. Activation requests are routed to a badge reader approvers group. System approvals require the itil role. Ensure users with the itil role are added to the badge reader approvers group.

If there are no people in the approval group, the workflow will skip past the approval group requirement, and activate the badge reader. For detailed information about approvals, groups, and adding users to groups, refer to Approvals Creating groups and Add a user to a group.

**Note:**
Badge Reader record required fields are read only when the badge reader device is activated. Badge reader devices can be deactivated by de-selecting the **Active** field on the Badge Reader record. Reactivation of a badge reader requires going through the approval process again.

### Procedure
1. Navigate to **All** > **Badge Reader Integration** > **Badge Readers**.
2. Select the name of the badge reader you want to activate.
   The Badge Reader record opens.
3. Ensure that all mandatory form fields are populated.
   The fields included are the **Name**, **Badge Event Handler**, **Device Identifier**, and **Secret Key** fields. See Use Badge Reader Client to define and register a badge reader device or Manually define and register a badge reader device for information regarding populating Badge Reader form fields.
4. Select **Request Activation** to initiate the activation approval workflow.
   The request is approved by a user with the itil role in the badge reader approvers group. If there is no badge reader approvers group or the group is empty, then the badge reader is activated when a user with the sn_badge.badge_admin role requests activation.

## Configure Walk-up Experience for Badge Reader Integration

Associate badge reader devices with an on-site Walk-up Experience queue. While you can associate more than one badge reader device to a walk-up location, individual badge reader devices are mapped to only one walk-up location.

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### Before you begin
Role required: sn_walkup.walkup_manager

### About this task
- The Walk-up Experience application requires that a badge reader device is mapped to a walk-up location for feature integration.
- Walk-up Experience managers can configure badge reader integration to a walk-up location using the Location Queues Badge Readers related list on the Walk-up Location Queue (wu_location_queue) table.
- At least one badge reader must be activated and available to integrate with the walk-up location. Refer to Request activation approval for a badge reader device if no badge readers are activated for use.
- You can define a check-in reason for each badge reader. When the requester checks in a location using that badge reader, the associated check-in reason is auto populated for the check-in. If no check-in reason is associated with the badge reader, then the location reason is considered for the check-in.

### Procedure
1. Navigate to **All** > **Walk-up Experience** > **Administration** > **Walk-up Locations**.
2. Click the name of the walk-up location queue that you want to associate with a badge reader device.
3. Click the **Location Queues Badge Readers** related link.
4. Click **New**.
5. On the form, fill in the fields.

**Location Queues Badge Readers form**

| Field | Description |
|---|---|
| Badge Reader | Badge reader that you want to associate with the location. |
| Location Queue | Location to which the badge reader is associated. |
| Check-in reason | Check-in reason that you want to link with the badge reader. |
| Check-in reason description | Description of the check-in reason that you want to link with the badge reader. |

6. Select **Submit**.

### Result
You can integrate multiple badge readers with walk-up location.

## View Badge Scanner Integration scan logs

Monitor scanner-use error activity at a Walk-up Experience onsite location by viewing the scan logs. Each time a badge reader device triggers an error, a scan event is logged in the **Badge Scan Logs** module.

### Before you begin
Role required: sn_badge.badge_admin

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### About this task

The **Badge Scan Logs** module only stores badge reader integration error messages. It does not display error messages for Walk-up Experience specific badge scans.

Walk-up Experience badge scan errors can be found in the System Log.

### Procedure

1. Navigate to **All** > **Badge Reader Integration** > **Badge Scan Logs**.
2. Select an event in the Badge Scan Logs list to view the associated **Message**, **Badge Reader**, and **User Badge**.

#### Badge Reader Integration customization

Badge Reader Integration includes several scripted extension points for you to customize script includes installed with the feature.

The underlying Badge Reader Integration script includes are read only. Customers who want to modify the look and feel of the feature can alter several script includes using scripted extension points.

Various scenarios exist whereby the ability to modify script-includes code is beneficial. For example, if you already use a data model to store your badge numbers, you may not want to use the Badge Reader Integration application User Badge (sn_badge_user_badge) table to store your badge numbers. Instead, you can create an extension implementation for `sn_badge.BadgeReader` that supports your data model.

Perhaps you want to customize the types of data you receive from a badge scan or how you want to parse that data. You can create an extension implementation for `sn_badge.BadgeReaderParser` that supports your data model.

The following code is available for alteration using scripted extension points with the Badge Reader Integration application:

| Scripted Extension Points | Description |
|---|---|
| BadgeReader<br><br>API name: `sn_badge.BadgeReader` | Extension point used by the BadgeReaderImpl script includes.<br><br>Use this script to find a badge reader by its device identifier. |
| BadgeReaderParser<br><br>API name: `sn_badge.BadgeReaderParser` | Extension point used by the BadgeReaderParserImpl script include.<br><br>Use this to parse the card data string from the API. |
| BadgeReaderUser<br><br>API name: `sn_badge.BadgeReaderUser` | Extension point used by the BadgeReaderUserImpl script include.<br><br>Use this script to find a sys_user from a badge number and facility code. |

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| Scripted Extension Points | Description |
| --- | --- |
| | **Note:** If you already have a data model for storing your badge numbers, this is the script to use to override the Badge Reader Integration application code to support your data model. |
| BadgeReaderScanProcessor<br><br>API name: `sn_badge.BadgeReaderScanProcessor` | Extension point used by the BadgeReaderScanProcessor script include.<br><br>Use this frontage to manage the badge scan event. |

For complete details about scripted extension points and how to create and use them, refer to Using extension points to extend application functionality and Creating and adding a scripted extension point.

## Walk-up Experience Microsoft Office 365 calendar integration

With Microsoft Office 365 calendar integration Walk-up Experience users can view appointments in their primary calendar. When they make an appointment, modify it, or cancel it, they are sent invites and updates via their Outlook calendar.

This feature is only available when Microsoft Office 365 Outlook is the hosted calendar service. Administrators enable the flows that execute the integration using Flow Designer. Other prerequisites include:

- Microsoft Azure AD and the Microsoft Office 365 tenant exists and is configured.
- Associated connections and credentials are setup and tested.

**Note:**
These prerequisites are assumed already in place at your business.

### Set up Microsoft Office 365 integration for Walk-up Experience

Enable Walk-up Experience Microsoft Office 365 calendar integration. When requesters make an appointment, modify it, or cancel it, the Outlook calendar is sent invites to an appointment and any updates.

**Before you begin**
Logging into the Microsoft Azure Portal (https://portal.azure.com) with your specific customer account is necessary. You will already have a tenant, as logging into the portal requires access to this tenant. For details about setting up a tenant, refer to Quickstart: Set up a tenant.

Also required is that you have a Microsoft Office 365 subscription linked to an existing tenant. For details regarding this, refer to Set up a Microsoft 365 developer subscription.

See the required permissions for Microsoft Azure client setup at Set up Microsoft Exchange Online spoke Set up  Microsoft Exchange Online spoke.

Virtual Agent Academy: Get service faster with Virtual Agent and Walk-Up Experience (video from the Virtual Agent Academy)

Role required: admin

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### Procedure

1. Confirm that the Walk-up Experience (com.snc.walkup), Microsoft Exchange Online Spoke (sn_ex_online_spke), and Microsoft Exchange Server Spoke (sn_exchange_spoke) plugins are activated on your instance.
2. Navigate to **System Oauth** > **Application Registry** > **Microsoft Exchange Online** to set up Oauth.
   a. Insert the client ID (Application ID), which you can get from the Microsoft Azure AD application.
   b. Insert the client secret, which you can get from the Microsoft Azure AD application.
   c. Copy and paste the following links to access authorization, token, and redirect:
      - Authorization url: https://login.microsoftonline.com/<tenant-ID>/oauth2/v2.0/authorize
      - Token url: https://login.microsoftonline.com/<tenant-ID>/oauth2/v2.0/token
      - Redirect url: https://<instance-name>.service-now.com/oauth_redirect.do
3. Navigate to **Connections & Credentials** > **Credentials** to set up credentials.
   a. Click **New**.
   b. Choose **OAuth 2.0 Credentials**.
   c. In the OAuth 2.0 Credentials new record provide a name for the Credential and in the **OAuth Entity Profile** form field, choose **Microsoft Exchange Online default_profile**.
   d. Click **Save**.
   e. Select **Get OAuth Token** in the Related Links section of the form.
   f. Sign in as a valid user on the Microsoft Exchange Tenant.
4. Navigate to **Connections and Credentials Aliases** to set up connection.
   a. Select **Microsoft Exchange Online**.
   b. In the **Connections** Related Links, click **New**.
   c. Name the connection `Exchange_Online_Connection` and choose the previously created credential in the **Credential** form field.
   d. In the Connection URL field, enter: `https://graph.microsoft.com`.
5. Navigate to **Flow Designer** to enable flows.
   a. Select **Create Walk-up Appointment Calendar Event**, open in Flow Designer, and activate.
   b. Select **Update/Delete Walk-up Appointment Calendar Event**, open in Flow Designer, and activate.
6. Schedule an appointment to confirm everything is working properly.
   a. Create a new test user in the system.
   Refer to Create a user for details.

   **Note:**
   Provide a user ID, first name, last name, password and email for the test user.

   b. Impersonate the test user in your instance.

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c. Navigate to **Self-Service** > **Service Portal** > **Walk-up Check-in** to schedule an appointment.

> **Note:**
> The **Walk-up Check-in** icon link must be configured to appear on the Service Portal landing page for you to see and click the link. Refer to Configure Walk-up Experience online check-in icon to appear on Service Portal if the link is not on the Service Portal landing page.

d. Schedule an appointment as the test user.

7. Verify everything is working correctly by navigating to **Flow Designer** > **Today's Executions**.
8. Click **Create Walk-up Appointment Calendar Event**.
9. Check the test user's corporate Microsoft Office 365 calendar to see the emailed calendar event.

> **Note:**
> It can take a minute or two before the calendar event is created. After you enable this feature, users automatically receive calendar invites, updates, and cancellations on their individual corporate calendars.

## Walk-up Experience queue and interaction management

Walk-up Experience managers and agents can efficiently manage all aspects of a walk-up location queue and interactions. Agents can view assigned walk-up locations, interactions, and associated stockrooms used for fulfilling the walk-up requests.

Walk-up Experience helps the agents to organize and manage walk-up queues.

Agents primarily access Agent Workspace to manage requests. Using Agent Workspace the agents can do the following activities.

- Access personal inbox to view work assigned from multiple service channels, including the Walk-up Service Channel.
- Get assignments automatically pushed to the inbox from the walk-up interaction queue.
- Work on concurrent or multiple interactions at the same time.
- Promote interactions to incidents or requests.
- Work with any requester in the queue at any time by pulling from anywhere in the queue list, as well as from the top of the list.
- Use Agent Assist to expedite fulfillment.

With Agent Workspace, the agents can fulfill interactions on a first-come-first-served basis as interactions are pushed to individual walk-up inboxes. Interactions are distributed to walk-up agent inboxes based on assignment rule configurations in the Advanced Work Assignment feature.

The agents can directly open incidents in Agent Workspace when an issue is not resolved at the walk-up location. Agents can also directly create a request for hardware or software through the Service Catalog when an asset is not available at the walk-up location stockroom.

Walk-up Experience also includes **Agent** module in the application navigator where agents supporting a walk-up location can perform the following actions.

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- Access personal walk-up inbox linking directly to Agent Workspace.
- View assigned walk-up interactions.
- Reassign and modify walk-up interactions when necessary.
- View all scheduled and upcoming appointments.
- View walk-up queue locations.
- View available assets and fulfill requests from a local stockroom.
- Create incidents and requests when necessary.
- Transfer walk-up interactions to other agents or queue locations when necessary.

The following applications are included in the **Agent** module of the Walk-up Experience navigation bar as well as viewed in the Agent Workspace Walk-up Experience interface:

### Walk-up Experience Agent applications

| UI view and application | Description |
|---|---|
| Platform: **My Walk-up Inbox**<br>Agent Workspace: **Inbox** | Walk-up interactions assigned to you in on Agent Workspace. Interactions are pushed to your inbox according to assignment rule configurations in the Advanced Work Assignment feature. |
| Platform: **My Walk-up Stockrooms**<br>Agent Workspace: **My Stockrooms** | Stockrooms and assets associated with the walk-up queue locations you support. |
| Platform: **My Walk-up Locations**<br>Agent Workspace: **Walk-up Locations** | Walk-up locations that you are assigned to. |
| Platform and Agent Workspace: **My Assigned Walk-ups** | Walk-up interactions you are assigned to resolve or fulfill. These interactions have a **Work in Progress** state. |
| Platform and Agent Workspace: **Open - Unassigned** | List of all open and unassigned walk-up interactions for your locations. These interactions have either a **New**, **Queued**, or **Work in Progress** state. |
| Platform and Agent Workspace: **Closed Walk-ups** | All closed walk-up interactions. Closed interactions have either a **Closed Complete** or **Closed Abandoned** state. |
| Platform: **Scheduled Appointments** | All upcoming appointments scheduled for your walk-up location. |

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**Walk-up Experience Agent applications (continued)**

| UI view and application | Description |
|---|---|
| Agent Workspace: **Appointments** | |

For more information on Agent Workspace and Advanced Work Assignment, see Agent Workspace and Advanced Work Assignment.

## View assigned Walk-up Experience locations

Walk-up Experience agents can view a list of the walk-up queues they are assigned to support. Locations queues reveal all the information an agent needs to know to operate the queue efficiently.

### Before you begin

Role required: sn_walkup.walkup_technician

### About this task

The agents can view associated walk-up location stockrooms in following ways:

- Through Agent Workspace
- Through navigation menu.

### Procedure

1. Navigate to **All** > **Workspace Experience** > **Agent Workspace Home**.
2. Select the **List** icon from the navigation menu.
3. Under **Walk-up**, select **Walk-up Locations**.
4. Select a queue name to view details about the location, such as, interactions, appointments, reasons for visits, and more.
5. Alternatively, to view walk-up locations through navigation menu, navigate to **Walk-up Experience** > **Agent** > **My Walk-up Locations**.
6. Select a location from the list to see the details such as, interactions, appointments, and reasons for visits.
   If there are any pending interactions with no associated guests at the queue, select **Abandon All** to cancel these interactions.

## View Walk-up Experience inbox

View a personal inbox of automatically assigned Walk-up Experience interactions using the Agent Workspace feature interface.

### Before you begin

Role required: sn_walkup.walkup_technician

### About this task

There are two ways the agents can view the walk-up inbox. The agents primarily access Agent Workspace for all Walk-up Experience related information, including the inbox. However the agents can also access Walk-up Experience in the application navigator, or left navigation bar, to link to and view the inbox in Agent Workspace.

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### Procedure

1. To view the walk-up inbox using Agent Workspace, navigate to **Workspace Experience** > **Agent Workspace Home**.
   The Agent Workspace homepage opens, greeting you with your name.
2. Click **Inbox** in the left navigation bar of the interface.
   Automatically pushed interaction assignments appear in the inbox based on agent schedules and assignment rule configurations in the Advanced Work Assignment feature. The agents can set an inbox status of **Available**, **Away**, and **Offline**.
3. Alternatively, to view the walk-up inbox via the application navigator, navigate to **Walk-up Experience** > **Technician** > **My Walk-up Inbox**.
   You are linked directly to your personal inbox in Agent Workspace. Automatically pushed interaction assignments appear in the inbox based on agent schedules and assignment rule configurations in the Advanced Work Assignment feature.

#### Related topics

Manage automatically assigned Walk-up Experience interactions

## Manage automatically assigned Walk-up Experience interactions

The agents supporting Walk-up Experience locations can view and manage interactions automatically pushed to the Agent Workspace inbox.

### Before you begin

Role required: sn_walkup.walkup_technician

### About this task

Walk-up Experience interactions can be automatically pushed to a personal inbox in Agent Workspace based on agent schedules and assignment rule configurations in the Advanced Work Assignment feature. The agents fulfill interactions on a first-come-first-served basis as they appear in the inbox.

To manually assign and manage interactions using the Walk-up Experience Agent modules found in the application navigator, refer to Manage Walk-up Experience interactions manually.

The Agents set a status in the Agent Workspace inbox to indicate readiness to accept interactions. Status choices are **Available**, **Away**, and **Offline**.

Even though interactions are automatically pushed to the walk-up inbox, agents can work with anyone in the walk-up queue at any time.

View walk-up queue interactions assigned to you automatically in your walk-up inbox or in your **My Assigned Walk-ups** list. You can also view all **Open - Unassigned** interactions for the queue you support.

With Agent Workspace you can view lists of all your related walk-up interactions and appointments, your cases, requester accounts and contacts, incidents, requests, and more using one convenient interface. The Walk-up Experience related interaction list includes the following items:

#### Walk-up Experience related interaction list

| List item | Description |
|---|---|
| My Assigned Walk-ups | Interactions you assign to yourself when you accept an active interaction or that are assigned to you. |

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**Walk-up Experience related interaction list (continued)**

| List item | Description |
|---|---|
| | Agents assign interactions to themselves when they accept a queued interaction. Managers can assign interactions to specific agents.<br><br>These interactions are in a Work in Progress state. Once assigned, an agent can transfer the interaction to another agent or queue to complete the work, if necessary. |
| Open — Unassigned | All open but unassigned interactions associated with your specific walk-up queue location. When a requester checks into a walk-up queue, an interaction is created. The interaction is Queued until an agent accepts it or is assigned the interaction. At that point, the state changes to Work in Progress. |
| Closed Walk-ups | All Closed Complete and Closed Abandoned interactions assigned to a specific walk-up location queue. Agents can abandon an interaction when a guest leaves the queue before receiving support. |

## Procedure

1. To begin supporting a walk-up queue requester, navigate to  > **Workspace Experience** > **Agent Workspace Home**.
   The Agent Workspace homepage opens, greeting you with your name.
2. Click **Inbox** and ensure your status is set to **Available**.
   View interactions in your inbox automatically pushed to you.
3. Select the interaction at the top of the list and begin resolving the issue or fulfilling the request.

   When you create an associated incident or request through the Service Catalog, a **New Incident** tab or a **New Catalog Item** tab opens next to the **Details** tab of the original interaction. Fill out the new incident form or order assets. Click **Save** to save the new incident or complete the order confirmation. You receive a Request Number for your ordered item.

   a. If an interaction requires an unusual amount of time to resolve or if the closure depends on resources not readily available, you can place the interaction on hold.
   The requester does not lose position in the queue and you can help another requester simultaneously. Placing an interaction on hold does not affect your capacity for new interactions. To put an interaction on hold, click the **Put on Hold** button.

   b. You can associate the interaction with another record by selecting **Associate Record** from the more UI actions icon ooo in the interaction header.

   c. To view the walk-up location stockroom for fulfillment requests, click **List** in the left navigation panel of the Agent Workspace interface, then click **My Stockrooms**.

   d. If you cannot resolve an issue, click the **Create Incident** button in the interaction header.
   If you cannot fulfill a request from the stockroom, click the more UI actions icon ooo in the interaction header to view more actions. Select **Create Request** from the list to access the Service Catalog.

4. When you are finished resolving the interaction, select the **Close** button in the interaction header.
   Closing an interaction affects your capacity because a new interaction will be pushed to your inbox.

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**Related topics**

- Agent Workspace UI
- Agent Workspace for ITSM
- Create an incident
- Create a request through a catalog

## Manage Walk-up Experience interactions manually

Agents supporting walk-up locations can manually manage queue requests with several Walk-up Experience interaction-related modules.

### Before you begin

Role required: sn_walkup.walkup_technician

### About this task

Manage interactions manually using the Walk-up Experience Technician modules found in the application navigator. To manage automatically assigned interactions from the Agent Workspace inbox, refer to Manage automatically assigned Walk-up Experience interactions.

Walk-up queues support requesters in the order that they check into the queue — first come, first served. The agents supporting the queue can decide who will work on the first interaction. As new requesters enter the queue and submit interactions, technicians share the workload, assigning queued interactions to themselves.

Certain requesters are considered VIPs. The system recognizes this when they check into the queue. An interaction for a VIP shows **true** for **VIP** in the Interactions list. The agents can move VIP requesters to the front of the queue by assisting them first.

**Note:**

Creating walk-up type interactions manually is not supported. A walk-up interaction is considered valid for check-in or appointment only if created via the check-in or appointment booking interfaces, and not via a table. Agents cannot check-in to a walk-up location on behalf of an end-user.

View walk-up queue interactions using several Walk-up Experience modules:

**Walk-up Experience interaction modules**

| Module | Description |
|---|---|
| My Assigned Walk-ups | Interactions you assign to yourself when you accept an active interaction or that are assigned to you.<br><br>Agents assign interactions to themselves when they accept a queued interaction. Managers can assign interactions to specific agents.<br><br>These interactions are in a Work in Progress state. Once assigned, an agent can transfer the interaction to another agent or queue to complete the work, if necessary. |
| Open — Unassigned | All open but unassigned interactions associated with your specific walk-up queue location. When a requester checks into a walk-up queue, an interaction is created. The interaction is Queued until an agent accepts it or is assigned the interaction. At that point, the state changes to Work in Progress. |

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**Walk-up Experience interaction modules (continued)**

| Module | Description |
|---|---|
| Closed Walk-ups | All Closed Complete and Closed Abandoned interactions assigned to a specific walk-up location queue. Agents can abandon an interaction when a requester leaves the queue before receiving support. |

### Procedure

1. Navigate to  > **Walk-up Experience** >  > **Agent** > **Opened - Unassigned**.
2. Find the requester name under the **Opened for** column of the Interactions list.
3. Click the interaction **Number** associated with the requester.
4. Enter your name in the **Assigned to** field on the form, change the **State** to **Work in Progress**, and select **Update**.
   a. To close an interaction if the requester has left the queue, click **Abandon** in the form header or choose **Closed Abandoned** from the **State** form field and click **Update**
   b. Alternatively, you can associate the interaction with another record by clicking the **Associate Record** button in the interaction header.
5. To resolve the interaction, navigate to **Walk-up Experience** > **Agent** > **My Assigned Walk-ups**.
6. Click the interaction number from the list to open the Walk-up Interaction form.
7. Resolve the issue or fulfill the request.
   a. Change the interaction status to **On Hold** if the requester is not present for an appointment or if the interaction entails a lengthy process, for example, an OS upgrade.
   b. To view the walk-up location stockroom for fulfillment requests, click the **Stockroom Consumables** related link.
   c. If you cannot resolve the issue or fulfill the request, click either the **Create Incident** or **Create Request** related link to create an incident or access the Service Catalog.

   When you create an associated incident or request through the Service Catalog, the associated related lists on the form populate accordingly. Related lists include the following details:
   - Incidents for Interaction: Incidents associated with the interaction
   - Requests for Interaction: Service Catalog requests associated with the interaction
   - Incidents by Same Caller: Incidents created for a walk-up requester
   - Requests by Same Caller: Requests created for a walk-up requester
8. Set the interaction **State** to **Closed Complete** and select **Update** to update the interaction, when you are finished resolving the interaction.
   Alternatively, you can click **Close** to complete the interaction.

### Related topics

Use platform view to fulfill a Walk-up Experience request from a stockroom

Create an incident

## View Walk-up Experience location stockroom and assets

Agent supporting Walk-up Experience locations can view and access stockrooms to provide commonly requested hardware and software assets for walk-up queue guests. Stockroom

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inventory is defined by asset and inventory managers. Walk-up location agents can monitor inventory and alert asset and inventory managers when additional consumables are needed.

### Before you begin
Role required: sn_walkup.walkup_technician

### About this task
The agents can view associated walk-up location stockrooms in following ways:

- Through Agent Workspace
- Through navigation menu.

### Procedure
1. Navigate to **All** > **Workspace Experience** > **Agent Workspace Home**.
2. Alternatively, to view walk-up locations through the application navigator, navigate to **All** > **Walk-up Experience** > **Agent** > **My Walk-up Stockrooms**.
3. From the navigation list, select **List**.
4. Under **Walk-up**, select **My Stockrooms**.
5. Select the name of your stockroom to view details such as the physical address, the group assigned to the stockroom, and the available assets (hardware, consumables, and software licenses).
6. Select any of the list tabs to see the available inventory.
   For example, you can select **Consumables** to see a list of all available consumables. The inventory list tabs include the following.

| Option | Description |
|---|---|
| **Hardware** | Cables, connectors, batteries, and more. |
| **Consumables** | Computer monitors, video equipment, com puter mouse, and more. |
| **Software Licenses** | Available software programs and tools. |
| **Other Assets** | Miscellaneous other assets. |

7. Select the name of an available consumable to see the details about the asset, such as quantity, cost, and expense information.

### Related topics
Use platform view to fulfill a Walk-up Experience request from a stockroom

## Use platform view to fulfill a Walk-up Experience request from a stockroom

Walk-up Experience agents can access an associated stockroom and fulfill user requests directly from an interaction in platform view.

### Before you begin
Role required: sn_walkup.walkup_technician

### About this task
When a walk-up queue requester requests a consumable, such as a computer monitor or keyboard, you can quickly fulfill the request by accessing an associated on-site stockroom. Walk-up requester can leave the queue with the requested item in hand.

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### Procedure

1. Navigate to **All** > > **Technician** > **My Assigned Walk-ups**.
   The Interaction list opens.
2. Click the interaction **Number** associated with the request.
3. Select **Stockroom Consumables** in the Related Links section of the interaction.
   The associated Stockroom list opens displaying all available consumables.
4. Select the requested consumable **Display name**.
5. Select the **Consume** button.
6. Update the form with the **Quantity**, **Asset**, and **User** information.
7. Select **OK**.
   The Consumable form indicates that an item has been consumed and attached to the specified user.
8. Retrieve the item from the stockroom and provide it to the requester.
9. Return to the interaction in your **My Assigned Walk-ups** module to change the **State** to **Closed Complete** and click **Update** to update the interaction.

   Alternatively, you can click **Close** to complete the interaction.

   If you cannot fulfill the request from the associated stockroom, click the **Create Request** related link from the interaction form to access the Service Catalog. Refer to Create a request through a catalog to order an item for the requester.

## Use Agent Assist to expedite Walk-up Experience fulfillment

Walk-up Experience agents can use the Agent Assist feature in Agent Workspace to expedite incidents and requests.

### Before you begin

Role required: sn_walkup.walkup_technician

### About this task

Agent Assist is a contextual search option available in Agent Workspace when a walk-up agent creates a new incident or new case associated with a Walk-up Experience interaction.

### Procedure

1. To use Agent Assist navigate to **Workspace Experience** > **Agent Workspace Home**.
2. Open a walk-up interaction from your inbox or from **My Assigned Walk-ups** under **Lists** that you know requires an associated new incident or new case.
3. Click the **Create Incident** or **Create Case** button.
   A new incident or case tab opens next to the details tab for the original associated walk-up interaction.
4. Click the agent assist icon to use the feature.
   For more detailed information about Agent Assist and using it to expedite incidents and requests, refer to Using Agent Assist in Agent Workspace and Order a catalog item using Agent Assist.

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## View and manage Walk-up Experience appointments in Agent Workspace

Viewing upcoming scheduled Walk-up Experience appointments provides technicians with an estimate of future queue demand and workload. Managers can view future appointments and adjust staffing at walk-up queue locations to best support demand.

### Before you begin

Role required: sn_walkup.walkup_technician

### About this task

The walk-up agents and managers primarily use Agent Workspace for all Walk-up Experience related information, including viewing and managing scheduled appointments.

**Note:**
You can also view and manage scheduled appointments from Walk-up Experience in the application navigator, or left navigation bar.

Appointments are automatically routed to your Agent Workspace inbox based on availability. You can also view a list of scheduled appointments and choose which one to accept.

Upcoming appointments also display with a small calendar icon next to the user name on the onsite walk-up location queue wall monitor. The user with an appointment appears on the monitor a short time before the appointment is scheduled to begin.

**Note:**
Upcoming appointments are also displayed on online check-in screen with the same calendar icon next to the user name.

### Procedure

1. Navigate to **All** > **Workspace Experience** > **Agent Workspace Home**.
   The Agent Workspace homepage opens, greeting you with your name.
2. Click **List** in the left navigation bar.
3. Under **Walk-up**, click **Appointments**.
   Walk-up appointments assigned to your queue are listed.
4. Click an appointment number to view details, such as the requester name, the interaction number and description, and the appointment time.

   a. To open the associated interaction to view details, click the open record icon next to the interaction number.

   b. Click **Accept appointment** to begin working on the interaction.

      If necessary, you can assign the appointment to another agent and add work notes.

      If a significant time has passed and the requester does not show up for the appointment, you can delete the appointment by clicking the more UI actions icon in the interaction header and selecting **Delete**.

   c. Select **Save**.

### Work on Walk-up interaction

Manage your Walk-up appointments in Agent Workspace.

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### Before you begin
Role required: sn_walkup.walkup_technician or admin

### Procedure
1. Navigate to **All** > **Workspace Experience** > **Agent Workspace Home**.
2. Select **Inbox** from the side bar.
3. Set your status as **Available**.
   A Walk-up interaction task is automatically pushed in your inbox, if you do not already have any walk-up interactions assigned to you.
4. Select **Accept**.
5. On the details page, select one of the following options.

6. If you already have interactions assigned to you, navigate to **Lists** > **Walk-up** > **My Assigned Walk-ups**.
7. From the Walk-up list, select **Location Kiosk**.
8. Select a kiosk assigned to the location from the list.
9. On the **Walk-up Location Kiosk** page, select **Check-in**.

   **Note:**
   Walk-up location kiosks are displayed only when the Show kiosk option is enabled.

10. On the **My Assigned Walk-ups** page, select the Walk-up interaction assigned to you.
11. After you have fulfilled or resolved the request, set the state of the Walk-up interaction to **Closed Complete**.

## Create an appointment through incident

Schedule an appointment on behalf of a requester through an incident record.

### Before you begin
Role required: itil or admin

### Procedure
1. Navigate to **All** > **Workspace Experience** > **Agent Workspace Home**.
2. From the navigation list, select **List**.
3. Under **Incidents**, select **Open** or **Assigned to me**.
4. Select the incident for which you want to schedule an appointment.
5. On the **Details** tab, select the More actions icon.
6. From the drop-down list, select the option **Book walk-up appointment**.
7. In the Walk-up Appointment Booking window, enter the required details to book an appointment on behalf of the requester.
8. Select **Submit**.

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### Result

- A walk-up appointment record is created.
- The **Walk-up Appointment** tab appears in the related list. The **Walk-up Appointment** related list must be added to the platform manually.
- The requester is notified of the appointment. The requester can also see the appointment created on the home page under the My active items widget.

## View and manage Walk-up Experience appointments from application navigator

Viewing upcoming scheduled Walk-up Experience appointments provides technicians with an estimate of future queue demand and workload. Managers can view future appointments and adjust staffing at walk-up queue locations to best support demand.

### Before you begin

Role required: sn_walkup.walkup_technician

### About this task

Agents and managers can view and manage scheduled walk-up appointments from Walk-up Experience in the application navigator, or left navigation bar.

**Note:**
Primary access is through Agent Workspace for all Walk-up Experience related information, including scheduled appointments.

Upcoming appointments also display with a small calendar icon next to the user name on the on-site walk-up location queue wall monitor. The user with an appointment appears on the monitor a short time before the appointment is scheduled to begin.

### Procedure

1. Navigate to **All** > **Walk-up Experience** > **Agent** > **Scheduled Appointments**.
   all walk-up appointments scheduled for the upcoming 14 days display.
2. Select an appointment number to view the details, such as the requester name, the interaction number and description, and the appointment time.

   a. If desired, to preview the associated interaction details, click the preview record icon next to the appointment number.

   b. To begin working on the interaction, click **Accept appointment** on the **Walk-up Appointment** form.

      If necessary, you can assign the appointment to an agent and add work notes.

      If a significant time has passed and the requester does not show up for the appointment, you can delete the appointment by selecting **delete**.

   c. Select **Update** to save any changes you make to the interaction form.

# Walk-up Experience Employee Center

Plan your visit and schedule an appointment through the Walk-up Experience Employee Center.

Employee Center portal enables users to easily scale their service solutions across departments, such as IT, HR, Workplace, Legal, and Procurement with digital workflows. This unified portal goes

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beyond the basic service delivery to provide a platform for communications, engagement, and content experiences. For more information, see Employee Center.

- Use Employee Center to schedule a walk-up appointment to get help, such as to request for new hardware, update software, or upgrade your system.
- You can make an appointment, request for the next open appointment, or see your upcoming appointments.

### Plan your visit

Schedule a single or multiple appointments to visit the walk-up lounge or the support lounge. You can also get remote help.

#### Before you begin

Role required: itil

#### Procedure

1. Launch the Employee Center service portal in your browser.
2. On the portal home page, select the **IT** topic from the mega menu..
3. Select the link **Walk-up: Plan your visit**.
   Alternatively, select **Walk-up visits** under the My active items widget.
4. On the walk-up check-in page, either join the queue or schedule an appointment for the future.
5. Select the **Schedule an appointment** tab.
6. Select a reason for your visit.
7. Click the calendar icon ( ) and select an available time slot.
8. Select the type of appointment.

   **Note:**
   You can choose the type of appointment only if the location accepts both, in-person and remote appointments.

9. Select **Schedule appointment**.

   **Note:**

   You can also schedule multiple appointments based on the selected location. When you reach the maximum appointment booking limit, a message is displayed.

#### Result

A success message is displayed. The details of the appointment are displayed under the **Your upcoming appointments** section.

You can also see your upcoming appointments under the My active items widget on Employee Center home page.

## Walk-up Experience dashboard overview

The Walk-up Experience dashboard and reporting module provides basic high-level reporting on incident and request types, record volume, average wait and service times, assignments by agents and location, and more. By viewing the dashboard, managers can quickly understand the walk-up location operations and can report performance data to upper management.

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To view the Walk-up Experience dashboard you must be assigned one of the following roles:

- sn_walkup.walkup_manager
- sn_walkup.walkup_admin
- admin

Access the dashboard by navigating to **Walk-up Experience** > **Dashboard**. To view detailed information, hover over any report graphic. You can save graphs as PNG or JPEG files to attach to emails or include in reporting presentations. All graphs can be refreshed for the latest data.

| Dashboard report graphic | Description |
|---|---|
| Completed Walk-ups for the Quarter | Total number of records created during the fiscal business quarter. Volume shown as a single score. |
| Exit Survey CSAT for this Year | Speedometer showing the average customer satisfaction sentiment (1 to 3) during the exit survey for the current calendar year. |
| Overall CSAT within Last Year | Speedometer showing the average customer satisfaction sentiment (1 to 5) captured by the email survey within the last year (364 days from current date). |
| Walk-ups by Location within Last Year | Total number of walk-up interactions, by location within the last year (364 days from current date). Volume shown as a spline distributed by month. |
| Walk-up Interactions with Incidents by Location within Last Year | Total number of walk-up incidents, by location within the last year (364 days from current date). Volume shown as a spline distributed by month. |
| Walk-up Interactions with Requests by Location within Last Year | Total number of walk-up requests, by location within the last year (364 days from current date). Volume shown as a spline distributed by month. |
| Walk-up Reasons by Location within Last Year | Reasons for visiting the walk-up queue, by location within the last year (364 days from current date). Data shown as a bar chart. |
| Walk-ups by Day of the Week | Total number of walk-up interactions per day during the course of a week, by location. Data shown as a bar chart. |
| Walk-ups by Hour | Total number of walk-up interactions, by hour and by location. Data shown as a bar chart. |
| Walk-up Consumables | Total number of assets consumed by walk-up guests, by location stockroom. Data shown as a bar chart. |
| Average Service Time by Location | Average time it takes to close an interaction, by location. Time average shown as a spline by month. |

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| Dashboard report graphic | Description |
|---|---|
| Average Wait Time by Location | Average time a walk-up guest waits for service, by location. Data shown as a bar chart. |

# Walk-up Experience on Now® Mobile

You can create and manage your appointments for a walk-up venue like the Tech Lounge when you use the ServiceNow® Walk-up Experience on the Now® Mobile app on your own mobile device.

With the Now® Mobile app, you can use your mobile device to book appointments, see where you are in a queue, and cancel or modify your appointments for the Tech Lounge. You will never miss an appointment again. You will get reminders about your upcoming appointments and notifications if your appointment changes.

## Book an appointment at a Walk-up Experience Tech Lounge

Book an appointment at a ServiceNow Walk-up Experience Tech Lounge by using the Now® Mobile app.

### Before you begin

Role required: user

### Procedure

1. On your mobile device, tap the Now® Mobile app icon ( ).
2. Navigate to the list of available Tech Lounges using any of these options.
3. From the list of active Tech Lounges, tap your preferred Tech Lounge.
4. Tap **Make Appointment**.

   **Note:**
   The option to book a slot in advance is not available in all Tech Lounges. If the **Maximum future bookable day** field doesn't appear in the Tech Lounge details view, you can't book a slot in advance in that particular Tech Lounge.

5. On the form, fill in the fields.

   **Make Appointment form**

   | Field | Description |
   |---|---|
   | Reason | Reason for your visit. |
   | Date | Preferred date for the visit. |
   | Time slot | Preferred time slot for your visit. |

   If you select a date when the Tech Lounge is closed or is not available for appointments, the time slot doesn't appear. Select a different date and time slot.

6. Tap **Submit**.
   Your appointment confirmation is displayed on the screen.

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7. **Optional:** Tap **OPEN** on your appointment to view the details.
   Another way to view your appointment confirmation is to return to the Tech Lounge list view and tap the **Visits** tab, or return to the Now® Mobile app home page and tap **My Tech Visits**.

## Modify an appointment at the Walk-up Experience Tech Lounge

Edit or cancel an appointment at a ServiceNow Walk-up Experience Tech Lounge by using the Now® Mobile app on your mobile device.

### Before you begin
Role required: user

### About this task
The time limit for modifying an appointment may vary across tech Lounges. You cannot modify a confirmed appointment within the time limit that was set for the particular tech Lounge. For example, a tech Lounge has set this time limit as two hours. So, if your appointment is at 10 a.m, you cannot modify it after 8 a.m. of the same day.

### Procedure

1. On your mobile device, tap the Now® Mobile app icon ( ).
2. Navigate to your appointment card using any of these options.
3. Tap the appointment card to open it.
4. Choose one of the following actions.
   You can also swipe the appointment card and tap your preferred action to modify the appointment.

## Join a queue at the Walk-up Experience Tech Lounge

Join a queue at a ServiceNow Walk-up Experience Tech Lounge by using the Now® Mobile app for immediate assistance with an issue.

### Before you begin
Role required: user

### Procedure

1. On your mobile device, tap the Now® Mobile app icon ( ).
2. Navigate to the list of available Tech Lounges using any of these options.
3. From the list of active Tech Lounges, tap your preferred Tech Lounge.
4. Tap **Join Queue**.

> **Note:**
> This option is displayed only when the Tech Lounge is open. If the Tech Lounge is closed, wait to join a queue during the normal operating hours. Alternatively, you can book an appointment if the option is available. For more information on how to book an appointment, see Book an appointment at a Walk-up Experience Tech Lounge.

5. On the form, fill in the fields.

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#### Join Queue form

| Field | Description |
|---|---|
| Reason | Reason for your visit. |
| Description | Brief description of the problem. |

6. Tap **Submit**.
   Your visit details and position in the queue are displayed on the screen.

### Leave a queue at the Walk-up Experience Tech Lounge

Leave a ServiceNow Walk-up Experience Tech Lounge queue at any time by using the Now® Mobile app on your mobile device.

#### Before you begin
Role required: user

#### Procedure

1. On your mobile device, tap the Now® Mobile app icon (  ).
2. Navigate to **My Items** > **My Tech Visits**.
3. Navigate to your Queue card using one of these options.

4. Tap your visit card to open it.
5. Tap **Leave queue**.
   You can also swipe your visit card and tap **Leave queue**.

## ITSM Agent Workspace - Legacy

Improve your ITSM agent experience and manage your IT fulfillment volume more efficiently using ITSM Agent Workspace. The easy-to-navigate, multi-tab interface enables you to efficiently oversee and resolve multiple incidents, problems, and change requests.

**Important:**
Starting with the Washington DC release, ITSM Agent Workspace is no longer deployed, enhanced, or supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base. Use Service Operations Workspace, which is a configurable workspace providing a unified experience for multiple IT Service Management and IT Operations Management workflows. For information about Service Operations Workspace for ITSM, see Service Operations Workspace for ITSM.

### ITSM Agent Workspace in action

Here's how IT agents use ITSM Agent Workspace.

Overview of ITSM agent workspace

### Key features

#### Data in unified location

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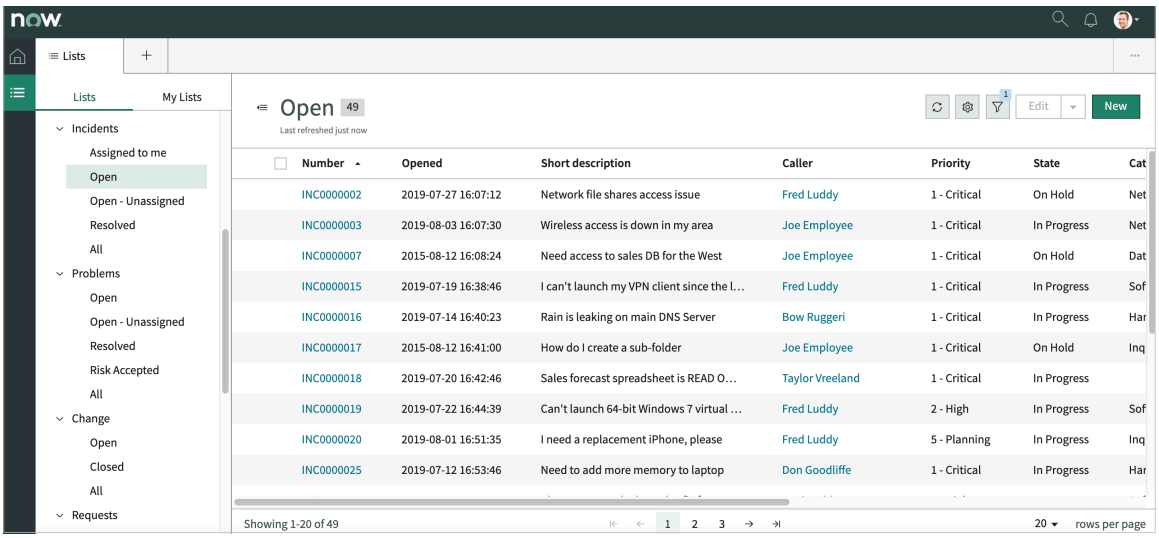
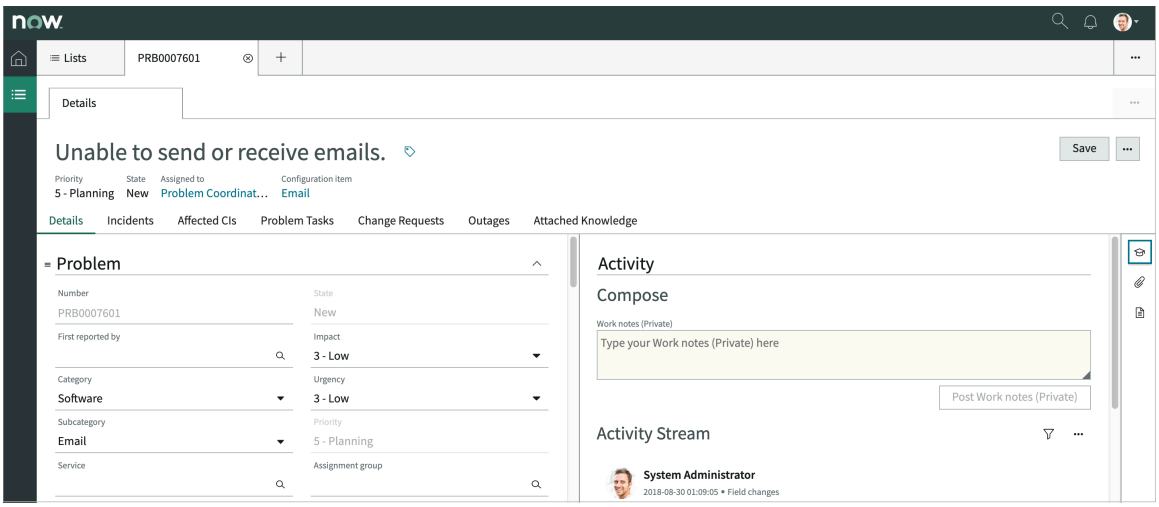
Interact with your requesters, respond to inquiries, and resolve incidents, problem, and change tasks using ITSM Agent Workspace.



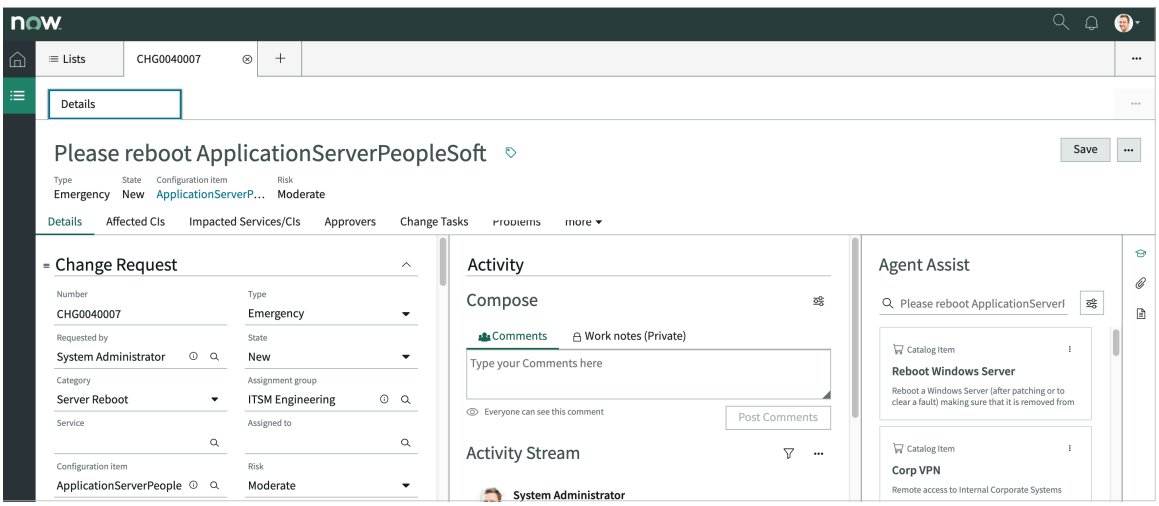

## Single-pane view

See all details related to an incident, problem, or change task in one place.




## Agent assistance

Efficiently and quickly resolve tickets with AI-assisted recommendations.

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## Get started

Select a tile to get started.




1. Agents and system administrators go here to learn about Workspace.




1. System administrators go here to set up Workspace.




1. Agents go here to learn how to use Workspace.

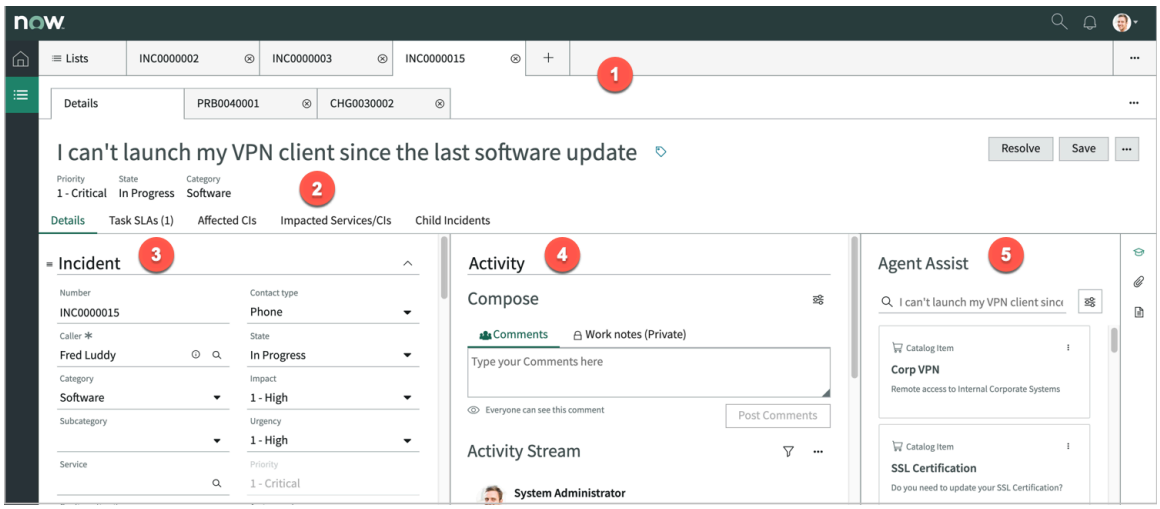
# Exploring ITSM Agent Workspace

Get an overview of ITSM Agent Workspace and how it works.

**Important:**
Starting with the Washington DC release, ITSM Agent Workspace is no longer deployed, enhanced, or supported. For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base. Use Service Operations Workspace, which is a configurable workspace providing a unified experience for multiple IT Service Management and IT Operations Management workflows. For information about Service Operations Workspace for ITSM, see Service Operations Workspace for ITSM.

## Features

Manage multiple incident, problem, and change records using these ITSM Agent Workspace features.




| Number | ITSM Agent Workspace feature | Description |
|---|---|---|
| 1 | Multi-tab interface | Tabs to easily navigate between multiple open records. |

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| Number | ITSM Agent Workspace feature | Description |
|---|---|---|
| | | • Incident records open in top-level tabs.<br>• Associated records, such as problem and change, open in sub-tabs below the Incident tab. |
| 2 | Form header | Configurable fields in the form header to give you a quick summary of incident, problem, or change records. |
| 3 | Form fields | Detailed view of the form fields from the Details related list. |
| 4 | Activity stream | Activity stream to display a chronological record of activities. The activity stream occupies a central location in the default layout, making it easy for agents to scroll through the record history. |
| 5 | Agent Assist | List of information across multiple sources such as open incidents, problem, and change records. With Predictive Intelligence, agents can also view similar task records. |

## Components installed with ITSM Agent Workspace

Several types of components are installed with activation of the ITSM Workspace (com.snc.agent_workspace.itsm) plugin, including user roles.

**Note:**
The Application Files table lists the components that are installed with this application. For instructions on how to access this table, see Find components installed with an application.

## Roles installed

| Role title [name] | Description | Contains roles |
|---|---|---|
| Workspace agent<br><br>[agent_workspace_user] | The Workspace agent role (agent_workspace_user) is added to the ITIL role. The role is required to access ITSM Agent Workspace. | None |

## Tables

ITSM Agent Workspace provides the Workspace view for the following tables:

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- Incident [incident]
- Problem [problem]
- Change [change]
- Problem Tasks [problem_task]
- Change Tasks [change_task]
- Affected CIs [task_ci]
- Impacted Services/CIs [task_cmdb_ci_service]
- Task SLA [task_sla]
- Outages [task_outage]
- Approvals [sysapproval_approver]

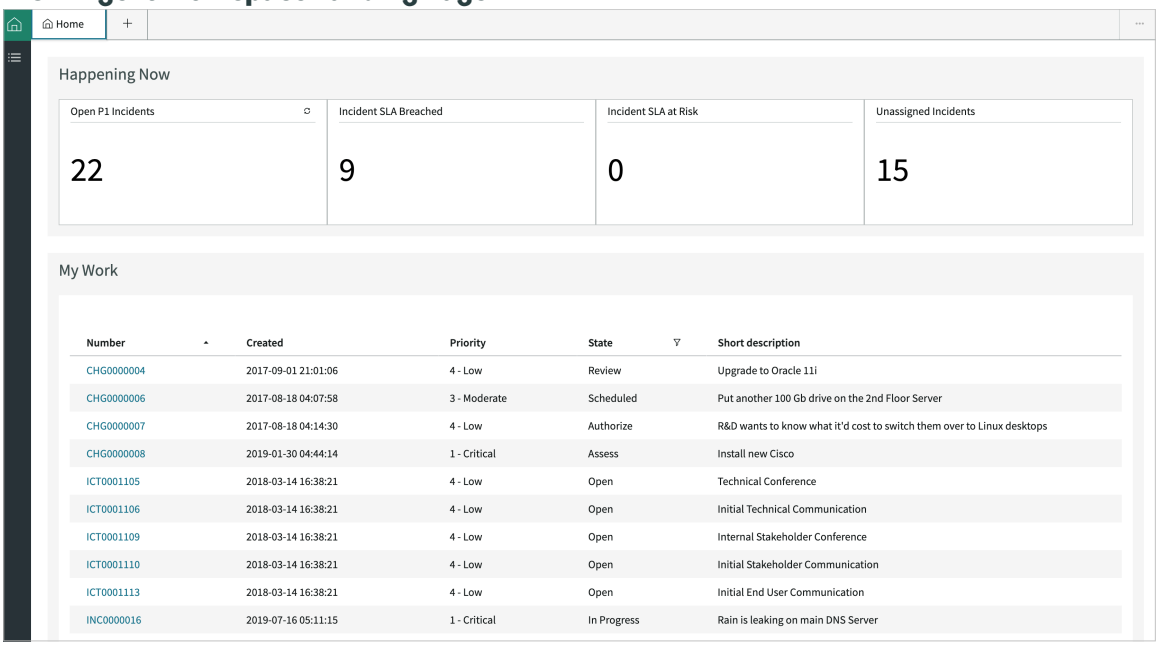
## Viewing incident details and your incident tasks in ITSM Agent Workspace - Standard landing page

On the ITSM Agent Workspace standard landing page, you can view incident reports that provide information such as the number of open priority 1 incidents, incidents for which SLA is not met, or incidents that are in the verge of breaching the SLA, and any unassigned incidents in the system. You can also view all the tasks that are assigned to you.

The ITSM Workspace plugin (com.snc.agent_workspace.itsm) activates the ITSM Workspace Landing Pages (com.snc.agent_workspace.itsm.landing_page) plugin that delivers the basic version of ITSM Agent Workspace landing page.

To see the list of incidents for a queue, click a tile in the Happening Now section. To view the details of an incident, click the incident number. The My Work section contains the list of all the tasks that are assigned to you.

### ITSM Agent Workspace Landing Page




## ITSM Agent Workspace landing page

Monitor the work assigned to you and the overall performance of incident resolution using Workforce Optimization for ITSM Agent Workspace.

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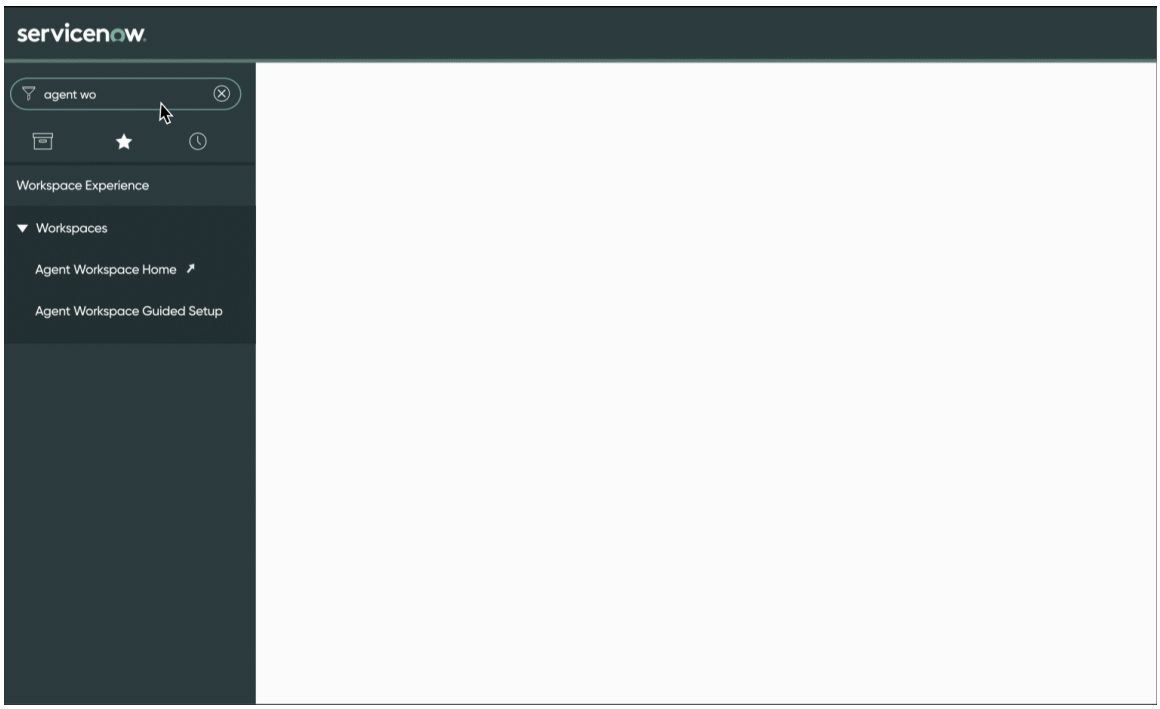
### Home tab




## End user and roles

| End user and goal | Required role |
| --- | --- |
| As a workspace agent, you can:<br>• Analyze the incidents you are currently working on or incidents that have not yet been assigned.<br>• Monitor incidents with SLAs that have been breached or at risk, open P1 incidents, or the ones not been updated in 24 hours.<br>• Track the mean time to resolution, first call resolution, and customer satisfaction to analyze the performance of incident resolution. | sn_incident_read, sn_incident_write, itil. |

## Use case

Monitor your work when you start your day, view reports that need your attention, and navigate to the incidents on which you want to take action.

## Indicators

**Mean time to resolution**

The average time taken to resolve incidents.

**First call resolution**

Number of incidents resolved the first time it was handled by an agent.

**Customer satisfaction**

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Overall customer satisfaction on incident resolution.

**My incidents**

A list of incidents that you manage.

**Unassigned incidents**

A list of incidents that has not been assigned.

### Breakdowns

- Priority
- Category
- Assignment Group
- Assigned To

### Reports

| Title | Type | Description |
|---|---|---|
| Open P1 Incidents | Single score ( ) | Number of open incidents with top priority. |
| Incidents not updated in 24 hours | Single score ( ) | Number of incidents that have not been updated in the last 24 hours. |
| Incident SLAs Breached | Single score ( ) | Number of incidents with SLAs that have been breached. |
| Incident SLAs at Risk | Single score ( ) | Number of incidents with SLAs that are at risk. |

## Setting up ITSM Agent Workspace

Set up ITSM Agent Workspace for your agents so they can engage with customers, answer questions, create task records, and resolve issues.

The ITSM Workspace (com.snc.agent_workspace.itsm) plugin provides you with the functionality of ITSM Agent Workspace. The plugin is available by default for new and existing customers.

**Important:**
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### Activate ITSM Workspace Landing Pages – Premium

You can activate the ITSM Workspace Landing Pages – Premium plugin (com.snc.agent_workspace.itsm.landing_page_premium) if you have the admin role. This plugin includes demo data and activates related plugins if they are not already active.

**Before you begin**
Role required: agent_workspace_user or admin

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### About this task

The ITSM Workspace Landing Pages – Premium plugin (com.snc.agent_workspace.itsm.landing_page_premium) activates the related plugin if it is not already active.

**Plugins for ITSM Workspace Landing Pages – Premium**

| Plugin | Description |
|---|---|
| Agent Workspace<br><br>[com.agent_workspace] | Provides a suite of tools that provide agents, case managers, help desk professionals, and managers with tools to help answer customer questions or resolve customer problems.<br><br>**Note:**<br>The Agent Workspace plugin activates the ITSM Workspace Landing Pages plugin (com.snc.agent_workspace.itsm.landing_page) that delivers the standard landing page for ITSM Agent Workspace. |
| Performance Analytics – Content Pack – ITSM Dashboards<br><br>[com.snc.pa.itsm_dashboards] | Activation of this plugin on production instances may require a separate Performance Analytics license. |

### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.
3. Select **Install** to start the installation process.

   **Note:**
   When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

   You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

### Related topics

List of plugins (New York)

## Set the default landing page

You can set a default landing page to surface the information that is most relevant for your agents.

### Before you begin

Role required: agent_workspace_user or admin

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### Procedure

1. Navigate to **All** > **Workspace Experience** > **Administration** > **All Workspaces**.
2. Click **Agent Workspace**.
3. In the Landing Pages related list, set the value of the **Order** field of the landing page that you want to set as the default to minimum.

   **Note:**
   The landing page with the minimum order value is considered to be the default landing page.

4. **Optional:** Verify the default landing page assignment by navigating to **Workspace Experience** > **Workspaces** > **Agent Workspace Home**.
   The default landing page opens.

## Add field or related list to a workspace form

You can quickly add fields or related lists to a workspace form by configuring form layout or related lists from Platform.

### Before you begin

Role required: agent_workspace_user or admin

### About this task

**Add fields and related list in workspace**



### Procedure

1. Navigate to **All** > **Incident** > **Open**.
2. Change the view of the task table to **Workspace**.

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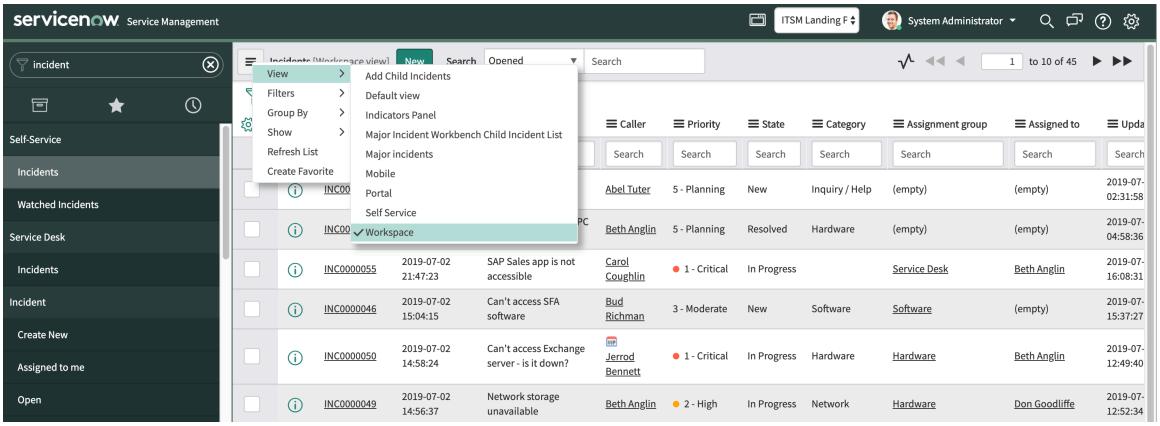


3. Open an incident record.
4. **Optional:** Click the settings icon ( ) and under System Settings, click **Developer**.
5. From the Application list, select ITSM Landing Pages or ITSM Landing Pages Premium depending on which form layout you want to update and close the window.
6. Perform any of the following actions.

7. Move the required fields and related lists from the **Available** box to the **Selected** box.
8. Click **Save**.

## Create an interaction record in ITSM Agent Workspace

Create an interaction record when you communicate with the user if you are not clear on the user requirements. You can create an incident or a request later from the interaction based on the use case.

### Before you begin

Role required: workspace_agent or admin

### About this task

- On clicking **Create Incident** from the Interaction record form, a new unsaved Incident opens that has the value of the caller and the short description copied from the Interaction record.
- On clicking **Create Problem** from the Interaction record form, a new unsaved Problem opens that has the value of the **Problem statement** copied from the **Short description** of the Interaction record. The **Allow Problem creation from Interaction** (*glide.problem.interaction.allow_create*) problem property available at **Problems** > **Administration** > **Problem Properties** determines whether the **Create Problem** option is shown on the Interaction form.
- On clicking the **Create Standard Change**, you are directed to the New Catalog Item page. Select **Standard Change** from the menu.
- On clicking **Create Request**, you are directed to the New Catalog Item page from where you can create a new catalog request.

### Procedure

1. Navigate to **Agent Workspace** > **Agent Workspace Home**.
2. Click the plus icon ( + ) to open a new tab.

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The New Interaction page appears.

3. On the form, fill the fields.

| Field | Description |
|---|---|
| Number | [Auto-generated]. Unique number to identify the interaction record. |
| Type | The communication channel using which the agent interacted with the user. |
| State | Different states through which the interaction proceeds for a resolution. |
| Opened for | The agent for whom the interaction is created. |
| Assigned to | The agent to work on the interaction. |
| Wait time | The duration from creation of the interaction to the time it is assigned to an agent. |
| Short description | A brief description of the interaction. |
| Work notes | Inscription about the work that you perform on the interaction record. |

4. Click **Save**.
An interaction record is created. The **User's Calls** and the **User's Task** related list are available on the Interaction form.
   - **User's Calls**: The **User's Calls** related list displays historical calls between a requester and Service Desk agents. This feature is available to the users who has the Service Desk Call plugin (com.snc.service_desk_call) already activated.

     **Note:**
     From the Orlando release, the Service Desk Call plugin (com.snc.service_desk_call) requires a separate subscription and must be activated by a ServiceNow personnel. Users with the admin role can no longer activate the plugin.

     The customer name in the **Opened for** field in Interaction is matched with the **Caller** field in Service Desk calls and records are retrieved based on the number of days mentioned in the interaction property **Number of days (integer) for which past user call records are retrieved. The default value is seven (7). A setting of zero (0) disables this feature.**

     (*glide.new_call.interaction.records_age*).
   - **User's Task**: When a requester contacts an agent through chat, phone call, request, or walk-in, the **User's Task** related list shows the agent all of the other tasks (incident, problem, change request, request, and so on) that have been created for the requester. For example, if a requester calls about the status of a request that was made the previous day, the **User's Task** related list shows the request. Workspace includes the other tasks in the **User's Task** related list when the value for the **Opened for** field in the interaction record matches the:
     - **Caller** field in an incident record
     - **Opened by** field in a problem record
     - **Requested by** field in a change record
     - **Requested for** field in a Service Catalog record

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## Create an outage from a task record in ITSM Agent Workspace

You can create an outage from a task record such as incident, problem, or change, to track the down time of a configuration item.

### Before you begin

Role required: agent_workspace_user or admin

### Procedure

1. Navigate to **All** > **Workspace Experience** > **Workspaces** > **Agent Workspace Home**.
2. Navigate to the task record type from which you want to create an outage.
3. Open the task record from which you want to create an outage.
4. Click the more actions icon ( ) and then click **Create Outage**.
5. On the form, fill in the fields.

| Field | Description |
|---|---|
| Number | Unique number that identifies the outage. |
| Configuration item | Configuration item (CI) that the outage applies to. |
| Type | Type of the outage such as Degradation, Outage, and Planned Outage. |
| Begin | Date and time when the outage starts. To enter the current date and time, click the **Begin Outage Now** related link. |
| End | Date and time when the outage ends. When the outage ends, open the record and enter the date and time manually. To enter the current date and time, click the **End Outage Now** related link. |
| Duration | Duration of the outage in days and hours. |
| Task number | Parent task record number from which you have created the outage. |
| Short description | Brief description of the outage. |

6. **Optional:** If you want to attach a supporting document, click the attachment icon ( ) and select the file.
7. Click **Save**.

# Using ITSM Agent Workspace

Use ITSM Agent Workspace to interact with customers, create and work on task records, and resolve issues.

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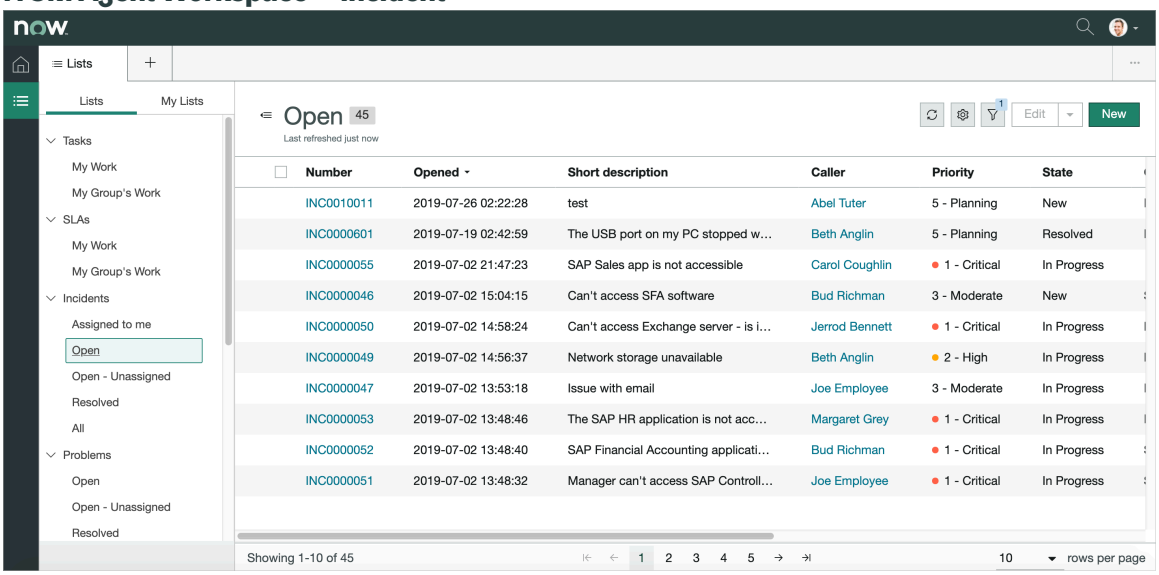
## ITSM Agent Workspace - Incident

The Incident workspace form is similar to the default platform Incident form.

If you want to change the view of the incident workspace form, customize the workspace view from the Incident form. For details, see Add field or related list to a workspace form.

Overview of ITSM Agent Workspace

**ITSM Agent Workspace — Incident**




### Create an incident in ITSM Agent Workspace

You can create an incident record to document a deviation from an expected standard of operation.

#### Before you begin
Role required: agent_workspace_user or admin

#### About this task
Incident records enable you to track the investigation, possible solutions, and resolution of a problem for a customer. If resolving the incident involves creating a problem, change, or service request, you can create the record directly from the incident record.

#### Procedure

1. Navigate to **All** > **Workspace Experience** > **Workspaces** > **Agent Workspace Home**.
2. From the navigation list, click **Incidents** > **Open**.
3. Click **New**.
4. On the form, fill in the fields.

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### Incident form

| Field | Description |
|---|---|
| Number | [Auto-generated]. Unique number to identify the incident record. |
| Caller | User who contacted you with an issue. Begin typing the first name of the caller to select from a list of matching names, or click the lookup icon ( ) and select the user. |
| Category | Type of issue. After selecting a category, you can select a subcategory if applicable. |
| Subcategory | Subdivision of the category. |
| Service | Business service that is affected. |
| Service Offering | Consists of one or more service commitments that uniquely define the level of service in terms of availability, scope, pricing, and packaging options. Service offering enables you to receive different features and their levels of performance for a given service. |
| Configuration item | Configuration item that is affected. |
| Contact type | Mode of communication taken by the user to create the incident. |
| State | Different states through which the incident proceeds during its life cycle. |
| Impact | The effect of an incident, problem, or change on the business processes. |
| Urgency | How long the resolution can be delayed until an incident, problem, or change has a significant business impact. |
| Priority | How quickly the service desk should address the task. Priority is based on impact and urgency. |
| Assignment group | Group to work on this incident. If you do not provide a value, the incident is automatically assigned.<br><br>You can populate the **Assignment group** field automatically based on the support group available for the respective configuration item (CI). If the CI does not have any support group, then the field gets populated with the support group available for service offerings. The business rule **Populate Assignment Group based on CI/SO** triggers the functionality when an incident, problem, or change request is created or updated and when the **Assignment group** and the |

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| Field | Description |
| --- | --- |
| | **Assigned to** field is empty. The following properties identify the field whose value populates the **Assignment group** field:<br>○ *com.snc.incident.ci_assignment_group.fiel*<br>This incident property identifies which CI field populates the **Assignment group** field.<br>○ *com.snc.incident.service_offering_assignm*<br>This incident property identifies which service offering field populates the **Assignment group** field.<br>**Note:**<br>The default value for the properties is support group for incident or problem and change group for change request respectively. The business rule **Populate Assignment Group based on CI/SO** is shipped as part of the development plugin ITSM CSDM Best Practice – Quebec plugin (com.snc.best_practice.itsm_csdm.quebec) and is available only for the new customers. |
| Assigned to | The user to work on this incident.<br>**Note:**<br>If the **Assignment group** changes, the **Assigned to** field is cleared. |
| Short description | Brief description of the incident. |
| Description | Detailed explanation of the incident. |
| Notes | |
| Watch list | Users who receive notifications about the incident when comments are added. |
| Work notes list | Users who receive notifications about the incident when work notes are added.<br>**Note:**<br>The administrator must create an email notification for the work notes list. |
| Additional comments (Customer visible) | More information about the issue as needed. All users who can view incidents can also see additional comments. |
| Work notes | Information about how to resolve the incident or steps taken to resolve it, if applicable. |
| Related Records | |
| Parent Incident | Associated parent incident that makes the current incident a child incident. |

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| Field | Description |
|---|---|
| | **Note:** When the parent incident is resolved, the child incident is also marked as resolved. |
| Problem | Any related problem record. |
| Change Request | Any related change request. |
| Caused by Change | Associated change request that prompted the creation of the incident. |
| Resolution Information | |
| Knowledge | Option for enabling a knowledge article to be created from this incident when the incident is closed.<br>**Note:** If you activate the KCS Integration for Incident Management plugin (com.snc.incident.knowledge), the check box is disabled and the **Create Knowledge** UI is available by clicking the more actions icon (...). |
| Resolution code | The resolution code for the incident. |
| Resolution notes | How or why the incident was closed. |
| Resolved by | User who resolved the issue. |
| Resolved | Date and time when the incident was resolved. |

5. Click **Save**.

### Create an incident from an interaction

Create an incident record directly from an interaction when the customer reports events that result in interruption of one or more services.

#### Before you begin

Role required: agent_workspace_user or admin

#### Procedure

1. Navigate to **All** > **Workspace Experience** > **Workspaces** > **Agent Workspace Home**.
2. Create an interaction record.
   For more information, see Create an interaction record in ITSM Agent Workspace.
3. On the interaction page, click **Create Incident**.
4. On the form, fill the fields.

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### Incident form

| Field | Description |
|---|---|
| Number | Auto-generated unique number to identify the incident record. |
| Caller | User who contacted you with an issue. Begin typing the first name of the caller to select from a list of matching names, or click the lookup icon ( ) and select the user. |
| Category | Type of issue. After selecting a category, you can select a subcategory if applicable. |
| Subcategory | Subdivision of the category. |
| Service | Business service that is affected. |
| Service Offering | Consists of one or more service commitments that uniquely define the level of service in terms of availability, scope, pricing, and packaging options. Service offering enables you to receive different features and their levels of performance for a given service. |
| Configuration item | Configuration item that is affected. |
| Contact type | Mode of communication taken by the user to create the incident. |
| State | Different states through which the incident proceeds during its life cycle. |
| Impact | The effect of an incident, problem, or change on the business processes. |
| Urgency | How long the resolution can be delayed until an incident, problem, or change has a significant business impact. |
| Priority | How quickly the service desk should address the task. Priority is based on impact and urgency. |
| Assignment group | Group to work on this incident. If you do not provide a value, the incident is automatically assigned based on assignment rules. |
| Assigned to | The user to work on this incident.<br>**Note:**<br>If the **Assignment group** changes, the **Assigned to** field is cleared. |
| Short description | Brief description of the incident. |
| Description | Detailed explanation of the incident. |
| Notes | |

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| Field | Description |
| --- | --- |
| Watch list | Users who receive notifications about the incident when comments are added. |
| Work notes list | Users who receive notifications about the incident when work notes are added.<br><br>**Note:**<br>The administrator must create an email notification for the work notes list. |
| Additional comments (Customer visible) | More information about the issue as needed. All users who can view incidents can also see additional comments. |
| Work notes | Information about how to resolve the incident or steps taken to resolve it, if applicable. |
| Related Records | |
| Parent Incident | Associated parent incident that makes the current incident a child incident.<br><br>**Note:**<br>When the parent incident is resolved, the child incident is also marked as resolved. |
| Problem | Any related problem record. |
| Change Request | Any related change request. |
| Caused by Change | Associated change request that prompted the creation of the incident. |
| Resolution Information | |
| Knowledge | Option for enabling a knowledge article to be created from this incident when the incident is closed.<br><br>**Note:**<br>If you activate the KCS Integration for Incident Management plugin (com.snc.incident.knowledge), the check box is disabled and the **Create Knowledge** UI is available by clicking the more actions icon (  ). |
| Resolution code | The resolution code for the incident. |
| Resolution notes | How or why the incident was closed. |
| Resolved by | User who resolved the issue. |
| Resolved | Date and time when the incident was resolved. |

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5. Click **Save**.
   An incident is created and the interaction appears in the Interactions related list.

### Create an incident from a chat

With ITSM Agent Workspace, you can accept and respond to customer chat requests and create incidents as needed.

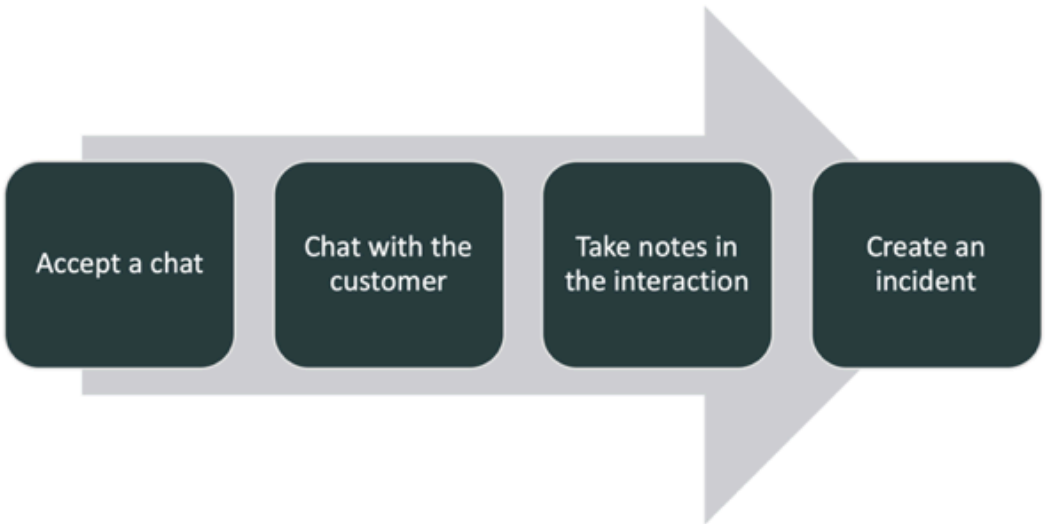
## Before you begin

Role required: agent_workspace_user or admin

## About this task

Chat with customers and find out more about their issues. Jot down notes about both the customer and the issue in an interaction form. If it's an easy fix, solve the issue directly from the interaction. If the issue requires more investigation, create an incident and assign it to an agent.

#### Create an incident from a chat workflow




## Procedure

1. Set your presence status so that you're ready to accept chats.

   From your inbox, click **Status** and select **Available**.

2. Accept a chat from your inbox and respond to the customer.

   Click **Accept** on the chat card, review the information in the Active Chat panel, and type your response.

3. Ask questions and find out more about the issue.
4. Add information about the customer and issue to the interaction record.
5. Create an incident for this issue.

   Click **Create Incident** on the Interaction form to open a new incident with the details from the interaction.

## What to do next

Resolve an incident using knowledge

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### Resolve an incident using knowledge

Resolve an incident by searching for related knowledge and attaching a knowledge article.

## Before you begin

Role required: agent_workspace_user or admin

## About this task

When you are ready to work on an incident, select an incident from a list or from your inbox. Read the details in the activity stream to get an understanding of the issue. Use Agent Assist to search for related knowledge, select and preview an article, and then attach it to the incident.

#### Resolve an incident using knowledge workflow




## Procedure

1. Open an incident from a list or from your inbox.
2. Review the incident details in the activity stream.
3. Use Agent Assist to search for related knowledge.
4. Select and preview an article.
5. Click **Attach** and then **Attach Article** to attach the article to the incident.

   The system attaches the knowledge article to the incident and adds the action to the activity stream.

   From the ITSM Service Portal, the customer can see the knowledge article attached to the incident and can click the link to open the article in a new tab. If the article solves the issue, the customer can click **Close Incident** in the Actions widget.

### Create a knowledge article from an incident

Create a knowledge article from an incident in ITSM Agent Workspace and capture the detailed information used to resolve an issue. Use the knowledge article for quick resolution of similar incidents.

## Before you begin

Role required: agent_workspace_user or admin

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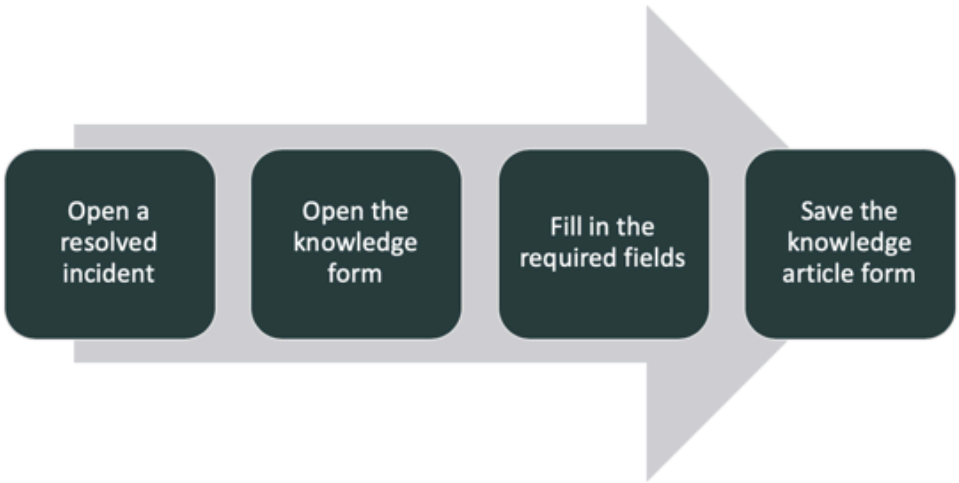
Activate the KCS Integration for Incident Management plugin (com.snc.incident.knowledge).

## About this task

You can create a knowledge article only when the incident is resolved and a knowledge article has not yet been created from the incident.

**Create knowledge article from an incident workflow**




## Procedure

1. Navigate to **All** > **Workspace Experience** > **Workspaces** > **Agent Workspace Home**.
2. From the list, click **Incidents** > **Resolved**.
3. Open the incident record from which you want to create a knowledge article.
4. Click the more actions icon ( ··· ) and then click **Create Knowledge**.
5. On the form, fill in the fields.

**Note:**
If the KCS Integration for Incident Management (com.snc.incident.knowledge) plugin is active, then the fields listed in the CSM Table Map (csm_table_map) table are copied from the incident. If the plugin is not active, then the incident number from the parent incident is copied to the **Parent** field of the knowledge gap feedback task and the text from the **Short Description** is copied to the **Description** field.

**Incident KCS Article form fields**

| Field | Description |
|---|---|
| Number | [Auto-generated] Unique number to identify the knowledge article. |
| Knowledge base | Knowledge base in which the article is stored. The Incident KCS Article is stored in the [kb_template_incident_kcs_article] table. |
| Category | [Auto-generated] Unique number to identify the knowledge article. |

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| Field | Description |
|---|---|
| Valid to | Date after which the knowledge article is deleted from the database. After this date, the article does not appear in the search result. |
| Version | [Auto-generated] Unique number to identify the knowledge article. |
| Workflow | [Auto-generated] Unique number to identify the knowledge article. |
| Source Task | [Auto-generated] Unique number to identify the knowledge article. |
| Attachment link | Option to automatically download an attached article instead of opening the article, when you access an article. |
| Display attachments | Option to display attachments in the knowledge article. The attachments appear below the article text. |
| Short description | Brief description of the knowledge article. |
| Issue | Information on the cause of the incident. |
| Resolution | Method used to resolve the incident. |

6. **Optional:** If you want to attach a supporting document, click the attachment icon ( ) and select the file.
7. Click **Save**.
   A knowledge article is created. The article record is listed in the Created Knowledge related list on the Incident form.

### Report a knowledge gap from an incident

Report a knowledge gap when you do not find any appropriate resolution documented for an incident. The knowledge gap record helps the team know to create a knowledge article for the incident.

#### Before you begin

Role required: agent_workspace_user or admin

#### About this task

If the KCS Integration for Incident Management (com.snc.incident.knowledge) plugin is active, then the fields to be copied from an Incident to the knowledge gap feedback task are maintained in the CSM Table Map (csm_table_map) table. If the plugin is not active, the incident number from the parent incident is copied to the **Parent** field of the knowledge gap feedback task and the text from the **Short Description** is copied to the **Description** field.

**Note:**
Incident managers with the sn_km_ml.knowledge_curation_user role can use the Demand Insights for Incidents dashboard to identify which incidents have no or insufficient knowledge coverage. For more information, refer Demand Insights for Incidents dashboard .

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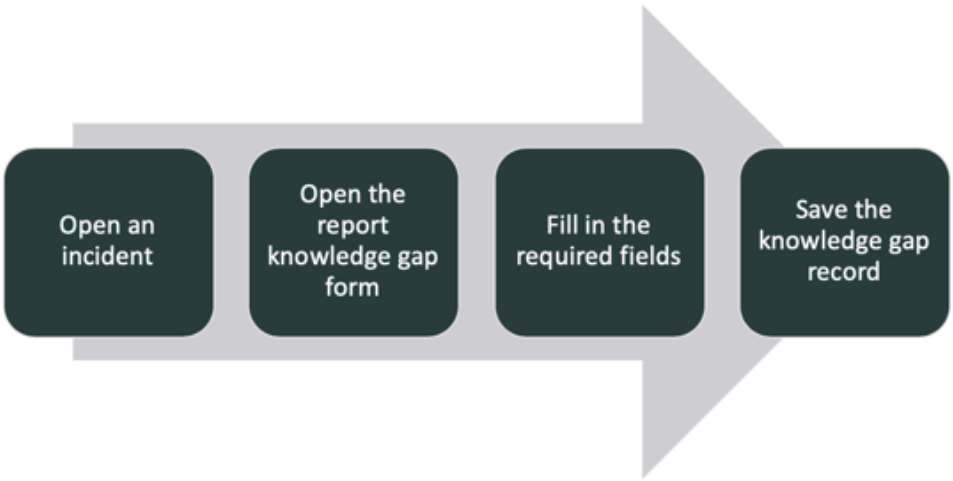
### Report knowledge gap from an incident workflow




## Procedure

1. Navigate to **All** > **Workspace Experience** > **Workspaces** > **Agent Workspace Home**.
2. Open an incident record from which you want to create a record to report a knowledge gap.
3. Click the more actions icon (...) and then click **Report Knowledge Gap**.
   A knowledge gap feedback task record is created in a sub-tab.
4. On the form, fill in the fields.
5. Click **Save**.
   The knowledge gap feedback task is saved and added to the Knowledge Gaps related list.

### Capture information on affected configuration items in ITSM Agent Workspace

Capture information on affected configuration items (CIs), with type as asset, in an incident to keep a record of the updated, repaired, swapped, or retired configuration items.

## Before you begin

Role required: itil or admin

Activate the Hardware Asset Management Professional plugin (com.sn_hamp).

## About this task

By keeping track of the assets, you can tell where the assets are located, how they are used, and when changes were made to them. This information helps you to monitor and manage your company using a systematic approach.

If you are not the caller of the incident and have a CI value in the affected CIs list, it is mandatory to provide information on the CI before changing the state of the incident to **Resolved**.

You can enter CI information either from the **Affected CIs** related list. You need to manually add the **Asset Action** and the **Swapped CI** fields in the related list. To know how to add related lists, refer Add field or related list to a workspace form.

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### Procedure

1. Navigate to **All** > **Incident** > **Open**.
2. Open an incident.
3. Navigate to the **Affected CIs** related list before resolving the incident.
4. Open the affected CI.
5. On the form, fill in the fields.

#### Information on CIs Affected form

| Field | Description |
|---|---|
| Asset Action | Information on whether a CI is updated or repaired, swapped with another CI, or retired from the system. The options available are: No action, Update/Repair, Swap, and Retire.<br>**Note:**<br>If you swap or retire a CI, the sn_hamp_asset.swap or sn_hamp_asset.retire events are generated respectively. |
| Swapped CI | Information on the new CI that is swapped with the existing CI.<br>**Note:**<br>○ This field appears only when you select the value of the **Asset Action** field as **Swap**.<br>○ The CI values available for swapped CI are the ones with asset CI class as hardware. |

6. Click **Save**.
   The record is saved and the information about CI is stored in the [task_ci] table.

## Create a copy of an incident in ITSM Agent Workspace

Create a copy of an incident to avoid having to manually enter the value of all the fields in the new incident.

### Before you begin

Role required: agent_workspace_user or admin

### About this task

Users with the agent_workspace_user role can copy any incident but users without any role can copy only the incidents that they created. Fields and related lists are copied from the parent incident to the new incident based on the incident property settings.

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**Note:**
Affected CIs (task_ci) and Impacted Services (task_cmdb_ci_service) are available by default in the related list. You cannot add any other table in this field but you can remove any of the default values.

### Procedure

1. Navigate to **All** > **Workspace Experience** > **Workspaces** > **Agent Workspace Home**.
2. From the list, click **Incidents** > **Open**.
3. Open the incident record that you want to copy.
4. Click the more actions icon ( ... ) and select **Copy Incident**.
5. In the Copy Incident dialog box, enter the name of the caller for whom you are creating the copied incident.
6. Click **OK**.
   A new incident is created and saved. The following message appears in the activity stream:

   `This incident is copied from INCXXXXXXX.`

## Propose an incident to be a major incident from a workspace

Proposing an incident as a major incident sends the request to the major incident manager to analyze the incident and accept or reject it as a major incident. Major incidents have a separate procedure with shorter timescales and urgency that is required to accelerate resolution process for incidents with high business impact.

### Before you begin
Role required: agent_workspace_user or admin

### Procedure

1. Navigate to **All** > **Workspace Experience** > **Workspaces** > **Agent Workspace Home**.
2. In the menu, click **Incidents** > **Open**.
3. Open the incident record that you want to propose as a major incident.
4. Click the more actions icon ( ... ) and then click **Propose Major Incident**.
5. In the Work notes field in the Propose Major Incident dialog box, provide information about the business impact that supports classifying this incident as a major incident and click **Propose**.
   The major incident state changes to **Proposed** and the message `INCXXXXXXX has been proposed as a major incident candidate` is displayed.

## Report a knowledge gap from an incident

Report a knowledge gap when you do not find any documented appropriate resolution documented for an incident. The knowledge gap record helps the team know to create a knowledge article for the incident.

### Before you begin
Role required: agent_workspace_user or admin

### About this task
If the KCS Integration for Incident Management (com.snc.incident.knowledge) plugin is active, then the fields to be copied from an Incident to the knowledge gap feedback task are maintained in the CSM Table Map (csm_table_map) table. If the plugin is not active, the incident number

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from the parent incident is copied to the **Parent** field of the knowledge gap feedback task and the text from the **Short Description** is copied to the **Description** field.

### Procedure

1. Navigate to **All** > **Workspace Experience** > **Workspaces** > **Agent Workspace Home**.
2. From the list, click **Incidents** > **Open**.
3. Open the incident record from which you want to create a record to report a knowledge gap.
4. Click the more actions icon ( ) and then click **Report Knowledge Gap**.
   A knowledge gap feedback task record is created in a sub-tab.
5. On the form, fill in the fields.
6. Click **Save**.
   The knowledge gap feedback task is saved and added to the **Knowledge Gaps** related list.

## Refresh impacted services and CIs

The impacted services and CIs related list in ITSM Agent Workspace refreshes its records based on the affected CIs. Identify the impacted services and CIs and take necessary action.

### Before you begin

Role required: itil, agent_workspace_user or admin

Ensure that you have configured the Business Applications related list.

### About this task

When you refresh impacted services, the Impacted Services/CIs, Business Applications, and Service Offerings related lists get updated based on the affected CIs. The records in each of the related list are unique even though the impact can be from a single affected CI. The following properties are responsible for this functionality:

- **Populate Impacted Services based on Affected CIs. Note: This requires any Business Service identified to have previously been converted to an Application Service.** (*incident.refresh_impacted.include_affected_cis*)
- **Populate the Business Application related list for incidents** (*com.snc.incident.populate_business_application*)
- **Populate the Service Offering related list for incidents** (*com.snc.incident.populate_service_offering*)

### Procedure

1. Navigate to **All** > **Workspace Experience** > **Workspaces** > **Agent Workspace Home**.
2. From the list, click **Incidents** > **Open**.
3. Open the incident record for which you want to refresh the related lists those values are based on affected CIs.
4. Click the more actions icon ( ) and then click **Refresh Impacted Services**.
   The records in the Impacted Services/CIs, Business Applications, and Service Offerings related lists are updated.

## Create a problem record from an incident

When the cause of an incident is an error or widespread issue, you can create a problem record to track the root cause of the issue.

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### Before you begin

Role required: agent_workspace_user or admin

### Procedure

1. Navigate to **All** > **Workspace Experience** > **Workspaces** > **Agent Workspace Home**.
2. From the list, click **Incidents** > **Open**.
3. Open the incident record from which you want to create a problem record.
4. Click the more actions icon ( ) and then click **Create Problem**.
5. On the form, fill in the fields.

| Field | Description |
|---|---|
| Number | [Auto-generated] Unique number to identify the problem record. |
| First reported by | Task that first identified the problem. In this case, it is the incident number from which it is being created. |
| Category | Group to which the problem belongs, such as software or hardware. After selecting the category, select the subcategory, if applicable. |
| Service | Business service that is affected. |
| Service Offerings | Consists of one or more service commitments that uniquely define the level of service in terms of availability, scope, pricing, and packaging options. You can choose to receive different levels of performance and features for a given service through service offerings. |
| Configuration item | Configuration item that is affected. The CI class of the selected configuration item identifies the type of problem, for example, hardware, network, or database. |
| State | For customers prior to the Madrid release, the available states are: **Open**, **Pending Change**, **Known Error**, and **Closed** or **Resolved**.<br><br>For customers starting with the Madrid release, the new state model is applied and the **State** field is read only. The field value changes as the problem proceeds from one state to another state. The states available are: **New**, **Assess**, **Root Cause Analysis**, **Fix in Progress**, **Resolved**, and **Closed**. |

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| Field | Description |
| --- | --- |
| | **Note:** To access the new state management process, activate the Problem Management Best Practice — Madrid (com.snc.best_practice.problem.madrid) plugin. |
| Impact | Effect that the problem has on business. |
| Urgency | Extent to which the problem resolution can bear delay. |
| Priority | How quickly the service desk should address the problem.<br>**Note:** The **Priority** field is read-only and is set according to the **Impact** and **Urgency** values. |
| Assignment group | Group to which the problem is assigned. If you don't supply a value, the problem is automatically assigned. |
| Assigned to | Problem coordinator that the problem is assigned to. If an assignment rule applies, the problem is automatically assigned to the appropriate user or group. |
| Problem statement | Brief description of the problem. |
| Description | Detailed description of the problem. |
| Notes section | |
| Work notes list | Users who receive notifications about the problem when work notes are added.<br>**Note:** The administrator must create an email notification for the work notes list. For more information, see Create an email notification. |
| Work notes | Information about the work that you perform on the problem. |
| Analysis Information section | |
| Workaround | Method used to temporarily solve the problem until it is resolved.<br>If a workaround is available, the problem coordinator can click the **Communicate Workaround** action to notify the related incidents. For more information, see |

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| Field | Description |
|---|---|
| | Synchronization between incident and problem records. |
| Cause notes | Description of what caused the problem. |
| Resolution Information section | |
| Resolved | Date and time when the incident was resolved. |
| Resolved by | User who resolved the issue. |
| Fix notes | Information on how fixed the problem was fixed. |
| Other Information section | |
| Opened | [Auto-generated] The user who opened the problem. |
| Opened by | [Auto-generated] Date and time when the user opened the problem. |
| Confirmed | [Auto-generated] User who confirmed the problem. |
| Confirmed by | [Auto-generated] Date and time the user confirmed the problem. |

6. **Optional:** If you want to attach a supporting document, click the attachment icon ( ) and select the file.
7. Click **Save**.

### Create a change request from an incident

If the cause of an incident requires a change to your infrastructure or a business service, you can create a change request from the incident as part of fixing the problem.

#### Before you begin

Role required: agent_workspace_user or admin

#### Procedure

1. Navigate to **All** > **Workspace Experience** > **Workspaces** > **Agent Workspace Home**.
2. From the list, click **Incidents** > **Open**.
3. Open the incident record from which you want to create a change.
4. Click the more actions icon ( ) and click **Create Change Request**.
5. In the Create Change Request dialog box, select the type of change.

| Option | Description |
|---|---|
| **Normal** | Any service change that is not a standard change or an emergency change. |
| **Standard** | A pre-authorized change that is low risk, relatively common, and follows a specified procedure or work instruction. |

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| Option | Description |
| --- | --- |
| **Emergency** | An emergency change that bypasses group and peer review and approval, and goes straight to the authorization state for approval by the CAB approval group. |

6. Click **Create**.
7. Creating the change record.
   For more information, see Create a change task.
8. Click **Save**.
   The change record appears under the Change Requests related list.

### Create a knowledge article from an incident in ITSM Agent Workspace

You can create a knowledge article from an incident in Agent Workspaces to capture the troubleshooting steps and other detailed information used to resolve an issue for faster resolution of similar incidents.

#### Before you begin

Role required: agent_workspace_user or admin

Activate the KCS Integration for Incident Management plugin (com.snc.incident.knowledge)

#### About this task

You can create a knowledge article only when the incident is resolved and you have not already created a knowledge article from that incident.

#### Procedure

1. Navigate to **All** > **Workspace Experience** > **Workspaces** > **Agent Workspace Home**.
2. From the list, click **Incidents** > **Resolved**.
3. Open the incident record from which you want to create a knowledge article.
4. Click the more actions icon ( ··· ) and then click **Create Knowledge**.
5. On the form, fill in the fields.

**Note:**

- If the KCS Integration for Incident Management (com.snc.incident.knowledge) plugin is active, then the fields listed in the CSM Table Map (csm_table_map) table are copied from the incident. If the plugin is not active, then the incident number from the parent incident is copied to the **Parent** field of the knowledge gap feedback task and the text from the **Short Description** is copied to the **Description** field.
- The **Confidence** and **Governance** fields appear when the Knowledge Management KCS Capabilities plugin (com.snc.knowledge_kcs_capabilities) is activated. For more information, see Managing the KCS article state.

#### Incident KCS Article form fields

| Field | Description |
| --- | --- |
| Number | [Auto-generated] Unique number to identify the knowledge article. |

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| Field | Description |
|---|---|
| Knowledge base | Knowledge base in which the article is stored. The Incident KCS Article is stored in the [kb_template_incident_kcs_article] table. |
| Category | [Auto-generated] Unique number to identify the knowledge article. |
| Valid to | Date after which the knowledge article is deleted from the database. After this date, the article does not appear in the search result. |
| Confidence | Maturity of an article based on its completeness and reusability. |
| Version | [Auto-generated] Unique number to identify the knowledge article. |
| Workflow | [Auto-generated] Unique number to identify the knowledge article. |
| Source Task | [Auto-generated] Unique number to identify the knowledge article. |
| Attachment link | Option to automatically download an attached article instead of opening the article, when you access an article. |
| Display attachments | Option to display attachments in the knowledge article. The attachments appear below the article text. |
| Governance | An attribute of an article that enables you to control sensitive, critical, or regulated information. Not all articles have the same requirement for compliance reviews. Some articles are based on the collective experience of the people who use the articles (experience-based). Other articles have policy or legal information that require tight control (compliance-based). |
| Short description | Brief description of the knowledge article. |
| Issue | Information on the cause of the incident. |
| Resolution | Method used to resolve the incident. |

6. **Optional:** If you want to attach a supporting document, click the attachment icon ( ) and select the file.
7. Click **Save**.
   A knowledge article is created. The article record is listed in the Created Knowledge related list on the Incident form.

### Create an improvement initiative from an incident

Create an improvement initiative from an incident to track and manage tasks for improving a service or process, or tasks related to the incident.

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### Before you begin
Role required: agent_workspace_user, itil, or admin

- The Continual Improvement Management (com.sn_cim) plugin must be activated. For more information on activating the plugin, see Request Continual Improvement Management.
- The administrator must add the Improvement Initiatives related list to the incident form in Workspace view.

### About this task
An improvement initiative contains goals to measure success, and phases that contain tasks with specific actions to complete the improvement. For more information, see Continual Improvement Management overview.

### Procedure
1. Navigate to **All** > **Workspace Experience** > **Workspaces** > **Agent Workspace Home**.
2. From the list, click **Incidents** > **All**.
3. Open the incident for which you want to create an improvement initiative.
4. Click the Improvement Initiative related list.
5. Click **New**.
6. In the **Improvement Initiative** field, click the search icon to find the appropriate initiative.
7. Associate an existing initiative or create a new one.

| Option | Description |
|---|---|
| **If you find an existing initiative** | Select the initiative to associate with this incident. |
| **If you do not find an initiative** | **a.** Click the Create Improvement Initiative related link.<br>**b.** Create an initiative by filling in the Improvement Initiative form. For more information, see Create an improvement request. |

8. **Optional:** If you want to attach a supporting document, click **Browse** and select the file.
9. Click **Save**.
   The improvement initiative is now associated with the incident.

## Delete an incident

If you no longer need incident information, you can delete the incident. This action deletes the incident both from the ServiceNow database and from the Incident [incident] table.

### Before you begin
Role required: agent_workspace_user or admin

### Procedure
1. Navigate to **All** > **Workspace Experience** > **Workspaces** > **Agent Workspace Home**.
2. From the list, click **Incidents** > **Open**.
3. Open the incident record that you want to delete.

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4. Click the more actions icon  and then click **Delete**.
5. In the Confirmation dialog box, click **OK**.

### Incident Management integration with Universal Request in ITSM Agent Workspace

With the integration of Incident Management and Universal Request applications, you can provide a consistent user experience for employees while creating service requests. By providing a common help desk for all employees, you can hide the complexities of inter-department request transfers and multi-department use cases.

Install and configure the Universal Request Integration for Incident Management plugin (com.snc.incident.universal_request). The integration provides the following configurations and functionalities:

## Incident management integration with Universal Request

- The Universal Request form has a UI action to create an incident. The default fields that are copied from the universal request record to the incident record when a new incident is created are: universal_request, short_description, description, caller_id, and opened_by. An incident manager can customize the fields using the system property *sn_inc_uni_req.incident.universal_request.copy_fields*.
- The **Universal Request** field appears on the Incident form only when an incident is associated with a universal request record.
- The **Transfer** button appears on the incident form where an itil agent can transfer an incident back to the universal request, another department, or service.
- An incident created from a record producer automatically creates a unviersal request. It happens only when the **Create Universal Request** check box is enabled on the record producer.
- When an incident associated to a universal request goes through a state change, a notification is sent to the employee (requester) with the universal request number and not the incident number.

### Create incident from Universal Request in ITSM Agent Workspace

Create an incident from a universal request record to restore service to a customer as soon as possible. After creating the incident record, you can investigate potential solutions.

#### Before you begin

Role required: routing_agent and ITIL or admin

Activate the Universal Request (sn_uni_req) and the Universal Request Integration for Incident Management (sn_inc_uni_req) plugins.

#### Procedure

1. Navigate to **Universal Requests** > **All**.
2. Open the universal request record from which you want to create an incident.
3. Click **Create Incident**.
   An incident record is created and associated with universal request. The incident record is not saved until you submit the record.

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4. Fill in the fields on the incident form and click **Save**.
   The universal request number from which the incident is created appears in the **Universal Request** field on the Incident form in workspace. The incident number appears in the **Primary Ticket** field and also in the **Associated Tickets** related list of the Universal Request form.

### Transfer incident in ITSM Agent Workspace

Transfer the back to the Universal Request queue, or to another department with or without resolution. When you realise that the issue is not incident related, transfer the incident without any resolution to the relevant department or service. If you resolve the issue, you can transfer the incident with the resolution.

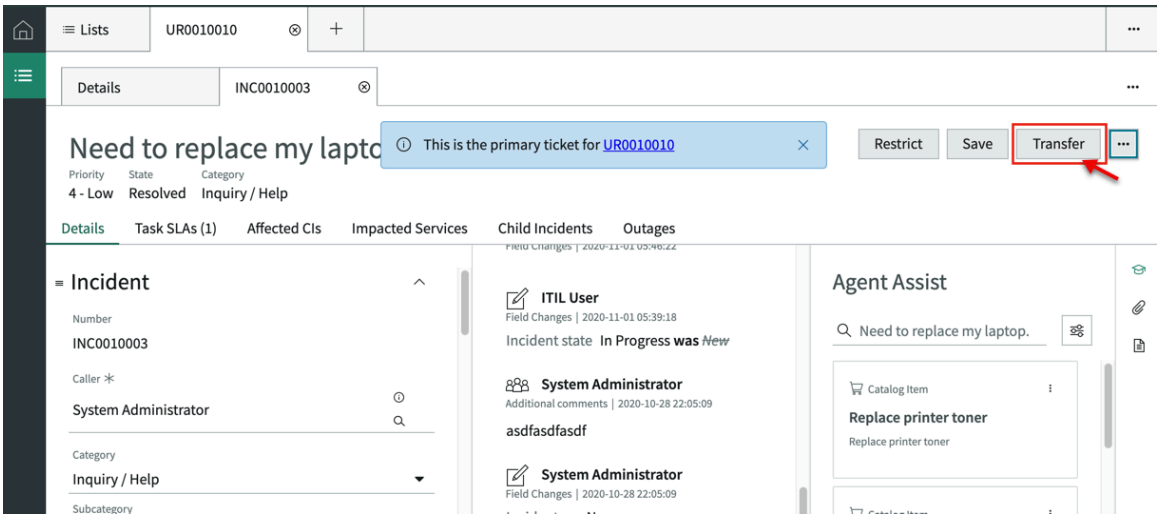
### Before you begin

Role required: itil or admin

Associate an incident with a Universal Request record.

### Procedure

1. Open the incident that you want to transfer.
2. Click **Transfer**.




3. In the **Transfer Ticket** dialog box, provide the following details.

   **Note:**
   Based on your transfer type configuration, the given fields are displayed. For more information, see Universal Request properties.

   - **Action**: Select if the case should be transferred to another department or back to Universal Request
   - **Department**: Select the department from the list.
   - **Service**: Select the specific service of the chosen department.

     **Note:**
     This field does not appear if you have selected **Transfer to Department** in **Action**

   - **Transfer reason**: Select the reason from the list.

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- **Transfer notes**: A brief description for routing the primary ticket that you want to pass to the UR Routing agent.
- **Copy additional comments and attachments**: Deselect if you do not want to transfer the ticket with additional comments and attachments. By default, all attachments and comments are transferred.

  **Note:**
  Work notes are not copied while transferring.

4. Click **Transfer**.

### Mark an incident as restricted

You can restrict an incident ticket that contains sensitive information. By marking an incident as restricted, you limit its access for the agents.

#### Before you begin
Role required: admin or user

#### About this task
Both agents and users can mark an incident as restricted. Users can mark an incident as restricted while creating it. An agent can also mark an incident a restricted while triaging it or while working on it. Cases marked as restricted can only be accessed by

- Routing agents who are part of the assignment group and has sensitive agent role.
- Agents who are a member of primary ticket assignment group.

#### Procedure

1. Navigate to **All** > **Workspace Experience** > **Workspaces** > **Agent Workspace Home**.
2. From the navigation list, click **Incidents** > **Open**.
3. Open the incident that you want to mark as restricted.
4. Click **Restrict**.
5. Click **Update**.

## ITSM Agent Workspace - Problem

The Problem workspace form is similar to the default platform Problem form.

All fields that are available on the Problem form are available on the problem workspace form. However, on the problem workspace form, the **State** field is read-only.

**Note:**
Currently, Agent Workspace supports only the creation and minor update of a Problem record such as updating the short description, description, and work notes.

Overview of itsm agent workspace - problem

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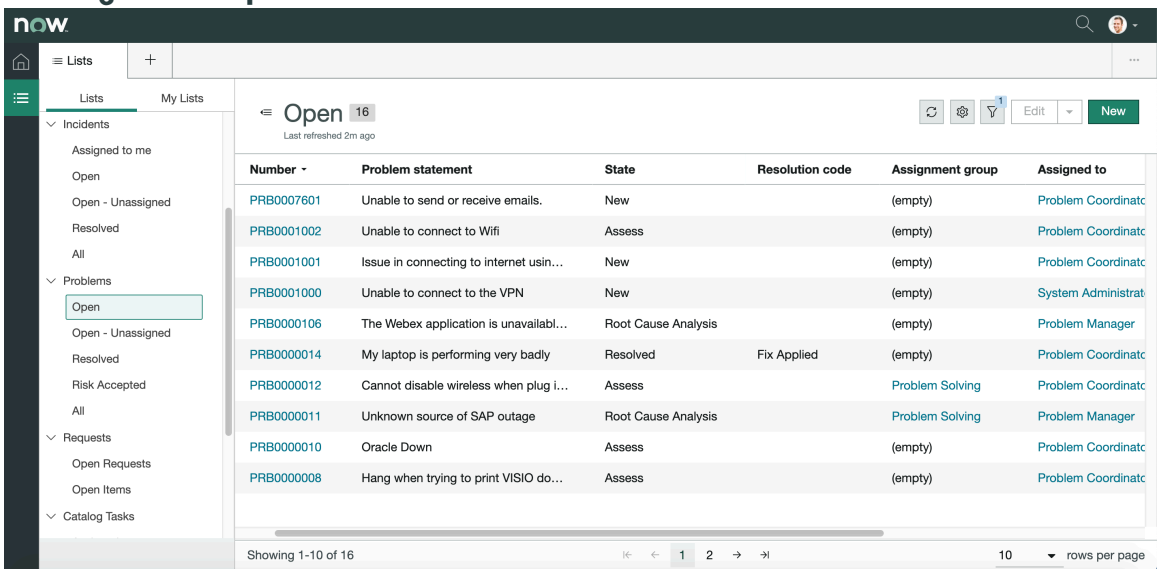
### ITSM Agent Workspace — Problem




## Create and track a problem in workspace

When you have recurring incidents or a major incident, you can create a problem to identify the root cause of the incidents and help prevent them from happening again.

### Before you begin

Role required: agent_workspace_user, problem_coordinator, or admin

### Procedure

1. Navigate to **All** > **Workspace Experience** > **Workspaces** > **Agent Workspace Home**.
2. From the Lists menu, select **Problems** > **Open**.
3. Click **New**.
4. On the form, fill in the fields.

#### Create New Problem form

| Field | Description |
|---|---|
| Number | [Auto-generated]. Unique number that identifies the problem record. |
| First reported by | Task that first identified this problem.<br>**Note:** Activate the Problem Management Best Practice — Madrid (com.snc.best_practice.problem.madrid) plugin. |
| Category and Subcategory | Group to which the problem belongs, such as software or hardware. After selecting the category, select the subcategory, if applicable. |
| Service | Business service, such as email or IT Services, that the problem applies to. |

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| Field | Description |
| --- | --- |
| Service Offering | Consists of one or more service commitments that uniquely define the level of service in terms of availability, scope, pricing, and packaging options. Service offering enables you to receive different features and their levels of performance for a given service. |
| Configuration item | Configuration item (CI) that the problem applies to. The CI class of the selected configuration item identifies the type of problem, for example, hardware, network, or database. |
| State | For customers prior to the Madrid release, the available states are: **Open**, **Pending Change**, **Known Error**, and **Closed** or **Resolved**.<br><br>For customers starting with the Madrid release, the new state model is applied and the **State** field is read only. The field value changes as the problem proceeds from one state to another state. The states available are: **New**, **Assess**, **Root Cause Analysis**, **Fix in Progress**, **Resolved**, and **Closed**.<br><br>**Note:**<br>To access the new state management process, activate the Problem Management Best Practice — Madrid (com.snc.best_practice.problem.madrid) plugin. |
| Impact | Effect that the problem has on business operations. |
| Urgency | Extent to which the problem resolution can bear delay. |
| Priority | How quickly the service desk should address the problem. The **Priority** field is automatically set to the **Impact** and **Urgency** values. |
| Assignment group | Group to which the problem is assigned.<br><br>You can populate the **Assignment group** field automatically based on the support group available for the respective configuration item (CI). If the CI does not have any support group, then the field gets populated with the support group available for service offerings. The business rule **Populate Assignment Group based on CI/SO** triggers the functionality when an incident, problem, or change request is created or updated and when the **Assignment group** and the |

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| Field | Description |
| --- | --- |
| | **Assigned to** field is empty. The following properties identify the field whose value populates the **Assignment group** field:<br>○ *com.snc.problem.ci_assignment_group.field* This problem property identifies which CI field populates the **Assignment group** field.<br>○ *com.snc.problem.service_offering_assignme* This problem property identifies which service offering field populates the **Assignment group** field.<br>**Note:**<br>○ The default value for the properties is support group for incident or problem and change group for change request respectively. The business rule **Populate Assignment Group based on CI/SO** is shipped as part of the development plugin ITSM CSDM Best Practice – Quebec plugin (com.snc.best_practice.itsm_csdm.quebec) and is available only for the new customers.<br>○ If you have not upgraded to Quebec or later versions, this plugin is not available by default. You can raise a Hi request to install the plugin. |
| Assigned to | Problem coordinator to whom the problem is assigned. If an assignment rule applies, the problem is automatically assigned to the appropriate user or group. |
| Problem statement | Brief description of the problem.<br>**Note:**<br>Activate the Problem Management Best Practice — Madrid (com.snc.best_practice.problem.madrid) plugin. |
| Description | Detailed description of the problem. |
| Notes | |
| Work notes list | Users who receive notification when work notes are added to the problem. |
| Work notes | Informative notes about the work performed on the problem. |
| Analysis Information | |
| Workaround | Method used to overcome the issue if no resolution is available yet. |

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| Field | Description |
|---|---|
| Cause notes | The cause of the problem. |
| Auto-generated information | |
| Resolved | [Auto-generated]. Date and time when the user resolved the problem. |
| Resolved by | [Auto-generated]. Name of the user who resolved the problem. |
| Fix notes | Information on how the problem was fixed. |
| Auto-generated information | |
| Opened | [Auto-generated]. Date and time when the user opened the problem. |
| Opened by | [Auto-generated]. User who opened the problem. |
| Confirmed | [Auto-generated]. Date and time when the user confirmed that the issue was indeed a problem. |
| Confirmed by | [Auto-generated]. User who accessed the issue and confirmed that it was a problem. |

5. Click **Save**.

### Create a problem from an interaction

You can create a problem record directly from an Interaction when the customer contacts regarding an issue and you need to investigate the cause of the issue.

#### Before you begin

Role required: agent_workspace_user or admin

- Activate the Problem Management Best Practice — Madrid (com.snc.best_practice.problem.madrid) plugin.
- Select the **Allow Problem creation from Interaction** (*glide.problem.interaction.allow_create*) problem property from **Problem** > **Problem Properties**.

**Note:**
Users who used to create problem record from the New Call feature of the Service Desk Call (com.snc.service_desk_call) plugin, can now create problems from Interaction. Starting the Orlando release, the Service Desk Call (com.snc.service_desk_call) plugin is a maintenance plugin and the user cannot activate the plugin.

#### Procedure

1. Navigate to **Workspace Experience** > **Workspaces** > **Agent Workspace Home**.
2. Create an interaction record.
   For more information, see Create an interaction record in ITSM Agent Workspace.
3. On the interaction page, click the more actions icon ( ··· ) and then select **Create Problem**.
4. On the form, fill in the fields.

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### Problem form

| Field | Description |
| --- | --- |
| Number | [Auto-generated]. Number that identifies the problem record. |
| First reported by | Task that first identified the problem.<br><br>**Note:**<br>Activate the Problem Management Best Practice — Madrid (com.snc.best_practice.problem.madrid) plugin. |
| Category and Subcategory | Group to which the problem belongs to such as software or hardware. After selecting the category, select the subcategory, if applicable.<br><br>**Note:**<br>Activate the Problem Management Best Practice — Madrid (com.snc.best_practice.problem.madrid) plugin. |
| Service | Business service that the problem applies to. |
| Service Offering | Consists of one or more service commitments that uniquely define the level of service in terms of availability, scope, pricing, and packaging options. Service offering enables you to receive different features and their levels of performance for a given service. |
| Configuration item | Configuration item (CI) that the problem applies to. The CI class of the selected configuration item identifies the type of problem, for example, hardware, network, or database. |
| State | For customers prior to the Madrid release, the available states are: **Open**, **Pending Change**, **Known Error**, and **Closed** or **Resolved**.<br><br>For customers starting with the Madrid release, the new state model is applied and the **State** field is read only. The field value changes as the problem proceeds from one state to another state. The states available are: **New**, **Assess**, **Root Cause Analysis**, **Fix in Progress**, **Resolved**, and **Closed**. |

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| Field | Description |
| --- | --- |
| | **Note:** To access the new state management process, activate the Problem Management Best Practice — Madrid (com.snc.best_practice.problem.madrid) plugin. |
| Impact | Effect that the problem has on business operations. |
| Urgency | Extent to which the problem resolution can bear delay. |
| Priority | How quickly the service desk should address the problem. The **Priority** field is automatically set to the **Impact** and **Urgency** values. |
| Assignment group | Group to which the problem is assigned. |
| Assigned to | Problem coordinator to whom the problem is assigned. If an assignment rule applies, the problem is automatically assigned to the appropriate user or group. |
| Problem statement | Brief description of the problem.<br>**Note:** Activate the Problem Management Best Practice — Madrid (com.snc.best_practice.problem.madrid) plugin. |
| Description | Detailed description of the problem. |
| Notes | |
| Work notes list | Users who receive notification when work notes are added to the problem. |
| Work notes | Informative notes about the work performed on the problem. |
| Analysis Information | |
| Workaround | Method used to overcome the issue if no resolution is available yet. |
| Cause notes | The cause of the problem. |
| Resolution information | |
| Resolved | [Auto-generated]. Date and time when the user resolved the problem. |
| Resolved by | [Auto-generated]. The user who resolved the problem. |
| Fix notes | Information on how the problem was fixed. |

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| Field | Description |
|---|---|
| Other Information | |
| Opened | [Auto-generated]. Date and time when the user opened the problem. |
| Opened by | [Auto-generated]. User who opened the problem. |
| Confirmed | [Auto-generated]. Date and time when the issue was confirmed as a problem. |
| Confirmed by | [Auto-generated]. User who accessed the issue and confirmed that it was a problem. |

5. Click **Save**.
   A problem record is created and the record appears in the Related tasks related list on the Interaction form.

### Create a problem task in a workspace

If you need to engage another team or agent for help, create a problem task and assign it to them.

#### Before you begin

Activate the Problem Management Best Practice — Madrid — State Model (com.snc.best_practice.problem.madrid.state_model) plugin to access the problem task types.

Role required: agent_workspace_user, problem_task_analyst, or admin

#### Procedure

1. Navigate to **All** > **Workspace Experience** > **Workspaces** > **Agent Workspace Home**.
2. In the List menu, choose **Problems** > **Open**.
3. Open the problem record for which you want to create tasks.
4. Click the Problem Tasks related list, and then click **New**.
5. In the Create Problem Task dialog box, select the problem task type to be created.
   - **General**: Tasks other than root cause analysis tasks.
   - **Root Cause Analysis**: Tasks to investigate the root cause of a problem and find a resolution for the problem.
6. Click **Create**.
7. On the form, fill in the fields.

#### Create New Problem Task form

| Field | Description |
|---|---|
| Number | [Auto-generated]. Number that identifies the problem task record. |
| State | For customers prior to the Madrid release, the available states are: **Open**, **Pending Change**, **Known Error**, and **Closed** or **Resolved**. |

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| Field | Description |
| --- | --- |
| | For customers starting with the Madrid release, the new state model is applied and the **State** field is read only. The field value changes as the problem proceeds from one state to another state. The states available are: **New**, **Assess**, **Root Cause Analysis**, **Fix in Progress**, **Resolved**, and **Closed**.<br><br>**Note:**<br>To access the new state management process, activate the Problem Management Best Practice — Madrid (com.snc.best_practice.problem.madrid) plugin. |
| Type | The problem task type. |
| Configuration item | Configuration item (CI) that the problem task applies to. The CI class of the selected configuration item identifies the type of problem, for example, hardware, network, or database. |
| Due date | Date by which the problem task must be completed. |
| Problem | ID number of the problem for which the problem task is created. |
| Priority | How quickly the service desk should address the problem. |
| Assignment group | Group to which the problem task is assigned. |
| Assigned to | Problem analyst to whom the task is assigned. |
| Order | Order in which the problem tasks must be associated to the problem.<br><br>**Note:**<br>Activate the Problem Management Best Practice — Madrid (com.snc.best_practice.problem.madrid) plugin. |
| Short description | Brief description of the problem task. |
| Description | Detailed description of the problem task. |
| Notes | |
| Work notes list | Users who receive notification when work notes are added to the problem task. |
| Work notes (Private) | Information about the work performed on the problem task. |
| Analysis information — Available for the Root Cause Analysis problem type | |

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| Field | Description |
|---|---|
| Cause code | Code for the cause of the problem type such as Environmental disaster, Hardware issue, or People/Process/Documentation. |
| Cause notes | Information on the cause of the problem task.<br>**Note:** Activate the Problem Management Best Practice — Madrid (com.snc.best_practice.problem.madrid) plugin. |
| Proposed fix notes | Proposed fix for the problem task. |
| Workaround | Method used to overcome the issue if no resolution is available yet. |
| Closure information | |
| Closed by | [Auto-generated]. Name of the user who closed the problem task. |
| Closed | Date and time when the user closes the problem task. |
| Close notes (Only for General problem task type) | Information on the work completed for the problem task. |

8. Click **Save**.
   The problem task record is created and is added to the Problem tasks related list on the Problem form.

### Attach a knowledge article to a problem or problem task from Agent assist

You can attach a knowledge article, for example a Known Error article, to a problem or problem task that provides information to solve the issue quickly.

#### Before you begin
Role required: agent_workspace_user or admin

#### Procedure

1. Navigate to **All** > **Workspace Experience** > **Workspaces** > **Agent Workspace Home**.
2. In the Lists menu, choose **Problems** > **Open**.
3. Access the relevant problem record or problem task.

| Option | Description |
|---|---|
| **If you are attaching an article to a problem record** | Open the problem record. |
| **If you are attaching an article to a problem task** | **a.** Open the related problem record.<br>**b.** Click the Problem Tasks related list.<br>**c.** Select the problem task record. |

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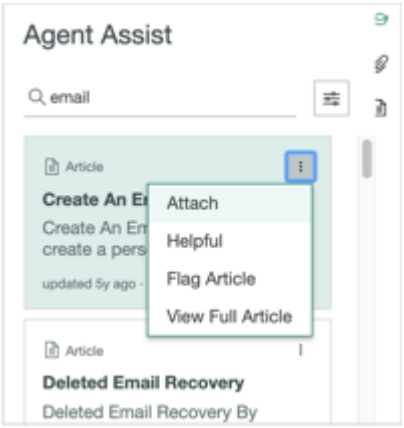
4. In Agent Assist, search for the article you want to attach and select it.
5. Click the more actions icon ··· and click **Attach**.




The knowledge article appears under the Attached Knowledge related list.

### Create a change request from a problem

If the cause of a problem requires a change to your infrastructure or a business service, you can create a change request from the problem as part of fixing the problem.

#### Before you begin

Role required: agent_workspace_user, itil, or admin

#### About this task

You can implement a resolution to a problem by applying a standard change procedure and testing to confirm service recovery. For a normal change, you raise a Request For Change (RFC). The Change Advisory Board (CAB) must approve the RFC before a resolution is applied to the Problem.

#### Procedure

1. Navigate to **All** > **Workspace Experience** > **Workspaces** > **Agent Workspace Home**.
2. From the list, click **Problems** > **Open**.
3. Open the problem record from which you want to create a change request.
4. Click the more actions icon (···) and click **Create Change Request**.
5. In the Create Change Request dialog box, select the type of change.

| Option | Description |
|---|---|
| **Normal** | Any service change that is not a standard change or an emergency change. |
| **Standard** | A pre-authorized change that is low risk, rela tively common, and follows a specified proce dure or work instruction. |
| **Emergency** | An emergency change that bypasses group and peer review and approval, and goes straight to the authorization state for approval by the CAB approval group. |

6. Click **Create**.

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7. Create the change record.
   For more information, see Create a change task.
8. Click **Save**.
   The change record appears under the Change Requests related list.

### Create an improvement initiative from a problem

Create an improvement initiative from a problem to track and manage tasks for improving a service or process, or tasks related to the problem.

#### Before you begin

Role required: agent_workspace_user, itil, or admin

- The Continual Improvement Management (com.sn_cim) plugin must be activated. For more information on activating the plugin, see Request Continual Improvement Management.
- The administrator must add the Improvement Initiatives related list to the problem form in Workspace view.

#### About this task

An improvement initiative contains goals to measure success, and phases that contain tasks with specific actions to complete the improvement. For more information, see Continual Improvement Management overview.

#### Procedure

1. Navigate to **All** > **Workspace Experience** > **Workspaces** > **Agent Workspace Home**.
2. In the **Lists** tab, click **Problems** > **All**.
3. Open the problem for which you want to create an improvement initiative.
4. Click the Improvement Initiative related list.
5. Click **New**.
6. In the **Improvement Initiative** field, click the search icon to find the appropriate initiative.
7. Associate an existing initiative or create a new one.

| Option | Description |
|---|---|
| **If you find an existing initiative** | Select the initiative to associate with this incident. |
| **If you do not find an initiative** | **a.** Click the Create Improvement Initiative related link.<br>**b.** Create an initiative by filling in the Improvement Initiative form. For more information, see Create an improvement request. |

8. **Optional:** If you want to attach a supporting document, click **Browse** and select the file.
9. Click **Save**.
   The improvement initiative is now associated with the problem.

### Delete a problem

If you no longer need problem information, you can delete the problem. This action deletes the problem both from the ServiceNow database and from the Problem table.

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### Before you begin
Role required: admin

### Procedure

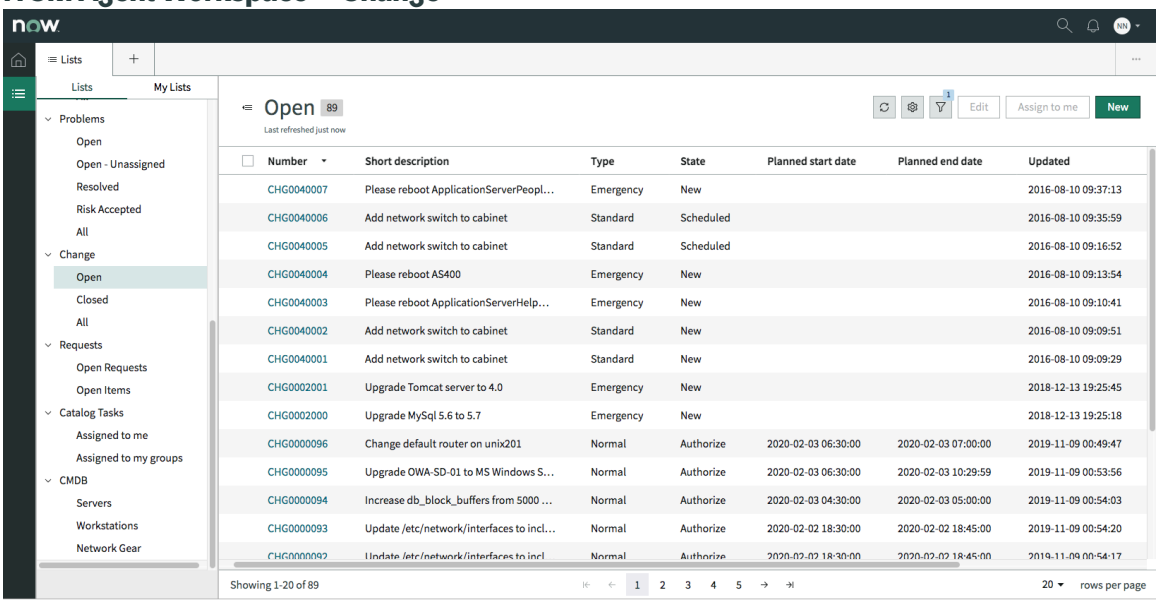
1. Navigate to **All** > **Workspace Experience** > **Workspaces** > **Agent Workspace Home**.
2. From the list, click **Problem** > **Open**.
3. Open the problem record that you want to delete.
4. Click the more actions icon (...) and then click **Delete**.
5. In the Confirmation dialog box, click **OK**.

## ITSM Agent Workspace - Change Management

Use ServiceNow® ITSM Agent Workspace to create and manage your change requests.

The Change workspace form is similar to the ServiceNow AI Platform Change request form. You can customize the view of the Agent Workspace form by changing the workspace view. For more information, see Add field or related list to a workspace form.

**ITSM Agent Workspace — Change**




### Create a change request in Agent Workspace

A change request is a proposal to alter a supported configuration item (CI). Use a change request form to record information such as the reason for the change, type, priority, and risk.

### Before you begin
Role required: sn_change_write, itil, or admin

### Procedure

1. Navigate to **All** > **Workspace Experience** > **Workspaces** > **Agent Workspace Home**.
2. From the navigation list, click **Change** > **Open**.
3. Click **New**.
4. Select a change type and then click **Create**.

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| Option | Description |
|---|---|
| **Normal** | Any service change that is not a standard change or an emergency change. |
| **Standard** | A pre-authorized change that is low risk, rela tively common, and follows a specified proce dure or work instruction. |
| **Emergency** | An emergency change that bypasses group and peer review and approval, and goes straight to the authorization state for approval by the CAB approval group. |

5. On the form, fill in the fields.

**Change form**

| Field | Description |
|---|---|
| Number | The unique change request number |
| Requested by | User who requested the change. |
| Category | The category of the change, for example, **Hardware**, **Network**, or **Software**. |
| Service | The business service that you want to make available for the change request. |
| Service Offerings | Consists of one or more service commitments that uniquely define the level of service in terms of availability, scope, pricing, and packaging options. Service offering enables you to receive different features and their levels of performance for a given service. |
| Configuration item | Configuration item (CI) that the change applies to. You can associate any type of CI with a change request, including service offerings. It also provides detailed access to SLA and availability requirements. |
| Priority | Priority value that is auto-generated based on impact and urgency. It identifies how quickly the service desk should address the task |
| Impact | Impact auto-calculated value that indicates a measure of the effect of an incident, problem, or change on business processes. |
| Type | Displays the selected change request type (Standard, Normal, or Emergency). You can change this value by selecting another type. |
| State | State of the change request. By default, the state is **New**. |
| Assignment group | Group assigned to the change. |

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| Field | Description |
| --- | --- |
| | You can populate the **Assignment group** field automatically based on the support group available for the respective configuration item (CI). If the CI does not have any support group, then the field gets populated with the support group available for service offerings. The business rule **Populate Assignment Group based on CI/SO** triggers the functionality when an incident, problem, or change request is created or updated and when the **Assignment group** and the **Assigned to** field is empty. The following properties identify the field whose value populates the **Assignment group** field:<br>○ *com.snc.change_request.ci_assignment_grou* This change property identifies which CI field populates the **Assignment group** field.<br>○ *com.snc.change_request.service_offering_a* This change property identifies which service offering field populates the **Assignment group** field.<br>**Note:** The default value for the properties is support group for incident or problem and change group for change request respectively. The business rule **Populate Assignment Group based on CI/SO** is shipped as part of the development plugin ITSM CSDM Best Practice – Quebec plugin (com.snc.best_practice.itsm_csdm.quebec) and is available only for the new customers. |
| Assigned to | User assigned to the change request. If an assignment rule applies, the change is automatically assigned to the appropriate user or group. |
| Risk | The risk level for the change.<br>Either **High**, **Moderate**, or **Low**. You can set this value manually or use Risk Calculation and Risk Assessment to derive it. |
| Short description | Brief description of the change. |
| Description | Detailed description of the change. |
| Planning section | |
| Justification | Reason for the planned change request, which helps approvers determine their decision. |

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| Field | Description |
|---|---|
| Implementation plan | Plan or process to follow to implement the change. |
| Risk and impact analysis | Detailed analysis of the risk and impact foreseen if the change is implemented. |
| Backout plan | The information required to restore the system to its original state if an implementation fails. |
| Test plan | Detailed information on the test strategy and objectives for the change request. |
| Schedule section | |
| Planned start date | Date to begin working on the change. |
| Planned end date | Date the change is planned to be completed.<br><br>If the task type is **Implementation**, the **Planned start date** and **Planned end date** values must fall within the planned start and end dates specified in the change request. |
| Unauthorized | Option to indicate that the change is an unauthorized change. For more information see, Unauthorized change request. |
| Actual start date | Start date of the implementation. |
| Actual end date | Date when the change was completely implemented. |
| Notes section | |
| Watch list | Users to receive notifications when work notes are added. |
| Work notes list | Users to receive notifications when work notes are added.<br><br>**Note:**<br>The administrator must create an email notification for the work notes list. |
| Additional comments (Customer visible) | More information about the change. |
| Work notes | Information about how to resolve the change or steps taken to resolve it, if applicable. This note is for internal use. The work notes information is not visible to your customer. |
| Closure Information section | |
| Close code | Resolution code for the change. |
| Close notes | How or why the change was closed. |

6. Click **Save**.

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### Create a standard change from an interaction

Create a standard change record directly from an interaction to implement a pre-approved, low-risk change without having to go through the Change Management module to implement it.

#### Before you begin
Role required: itil, sn_change_write or admin

#### Procedure

1. Navigate to **All** > **Workspace Experience** > **Workspaces** > **Agent Workspace Home**.
2. Create an interaction record.
   For more information, see Create an interaction record in ITSM Agent Workspace.
3. On the Interaction form, click the more actions icon and then click **Create Standard Change**.
4. On the New Catalog Item page, expand the **Standard change** list and select from the available change categories.
5. Click **Submit**.
   A standard change is created and the record appears in the Related tasks related list on the Interaction Management form.

### Link a change request to an incident through Agent Assist

You can identify incidents caused by a change and link it to the change record from the Agent Assist panel in a workspace.

#### Before you begin
Role required: sn_change_write, itil, or admin

#### Procedure

1. Navigate to **All** > **Work Experience** > **Workspaces** > **Agent Workspace Home**.
2. From the list, click **Change** > **Open**.
3. Click the change record you want to work on.
4. In Agent Assist, click the settings icon ( ).
5. Select **Change Related Incidents** from the menu list.
6. Click the more actions icon ( ) in the incident tile that you want to link to the change.
7. Click the **Link to Incident** menu item.
8. In the Link to Incident form, fill in the work notes and any additional comments.
9. Click **Link to Incident**.

#### Result
The change record is linked to the incident and the incident details appear when you view the Incidents Caused By Change related list.

### Delete a change request

If you no longer require the change information, you can delete the change record. This action deletes the change record form the ServiceNow database and the Change [change] table.

#### Before you begin
Role required: agent_workspace_user, itil_admin, or admin

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### Procedure

1. Navigate to **All** > **Work Experience** > **Workspaces** > **Agent Workspace Home.**.
2. From the list, click **Change** > **Open**.
3. Open the change record that you want to delete.
4. Click the more actions icon ( ) and then click **Delete**.
5. In the Confirmation dialog box, click **OK**.

#### Disable creating an emergency change in Agent Workspace

Limit the access to create an Emergency change request from the Agent Workspace. However, you can continue creating the emergency change from your ServiceNow AI Platform instance.

### Before you begin

Role required: itil_admin or admin

### Procedure

1. Navigate to **All** > **Change** > **Administration** > **Workspace Record Types Selectors**.
2. Click the *change_request* target table that has the **Emergency** display value.
   The record opens in the read-only mode.
3. Click **here** in the message displayed to edit the record.
   The editable record opens.
4. Click the **Active** check box to make it inactive.
   By making the record inactive, you remove the **Emergency** option that appears in the **New Change Request** window of the Agent Workspace. This action impacts creating change in placed where the interceptor is used.

# Workforce Optimization for ITSM

Manage and maintain the productivity of your workforce from a single location using Workforce Optimization for ITSM. Using this application, you can efficiently manage your team's skills and schedules, route work assignments to your team, and monitor their performance.

## Workforce Optimization for ITSM in action

Here's how managers use Workforce Optimization for ITSM. Workforce Optimization for ITSM Overview

## Get started

Workforce Optimization for ITSM enables you to do these tasks:

- Automatically route work to agents.
- Schedule your teams' work.
- Assign or reassign work from a central location.
- Monitor and measure team performance and provide feedback using assessments.
- Create opportunities to coach and train your teams based on the assessments.

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Optimize your workforce



Learn how managers can use Workforce Optimization for ITSM

Channels



Route work to specific groups so that the right work goes to the right agent

Schedule



Manage your agents' schedule effectively

Work scheduler



Assign complex work items to agents based on their skills and availability

Teams



Organize your teams into assignment groups

Coaching



Assess the quality of your teams' completed interactions

Reference



Get details about Workforce Optimization for ITSM components such as roles, tables, and system properties

## Request apps on the store

Visit the ServiceNow Store website to view all the available apps and for information about submitting requests to the store. For cumulative release notes information for all released apps, see the ServiceNow Store version history release notes.

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### Troubleshoot and get help

- ServiceNow Community
- Search the Known Error Portal for known error articles
- Contact Customer Service and Support

## Exploring Workforce Optimization for ITSM

Use Workforce Optimization for ITSM to optimize your workforce and manage your teams efficiently. Coach your teams so that they gain the skills that let you address the demands from your customers. Efficiently schedule your teams work to provide better coverage with integrated channel management.

### Workforce Optimization for ITSM overview

As a manager, you can monitor the demand for agents and skills in your organization to resolve issues. Assess agent skills, identify areas where they need improvement and provide training to enhance their skills set. Track your teams performance, and manage the schedule of all agents in your assignment group—all from a unified location.

As an agent, you can manage your own schedule, access the schedules of your peers and request time off or shift swaps.

Listen to the podcast that gives you an overview of Workforce Optimization for ITSM.

Workforce Optimization for ITSM Overview

To plan for your Workforce Optimization for ITSM implementation, see Getting started with Workforce Optimization for ITSM.

### Workforce Optimization for ITSM workflow

The image displays the manager workflow between the different modules in Workforce Optimization for ITSM. Each of these modules can be used independently or together in the application.

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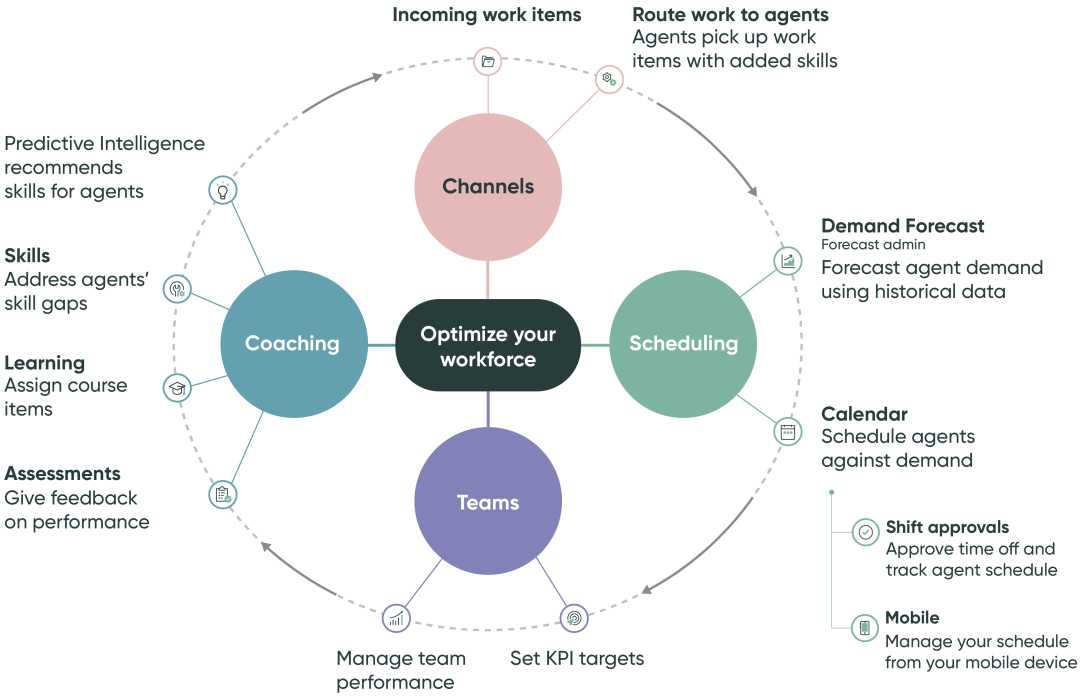
### Workforce Optimization for ITSM workflow

**Channels**
Route work based on skills and make sure the right work goes to the right agent.
Role: Channel manager

**Scheduling**
Plan shifts, create schedules, and publish them for the next time period.
Role: Shift planning admin

**Teams**
Organize your teams into assignment groups and monitor their performance.
Role: Teams admin

**Coaching**
Assess the quality of your team's completed interactions and tasks.
Role: Coach admin




## Channel Management

Monitor your team in real time and jump in to help when there's a need.

Using this application, you can also:

- Route work to specific groups based on agent skills
- Review real-time performance as the team is actively working on tasks across channels
- Monitor pending work items in a queue

## Scheduling

Access the calendar of your teams to know which agents are scheduled for coverage and which agents have taken time off.

Using the application, you can also:

- Assign agents to shifts
- Define break time
- Preview and publish team schedule
- Approve agent time-off or shift-swap requests

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### Work scheduler

Plan your teams' work and assign work items based on their skills, availability, capacity, and time zone.

Using the application, you can also:

- View your teams' shifts, events, and work assignments
- Assign or reassign work items from a central location
- Use matching rules to rank team members
- Add criteria for matching rules to assign work items based on the rules

### Teams

Monitor performance trends for your teams using KPI groups. Create a set of KPIs and apply them to all groups within a team and assess team performance from one location.

Using the application, you can also:

- Identify all the teams that you manage as well as the ones you have visibility into
- Analyze KPIs that are crucial for your team
- Drill into agents within each team and monitor their performance
- Access the profile of each agent to view details such as their manager, peers, and assignment groups
- Drill down into the skills for each agent or recommend them for coaching

### Coaching and Skills Assessment

Enhance the quality of work done by your agents using Coaching. Use Predictive Intelligence to recommend skills based on issues the agents have resolved. Create coaching opportunities based on the recommendation and train the agents to acquire those skills.

Using this application, you can also:

- Automate the scoring, grading, and assessment of agent skills
- Use coaching opportunities to create assessments
- Track training assigned to agents based on their assessments
- Analyze the skill gap and recommend training

## Getting started with Workforce Optimization for ITSM

Easily find tasks that you must complete in a module in Workforce Optimization for ITSM.

| Workforce Optimization for ITSM modules | Benefit | Finding tasks to complete in the module |
|---|---|---|
| Channels | Automatically route work to assigned groups | Getting started with Channels in Workforce Optimization for ITSM |
| Schedule | Schedule your teams' work using Schedule | Getting started with Scheduling in Workforce Optimization for ITSM |

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| Workforce Optimization for ITSM modules | Benefit | Finding tasks to complete in the module |
|---|---|---|
| Work Scheduler | Assign work using Work scheduler | Getting started with Work scheduler in Workforce Optimization for ITSM |
| Teams | Analyze team performance using Teams | Getting started with Teams in Workforce Optimization for ITSM |
| Coaching | Train your teams with Coaching with Learning | Getting started with Coaching in Workforce Optimization for ITSM |

# Getting started with Workforce Optimization for ITSM

Learn the basics of getting Workforce Optimization for ITSM up and running.

To get started, you must first activate Workforce Optimization for ITSM, then organize your teams into assignment groups, and assign a primary assignment group for each agent.

## Activate Workforce Optimization for ITSM

The Workforce Optimization for ITSM Configurable Workspace plugin (sn_wfo_cfg_itsm) is available with the ITSM Enterprise subscription package.

### Before you begin

Role required: admin

### About this task

Visit the ServiceNow Store website to view all the available apps and for information about submitting requests to the store. For cumulative release notes information for all released apps, see the ServiceNow Store version history release notes.

#### Workforce Optimization for ITSM plugins

| Plugin | Description |
|---|---|
| Workforce Optimization for ITSM Configurable Workspace (sn_wfo_cfg_itsm)<br><br>**Note:**<br>This is a ServiceNow Store plugin. You must install this plugin separately from the ServiceNow Store. | Activates related plugins that enable you to use the Scheduling, Work Scheduler, Coaching, Teams, and Channel Management applications in Workforce Optimization for ITSM. |
| MetricBase<br><br>(com.snc.clotho) | Enables you to use Demand Forecast in Workforce Optimization for ITSM.<br><br>To use Demand Forecast, you must activate the MetricBase plugin before you activate the Workforce Optimization for ITSM plugin. For more information, see Request the MetricBase product. |

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**Workforce Optimization for ITSM plugins (continued)**

| Plugin | Description |
|---|---|
| | When you activate both of these plugins, the Agent Forecast plugin (com.sn_agent_forecast) is activated. |
| ITSM Virtual Agent Conversations<br><br>(com.snc.itsm.virtualagent)<br><br>**Note:** This is a ServiceNow Store plugin. You must install this plugin separately from the ServiceNow Store. | Activates the ITSM Virtual Agent and enables you to use a virtual agent to create time-off requests. |
| ITSM Mobile Agent for Workforce Optimization for ITSM<br><br>**Note:** This is a ServiceNow Store plugin. You must install this plugin separately from the ServiceNow Store. | Activates the ITSM Mobile Agent and enables agents to request shift-swaps or time off and managers to approve the requests using the ITSM Mobile Agent application. |
| Process Mining plugin (com.sn_po). | Integrates Process Mining with Workforce Optimization for ITSM. |

You can also get these Workforce Optimization for ITSM application plugins from the ServiceNow Store.

| Plugin | Description |
|---|---|
| Team Performance (sn_team_perf)<br><br>**Note:** When you install this plugin, make sure that you've upgraded the following plugins to the latest store release version:<br>• Workforce Optimization for ITSM Configurable Workspace (sn_wfo_cfg_itsm).<br>• Workforce Optimization Configurable Workspace Core (sn_wfo_cfg_ws).<br>• Workforce Optimization Common(sn_wfo_common). | Enables you to track and analyze performance trends for your teams from a single location.<br><br>**Important:** This plugin gets automatically installed when the Workforce Optimization for ITSM Configurable Workspace (sn_wfo_cfg_itsm) plugin is activated. |
| Coaching (sn_coaching) | Enables you to assess your teams' abilities to resolve incidents efficiently. |

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| Plugin | Description |
| --- | --- |
| **Note:** When you install the Coaching (sn_coaching) plugin, make sure that you've upgraded the following plugins to the latest store release version:<br>• Workforce Optimization for ITSM Configurable Workspace (sn_wfo_cfg_itsm).<br>• Workforce Optimization Configurable Workspace Core (sn_wfo_cfg_ws).<br>• Workforce Optimization Common (sn_wfo_common). | **Important:** This plugin gets automatically installed when the Workforce Optimization for ITSM Configurable Workspace (sn_wfo_cfg_itsm) plugin is activated. |

### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.
3. Select **Install** to start the installation process.

   **Note:**
   When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

   You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

## Configuring groups in Workforce Optimization for ITSM

As a manager, you can manage and optimize your entire workforce using Workforce Optimization for ITSM from one central location. Organizing your teams, for example, different levels of employees in your organizational chart, into groups is the foundation on which Workforce Optimization for ITSM operates.

Therefore, after you set up your teams as groups in Workforce Optimization for ITSM, as a manager, you can route work, set up schedules, train your teams, and analyze all aspects of your workforce from one location.

## Planning for your Workforce Optimization for ITSM implementation

Before you start implementing Workforce Optimization for ITSM, make sure you do the following:

**Important:**
Groups are synonymous with assignment groups. A team member can belong to multiple groups but must have one group identified as their primary assignment group. If not, that team member cannot view their schedules in Service Operations Workspace. For more information on Schedules in Service Operations Workspace, see Service Operations Workspace - Scheduling.

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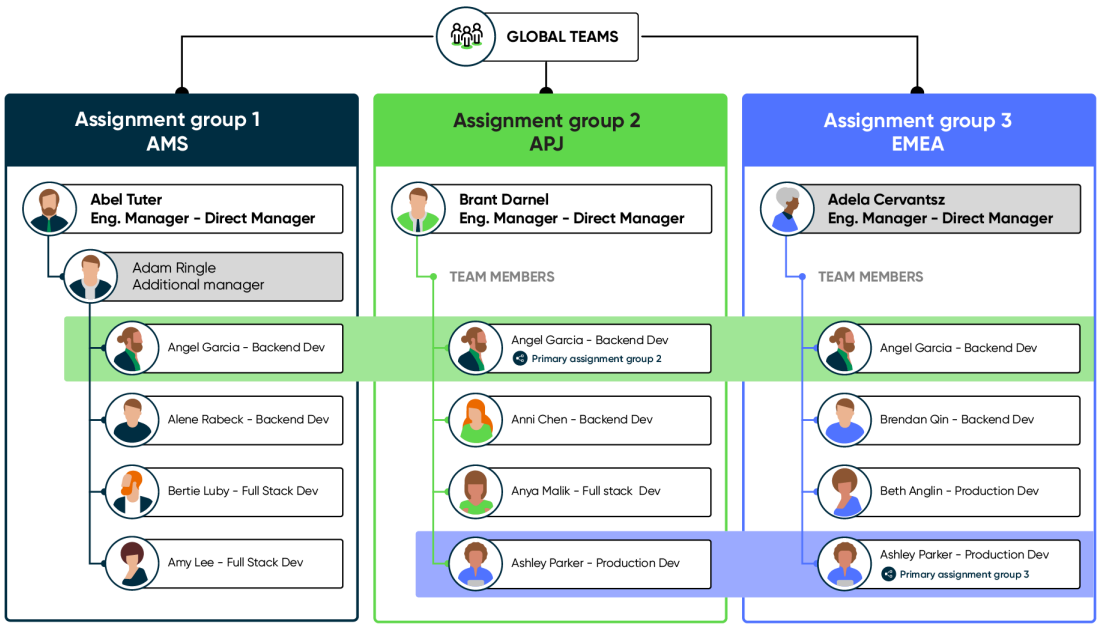
1. **Identify your teams**

   Define the different teams within your organizations that you want to manage. Each of these teams will be configured as a group in the User Groups [sys_user_group] table. When a user logs into Workforce Optimization for ITSM, the workspace will only display the logged-in user's teams and information related to those teams.

2. **Assign a primary assignment group for each member of your team**

   A team member can belong to multiple groups but you must identify one group identified as the primary group for each team member and assign it to them. This determines which assignment group's team calendar that the team member can view in the Schedules module in Service Operations Workspace and also determines activities such as coaching and approvals. For more information on setting a primary assignment group, see Assign a primary assignment group for each agent.

   The image below shows a representation of assigning a primary group to a team member who belongs to more than one group.




3. **Add a manager to each group**

   Each team must have a manager assigned. This manager is someone who would directly oversee the team.

4. **Add additional managers to each group**

   For each group that you create, you can also add managers who don't directly manage the group but need visibility into those groups. These managers are known as additional managers.

If you have three teams in different regions and the first team is in Americas (AMS), the second one is in Asia-Pacific (APJ) and the third one is in Europe, the Middle East, and Africa (EMEA), you must create an assignment group for each one of them and also associate each team member to one of the groups as their primary assignment group. You can also associate more managers to a team although they may not directly manage that team. These managers are referred to as additional managers who have visibility into the what the team does.

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**Related topics**

Exclude access for specific groups in Workforce Optimization for ITSM manager workspace

Using extension points to include access for specific groups in Workforce Optimization for ITSM manager workspace

### Assign a primary assignment group for each agent

Associate each agent in your team to a primary assignment group to enable them to see the KPI metrics for the groups to which they belong.

#### Before you begin

Role required: sn_wfo_cfg_itsm.admin

#### About this task

Before you set up Workforce Optimization for ITSM, you must assign each agent in your team to an assignment group that is identified as the primary assignment group to which they belong.

#### Procedure

1. Navigate to **All** > **User Administration** > **Users**.
2. Right-click the form context menu icon ( ) and select **View** > **WFO**.
3. In the **Primary Assignment Group** field, select a group as the primary assignment group for each agent.
   If you do not see the **Primary Assignment Group** field, select the gear icon and add the **Primary Assignment Group** field to the **Selected** column and click **OK**.

## Channels in Workforce Optimization for ITSM

Learn how you can use channels to route work to specific groups and with skill-based routing make sure that the right work goes to the right agent. Monitor the health of your queues reviewing real-time performance and jumping in to help with escalations.

Manage queues and monitor real-time team performance from a central location using Channel Management.

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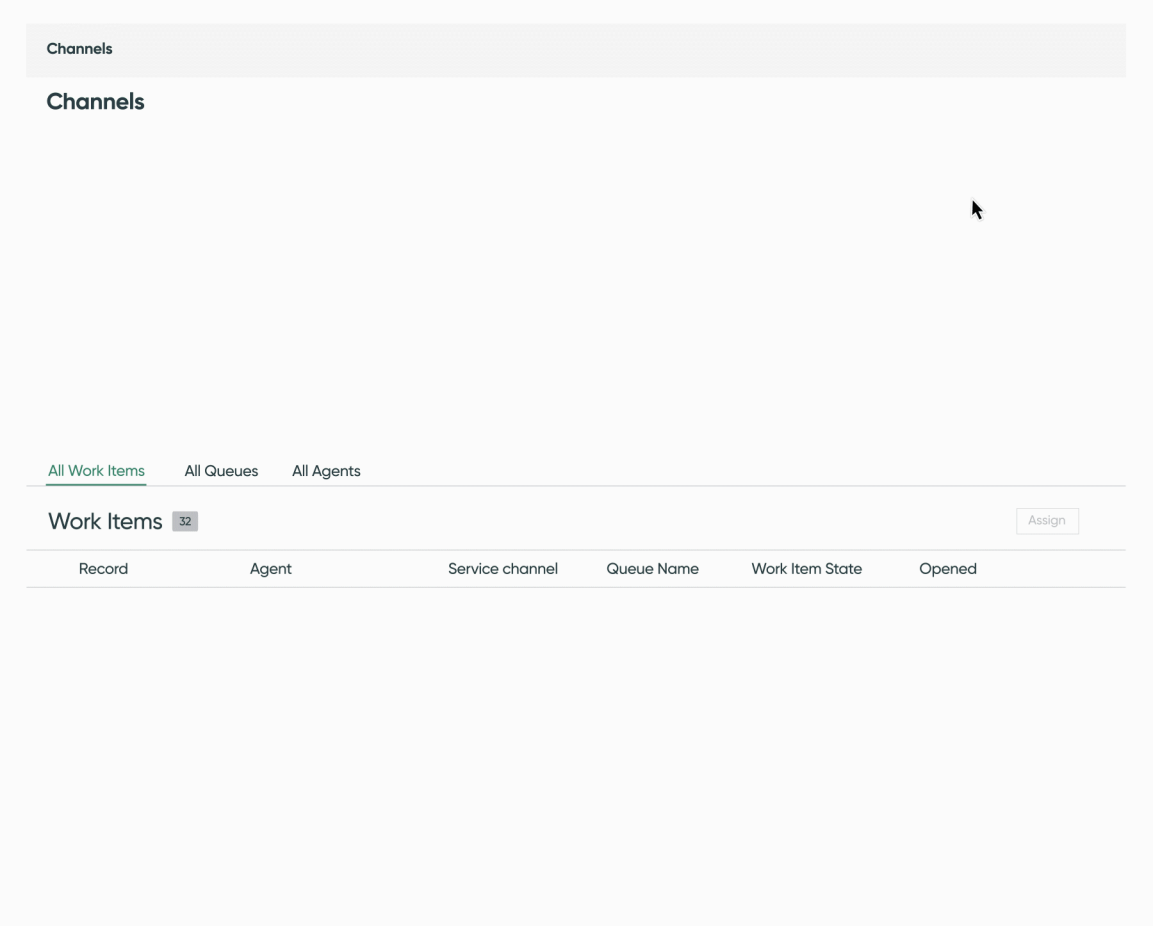


As a channel manager, you can:

- Associate assignment groups to queues
- Monitor the health of your queues in real time
- Track team performance
- Monitor pending work items in the queue

## Getting started with Channels in Workforce Optimization for ITSM

Easily find the tasks that you must complete in the Channels module.

### Scheduling

| Benefit | Role | Find tasks to complete in Channels |
|---|---|---|
| Activate Channels in Workforce Optimization for ITSM. | admin | Activate Channels |
| Refer to the components such as roles, system properties, and reports used in Channels. | Any Channels role | Understand components used in Channels in Workforce Optimization for ITSM |
| Set up service channels, queues, and key performance | Channel Management Admin | Set up Channels in Workforce Optimization for ITSM |

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**Scheduling (continued)**

| Benefit | Role | Find tasks to complete in Channels |
|---|---|---|
| indicators to route work items automatically to agents. | | |
| Route work items to assigned groups. | Channel Management User | Automatically route work items to agents |

## Example for using channel management in Workforce Optimization for ITSM

Understand how you can route work to specific groups and monitor real-time performance using Channel Management.

A manager manages IT operations for a large organization and has 12 teams reporting to them. Each of their teams has anywhere from 20 through 50 agents. They must ensure that incoming work gets effectively routed to the right groups across all channels.

As a manager, the manager must ensure that they can set up **Channel Management** to monitor team performance as follows:

- Add service channels and queues to route work items
- Add KPIs to the channels and queues to measure team performance
- Monitor their teams' ongoing work and performance
- Join chat conversations to assist agents

For detailed information on setting up channels using Workforce Optimization for ITSM, refer to Setting up Channels using Workforce Optimization for ITSM.

## Setting up Channels in Workforce Optimization for ITSM

Set up service channels, queues, and key performance indicators (KPIs) to route work items automatically to agents based on an agent's availability, capacity, and skills.

With Workforce Optimization for ITSM:

- As a channel administrator, you can set up service channels and work item queues and then automatically route incoming work to agents. You can also configure real-time refresh intervals for the metrics and lists so that managers can always see the latest information about their teams.
- As a manager, you can view the real-time operational metrics for the work that is being done by your teams and the specific items that your teams are working on.

**Note:**
As an administrator, you can configure filters to refine the search and view targeted results. Filters are persisted across all channel management pages in the session. To view a list of the default interactive filters and the KPI reports for channels, queues, agents, and groups that you can map to the interactive filters, see the filter configuration tables for Channels. By default, the assignment group filter is applied to all lists and groups that you manage. You can disable interactive filters by using the *sn_channel_mgmt.filter_config.enable* property.

### Add service channels and queues

Add service channels and queues to automatically route incoming work items to agents.

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### Before you begin
Role required: sn_channel_mgmt.admin

### About this task
A service channel is a means of assigning a specific type of work items to agents. You can modify the existing service channels or create your own custom service channel.

### Procedure
1. To create a service channel, do the following:
   a. Navigate to **Workforce Optimization for ITSM** > **Channel Management** > **Service Channels**.
   b. Click **New** and refer to the information in the Create a service channel to create the service channel.
   c. Click **Submit**.
   The service channel is created.
2. To create a queue, do the following:
   a. Navigate to **Workforce Optimization for ITSM** > **Channel Management** > **Queues** or select the service channel and click the **Queues** tab.
   b. Click **New** and refer to the information in Create a work item queue to create the queue.
   The queue is created in the service channel.

## Create assignment rules and groups

Define agent assignment rules and specify groups of agents who are eligible to receive overflow work assignments for a queue.

### Before you begin
You must first create a new assignment rule before you create a service channel. For more information, see create a service channel. Use Exploring Advanced Work Assignment (AWA) to route work items automatically to agents based on an agent's availability, capacity, and skills.

Role required: sn_channel_mgmt.admin

### About this task
An eligible assignment group can consist of one or more groups of agents available to work on items in the queue.

### Procedure
1. Navigate to **All** > **Workforce Optimization for ITSM** > **Channel Management** > **Queues**
2. Select a queue to define an assignment rule.
3. In the **Assignment Eligibility** tab, click **New**.
4. On the form, fill in the fields.

| Field | Definition |
|---|---|
| Agent assignment rule | Name of the rule to assign work items to agents. |
| Eligible at | The duration that this assignment rule is valid for a set of agents. |
| Groups | The set of groups eligible for assignment. |

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| Field | Definition |
| --- | --- |
| | ○ Click the lock icon to unlock it and select the agent groups in the eligible assignment pool.<br>○ Click the lock icon to lock it. |

5. Click **Submit** to create the eligible or **Update** if modifying an eligible assignment pool.
The Queues [awa_queues] table is updated with the eligible assignment group.

**Note:**
For a new service channel, you must first create a new assignment rule and then create a service channel.

### Configure KPIs for service channels

Configure key performance indicators in service channels to track the ongoing work and real-time performance of your teams.

### Before you begin
Role required: sn_channel_mgmt.admin

### About this task
Add the Channel Management reports that are by default configured with Workforce Optimization for ITSM or create a new KPI report that matters the most to you. Key performance indicators help managers perform the following actions:

- Review real-time performance as the team is actively working on tasks across channels and queues.
- Track progress against KPIs and drill down into agents, team, and individual performance.
- Drill down into all queues and monitor ongoing incidents, interactions, and tasks.
- Jump in and support agents for help-requested work items using chat whisper or add work notes to a task.
- Refine data in the dashboard using the Assignment Group interactive filter without modifying the reports. For more information, see Interactive Filters.

#### Enable or disable KPI score auto-refresh

- By default, the KPI scores are set for auto-refresh every five seconds. You can change the interval using the *sn_channel_mgmt.kpi_auto_refresh.interval.seconds* system property.
- To disable auto-refresh, set the **sn_channel_mgmt.channels_card_auto_refresh.enable** property to **false**.

#### Refresh the service channel cards automatically or manually

- By default, the service channel cards are set for auto-refresh every two minutes. You can change the interval using the **sn_channel_mgmt.channel_card_auto_refresh.interval.seconds** syetem property.
- To manually refresh the service channel cards, select the refresh icon.

For more information on the properties, see Channel Management components in Workforce Optimization for ITSM.

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### Procedure

1. Navigate to **Workforce Optimization for ITSM** > **Channel Management** > **Service Channels**.
2. Click the service channel to which you want to add KPIs.
3. In the **Reports** tab, click **Edit**.

   **Note:**
   You must add the Reports related list if you do not see the **Reports** tab.

4. Add reports that are configured by default in Workforce Optimization for ITSM.
   For information on Channel Management reports, see Channel Management components in Workforce Optimization for ITSM.

   **Note:**
   Review the report's definition and add the corresponding filters that are applicable to the service channel that matters the most to you.

5. Add Workforce Optimization for ITSM KPIs filtered based on **My Managed Groups**.
6. Select **Save**.
7. **Optional:** To create a KPI report that explicitly apply to your teams, do the following:
   a. Navigate to **Reports** > **Create New** > **.**
   b. Fill in the details on the form. For more information, see Single score report.
   c. Select **Save**.

      The KPI report is created.

   d. Navigate to **Reports** > **Administration** > **Interactive Filters**.
   e. Select **Channel Management Groups Filter**.
   f. Select the Interactive filter references related list and select **New**.

      The Interactive Filter Reference - Channel Management Groups Filter page appears.

   g. Select the KPI report's table name and field name. For more information, see Create a reference field interactive filter.
   h. Select **Submit**.

      Repeat the steps above to add more reports.

      - KPI reports are added with an **Order** being shown as 100, 200 and so on. You can also change the order of a KPI report during selection.
      - By default, the report name is considered as the **Name**. However, you can change the display name per your business needs.

   The KPIs are added to the service channel and appear in the Channels page. The first five KPIs with the lowest order number appear in the service channel cards.

## Configure KPIs for agents

Configure key performance indicators (KPIs) in service channels for your agents so that you can track the agents' ongoing work and real-time performance.

### Before you begin

Role required: sn_channel_mgmt.admin

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### About this task

Add key performance indicators to channels to help managers perform the following actions:

- Review real-time performance of agents who are actively working on tasks across channels and queues.
- Track progress against KPIs and drill down into agents and individual performance.

The KPI scores are automatically refreshed at an interval of 30 seconds. However, you can modify the refresh interval by adding the *sn_channel_mgmt.kpi_auto_refresh.interval.seconds* system property. Also, the service channel card refreshes automatically in 2 minutes as configured in the *sn_channel_mgmt.channel_card_auto_refresh.interval.seconds*. You can also manually refresh by clicking the Refresh icon.

### Procedure

1. Navigate to **All** > **Workforce Optimization for Customer Service** > **Channel Management** > **Service Channels**.
2. Click the service channel to which you want to add the KPIs.
3. Click the Agents Reports related list.
4. Add the reports for agents in Channel Management that are by default configured with Workforce Optimization for ITSM.

   **Note:**
   Review the report's definition and add the corresponding filters that are applicable to the service channel that matters the most to you.

5. Click **Save**.
6. **Optional:** To create a KPI report that is explicitly applicable to your teams, do the following:

   a. Navigate to **Reports** > **Create New**.

   b. Fill in the details.
   For more information, see Create a single score report.

   c. Click **Save**.
   The KPI report is created.

   d. Navigate to **Reports** > **Administration** > **Interactive Filters**.

   e. Click **Channel Management Agent Filter**.

   f. Select the Interactive filter references related list and click **New**.
   The Interactive Filter Reference - Channel Management Agent Filter page appears.

   g. Select the KPI report's table name and field name.
   For more information, see Create a reference field interactive filter.

   h. Click **Submit**.

   i. Repeat steps 1 to 4 for each KPI report to be added in the service channel.

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- KPI reports are added with an **Order** being shown as 100, 200, and so on. You can also change the order of a KPI report during selection.
- By default, the report name is considered as the **Name**. However, you can change the display name per the business needs.

### Result

The KPIs that are configured in the service channel appear in the Current Work section of the agent's Overview page. For more information, see Track and analyze agent's performance.

## Configure KPIs for queues

Configure key performance indicators in queues to track the incoming work for specific categories of work in a service channel.

### Before you begin

Role required: sn_channel_mgmt.admin

### Procedure

1. Add KPIs to a queue.
2. Click the **Reports** tab.

   **Note:**
   You may have to configure the related list to display the **Reports** tab.
3. Click **Edit**.
4. Add Workforce Optimization for ITSM KPIs (reports) that are filtered based on **My Managed Groups**.
   To create reports that explicitly apply to your managed teams, refer to Create a report.
5. Click **Submit**.
   The key performance indicators are added to the queue and appear in the **All Queues** tab in Manager Workspace. By default, the indicators get automatically refreshed at an interval of five seconds. You can add the *sn_channel_mgmt.kpi_auto_refresh.interval.seconds* property to the system properties to modify the interval time.

## Configure supervisor lists for service channels

Configure supervisor lists in a service channel to view the list of active work items across service channels and queues.

### Before you begin

Role required: sn_channel_mgmt.admin

### About this task

A database view that defines table joins is used for generating reports for a supervisor list. For example, you can create a database view that can join the Incident table to the Interaction and Metric tables. When you use this database view, and create a supervisor list to report on the active work items, you may include fields from any of these three tables. For more information, see Creating database views for reporting.

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**Note:**
You can configure three supervisor lists for each service channel. The first three lists with the lowest order number appear in Channel Management.

### Procedure

1. Navigate to **All** > **Workforce Optimization for ITSM** > **Channel Management** > **Service Channels**.
2. Select the service channel to which you want to add a supervisor list.
3. Click the **Supervisor Lists** tab.

   **Note:**
   If you do not see the **Supervisor Lists** tab, you must configure the form layout and the Reports related list.

4. Click **New**.
5. On the form, fill in the fields:

**Supervisor Lists form**

| Field | Description |
|---|---|
| List Title | Display name for the list. |
| Tab Title | Title for the tab that appears in the manager workspace. |
| Service Channel | Service channel in which the list appears. |
| View Name | Database view for the service channel. |
| Order | Number that displays the order.<br>**Note:**<br>The first three lists with the lowest order number appear in Channel Management. |

6. Click **Submit**.
   The supervisor list is added to the service channels and appears in the Channels module in Manager Workspace.

## Schedule the generation of a daily report

Generate and distribute a daily scheduled report that summarizes the agent's work performance via email.

### Before you begin
Role required: sn_channel_mgmt.admin

### About this task

| When | Then |
|---|---|
| The *Send Daily Agents Report* schedule job is run | The *sn_channel_mgmt.agents_report* event is executed |

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| When | Then |
|---|---|
| The *sn_channel_mgmt.agents_report* event is executed | The *Daily Agents Report* notification is triggered |
| The *Daily Agents Report* notification is triggered | The *daily_agents_reports* email script is executed |
| The *daily_agents_reports* email script is executed | An email is sent to all managers |

**Note:**
To change the existing report, modify the *daily_agents_reports* email script.

### Procedure

1. Navigate to **All** > **System Definition** > **Scheduled Jobs**.
2. Search and select **Send Daily Agents Report**.
   The scheduled script form appears.
3. Click the link **here** to edit the record.
4. Select the **Active** check box.
5. In the **Run** field, ensure that the option **Daily** is selected.
   The script, by default, sends the agents' work summary report daily to the managers.
6. Select the **Time zone**.
7. Do any of the following:
   - To update the scheduled job, select **Update**.
   - To execute the scheduled script, select **Execute Now**.

### Result
All managers and additional managers of the teams receive an email notification that summarizes their agents' performance.

## Channel Management extension point in Workforce Optimization for ITSM

Use extension points to call scripts to configure the list sort order in Channel Management.

To see a list of extension points that you can use for Workforce Optimization for ITSM, navigate to **System Extension Points** > **Scripted Extension Points**. Use scripted extension points to integrate customizations without altering the core components in the application code. When customizing a base application, you implement the scripted extension points by creating the custom script includes and registering them against the scripted extension points. For detailed information on implementing extension points, see Using scripted extension points in server-side scripts.

### Extension points to configure

| Extension script | Description |
|---|---|
| *sn_channel_mgmt.ChannelMgmtExtensionPoint* | Add or modify the columns and sort directions in the `vardata` section to configure the sorting mechanism for the All Agents and All Queues lists in Channel Management. |

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**Extension points to configure (continued)**

| Extension script | Description |
|---|---|
| | As an example, The Presence State column with **ASC** as a sort direction in the extension script displays the Presence State records in an ascending order in the All Agents list.<br>**Note:** You can create multiple implementations; however, the implementation with the lowest order number is executed. |
| *sn_channel_mgmt.AgentListColumns* | Add or update the `getColumns` to modify the current implementation to configure the columns for the All agents list in Channel Management. |
| *sn_channel_mgmt.QueueListColumns* | Add or update the `getColumns` to configure the columns in the All queues list for Channel Management. |

## Routing work items using Channels in Workforce Optimization for ITSM

Route work items to assigned groups using channels. Use skill-based routing to ensure that the right work goes to the right agent. Review real-time performance as your team is actively working on tasks across channels. When you see escalations, you can help your agents resolve issues without the requester being aware of it.

### Monitor ongoing work in service channels and queues

Monitor the incoming data and on-going work done by your agents against each service channel and queue.

#### Before you begin

Role required: sn_wfo_cfg_ws.manager

#### About this task

Track the real-time performance of your teams directly reporting to you and the teams you have visibility into. Drill down into the data for a work item, a specific agent, service channel, queue, or assignment group. Filter agents based on assigned queues and assignment groups. Assign the work items or help agents as needed.

Drill-down into the specific record and perform the following actions against each channel and queue:

- Real-time information of ongoing incidents, interactions, and other tasks.
- Work done during the day.
- Waiting work items that must be assigned.
- Drill down and view agent information in one or more assignment groups.
- Summary information across queues and agents
- Take or change ownership.
- Add comments.

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### Procedure

1. Navigate to **All** > **Workforce Optimization for ITSM** > **Manager Workspace**.
2. Using one of the following ways, select a service channel:
   - From the **Overview** section.
   - From the **Active Work Items** tab.
3. Monitor ongoing work from agents.

## Manage service channels and queues

Manage your agents' on-going work against every queue. Monitor the incoming data of the service channels and track real-time performance of your direct reporting teams and additional managing teams using key performance indicator reports in service channels and queues.

### Before you begin
Role required: sn_wfo_cfg_ws.manager

### About this task
The work item views display the list of pending and queued work items from all channels and queues. Drill down into the specific record to get an idea of how much work is at-hand within the team on various channels and queues pertaining to the assignment groups. The work item is allocated to qualified agents using work item queues, routing conditions, and assignment criteria that you define. Using channels and queues, managers at a glance can gain visibility into the team's on-going work, quality of service, and improve agent performance and end-user experience.

### Procedure

1. Navigate to **All** > **Workforce Optimization for ITSM** > **Manager Workspace**.
2. Click the **Channels** icon.
3. Click the **Queues** tab.
4. Select a queue and do any of the following:
   - Assign work items to agents.
   - Take or change work item ownership.
   - Review agent performance.

## Assist agents by joining their chat conversation

Assist agents in real time by joining their chat conversation and collaborate on any record by connecting with the right people instantly to achieve faster resolution.

### Before you begin
Role required: sn_wfo_cfg_ws.manager

### About this task
View the work-in-progress chat interactions and see if any of the agents has set the **Help Requested** flag as **Yes**. Open the interaction record and view all messages exchanged between the end user and agent, gain the context and choose to join the conversation by either sending internal messages or joining the conversation in public.

### Procedure

1. Navigate to **All** > **Workforce Optimization for ITSM** > **Manager Workspace**.
2. Do one of the following:

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- Click the **Help Requested** indicator on the landing page.
- Click the **Channels** icon, select a queue and then click the **Active Interactions** tab.
- In **Lists**, click **Conversation Monitoring**.

3. Click the interaction record for which you want to join the conversation.
4. Choose **Join Conversation** to start interacting with the agent or **Send Private Message** to send an message that only goes to the agent.
   The chat conversation is established.

### Allocate work items manually to agents

Allocate pending work items to agents to complete the work.

#### Before you begin

Role required: sn_wfo_cfg_ws.manager
Ensure that the agent has relevant skills, availability, and access to at least one queue in the service channel.

#### About this task

The active work items remain in the queue pending manual allocation for one of the following reasons:

- The agent's capacity is exceeded to the maximum.
- Work items may not be accepted by any available agents.
- Agents with required skills are not available.

#### Procedure

1. Navigate to **All** > **Workforce Optimization for ITSM** > **Manager Workspace**.
2. Click the **Channels** icon.
3. Do any of the following to manually allocate the work items.
   The list of available agents appears with details such as presence state, capacity, and matching skills.
4. Select the agent to assign the work item.
   For example, if the capacity is 0/4, it means that the agent's maximum capacity is 4 work items.

   **Note:**
   You can allocate a single work item at a time to the agent.

5. Click **Allocate**.
   The work item is allocated to the selected agent. The agent gets an alert on the assigned work item.
   - If the agent accepts the work item and the status moves from **Pending Accept** to **Accepted** state. The **Assigned To** field is updated with the agent's name.
   - If the agent rejects the work item and the status moves to **Queued** state.
   - If the agent does not accept the work item for a long time, with the status as **Pending Accept** and you must allocate it again.

### Track and analyze agent's performance

View your agent's profile and summary information in Agent 360 and review their performance.

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### Before you begin
Role required: sn_wfo_cfg_ws.manager

### About this task
You can drill down into the data for a specific agent and view the following details.

- Real-time information of ongoing cases, interactions, and other tasks.
- Upcoming time off.
- Assigned training tasks.
- Skill set, schedule, and profile

### Procedure
1. Navigate to **All** > **Workforce Optimization for ITSM** > **Channel Management** > **Service Channels**.
2. To view information about the agent and their work, click the **All Agents** tab.

| Field | Description |
|---|---|
| Agent | Agent name. Click the agent's name to view the agent's profile summary in Agent 360. |
| Service Channel | Service channel name. |
| Total Capacity | Number of items automatically assigned to agents (pending overrides).<br>○ Chat: The default is 4.<br>○ Incident: The default is 2. |
| Capacity in use | The number of on-going work items. |
| Utilization | Condition that determines what constitutes an active item that counts toward agent workload/capacity in percentage. |
| Assignment Group | Group to which the work item is assigned. |

3. Select an agent to view real-time reports.
   You can also view agent presence history such as how often they were active or were on breaks on a given day.

## Override channel capacity for an agent

Change the default number of work items that an agent can handle for a service channel.

### Before you begin
Role required: sn_wfo_cfg_ws.manager

### About this task
By default, the override capacity is valid for 12 hours. Administrator can change the duration using the *sn_channel_mgmt.awa_agent_temporary_override_time.minutes* system property. For information on adding a system property, see Add a system property. The capacity resets to the previous value after the specified time. The scheduled job *Reset Temporary Capacity Override* is executed every two minutes to check the invalid or expired overridden capacity and resets to the previous value.

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**Note:**
You can override the channel capacity for a single agent at a time. Ensure that an agent to whom you want to override the channel capacity needs to be associated with Advanced Work Assignment and the required channels.

### Procedure

1. Navigate to **All** > **Workforce Optimization for ITSM** > **Manager Workspace**.
2. Navigate to an agent's profile.
3. Click the **Overview** tab.
4. In the **Channels** section, select the service channel for which you want to override the capacity.
5. Click **Capacity Override**.
   The **Agent Capacity Override** page appears.
6. In the **Override Capacity** field, enter the new capacity.
7. Click **Apply**.

### Result

A message appears indicating the capacity update is valid for the defined duration. The capacity resets to the previous value after the specified time.

#### Using Voice with Workforce Optimization for ITSM

Use Voice to deflect incidents away from your human agents using bots. You can record phone interactions when agents resolve issues. Also, you can monitor those interactions to evaluate and improve the quality of incident resolutions.

This video provides an overview of the Voice application: Cloud Call Center Overview

With the Voice application, you can:

- Enable your workforce to use the voice channel and get call recordings, call transcripts, and reports of sentiment analysis when agents interact with callers. You can visualize all of this information within the Channels application in Workforce Optimization for ITSM.
- Analyze the call transcripts and sentiments of users after an interaction is complete so that you can create assessments and provide feedback and training for agents.
- Synchronize agent presence within the queue.

**Note:**
You can integrate any third-party telephony service with the ServiceNow Voice Center application. By default, the Voice provides you with the ability to integrate with the Amazon Connect application.

You can visualize the metrics from the Amazon Connect phone queues that are routed through Voice using the Channels application in Workforce Optimization for ITSM.The Voice application uses Advanced Work Assignment to report data from the Amazon Connect queues.

## Voice Amazon Connect integration workflow

Here's how the Voice integrates with Amazon Connect:

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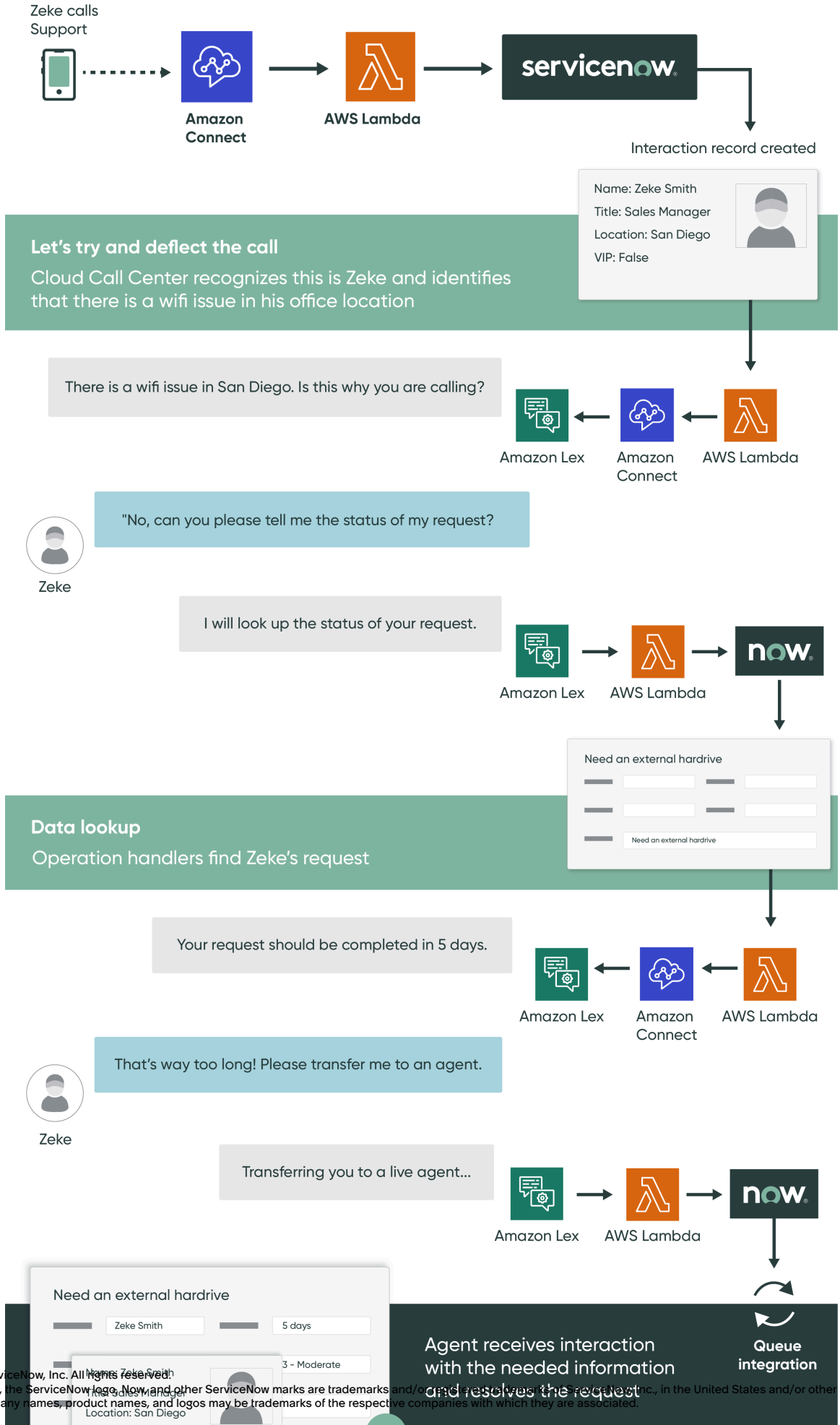


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## Benefits of using Voice with Workforce Optimization for ITSM

As a manager, you can:

- Monitor your agent's calls as they resolve customer issues.
- View synchronized agent presence states within the Channels application in Workforce Optimization for ITSM.
- Assess your agents by reviewing recordings of the agent interaction and call transcripts.
- Analyze sentiments from the call transcripts and use that information to coach and train your agents.

As an agent, you can:

- Get information about the caller before you answer an incoming call.
- Analyze call transcripts and listen to recordings after you complete an interaction.
- Place outbound calls using automated outbound dialing.

### Associate Amazon Connect queues for ITSM to a ServiceNow instance

Set up phone queues for Amazon Connect to gain visibility into the queues using Workforce Optimization for ITSM.

#### Before you begin

Enable the Advanced Work Assignment plugin (com.glide.awa) to create the Amazon Connect queues. You must activate this plugin before you activate the Cloud Call Center Core (sn_cti_core) plugin so that you can successfully integrate the two applications.

After you install the Cloud Call Center applications, when you enable the Advanced Work Assignment plugin (com.glide.awa), the Amazon Connect (phone) service channel appears in the Workforce Optimization for ITSM.

Role required: sn_wfo_cfg_ws.admin or sn_cti_amzn_cct.admin

#### About this task

After an agent completes a call using Workforce Optimization for ITSM, you can learn:

- Who was on hold and how long they were on hold
- How long the calls are taking
- Which agents are available and when they're available
- How many agents are available and what is their current utilization

You can see the following queues when you install the demo data with the sample contact flow:

**Amazon Connect Phone Queues**

| Calls get routed to this queue | When |
|---|---|
| Basic Queue | An utterance is generic, such as, "Let me talk to an agent." |
| VIP Queue | A user who has the VIP field enabled calls Support. |
| IT Equipment Support | An utterance includes IT equipment support or hardware issues. |
| Application Support | An utterance includes application support. |

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A routing profile links queues to agents. Every agent must have a routing profile in the Amazon Connect instance that is integrated with the ServiceNow instance. For more information, see create a routing profile.

**Note:**

- You can associate each profile with multiple Amazon Connect queues.
- You must associate each of these queues in your Amazon Connect instance with the corresponding queue in your ServiceNow instance using an Amazon Connect ARN number. This association enables you to report on queue statistics and call metrics within Workforce Optimization for ITSM.

### Procedure

1. Create placeholder queues for an Amazon Connect (phone) service channel if you need additional queues.
   For more information on creating a queue, see Create a work item queue.

   **Note:**
   Do not add work item routing conditions when you create placeholder queues.

2. Associate the ServiceNow Advanced Work Assignment (AWA) queue record with the Amazon Web Services (AWS) queue ARN.
   a. In the Amazon Connect instance, navigate to **Routing** > **Queues**.
   b. Select a queue.
   c. Copy the ARN for the queue.
   d. In the ServiceNow instance, navigate to **Advanced Work Assignment** > **Queues** and select the corresponding queue.
   e. In the **Cloud Call Center Source ID** field, enter the ARN number.
   f. Click **Update**.
   g. Repeat these steps for each queue.
3. Add assignment groups to a queue.
   a. Select a work item queue.
   b. Click the Group Queue Priorities related list.

      **Note:**
      You may have to configure the form to display this related list.

   c. Click **New**.
   d. In the **Group** field, add an assignment group that include agents who can handle this queue.
   e. In the **Order** field, select the order number for the assignment group that shows the priority in which incoming calls are handled.
   f. Click **Submit**.

## Listen in to an agent call

Monitor agent calls when they are resolving issues for external callers by using Workforce Optimization for ITSM.

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### Before you begin
You must have an active session with Amazon Connect and be able to monitor live conversations. For more information, see Monitor live conversations.

Role required: sn_wfo_cfg_ws.manager

### About this task
When the Amazon Connect application answers a call from an external source, an interaction record is created.

### Procedure
1. Monitor your agent's call queue when an agent is talking to an external caller in Workforce Optimization for ITSM.
2. Open the active interaction record when the phone call is in progress.
3. Click **Monitor Call** and listen into the call in Amazon Connect.

## Analyze transcripts and sentiments for the Amazon Connect phone channel

Analyze your agent's call recordings, transcripts, and sentiment reports. With this information, you can assess the call quality and train your agents to handle calls better in the future.

### Before you begin
Role required: sn_cti_core.user_manager

### About this task
When an agent interacts with an external caller, the call gets recorded and transcribed. The application tags every statement within a transcript with a sentiment score. After a call has been completed, a sentiment report is automatically generated.

**Note:**
The manager must have an active session with Amazon Connect to view the transcripts and sentiments. The transcripts and sentiments are generated in the Amazon Connect application. They are then displayed in the Channels application in Workforce Optimization for ITSM.

### Procedure
1. Navigate to **All** > **Workspace Optimization for ITSM** > **Manager Workspace**.
2. Select an interaction record for analysis.
3. Click **Call Analysis**.
   The Amazon Connect application generates the interactions and sentiment analysis of those interactions and displays them as a report in Workforce Optimization for ITSM.

## Analyze skills for your teams in Workforce Optimization for ITSM

Add skills to groups and view skill assignments for your teams.

### Before you begin
Role required: skill_admin

### Procedure
1. Navigate to **All** > **Workforce Optimization for ITSM** > **Manager Workspace**.
2. Click the Teams icon.

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3. Select a team for which you want to analyze skills.
4. Add a skill to the team.
   a. Click **New**.
   b. In the **Skill** field, select a skill.
   c. In the **Skill level** field, select a level for the selected skill.
   d. In the **Inherited from** field, select the skill from which this skill is inherited.
   e. Click **Save**.
   You can click on a skill to analyze skill data such as the number of users or tasks with that skill, the overall skill coverage, and how many experts you currently have with that skill.

## Channel Management components in Workforce Optimization for ITSM

Workforce Optimization for ITSM has roles to administer channels and queues, properties to configure default behavior, and reports to analyze data in Workforce Optimization for ITSM.

### Roles

| Role title [name] | Description | Contains roles |
|---|---|---|
| Channel Management User [sn_channel_mgmt.user] | Grants read access to channel reports, channel view, and queue report tables. | awa_manager |
| Channel Management Admin [sn_channel_mgmt.admin] | Grants administrative rights to create, read, update, and delete (CRUD) channel reports, channel view, and queue report tables. | • sn_channel_mgmt.user<br>• awa_admin<br>• sn_wfo.admin<br>• report_admin |

### Properties

**Note:**
To use channel management properties, they must be added to the System Property [sys_properties] table. For information on how to add a system property, refer to Add a system property.

| Property | Description |
|---|---|
| sn_channel_mgmt.list_auto_refresh.enable | Set this property to **false** to disable auto-refresh of lists in Channel Management.<br>• **Type**: True or False<br>• **Default value**: True |
| sn_channel_mgmt.channels_card_auto_refresh.enable | Set this property to **false** to disable auto-refresh of lists in Channel Management.<br>• **Type**: True or False<br>• **Default value**: True |

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| Property | Description |
| --- | --- |
| sn_channel_mgmt.list_auto_refresh.interval.seconds | Sets the frequency for refreshing the channel management list data.<br>• **Type**: Integer<br>• **Default value**: 30 |
| sn_channel_mgmt.kpi_auto_refresh.interval.seconds | Sets the frequency for refreshing the channel management indicator data.<br>• **Type**: Integer<br>• **Default value**: 5 |
| sn_channel_mgmt.channel_card_auto_refresh.interval.seconds | Sets the auto refresh interval for the cards on channel management overview container.<br>• **Type**: Integer<br>• **Default value**: 120 |
| sn_channel_mgmt.filter_config.enable | When set to **true**, displays the **Assignment Group** interactive filter in channels.<br>• **Type**: True or False<br>• **Default value**: True |
| sn_channel_mgmt.awa_agent_temporary_override_time.in.hours | Overrides the duration set for the channel capacity.<br>• **Type**: Integer<br>• **Default value**: 12 hours |

## Reports

| Report name | Description |
| --- | --- |
| Interaction Work Items Assigned Today | Number of interaction work items assigned on a given day. |
| Abandoned Interaction Work Items | Number of abandoned interaction work items. |
| Unassigned Interaction Work Items | Number of interaction work items not assigned to agents. |
| Average Work Item CSAT Score | Customer Satisfaction score for an average work item. |
| Unassigned Incident Work Items | Number of incident work items not assigned to agents. |
| Completed Interaction Work Items | Number of interaction work items completed by agents. |
| Today's Average Interaction Service Time | Average time it takes to close an interaction. |

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| Report name | Description |
|---|---|
| Interaction Work Items Resolved Today | Average number of interaction work items resolved on a given day. |
| New Incident Work Items Created Today | New work items created for incidents on a given day. |
| Average Handling time for Interaction Work Items | Average time taken to resolve interaction work items. |
| Agents Available to take Interaction Work Items | Number of agents available to work on the interaction work items. |
| Breached SLA Incident Work Items | Number of work items with breached SLAs. |
| Open P1 Incident Work Items | Number of work items open for P1 incidents. |
| Incident Work Items Resolved Today | Number of work items resolved on a given day. |
| Average Walkup Interaction Wait Time | The average time a user is in queue before starting a walk-up interaction. |
| Currently Waiting Interaction Work Item | Work items currently in queue waiting to be processed. |

### Interactive Filters for Reports

| Name of the interactive filter | Description | Reference table |
|---|---|---|
| Channel Management Agent Filter | Filters the reports based on an agent. | [sys_user] |
| Channel Management Group Filter | Filters the reports based on groups. | [sys_user_group] |
| Channel Management Queues Filter | Filters reports based on queues. | [awa_queue] |
| Channel Management Service Channel Filter | Filters reports based on service channels. | [awa_service_channel] |

## Scheduling in Workforce Optimization for ITSM

Learn how you can plan shifts with automatically staggered break times for your agents to manage their schedule effectively in Workforce Optimization for ITSM. Publish schedules for the next scheduling period to get a snapshot of which agent is lined up to solve issues for that time period.

### Shift planning

Manage the scheduling for your organization from a central location. Use On-Call Scheduling with Workforce Optimization for ITSM to have dedicated team members to resolve issues as they arise.

The image provides a high-level overview of the Scheduling application.

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## Scheduling

Manage on-call and regular shifts from a central location. Get the coverage you need and have dedicated agents to resolve issues as they arise.

**Plan**
Create shift plans that automatically stagger breaks to maximize coverage

**Schedule**
Create schedule plans, view them in real time, and publish the schedule for the next time period

**Manage**
Create time-off requests and swap shifts for your agents without going through an approval process

**Forecast**
Model demand scenarios to analyze agent forecast and view updated demand on the calendar

**View team schedule**
Know when your peers are working and when they are taking time off

**Add events**
Create events such as a meeting, training, or an ad hoc work shift

**Request time off**
Send a request for the span of time you want to take off

**Swap shifts**
Trade shifts with your peers

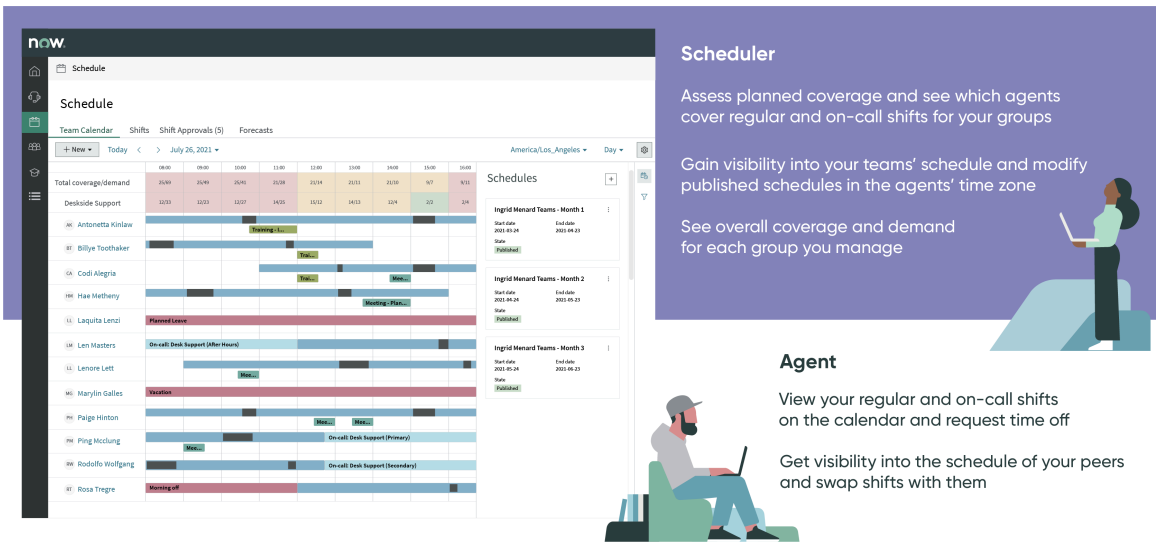


**Scheduler**
sn_shift_planning.admin

**Agent**
sn_shift_planning.agent



The image provides a high-level overview of the tasks schedulers and agents can perform on the calendar.




As a shift planning administrator, you can:

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- Create shifts to make sure you have team coverage for the required span of time.
- Add breaks to the shifts that automatically stagger agent availability for those shifts.
- Preview the schedule and make necessary changes before publishing it to your agents.
- Access the schedule of all of your teams from one location.

As a shift planning agent, you can:

- Look up your schedule and request time off when required.
- Swap your shift with one of your peers.

## Getting started with Scheduling in Workforce Optimization for ITSM

Easily find the tasks that you must complete in the Scheduling module.

**Scheduling**

| Benefit | User | Finding tasks to complete in Scheduling |
|---|---|---|
| Activate Scheduling in Workforce Optimization for ITSM. | admin | Activate Scheduling |
| Refer to the roles, system properties, and more used in Scheduling and Schedule adherence. | Any scheduling role | Understand components used in Scheduling in Workforce Optimization for ITSM |
| Configure event categories, access for event types and more. | Scheduling admin | Set up Scheduling in Workforce Optimization for ITSM |
| Manage your workforce efficiently by planning your teams' shifts and schedule plans. You can also plan and manage schedules and staffing needs across your teams from one location. | Scheduling manager | Schedule your teams' work in Workforce Optimization for ITSM |
| Understand how Schedule adherence works. | Any role | Understand Schedule adherence in Workforce Optimization for ITSM |
| Evaluate if your agents are adhering to their schedules and fine-tune your staffing requirements based on their adherence. | Scheduling manager | Monitor schedule adherence of your agents |
| Predict resources based on historical data. | Scheduling admin | Demand Forecast in Workforce Optimization for ITSM |

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## Example for using scheduling in Workforce Optimization for ITSM

Understand how you can set up and publish agent schedules and how your agents can manage their own schedule based on an example.

A manager manages IT operations for a large organization and has 12 teams reporting to them. Each of their teams has anywhere from 20 through 50 agents. At any given point, they needs visibility into their teams' schedule. They must also be able to create shifts, and approve or reject shift-swap or time-off requests from their agents.

As a manager, they can manage their entire teams' schedule using **Scheduling**. Ingrid's team can manage their own schedule effectively by requesting shift-swaps or time-off.

The manager and their team can manage schedules by performing the following steps from one central location:

1. Create shift plan
2. Create a schedule plan
3. Assign agents to work shifts
4. Publish the schedule
5. Agents make requests to change the schedule or take time off

   For more information, refer to Service Operations Workspace - Scheduling.
6. Approve requests

Get an overview of how to you can create shift plans and assign agents to the shifts using the schedule plan in this video. Create schedule plans and shifts

Get an overview of how you can monitor shifts and schedule for your entire team from a single location in this video.

Workforce Optimization for ITSM Monitor Team Schedule

Get an overview of how agents use the workspace to manage their schedule.

Workforce Optimization for ITSM Agent Schedule

For detailed information on creating and managing schedules using Workforce Optimization for ITSM, refer to Scheduling in Workforce Optimization for ITSM.

## Setting up Scheduling in Workforce Optimization for ITSM

Manage events using the team calendar. You can create different types of event categories and use scripted extension points to customize the event types.

### Configure the due date logic for shift approval flows

As an administrator, you can configure the due date logic for the time-off request and shift-swap request approval flows.

#### Before you begin

Make sure that your application is in the Shift Planning scope.

Role required: admin

#### About this task

You can configure the flows to restrict who can approve the requests. For example, you can set it to only the manager of the agent's primary assignment group who can approve them. If the agent

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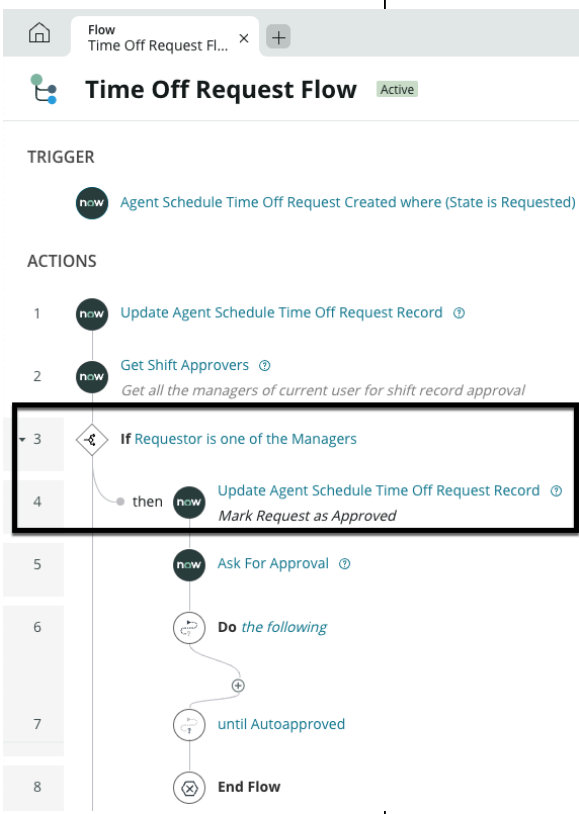
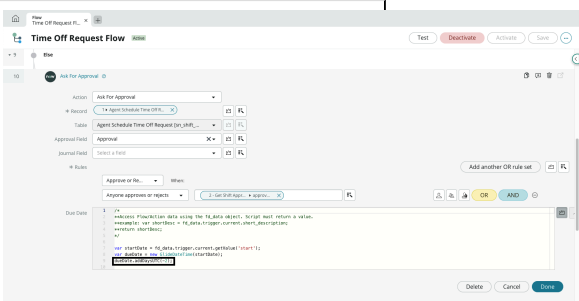
submits the request for approval within two days before the agent time-off start date, then the request for approval is auto-rejected.

### Procedure

1. Navigate to **All** > **Process Automation** > **Flow Designer**.
   Each flow has a requester and an approver workflow.
2. Configure the due date logic for the Time-off request flow.

| If | Then | Reference image |
|---|---|---|
| **The requester is one of the managers** | The request is auto-approved. |  |
| **The requester is the agent** | Enter the due date to approve the request.<br>**a.** Open **Else** > **Ask For Approval** flow.<br>**b.** In the **Due Date** field, select the down arrow icon ( ).<br>**c.** In the **Due Date** script window, update the value in the `dueDate.addDaysUTC(-2);` parameter to the number of days you want to set the due date for approval.<br>**d.** Select **Done**. |  |

3. Configure the due date for the Swap request approval flow.

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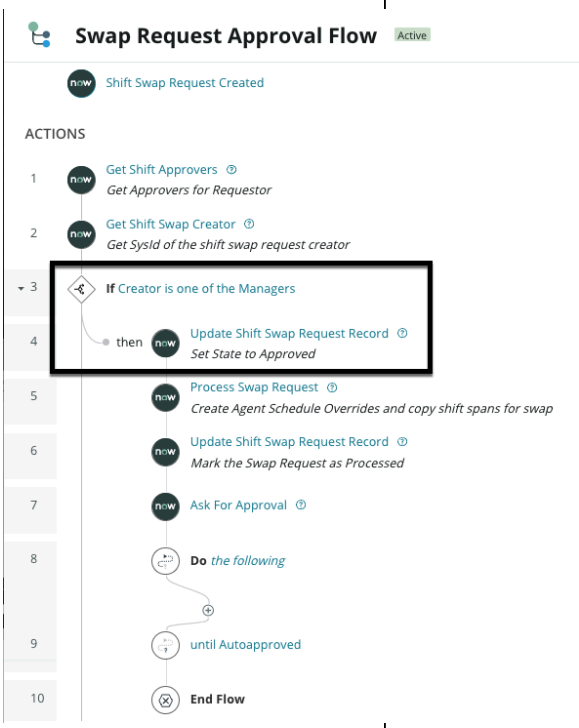
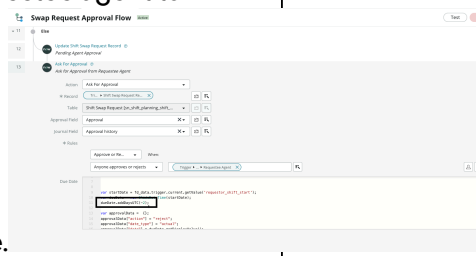
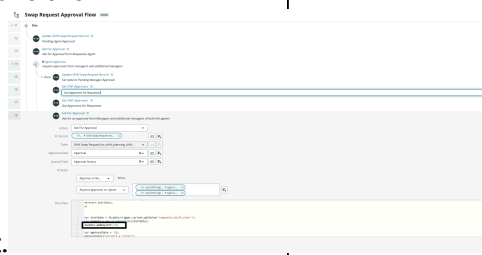
| If | Then | Reference image |
| --- | --- | --- |
| **The shift-swap requester is one of the managers** | The request is auto-approved. |  |
| **The shift-swap requester is an agent (Requestee)** and the **The shift-swap approver is the manager** | Enter the due date for the requestee agent to approve.<br>**a.** Open **Else** > **Ask For Approval**- Ask for Approval from Requestee Agent flow.<br>**b.** In the **Due Date** field, select the down arrow icon ( ).<br>**c.** In the **Due Date** script window, updated the value in the `dueDate.addDaysUTC(-2);` parameter to the number of days you want to set the due date for approval.<br>**d.** Select **Done**.<br>Enter the due date to approve the request.<br>**a.** Open **Ask For Approval** - Ask for an approval from Managers and additional managers of both the agents flow.<br>**b.** In the **Due Date** field, select the down arrow icon ( ). | Enter the due date for the requestee agent to approve.<br>  <br>Enter the due date to approve the request.<br>  |

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| If | Then | Reference image |
|---|---|---|
| | **c.** In the **Due Date** script window, updated the value in the `dueDate.addDaysUTC(-2);` parameter to the number of days you want to set the due date for approval.<br>**d.** Select **Done**. | |

**Related topics**

Build your first flow in Flow Designer

### Configure event categories for the ITSM Manager Workspace

Add an event category. Create or update field configurations for events. You can also specify if an event category must be excluded when the shift coverage for agents is calculated.

## Before you begin

Role required: sn_shift_planning.admin

The following event category configurations are available by default:

- Work
- Meeting
- Training
- Custom Event
- Time Off
- Break

## Procedure

1. Navigate to **All** > **Workforce Optimization for ITSM** > **Scheduling** > **Event Categories**.
2. In the **Event Categories** list, click **New**.
3. In the **Name** field, enter a name for the event category.
4. If you want to exclude this event category for agent coverage calculation, enable the **Exclude from coverage** check box.
5. In the **Event field configuration** dialog box, edit the following configuration as needed:

**Note:**

- You can remove any property that does not apply to a type of event.
- By default, agents can add attendees to the meeting and training event types.

```
{
            "create": {                 //Creates an event type
 form
                "attendees": {          //Adds the Attendees
 field
                "mandatory": true,      //Sets this field as
 mandatory
```

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```
                "readOnly": false,     //Sets this field as
read-only
                "allowAllUsers": false //Allows you to only add
users managed by the logged-in user; to add any user, set this
value to true
                },
                "startDate": {
                "mandatory": true,
                "readOnly": false
                },
                "endDate": {
                "mandatory": true,
                "readOnly": false
                },
                "additionalSelectors": [    //Add custom fields
to the form
                {
                    "fieldLabel": "Select Shift", //Name of the
field that displays on the form
                    "table":
"sn_shift_planning_shift_plan", //Name of the table referenced
by the field
                    "field": "name", //Any field from the
selected table whose display values must be shown in the
custom field
                    "value": "",
                    "mandatory": true,
                    "additionalQueryString": ""
                }
                ]
            },
            "edit": {                   //Edit an event type
form
                "attendees": {
                "mandatory": true,
                "readOnly": false,
                "allowAllUsers": false
                },
                "attendeesFieldForAgent": { //Add attendees to
events
                "mandatory": true,
                "visible":true,
                "readOnly": false,
                "allowAllUsers": false,
                "label":"Attendees"
                },
                "startDate": {
                "mandatory": true,
                "readOnly": false
                },
                "endDate": {
                "mandatory": true,
                "readOnly": false
                },
                 "description":{               //Add text
fields to the form
     "mandatory":false,
```

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```
      "readOnly":false,
      "label":"Notes"
      },
                "additionalSelectors":[
                {
                    "fieldLabel": "Select Shift",
                    "table": "sn_shift_planning_shift_plan",
                    "field": "name",
                    "value": "",
                    "mandatory": true,
                    "additionalQueryString": ""
                }
                ]
            }
        }
```

6. Click **Submit**.

### Configure an event load order in Workforce Optimization for ITSM

Add a system property to display your preferred event categories first on the calendar.

#### Before you begin

Set the map application scope to **Shift Planning**. For information on how to set the scope, see Set map application scope.

Role required: admin

#### Procedure

1. In the application navigator, enter `sys_properties.list`.
2. Click **New**.
3. Enter the following field values.

| Field | Value |
|---|---|
| Suffix | `sn_shift_planning.event_load_order` |
| Application scope | Shift Planning |
| Type | String |
| Value | `{ "fastLoad":[ "07e433f449a11010f877de942e7c1d18" ] }`<br><br>where *`fastLoad`* is the array of sys_ids for event categories that you would like to load first. The remaining custom event categories will be loaded after all event categories with *`fastLoad`* categories are loaded and updated on the calendar. |
| Read roles | sn_shift_planning.agent |

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| Field | Value |
|---|---|
| Write roles | sn_shift_planning.admin |

4. Click **Submit**.

### Create or enable access to event types to add them to the team calendar

Create multiple events from the same category and add them to the calendar in ITSM Manager Workspace. Enable agents or managers to create specific event types.

## Before you begin

Role required: sn_shift_planning.admin

## Procedure

1. Create an event type.

   a. Navigate to **All** > **Workforce Optimization for ITSM** > **Scheduling** > **Event Types**.

   b. Click **New**.

   c. On the form, fill in the fields.

   **Event Type form**

| Field | Description |
|---|---|
| Name | Unique name for the event type. |
| Priority Order | Priority of the event type that you want to exclude from the coverage. The higher the number means the higher the priority.<br><br>For example, let's say you are attending a work event for four hours in a day. You have marked that time window as both a time off and as a meeting event type. If time off has a higher order of priority, then the application excludes that event type from coverage. |
| Color | Color that identifies this type of event in the team calendar. |
| Use custom colors | Preferred color that you can select to display the background and border of the event type in the team calendar. |
| Active | Option that when enabled, displays the event type on the calendar. |
| Category | Type of event, for example, custom, meeting, break, or time off. |

   d. Click **Submit**.

2. Enable agents or managers to create specific event types.
   For information on adding or removing access to user for event types, see Include or exclude access for event types.

## What to do next

Add events to the team calendar

### Event type extension points in Workforce Optimization for ITSM

Use extension points to call scripts for event categories such as a meeting, time off, or work time.

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To see a list of extension points that you can use for Workforce Optimization for ITSM, navigate to **System Extension Points** > **Scripted Extension Points**. In the Extension Points list, open the `sn_shift_planning.EventManager` extension point.

Use scripted extension points to integrate customizations without altering the core components in the application code. When customizing a base application, you implement the scripted extension points by creating the custom script includes and registering them against the scripted extension points.

### Extension points for event types

| Extension point name | Description |
|---|---|
| `sn_shift_planning.EventManager` | Implement this extension point to customize the logic for the event categories that you create. |

You can use extension points to create events such as meeting, training, and time-off requests. For example extension point implementations, see the following extension instances in the Implementations related list:

| Category | Extension script |
|---|---|
| Meeting | `AgentScheduleMeetingEventManager` |
| Break | `AgentScheduleBreakEventManager` |
| Training | `AgentScheduleTrainingEventManager` |
| Time off | `AgentScheduleTimeOffEventManager` |
| Work | `AgentScheduleWorkEventManager` |

**Related topics**

Using extension points to extend application functionality

## Scheduling your teams' work in Workforce Optimization for ITSM

Manage your workforce efficiently by planning shifts for each day and assigning users to the shifts. With Scheduling, you can use your resources efficiently by planning and managing schedules and staffing needs across your teams from one location. You can also integrate with on-call scheduling and create shifts and schedule for on-call rotations.

You can add meeting, training, time-off request, or an ad hoc work shift using the team calendar. You can also filter agents in the team calendar based on their location, region, assignment groups, schedule plan, list of team members, or any field in the agent's record.

**Important:**
You must index new tables to see them in Work Scheduling. For more information on indexing tables, see Configure a table for indexing and searching.

### Create a shift plan

Schedule shifts for your team so that you can make sure that you are covering all work assignments and breaks. You can also specify the days of the week that you might need to override scheduled shifts.

**Before you begin**
Role required: sn_shift_planning.admin

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### About this task

In the **Shifts** tab, you can view the work shifts and on-call shifts in separate tabs. The shifts are grouped by active and inactive shifts. The contextual side panel displays the active and then the inactive shifts in the order it is displayed in the **Shifts** tab. You can scroll through the shifts using pagination.

**Note:**
Your administrator can set user preferences for the pagination size to view work shifts and on-call shifts. For more information see, Scheduling in Workforce Optimization for ITSM

### Procedure

1. Navigate to **Workspaces** > **Manager Workspace**.
2. Click the Schedule icon ( ).
3. Click the **Shifts** tab.
   - **Search shift plans:** Type keywords in the Work shift or On-call shift search field to access related shift plans easily.
   - **Filter shift plans:** Use the filter icon ( ) to view shifts based on whether the shift is in draft or published state.
     - To filter work shifts, in the **Work shift** tab, click the filter icon ( ) and select the desired state of shifts you want to view using the **State** field. Use the **Days of week** filter to narrow down the display of shifts based on the desired days in a week.
     - To filter on-call shifts, in the **On-call shift** tab, click the filter icon ( ) and select the desired state of shifts you want to view.
4. Click the plus (+) icon.
5. Create a shift.

#### Related topics

On-Call Scheduling

## Create a schedule plan

Manage your team's schedule by creating a schedule plan that covers a span of time and includes your team's work shifts. You can also assign agents to shifts based on their skills and availability. This way, you can make sure that you are using your resources in the best way possible for your organization.

### Before you begin

Role required: sn_shift_planning.admin

### About this task

You can set the number of days to cache agent schedules using the *sn_shift_planning.number_of_days_to_cache* system property.

If you do any of the following:

- Import agent schedules using table import
- Disable business rules and use a script to load the data

you must manually run the *Shift Planning - Delete All Agent Schedules Cache* schedule job to clear the cache.

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**Note:**
Your administrator can set user preferences for the pagination size to view schedule plans. For more information see, Scheduling in Workforce Optimization for ITSM

### Procedure

1. Navigate to **Workspaces** > **Manager Workspace**.
2. Click the Schedule icon ( ).
3. Create a schedule plan.
   a. Click the **Team Calendar** tab.

      **Note:**
      You can analyze the staff alignment for a day or for the week.

   b. In the contextual side panel, click the Show Schedules icon to display the schedules.
   c. In the Schedules panel, click the + icon.

      **Tip:**
      - **Search schedules:** Type keywords in the Schedules search field to access related schedule plans easily.
      - **Filter schedules:** Select the filter icon ( ) and then select the desired schedule states using the **Schedule plan state** filter and the desired start and end dates using the **Schedule plan dates** filter to narrow down the display of schedules in the team calendar.

      You can duplicate an existing schedule to create another one. The start date changes to the day after the current date and the end date changes to 30 days from the current date.

   d. In the **Name** field, enter a name for the schedule plan.
   e. From the **Start Date** field, select a date to start the schedule plan and click **OK**.
   f. From the **End Date** field, select a date to end the schedule plan and click **OK**.
   g. In the **Assignment groups** section, assign the schedule plan to your groups.
      - To assign it to all groups you manage, select **Groups I manage**.
      - To assign it to specific groups, select **Specific groups**.

      You can view the schedule of all agents in the assignment group that you directly or additionally manage.
   h. Click **Save schedule**.
   .
4. Add a work shift to the schedule plan.

   **Note:**
   To add more shifts to an existing schedule plan, select the schedule plan and then add the work shift.

   a. Click **Add Shift**.
   b. In the **Shift** field, select the work shift that you want to add to the schedule plan.
   c. In the **Event type** field, select the work event that categorizes the work shift.

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5. Add agents to the work shift.
   a. In the **Assign agents** field, search for agents and add one or more agents to add to the shift.
   b. To publish the schedule plan, select **Publish**.

   It may take a few minutes for the screen to refresh. For more information on publishing a schedule plan, see Publish a schedule plan for visibility into team coverage.

### Enable your teams to sign up for work shifts

Empower your teams to sign up for work shifts based on their availability and preference.

#### Before you begin
Role required: sn_shift_planning.admin

#### About this task
When a schedule plan is enabled for sign-up, you can receive notifications. You can also receive notifications when the schedule plan that's open for sign up is due on the current day or when it's due soon.

**Important:**
Your administrator must set the value in the *glide.ui_notification.max_recipients* property to the maximum number of agents for which you want to send the notifications.

#### Procedure
1. Navigate to **All** > **Workforce Optimization for ITSM** > **Manager Workspace**
2. Select the Schedule icon ( ).
3. Add a schedule plan.
   a. Select the **Team Calendar** tab.
   b. In the Contextual side panel, click the Show Schedules icon to display the schedules.

**Tip:**
Select the filter icon ( ) and then select the desired sign-up state and sign-up dates to narrow down the schedule plans enabled for sign-up.

| In the filters, to add the desired | Do this |
|---|---|
| **Sign-up state** | i. Double-click one or more sign-up states in the **Available** column to move them to the **Applied** column.<br>ii. Select **Apply**. |
| **Sign-up dates** | i. Select a predefined option such as **Last 7 days** or select the start and end date for which you want to see the schedule plans enabled for sign-up.<br>ii. Select **Apply** |

   c. In the Schedules panel, select the + icon.

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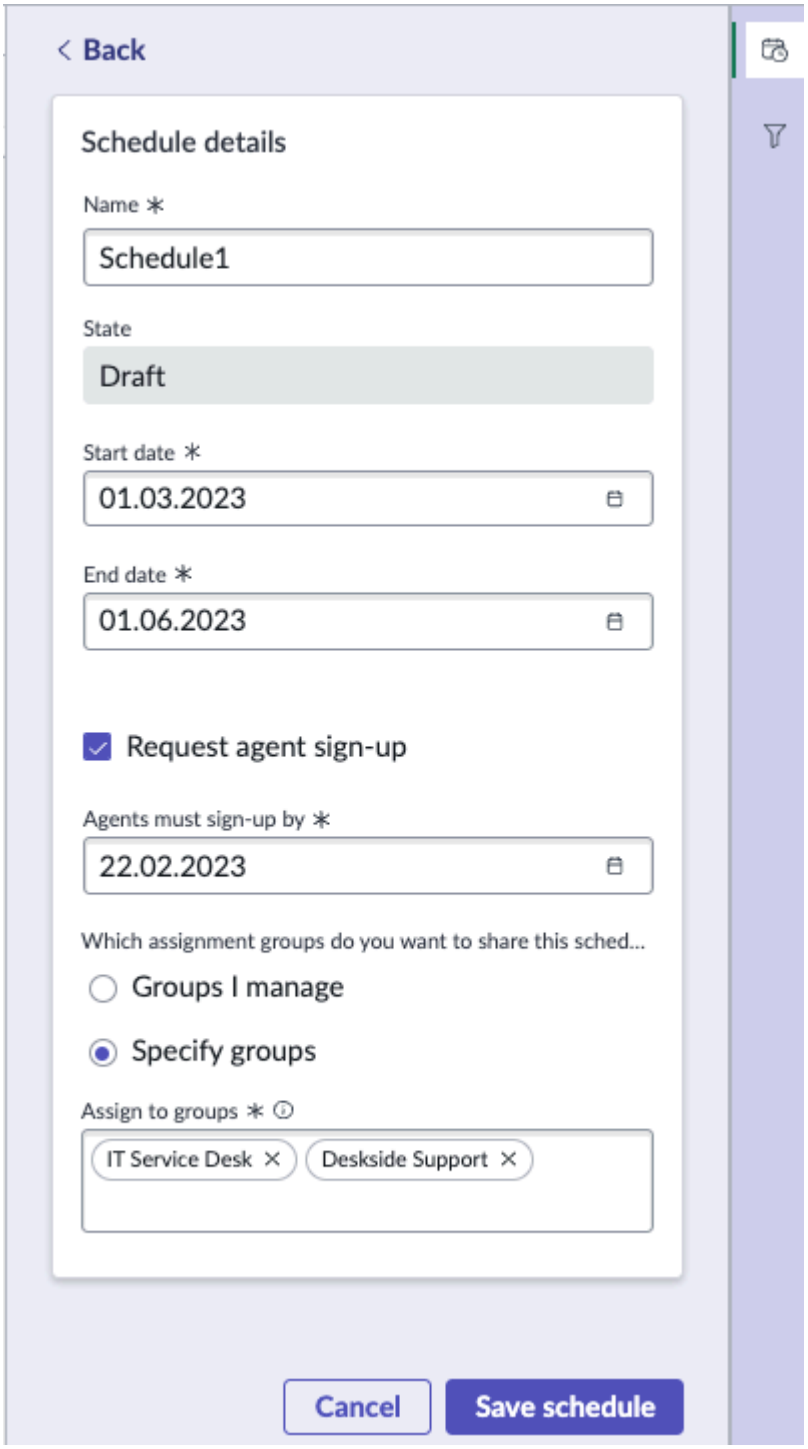
You can duplicate an existing schedule to create another one. After you duplicate a schedule that has the shift sign up enabled, you can update the start date, end date, and the date for which the agents must sign up for the schedule.

**Note:**
If there are no agents associated with the schedule, then the shifts associated with the schedule aren't duplicated.

**d.** Fill in the required fields on the form.
The image below shows an example of a filled-in Schedule form.

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e. To enable your agents to sign up for work shifts, do the following:

i. Enable the **Request Agent Signup** check box.

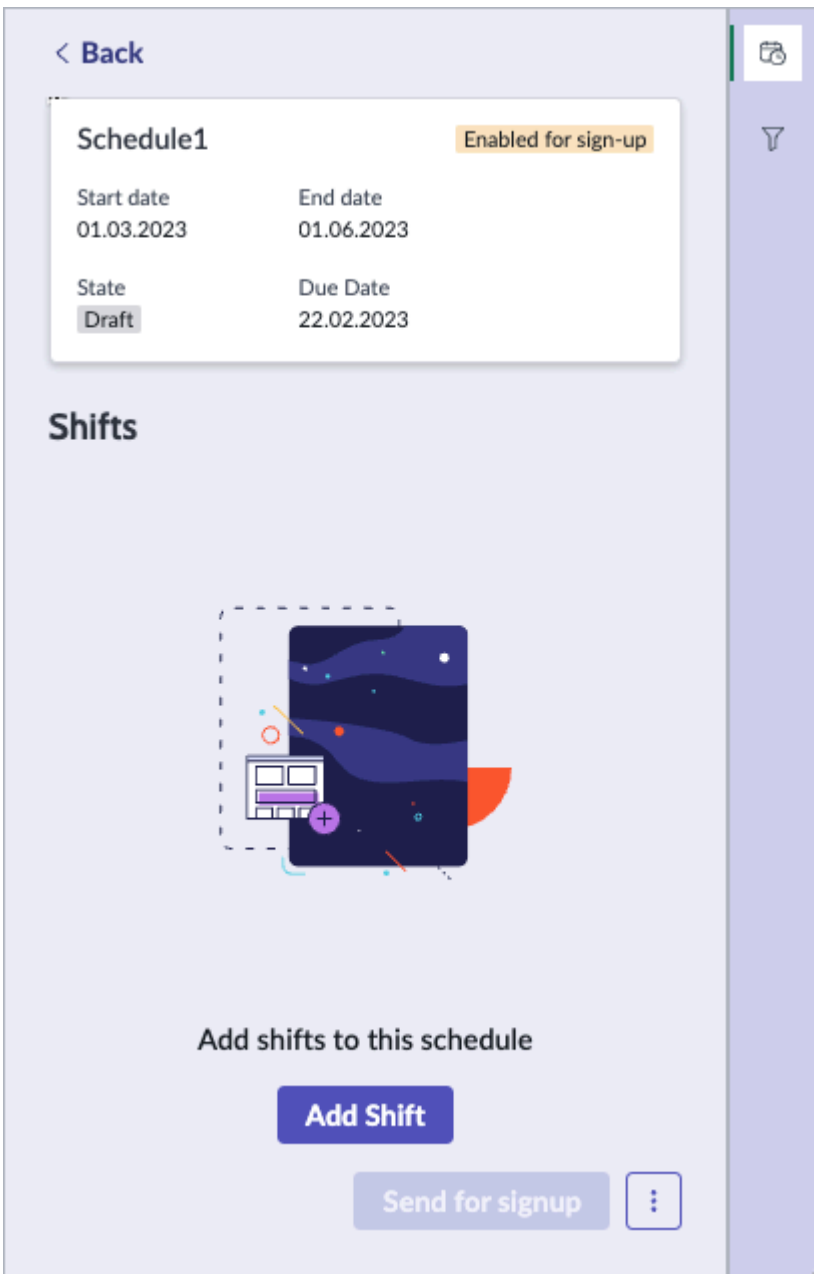
ii. In the **Agents must sign-up by** field, enter the date by which they must sign up for shifts within that schedule.

**Tip:**
If your agents have signed up for their preferred shifts, the **Assigned To** field is auto-populated with those agents.

f. Select **Save schedule**.

4. Add a work shift to the schedule plan.

a. Select the schedule plan you've created.
The image below displays the schedule plan that was created.

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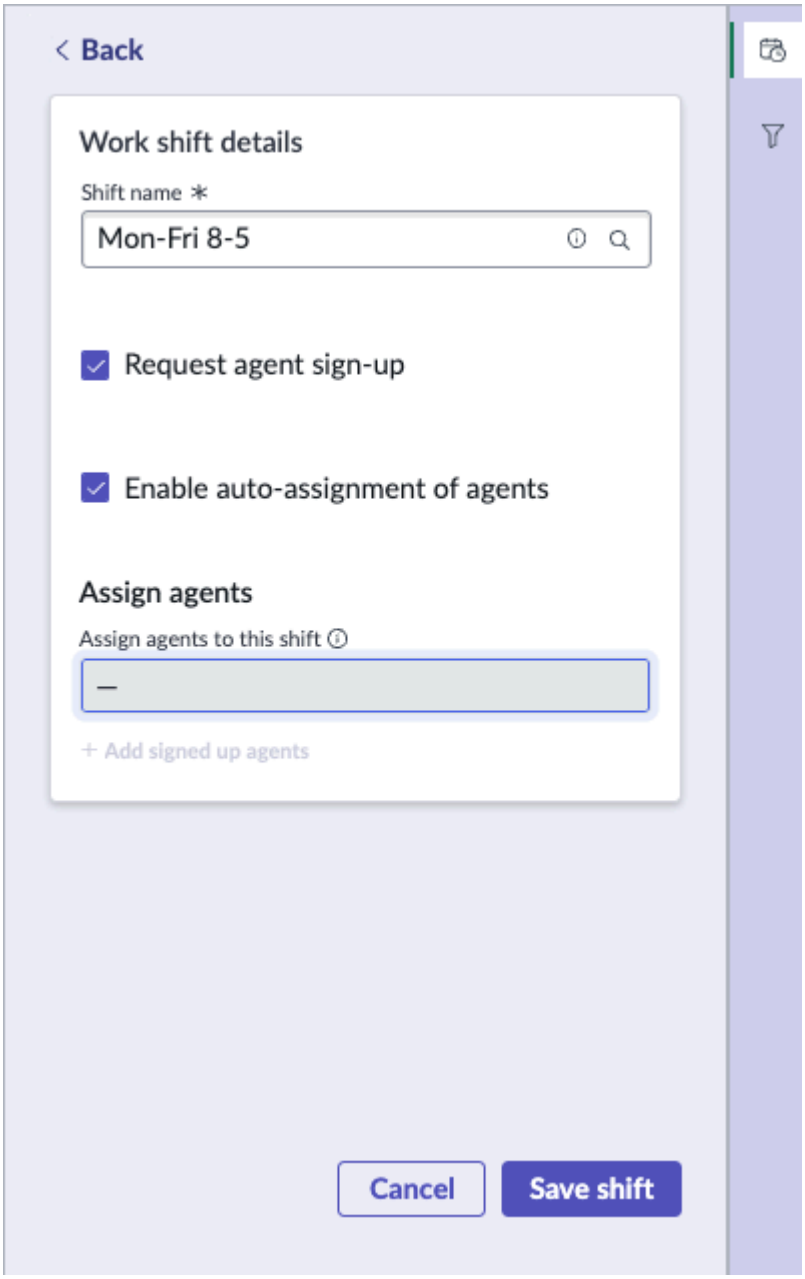
**b.** Select **Add Shift**.
The image below provides an example of a form to enter the details for a shift.




**c.** In the **Shift** field, select the work shift that you want to add to the schedule plan.

**Note:**
If the schedule plan has been enabled for agents to sign up for shifts, the following fields are automatically enabled:

- **Request agent sign-up**
- **Enable auto-assignment of agents**

If you want to assign agents manually, you can disable these check boxes at any time.

**d.** If the shifts are enabled for sign-up, you can select **Send for signup**.

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All shifts that have been enabled for sign-up are sent to the agents to sign up for their shifts. You can select **Close sign-up** to close agent sign-up for a shift before the sign-up due date and manually assign the agents.

- The **Enabled for sign-up** highlighted label changes to **Closed for sign-up**.
- The system will automatically close the sign ups after the sign-up due date.

5. Add agents to the work shifts.

6. Select **Save shift**.
   The state for the schedule plan changes to **Generating Preview**.
7. To publish the schedule plan, select **Publish**.

**Note:**
It may take a few minutes for the screen to refresh.

The table describes the different shift sign-up states in the schedule plan.

| Schedule plan sign up state | Description |
|---|---|
| Sign-up not enabled | The schedule plan isn't enabled for sign-up. |
| Enabled for sign-up | ○ Schedule plan is enabled for sign-up but isn't yet ready for agents to sign up for shifts.<br>○ Schedule plan can't be published when enabled for sign-up. |
| Open for sign-up | ○ Schedule plan is enabled for sign-up and is ready for agents to sign up.<br>○ Schedule plan can't be published or deleted when it's open for sign-up.<br>○ When open for sign-up:<br>▪ The sign-up due date can't be changed.<br>▪ The work shift details can't be changed.<br>▪ New shifts can't be added.<br>▪ If enabled for auto-assign, the agent assignment in a shift can't be changed. |
| Closed for sign-up | Schedule plan is closed for agents to sign up. |

### Publish a schedule plan for visibility into team coverage

Generate a preview of your schedule plan and publish it so that your agents can see their shifts and schedules ahead of time. You can unpublish a schedule to make changes and then publish it again.

#### Before you begin
Role required: sn_shift_planning.admin

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### About this task

You can make a copy of a schedule and update it to create a new schedule. Updates could include modifying the schedule start and end dates as well as adding or removing shifts or agents.

When you make a copy of the schedule, the following updates are automatically made to the schedule copy:

- The start date is set to the current date and the end date to 30 days from the current date.
- The schedule state changes to **Draft**. You can make the necessary changes to the shift and click **Save**.
- The schedule only displays agents in the assignment group of the current logged in user.

You can also unpublish a schedule make updates, and then publish it again.

When you unpublish a schedule:

- If the start date is the either the current date or had occurred in the past, the schedule state remains as **Published** and the end date changes to tomorrow.
- If the start date is in the future, the application changes the schedule state to **Draft**.
- If you delete one or more groups in a schedule plan, all agents who are part of the deleted groups are removed from the shifts in the schedule. After you remove the groups, the schedule changes to draft state and the team calendar refreshes with the updated data.

### Procedure

1. Navigate to **All** > **Workforce Optimization for ITSM** > **Manager Workspace**.
2. Click the Schedule icon ( ).
3. Generate a schedule preview.
   a. Click the **Team Calendar** tab.
   b. Click the show schedules icon ( )to display in the contextual side panel.
   The team calendar refreshes and generates the preview when you save a work shift.
4. Publish a schedule.
   a. Select a schedule and edit the schedule if necessary.
   b. Edit the schedule if necessary and click **Save**.
   c. Click **Publish**.

   **Note:**
   You can click **Delete** in **Draft** state and delete the schedule if you no longer need it.

   All the schedules that are in **Draft** state move to **Published** state. You can view the published schedule in the team calendar.

**Note:**
You can use pagination to scroll through your agents' schedules.

## Track and manage your teams' schedule

Create, update, or monitor your teams' schedule from one location. You can approve or reject requests for swapping shifts or time off for agents within your assignment group.

### Before you begin

Role required: sn_shift_planning.admin

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### About this task

Using the team calendar, you can access the list of all of your agents by assignment group. When you select a shift for an agent, you can see the agent's work schedule including the break time. You can also view the number of agents that are scheduled at every time interval for each group.

### Procedure

1. Modify an agent's shift.
   The schedule that includes this shift must be in **Preview** or **Published** state.
   a. Navigate to **Workforce Optimization for ITSM** > **Manager Workspace**.
   b. Click the Schedule icon ( ).
   c. In the **Team Calendar** tab, navigate and point to the shift for the agent that you want to modify the schedule for.
   d. In the shift pop-up window, click the Edit icon ( ).
   e. Modify the agent's shift as desired.

      **Note:**
      If the existing shift has a break, you can add more breaks to the shift.

   f. Click **Save**.
2. Approve or reject an agent's time off or shift-swap with another agent.

   **Note:**
   You must approve a request two days before the time-off or shift-swap start date. If not, the approval will be auto-rejected. An administrator can change this default setting. For more information, see **Setting the due date for time-off and shift-swap request approvals** in Scheduling in Workforce Optimization for ITSM in configurable workspace.

   a. Click **Approvals**. You can view all agent requests in your queue and the details for each request. You can use the **Compose** field to communicate with the agent.
   b. Select a request that you want to approve or reject and do one of the following:
      - To approve a request, click **Approve**.
      - To reject a request, click **Reject**.

   If you approve the request, the schedule gets updated in the team calendar based on the approvals.

## Analyze your staff alignment using Demand Forecast

Use Demand Forecast to plan the number of staff members that you require so that you have enough agents to do the job.

### Before you begin

Role required: sn_agent_forecast.user

### About this task

Using Demand Forecast, you can:

- Monitor agent or team shift coverage for any day or week.
- Analyze if you are overstaffed, understaffed, perfectly staffed, or not aligned well with your staffing needs.

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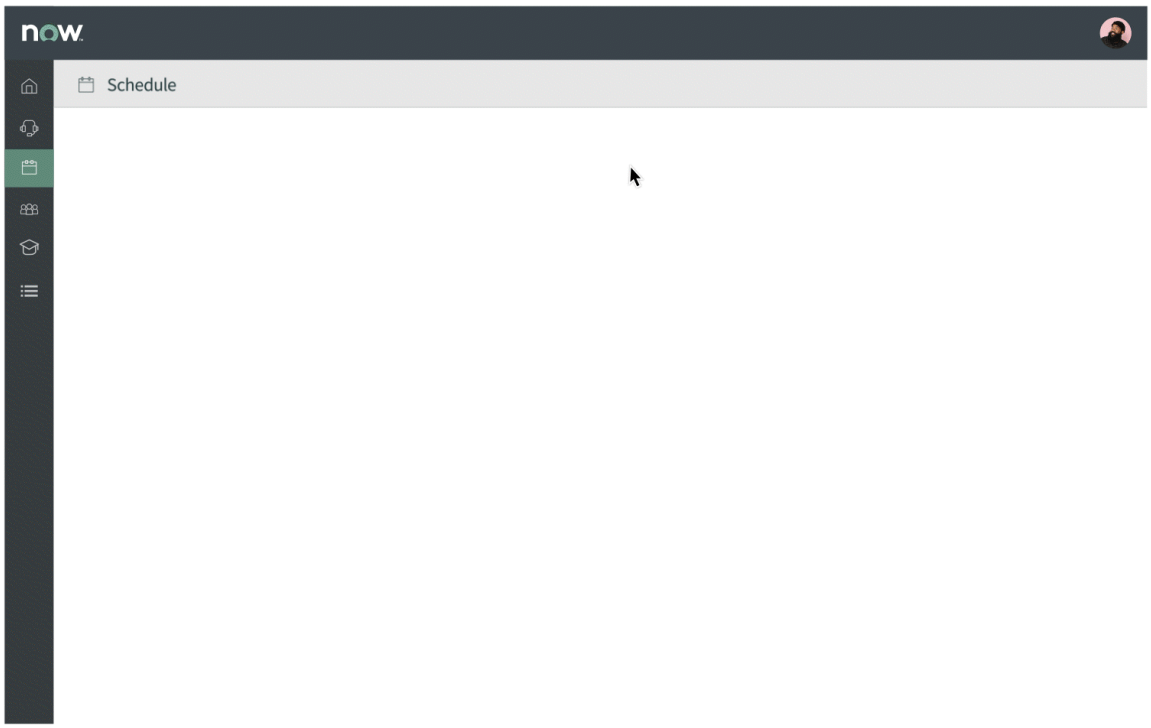
- Adjust your staff alignment depending on the coverage that you need and the schedule of your teams.
- Analyze your staff alignment as you are creating a schedule.
- You can analyze the agent coverage you have and the actual demand for the number of agents based on assignment groups and work shifts in a day.

### Procedure

1. Navigate to **All** > **Workforce Optimization for ITSM** > **Manager Workspace**.
2. Click the Schedule icon ( ).
3. Click the **Team Calendar** tab.
4. Analyze your staff alignment for each shift.
   You can click the filter icon and select the assignment groups and shift plans for which you want to view the staff alignment.

   The following image shows an example of the staffing alignment in a Week view. The misaligned staffing indicator in the pop-up window shows that the forecast manager has scheduled four agents for each shift but more agents are needed to cover the shifts.




## Understanding user criteria for event types in Workforce Optimization for ITSM

Manage user access for any event type such as meeting, training, and time-off requests in the team calendar.

You can include or exclude Create, Read, Write or Update, and Delete (CRUD) rights for event types using the inclusion and exclusion user criteria access. You can perform the CRUD operations for users, groups, or roles.

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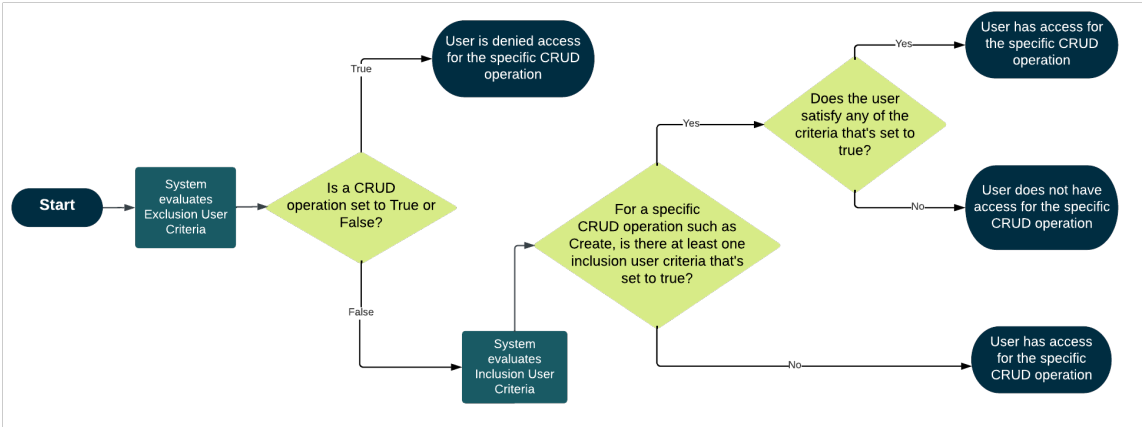
**Note:**
By default:

- Users have role-based access to manage event types.
- Team members don't have read-access to events of type **Actual work**.

For additional flexibility around managing the CRUD access, you can set the user criteria for each event type. For example, if team members don't have access to edit their work shifts using their role-based access, you can set that access using user criteria. You can set this access for specific team members or for the whole group.

The flow diagram shows the logic on how inclusion and exclusion user criteria access work for event types.




**How inclusion and exclusion user criteria access works**

When the user criteria rules get evaluated, it's done in the following order:

1. The system first evaluates the exclusion access for each criteria.
   - If the exclusion access for a CRUD operation is set to **true**, then the system evaluates the user criteria.
     a. If the user doesn't have access based on their role, then the user is denied access for the specific CRUD operation.
     b. If the user isn't denied access, then the system evaluates the inclusion criteria.
   - If the exclusion access for a CRUD operation is set to **false**, then the system evaluates the inclusion criteria.
2. For the inclusion access, for a specific CRUD operation such as Create, the system checks if at least one of the inclusion user criteria is set to **true**. If yes, then the system evaluates the user criteria based on the user's role access.
   - If the user:
     - Has access for the CRUD operation based on their user role, then the user can perform that action. For example, if the event type is training and the CRUD operation is **Create** then the user can create the training event types.
     - Doesn't have access for the CRUD operation based on their user role, then the user can't perform that action.
   - If at least one of the inclusion criteria isn't set to **true**, the user doesn't have access to the specific CRUD operation. In this example, the user can't create the training event types.

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**Note:**
The exclusion access always takes precedence over the inclusion access. If no inclusion or exclusion access is set, then the role-based access is used for managing event types.

### Create user criteria for event types in Workforce Optimization for ITSM

Add a user criteria record to specify which users, roles, and groups can access event types in Workforce Optimization for ITSM.

#### Before you begin
Role required: admin

#### Procedure

1. Navigate to **All** > **Service Catalog** > **Catalog Definitions** > **User Criteria**.
2. Select **New**.
3. On the form, fill in the fields.

| Field | Description |
|---|---|
| Name | Unique name for the user criteria |
| Users | Users who can access event types. |
| Groups | Groups who can access event types. |
| Roles | Roles who can access event types when you apply the user criteria. |
| Advanced | Option to create a script for the user criteria. |
| Active | Enabling the check box makes the user criteria available. |
| Companies | Companies who can access event types. |
| Location | Locations that can access event types. |
| Departments | Departments that can access event types. |
| Match All | Option to make every condition that is set required when the user criteria are applied. |

4. Select **Submit**.

#### Related topics

Create a user criteria record for Service Portal

### Include or exclude user access for event types

Add or remove access to users for any event type so that they can view event types that are relevant only to them.

#### Before you begin
Role required: sn_shift_planning.admin

#### Procedure

1. Navigate to **All** > **Workforce Optimization for ITSM** > **Scheduling** > **Event Types**.
2. Select an event.

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3. Exclude or Include specific CRUD access for users to events.

4. Click **Update**.

### Verify access criteria for a group or a team member in Workforce Optimization for ITSM

Check what create, read, update, and delete rights your groups or your team members have for events to make sure that they have the correct permissions that they need.

#### Before you begin
Role required: sn_shift_planning.admin

#### Procedure

1. Navigate to **Workspaces** > **Manager Workspace**.
2. In the lists module, go to **Scheduling** > **Event type**.
3. Select an event for which you want to verify user access.
4. Select the **User access** tab.
5. Do any of the following.
   The screen displays the create, read, write, and delete columns as **true** for each team member that has access to the specific type of access to the selected event.

### Add events to the team calendar

Create a meeting, training, time-off request, a custom event or an adhoc work shift from the team calendar.

#### Before you begin
Role required: sn_shift_planning.admin

#### About this task
You can create custom event types and add or remove the desired fields. For more information, see Configure event types for the ITSM Manager Workspace.

**Note:**
In the team calendar, when you select an event for a team member and delete it, the event will also be deleted for other participants in the event.

#### Procedure

1. Navigate to **All** > **Workforce Optimization for ITSM** > **Manager Workspace**.
2. Select the Schedule icon ( ).
3. Select the **Team Calendar** tab.
4. Select **+New**.
5. Create an event.

6. Select **Save**.

### Swap your agents' shifts in Workforce Optimization for ITSM

Swap an agent's shift in your assignment group with another agent who can work on that shift and skip the approval process.

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### Before you begin
Role required: sn_shift_planning.admin

### Procedure
1. Navigate to **All** > **Workforce Optimization for ITSM** > **Manager Workspace**.
2. Click the Schedule icon (  ).
3. In the **Team Calendar** tab, navigate and point to the shift for the agent that you want to swap with another agent.
4. In the shift pop-up window, click the Shift Swap icon ( ).
5. In the **Requested Shift** section, click the **Agent** field and select the agent who can work on that shift.
6. Click **Submit**.
   The team calendar displays the updated schedule.

## Scheduling components in Workforce Optimization for ITSM

Workforce Optimization for ITSM has roles to administer agent shifts and schedules and properties to configure default behavior.

### Roles

| Role title [name] | Description | Contains roles |
|---|---|---|
| Shift Planning User [sn_shift_planning.user] | Grants read access for scheduling including the ability to view schedules and shifts. | |
| Shift Planning Agent [sn_shift_planning.agent] | Grants agents access to their calendar. Agents can request shift swap or time off. | sn_shift_planning.user |
| Shift Planning Admin [sn_shift_planning.admin] | Grants administrative access to create, read, update, and delete (CRUD) schedules and work shifts. | • sn_shift_planning.approver<br>• sn_shift_planning.user<br>• sn_shift_planning.agent |

### Properties

| Property | Description |
|---|---|
| sn_itsm_ mobile_agent.events_query_days_past | The maximum number of days past events for your shifts can be displayed on your mobile application. You can enter values that range from -1 to -31.<br>• **Type:** Integer<br>• **Default value:** -31 |
| sn_itsm_ mobile_agent.events_query_days_future | The maximum number of days future events for your shifts can be displayed on your mobile |

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| Property | Description |
| --- | --- |
| | application. You can enter values that range from 1 to 90.<br>• **Type:** Integer<br>• **Default value:** 90 |
| sn_uib_agent_sp.allow_agent_edit_break | Enables agents to edit the start and end time of their break time in a shift span.<br>• **Type:** true\|false<br>• **Default value:** false |
| sn_uib_agent_sp.allow_agent_add_remove_break | Enables agents to add or remove their break time in a shift span.<br>• **Type:** true\|false<br>• **Default value:** false |
| sn_shift_planning.number_of_days_to_cache | Number of days to cache agent schedules.<br>• **Type:** Integer<br>• **Default value:** 5 |
| sn_shift_planning.max_shifts_to_autoassign | Number of preferred shifts from a schedule plan that will be auto-assigned.<br>• **Type:** Integer<br>• **Default value:** 1 |
| sn_shift_planning.max_shifts_allowed_for_signup | The maximum number of shifts that agents can sign up for within a schedule plan.<br>• **Type:** Integer<br>• **Default value:**1 |
| sn_shift_planning.enable_agent_signup | Enable agents to sign up for their own shifts.<br>• **Type:** true\|false<br>• **Default value:**true |
| sn_shift_planning.enable_schedule_signup_link | Enables or disables the link in the Upcoming section in the Service Operations Workspace landing page where agents can view shifts that they've signed up for that are due on the current day and the day after the current day.<br>• **Type:**true\|false<br>• **Default value:** true |

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| Property | Description |
|---|---|
| sn_shift_planning.days_to_signup_due_date | The number of days before the shift sign-up due date when agents and managers are notified.<br>• **Type:** Integer<br>• **Default value:** 2 |
| sn_shift_planning.display_shift_name | Set this property to true to display the shift name. If the value is set to false, the event type will be displayed.<br>• **Type:** Boolean<br>• **Default value:** True<br>**Note:** It will take 24 hours for any changes you make to the property value to take effect. To view the changes immediately, run the *Shift Planning - Delete All Agent Schedules Cache* scheduled job. |
| assignShiftAgentsTypeaheadDisableAutoClose | Turns off the closing of the **Assign agents to this shift** typeahead list every time an agent is selected.<br>In the application navigator, enter `sys_ux_page_property.LIST` and press **Enter**.<br>• **Type:**true\|false<br>• **Default value:** false |

## Scheduled jobs

### Scheduled Job

| Name | Description |
|---|---|
| Shift Planning - Delete All Agent Schedules Cache | Deletes cache from the sn_shift_planning_agent_availability table.<br>• Runs automatically everyday at 2:30 am<br>• Run this job on-demand when you import data. |

## User preferences

Navigate to **All** > **User Administration** > **User Preferences** and add the preferences listed in the table below.

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**Note:**
To set a system-wide user preference, select the **System** check box.

For information on setting user preferences, see User preferences.

| User Preference | Description |
|---|---|
| workspace.onCallShiftsPageSize | Set the maximum number of on-call shifts to view per page in the **On-call shifts** tab in the Shifts side panel.<br>• **Name:** workspace.onCallShiftsPageSize<br>• **Type:** Integer<br>• **Value:** Enter the preferred number of on-call shifts you want to view per page. |
| workspace.workShiftsPageSize | Set the maximum number of work shifts to view per page in the **Work shifts** tab in the Shifts side panel.<br>• **Name:** workspace.workShiftsPageSize<br>• **Type:** Integer<br>• **Value:** Enter the preferred number of work shifts you want to view per page. |
| workspace.schedulePlanPageSize | Set the maximum number of scheduling plans to view per page in the Schedules side panel.<br>• **Name:** workspace.schedulePlanPageSize<br>• **Type:** Integer<br>• **Value:** Enter the preferred number of schedules you want to view per page. |

## Schedule Adherence in Workforce Optimization for ITSM

Analyze how closely your agents adhere to their scheduled activities. You can also analyze whether they complete the total time they were scheduled to work. Use these metrics to align your staffing needs better and forecast the demand for agents more effectively.

Adherence measures how closely agents follow their schedule to complete their assigned work. Conformance measures the work completed regardless of when it was completed.

Use Schedule Adherence to:

- Gain insights into how agent resources were historically used and plan your staffing needs based on that data.
- Measure whether the effort spent on forecasting agent demand and scheduling team members is used in an optimal manner.
- Discover coaching opportunities for your agents when you find gaps in their adherence. For more information, see Coaching.

As a manager, you can do the following actions:

- Gain insights into whether your team is complying with published schedules.
- Increase your team's performance by setting expected adherence targets.

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- View the time attendance of your agents by looking at such details as clock-in and clock-out times.
- Analyze the historical time attendance of your team members.
- View planned versus actual historical data for your team and individual agents.
- Modify the clock-in and clock-out times of your agents.

As an administrator, you can set the threshold percentages and change the formulas for calculating schedule adherence and conformance.

As an agent, you can clock-in to and clock-out of your work shift. For more information, see Service Operations Workspace - Scheduling.

Here's a typical schedule adherence and conformance workflow:

1. The administrator sets the *`Agent Time Work Event Trigger`* business rule as active to record the clock-in and clock-out times of Workforce Optimization for ITSM agents.
2. An agent works for the ITSM team and reports to a manager. Let's assume this scenario is a typical work day:
   a. The agent logs in to ITSM Agent Workspace .
   b. The agent changes the presence status to **Available** and starts work. The clock-in event gets generated.
   c. The agent changes the presence status to **Break** and goes for lunch. The clock-out event gets generated.
   d. When the agent comes back from lunch and answers a phone call, the presence state becomes **Busy** and the clock-in event gets generated.
   e. The agent then logs out from CSM Agent Workspace or changes the presence status to **Offline**. The clock-out event gets generated.
   f. At the end-of-the-day, the agent's time worked summary is generated with key performance indicators (KPIs), such as Start Time, End Time, Planned Work, Time Not Worked, Available Non Planned Time, Time Worked, and Adherence%, Conformance %.
3. The agent's manager logs in to Manager Workspace to view the agent's time worked in the **Team Calendar**. The manager can also view the agent's actual time worked and working pattern for all historical days. If required, the manager can coach the agent to a desired performance that fits in with the team culture.

### Monitor schedule adherence of your agents

Evaluate whether or not your agents are adhering to their assigned schedules. Look for areas where agent activities that do not offer much value can be reduced or eliminated and fine-tune your staffing levels requirements based on their adherence.

#### Before you begin

Role required: sn_shift_planning.admin

#### About this task

- A high adherence rate indicates that agents are sticking to their schedules and resolving work items as expected. Low adherence rates indicate that you may want to analyze the processes or decisions and tweak them to manage your teams' schedule efficiently. The numbers are highlighted in red for non-adherent agents.
- Schedule adherence and conformance calculations are based on the formulas to calculate schedule adherence and conformance and also the agents' actual and planned work timings. The following are the default formulas that are used to calculate adherence and conformance

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for agents. However, your administrator can customize the Schedule adherence extension points to configure the formulas as required.

Components and formulas used in schedule adherence:

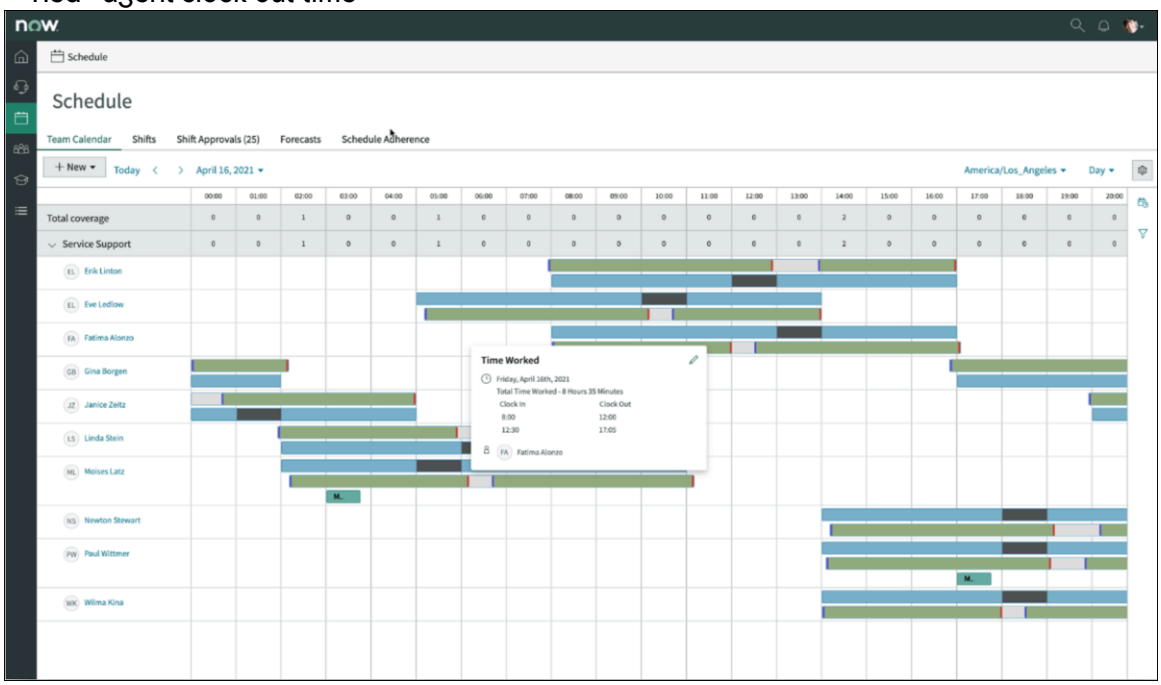
- The *Agent Time Work Event Trigger* business rule generates clock-in and clock-out events anytime there's a change in agent's presence state. The *shift_planning_clock-in* and *shift_planning_clock-out* scripts generate the agents' clock-in and clock-out events from the login and logout sessions.
- Formulas:
  - Schedule adherence is calculated as `(Minutes worked in shift/Scheduled shift time in minutes + Overtime)`.
  - Conformance is calculated as `(Minutes worked in shift + Overtime)/ Scheduled shift time in minutes`.

## Procedure

1. Navigate to **Workspaces** > **Manager Workspace**.
2. Click the Schedule icon ( ).
3. Monitor the schedule adherence of your agents.

The image below shows an example of how well the team members are adhering to their work schedules. The bar colors are represented as follows:

- Blue—planned work shift
- Gray—agent not available
- Green—agent is available
- Purple—agent clock-in-time
- Red—agent clock-out-time

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## Use time-worked summary to analyze agent schedule adherence and conformance

Analyze if your teams are adhering to planned schedules. Use historical adherence to see how well your agents have followed their schedules in the past.

### Before you begin

Role required: sn_shift_planning.admin

### About this task

**Note:**

- Historical adherence provides a reports of real-time adherence.
- Adherence and conformance calculations are based on your agents' actual and planned work schedules. Your administrator can modify the schedule adherence and conformance configurations. For more information, see Schedule Adherence reference.

### Procedure

1. Navigate to **Workspaces** > **Manager Workspace**.
2. Click the Lists icon ( )
3. In the **Schedule Adherence** category, do any of the following:
   - To analyze your agents' time-worked summary, select **Time Worked Summary**.
   - To analyze your agents' time attendance, select **Time Attendance**.

**Note:**
The **Available Non Planned time** captures the time the agent was available and clocked in outside of the agent's scheduled work events. For example, if an agent is scheduled to attend a training from 1 pm to 2 pm, but forgets to clock out that attendance, then that time is considered as the clocked-in time. Therefore, the training time from 1 pm to 2 pm will be captured as the available non-planned time.

### Example:

To understand the computations of the fields in a time worked summary, let's consider Fatima Alonzo's work day:

- Shift time begins at 8 a.m. and goes to 4 p.m. = 8 hours
- Planned time = 8 hours = 480 minutes
- Clocks in 8 a.m. and clocks out at 12 p.m. for a break. Back from the break, clocks in at 12:30 p.m. and clocks out at 4 p.m.
- Minutes worked in shift = 480 - 30 = 450 minutes
- Schedule adherence= (minutes worked in shift/scheduled shift time in minutes + overtime) = 450/(480+65) = 82.57%
- Conformance= (minutes worked in shift + overtime)/scheduled shift time in minutes = (450 + 65) / 480 = 107.29 percent.

**Note:**
Fatima Alonzo is adherent because the schedule adherence and conformance are within the threshold. To see which agents are non-adherent, look for the numbers that are highlighted in red.

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### Schedule adherence extension points in Workforce Optimization for ITSM

Use the schedule adherence extension points to call custom scripts for agent schedule adherence and conformance.

To access the extension points, navigate to **System Extension Points** > **Scripted Extension Points**.

#### Extension points for schedule adherence

| Extension point name | Description |
|---|---|
| *sn_shift_planning.ScheduleAdherenceExtPoint* | Implement this extension point to customize the logic for schedule adherence and conformance. |

**Related topics**

Using extension points to extend application functionality

### Configure properties for schedule adherence and conformance

Configure schedule adherence properties to calculate the adherence and conformance of your agents so that you can improve the operational efficiency of your organization.

## Before you begin

Role required: admin

## About this task

The threshold settings for adherence and conformance indicate how many minutes early or late an agent can clock in or clock out to a scheduled work shift without being considered as non-adherent.

## Procedure

1. Navigate to **All** > **Shift Planning** > **Schedule Adherence** > **Settings**
2. On the form, fill in the fields.

#### Schedule Adherence properties form

| Field | Description |
|---|---|
| Enable Schedule Adherence | Calculation and information about the agents' adherence to the schedules. |
| Threshold for early checkin for planned shift (in Minutes) | Time that you can set for early check in. This time is the acceptable time for an agent to start the work shift before the actual shift time. The default value is 60 minutes. For example, if an agent's planned work shift is 8 a.m. to 5 p.m. and the agent clocks in at 7 a.m., the threshold time allows flexibility and the agent is not considered as a non-adherent agent. |
| Threshold for adherence % of Time Worked Summary | Percentage that you can set for a threshold in adherence. The agents who do not qualify to be above the defined threshold value (70%) are considered non-adherent agents. |
| Lower threshold conformance % of Time Worked Summary | Lower threshold percentage that you can set for flexibility in conformance. The agents who do not qualify for the defined lower and upper conformance threshold values (80-120) are considered as non-conformant agents. The default value is 80%. |

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| Field | Description |
| --- | --- |
| Upper threshold for conformance % of Time Worked Summary | Upper threshold percentage that you can set for flexibility in conformance. The agents who do not qualify for the defined lower and upper conformance threshold values (80-120) are considered as non-conformant agents. The default value is 120%. |
| Default threshold time for clock-out event generation (in Minutes) | Default threshold time to generate an automatic clock-out event if an agent fails to clock out. The default value is 60 minutes. For example, if an agent's planned work shift is 8 a.m. to 5 p.m. and the agent fails to clock out at 5 p.m., the system waits for 60 minutes as the threshold time and generates an automatic clock-out event. |

3. Click **Save**.

**Related topics**

Schedule Adherence in Workforce Optimization for ITSM

## Demand Forecast in Workforce Optimization for ITSM

Learn how you can use Demand Forecast to predict resources based on historical data.

The video below shows an overview of the Demand Forecast application.

Demand Forecast in Workforce Optimization for ITSM

Demand Forecast uses MetricBase to forecast the demand for teams.

When you create demand forecast configurations, the application creates metrics:

- To forecast the number of agents you need for interactions.
- To resolve incidents throughout a given day.

**Note:**
You can create forecast configurations for any table.

## Analyzing Demand Forecast resource prediction

Watch this video to see how you can model demand scenarios and view updated demand on the calendar.

Demand Forecast - Model Demand Scenarios

As a manager with the forecast admin role, you can create forecast parameters in the Workforce Optimization for ITSM Manager Workspace. Modify forecast parameters to visualize forecast data and preview time-series data before publishing it. You can create any number of forecasts to preview the time-series data in real time.

You can also make manual adjustments to tweak the forecast and analyze the forecast pattern. You can overlay the manual adjustments on the visualized forecast data and view the time-series data to analyze the forecast model. For example, if you have a specific pattern for the upcoming week but you know that a national holiday falls in the middle of the week where you need more agents because you expect the sales to go up, you can manually tweak the forecast to increase it by 10% and analyze that data.

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## Demand Forecast

The Demand Forecast application includes the following four modules:

### Demand forecast application modules

| Module Name | Description |
|---|---|
| Data Collection Definitions | Set conditions to define the data you want to collect for incidents, interactions, or any table. |
| Formula Parameters | Add parameters to be defined in the formula to calculate the resource count per hour in a day. |
| Resource Conversion Formula | Add formulas to convert forecast to resources. |
| Group Forecast Configuration | Associate the configured formula for resource conversion to groups. |

As a forecast admin (sn_agent_forecast.admin), you can forecast the number of agents you need for a shift.

To forecast the demand:

1. Collect data by defining data collection definitions
2. Create forecast parameters.
3. Create formulas to convert the forecasting number of incidents into the number of resources you must respond to those incidents.
4. Associate the formulas to assignment groups.
5. View the predicted demand on the calendar.

**Note:**
Refer to Demand Forecast in Workforce Optimization for ITSM configurable workspace for information on default components and configurations installed with Demand Forecast.

## Collect data by defining data collection definitions

Use the **Data Collection Definitions** application to define the data you want to collect for forecasting agents.

- Use the *Collect daily data for automated forecast configurations* scheduled job to gather data for the metrics defined in the data collection definitions. The scheduled job fetches the records from the previous day for each hour and for every assignment group. It stores this data in the MetricBase.

  You can access the time series for the collected data using the MetricBase `list` on the Group [sys_user_group] table. For more information on accessing MetricBase data, refer to Access MetricBase data using the list command.

- Use the *Collect historical data for automated forecast configurations* on-demand job to collect hourly historical data. This job collects data for the past three years.
- Use the **Forecast resources for future** scheduled job to forecast the resources based on the collected data. The scheduled job stores the data in the Agent Forecast metric in MetricBase.

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Refer to the forecast properties to set the collection frequency such as the number of days you must collect the data. You can use this information to calculate the forecast or the time period for which you want to store the data.

**Note:**
The time series metrics created for data collection definitions use the **WFO Forecast** retention policy. This policy stores data at a one-hour interval for the past three years.

## Create formula parameters

Use numeric values or a script to define parameters to use in the formula for forecasting. Refer to the resource forecast configurations for the configured resource forecast formulas available by default.

## Associate formulas to assignment groups

To convert the number of incidents to agents, associate assignment groups to the resource-conversion formula.

## View the predicted demand on the calendar

The data collected by the Agent Forecast metric in MetricBase is used to forecast the agents you need for each hour in a day. This data is displayed on the team calendar. In a Week view for the calendar, it displays the staffing levels for a given week.

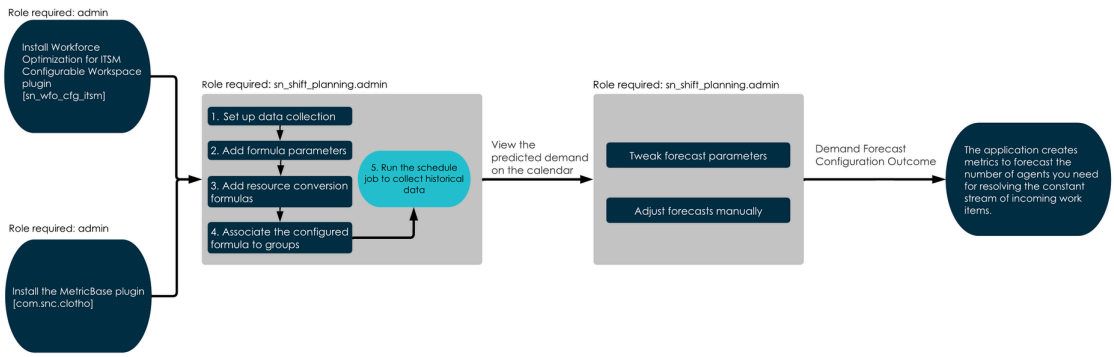
### Related topics

Set up Demand Forecast

### Setting up Demand Forecast in Workforce Optimization for ITSM

Configure the data you want to collect, modify forecast parameters and calibrate manual adjustments using Demand Forecast.

The image shows the end-to-end flow of setting up Demand Forecast.




### Configure Demand Forecast

Define the data that you want to collect for incidents, interactions, or any table to forecast the number of agents that you require for your staffing needs.

### Before you begin

- You must have the MetricBase plugin [com.snc.clotho] enabled to use Demand Forecast in Workforce Optimization for ITSM. For more information, see Requesting the MetricBase product.
- You must be in the global application scope.

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Role required: sn_agent_forecast.admin

### Procedure

1. Navigate to **All** > **Workforce Optimization for ITSM** > **Demand Forecast**
2. Define the data that you want to collect for forecasting the number of agents that you need.
   a. Click **Data Collection Definitions**.

      See the forecast configuration tables for demand forecast for the list of configurations that are available by default.

   b. Click New.
   c. On the form, fill in the fields.

**Forecast Configuration form**

| Field | Description |
|---|---|
| Name | Unique name for the collection forecast configuration. |
| Type | Data Collection Definition type that is set to **Collection** by default and collects data using a scheduled job. |
| Table | Table that is used for collecting data.<br>From the list, do one of the following:<br>▪ To collect data to forecast incidents, select **Incidents**.<br>▪ To collect data to forecast interactions, select **Interactions**. |
| Condition | Conditions that you can set so that you can capture the data that you need. |
| Date Field | Data that you can add to forecast for the future. |

   d. Click **Submit**.

> **Note:**
> A forecast parameter in **Published** state is automatically created.

   e. Create an index for the table that you have created using the date field and the conditions that you have added to the table. For information on creating a table index, see Create a table index.

3. Add parameters for the formula to calculate how many agents you need per hour in a day.
   a. Click **Formula Parameters**.
   b. In the **Name** field, enter a name for the parameter.
   c. Do one of the following:
      ▪ To add a value to be calculated for the formula, in the **Value** field, enter the value.
      ▪ To use the performance analytics score card API or a custom API, click **Advanced,** and add the script.

   The Average Chat Duration and Average Walkup Duration forecast parameters that are provided by default are examples of how you can use scripts to add the parameters. For a list of parameters provided by default, see the forecast parameters in demand forecast for the list of configurations that are available by default.

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**Note:**
A resource conversion formula uses multiple data collection definitions to calculate the resource conversion. In a data collection definition, if the forecast parameters set for each of the forecast configurations vary, the resource conversion formula uses the lowest parameter values set for a forecast configuration.

For example, let's assume:

- The P1 Incidents Created forecast configuration has the period length set to seven days and periods to forecast set to 2. Therefore, the next number of days for which the forecast would be calculated is 14 days.
- The Chat Interactions Created forecast configuration has the period length set to seven days and periods to forecast set to 4. Therefore, the next number of days for which the forecast would be calculated is 28 days.

When you add both of these forecast configurations to the resource conversion formula, it only considers the lower of the two forecast configuration values, which is 14 days, to calculate the resource conversion.

**d.** Click **Submit**.

**4.** Configure the resource conversion formula.

**a.** Click **Resource Conversion Formula**.

**b.** Click **New**.

**c.** On the form, fill in the fields.

**Forecast Configuration form**

| Field | Description |
|---|---|
| Name | Name for the resource forecast configuration. |
| Type | Type that is set to **Resource Conversion Formula**. |
| Formula | Formula to calculate the forecasted number of agents that you need.<br><br>In the Related Links section, do the following:<br><br>▪ Click **Browse Forecast Configuration**, select the forecast configuration to add to the formula and click **Add**.<br>▪ Click the **Browse Forecast Parameter** related link, select the forecast parameter to add to the formula, and click **Add**.<br><br>**Note:**<br>**FC** refers to Forecast Configuration and **FP** refers to Forecast Parameter. |

**d.** Click **Submit**.

**5.** Associate an assignment group with a resource conversion formula.
You can assign a forecast configuration to multiple assignment groups, but an assignment group can have only one forecast configuration.

**a.** Click **Group Forecast Configurations**.

**b.** Click **New** and do the following:

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- In the **Assignment Group** field, click the search icon ( ) and select the group to which you want to associate a forecast configuration.
- In the **Forecast Configuration** field, click the search icon ( ) and select a **Resource Conversion Formula**.

### What to do next

Run the *`Collect historical data for automated forecast configurations`* scheduled job. For more information, see scheduled jobs for demand forecast .

#### Related topics

Use Demand Forecast

## Define the minimum and maximum number of agents to forecast demand

Set the minimum or maximum number of agents required per hour so that you always have the desired staffing coverage.

### Before you begin

Role required: sn_agent_forecast_admin

### About this task

When you calculate the number of agents for your staffing needs, you have the option of defining how many minimum or maximum number of agents you would need by default per hour using the `Math.min` and the `Math.max` functions.

### Procedure

1. Navigate to **All** > **Workforce Optimization for ITSM** > **Demand Forecast** > **Formula Parameters**.
2. Create a formula parameter to set either the minimum or maximum number of agents you need every hour.
   a. Click **New**.
   b. In the **Name** field, enter a unique name for the parameter.
   c. In the **Value** field, enter the number of agents required when converting resources.
      - To set the minimum number of agents, enter the lowest number of agents you would require per hour.
      - To set the maximum number of agents, enter the highest number of agents you would require per hour.
   d. Click **Submit**.
3. Create a Resource Conversion formula.
   a. Click **Resource Conversion Formula**.
   b. Click **New**.
   c. in the **Name** field, enter a unique name for the resource conversion formula.
   d. Right-click the form header and click **Save**.
   e. In the **Formula** field, do one of the following:

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- To create a formula for the minimum number of agents required per hour:

  i. Add the `Math.max` function.

  ii. Click **Browse Formula Parameters** and select the formula you have created to set the minimum number of agents.

  iii. Click **Browse Forecast Configuration** and select the formula you want to use for the forecast configuration.

  When the resource conversion formula is calculated, the higher of the two values is used as the lower limit for the minimum number of agents required per hour.

  For example, let's assume you need a minimum of two agents per hour and you're using the following formula: `Math.max(([FP:Min Number of Agents]), (([FC:Chat Interactions Created] * [FP:Average Chat Duration]) / [FP:Average Agent Work Time Per Day]))`, where,

  - You've set the `[FP:Min Number of Agents]` value to 2.
  - The output value for this formula `[FC:Chat Interactions Created] * [FP:Average Chat Duration]) / [FP:Average Agent Work Time Per Day]` is 0.

  Although the forecast configuration indicates that no agents are required, because you've set the minimum number of agents to two, that value will be used for resource conversion.

- To create a formula for the minimum number of agents required per hour:

  i. Add the `Math.min` function.

  ii. Click **Browse Formula Parameters** and select the formula you have created to set the maximum number of agents.

  iii. Click **Browse Forecast Configuration** and select the formula you want to use for the forecast configuration.

  When the resource conversion formula is calculated, the lower of the two values is used as the upper limit for the minimum number of agents required per hour.

  For example, let's assume you need a maximum of eight agents per hour and you're using the following formula: `Math.min(([FP:Max Number of Agents]), (([FC:Chat Interactions Created] * [FP:Average Chat Duration]) / [FP:Average Agent Work Time Per Day]))`, where,

  - You've set the `[FP:Max Number of Agents]` value to 8.
  - The output value for this formula `[FC:Chat Interactions Created] * [FP:Average Chat Duration]) / [FP:Average Agent Work Time Per Day]` is 10.

  Although the forecast configuration indicates that 10 agents are required, because you've set the maximum number of agents to eight, that value will be used for resource conversion.

f. Click **Submit**.

### Modify forecast parameters to visualize forecast data

Configure and tweak forecast parameters to see how the forecast behaves when you vary the period length, periods to forecast, or algorithm. You can view the modified forecast on the time-series visualization.

#### Before you begin

Role required: sn_agent_forecast.admin and sn_wfo_itsm.manager

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The user with these roles must also be a manager of the assignment group that is associated with the resource conversion formula.

### About this task

You can define the start and end dates for which you want to visualize the forecast data. The start date for a forecast configuration is based on the number of historical days you want to consider for data visualization. This is set using the *sn_agent_forecast.number_of_historical_days_in_timeseries_chart* property.

The default start date is set to 90 days ago starting from the day before the current day. The end date is calculated based on the period length and the periods to forecast represented in days. For example, if the period length is 7 days and the periods to forecast is 5, then the end date is 35 days including the current day.

### Procedure

1. Navigate to **All** > **Workforce Optimization for ITSM** > **Manager Workspace**.
2. Click the Schedule icon  .
3. Click **Forecasts**.
4. Select the forecast model for which you want to view the time-series data.
   You can visualize each of the forecast parameters that were created for the forecast model.
5. Click the gear icon  .
6. Click the plus (+) sign.
7. Configure the forecast parameter.
   a. From the **Period length unit** list, select the unit for the length of the period to forecast.
   b. In the **Period length** field, enter the length of a season to forecast.
   c. In the **Periods to forecast** field, enter the number of seasons, which is the period length, for which you want to forecast.
   d. In the **Algorithm** field, select an algorithm you want to use to calculate the forecast.
   e. Click **Update**.
   The forecast is created in **Draft** state. The forecast is calculated and displays in the forecast model. You can analyze the forecast with the new forecast parameters before you publish it.
8. To preview a forecast before publishing it, click **Preview**.
   The forecast is calculated using the algorithm and parameters configured in the forecast parameter. When you create a manual adjustment to predict future resources, Demand Forecast overlays the adjustment in the time-series chart.
9. Publish the forecast parameters.
   a. To publish a newly created forecast parameter, click **Save** and then click **Publish**.
   b. To publish an active forecast parameter, click **Publish**.

   **Note:**
   You can only have one forecast in **Published** state, which is used to calculate the resources.

   When the forecast parameter is published:

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- The state of the record changes to **Published**.
- The **Forecast resources for future** job runs daily and uses the published forecast parameters to calculate the agent forecast. The calculation uses the resource conversion formula to calculate the forecast data from the current point forward. You can view the updated resources in the team calendar.
- Any other forecast parameters that were created would be unpublished and inactive.

### What to do next

Create a manual adjustment for a forecast

## Create a manual adjustment for a forecast

Adjust forecasts manually to fine-tune them for greater accuracy. Create the adjustment for a specified time period and analyze how it impacts your forecast.

### Before you begin

Role required: sn_agent_forecast.admin and sn_wfo_cfg_itsm.manager

The user with these roles must also be a manager of the assignment group that is associated with the resource conversion formula.

### Procedure

1. Navigate to **All** > **Workforce Optimization for ITSM** > **Manager Workspace**.
2. Click the Schedule icon.
3. Click **Forecasts**.
4. Select the forecast model for which you want to make a manual adjustment.
5. Click the Manual Adjustments icon.
6. Make a manual adjustment.
   a. Click the manual adjustment icon.
   b. Fill in the following fields.

| Field Name | Description |
|---|---|
| Name | Unique name for the manual adjustment. |
| Start Date Time | Date and time when the manual adjustment for the forecast must start. |
| End Date Time | Date and time when the manual adjustment for the forecast must end. |
| Adjustment Unit | Unit for the manual adjustment.<br><br>Available values:<br>▪ Percentage—adjustment value percentage. For example, if the forecast data shows incident count and if the adjustment value is 15, the manual adjustment shows a 15% increase in incident count than the forecast data.<br>▪ Number—adjustment value count. For example, if the forecast data shows incident count and if the adjustment value is 15, the manual adjustment shows 15 more incidents than the forecast data. |

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| Field Name | Description |
|---|---|
| Adjustment Value | The numeric value for which you want to adjust the forecast. The value is applied to each group in the Groups [sys_user_groups] table. The manual adjustment visualization on the time-series chart displays the data for your groups. For example, let's assume that the value is 15 and the unit is number. On a given day, if you have two groups for a forecast model and both have 2 agents each before you do the manual overlay, when you enter the value as 15, it is applied to each of the two groups and the total value displays as 34.<br><br>This is calculated as follows:<br>▪ Two agents for group A + the adjustment value 15 = 17<br>▪ Two agents for group B + the adjustment value 15 = 17<br>The total is 34. |

**c.** Click **Save**.
The manual adjustment is created in **Draft** state. The manual adjustment is calculated and displays as a green line in the forecast model. You can analyze or update the forecast with this manual adjustment before you publish it.

**7.** Publish the manual adjustment.

**a.** Click the saved manual adjustment that you want to use for forecasting resources.

**b.** Click **Publish**. The state changes to **Ready to Publish**.
When the **Forecast resources for future** job is run, it calculates the forecast, checks for manual adjustments, applies those values if any, and moves it to the **Published** state.

**Note:**

- When you unpublish a forecast, it moves to **Draft** state. You can delete a forecast that is in **Draft** state.
- If you want to end a manual adjustment after it has started and before its end date, you can click **End Now**.

The forecast will no longer be used in the resource conversion formula.

When the manual adjustment is published:

- The state of the record changes to **Published**.
- The adjusted values will be used in the resource conversion formula and the demand forecast displayed on the calendar.
- Any other manual adjustment configurations that were created would be unpublished and moved to **Draft** state.

### Demand Forecast components in Workforce Optimization for ITSM

Workforce Optimization for ITSM installs roles to administer ITSM Manager Workspace Demand Forecast, properties to configure default behavior, scheduled jobs to collect data for the configurations, tables to store data, forecast configurations to collect data for incidents and interactions and a retention policy to store metric data.

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## Forecast configurations

| Name | Description |
|---|---|
| Chat Interactions Created | Collects data for chat interactions. |
| Non P1 Incidents Created | Collects data for all incidents that are not tagged as priority 1. |
| P1 Incidents Created | Collects data for priority 1 incidents. |
| Walkup Interactions Created | Collects data for walk up interactions. |

## Metric retention policy

The **WFO Forecast** time series metric retention policy is available by default for all forecast configurations. By default, this retention policy stores data at a one-hour interval for the past three years.

## Formulas to create resource forecast configurations

| Name | Formula to create this resource forecast configuration |
|---|---|
| Chat Interactions to Agent Conversion | `([FC:Chat Interactions Created] * [FP:Average Chat Duration]) / [FP:Average Agent Work Time Per Day]` |
| Incident and Interaction Resources | `[FC:Incidents Created to Agent Conversion] + [FC:Chat Interactions to Agent Conversion] + [FC:Walkup Interactions to Agent Conversion]` |
| Incidents Created to Agent Conversion | `(([FC:P1 Incidents Created] * [FP:Average P1 Incident Work Time]) / [FP:Average Agent Work Time Per Day]) + (([FC:Non P1 Incidents Created] * [FP:Average Non P1 Incident Work Time]) / [FP:Average Agent Work Time Per Day])` |
| Walkup Interactions to Agent Conversion | `([FC:Walkup Interactions Created] * [FP:Average Walkup Duration]) / [FP:Average Agent Work Time Per Day]` |

## Forecast parameters

| Name | Description |
|---|---|
| Average Agent Work Time Per Day | Average time an agent works in a given day. |
| Average Chat Duration | Average duration of an agent chat for each incident or interaction. |
| Average Non P1 Incident Work Time | Average time an agents spends working on all incidents that are not categorized as Priority 1. |
| Average P1 Incident Work Time | Average time an agents spends working on all incidents that are categorized as Priority 1. |

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| Name | Description |
| --- | --- |
| Average Walkup Duration | Average duration an agent spends on a walkup interaction. |

If you create forecast parameters for a forecast configuration, the values set in the configuration are used instead of the default forecast parameters listed in the forecast properties section. For information on configuring forecast parameters, see Modify forecast parameters to visualize forecast data

## Forecast properties

| Name | Description | Example |
| --- | --- | --- |
| sn_agent_forecast.historical_data_points | The hourly historical data points to be used for the forecast.<br><br>The maximum allowed data points is 26280. The default value is 8760 and represents the hourly data points for a one year time period (24 hours x 365 days x 1 year). | For example: 24 hours x 365 days x 3 years = 26280 |
| sn_agent_forecast.seasonal_frequency | The seasonal frequency of a repeated pattern. The default value is 168. | For example:<br>• Daily data pattern = 1*24 = 24<br>• Weekly data pattern = 7 * 24 = 168<br>• Monthly data pattern = 30 * 24 = 720 |
| sn_agent_forecast.forecast_periods | The number of periods/ seasons to forecast. A period is the length of a season.The default value is 5. | For example:<br>• If the length of a season is daily which is equal to 24 hours (1 day) and the forecast period is 30, then the number of periods to forecast is equal to 24 * 30 = 720 hours.<br>• If the length of a season is weekly which is equal to 168 hours (1 week) and the forecast period is 5, then the |

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| Name | Description | Example |
| --- | --- | --- |
| | | number of periods to forecast is equal to 168 * 5 = 840 hours. |
| sn_agent_forecast.number_of_historical_days | The number of historical days that will be plotted in the time-series chart in Manager Workspace. | For example, if the number is set to 90,then the number of days is counted from the current day to 90 days ago. |

## Roles for Demand Forecast

| Role title [name] | Description | Contains roles |
| --- | --- | --- |
| Forecast admin [sn_agent_forecast.admin] | Grants administrative rights to create, read, update, and delete (CRUD) forecast configuration tables. | • sn_agent_forecast.users<br>• clotho_admin |
| Forecast user [sn_agent_forecast.user] | Grants read access to forecast configuration tables. | |

## Tables for Demand Forecast

| Table | Description |
| --- | --- |
| Forecast Configuration [sn_agent_forecast_configuration] | Define data collection definition and resource conversion formula configurations. |
| Forecast Parameter [sn_agent_forecast_parameter] | Define forecast parameters required for the formula. |
| Forecast Configuration group [sn_agent_forecast_configuration_m2m_sys_user_group] | Associate resource conversion formula with assignment groups. |

## Forecast configurations available by default

By default, forecast configurations are available for the following groups:

- Deskside Support
- IT Service Desk
- Application Support
- Technical Support

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### Schedule jobs for Demand Forecast

| Name | Description |
| --- | --- |
| *Collect historical data for automated forecast configurations* | • On-demand job to collect historical data<br>• Collects historical data daily for every hour for the past three years |
| *Collect daily data for automated forecast configurations* | • Runs daily at 2 am<br>• For each table defined in the Data Collection Definition configuration, it fetches the records from the previous day for each hour for every group and stores it in the MetricBase<br>• You can access the time series for the collected data using the MetricBase list command on the Group [sys_user_group] table<br>• Uses the WFO Forecast retention policy for data retention |
| *Forecast resources for future* | Calculates the forecast resources for the future based on the collected data.<br>• Runs daily at 3 am<br>• Collects hourly data every day for the formula forecast configuration<br>• Stores the data in the Agent Forecast metric in MetricBase<br>• Uses forecast properties to set the data collection frequency or time period to store the data. The forecast properties will not be used if a published forecast parameter exists for a data collection definition. |

## Work scheduler in Workforce Optimization for ITSM

Manage the work of all your teams from a central location. You can get visibility into your entire teams' workload. You can assess the complexity level of your teams' tasks, their capacity to take on the work, and assign or reassign work—all from a calendar interface.

Here's an overview of Work scheduler. Work scheduler

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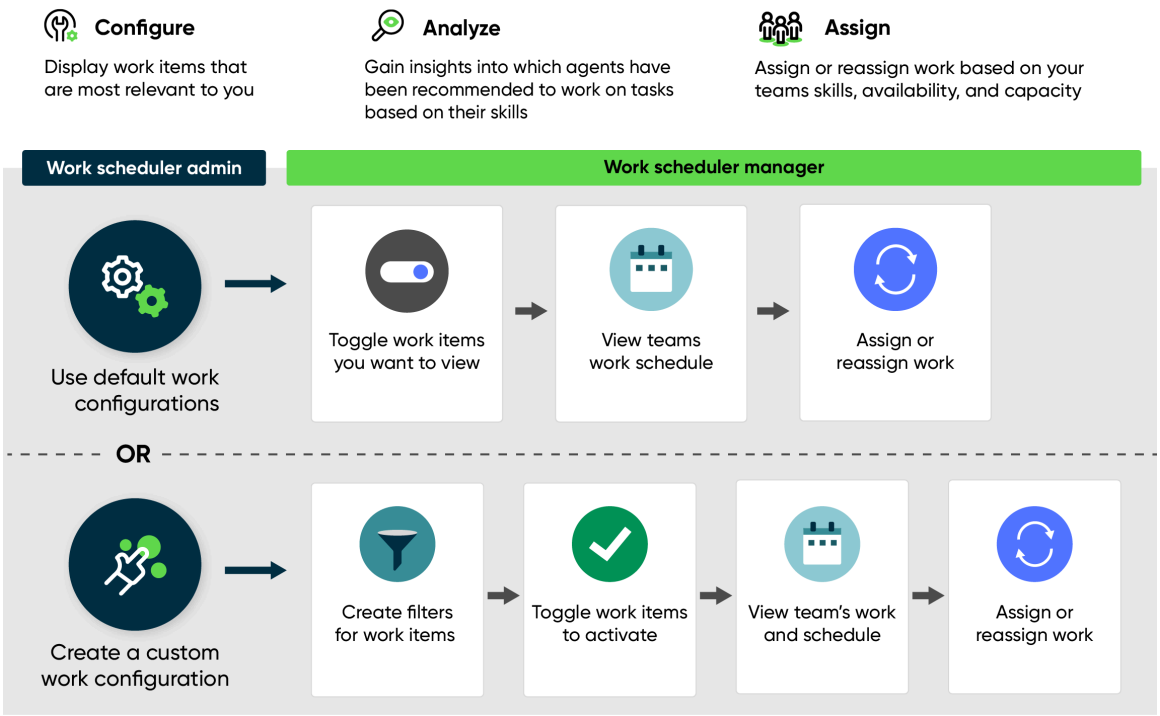
The image provides a high-level overview of Work scheduler.




As an admin, you can:

- Create work configurations that managers can view in their work queue. For information on setting up work configurations, see Set up a work configuration.
- Create work scheduler cards and configure them based on your needs. For more information, see Create a Work scheduler card using the Next Experience UI Builder.
- Associate the work scheduler cards with work configurations. For more information, see Associate a work scheduler card to the work configuration.

As a manager, you can:

- Create custom preset filters to prioritize your work items based on what's important for you.
  - You can define the filters based on task type. For example, you can set filters for incidents that are categorized as Priority 1 and Priority 2.
  - You can also define filters based on use cases. For example, if you want to prioritize catalog tasks from a VIP business unit over other units, you can define those conditions for the filter.
- Configure your work queue to display the most relevant work items.
- Assign work items based on skill recommendation.
- Assign work items based on your teams' shifts.

For more information, see Assign work based on your teams' skills and capacity.

## Getting started with Work scheduler in Workforce Optimization for ITSM

Easily find the tasks that you must complete in the Scheduling module.

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### Work scheduler

| Benefit | Roles | Finding tasks to complete in Work scheduler |
|---|---|---|
| Activate Work scheduler in Workforce Optimization for ITSM. | admin | Activate Work scheduler |
| Refer to the components such as system properties used in Work scheduler. | Any Work scheduler role | Understand components used in Work scheduler in Workforce Optimization for ITSM |
| Set up Work scheduler for the managers so that they can assign work items based on their teams' skills, availability, and capacity. | Work scheduler admin | Set up Work scheduler in Workforce Optimization for ITSM |
| Manage your teams' work assignments easily by customizing your work queue to display the most relevant work items. | Work scheduler manager | Use Work scheduler in Workforce Optimization for ITSM |

## Setting up Work scheduler in Workforce Optimization for ITSM

Customize an existing work scheduler card based on your need. You can also create a work configuration and work scheduler card from scratch and associate them so that managers can view the cards in their work queue.

### Customize a Work Scheduler card using the Next Experience UI Builder

Customize the Work Scheduler card components, such as adding an extra field, or changing the color or order of a field, to display them in the Work scheduler queue.

#### Before you begin
Role required: admin, workspace_admin, or ui_builder_admin

#### About this task
You can duplicate an existing work item variant such as an Incident, Problem, Change Request and customize it based on your needs.

#### Procedure

1. Navigate to **All** > **Now Experience Framework** > **UI Builder**.
2. In the **My experiences** list, select **Manager Workspace**.
3. Select the Pages icon.
4. In the **Page** menu, select **Work scheduler**.
5. In the left pane, go to the **Content** section and navigate to **Body (Flex)** > **Work queue (Flex)** > **Sidebar**.
6. In the right pane, select the icon (⬚) in the **Work item cards default** sub-page.
7. In the left pane, select **Body (Flex)** > **Viewport1**.
8. In the right pane, select the icon (⬚) next to a card, for example, **Incident default**, that you want to configure.

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9. To duplicate the selected variant, in the left pane, in the **Variants** section, hover over the variant you want to duplicate, select the ( ) icon and select **Duplicate**.
10. Hover over the variant you have duplicated, select the ( ) icon and select **Edit conditions**.
11. In the **Order** field, set the order to be the lowest value so that this variant will display in manager workspace.

    **Tip:**
    You can only display one variant for a work item type.

12. Click **Save**.
13. Customize the variant you've created using any of the tasks or steps listed in Create a Work scheduler card using the Next Experience UI Builder.

**Example:**

| If you'd like to configure this in the Work Scheduler card | Refer to |
|---|---|
| Add fields | Create page scripts for Work scheduler and refer to the Create the **Transform workItem to cardProps** page script steps. |
| Add an avatar | Configure an avatar component for Work scheduler |

**Related topics**

Create a page in UI Builder

### Set up a work configuration

Create a work configuration for a work item. Add filters that display key information that the manager wants to analyze. This work configuration will determine how the work items display on the Work scheduler calendar in manager workspace.

**Before you begin**
Role required: sn_wfo_work_sched.admin

**Procedure**

1. Navigate to **All** > **Work Scheduler** > **Work Configurations**.
2. Click **New**.
3. On the form, fill in the fields.

| Field | Description |
|---|---|
| Name | Unique name for the work configuration. |
| Table | Table for which you want to create the work configuration.<br><br>The following tables are available by default to create work configurations:<br>○ Catalog Task<br>○ Change Request |

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| Field | Description |
| --- | --- |
| | ○ Change Task<br>○ Incident<br>○ Interaction<br>○ Problem<br>○ Request<br>○ Requested Item |
| Description field | The field from the selected table that you want to use for describing the work item. |
| Assigned to field | The field from the selected table that you want to use for assigning an agent to the work item. |
| Assignment group field | The field from the selected table that you want to use for assigning a group to the work item. |
| Start date field | The field from the selected table that you want to use to display the start date for the work item. |
| End date field | The field from the selected table that you want to use to display the end date for the work item. |
| Default color | The preferred color to display the work item card in the manager workspace. |
| UX app route | The route where the card layout is defined for this work item type. The route displays in UI Builder in the list of experiences. This UX app route determines the layout of the work item card. By default, it is set to **Default card**, which displays the following fields:<br>○ Description field<br>○ Assigned to field<br>○ Assignment group field<br>○ Start date field<br>○ End date field<br>If you need additional fields, you must add them in the **Extra fields** field. For information on defining a card layout, see Create a Work Scheduler card using UI Builder. |
| Order | The display order of the work item. |
| Extra fields | **Important:**<br>If you need additional fields on the selected table that you would like to display in the work item card in the manager workspace, you must add it in this field. |
| Matching rule | Select a matching rule for the work configuration. |

4. Right-click the form header and click **Submit**.
5. Create a work configuration filter.

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a. In the **Work Configuration filters** related list, click **New**.

b. In the **Name** field, enter a unique name for the filter.

c. Right-click and save the form to add the selected table.

d. Add the desired conditions for the work configuration filter.
For information on adding conditions, see Condition builder.

e. Select **Update**.

### Create a Work scheduler card using the Next Experience UI Builder

Create a work scheduler card and add the components that you want to display based on your needs in the Work Scheduler application in manager workspace.

#### Before you begin
Role required: admin, workspace_admin, or ui_builder_admin

#### Procedure

1. Navigate to **All** > **Now Experience Framework** > **UI Builder**.
2. In the **My experiences** list, select **Manager Workspace**.
3. Select the Pages icon.
4. In the **Page** menu, select **Work scheduler**.
5. In the left pane, go to the **Content** section and navigate to **Body (Flex)** > **Work queue (Flex)** > **Sidebar**.
6. In the right pane, select the icon ( ) in the **Work item cards default** sub-page.
7. In the left pane, select **Body (Flex)** > **Viewport1**.
8. In the right pane, select **+Add** and enter a name for the card.
The **Path** field is automatically populated.
9. Select **Create**.
A new card is created.

> **Important:**
> After you create the work scheduler card, you must select the name of this card in the **UX app route** field in the work configuration you have created. For information on setting up a work configuration, see Set up a work configuration.

10. Select **Done**.
Follow the steps listed in each of the topics below in the given sequence to customize Work scheduler.

#### Related topics

Create a page in UI Builder

### Create a client state parameter for Work scheduler

Add custom client state parameter values to add properties to the card components.

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### Before you begin
Role required: admin, workspace_admin, or ui_builder_admin

### Procedure

1. Select the Client state icon ( ).
2. In the Client state parameters section, click **+Add**.
3. Create the client state parameter.
   a. In the **Name** field, enter *cardProps*.
   b. From the **Type** menu, select *JSON*.
   c. In the **Initial value** field, select **Edit**.
   d. In the **Initial value** pop-up screen, enter the following code:

```
{
    "tagline": {},
    "heading": {},
    "dropdowns": [],
    "content": [],
    "assignedTo": null,
    "aria": {}
  }
```

   e. Select **Apply**.

Here's a demo on how to create client state parameters. Create client state parameters

### What to do next
Create page scripts for Work scheduler

#### Related topics

Create and bind a client state parameter to a component

## Create page scripts for Work scheduler

Add custom page scripts for the Work scheduler so that you can update the client state through events or update transform workItem object to properties.

### Before you begin
Role required: admin, workspace_admin, or ui_builder_admin

### About this task
Add the *Handle card clicked* and the *Handle card action clicked* page scripts to handle events that are generated when the card and its actions are clicked.

Add the *Transform workItem to cardProps* page script to transform the *workItem* object in the Work queue to properties for the card components.

**Note:**
If you have customized a Work scheduler card, you can follow the steps below to add client scripts.

### Procedure

1. Select the Client Scripts icon ( ).
2. Create the *Handle card clicked* page script.

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**a.** In the **Page scripts** section, click **+Add**.

**b.** In the **Script name** field, enter *Handle card clicked*.

**c.** In the **Script Includes** section, add the following script:

```
/**
* @param {params} params
* @param {api} params.api
* @param {any} params.event
* @param {any} params.imports
* @param {ApiHelpers} params.helpers
*/
function handler({api, event, helpers, imports}) {
  const {workItem} = api.context.props;
  api.emit('CARD_CLICKED', {workItem});
}
```

**3.** Create the *Handle card action clicked* page script.

**a.** In the **Page scripts** section, click **+Add**.

**b.** In the **Script name** field, enter *Handle card action clicked*.

**c.** In the **Script Includes** section, add the following script:

```
/**
* @param {params} params
* @param {api} params.api
* @param {any} params.event
* @param {any} params.imports
* @param {ApiHelpers} params.helpers
*/
function handler({api, event, helpers, imports}) {
  const {workItem} = api.context.props;
  const {action: actionItem} = event.payload;
  api.emit('CARD_ACTION_CLICKED', {workItem, actionItem});
}
```

**4.** Create the **Transform workItem to cardProps** page script and attach the *WorkSchedulerUIBCardUtils* script include.

**a.** In the **Page scripts** section, click **+Add**.

**b.** In the **Script name** field, enter *Transform workItem to cardProp*.

**c.** In the script editor, add the following script:

```
/**
* @param {params} params
* @param {api} params.api
* @param {any} params.event
* @param {any} params.imports
* @param {ApiHelpers} params.helpers
*/
async function handler({api, event, helpers, imports}) {
    const {workItem} = api.context.props;
    const {mappingFields, recordFields} = workItem;
    const cardUtils =
 imports['sn_wfo_work_sched.WorkSchedulerUIBCardUtils']();
    const fallbackValueLabel = await helpers.translate('<not
 defined>');
```

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```
    const dropdownItems = workItem.tableMetadata.canDelete
        ? [{id: 'delete', label: await
helpers.translate('Delete')}]
        : [];
    // Fields for getContent() and getAria()
    const contentFields = [{
        name: 'assigned_to',
        label: await helpers.translate('Assigned to')
    },
    {
        name: 'assignment_group',
        label: await helpers.translate('Assignment group')
    },
    {
        name: 'start_date',
        label: await helpers.translate('Start date')
    },
    {
        name: 'end_date',
        label: await helpers.translate('End date')
    }];
    // Create cardProps
    const cardProps = {};
    cardProps.tagline = {
        label: workItem.recordFields._row_data.displayValue
|| null
    };
    cardProps.heading = {
        label: mappingFields.description ?
mappingFields.description.displayValue : fallbackValueLabel
    };
    cardProps.dropdowns = dropdownItems.length > 0
        ? [{id: 'dropdown1', items: dropdownItems, icon:
'ellipsis-v-outline'}]
        : [];
    cardProps.content = await cardUtils.getContent(helpers,
contentFields, workItem, null, null, true);
    cardProps.aria = await cardUtils.getAria(helpers,
contentFields, workItem, null, true);
    cardProps.assignedTo = mappingFields.assigned_to ?
mappingFields.assigned_to.displayValue : null;
    api.setState('cardProps', cardProps);
}
```

To customize the display of the fields, refer to https://developer.servicenow.com/dev.do#!/reference/next-experience/utah/now-components/now-label-value-stacked/overview.

5. Click **Save**.

Here's a demo on how to create page scripts for Work scheduler. Create page scripts

### What to do next

Define the workItem property in the Work scheduler page configuration

### Related topics

Define and bind client scripts to components

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### Define the workItem property in the Work scheduler page configuration

Add the *workItem* property to the Work scheduler page configuration to receive the *workItem* object provided by the work queue.

#### Before you begin
Role required: admin, workspace_admin, or ui_builder_admin

#### Procedure

1. In the **Page configuration** section, select the **Config** tab.
2. In the **Properties** section, select **Edit**.
3. In the **Edit properties** pop-up window, select **+Add**.
4. In the **Property name** field, enter *workItem*.
5. From the **Type** menu, select *JSON*.
6. Select **Add**.
7. Select **Save**.
   The *workItem* property is created.
8. Hover over the *workItem* property and select the Dynamic data binding icon ( ).
9. In the *workItem* field, type *@state.workItem*.
10. Click **Save**.

    Here's a demo on how to define the workItem property in the Work scheduler page configuration. Define the work item property in the Work Scheduler page configuration

#### What to do next
Define event mappings for Work scheduler

### Define event mappings for Work scheduler

Add event mappings required for card interactions and for the card properties transformation to the page configurations in Work scheduler.

#### Before you begin
Role required: admin, workspace_admin, or ui_builder_admin

#### Procedure

1. In the **Page configuration** section, select the **Events** tab.
2. Attach the *Transform workItem to cardProps* to the **Page ready** event.
   a. In the **Page ready** menu, select **+Add a new event handler**.
   b. In the pop-up screen, go the Scripts section and select *Transform workItem to cardProps*.
   c. Select **Add**.
3. Attach the *Transform workItem to cardProps* to the **Page ready** event.
   a. In the **Page ready** menu, select **+Add a new event handler**.
   b. In the pop-up screen, go the Scripts section and select *Transform workItem to cardProps*.
   c. Select **Add**.
4. Attach the *Transform workItem to cardProps* to the **Page property changed** event.

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a. In the **Page property changed** menu, select **+Add a new event handler**.

b. In the pop-up screen, go the Scripts section and select *Transform workItem to cardProps*.

c. Select **Add**.

5. Attach the *CARD_CLICKED* and *CARD_CLICKED (Work item cards)* events.
The **Create an event** popup screen displays.

Here's a demo on how to define event mappings for the Work scheduler. Define event mappings for the Work Scheduler

### What to do next

Configure container components for Work scheduler

### Related topics

Events in UI Builder

## Configure container components for Work scheduler

Present information in an intuitive format using the Card Base Container component.

### Before you begin

Role required: admin, workspace_admin, or ui_builder_admin

### Procedure

1. In the **Content** section, select **+Add component**.
2. In the **Components** pop-up screen select **Card Base Container**.
3. In the **Config** tab, set the interaction and aria properties.
   - From the **Interaction** menu, select *Click*.
   - In the Accessibility section, select the Dynamic data binding icon
   - From the **ARIA Properties** list, select *@state.cardProps.aria*.
4. Select the **Events** tab.
5. In the **Card clicked** menu, select **+Add a new event handler**.
The Event handler preview pop-up screen appears.
6. In the **Scripts** section, select *Handle card clicked*.
7. Select **Add**.
8. Select **Save**.

Here's a demo on how to configure container components in Work scheduler. Configure container components for Work Scheduler

### What to do next

Configure a Work scheduler card heading component

## Configure a Work scheduler card heading component

Customize the Work scheduler heading component to display the title based on your needs.

### Before you begin

Role required: admin, workspace_admin, or ui_builder_admin

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### Procedure

1. In the **Content** section, select **+Add component**.
2. In the **Components** pop-up screen select **Card Base Header**.
   The selected container displays in the right pane.
3. Configure the header component.
   a. In the **Config** tab, hover over the **Dropdowns** section and select the Dynamic data binding icon.
   b. From the **Dropdowns** menu, select *@state.cardProps.dropdowns*.
   c. Hover over the **Heading** section and select the Dynamic data binding icon.
   d. From the **Heading** menu, select *@state.cardProps.heading*.
   e. Hover over the **Tagline** section and select the Dynamic data binding icon.
4. Add **Handle card action clicked** to the **Card header action clicked** event.
   a. Select the **Events** tab.
   b. In the **Card header action clicked** section, select **+Add a new event handler**.
   c. From the **Tagline** menu, select *@state.cardProps.tagline*.
   d. In the **Event handler preview** pop up screen, from the **Scripts** section, select **Handle card action clicked**.
   e. Click **Add**.
5. Click **Save**.

Here's a demo on how to configure a Work scheduler card heading. Configure a Work Scheduler card heading component

### What to do next

Configure a display type component for a Work scheduler card

## Configure a display type component for a Work scheduler card

Add the *Label value stacked* display work item fields within the card.

### Before you begin

Role required: admin, workspace_admin, or ui_builder_admin

### Procedure

1. In the **Content** section, navigate to **Body(Flex)** > **Card Base Container (Flex)** > **Card Base Header**.
2. Right-click **Card Base Header** and select **Add component after**.
3. In the pop-up screen, select the **Label value stacked** component.
4. In the left pane, select **Label value stacked**.
5. In the right pane, select the **Config** tab and configure the size, alignment, and items.
   a. In the Alignment menu, select *Horizontal-equal*.
   b. In the Size menu, select **Small**.
   c. Hover over **Items**and select the Dynamic data binding icon.
   d. In the **Items** menu, enter *@state.cardProps.content*.

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e. In the **Item min, width** field, enter `75 px`.

f. Enable **Wrap text** and **Truncated** options.

g. Click **Save**.

Here's a demo on how to configure a display type component for a Work scheduler card.
Configure a display type component for a Work Scheduler card

### What to do next

Configure an avatar component for Work scheduler

### Related topics

Working in UI Builder

## Configure an avatar component for Work scheduler

Use the *`Container`* component to add an avatar and the user name of the work item assignee.

### Before you begin

Role required: admin, workspace_admin, or ui_builder_admin

### Procedure

1. In the **Content** section, navigate to **Body(Flex)** > **Card Base Container (Flex)** > **Card Base Header**.
2. Right-click **Card Base Header** and select **Add component after**.
3. In the pop-up screen, select the **Label value stacked** component.
4. In the left pane, right-click **Label value stacked** and select **Add component after**.
5. Configure the component.

   a. In the **Components** pop-up screen, select **Container**.

   b. In the **Config** tab, do the following:

      i. Select the Edit component visibility icon ( ).

      ii. Hover over the **Hide component** field and select the Dynamic data binding icon .

      iii. In the **Hide component** field, enter `!@state.cardProps.assignedTo`

      iv. In the **Direction** menu, select **Row**.

      v. In the **Styles** tab, in the **Align items** field, select the center icon.

      vi. Select **Save**.

6. To add the Avatar component, select **Container(Flex)** > **+Add component**.
7. Select **+Add component**
   The Components pop-up screen appears.

   Here's a demo on how to configure an avatar component for Work scheduler  Configure an avatar component for Work Scheduler

## Associate a work scheduler card to the work configuration

Associate the work scheduler card that you've created to the work configuration to display the card in the Work scheduler sidebar.

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### Before you begin
Role required: admin, workspace_admin, or ui_builder_admin

### Procedure
1. Navigate to **All** > **Work Scheduler** > **Work configuration**.
2. Select the work configuration to which you want to associate the work scheduler card.
3. In the **UX app route** field, select the name of the work scheduler card.
4. Select **Update**.
   The work configuration card displays in Work scheduler in manager workspace.

   For information on setting up a work configuration, see Set up a work configuration.

   For information on creating the work scheduler card, see Create a Work Scheduler card using UI Builder.

#### Create extension points for Work scheduler

Create extension points to customize your implementation in Work scheduler. For example, if you want your team members to work on an on-site task, you can configure the location of your team members to the work items assigned to them so that they can get to the tasks quickly.

### Before you begin
Role required: admin

You must set the application scope to Work scheduler (sn_wfo_work_sched).

### About this task
The *WorkItemSkillsRecommendationManager* extension point is available by default.

### Procedure
1. Navigate to **All** > **System Extension Points** > **Scripted Extension Points**.
2. Open the *sn_wfo_work_sched.WorkItemRecommendationManager* extension point.
3. In the Related Links section, select **Create Implementation**.
4. Define the functions based on your needs to customize your implementation.

## Assigning work using Work Scheduler in Workforce Optimization for ITSM

Manage your teams' work assignments easily by customizing your work queue to display the most relevant work items.

Gain insights into which agents have been recommended to work on a task based on the mandatory and optional skills they have.

#### Assign work based on your teams' skills and capacity

Plan your teams' work and assign work items such as incidents, problems, change requests, or interactions to them based on their skills, availability, and capacity. View your teams' shifts, events, and work assignments and assign or reassign the work items from a central location.

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### Before you begin

**Note:**
Your administrator must add sys ids for event categories that you want to display in the calendar to the *sn_wfo_work_sched.shift_data_categories* system property. For more information, see Work Scheduler components in Workforce Optimization for ITSM reference.

Role required: sn_wfo_work_sched.manager

### About this task

Analyze the tasks that your agents are assigned to and their actual shift plans. If the agent doesn't work during the duration the task has to be completed, you can reassign the task based on agent availability.

**Note:**

- Each type of task is displayed in the color defined in the queue configuration.
- You can enter keywords in the **Search** field in the sidebar to search a card.

### Procedure

1. Navigate to **Workspaces** > **Manager Workspace**.
2. Select the **Work Scheduler** icon.
   - You can view the work shifts of all of your agents for all teams you manage. When you select the shift, the pop-up displays the shift details such as the shift time span and agent break times.
   - In the contextual side panel, select the Filter icon ( ) and then select any filter, add the desired criteria, and select **Apply** to narrow down the display of the team members in the calendar. You can filter based on your team's assignment group, skills, location, schedule plan, or shift plan.
3. **Optional:** If you don't have any queue configurations in the Work scheduler, select the queue settings icon ( ) and then enable up to five work item types.
   The application creates a queue configuration and corresponding filters for each enabled work item type.
4. **Optional:** Create a queue configuration.
   a. Select **Queue configurations**.
   b. In the **My queue configurations** list, select **New**.
   c. On the form, fill in the fields.

| Name | Description |
|---|---|
| Name | Name for the queue configuration. |
| Work configuration | The type of work configuration you want to use for the queue configuration. |
| Color | The work item color that displays in the calendar. |
| Order | The order number in which you want the queue configuration displayed in Work scheduler. |

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| Name | Description |
| --- | --- |
| Matching rule | The matching rule for the work item type. |

**d.** Select **Save**.

**5.** Analyze your teams' work and schedule.

**a.** From the **Queue** menu, select a work item to view related tasks.

For example, if you select **Unassigned Incidents**, you can see all tasks related to the Unassigned Incident queue.

You can select a time zone to view the agent schedule in that time zone.

**b.** Analyze the tasks and work shifts for each agent in the calendar.
You can use the pagination to scroll through the work shifts.

**6.** Assign a work item to an agent.

**a.** Select a task that you want to assign to an agent.

When you enable the **Show suggested only** option, by default, you can choose to display team members based on their availability, skills, or time zone. The ranking of the team members are based on matching assignment rules set for each criteria. Work scheduler uses Assignment workbench to evaluate agents to work on tasks.

You can select one or more of these criteria and the ranking of the team members will be based on the selected criteria:

- **WFO - Availability**—The number of hours the team member is available.
- **WFO - Mandatory skills**— If the task has mandatory and optional skills associated with it, the work scheduler displays agents who have all of the mandatory skills first and then the agents who have the optional skills.
- **WFO - Optional skills**— If the task only has optional skills associated with it, then the list displays the agents with the optional skills.
- **WFO- Timezone overlap**—The delta between the task time zone and the user's time zone. For example, if the user is located in the Pacific time zone and if the task location is in the Eastern time zone, then it will display as **+3**; if the task location is Hawaii, then it will display as **-3**.

To add your own matching rule, see Create a criteria for a matching rule in Work scheduler.

All of these criteria are based on the **More is better** ranking method where a higher value is better. For example, when the WFO-Mandatory skills criteria is enabled, team members that have more skills that are mandatory to work on the work item will be ranked higher.

For each criteria, if there is 100% match, then the values are displayed in green color; if not, the values are displayed in yellow color. If all criteria match a 100% then the matching details are displayed in green color; if not, they're displayed in yellow color.

**b.** Select an agent from the work scheduler calendar to whom you want to assign the task.

**c.** Click and drag your mouse device for the time span on the calendar for which you want the agent to work on the task.

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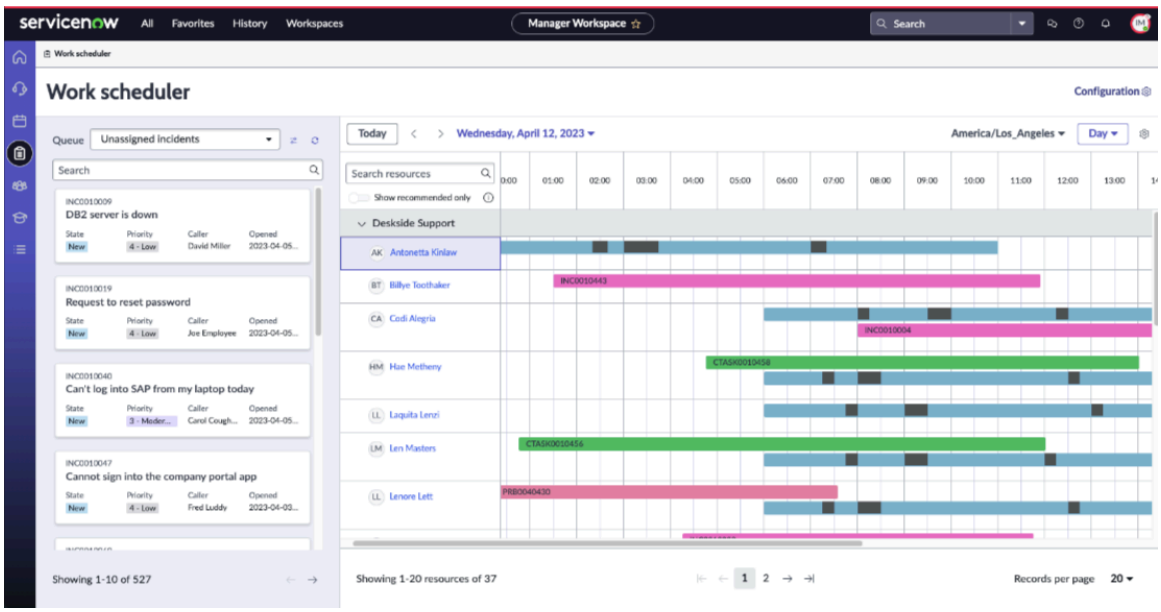
The task is assigned to that agent. You can also edit the duration of the time span or drag the time span and reassign the task to another agent.

**Note:**
From the work queue, when you select a task that has been assigned to an agent, the application auto-scrolls to the page that has the timespan for the task and displays the schedule for the agent.

7. **Optional:** Update a work item from the calendar.
   a. Select a desired task on the calendar that you want to update.
   b. Select the Edit icon to access a work item record.
   c. On the form, make the necessary updates.
   d. Select **Update**.

(Optional) The image below is a representation of the Work scheduler screen.




## Create a criteria for a matching rule in Work scheduler

Add a criteria for a matching rule to enable assignment of work items to team members based on the rule.

### Before you begin
Role required: admin

### About this task
The following matching rules, which are available by default, are based on the selection criteria matching type:

| Rule name | Work configuration name | Table | UX app route |
|---|---|---|---|
| Incident Matching rule | Incidents | Incident [incident] | Incident |
| Problem Matching rule | Problems | Problem [problem] | Problem |

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| Rule name | Work configuration name | Table | UX app route |
|---|---|---|---|
| Requested item Matching rule | Requested items | Requested Item [sc_req_item] | Requested item |
| Request Matching rule | Requests | Request [sc_request] | Request |
| Catalog Task Matching rule | Catalog Task | Catalog Task [sc_task] | Catalog task |
| Change Request Matching rule | Change Request | Change Request [change_request] | Change requests |
| Change Task Matching rule | Change Task | Change Task [change_task] | Change task |

For information on how matching criteria works, see Matching criteria for work items in Work scheduler.

The following four criteria are available by default:

- WFO-Mandatory skills
- WFO-Availability
- WFO-Optional skills
- WFO-Timezone overlap

### Procedure

1. Navigate to **All** > **Work scheduler** > **Matching Rules**.
2. In the Matching Rules list, select a matching rule; for example, the **Incident matching rule**.
3. In the Select Criteria related list, select **New.**
4. Fill in the fields on the form.
   For information on creating a new matching criteria, see Create assignment workbench matching criteria.
5. Select **Submit**.

#### Matching criteria for work items in Work scheduler

The assignment workbench uses configurable matching criteria, such as skills and availability, to evaluate the agents in a selected group and provide an overall ranking.

There are three types of matching criteria:

- **Simple Match**: creates one-to-one matching, such as matching the time zone of an agent with the time zone of a task location.
- **Aggregate**: uses a simple query and returns an aggregate result. For an aggregate type, select a table and create a filter, and then select an aggregate field such as the **Assigned to** field. This type of query returns a set of users.
- **Scripted**: uses a scripted query which returns a list of users.

Several matching criteria are provided with the assignment workbench:

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- **Availability Today**: Availability is calculated based on the agent's work schedule, assigned work, and personal time off. The more availability an agent has, the higher the contribution to the agent's overall rank.
- **Matching Skills**: The number of agent skills that match the skills required for the incident. The more skills that match, the higher the contribution to the agent's overall rank.
- **Matching Skills - Mandatory Skills Support** Calculates the number of agent skills that match the mandatory skills. It does this by filtering out all agents who do not have the mandatory skills and ranks the remaining agents. The more skills that match, the higher the contribution to the agent's overall rank.

> **Note:**
> If using the mandatory skills feature, use the **Matching Skills - Mandatory Skills Support** criterion to match agents with the Configuring the mandatory skills feature identified for an incident.

- **Assigned Incidents**: The number of incidents already assigned to this agent. The more incidents assigned, the lower the contribution to the agent's overall rank.
- **Last Assigned**: For the sake of balancing assigned work, prioritized the agent based on the last assigned work.

To create matching criteria, select the type and use the fields related to that type to build the query. After creating matching criteria, you can create a configuration for the assignment workbench by creating a matching rule of the type **Selection criteria** and selecting the desired matching criteria.

As part of selecting the matching criteria for the workbench configuration, you can specify the following settings for each individual criterion:

- ranking and display usage
- ranking method
- ranking weight
- threshold
- active/inactive

## Ranking and display usage

In the **Use for** field, specify how you want that matching criterion to be used:

- Ranking and display: uses the criterion to determine agent ranking and displays it in a column on the workbench.
- Display only: displays the criterion in a column on the workbench but does not use it to determine agent ranking.
- Ranking only: uses the criterion to determine agent ranking but does not display it on the workbench.

## Ranking method

There are two ranking methods:

- More is better: for example, more availability is better when determining the agent ranking.
- Less is better: for example, fewer assigned incidents are better when determining agent ranking.

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### Weight

Each matching criterion has an assigned weight. By default, the matching criteria has an assigned weight of 10. You can assign a higher weight to the criteria that's more important.

### Threshold

A threshold sets a minimum requirement for a criterion. For example, set the threshold of the Matching Skills criterion to 3 if you want to see only those agents who have at least three of the required skills for a task. For availability, set the threshold to the desired number of hours to display only those agents who have that minimum number of work hours available. You can set the threshold in the **Select Criteria** related list on the Matching Rule form. If necessary, personalize the list and add the **Threshold** column.

### Active/Inactive

There can be several matching criteria associated with the matching rule that determines the assignment workbench configuration. Each individual criterion can be set to active or inactive. Changing this setting has an immediate impact on the agent ranking. You can make this change in the **Select Criteria** related list on the Matching Rule form. If necessary, personalize the list and add the **Active** column.

### Calculating the agent ranking

The assignment workbench adds the values of the matching criteria and their respective weights and uses these values to determine the overall agent ranking.

1. Calculate a number for each criterion.
2. Multiply that number by the criterion weight.
3. Divide the result by the total of all criterion.
4. Repeat for each criterion and add the results.

The following example shows how the ranking is determined for an agent with these matching criteria values:

- Matching Skills with Mandatory Skills Support: 5/6
- Availability Today: 7 hours
- Assigned Incidents: 2

Calculations:

- **Matching Skills**: `2 / 3 = 0.666` (with 3 being the maximum number of skills)
- **Availability Today**: `7 / 8 = 0.875` (with 8 being the maximum number of hours)
- **Assigned Incidents**: `2 / 26 = 0.0769` (with 26 being the total number of tasks in the table)
- **Weight**: each matching criteria has an equal weight of 10

```
((0.666 x 10) / Total of criterion weight (10+10+10)) + ((0.875
 x 10) / Total of criterion weight (10+10+10)) + ((0.0769 x
 10) / Total of criterion weight (10+10+10))
```

```
(6.66 / 30) + (8.75 / 30) + (0.769 / 30)
```

```
0.222 + 0.291 + 0.0256 = 0.53
```

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This calculation is performed for each agent in the assignment group. Agents are ranked based on the value of this calculation, with the highest number earning the highest ranking.

## Work Scheduler components in Workforce Optimization for ITSM reference

Workforce Optimization for ITSM has properties to configure the Work scheduler default behavior.

### Properties

Enter *sys_properties.list* in the Workspace filter navigator and search for the work scheduler properties listed below.

**Properties**

| Property | Description |
|---|---|
| sn_wfo_work_sched.allowed_tables | Defines the list of tables that a Work scheduler admin (sn_wfo_work_sched.admin) can use to create configurations for work assignments in the Workforce Optimization for ITSM manager workspace.<br>• **Type:** string<br>• **Default value:** incident,problem,change_request,change_task,sc_task,sc_request, |
| sn_wfo_work_sched.shift_data_categories | Comma separated sys ids for event categories that display in the Work scheduler calendar in the manager workspace.<br>**Type:** string |
| sn_wfo_work_sched.should_fetch_shift_data | Enables the display of shift spans in Work scheduler in Workforce Optimization for ITSM manager workspace.<br>• **Type:** true\|false<br>• **Default value:** true |
| sn_wfo_work_sched.recommend_criteria_limit | Defines how many matching criteria can be created for each matching rule in Work scheduler when suggestions are enabled.<br>• **Type:**integer<br>• **Default value:**10 |
| sn_wfo_work_sched.match_criteria_threshold | Defines which users are shown in Work scheduler when suggestions are enabled and the matching criteria percentage is greater than the value indicated.<br>• **Type:** integer<br>• **Default value:** 0 |

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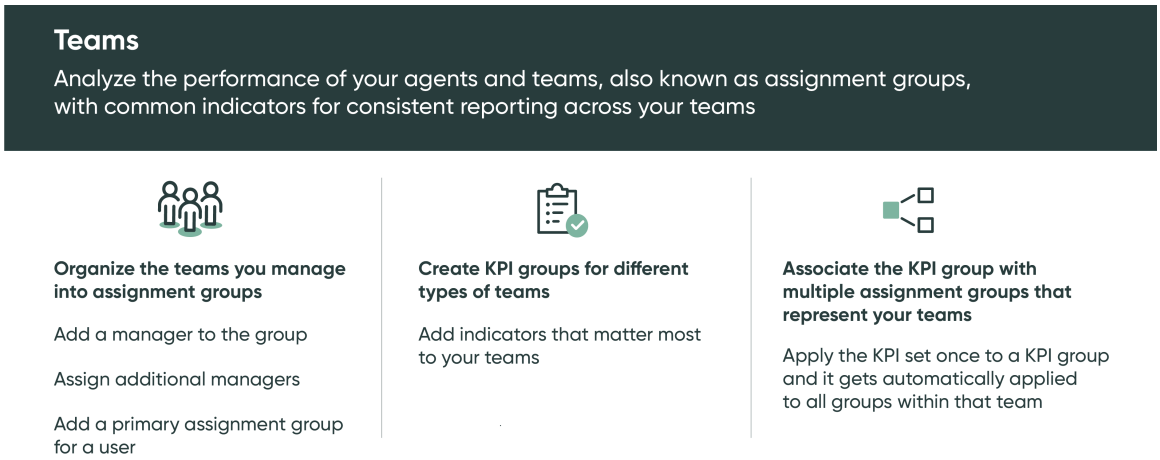
# Teams in Workforce Optimization for ITSM

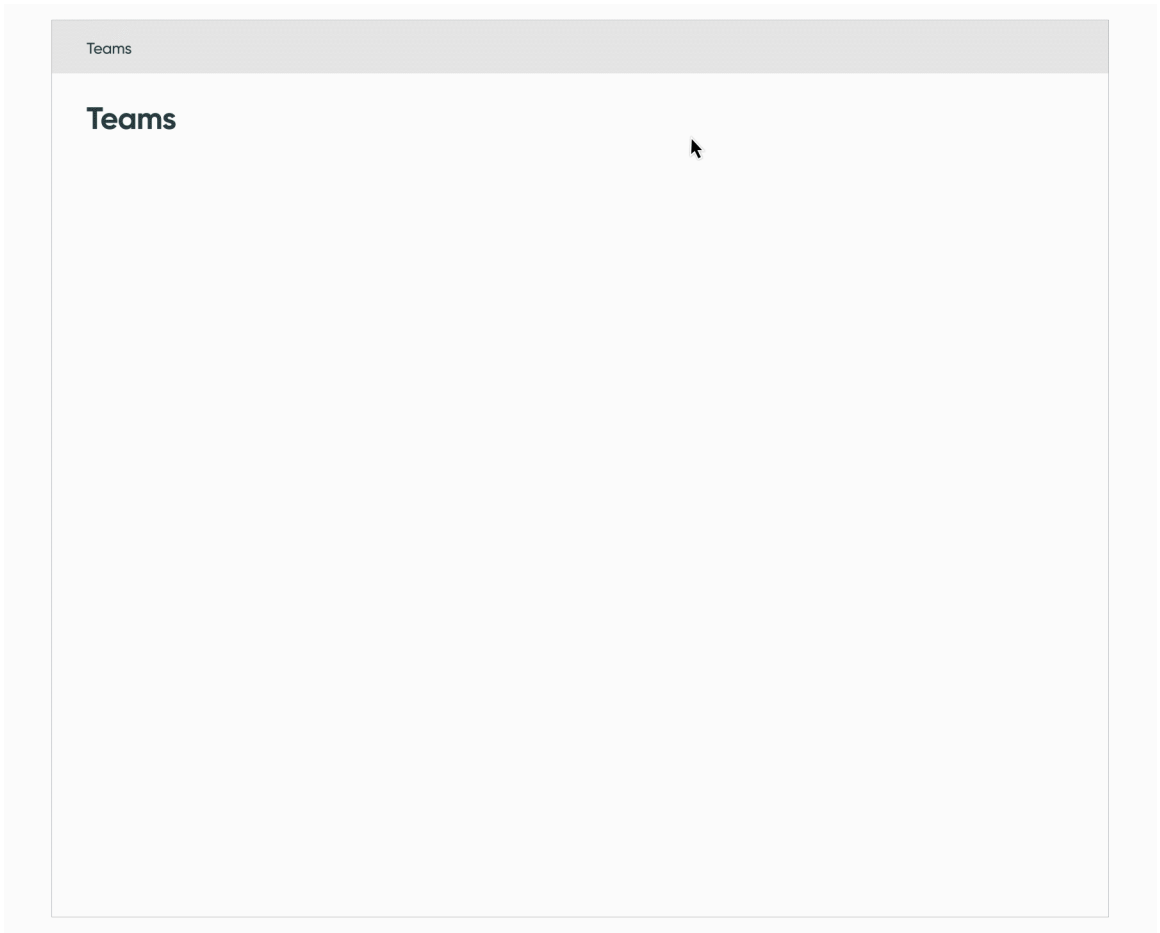
Learn how you can organize each of your teams into assignment groups. You can then define a set of Key Performance Indicators (KPIs) to analyze the performance of all groups within that team. Drill into the metrics for a group, an agent, or an incident within that team—all from a central location.

This video gives you an overview of how you set up your teams into assignment groups and add KPIs to measure performance. Organize your teams into assignment groups

The image shows a visual representation of how you can organize your teams into groups.




Drill down into your reports.

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As an administrator for **Teams**, you can:

- Create a KPI group for a common set of indicators (KPIs) you use to measure your teams' performance.

  **Note:**
  Your teams are called assignment groups within the **Teams** application.

- Add the KPIs to the KPI group.
- Add assignment groups to the KPI group.

  **Note:**
  Make sure that you've added a manager to each assignment group. The manager either directly manages the assignment group or needs visibility into the assignment group.

As a manager, you can:

- Analyze the performance trends for your teams.
- Drill down into the performance of teams, agents, or incidents.

## Getting started with Teams n Workforce Optimization for ITSM

Select a task that you would like to perform to navigate to the topic for detailed instructions.

**Teams**

| Benefit | Users | Finding tasks to complete in Teams |
|---|---|---|
| Activate Teams in the Workforce Optimization for ITSM. | admin | Activate Teams in Workforce Optimization for ITSM |
| Refer to the roles, tables, and other components used in Teams. | Any Teams role | Teams components in Workforce Optimization for ITSM |
| Organize teams into assignment groups for managers so that they can analyze team performance. | admin | Setting up Teams in Workforce Optimization for ITSM |
| Integrate with Process Mining | admin | Setting up the integration of Process Mining with Workforce Optimization for ITSM |
| Analyze your teams' performance | Team performance admin | Analyzing team performance using Teams in Workforce Optimization for ITSM |
| Identify anomalies or bottlenecks within the process | Process Mining Analyst | Identifying bottlenecks using Process Mining integration with Workforce Optimization for ITSM |

## Example for using teams in Workforce Optimization for ITSM

Understand how you can manage your teams from a single location using an example.

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A manager of IT Service Desk directly manages 3 teams. They are an additional manager of other teams that they have visibility into although they don't directly report to them.

To analyze team performance, the manager:

1. Organizes the teams into groups called assignment groups. The teams either directly report to the manager or the manager may have visibility into team performance.
2. Creates a KPI group with a set of indicators that matter most to measure the performance of their assignment groups.
3. Adds all assignment groups that use the set of KPIs to the KPI group.

With this set up, the manager can effectively analyze the performance of the teams grouped by KPI groups.

The manager can set up and use Teams by performing the following steps:

1. Create a KPI group
2. Add KPIs to that group
3. Add managers to assignment groups
4. Add assignment groups to the KPI group
5. Associate multiple KPI groups with one or more assignment groups.
6. Drill down into a KPI, agent, or an incident to analyze performance

Get an overview of how you can analyze team performance in this video. Use Teams to track performance

For detailed information on how to setup and use Teams, see Teams.

## Setting up Teams in Workforce Optimization for ITSM

Organize your teams into assignment groups and create reports for those groups so that you can gain visibility into the team's performance.

Set up Teams in Workforce Optimization for ITSM

**Important:**
If you have enabled the Team Performance (sn_team_perf) plugin from the ServiceNow Store, you must make sure that you have upgraded the following plugins to latest version of the store release for the Tokyo family release:

- Workforce Optimization for ITSM Configurable Workspace (sn_wfo_cfg_itsm).
- Workforce Optimization Configurable Workspace Core (sn_wfo_cfg_ws).

For more information, see Activate Workforce Optimization for ITSM.

### Add a system property to set default date range in Workforce Optimization for ITSM

Add a system property to set the default date range in the configurable Workforce Optimization for ITSM application.

**Before you begin**
Role required: admin

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### About this task
The Teams application uses the sn_optimize.default_date_range property in the configurable Workforce Optimization for ITSM application to set the default date range in the date range picker to view your team's performance for that time period.

### Procedure
1. Select **All** and in the application navigator, enter enter `sys_properties.list`.
2. Select **New**.
3. Enter the following field values.

| Field | Value |
|---|---|
| Name | sn_optimize.default_date_range |
| Type | Integer |
| Value | The preferred number of days based on which the start and end dates are set in the date range picker in the Teams module. |
| Read roles | sn_team_perf.team_performance_user |
| Write roles | sn_team_perf.team_performance_admin |

## Create KPI groups to monitor team performance

Create key performance indicator (KPI) groups with the KPIs that matter most to your teams. When you associate your KPI groups with assignment groups, you can monitor your team's performance.

### Before you begin
Role required: sn_team_perf.team_performance_admin

### About this task
By default, the KPIs that are associated with your KPI assignment groups are scheduled to collect data daily. The KPIs must have the following indicator breakdown:

- Assignment groups
- Assigned to

### Procedure
1. Create a KPI group.
   a. Navigate to **Workforce Optimization for ITSM** > **Team Performance** > **KPI Groups**.
   b. Click **New**.
   c. In the **Name** field, enter a name for the KPI group.
   d. In the Type menu, select **Teams**.

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**Note:**
If you select a type that isn't supported in Team Performance, such as the Channels type, the Related list for the KPI group will show the default list from the sn_team_perf_kpi_group_m2m_pa_indicators table.

e. Right-click the form header and click **Save**.

You can add up to five KPIs to a KPI group. For more information about KPIs and how the aggregates are calculated, see the overview video in the Teams example section.

2. Add KPIs to a KPI group.
   a. In the KPIs related list, click **New**.
   b. In the **KPI** field, select the KPI to apply for this group.
   c. Click **Submit**.
3. Add KPI assignment groups to the KPI group.

**Note:**
- You can associate multiple KPI groups with one or more assignment groups.
- You can add additional managers to each assignment group.
- You can associate a user with a KPI group as the primary assignment group for that user.

   a. In the **Assignment Groups** tab, click **Edit**.
   b. Move the desired assignment groups from the Collection to the Assignment Groups list.
   c. Click **Save**.

**Note:**
When you open a KPI Group, by default, the KPI Groups form displays the KPI Group's type based on the application you've currently selected.

### Copy a KPI group

Copy an existing KPI group. In the copied KPI group, everything, including the KPI threshold, gets copied except the assignment group mapping. You can modify the copied KPI group according to your requirement.

#### Before you begin
Role required: sn_team_perf.team_performance_admin

#### Procedure
1. Navigate to **All** > **Workforce Optimization for ITSM** > **Team Performance** > **KPI Groups**.
2. Open any KPI group that you want to copy.
3. Select **Copy**.

The copied KPI group opens. The copied KPI group name is the same as the one that you copied with Copy of in the front of the name.

You can change the name, description, and order according to your requirements. You can also change the supporting KPIs.

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### Create a threshold for each KPI in a KPI group

Create a threshold for each KPI in a KPI group to monitor the indicator status and analyze your team's performance. Define the threshold with upper- and lower-limit values to assess team performance for each indicator.

## Before you begin

Role required: sn_team_perf.team_performance_admin

## Procedure

1. Navigate to **All** > **Workforce Optimization for ITSM** > **Team Performance** > **KPI Groups**.
2. Open any KPI group for which you want to create a KPI threshold, for example, IT Service.
3. Open any KPI, for example, Closed incidents.
4. Select the **KPI Thresholds** tab.
5. On the form, fill in the fields.

### KPI Threshold

| Field | Description |
|---|---|
| KPI | Name of the KPI that you selected. This field is auto-filled. |
| Lower Threshold | Lower limit defined for this KPI. |
| Upper Threshold | Upper limit defined for this KPI. |
| Status | The status for the defined threshold: Critical, Positive, or Warning.<br>**Note:** The corresponding icon for each status is displayed in the Workforce Optimization workspace when the **Show Icon** check box is enabled for the status. This option is enabled by default for the critical status. |
| Order | A number for the defined threshold limits. This number must be unique for each set of limits. |
| Show Icon | Corresponding icon for each status. The icons are displayed only on the Manager Workspace when the **Show Icon** check box is selected.<br>The parent KPI related to the KPI group shows the icons based on a threshold in the grid component, if applicable.<br>Users can view the following icons based on a threshold in the Workforce Optimization workspace.<br>○ The critical icon ( )<br>○ The positive icon ( )<br>○ The warning icon ( ) |

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| Field | Description |
|---|---|
| | The icons are displayed on all the pages where the parent KPIs are related to the KPI group based on the values that you set for the lower- and upper-threshold limits. |

6. Select **Submit**.

**Note:**
In the Manager workspace, when users drill down into a KPI, the single scorecard component shows a threshold warning for critical thresholds nearing or exceeding the threshold limit. The following are examples of the messages that the scorecard shows:

- Approaching threshold of 95%
- Exceeded threshold of 170

The scorecard shows the warnings corresponding to the followings conditions:

**For maximize type KPIs**

- Value < Lower Threshold (Critical): Exceeded <Lower Threshold Value>
- Lower Threshold (Critical) < Value < Upper Threshold (Critical): Approaching <Lower Threshold Value>

**For minimize type KPIs**

- Value > Upper Threshold (Critical): Exceeded <Upper Threshold Value>
- Lower Threshold (Critical) < Value < Upper Threshold (Critical): Approaching <Upper Threshold Value>

### Add managers to a KPI assignment group

Assign one or more managers to each KPI assignment group so that they can gain visibility into the group and monitor the team's performance.

#### Before you begin
Role required: sn_wfo_admin or admin

#### About this task
You can associate a user with a primary assignment group by selecting the group in the user record.

#### Procedure

1. Navigate to **All** > **Workforce Optimization for ITSM** > **Team Performance** > **Additional Managers**.
2. Click **New**.
3. In the **Assignment Group** field, select an assignment group.
4. In the **Manager** field, select a manager that you want to add to this assignment group.
5. Click **Submit**.

#### What to do next
Analyze the performance trends for your teams

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# Analyzing team performance using Teams in Workforce Optimization for ITSM

Use Teams to track and analyze performance trends for your teams from a single location. You can monitor the trends for each agent within your team and compare your agents or team members with one another. With Teams, you can identify skill gaps so that you can recommend which skills are needed to coach your agents.

Organize your teams into assignment groups. You can add a set of key performance indicators (KPIs) to help you measure team performance consistently across the groups.

For example, let's say that you manage the IT Service Desk unit. The unit contains multiple teams, such as Hardware and Network Support. You can create a KPI group for the IT Service Desk unit and then add Hardware and Network Support as assignment groups to this KPI group. Next, you add a set of KPIs to the KPI group. With this data, you can measure the performance trends across the Hardware and Network Support teams.

Also, an admin can associate multiple KPI groups with one or more assignment groups. For example, let’s say that there are two KPI Groups:

- IT Service
- Operations

The IT Service KPI group comprises two assignment groups:

- IT Service Desk
- Deskside support

So, an admin can add one or more assignment groups already available in the IT Service KPI group to the Operations KPI group. For example, Deskside support.

As the Deskside support assignment group is a part of both the KPI groups, it means one or more KPI groups can be associated with one or more assignment groups.

## Add KPI targets for agents

Set key performance indicator goals that you want your agents to achieve so that they can improve the quality of how they resolve incidents. You can also set goals to monitor and improve an existing baseline measurement.

### Before you begin

Role required: pa_target_admin and sn_team_perf.team_performance_admin

### About this task

You can set a global KPI target for an agent or a team that you manage. You can create the target for any indicator in the KPI group associated with the KPI assignment group that you manage. When you set the global target, it is visible to anyone within the assignment group and also displays on the time-series widget.

When you set a personal target, it is only visible to you.

### Procedure

1. Navigate to **All** > **Workforce Optimization for ITSM** > **Manager Workspace**.
2. Click the teams icon.
3. Select a team.
4. Select the agent for whom you want to set KPI targets.
5. Click the target icon.

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- To create a new target, click the plus (+) sign.
- To edit an existing target, select the target you want to edit.

6. Select the target type.
   - To set a global target, click **Global**.
   - To set a personal target, click **Personal**.
7. Set the KPI target.
8. In the **Start date** field, click the calendar icon, select the date when you want to start tracking the goal for the target, and click **OK**.
9. In the **Review date** field, click the calendar icon, select the date when you want to review the set goal, and click **OK**.
10. Set the target.
    - If you are creating a new target, click **Save**.
    - If you are updating an existing target, click **Update**.

    You can analyze the target trend in the indicator time-series metric.

**Related topics**

Performance Analytics targets

### Analyze the performance trends for your teams

Analyze trends to monitor your team's performance within a KPI group.

**Before you begin**

Role required: sn_team_perf.team_performance_admin

**About this task**

Analyze the data by drilling down into the data for a team, a specific team member, an indicator, or an incident.

**Procedure**

1. Navigate to **All** > **Workspaces** > **Manager Workspace**.
2. Click the Teams icon.
3. From the **KPI group** list, select the KPI group to analyze performance.

   You can view the data for the top-level KPIs.

   **Note:**

   The Teams page shows the list of assignment groups that are associated with the selected KPI group.

4. Select a date range to view your team's performance for that time period.

   You can set the default date range using the *sn_optimize.default_date_range* system property.

   All teams that you manage are identified with a **My team** highlight in the group header. You can also see the team that you have visibility into.
5. Drill down into the data for the team.

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| To | Do this |
| --- | --- |
| Analyze indicator performance | Click the **Performance** tab to track and analyze the overall indicator performance for all members in the team.<br>**a.** To analyze the indicator performance for the team, click on an indicator. You can then select a location on the time-series visualization or on an incident count in the table to drill down further.<br>**b.** To analyze indicator performance for a team member, click an indicator value for the team member. |
| Track incidents | Click the **Incidents** tab and analyze all incidents that are related to the team.<br>○ To view the incident details, select an incident.<br>○ To view a team member's details, from the **Assigned to** column, select a team member. |
| Analyze skills for your team | Click the **Performance** tab to analyze skills for each agent in your team.<br>**a.** Select an agent for whom you want to analyze skills based on skill-level type.<br>**b.** Do one of the following:<br>▪ To analyze all skills for the agent, click the **Skills** tab.<br>▪ To analyze skills based on the skill level types associated with the agent, click the **Overview** tab and in the **Skills** section, select a score for the skill level type. |

You can also review incidents, details of assignment groups, additional managers, and information that is relevant to the team.

### Get insights into performance of your team

Get insights into process bottlenecks and find potential areas that you could optimize. You can also view variation analysis.

## Before you begin

Role required: sn_process_optimization_analyst

You must have mined the project for that KPI group for which you want to analyze process insights. For more information, see Create a Process Mining project for a KPI group.

## About this task

You get the process insights and variation analysis for a parent or a child KPI. You can also view the metrics and records for a parent or child KPI.

## Procedure

1. Navigate to **Workspaces** > **Manager Workspace**.
2. Select the Teams icon (  ).
   The Teams page opens.

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**Note:**
The Teams page shows assignment groups and their corresponding details, for example, Average handle time, Closed incidents, or Final call resolution. You can click the values for the related assignment group if you want more details. Such as, if you click a value for Average handle time, the new page shows the average handle time metrics detail page for the group IT service desk.

3. Select the assignment group, for example IT Service Desk, for which you want to analyze process insights.

   The Teams page shows the KPIs that are mapped to an assignment group and the KPI groups that you selected in the KPI group list. You can change the KPI group using this list. You see the KPIs belonging to the KPI group for the same assignment group. But if only one KPI group is associated with the selected assignment group, the **KPI group** list is displayed as inactive.

   If you further drill down into a specific user in an assignment group, the user details page shows the assignment group that the user belongs to and the KPI group that the assignment group belongs to.

4. Drill down into a KPI, for example, Closed incidents.

**Note:**
If you want to view insights for a parent KPI, click the **Process analysis** tab. Click the **Metrics** tab to view the metric details, for example, the details of Closed incidents. To see the number of records for closed incidents, click the **Records** tab.

5. Drill down into a KPI for an agent, for example, P1 incidents.
6. Select the **Process analysis** tab and perform process insights and variation analysis.
   You can analyze the process insights for the date range for which you've mined the data. For more information on business insights, see View business insights.

**Related topics**

Analyze and get process insights

### View the performance data of your team for a specific date

You can view your team's performance data for a specific date using a time-series chart.

**Before you begin**
Role required: sn_wfo_cfg_itsm.manager and sn_team_perf.team_performance_admin

**Procedure**

1. Navigate to **All** > **Workforce Optimization for ITSM** > **Manager Workspace**.
2. Select the teams icon.
3. Select a team and drill down to a KPI, for example, Closed incidents.
4. Point to the time-series chart.

   The chart shows the performance data for the selected date range. The time-series chart shows the specific date. You can view the data for any available date.

5. Select the chart for the date.

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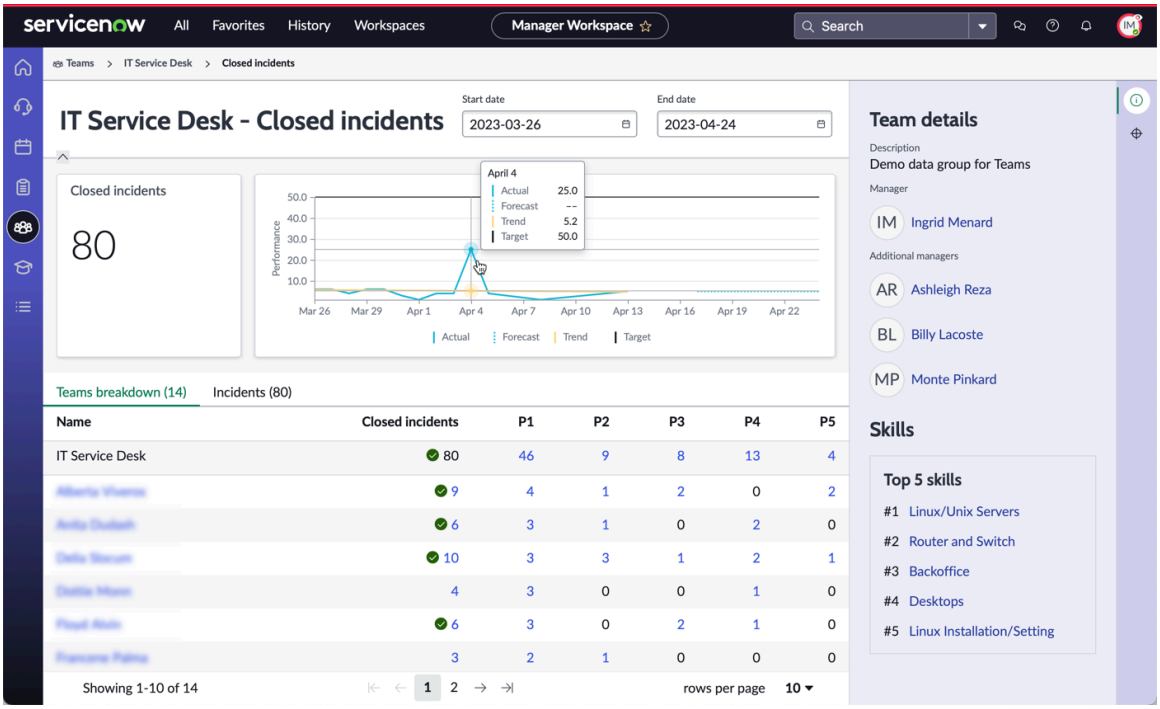
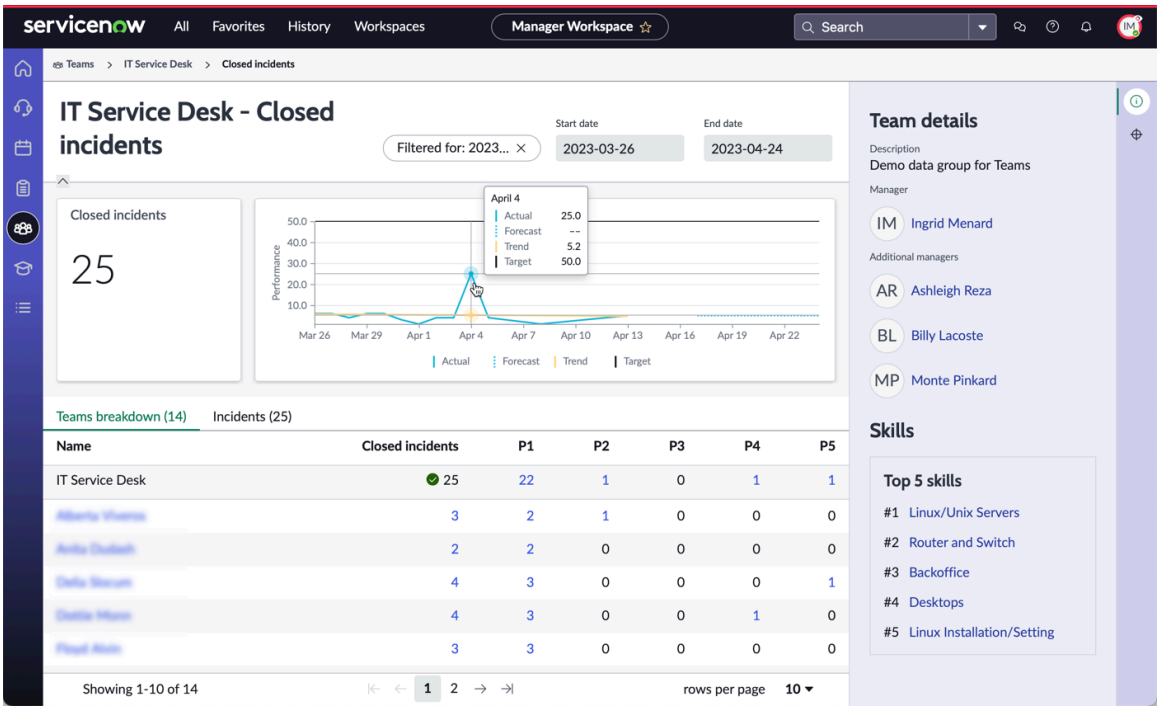



The KPI details page shows the selected date (date filter) in the same format as the date in the date range fields. For example, Filtered for: 2023-04-15. This page also shows the filtered data for that selected date. The following image shows the selected date and the corresponding data.




6. Drill down further to a KPI, for example, P1.

   The details page shows the data for the selected date.

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**Note:**

When you select a date on the time-series chart, the date range fields become inactive. You can close the date filter anytime to go back to the data filtered by the date range.

You can close the date pill filter to go back to the data you want to see for the selected date range.

## Teams components in Workforce Optimization for ITSM

Workforce Optimization for ITSM uses roles to administer teams and properties to modify default behavior.

### Roles

| Role title [name] | Description |
|---|---|
| Teams User [sn_team_perf.team_performance_user] | Grants access to read KPI tables. |
| Teams Admin [sn_team_perf.team_performance_admin] | Grants access to create and configure KPIs, KPI groups, and assignment groups in the Teams module. |
| Teams Manager [sn_team_perf.team_performance_manager] | Grants access to Team Performance module in Manager Workspace. |

### Properties

| Property | Description |
|---|---|
| sn_team_perf.kpi_group.max_parent_kpis | The maximum number of parent indicators that you can add to one KPI group.<br>• **Type:**Integer<br>• **Default value:**5 |
| sn_team_perf.kpi_group.max_supporting_kpis | The maximum number of supporting KPIs you can define for a parent KPI.<br>• **Type:**Integer<br>• **Default value:**10 |
| sn_team_perf.ws.max_assignment_groups | The maximum number of assignment groups prioritized by order number to display on the Teams application in Manager Workspace.<br>• **Type:**Integer<br>• **Default value:**15 |
| sn_optimize.default_date_range | The default date range set in the date range picker. |

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| Property | Description |
| --- | --- |
| | • **Type:**Integer<br>• **Default value:**30 |

### Indicators

| Indicator Name | Description |
| --- | --- |
| Closed Incidents | Number of incidents closed. |
| Customer Satisfaction | Average customer satisfaction for incidents based on CSAT survey results. This indicator is associated with agent and assignment group breakdowns. It provides the customer satisfaction survey results for each agent and the agent's team. |
| Quality | Provides calculated assessment feedback score. |
| Average Handling Time (MTTR) | Mean time taken to resolve an incident. |
| First Call Resolution | Percentage of incidents resolved on first call. |
| Trainee Quality Rating | Average score, in percentage, of all surveys taken by the coach to assess the trainee. |
| Incidents triaged by VA | The number of incidents automatically created by the Virtual Agent for your team when tasks are deflected. You must have ITSM Virtual Agent Conversations (com.snc.itsm.virtualagent) installed on your system to analyze this KPI. |

## Coaching in Workforce Optimization for ITSM

Learn how you can review and assess the quality of the interactions and tasks completed by your teams. You can enhance the skills set of your teams by assigning training that is based on those assessments. You can also add skills to the profiles of your teams after they get trained.

Initiate a skill review process to have your teams assess their own skill set and approve or reject the skills. After it's approved, they'll automatically be added to the skill set of the team member.

### Coaching overview

The image shows a high-level workflow on how coaching admins set up Coaching, and how managers and agents use Coaching.

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The infographic shows how you can use Predictive Intelligence to recommend skills for your agents.

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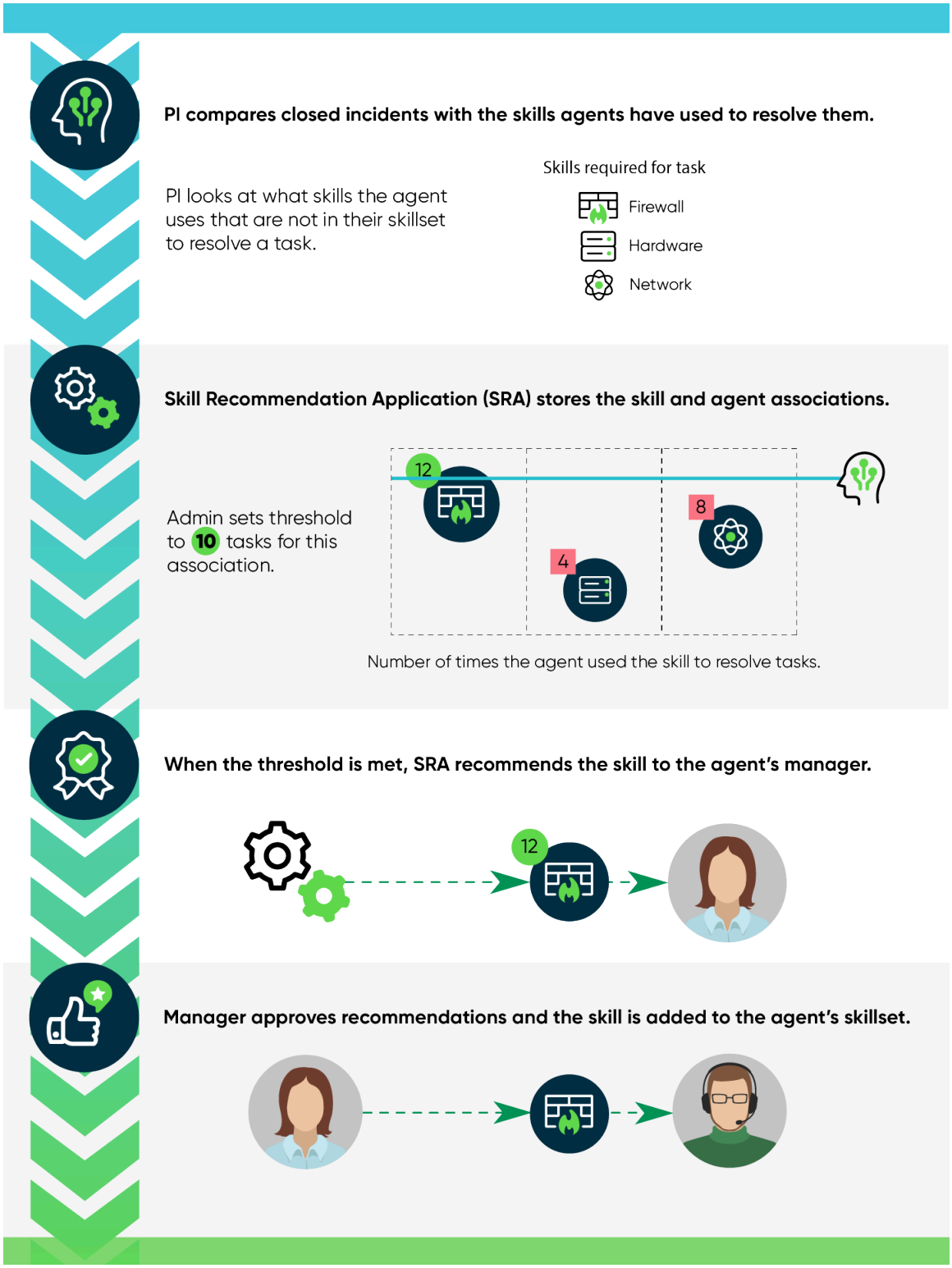


## Coaching terminology

| Terminology | Description |
|---|---|
| Coaching assessment | Using assessments, you can evaluate an agent and then assign training and skills based on the evaluation. An assessment can be generated automatically from a coaching opportunity based on |

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| Terminology | Description |
| --- | --- |
| | the conditions set in the opportunity. As assessment can also be generated manually. |
| Coaching opportunity | A critical moment in a process that generates an assessment based on set conditions. A coaching opportunity can be generated at any time during the life cycle of any task record, which could include incidents, problems, change requests, or request items. |
| Virtual coach | A record that can be associated with a coaching opportunity that automatically completes tasks associated with an assessment. |
| Coaching survey | A survey associated with a coaching assessment that lets coaches provide feedback on the work completed by the agents. It also lets agents provide feedback on the coaching effectiveness. |

## Coaching assessments

You can create coaching assessments manually and associate it with a task record or generate them automatically using coaching opportunities. When the trigger conditions set in a coaching opportunity are met, an assessment is automatically generated. It's then automatically assigned to the coach for the trainee to assess the context in which the assessment was triggered. For example, let's assume an employee doesn't write clear work notes when they escalate an incident. You can set conditions for this scenario in the coaching opportunity to create a coaching assessment. The coach can evaluate the employee using the assessment and add learning tasks to train them to write better work notes.

After you create coaching assessments manually or automatically, you can do any of the following:

- Award skills
- Assign learning tasks
- Associate coaching surveys to the assessment

**Note:**
You can automate these tasks using a virtual coach that's associated with the coaching opportunity.

**Awarding skills**: After the coach completes an assessment, they can award skills that's related to the assessment to the trainee.

**Assigning learning tasks**: Coaching assessments can have learning tasks associated with it to train the agent based on the assessment. When the agent completes the training, the skills associated with the learning tasks are added to the skills set of the agent. For example, let's assume that the agent resolved an escalation that required router skills. If the agent doesn't have that skill, then the learning tasks can include training for router skills. After the agent completes the training, the router skill is added to the skill set of the agent. Next time when an incident that requires router skills is assigned to the agent, they'll be able to resolve the incident successfully.

**Setting up coaching surveys**: Coaching surveys can be associated with a coaching assessment. When the coach completes the coaching assessment, a survey can be triggered. Coaching surveys let coaches provide feedback on the ability of the agents' to resolve incidents or the quality of their completed tasks. Trainee surveys let agents provide feedback on the coaching effectiveness.

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- **Survey for the coach** is taken by the coach where the coach can provide feedback to rate the trainee. For example, did the trainee demonstrate the knowledge and technical competence required?
- **Survey for the trainee** is taken by the agent where the agent can provide feedback to rate the coach. For example, were the learning tasks assigned to the agent useful in building skills?

## Coaching opportunity

A coaching opportunity is a critical moment in a process where coaching assessments get triggered based on conditions set in the coaching opportunity record. A coaching opportunity can be generated at any time during the life cycle of any task record. These records could include any task such as an incident, problem, change request, or request item. For example, you can set conditions to trigger a coaching opportunity when an incident reassigned or escalated. For examples on identifying coaching opportunities, see Identifying coaching opportunities.

You can do the following in a coaching opportunity record:

- Set trigger conditions.
- Associate skills, learning tasks, or surveys with the coaching opportunity. These items are automatically associated with the assessment that is associated with the opportunity.
- Define a virtual coach. When an assessment is automatically created from an opportunity, and if a virtual coach record is associated with it, then the assessment is automatically moved to the closed, complete state. It will also automatically award skills and any learning tasks associated with the assessment to the trainee. The surveys associated with the opportunity will be assigned to the coach or the trainee as well.

**Note:**

- All virtual coach records have a coaching opportunity associated with it but not all coaching opportunities have an associated virtual coach record.
- A virtual coach can't be associated with a manually generated assessment.

For information on virtual coach, see Identify and add course items for a virtual coach.

## Example of assessment triggers

| Did the coaching opportunity trigger an assessment? | Is a virtual coach associated with the coaching opportunity and are the conditions set met? | Result |
|---|---|---|
| Yes | Yes | Because a virtual coach is associated with the coaching opportunity, it completes the following tasks automatically:<br>• Award skills<br>• Assign learning tasks<br>• Associate coaching surveys to the assessment |
| Yes | No | Because a virtual coach isn't associated with the coaching opportunity, you must complete the following tasks manually: |

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| Did the coaching opportunity trigger an assessment? | Is a virtual coach associated with the coaching opportunity and are the conditions set met? | Result |
|---|---|---|
| | | • Award skills<br>• Assign learning tasks<br>• Associate coaching surveys to the assessment |
| No | No | You can create a manual assessment and complete the following tasks manually:<br>• Award skills<br>• Assign learning tasks<br>• Associate coaching surveys to the assessment |

You can use Coaching for any task-based process for such as Change Management, Customer Service Management or Incident Management to set up Coaching. You can also use Coaching for a non-task or custom table source by configuring a business rule.

As a coach, you can:

- Use surveys to evaluate the performance. of your teams.
- Recognize improvement opportunities and assign training tasks.
- Assess the ability of trainees to resolve incidents.
- Assign training that is based on the assessments.
- Add skills to the skill set of a trainee that is based on a recommendation from Predictive Intelligence.
- Initiate a skill review process to have your teams assess their own skill set.
- Approve or reject a skill assessed by members of your team.

As a trainee, you can:

- Get trained to address your skill gaps.
- Evaluate the skill proficiency for an existing skill or add a new skill to your skill set.
- Request approval from your manager to add the evaluated skills to your skill set.

## Getting started with Coaching in Workforce Optimization for ITSM

Easily find the tasks that you must complete in the Coaching module.

### Coaching with Learning

| Benefit | Roles | Finding tasks to complete in Coaching |
|---|---|---|
| Activate Coaching in the Workforce Optimization for ITSM. | admin | Activate Coaching |

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**Coaching with Learning (continued)**

| Benefit | Roles | Finding tasks to complete in Coaching |
|---|---|---|
| Refer to the roles, tables, and other components used in Coaching. | Any coaching role | Understand components used in Coaching in Workforce Optimization for ITSM |
| Set up Coaching. | Admin | Set up Coaching in Workforce Optimization for ITSM |
| Train your teams using Coaching with Learning. | Coach | Train your teams using Coaching with Learning in Workforce Optimization for ITSM |
| Manage skills for your teams from a central location | Skill admin | Manage skills in Workforce Optimization for ITSM |

## Example for using Coaching in Workforce Optimization for ITSM

Understand how you can assess your agents performance, identify skill gaps, and train them to enhance their skills sets with Coaching.

An IT manager manages IT operations for a large organization that has 12 teams reporting to the manager. Each of the manager's teams has anywhere from 20 through 50 agents. This manager is also added as a manager of other teams where they need visibility.

The manager wants a single location to:

- Monitor the skills that the teams use the most to solve issues
- Analyze metrics and monitor pending coaching assessments and training for the teams
- Add skills used for resolving issues or when Predictive Intelligence Workbench recommends them.

The manager can manage all of these actions by doing the following:

1. Set conditions that trigger coaching opportunities.
2. Assess agents' skills and assign training.
3. Add skills to agent profile when they complete training or using recommendations from Predictive Intelligence.

Get an overview on coaching, creating assessments, taking surveys, assigning training, and adding skills.

Workforce Optimization for ITSM Coaching Overview

Get an overview of how you can add skills manually or the ones recommended using Predictive Intelligence and the Skill Recommendation application.

Workforce Optimization for ITSM Skill Recommendation

For detailed instructions on setting up and using Coaching for Workforce Optimization for ITSM, see Coaching.

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## Setting up Coaching in Workforce Optimization for ITSM

Manage agent skills and assess the quality of completed tasks. Use predictive intelligence to recommend skills for agents. Train your agents with internal and external learning content.

To identify and add course items for a virtual coach, see Identify and add course items for a virtual coach.

**Important:**
If you have enabled the Coaching (sn_coaching) plugin, make sure that you have upgraded the following plugins to latest store release version:

- Workforce Optimization for ITSM Configurable Workspace (sn_wfo_cfg_itsm).
- Workforce Optimization Configurable Workspace Core (sn_wfo_cfg_ws).
- Workforce Optimization Common (sn_wfo_common).

For more information, see Activate Workforce Optimization for ITSM.

### Configure an indicator to display in the Coaching Overview tab in Workforce Optimization for ITSM

Add a system property to display the desired indicator in the Coaching Overview tab in the Coaching application.

#### Before you begin

Set the map application scope to **Coaching**. For information on how to set the scope, see Set map application scope.

Role required: admin

#### About this task

Replace the existing indicator with any Performance Analytics indicator that has the Assigned to and Assignment group breakdowns to display in the Coaching Overview tab in the Coaching application.

#### Procedure

1. In the application navigator, enter `sys_properties.list`.
2. Click **New**.
3. Enter the following field values.

| Field | Value |
|---|---|
| Suffix | sn_coaching.coaching_overview_default_quality_indicator |
| Application scope | Coaching |
| Type | String |
| Value | {"title": "<name>", "sys_id": "<sys id>"}<br><br>where <name> is the name of the indicator that you want to display in the Coaching Overview tab and <sys id> is the unique record identifier (sys_id) of the indicator.<br><br>Example: |

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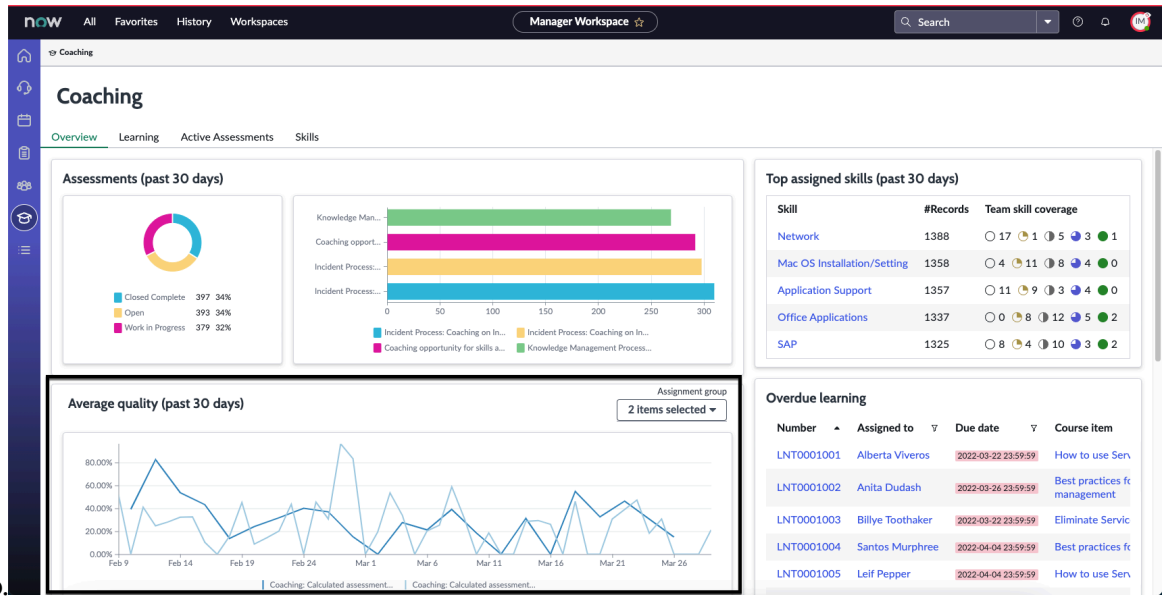
| Field | Value |
|---|---|
| | ○ Name: % of P1 incidents resolved on first call.<br>○ Sys ID: 0423e59387401010ca99e12397cb0bbb<br>{"title": "% of P1 incidents resolved on first call", "sys_id": "0423e59387401010ca99e12397cb0bbb"} |
| Read roles | sn_coaching.coach |

4. Click **Submit**.
   The configured indicator replaces the existing indicator in the Overview tab in the Coaching application in Workforce Optimization for ITSM.

   The image below show an example of the configured indicator displayed in the Coaching Overview tab.




### Configure a list menu to display in the Learning tab in Workforce Optimization for ITSM

Add a system property to add to or modify the list menu for Coaching with Learning in the Coaching application in Workforce Optimization for ITSM.

### Before you begin

**Important:**
This feature is available with the Coaching with Learning plugin (sn_coach_lrn) from the ServiceNow Store. To enable this feature, see Activate Workforce Optimization for ITSM for configurabe workspace.

Set the map application scope to **Coaching With Learning**. For information on how to set the scope, see Set map application scope.

Role required: admin

### Procedure

1. In the application navigator, enter `sys_properties.list`.
2. Click **New**.
3. Enter the following field values.

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| Field | Value |
|---|---|
| Suffix | learning_list_menu_props |
| Name | sn_coach_lrn.learning_list_menu_props |
| Application | Coaching With Learning |
| Type | String |
| Value | <pre>[{<br>    “children”: [{<br>            “conditions”: “<filter condition on table>“,<br>            “label”: “<list name>“,<br>            “id”: “<unique identifier for the selection path>“,<br>            “selectionPath”: [<br>                “<list parent name>“,<br>                “<unique identifier for the selection path>”<br>            ],<br>            “table”: “<table name>”<br>        }<br>    ],<br>    “label”: “<list name>“,<br>    “id”: “<list parent name>“,<br>    “isExpanded”: true,<br>    “selectionPath”: [“<list parent name>“]<br>}]</pre> where:<br>○ <children> is an array of objects to create the list<br>○ <conditions> is the condition set on the selected table<br>○ <label> is the name of the list<br>○ <id> unique identifier for the selection path<br>○ <selectionPath> is the path to establish parent-child relationship in the menu<br>○ <table> is the name of the table for the menu item |
| Read roles | sn_wfo_cfg_ws.user |
| Write roles | sn_wfo_cfg_ws.admin |

4. Click **Submit**.
   The configured list displays in the Learning tab in Coaching in the Workforce Optimization for ITSM manager workspace.

### What to do next

You can copy the code below into the Value field in the system property and modify as required.

```
[{
    “children”: [{
```

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```
            “conditions”:
 “assigned_toDYNAMICfdc474aab313001013a082c136a8dc15”,
            “label”: “All Tasks”,
            “id”: “all”,
            “selectionPath”: [
                “learning_tasks”,
                “all”
            ],
            “table”: “sn_lc_learning_task”
        },
        {
            “conditions”:
 “assigned_toDYNAMICfdc474aab313001013a082c136a8dc15^active=tru
e”,
            “label”: “Active Tasks”,
            “id”: “active”,
            “selectionPath”: [
                “learning_tasks”,
                “active”
            ],
            “table”: “sn_lc_learning_task”
        },
        {
            “conditions”:
 “assigned_toDYNAMICfdc474aab313001013a082c136a8dc15^due_date<ja
vascript:gs.beginningOfToday()^state!=3”,
            “label”: “Overdue Tasks”,
            “id”: “overdue”,
            “selectionPath”: [
                “learning_tasks”,
                “overdue”
            ],
            “table”: “sn_lc_learning_task”
        },
        {
            “conditions”:
 “assigned_toDYNAMICfdc474aab313001013a082c136a8dc15^state=3",
            “label”: “Completed Tasks”,
            “id”: “complete”,
            “selectionPath”: [
                “learning_tasks”,
                “complete”
            ],
            “table”: “sn_lc_learning_task”
        }
    ],
    “label”: “Learning Tasks”,
    “id”: “learning_tasks”,
    “isExpanded”: true,
    “selectionPath”: [“learning_tasks”]
}, {
    “children”: [{
            “conditions”: “”,
            “label”: “All Catalogs”,
            “id”: “all”,
            “selectionPath”: [
                “learning_catalogs”,
```


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```
                "all"
            ],
            "table": "sn_lc_catalog"
        },
        {
            "conditions": "sys_created_by=javascript:
 gs.getUserName()",
            "label": "My Catalogs",
            "id": "my",
            "selectionPath": [
                "learning_catalogs",
                "my"
            ],
            "table": "sn_lc_catalog"
        }
    ],
    "label": "Learning Catalogs",
    "id": "learning_catalogs",
    "isExpanded": true,
    "selectionPath": ["learning_catalogs"]
}, {
    "children": [{
            "conditions": "active=true",
            "label": "All Courses",
            "id": "all",
            "selectionPath": [
                "learning_courses",
                "all"
            ],
            "table": "sn_lc_course_item"
        },
        {
            "conditions":
 "authorDYNAMIC90d1921e5f510100a9ad2572f2b477fe^active=true",
            "label": "Internal Courses",
            "id": "internal",
            "selectionPath": [
                "learning_courses",
                "internal"
            ],
            "table": "sn_lc_content"
        },
        {
            "conditions": "active=true",
            "label": "External Courses",
            "id": "external",
            "selectionPath": [
                "learning_courses",
                "external"
            ],
            "table": "sn_lc_external_content"
        }
    ],
    "label": "Learning Courses",
    "id": "learning_courses",
    "isExpanded": true,
```


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```
    "selectionPath": ["learning_courses"]
}]
```

### Integrate Coaching With Learning with third-party learning management systems

Connect your ServiceNow instance with third-party learning sites to pull learning content into your repository.

## Before you begin

**Important:**
Coaching with Learning application is available from the ServiceNow® Store. To enable this application, see Activate Workforce Optimization for ITSM.

Role required: learning_admin

## About this task

### Applications to integrate third-party learning sites

Activating the Coaching with Learning (sn_coach_lrn) plugin enables the following applications from the ServiceNow Store:

- Enterprise Service Management Integrations Framework
- Cornerstone spoke
- Pluralsight spoke
- Udemy spoke
- ServiceNow University spoke. For more information on the ServiceNow University spoke, ServiceNow University Spoke.

For information on integrating with third-party learning sources, see Integrating Learning Core with third-party learning management systems.

## Procedure

1. Create the integration source for each of your third-party systems.

   **Note:**
   Cornerstone, Pluralsight, Udemy, ServiceNow University integrations are available by default.

   a. Navigate to **Integrations Framework** > **Source**
   b. Click **New**.
   c. In the **Name** field, enter the name of the integration source, for example, Pluralsight.
   d. Right-click the form header and click **Save**.
   e. In the Integration Services related list, click **New**.
   f. On the form, fill in the fields:

| Field | Description |
|---|---|
| Name | Name of the integration service, for example, Pluralsight. |
| Import set tables | List of intermediate tables which store records from the third-party system. |

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| Field | Description |
|---|---|
| | **Note:** This field is enabled only when Scheduled pull service is selected in the **Service type** field. |
| Flow | Flow that interacts with the third-party system to pull the required data. |
| Active | Option to indicate that the integration service is available for use. |
| Application | Application which contains the integration service record. |
| Source | Name of the third-party system with which you want to integrate your application. |
| Order | Order in which you want to run transformation scripts. |
| Service type | Option to indicate the type of service **Scheduled pull** or **Ondemand Push**. |
| Retry policy | Configuration set to push a record if the previous push fails.<br>**Note:** This field appears only when Ondemand Push service is selected in the **Service type** field. |

**g.** Click **Update**.

**2.** Integrate your ServiceNow instance with your third-party learning source accounts.
The records from the third-party content are pulled into your ServiceNow instance using and API call. To successfully run this API call, you must do the following:

**a.** In the application navigator, enter `sys_properties.list` and press **Enter**.

**b.** For each of the following properties, set the value to **1638400**:

- com.glide.transform.json.max-partial-length
- com.snc.process_flow.reporting.serialized.val_size_limit

For more information on these system properties, see Coaching With Learning System Properties.

**3.** Activate schedule flows to integrate third-party learning content.

**a.** Navigate to **Process Automation** > **Flow Designer**

**b.** In the **Flows** section, select each of the following flows and click **Activate**:

- Trigger Cornerstone Learning Sync
- Trigger Pluralsight Learning Sync
- Trigger Udemy Learning Sync
- Trigger ServiceNow University Sync

**c.** Navigate to **Learning** > **Administration** > **Learning System Configuration**

**d.** Select each of the third-party learning sources and set the **Active** field to **true**.
Schedule flows automatically run on a scheduled basis to synchronize third-party learning content into your ServiceNow instance.

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4. After you configure the third-party integration sources you can refresh the entire third-party content or synchronize new and updated services into your ServiceNow instance.
   - To refresh the entire content, set the *full_pull* property to **true**.

     **Note:**
     We recommend that you periodically refresh the entire content.

   - To synchronize new and updated services, set the *full_pull* property to **false**.

   a. Open any integration source for which you want to pull content.

   b. Click **Run Job**.
   The integration framework pulls the corresponding third-party learning courses into the Learning External Content [sn_lc_external_content] table on your ServiceNow instance.

   When synchronizing new and updated services, the content is populated as described in the table below.

| Third-party content | New and Updated Services Synchronized |
|---|---|
| Udemy | ○ Courses<br>○ User activity |
| Cornerstone | ○ Users<br>○ Courses<br>○ User activity |
| Pluralsight | ○ Courses<br>○ Course progress such as percentage |
| ServiceNow ServiceNow University | ○ Courses<br>○ User activity |

### External Content Integration Sources

When you integrate Coaching With Learning with third-party learning management systems, the source record for Cornerstone OnDemand, Pluralsight, Udemy, and ServiceNow University applications are automatically created in the Enterprise Service Management Integrations Framework. These source records contain a predefined set of properties and integration services.

#### Integration source record for Cornerstone Ondemand

| Field | Description |
|---|---|
| Name | Name of the record in Enterprise Service Management Integrations Framework: Cornerstone. |
| Properties | Set of properties that are predefined for Cornerstone OnDemand application. |

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### Integration source record for Cornerstone Ondemand (continued)

| Field | Description |
|---|---|
| | • **page_size**: Number of records that are pulled through an API call from Cornerstone OnDemand application.<br>• **full_pull**: When set to **True**, all the active users and learning courses from the Cornerstone OnDemand system are pulled into the ServiceNow instance.<br>When set to **False**, modified users, modified transcripts, and updated courses are pulled from the Cornerstone OnDemand system into the ServiceNow instance.<br>• **url_prefix**: Deep link prefix to pull learning objects from Cornerstone OnDemand system during run time.<br>• **pull_offset_hours**: The time, in hours, calculated from the last successful run for the next synchronization to occur<br>For example, the last successful run was on 12/12/2021 at 17:00:00, pull_offset_hours is set to 5, and full_pull is set to False. The next pull fetches all the records that have been modified from 12/12/2021 12:00:00 until current date and time. |
| Integration Services | Services interact with Cornerstone Ondemand application to pull or push learning courses.<br>• **Course assign service**: Assigns a course to an employee in the Cornerstone Ondemand application.<br>• **Sync users**: Maps users in the Cornerstone OnDemand system to users in the ServiceNow system using email Ids.<br>**Note:** If you want to use user_id or user_name field for mapping users, then override**getCornerstoneUser method** in the sn_lc.UserMappingUtil script.<br>• **Courses**: Pulls learning courses from Cornerstone OnDemand system into ServiceNow.<br>• **User activity**: Pulls details of user activity on learning courses from Cornerstone OnDemand system into ServiceNow. |

### Integration source record for Pluralsight

| Field | Description |
|---|---|
| Name | Name of the record in Enterprise Service Management Integrations Framework: Pluralsight. |
| Properties | Set of properties that are predefined for the Pluralsight system. |

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### Integration source record for Pluralsight (continued)

| Field | Description |
|---|---|
| | • **page_size**: Number of records that are pulled through an API call from Pluralsight.<br>• **full_pull**: When set to **True**, all the learning courses are pulled from Pluralsight into the ServiceNow instance. When set to **False**, updated learning courses progress is pulled from Pluralsight into the ServiceNow instance.<br>• **pull_offset_hours**: Value that is considered for pulling modified records.<br><br>For example, the last successful run was on 12/12/2021 at 17:00:00, pull_offset_hours is set to 5, and full_pull is set to False. The next pull fetches all the records that have been modified from 12/12/2021 12:00:00 until current date and time. |
| Integration Services | Integration services interact with Plural sight application to pull learning courses into ServiceNow.<br>• **Courses**: Pulls learning courses from Pluralsight into ServiceNow.<br>• **Course progress**: Pulls the progress of learning courses from Pluralsight into ServiceNow. |

### Integration source record for Udemy

| Field | Description |
|---|---|
| Name | Name of the record in Enterprise Service Management Integrations Framework: Udemy |
| Properties | Set of properties that are predefined for the Udemy system.<br>• **page_size**: Number of records that are pulled through an API call from Udemy into ServiceNow.<br>• **full_pull**: When set to **True**, all the learning courses are pulled from Udemy into the ServiceNow instance. When set to **False**, updated learning courses and learning course progress are pulled from Udemy into the ServiceNow instance.<br>• **pull_offset_hours**: Value that is considered for pulling modified records.<br><br>For example, the last successful run was on 12/12/2021 at 17:00:00, pull_offset_hours is set to 5, and full_pull is set to False. The next pull fetches all the records that have been modified from 12/12/2021 12:00:00 until current date and time. |

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**Integration source record for Udemy (continued)**

| Field | Description |
|---|---|
| Integration Services | Integration services interact with Udemy application to pull learning courses into ServiceNow.<br>• **Pull Courses:** Pulls learning courses from Udemy into ServiceNow platform.<br>• **Pull user activity:** Pulls details of user activity on learning courses from Udemy into the ServiceNow platform. |

**Integration source record for ServiceNow University**

| Field | Description |
|---|---|
| Name | Name of the record in Enterprise Service Management Integrations Framework: ServiceNow University |
| Properties | The **full_pull** property is predefined for the ServiceNow University system.<br>• When set to **True**, all the learning courses are pulled from ServiceNow University into the ServiceNow platform.<br>• When set to **False**, updated learning courses and learning course progress are pulled from ServiceNow University into the ServiceNow platform. |
| Integration Services | Integration services interact with ServiceNow University application to pull learning courses into ServiceNow.<br>• **Pull Courses:** Pulls learning courses from ServiceNow University into the ServiceNow platform.<br>• **Pull user activity:** Pulls details of user activity on learning courses from ServiceNow University into the ServiceNow platform. |

## Training your teams using Coaching in Workforce Optimization for ITSM

Assess your teams' abilities to resolve incidents efficiently by reviewing their work at critical service moments using Coaching in Workforce Optimization for ITSM.

With Coaching, you can do the following:

- Provide training for your agents to address skill gaps.
- Use surveys to apply consistent, measurable scores across teams.
- Create opportunities for improvement using the Coaching application.
- Use Predictive Intelligence to recommend skills for your agents and provide training to address those skill gaps.

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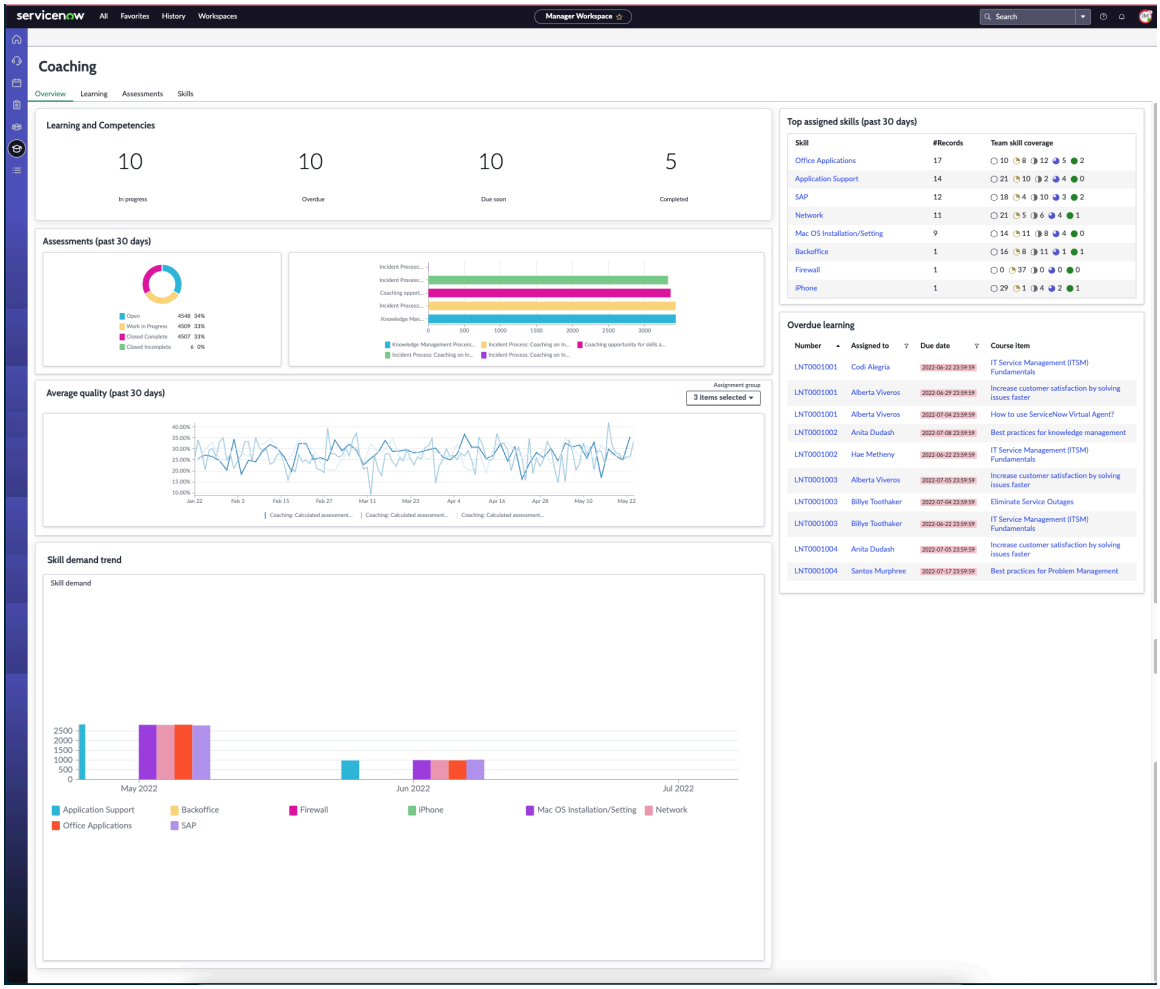
### Coaching Overview page

Monitor the progress of assessments and track learning tasks that are overdue. You can also add a coaching quality indicator to monitor trends. Analyze which skills have been assigned the most to your team recently and which top skills are in demand.




## Access the Coaching Overview page

To open the dashboard:

- Navigate to, **Workspaces** > **Manager Workspace**.
- Select the Coaching icon .
- Select the **Overview** tab.

## End user and roles

| End user and goals | Required role |
|---|---|
| As a coach, you can analyze:<br>• The status of assessments for the past 30 days.<br>• Which learning tasks are past their due date for completion. | sn_coaching.coach |

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| End user and goals | Required role |
| --- | --- |
| • Which skills you've assigned the most to your teams during the last 30 days.<br>• The trend for the top five skills that are in demand. | |

## Data visualizations

| Title | Type | Description |
| --- | --- | --- |
| Learning and Competencies | Single score | The number of learning tasks that are in progress, overdue, due to be completed in the next 5 days, or have been completed in the last 30 days. |
| Assessments | Donut chart | Status of assessments for the past 30 days. |
| Average quality | Line chart  | Trend in the average quality of coaching assessment in the last 30 days. |
| Skill demand trend | Bar chart | Trend for the top five skills that are in demand. |

### Learning in Workforce Optimization for ITSM

Use Coaching with Learning to train your agents with internal and external learning content. Organize similar content into learning libraries. Assign learning tasks to your agents and track completion. Create learning paths that include a collection of courses on a specific topic associated with a set of skills.

**Important:**
Coaching with Learning is available when you enable the Coaching with Learning application from the ServiceNow® Store. To enable this application, see Activate Workforce Optimization for ITSM .

Coaching with Learning in Workforce Optimization for ITSM

### Create a course catalog in Workforce Optimization for ITSM

Create course catalogs and set user criteria to define user access to the course items and learning paths associated with it.

**Before you begin**
Role required: sn_wfo_cfg_itsm.admin

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### Procedure

1. Navigate to **Workspaces** > **Manager Workspace**.
2. Select the Coaching icon (  ).
3. Select the **Learning** tab.
4. Go to **Learning course catalogs** > **All course catalogs**.
5. Select **New**.
6. Create a course catalog.
   For more information, see Create a course catalog.

## Create a learning library

Create a learning library to organize related content into categories.

### Before you begin

Role required: sn_wfo_cfg_itsm.manager

### Procedure

1. Navigate to **All** > **Workforce Optimization for ITSM** > **Manager Workspace**.
2. Select the coaching icon.
3. Select the **Learning** tab.
4. Select **Learning Libraries** and select **My learning libraries**.
5. Create a learning library.
   a. Select **New**.
   b. In the **Title** field, enter a unique name for the learning library.
   c. In the **Description** field, enter a description for the learning library.
   d. Select **Save**.

   **Note:**
   The learning library is visible to all groups that you directly or additionally manage.

6. Add learning courses to learning libraries.
   a. Select the **Content** tab.
   b. Select **Add**.
   c. In the **Add Learning Courses** pop-up window, select all course items you want to add to the learning library.
   d. Select **Add**. The course items are added to the learning library.

   **Note:**
   To remove any course item you have added, select the course item and Select **Remove**.

7. Add a group to a learning library.
   a. Select the **Applicable Groups** tab.
   b. Select **New**.
   c. In the **Group** field, select a group that you want to associate with the learning library.
   d. Select **Save**.

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### Create internal learning content

Add internal courses so that agents can learn new content and enhance their skill set.

## Before you begin

Role required: sn_wfo_cfg_itsm.manager

## Procedure

1. Navigate to **All** > **Workforce Optimization for ITSM** > **Manager Workspace**.
2. Select the coaching icon.
3. Select **Learning Courses** and select **Internal Courses**.
   You can search courses based on keywords using the **Search courses** field or narrow down the display of the courses based on skills using the **Filter courses by skill** field.
4. Create an internal learning course.
   a. Select **New**. The **Learning Internal Content** screen appears.
   b. Fill in the following fields.

| Name | Description |
|---|---|
| Title | Name of the course. |
| Internal source | Select the type of content for the course.<br>Here are the available types of courses:<br>▪ URL—Youtube, Vimeo, or any link for a video<br>▪ Knowledge article<br>▪ Free form<br>▪ Quiz |
| Days to complete | The number of days required to complete the course. Default value is set to 5. |
| Course catalog | The catalog associated with the course. |
| Knowledge article | If the internal source is a knowledge article, select the article. |
| URL Domain | If the internal source is URL, select the domain for the URL.<br>Here are the available URL domain types:<br>▪ Youtube<br>▪ Vimeo<br>▪ Other |
| URL | If the internal source is URL, enter the URL for the selected domain. |
| Estimated duration | Length of time when the course has to be completed. For example, for a video, it is the duration of the video. For a KB article, the duration is estimated based on the length of the article. |

5. Select **Save**.
6. Add a skill to the internal content.

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a. Select the **Associated skills** tab.

b. Select **New**.

c. In the **Skill** field, select a skill you want to associate with the internal content.

d. In the **Skill level** field, select a skill level for the selected skill.

e. Select **Save**.

7. Add a learning task to the internal content.

a. Select the **Learning Tasks** tab.

b. Select **New**.

c. In the **Assigned to** field, select a trainee to whom you want to assign the learning task.

d. In the **Course item** field, select the course item to associate with the learning task.

e. In the **Due date** field, Select the calendar icon and select the date and time when you want to trainee to complete the learning task.

f. Select **Save**.

### Access external courses using Coaching with Learning

Add courses from external sources such as Udemy, Pluralsight, or Cornerstone to enable your users to gain skills from external content.

#### Before you begin

Role required: sn_wfo_cfg_itsm.manager

You must integrate Coaching with third-party learning management systems. For information on how to perform this integration, see Integrate Coaching With Learning with third-party learning management systems.

#### Procedure

1. Navigate to **All** > **Workforce Optimization for ITSM** > **Manager Workspace**.
2. Click the coaching icon.
3. Click the **Learning** tab.
4. Go to **Learning Courses** > **External Courses**.
   You can search courses based on keywords using the **Search courses** field or narrow down the display of the courses based on skills using the **Filter courses by skill** field.
5. Select a course.
6. Click **Go to course**.
   You can review and learn the external course.

#### Related topics

Integrating Learning Core with third-party learning management systems

### Assign a course item to agents

Assign a course item to one or more agents and add a due date for them to complete the course.

#### Before you begin

Role required: sn_wfo_cfg_itsm.manager

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### About this task

You can analyze the course items that were most taken by your team members. You can also see which courses were created in the last five days.

**Note:**
You can close the status of a course item for any of your team members that you directly or additionally manage by selecting **Mark as complete** for that course item.

### Procedure

1. Navigate to **All** > **Workforce Optimization for ITSM** > **Manager Workspace**.
2. Select the coaching icon (  ).
3. Select the **Learning** tab.
4. Select **Learning Courses** > **All Courses**.
   - You can search courses based on keywords using the **Search courses** field or narrow down the display of the courses based on skills using the **Filter courses by skill** field.
   - In the course item cards, you can view details of each course, for example:
     - The course duration.
     - The type of course item, for example, a URL or a knowledge article.
     - Whether the course item is an internal or an external course item.
     - Skills associated with the course. If a course has more than one skill, you can select the count next to a skill and view all skills. To remove a skill, select a skill and select **Remove**.
   - You can close the status of a course item for any of your team members that you directly or additionally manage and by selecting **Mark as complete** for that course item.
5. Select the assign icon (  ) for the course item you want to assign to agents.
6. In the **Assign learning course** screen, assign the learning course to groups or team members.

   a. If the agents have to complete the course item within a given date, select the **Mandatory** check box.

   b. In the **Due date** field, select the date by which they need to complete it.

   c. Select **Assign**.

**Note:**
- The course that is most taken by your agents is identified with the **Most taken** highlight.
- The course that has been created less than five days before the current date is identified with the **New** highlight.

## Create a learning path in Workforce Optimization for ITSM

Create a learning path, add relevant skills and course items, and publish the path. When your agents complete the path, any skills associated with the path are automatically added to the agent's profile.

### Before you begin

Role required: sn_wfo_cfg_ws.manager

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This video walks you through the steps for creating a learning path. Create a learning path

### Procedure

1. Navigate to **Workspaces** > **Manager Workspace**.
2. Select the Coaching icon (  ).
3. Select the **Learning** tab.
4. Navigate to **Learning Paths** > **All learning paths**.
   - You can search a path based on keywords using the **Search** field or narrow down the display of the paths based on skills using the **Filter by skill** field.
   - You can select a learning path to view the details. You can analyze the path objective, the skills associated with the course items, the total number courses in the path, and the duration to complete them.
   - You can select the link that displays the skills and view all skills associated with the learning path. The list of skills will display if there are more than 5 skills associated with the learning path.
5. Select **Create new path**.
   The **New learning path** screen displays.
6. Create a learning path.
   a. In the **Path name** field, enter a unique name for the learning path.
   b. In the **Course Catalog** field, select the catalog to which you want to associate the learning path.

      **Important:**
      You can customize the publish flow for any catalog other than the **Default Catalog**. For information on publish flow, see Create a course catalog and the Course catalog form.

   c. Select **Next**.
   The learning path that is created is in **Draft** state. You can choose to complete it later.
7. Add or remove course items.
   - You can search courses based on keywords using the **Search** field or narrow down the display of the courses based on skills using the **Filter by skill** field.
   - You can select a course and preview the details.

   **Note:**
   You can add a quiz as a course item.

   a. Enable or disable the check box for the course items that you want to add or remove from the learning path.
   b. Select **Add items**.
   The **Review** screen appears. A learning path consists of a list of courses that a trainee takes in a given order. You can drag the courses in the list to set the order in which the trainee has to complete the path. In the **Items in the learning path** list, the added course items display in the order you have selected them. You can drag and reorder these items.
8. Review the learning path.
   The skills associated with the selected courses are automatically populated in the **Course skills** field.

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a. Review and edit any required details.
You can also add additional skills to the learning path.

b. **Optional:** To remove items that you no longer want to associate with the learning path, select the item and then select **Remove selected items**.

c. Select **Next**.
The **Publish** screen appears.
   - The screen displays the agent view of the learning path.
   - The **Curriculum** section displays the course items in the order that you have selected in the **Review** screen.
   - If you do not want to publish the learning path, you can select **Save** and come back to it later.

9. Select **Submit** to publish the learning path.
The learning path is published based on the Publish flow.

### Assign a learning path to agents

Assign a learning path to one or more agents and add a due date for them to complete the path.

#### Before you begin

Role required: sn_wfo_cfg_itsm.manager

#### About this task

#### Procedure

1. Navigate to **All** > **Workforce Optimization for ITSM** > **Manager Workspace**.
2. Select the coaching icon ( ).
3. Select the **Learning** tab.
4. Select **Learning paths** > **All learning paths**.
   - You can search paths based on keywords using the **Search** field or narrow down the display of the paths based on skills using the **Filter by skill** field.
   - Each path displays a highlight that shows whether it is in draft or published state. You can select a path that is **Draft** state and complete it. You can select a path that is in **Published** state and view the path details.
5. Select the Assign icon ( ) for the path you want to assign to agents.
The Assign icon is only available when the path is in **Published** state.
6. In the **Assign learning path** screen, assign the learning path to groups or team members.
   a. If the agents have to complete the path within a given date, select the **Mandatory** check box.
   b. In the **Due date** field, select the date by which they need to complete the path.
   c. Select **Assign**.
   You can see the progress your agents have made as they work on a path.

### Create a learning task

Create learning tasks for agents to keep track of their learning activities.

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### Before you begin
Role required: sn_wfo_cfg_itsm.manager

### About this task
Set learning task completion due dates to include or exclude weekends using the *exclude_weekends_on_learning_task_due_date* system property. For more information, see Workforce Optimization for ITSM Reference.

### Procedure
1. Navigate to **All** > **Workforce Optimization for ITSM** > **Manager Workspace**.
2. Click the coaching icon ( ).
3. Click the **Learning** tab.
4. Click **Learning Tasks** and select **All Tasks**.
5. Create a learning task.
   a. Click **New**.
   b. Fill in the following fields.

| Name | Description |
|---|---|
| Assigned to | Name of the agent to whom you want to assign the learning task. |
| Learning library | The learning library that contains the course item for the learning task. |
| Course item | The course that needs to be completed by the agent. |
| Due date | Date when the agent must complete the course. Default is 5 days after the creation of the learning task. This value is calculated from the **Days to Complete** field for the course item. For learning tasks that are assigned or in progress, the due date field is highlighted as follows:<br>▪ Green—if the task is due after the current day.<br>▪ Yellow—if the task is due on the current day.<br>▪ Red—if the task was due before the current day. |

6. Click **Save**.

## Analyze quiz details in Workforce Optimization for ITSM

Access a quiz to analyze the details.

### Before you begin
Role required: sn_wfo_cfg_itsm.manager

### Procedure
1. Navigate to **Workspaces** > **Manager Workspace**.
2. Select the coaching icon.
3. Select the **Learning** tab.
4. Go to **Learning courses** > **Internal courses**.
5. Select a quiz.

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6. Select **View quiz details**.
   The quiz details page appears.

### Surveys in Workforce Optimization for ITSM

Assess the quality of your teams' completed tasks. Use surveys to get feedback on from your team.

> **Note:**
> For detailed information on how to create a survey and associate with a coaching opportunity, see Create a survey and associate with a Coaching opportunity.

### Assess the quality of your agent's completed tasks

Assess the ability of your agents to resolve incidents or the quality of their completed tasks.

## Before you begin

You can create an assessment from an interaction or any task type. When you manually create an assessment, you can add a survey to it. Coaching assessments also get created and assigned to the coach based on the trigger conditions that are defined in coaching opportunities.
Role required: sn_coaching.coach

## About this task

If the coaching opportunity includes a survey, you can opt to take the survey and the assessment. When you use a survey to assess a trainee, the score for the survey is automatically calculated when you complete the survey. The assessment rating is then updated based on that score.

The Coaching Overview screen displays the average quality of the tasks that were completed in the past 30 days for your assignment groups.

- The donut chart displays the number of assessments in various states of completion. You can point to one of the states and click to open all assessments in that state.
- The bar chart displays assessments created by coaching opportunities. You can click on any of the data in the graph to access the assessments.
- You can click on the graph that displays the indicator data and access detailed information on the indicator.

## Procedure

1. Navigate to **All** > **Workforce Optimization for ITSM** > **Manager Workspace**.
2. Perform adhoc assessments or the ones triggered by coaching opportunities.

3. On the form, fill in the fields to assess the agent.

### Assessment form

| Field | Description |
|---|---|
| Opportunity | Coaching opportunity that is associated with the coaching assessment. |
| State | State of the assessment.<br>○ **Open**: New coaching opportunity.<br>○ **Work in progress**: Trainee is being coached. |

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| Field | Description |
|---|---|
| | ○ **Resolved**: Trainee is assigned coaching programs and training modules.<br>○ **Closed Complete**: Assessment has been resolved and closed.<br>○ **Closed Incomplete**: Assessment that has been closed but not completed, typically because the coaching assessment **Due Date** has expired. |
| Assessment Rating | How well the agent resolved the incident. The Coaching application automatically populates this field when a coach completes a survey for the trainee. |
| Follow up | Whether the coach must take further action to improve the trainee performance. |
| Comments | Notes, if any, to add about the assessment. |
| Survey taken by coach | Survey for the trainee taken by the coach.<br>You can add a survey for an assessment when you create the assessment manually or when the coaching opportunity triggers an assessment that does not have a survey.<br>When a coaching opportunity triggers an assessment and contains a survey, the survey is automatically added to the assessment and cannot be changed by the coach. |
| Survey taken by trainee | Survey for the coach taken by the trainee. |
| Add skills | Skills to add to the trainee profile when the assessment is complete. When you click this field, it displays all skills and the skill levels that are not in the trainee profile. |
| Add training | Training to assign to the trainee.<br>You can also assign learning tasks from course items. |

4. Do the following:
   - To complete the adhoc assessment, click **Save**.
   - To complete assessments creating using coaching opportunities, click **Complete assessment**.

### Create a survey in Workforce Optimization for ITSM

Create surveys and publish them. You can assign published surveys to an agent or a group. You can also share the survey with other teams by adding managers of those teams as the owners of the survey.

#### Before you begin

Role required: sn_wfo_cfg_ws.manager

#### Procedure

1. Navigate to **Workspaces** > **Manager Workspace**.
2. Select the Coaching icon ( ).
3. Select the **Assessments** tab.

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4. Select **Surveys** > **View Surveys**.
5. Add a survey.

   **Note:**
   For detailed information on how to create a survey and associate with a coaching opportunity, see Create a survey and associate with a Coaching opportunity.

6. Configure the survey based on your needs.
   For information on configuring a survey, see Configure a survey using Survey Designer.

   **Note:**
   To share the survey with other managers, you must add managers of those teams as the owners of the survey.

### Assign a survey to agents or groups

Assign a published survey to agents or groups so that they can take the survey.

#### Before you begin
Role required: sn_wfo_cfg_ws.manager

#### About this task

#### Procedure
1. Navigate to **Workspaces** > **Manager Workspace**.
2. Select the Coaching icon ( ).
3. Assign a survey to an agent or a group.

   **Note:**
   You can only assign surveys that are in the **Published** state.

   a. Select **Assign Survey**.
   The **Assign a new survey** pop-up appears.

   b. Assign the survey to an agent or a group.
   - To assign the survey to a group, in the **Assign at group level** field, add the groups to which you want to assign the survey.
   - To assign the survey to agents, in the **Assign to specific team members** field, add the individual members of the team to which you want to assign the survey.

   c. Select **Assign**.
   The survey is assigned to the agent. When agents complete the survey, you can select **View Scorecard** and analyze reports from the survey.

   Agents receive a notification when a survey is assigned to them.

## Coaching components in Workforce Optimization for ITSM

Workforce Optimization for ITSM installs the roles and tables when you enable the Workforce Optimization for ITSM plugin (sn_wfo_cfg_itsm).

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## Roles

| Role title [name] | Description | Contains roles |
|---|---|---|
| Coaching Admin [sn_coaching.admin] | Grants administrative rights to create, read, update, and delete (CRUD) coaching opportunities, assessments, training, and skills. | • sn_coaching.coach<br>• sn_lc.learning_admin |
| Coaching Coach [sn_coaching.coach] | Grants administrative rights to create, read, or update coaching opportunities, assessments, training, and skills. | • sn_coaching.trainee<br>• pa_viewer<br>• sn_lc.catalog_manager |
| Coaching Trainee [sn_coaching.trainee] | Grants access to add training, assessments, and skill records. | • skill_user<br>• pa_viewer<br>• survey_reader |

## Coaching Opportunities

| This coaching opportunity | Triggers when |
|---|---|
| Coaching on Incident SLA Breach | An SLA is breached. |
| Coaching on interaction long call time | A phone call lasts longer than 10 minutes. |
| Coaching on interaction long chat time | A chat interaction lasts longer than 30 minutes. |
| Coaching on interaction long walk-up time | A walk-up interaction lasts longer than 60 minutes. |

## Coaching surveys

| Name | Description |
|---|---|
| Phone Quality Survey | Survey associated with the Phone Interaction coaching opportunity. The coach assesses the agent using this survey after the agent completes a phone interaction. |
| Chat Quality Survey | Survey associated with the Chat Interaction coaching opportunity. The coach assesses the agent using this survey after the agent completes a chat interaction. |
| Walk-up Quality Survey | Survey associated with the Walk-up Interaction coaching opportunity. The coach assesses the agent using this survey after the agent completes a walk-up interaction. |

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## Business rule

| Business rule | Table | Description |
|---|---|---|
| Calculate coaching survey score | Assessment Instance [asmt_assessement_instance] | Sets the feedback rating based on the survey score. |

## Coaching with Learning

**Important:**
This feature is available with the Coaching with Learning plugin (sn_coach_lrn) from the ServiceNow Store. To enable this feature, see Activate Workforce Optimization for ITSM configurable workspace.

## Roles in Coaching with Learning

| Role title [name] | Description | Contains Roles |
|---|---|---|
| Learning admin [sn_lc.learning_admin] | Grants administrative rights to create, read, update, and delete (CRUD) catalog, learning content, roles, and configure learning source. | • sn_lc.catalog_manager<br>• sn_hr.integr_fw.admin |
| Learning course catalog admin [sn_lc.learning_course_catalog_admin] | Grants administrative rights to create, read, or update learning course catalogs. | |
| Learning catalog manager [sn_lc.catalog_manager] | Grants administrative rights to create, read, or update learning libraries. | • sn_lc.task_creator<br>• sn_lc.content_writer |
| Learning catalog group manager [sn_lc.catalog_group_manager] | Grants administrative rights to create, read, or update learning libraries based on groups. | • sn_lc.task_creator<br>• sn_lc.content_writer |
| Learning content writer [sn_lc.content_writer] | Grants read or write access for learning courses. | sn_lc.content_creator |
| Learning content advisor [sn_lc.learning_advisor] | Can assign learning tasks. | |
| Learning task creator [sn_lc.task_creator] | Grants read or write access for learning tasks. | |

## Tables in Coaching with Learning

| Table | Description |
|---|---|
| Learning External Content [sn_lc_external_content] | Stores details of external course items that are pulled from third-party systems. |

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| Table | Description |
|---|---|
| Learning User Course Activity [sn_lc_user_course_activity] | Stores details of learning course activities such as user to whom the course is assigned, status, due date, and name of the learning course. |
| Learning Content [sn_lc_content] | Stores details of internal learning content such as knowledge articles, videos that are created in ServiceNow. |
| Learning Course Item [sn_lc_course_item] | Stores details of learning course items, such as the source to which the learning course belongs. |
| Learning Catalog [sn_lc_catalog] | Stores details of learning catalog items with its course items. |
| Learning Task [sn_lc_learning_task] | Stores details of learning tasks, such as user to whom the learning task assigned, and due date by when the learning task must be completed. |
| Learning System Configuration [sn_lc_learning_system_configuration] | Stores configuration parameters of sources (third-party learning management systems). |

## Properties in Coaching with Learning

| Property | Description |
|---|---|
| glide.ui.sn_coaching_assessment_activity_fields | Edit coaching assessment activities.<br>• **Type:** string<br>• **Default value:** assigned_to,cmdb_ci,state,impact,priority,opened_by,work_notes,comments,*Attachme |
| sn_coaching.recommended_learning_deprecated | Coaching with Learning - deprecated Trainings is being deprecated and replaced with the Learning Tasks and course items from Coaching with Learning.<br>• **Type:** string<br>• **Default value:** true |
| sn_coach.lrn.exclude_weekends_property | Enable to exclude weekends while setting the due date for learning tasks.<br>• **Type:** true\|false<br>• **Default value:** true |
| sn_coach_lrn.learning_list_array_properties | List array properties for the now-list-menu component on the Learning Tasks tab, coaching module.<br>• **Type:** string<br>• **Default value:** script for data array |

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| Property | Description |
|---|---|
| com.glide.transform.json.max partial-length | Transforms JSON objects to internal objects and sets the word limit for records fetched through an API call.<br>• **Type:** integer<br>• **Default value:** 16384<br>**Note:**<br>You must Add this system property to set the desired value.<br>When you synchronize third-party learning content with your ServiceNow instance, if the word count of the content being pulled into your instance exceeds the value set for this property, the synchronization will fail. |
| com.snc.process_flow.rsp.ctrl.serialized_value_limit | Specify the number of bytes allowed for runtime values in each step in the flow execution details. To prevent truncation, set the value to an integer equal to or less than zero.<br>• **Type:** integer<br>• **Default value:** 16384<br>**Note:**<br>When you synchronize third-party learning content with your ServiceNow instance, if the word count of the content being pulled into your instance exceeds the value set for this property, the synchronization will fail. |
| sn_coach_lrn.learningpath_detail_view.item | Number of course item records on learning path page that will display in Service Operations Workspace.<br>• **Type:** integer<br>• **Default value:** 50 |
| sn_coach_lrn.sn_lc_enable_discover | Enables the **Discover** tab in the Service Operations Workspace learning application.<br>• **Type:** Yes\|No<br>• **Default value:** Yes |
| sn_coach_lrn.sn_lc_enable_recommendations | Enables learning path recommendations in the Service Operations Workspace learning application.<br>• **Type:** Yes\|No<br>• **Default value:** Yes |

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## Surveys in Coaching with Learning

| Name | Description |
|---|---|
| Phone Quality Survey | Survey associated with the Phone Interaction coaching opportunity. The coach assesses the agent using this survey after the agent completes a phone interaction. |
| Chat Quality Survey | Survey associated with the Chat Interaction coaching opportunity. The coach assesses the agent using this survey after the agent completes a chat interaction. |
| Walk-up Quality Survey | Survey associated with the Walk-up Interaction coaching opportunity. The coach assesses the agent using this survey after the agent completes a walk-up interaction. |

## Recommendation grouping

The recommendation groups listed in the table below are available by default to the logged-in user's primary assignment groups.

**Note:**
You can deactivate the recommendations for the recommendation groups provided by default, but you cannot delete them. To deactivate the recommendations, in the Recommendations related list in the Context form, change the **Active** field value to **false**.

You can create additional recommendations and recommendation groups and associate them with recommendation contexts. For more information, see Recommended Actions application

| Recommendation group name | Recommendation provided based on this criteria |
|---|---|
| Based on your work items | The work you've done in the past. |
| Based on your team's activity | The activities from the teams to which you belong. |
| Based on your previous courses | Courses you've completed in the past. |
| Most popular in your team | Courses that are considered the most popular by your team. |
| New from your library | Courses in your learning library. |
| Most popular in your organization | Courses that are most popular in your organization. |
| New from your catalogs | New courses in your course catalog. |

## Deleting course activity records

Course activity records are used for learning recommendations and are retained for 365 days by default. Do the following to change the number of days, represented as Age in seconds, for which you want to retain the record.

1. In the application filter navigator, enter `sys_auto_flush.LIST` and press **Enter**. The **Auto Flushes** list displays.
2. In the **Tablename** column, select the Learning User Course Activity [sn_lc_user_course_activity] table.
3. In the **Age in seconds** field, change the value to the time you desire to retain the records.

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# Skills Management in Workforce Optimization for ITSM

Manage skills for your teams from a central location. Analyze skill data and assess the skills that you need for your organization. Use Predictive Intelligence to recommend skills for your team.

**Note:**
As an admin, you can add sample data to get started building your skill taxonomy using the Skills Library Data for Skills Management (com.snc.skills_management.seed_data) plugin. You must have the Workforce Optimization for ITSM Configurable Workspace plugin (sn_wfo_cfg_itsm) installed. For more information on downloading skills sample data, see Create skill categories using sample data.

## Adding skills to agents' skill set in Workforce Optimization for ITSM

Analyze all skills and the levels for each skill that your agents have from one location.

Skill Recommendation

The skill matrix in Workforce Optimization for ITSM in the Coaching application displays all skills for all the teams that you manage or additionally manage.

Using the skill matrix, you can:

- View a list of all skills and the level for each skill for every agent grouped by assignment group.
- View the overall skill coverage for each group.
- Filter the skill matrix based on users, groups, skill type, skill level, or skill category.

**Note:**
Reset the filter if you want to view the skills for all users. When you reset the filters, all filters other than the Skill filter are reset. The Skill filter retains the skill selections that you've applied to display in the skill matrix.

You can view up to 50 skills at any point in time. For more information on skills and skills levels, see Skills Management.

When your agents gain new skills you can add them manually or use Predictive Intelligence to recommend skills that agents have used that have not yet been added to their skill set. For information on how predictive intelligence works to recommend skills for agents, see Coaching in Workforce Optimization for ITSM.

### Add or update skills using Workforce Optimization for ITSM

Add skills or update skill levels for an agent so that it gets added to their skill set.

#### Before you begin
Role required: skill_manager

#### Procedure

1. Navigate to **All** > **Workforce Optimization for ITSM** > **Manager Workspace**.
2. Select the coaching icon.
3. Select the **Skills** tab.
4. Add a skill or update a skill level.

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### Approve or reject recommended skills in Workforce Optimization for ITSM

Approve predicted skills if the skill is necessary for the agent to complete assigned tasks. If the skill doesn't apply to the agent, you can reject a skill.

#### Before you begin
Role required: skill_manager

#### About this task
The Predictive Intelligence application for skills displays the recommended skills on each agent's profile. The application uses sample incidents that the agent has worked on to recommend skills for an agent.

#### Procedure

1. Navigate to **All** > **Workforce Optimization for ITSM** > **Manager Workspace**.
2. Select the coaching icon.
3. Select the **Skills** tab.
4. Approve or reject a skill that is recommended by Predictive Intelligence.
   a. In the skill matrix, select **Recommended** to approve and recommend a skill for the user.
   b. In the **Details** tab, review the request for skill approval, the sample incident resolutions that were used to predict the skill, and the activity stream.
      - To approve a skill, select **Approve**. The skill is added to the agent and the lowest level for the skill is automatically associated with the added skill. The state for the request changes to **Approved** and the skill is added to the agent.
      - To reject a skill, select **Reject**. The state for the request changes to **Rejected**. Predictive Intelligence doesn’t recommend the skill for the user again and the field changes to **Add**.
   c. Select the more options ( ··· ) icon and select **Save**.
   The application assigns the skill to the user. If the assigned skill doesn’t have a skill level, the application adds the basic skill level to the user.

## Setting up skill prediction in Workforce Optimization for ITSM

Collect skill data based on skills agents have used for incident resolution. Use supervised learning to recommend these skills for agents to resolve similar open incidents. You can also find patterns in how skills are used for incident resolution and use unsupervised learning to recommend skills for agents.

#### Before you begin
Predictive Intelligence must be set up and configured on your instance to train the models. For more information, see Predictive Intelligence.

Activate the Skill Recommendation application plugin (com.snc.sre) to use predictive intelligence for recommending skills.

Role required: sn_sre.admin

#### Procedure

1. Configure the properties for the Skill Recommendation application.
2. Run the solution definition models to train the supervised and unsupervised solutions.
   For more information on training a solution, refer to Create and train a similarity solution.

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3. Run the *Start skill prediction* scheduled job everyday to start predicting skills for incidents or agents.
   This scheduled job is inactive by default. When you activate it, the job runs daily at 1:00 AM on all incidents resolved the previous day. The job then adds the skills to the User Predicted Skill [sn_sre_user_predicted_skill] table and Task Predicted Skill [sn_sre_task_predicted_skill] table.

### Use extension points for skill prediction

Use scripted extension points to customize skill prediction for tasks.

#### Before you begin

The Skill Recommendation extension point is included with the Skill Recommendation (com.snc.sre) plugin.
Role required: admin

#### About this task

You can create multiple implementations for each extension point and provide an order number for each implementation. The implementation that has the lowest order number is executed.

#### Procedure

1. Navigate to **All** > **System Extension Points** > **Client Extension Points**.
2. From the Extension Points list, select **Skill Recommendation** (sn_sre.SkillPredictionAPI).
3. Do one of the following:
   - To create a new skill recommendation implementation, click **Create Implementation**.
   - To modify an existing implementation, from the **Implementations** related list, select a class.
4. Modify the script as required.
5. Click **Update**.

## Initiate a skill review for teams or groups

Start a skill review process for your groups or specific team members so that they can review and update their existing skills or to add new skills. Provide a due date for them to complete the skill review.

#### Before you begin

Skill Review

Role required: sn_wfo_skillreview.manager

#### Procedure

1. Navigate to **Workspaces** > **Manager Workspace**.
2. Select the Coaching icon (  ).
3. Select the **Skills** tab.
4. Select **Generate skill request**.
   You can save the generated skill request in **Draft** state and work on it at a later time.
5. Fill in the fields on the **Initiate skill review** form:

| Field | Description |
|---|---|
| Title | Name for the skill review. |

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| Field | Description |
| --- | --- |
| Due Date | Date by which the team member or group must complete the skill review. |
| Assignment | ○ **To my groups:** sends the skill review to the team members is all of your groups.<br>○ **Specific groups or team members:**sends the skill review to the specified groups or team members. |
| Skills to review | ○ **Team member's existing skills:** request for team members to review their existing skill levels and update them.<br>○ **Additional skills:** request team members to add new skills. |

6. Select **Submit**.

**Note:**
You can cancel a skill review request that you have submitted for review.

The agent will receive a notification to review the request.

## Approve or reject a skill review request

Review skills when your team updates their skill proficiencies and requests approval. You can approve or reject each of those skills. The skills that you approve are added to the agent's profile.

### Before you begin
Role required: sn_wfo_skillreview.manager

### About this task
You will receive a notification when an agent in your assignment group submits a skill review request.

### Procedure

1. Navigate to **Workspaces** > **Manager Workspace**.
2. Select the Coaching icon ( ).
3. Select the **Assessments** tab.
4. Select **Skill review requests** > **Pending manager review**.
5. Select an agent to approve or reject the skills.
   In the **Comments** field, you can add a comment for approving or rejecting the skill.
   - To approve one or more skills, select the skills and select **Approve**. You can also select **Approve All** to approve all skills.
   - To reject one or more skills, select the skills and select **Reject**. You can also select **Reject All** to reject all skills.
6. Select **Complete**.

The skills you've approved gets added to the agent's skill set.

## Routing work based on skills in Workforce Optimization for ITSM

Route work to your teams based on skills, schedule your teams' work, and train your teams to enhance their skills set using Workforce Optimization for ITSM.

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The video shows how skill-based routing works in Workforce Optimization for ITSM.

Skill-based routing

### Automatically add skills to incidents or interactions in Workforce Optimization for ITSM

Define conditions for incidents or interactions and add skills required for those conditions using skill determination rules. When new incidents and interactions that are created meet these conditions, the skill determination business rule automatically adds the skills to those records. In the Workforce Optimization for ITSM Channels and Work scheduler applications, the work items get automatically assigned to the right agents based on the skills.

## Before you begin

Role required: skill_admin or admin

## About this task

The following business rules are used in Workforce Optimization for ITSM skill determination:

- *`Skill determination for incident`* evaluates new incidents for the conditions defined in the skill determination rules set for all incidents and adds those skills to the incident records.
- *`Skill determination for interaction`* evaluates new interactions for the conditions defined in the skill determination rules set for all interactions and adds those skills to the interaction records.

The table below shows the skill determination rules available for Workforce Optimization for ITSM.

**Note:**
To add language detection skills, you must set dynamic translation APi. for more information, see Dynamic Translation API.

### Default skill determination rules for Workforce Optimization for ITSM

| Skill Determination Rule | Source Table | Type | Description |
|---|---|---|---|
| Language Detection Incident | Incident [incident] | Advanced | The business rule evaluates new incidents for the language entered in the incident short description and adds that language as a required skill for those incidents. |
| Language Detection Interaction | Interaction [interaction] | Advanced | The business rule evaluates new interactions for the language entered in the interaction short description and adds that language as a required skill for those interactions. |
| SAP Skills | Incident [incident] | Simple | The business rule evaluates new incidents for the **Service** field that starts with 'SAP', 'sap', or 'Sap' and adds **SAP** and **Backoffice** skills as required skills for those incidents. |
| VPN Incident | Incident [incident] | Simple | The business rule evaluates new incidents for the **Short description** field that contains 'VPN', 'vpn', or 'Vpn' and adds **Router and Switch** and |

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**Default skill determination rules for Workforce Optimization for ITSM (continued)**

| Skill Determination Rule | Source Table | Type | Description |
|---|---|---|---|
| | | | **Network** skills as required skills for those incidents. |
| VPN Interaction | Interaction [interaction] | Simple | The business rule evaluates new interactions for the **Short description** field that contains 'VPN', 'vpn', or 'Vpn' and adds **Router and Switch** and **Network** skills as required skills for those incidents. |
| Windows | Incident [incident] | Simple | The business rule evaluates new incidents for the **Configuration item** field that contains 'Windows', 'windows', or 'WINDOWS' and adds **Windows Installation/Setting** and **Windows Servers** skills as required skills for those incidents. |

### Procedure

1. Navigate to **All** > **Skills** > **Skill Determination Rules**.
2. Add the desired rule for an incident or an interaction.
   For information, see Create Skill Determination rules to assign skills to work items.

## Skill review request components in Workforce Optimization for ITSM

Workforce Optimization for ITSM installs roles and enables notifications when you install the application.

### Roles

| Role title [name] | Description |
|---|---|
| Skill review manager [sn_wfo_skillreview.manager] | Grants administrative rights to create, read, update, and delete (CRUD) skill review request records. |
| Skill review user [sn_wfo_skillreview.user] | Grants administrative rights to create, read, or update skill review request records. |

### Notifications

Navigate to **All** > **System Notifications** > **Provider** > **Notifications** to access the notifications below that are provided by default. For more information on adding notifications, see Provider notification.

| Notification name | Value |
|---|---|
| Skill Request Pending Manager Review | When enabled, the manager receives a notification when their agent submits a skill review request to their manager for review. |

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| Notification name | Value |
|---|---|
| | • **Type:**string<br>• **Default value:**true |
| Skill Request Reviewed | When enabled, the agent receives a notification when their manager submits a skill request that has been reviewed.<br>• **Type:**string<br>• **Default value:**true |
| Skill Request Cancel | When enabled, if the agent or manager cancels the skill review request then the skill review request assignee will receive a notification.<br>• **Type:**string<br>• **Default value:**true |
| Skill Request Pending User Review | When enabled, the agent receives a notification that their manager has submitted a skill request for the agent to review.<br>• **Type:**string<br>• **Default value:**true |

## Skill Recommendation components in Workforce Optimization for ITSM

Workforce Optimization for ITSM uses roles to administer skill recommendation, tables to store skill data, and properties to modify default behavior, and scheduled job to recommend skills in configurable Workforce Optimization for ITSM.

### Roles

| Role title [name] | Description | Contains roles |
|---|---|---|
| Skill Recommendation User [sn_sre.user] | Grants rights to view skill recommendation tables. | wfo.user |
| Skill Recommendation Admin [sn_sre.admin] | Grants administrative rights to edit the properties for skill recommendation. | • wfo.admin<br>• sn_sre.user |

### Properties

Navigate to **Skill Recommendation** > **Configuration** to configure these properties.

| Property | Description |
|---|---|
| Enable skill recommendation. | Enable this p |

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| Property | Description |
| --- | --- |
| sn_sre.enable_skill_recommendation | • **Type:**true<br>• **Default va** |
| Maximum number of skills to predict based on supervised learning.<br>sn_sre.max_supervised_skills | Using superv ordered by c<br>• **Type:**Integ<br>• **Default va** |
| Maximum number of skills to predict based on supervised learning.<br>sn_sre.max_unsupervised_skills | Using unsup incident ord<br>• **Type:**Integ<br>• **Default va** |
| Number of resolved similar tasks to use for predicting skills.<br>sn_sre.number_of_similar_incidents | The number learning, ord<br>• **Type:**Integ<br>• **Default va** |
| Number of times Predictive Intelligence must predict the same skill for an agent before recommending it for the agent.<br>sn_sre.user_predicted_skill_threshold | The number before recor<br>• **Type:**Integ<br>• **Default va** |
| Similarity solution definition to recommend skills from similar incidents.<br>sn_sre.unsupervised_solution_definition_for_incidents | Name of the resolve incid definition, yo<br>• **Type:**Strin<br>• **Default va** |
| Similarity solution definition to recommend skills for incidents.<br>sn_sre.supervised_solution_definition_for_incidents | Name of the resolve incid definition, yo<br>• **Type:**Strin<br>• **Default va** |

## Scheduled job

| Scheduled job | Description |
| --- | --- |
| Start skill prediction | Runs the job every day at 1 AM on all incidents that were closed the previous day. Recommends the skills used to close the incidents to resolve similar open incidents. |

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### Tables

| Table | Description |
|---|---|
| User Predicted Skill [sn_sre_user_predicted_skill] | • Stores how many times a skill has been predicted for the user.<br>• Skills not recommended in the last 60 days are automatically deleted from this table. |
| Task Predicted Skill [sn_sre_task_predicted_skill] | • Stores the skills predicted to resolve each type of incident.<br>• Tables created over 60 days ago are automatically deleted from this table. |

## Integrating Process Mining with Workforce Optimization for ITSM

Integrate Workforce Optimization for ITSM with Process Mining to discover bottlenecks in your processes and take action.

### Setting up the integration of Process Mining with Workforce Optimization for ITSM

Use default templates so that you can create process mining projects for your assignment groups to mine the data.

The Process Mining template for the Incident tables is available by default with the Default template type.

But you can create a new template with the Default template type on a new table. For more information, see Create Process Mining templates.

**Note:**
Workforce Optimization only mines the data for the Incident table. So, Workforce Optimization uses only the Incident table.

#### Create Process Mining templates

Create templates on tables for which you want to create the process mining projects.

**Before you begin**
Role required: admin

**Note:**
You can only create templates for tables where Sys Audit (sys_audit) is enabled. For more information on Sys Audit, see Sys Audit and Audit Relationship Change tables and Enable auditing for a table.

**Procedure**

1. Navigate to **All** > **Process Mining** > **Templates** > **All Templates**.
2. Create a default process mining template.

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**Note:**
The Process Mining template for the Incident table is available by default.

a. Select **New**.
The **Project Definition** screen appears.

b. In the **Name** field, enter a name for the process mining template.

c. In the **Template type** field, select **Default**.

d. Right-click the form header and select **Save**.

3. Create table configuration for the process mining template.
   a. In the Table Configuration related list, select **New**.
   b. In the **Name** field, enter a name for the table configuration.
   c. In the Table menu, select the table, for example, Incident, for which you want to mine the data.
   d. Select **Submit**.
4. Create an activity definition.

   a. Select the table configuration that you've created.

   b. In the Activity Definitions related list, select **New**.
   You must add at least one activity to create the process project.

   c. In the **Field** field, select the field for which you want to create the activity definition.

   d. Select **Submit**.

5. Select **Submit**.
   Repeat these steps and create a template for each table for which you want to mine the data.

**Related topics**

Create a Process Mining project for a KPI group

### Workforce Optimization for ITSM integration with Process Mining components

Workforce Optimization for ITSM installs roles and properties to configure the Workforce Optimization for ITSM integration with Process Mining.

## Properties

| Property | Description |
|---|---|
| sn_team_perf.enable.po.wfo | Enable the integration of Process Mining with Workforce Optimization for ITSM.<br>• **Type:** true \| false<br>• **Default value:** false |

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| Property | Description |
| --- | --- |
| promin.wfo.run_frequency | Time interval to re-mine Process Mining projects. After you run the Process Mining - WFO Remine Projects scheduled job to mine the data, you can run it again only at the set interval. If you run the job earlier than that, it will not remine the data.<br>• **Type:** integer<br>• **Default value:** 7 days |

## Roles

| Role title [name] | Description | Contains roles |
| --- | --- | --- |
| Process Mining Analyst [sn_process_optimization_analyst] | Create and share Process Mining projects. | sn_process_optimization_viewer |

## Scheduled jobs

Navigate to **All** > **System Definition** > **Scheduled jobs**.

| Name | Description |
| --- | --- |
| Process Mining - WFO Remine Projects | Automatically runs once a day. You can run this job on demand when additional data is added to a project so that you get the up-to-date process insights into your projects. The job will remine data based on the frequency set in the *promin.wfo.run_frequency* property. |

## Identifying bottlenecks using Process Mining integration with Workforce Optimization for ITSM

Get insights into your teams' performance and analyze anomalies or bottlenecks within the process when you drill down into a leaf node KPI.

A leaf node KPI is a child KPI that cannot be drilled down further.

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**Important:**

- To integrate Process Mining with Workforce Optimization for ITSM, you must enable the Process Mining plugin (com.sn_po) after you enable the Workforce Optimization for ITSM (sn_wfo_cfg_itsm) plugin from the ServiceNow Store.
- You must enable the *sn_team_perf.enable.po.wfo* system property to **True** to enable the integration of Process Mining with Workforce Optimization for ITSM. For more information, see Workforce Optimization for ITSM integration with Process Mining.
- You can create your own process finding definitions. You also have the option of enabling process finding definitions that have default process configurations for incidents, problems, and change requests when you install the ITSM Process Mining Content Pack (sn_itsm_po) plugin available from the ServiceNow Store. If you do not enable this plugin, you can analyze process variations but not process findings.

For more information, see Activate Workforce Optimization for ITSM and Request Process Mining.

### Create a Process Mining project for a KPI group

Create Process Mining projects for each KPI group and its assignment groups. One project is created per KPI group per table.

## Before you begin

Your administrator:

- Must have created templates on tables that you want to create the process projects for. For information on creating templates, see Create Process Mining templates.
- Must run the *Process Mining - WFO Remine Projects* on-demand scheduled job when additional data is added to the projects so that you get the up-to-date process insights into your projects. The job is run on all projects that meet set criteria such as the frequency to remine that is set using the **promin.wfo.run_frequency** system property. Also, the scheduled job updates the project and remine when there are any changes to the assignment groups.

  For more information, see Workforce Optimization for ITSM integration with Process Mining.

Role required: sn_process_optimization_analyst

The KPI assignment group manager must have this role to create process projects for their KPI groups.

## About this task

After you mine the project, the Project Definition for Process Minings (sn_team_perf_promin_project_groups) project mapping table holds the reference for Workforce Optimization. Each project in the table has a unique source associated with each application. For example, the **Source** field in the table shows the assignment group associated with the Workforce Optimization project. The **Source** field is an identifier for the specific applications. The table also shows the KPI group associated with the project that you've mined.

## Procedure

1. Mine the project to create process mining projects for each KPI group.

   a. Navigate to **All** > **Workforce Optimization for ITSM** > **Team Performance** > **KPI Groups**.

   b. Select a KPI group.

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c. Select **Initiate Process Mining**.

The process mining is run on active assignment groups. The project mining process is run on all leaf node automated or formula indicators in the KPI group.

A corresponding project is created in the **All** > **Workforce Optimization for ITSM** > **Team Performance** > **WFO Projects** module. When the mining is complete, the **Mining state** field changes to **Available**.

A user with the role, sn_wfo_cfg_itsm.manager, has a access to create or view the project, and can view the process insights and variation analysis in the **Process analysis** tab.

**Note:**

- If a project process has been mined for a specific table in an assignment group, the projects are created for those assignment groups. Therefore, you can't mine the table in that assignment group again.
- If you're using a formula indicator for process mining, you can select any indicator source that is used in the formula.

2. **Optional:** If you add additional assignment groups to the KPI group after you do process mining, you must remine the group again.

a. In the Assignment Group related list for the selected KPI group, select **Edit**.

b. Add the desired assignment group to the KPI group.

(Optional) A process is automatically created for the assignment group. If you add an assignment group to the KPI group, the assignment group will be updated in the filter condition, and if you remove any assignment group, it will be removed from the project filter condition. An informational message is displayed when an assignment group is added to the KPI group only if the KPI group is already mined.

All the assignment groups associated with the KPI group for which you've created the project are updated in the filter condition of the table configuration.

For more information on mining data, see Generate a model.

After any previous versions of Team Performance are upgraded to the latest version (Team Performance App Version: 7.0.1), all the previous projects will be removed for KPI groups that had multiple projects for assignment groups and new projects will be created for each of them.

## Advanced configurations for Workforce Optimization for ITSM

You can perform advanced configurations such as customizing Workforce Optimization for ITSM pages, and defining filters for different modules. You can also specify the access to assignment group data to display only the assignment group data relevant to the logged-in user.

### Workforce Optimization for ITSM reference

Refer to install components such as roles, tables, and system properties to configure and administer Workforce Optimization for ITSM.

To get details on which roles can be associated with each Workforce Optimization for ITSM persona, see Roles in Workforce Optimization for ITSM.

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## Reference overview

Find reference topics you need to that you need to complete to administer Workforce Optimization for ITSM.

| Benefit | Reference topic |
|---|---|
| Separate data, processes, and administrative tasks into logical groupings called domains. | Domain separation and Workforce Optimization for ITSM |
| Refer to roles and indicators used in the ITSM manager workspace. | Workforce Optimization ITSM Manager Workspace components |
| Refer to tables to store user and application data or database views and a schedule job to collect data for indicators. | Workforce Optimization for ITSM components |
| Refer to roles to administer channels and queues, properties to configure default behavior, and reports to analyze channel data. | Channel Management components in Workforce Optimization for ITSM |
| Refer to roles to administer agent shifts and schedules, properties, and user preferences to configure default behavior. | Scheduling components in Workforce Optimization for ITSM |
| Refer to roles to administer demand forecast, properties to configure default behavior, scheduled jobs to collect data for the configurations, and more to configure demand forecast. | Demand Forecast components in Workforce Optimization for ITSM |
| Refer to properties to configure the Work scheduler default behavior. | Work Scheduler components in Workforce Optimization for ITSM reference |
| Refer to roles to administer teams and properties to modify default behavior. | Teams components in Workforce Optimization for ITSM |
| Refer to roles, tables, properties and more for Coaching. | Coaching components in Workforce Optimization for ITSM |
| Refer to roles and how to access notifications for Skill review request. | Skill review request components in Workforce Optimization for ITSM |
| Refer to roles, properties, scheduled job, and tables for Skill recommendation. | Skill Recommendation components in Workforce Optimization for ITSM |
| Refer to roles and properties for integrating with Process Mining. | Workforce Optimization for ITSM integration with Process Mining components |

### Workforce Optimization ITSM Manager Workspace components

The configurable ITSM Manager Workspace has roles to administer the workspace, properties to configure default behavior, and indicators to analyze performance.

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## Roles

| Role title [name] | Description | Contains roles |
|---|---|---|
| Manager Workspace User [sn_wfo_cfg_ws.user] | Grants read access to the Next Experience UI Builder workspace. | • workspace_user<br>• canvas_user |
| Manager Workspace Manager [sn_wfo_cfg_ws.manager] | Grants read access to primary assignment groups and additional managers. Grants read access to home and list modules. | • sn_wfo_cfg_ws.user<br>• sn_wfo.user<br>• sn_wfo_skillreview.manager |
| Manager Workspace Admin [sn_wfo_cfg_ws.admin] | Grants administrative rights to create, read, update, and delete (CRUD) all applications and settings in Manager Workspace. | • sn_wfo_cfg_ws.manager<br>• workspace_admin<br>• ui_builder_admin<br>• canvas_admin<br>• sn_wfo.admin |

### Workforce Optimization for ITSM components

The Workforce Optimization for ITSM application has tables to store user and application data or database views and a schedule job to collect data for indicators.

## Roles

| Role title [name] | Description | Contains roles |
|---|---|---|
| Workforce Optimization User [sn_wfo.user] | Grants read access to primary group and additional managers. | • pa_analyst<br>• sn_agent_forecast.user<br>• approver_user |
| Workforce Optimization Admin [sn_wfo.admin] | Grants administrative rights to create, read, update, and delete (CRUD) additional managers. | • sn_wfo.user<br>• pa_analyst<br>• sn_agent_forecast.admin |
| Workforce Optimization ITSM Employee [sn_wfo_cfg_itsm.employee] | Grants read rights for Coaching, Scheduling and Teams applications. | • sn_wfo.user<br>• sn_shift_planning.agent<br>• sn_coaching.trainee<br>• sn_team_perf.team_performance_user<br>• awa_agent |

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| Role title [name] | Description | Contains roles |
|---|---|---|
| | | • canvas_user<br>• sn_wfo_skillreview.user |
| Workforce Optimization ITSM Manager [sn_wfo_cfg_itsm.manager] | Grants rights to create, read, or update, Coaching, Scheduling, Teams, or Channel Management applications. | • sn_wfo_cfg_ws.manager<br>• itil<br>• sn_walkup.walkup_manager<br>• sn_agent_forecast.user<br>• sn_shift_planning.admin<br>• sn_coaching.coach<br>• sn_team_perf.team_performance_manager<br>• sn_channel_mgmt.user<br>• sn_sre.user<br>• pa_target_admin<br>• awa_agent<br>• skill_manager<br>• sn_wfo_skillreview.manager<br>• sn_wfo_work_sched.manager<br>• sn_cti_core.user_manager<br>**Note:** This role is automatically installed if you have integrated Workforce Optimization for ITSM with ServiceNow Voice.<br>• sn_process_optimization_analyst |
| Workforce Optimization ITSM Admin [sn_wfo_cfg_itsm.admin] | Grants administrative rights to create, read, update, and delete (CRUD) Coaching, Scheduling, Teams, or Channel Management applications. | • sn_wfo_cfg_itsm.manager<br>• sn_shift_planning.admin<br>• sn_coaching.admin<br>• sn_team_perf.team_performance_admin<br>• sn_agent_forecast.admin<br>• sn_sre.admin<br>• skill_admin<br>• sn_process_optimization_analyst<br>• sn_wfo_work_sched.admin |

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## Filter Configuration Tables

| Module Name | Module Tables / Database View |
|---|---|
| Schedule | • User [sys_user]<br>• User Skill [sys_user_has_skill]<br>• Agent Schedule [sys_shift_planning_agent_schedule]<br>• Schedule Event [sn_shift_planning_event]<br>• Manager Groups database view [sn_wfo_manager_group] |
| Coaching | • Skill [cmn_skill]<br>• Skill Category M2M [cmn_skill_m2m_category]<br>• Group Member [sys_user_grmember] |
| Channels | Manager Groups database view [sn_wfo_manager_groups]<br>**Note:**<br>The filters for your channels have been custom built so that you can navigate using Advanced Work Assignment channels and queues. Because they were custom built, you can't create or customize filters for channels module. |

## Scheduled job

| Name | Description |
|---|---|
| WFO data collection | Runs the job on demand and collects data for all Workforce Optimization for ITSM indicators. |

## Domain separation and Workforce Optimization for ITSM

Domain separation is supported in Workforce Optimization for ITSM. Domain separation enables you to separate data, processes, and administrative tasks into logical groupings called domains. You can control several aspects of this separation, including which users can see and access data.

## Support level: Basic

- Business logic: Ensure that data goes into the proper domain for the application’s service provider use cases.
- The application supports domain separation at run time. The domain separation includes separation from the user interface, cache keys, reporting, rollups, and aggregations.
- The owner of the instance must set up the application to function across multiple tenants.

Sample use case: When a service provider (SP) uses chat to respond to a tenant-customer’s message, the customer must be able to see the SP's response.

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For more information on support levels, see Application support for domain separation.

## How domain separation works in Workforce Optimization for ITSM

Domain separation is supported in Workforce Optimization for ITSM and does not require any setup or configuration.

## Domain separation for Channels Workforce Optimization for ITSM

For information on how domain separation works in Channel Management for Workforce Optimization for Customer Service, refer to Domain separation and Advanced Work Assignment

Domain separated tables for Channel Management

- sn_customerservice_case
- interaction

## Domain separation for Scheduling Workforce Optimization for ITSM

When an agent schedule is generated and assigned to an agent, the schedule is only available in the domain to which that agent belongs.

Domain separated tables for Scheduling

- sn_shift_planning_agent_schedule
- sn_shift_planning_agent_schedule_request
- sn_shift_planning_break
- sn_shift_planning_day
- sn_shift_planning_event
- sn_shift_planning_schedule_plan
- sn_shift_planning_schedule_shift
- sn_shift_planning_schedule_shift_agent
- sn_shift_planning_shift_plan
- sn_shift_planning_shift_swap_request

## Domain separation for Teams in Workforce Optimization for ITSM

The *sn_wfo_add_manager* table is domain separated. When users are added as additional managers, those users can only view users within that domain.

## Domain separation for Skill Recommendation in Workforce Optimization for ITSM

Domain separated tables for Skill Recommendation

- sn_sre_task_predicted_skill
- sn_sre_user_predicted_skill

## Domain separation for Coaching in Workforce Optimization for ITSM

For information on how domain separation works in Coaching for Workforce Optimization for ITSM, refer to Domain separation and Coaching

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## Global Search in Workforce Optimization for ITSM

Locate what you're looking for quickly using the global search in Workforce Optimization for ITSM.

As an agent or a manager, easily find the information you need by searching users, groups, shifts, schedules, or tasks using the search icon  .

**Note:**
To search shifts and schedules, you must generate the text index for the following tables before you start performing the search for shifts and schedules:

- Schedule [sn_shift_planning_schedule_plan]
- Shift Plan [sn_shift_planning_shift_plan]

## Requesting time-off using the ITSM Mobile Agent for Workforce Optimization for ITSM

Using the ITSM Mobile Agent app, shift planning agents can access their schedule. They can request time off to get their manager's approval or swap shifts with their peers and receive notifications for those requests and approvals.

Workforce Optimization for ITSM Mobile Agent

**Important:**
The ITSM Mobile Agent for Workforce Optimization for ITSM features are available with the ITSM Mobile Agent 5.0 store application. For more information, see Activate Workforce Optimization for ITSM.

## Using On-Call Scheduling with Workforce Optimization for ITSM

If you are using Mobile experience for On-Call Scheduling along with the ITSM Mobile Agent for Workforce Optimization for ITSM, you can access the On-Call Scheduling actions from the Schedule section.

To access:

- **Upcoming shifts**: tap **My calendar** and view your shifts.
- **Time-off requests**: tap **On-call time-off requests** and view the list of requests awaiting your approval and the ones for which you have completed the approval process.
- **Who is on-call**: tap **Who is on-call** to view the list of groups in the on-call schedule.

## Setting the number of days to display events in shifts on the ITSM Mobile Agent

As a Workforce Optimization admin [sn_wfo.admin], you can configure the number of days events for shifts can be displayed on the mobile application using system properties. For more information, see **Properties** in the **Scheduling** section in Scheduling in Workforce Optimization for ITSM.

### Related topics

Mobile experience for On-Call Scheduling

### Notifications in ITSM Mobile Agent for Workforce Optimization for ITSM

Receive notifications when you manage shift-swap and time-off requests. Enable notifications for the actions that are most relevant to you. For example, get notified when you receive a request for approval from an agent who wants to swap shifts with a peer.

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As a Workforce Optimization for ITSM agent (sn_shift_planning.agent) and a Workforce Optimization for ITSM manager (sn_wfo_cfg_ws.manager), you can enable or disable notifications for shift-swap and time-off requests and approvals. Agents can request a shift-swap with their peers and get approval from their manager. They can also request approval for time-off from their managers.

You must set your notification preferences in your desktop application to receive the notifications in your ITSM Mobile Agent application.

To enable the notifications:

1. On your desktop application instance, click the gear icon  in the top-right corner. The **System Settings** screen appears.
2. Click **Notifications**.
3. Enable **Allow Notifications**.
4. In the **Notifications Category** section, click **Mobile - Shift Planning**.
5. Enable the desired notification.

| When you enable this notification | You receive a notification when your |
|---|---|
| Shift-swap approval request | • Agents send shift-swap requests to approve.<br>• Your peer sends a shift-swap request to approve. |
| Shift-swap approved by manager | Manager approves your request to swap shifts with your peer. |
| Shift-swap approved by peer | Peer approves your request to swap shifts with them. |
| Shift-swap rejected by manager | Manager rejects your request to swap shifts with your peer. |
| Shift-swap rejected by peer | Peer rejects your request to swap shifts with them. |
| Time-off approval request | Agents send requests to approve time off. |
| Time off approved | Manager approves your time-off request. |
| Time off rejected | Manager rejects your time-off request. |

**Related topics**

Setting notification preferences in Core UI

### Make a request to swap shifts or take time off using the Mobile Agent application

Use the ITSM mobile app to look up your schedule, request time off, or swap your shift with your peers. If you can work during the requested shift, you can also approve your peer's request for the shift swap.

#### Before you begin

Role required: sn_shift_planning.agent

#### Procedure

1. Navigate to the ITSM Mobile Agent application.
2. Request time off.

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3. If you are using:
   - An Android application, tap the send icon.
   - An iOS application, tap **Submit**.

   A notification to approve your request is sent to your manager.
4. Request a shift-swap.
   You can communicate with other agents by using Connect Chat or the activity stream on the record to make sure that they would like to swap the requested shift with you.
5. In the **Schedule** section, tap **My calendar**.
6. Tap the date for which you want to make the request.
7. Tap the work shift for that day.

   **Note:**
   Alternatively, you can swipe left on the shift you want to request time off or shift swap and select the desired option.

8. Tap **Request shift swap**.
9. In the **Swap with** field, tap and select the agent you want to swap with.
10. Make a shift-swap request.
11. In the **Requested shift** field, tap and select the agent's shift that you want to swap with.
12. If you are using:
    - An Android application, tap the send icon.
    - An iOS application, tap **Submit**.

    A notification is sent to the agent to approve your request.

### Approve or reject a shift swap using the ITSM Mobile Agent application

Using your ITSM Mobile Agent application, approve a shift swap requested by your peer if you are available to work at that time. You can reject it if you are unable to work then.

#### Before you begin

Role required: sn_shift_planning.agent

**Note:**
If you have notifications enabled, you can approve or reject shift-swap requests from the notifications without opening the request.

#### Procedure

1. Navigate to the ITSM Mobile Agent Agent application.
2. Tap **Approvals**.
3. In the **Pending** list, select a request to approve and review the request details.
4. Do one of the following:
   - To approve a request, tap **Approve**.
   - To reject a request, tap **Reject**.

   Your peer receives a notification on the request approval status.

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### Track and manage your agent's schedule using the ITSM Mobile Agent application

Monitor the shifts and schedule of teams within your assignment group using the ITSM Mobile Agent application. You can approve or reject requests for swapping shifts or time off for your agents.

#### Before you begin

Role required: sn_shift_planning.admin

**Note:**
If you have notifications enabled, you can approve or reject shift-swap or time-off requests from the notifications without opening the request.

#### Procedure

1. Navigate to the ITSM Mobile Agent application.
2. Monitor your team's schedule.
   a. Tap **My team**.
   b. In the **Schedule** section, click **Team Calendar**.
   c. Tap the day for which you would like to monitor the schedule.
   d. Tap a shift for the day to view the details for the shift.
3. Approve or reject an agent's time off or shift-swap with another agent.
   a. Tap **My work**.
   b. Tap **Approvals**. You can view the pending requests in your queue waiting for approval and also the approvals you have completed and the details for each request.
   c. From the **Pending** list, tap a request to approve.
      - To approve a request, tap **Approve**. The schedule gets update in the calendar based on the approval.
      - To reject a request, tap **Reject**.

   The agent receives a notification when you approve or reject the request.

## Workforce Optimization for ITSM landing pages

Track and monitor the performance of your organization using the Workforce Optimization for ITSM landing pages. If you are a coach or a channel manager, you can access metrics specific to your application using the Channels or the Quality landing pages respectively.

You can clone an existing landing page and customize it using the Next Experience UI Builder. For more information, see Customize a Workforce Optimization for ITSM page using Next Experience UI Builder.

### Workforce Optimization for ITSM manager landing page

Stay on top of the status of incidents your teams are working on at a given time. Monitor training that's overdue and how many assessments are open and require approval. Analyze your teams' work and SLA status for the desired time period.

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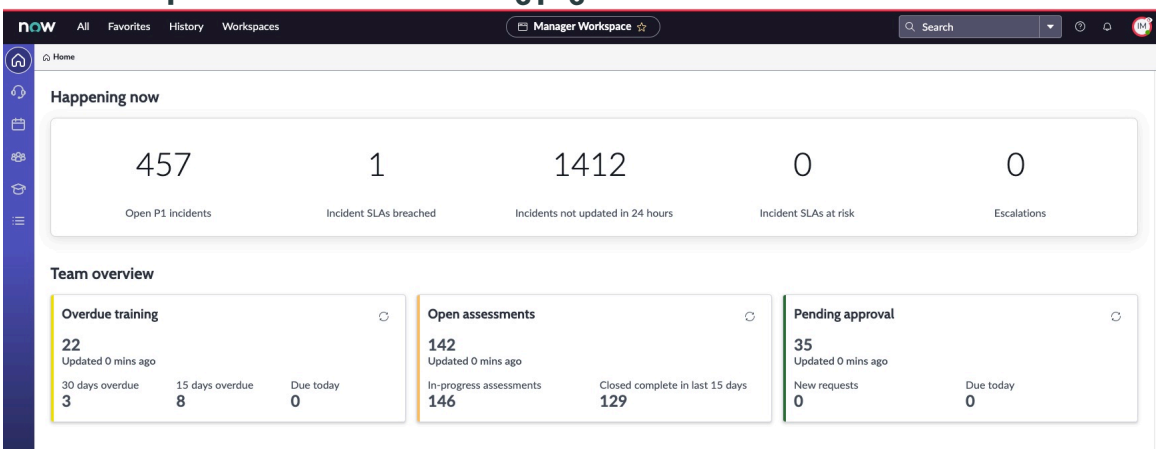
### Workforce Optimization for ITSM landing page




## End user and roles

| End user and goal | Required role |
|---|---|
| As a workspace manager, you can:<br>• Monitor open P1 incidents, SLAs that have been breached, at risk, the ones not been updated in 24 hours, or escalations.<br>• Analyze the incidents your team is currently working on or incidents that have not yet been assigned.<br>• Track the mean time to resolution, first call resolution, and customer satisfaction based on the assignment group for the desired time period. | sn_wfo_cfg_ws.manager |

## Use case

Monitor your agent's work when you start your day, view reports that need your attention, and navigate to the incidents on which you want to take action. Analyze the performance of a specific team for a desired time period by selecting the team from the Teams list and also the desired date range.

## Indicators

**Mean time to resolution**

The average time taken to resolve incidents.

**First call resolution**

Number of incidents resolved the first time it was handled.

**Customer satisfaction**

Overall customer satisfaction on incident resolution.

**Team Performance**

A list of incidents assigned to the teams managed by the current logged-in user.

**Unassigned incidents**

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A list of incidents assigned to groups managed by the current logged-in user that does not have an assignee.

## Breakdowns

- Priority
- Category
- Assignment Group
- Assigned To

## Data visualizations

Select a visualization to view details.

| Title | Type | Description |
|---|---|---|
| Open P1 Incidents |  Single score | Number of open incidents with top priority. |
| Incidents not updated in 24 hours |  Single score | Number of incidents that have not been updated in the last 24 hours. |
| Incident SLAs Breached |  Single score | Number of incidents with SLAs that have been breached. |
| Incident SLAs at Risk |  Single score | Number of incidents with SLAs that are at risk. |
| Escalations |  Single score | |

### Workforce Optimization for ITSM Channels landing page

Manage queues and analyze the status of incidents and chats using the Channels landing page. You can also monitor team performance and work assignments from one location.

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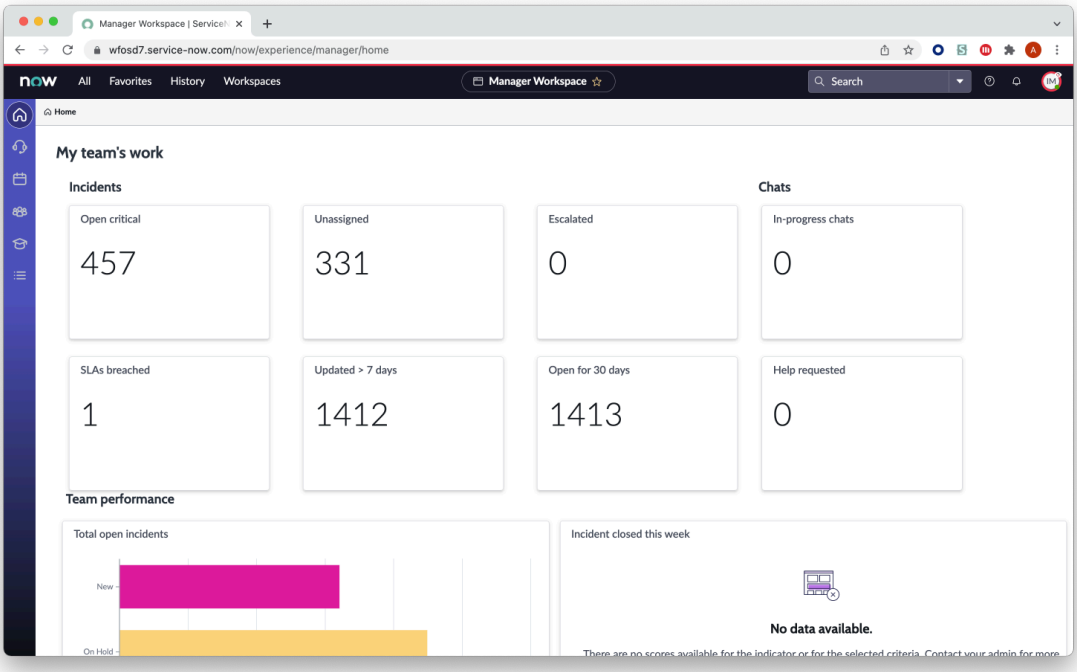


## End user and roles

As an admin, you can create or customize landing pages for the channel manager. For more information, see Creating custom landing pages for workspaces. If you have multiple landing pages, you can set the order for the landing pages. The lower the order, the higher the precedence in displaying the pages.

| End user and goal | Required role |
| --- | --- |
| As a channel manager, you can:<br>• Analyze real-time data such as:<br>  ○ The number of incidents with critical priority, breached SLAs, escalated or unassigned incidents.<br>  ○ The number of chats that are in progress or with requests for help.<br>  ○ Agent distribution across work assignments, work items awaiting to be assigned, and number of agents available.<br>  ○ The performance of your team.<br>• Drill down into each report or analytics to get more data. | sn_channel_mgmt.user |

## Use cases

As a channel manager, you can monitor key information such as the number of SLAs that have been breached, how many open incidents have critical priority, and how many work items are waiting to be assigned from one location.

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## Performance Analytics Indicator

**Incidents closed this week**: The number of incidents closed during the current week.

## Breakdowns

- Assigned to
- Assignment group

## Data visualizations

| Title | Type | Source table or database view | Description |
|---|---|---|---|
| Open Critical | Single score | Incident [incident] | Number of open incidents with critical priority. |
| Unassigned | Single score | Incident [incident] | Number of open incidents that have not been assigned. |
| Escalated | Single score | Incident [incident] | Number of open incidents that have been escalated. |
| SLAs breached | Single score | Task SLA [task_sla] | Number of open incidents with Service Level Agreements that have been breached. |
| Updated > 7 days | Single score | Incident [incident] | Number of open incidents that have not been updated in the last 7 days. |
| Open for 30 days | Single score | Incident [incident] | Number of incidents that have not been updated in the last 30 days. |
| In-progress chats | Single score | | Number of open interactions where agents are currently on a chat with customers resolving issues. |

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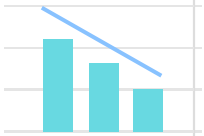
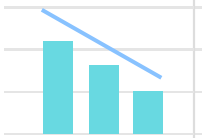
| Title | Type | Source table or database view | Description |
|---|---|---|---|
| Help requested | Single score  | | Number of current open interactions where agents are requesting help from a manager while on a chat with customers to resolve issues. |
| Agent distribution | Bar chart  | Presence States [awa_presence_state] | The current presence status of agents distributed on work assignments. |
| Waiting work items | Single score  | | Number of work items that are currently waiting to be assigned. |
| Available agents | Single score  | | Number of agents currently available to work on work items. |
| Total open incidents | Bar chart  | | Total number of incidents that are in various workflow states and have not been closed. |

### Workforce Optimization for ITSM Coaching landing page

Monitor the performance of your agents and measure the quality of how they resolved issues using the Coaching landing page. Analyze patterns in skill usage over time and see which skills are in demand.

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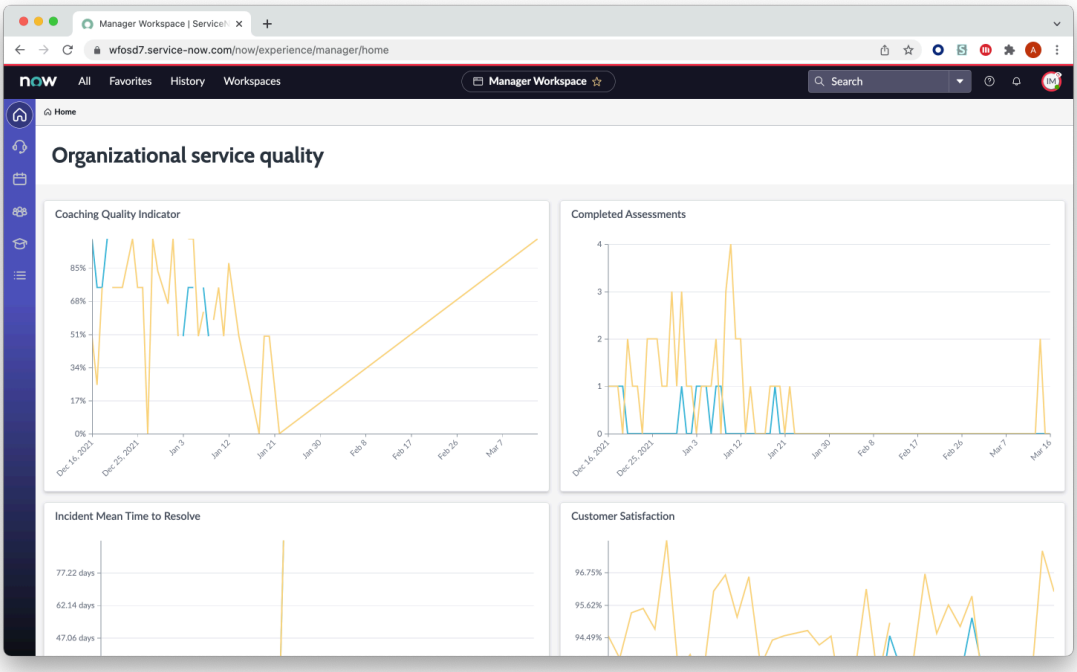


## End user and roles

As an admin, you can create or customize landing pages for the coach to monitor the quality of how agents resolve incidents. If you have multiple landing pages, you can set the order for the landing pages. The lower the order, the higher the precedence in displaying the pages.

| End user and goal | Required role |
| --- | --- |
| As a coach, you can analyze real-time data such as:<br>• The quality of how agents resolved incidents.<br>• The mean time it took to resolve the incidents.<br>• The trends in customer satisfaction, the type of skills used to resolve incidents, and completed assessments.<br>• List of overdue training and assessments. | sn_coaching.coach |

## Use cases

As a coach, you can monitor the quality of agents resolving issues and take corrective actions by assessing their ability to resolve skills and provide them with training to address their skill gaps.

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## Indicators

| Indicator name | Description |
|---|---|
| CSAT | Average customer satisfaction based on CSAT survey results. |
| Quality | Average score, in percentage, of all surveys taken by the coach to assess the trainee. |
| Incident Mean Time to Resolve | Average time agents have taken to work on an incident until they've marked it as closed or resolved. |
| Completed Assessment | Assessment closed over time. |

## Breakdowns

- Assigned to
- Assignment group

## Data visualizations

| Title | Type | Source table | Description |
|---|---|---|---|
| Trainings | List | Assigned Training [sn_coaching_assessment_recommended_learning] | List of training that agents need to complete. |
| Coaching Assessments | List | Assessed Record [sn_coaching_assessment_assessed_record] | List of assessments that coaches need to complete for their agents. |

## Customize a Workforce Optimization for ITSM page using the Next Experience UI Builder

Clone an existing Workforce Optimization for ITSM page and customize it based on your needs using the Next Experience UI Builder.

### Before you begin

Role required: admin, workspace_admin, or ui_builder_admin

### About this task

All Workforce Optimization for ITSM Next Experience UI Builder pages and page variants are read-only. You can copy a page variant and then customize it. You can create a page variant from scratch or use a page template. For more information, see Create a variant of a page.

**Note:**
After you copy and customize a page variant, any automatic updates applied to the original read-only page variant will not be applied to the page variant that you have customized.

To open your configurable workspace experience in UI Builder, see Open a Configurable Workspace experience in UI Builder

For a list of all workspaces ServiceNow offers to target specific users, see List of workspaces.

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### Procedure

1. Navigate to **All** > **UI Builder**.
2. In the UI Builder screen, select **Manager Workspace**.
3. In the **Page** menu, select the page you want to edit.
   For example, Landing Page or Work Scheduler.
4. In the **Variants** section, select the menu icon ( ) of the variant you would like to copy select **Duplicate**.
5. In the variant that you've duplicated, select the menu icon ( ) and select **Edit page variant settings**.
6. In the Edit settings pop-up window, do the following:
   - In the **Variant name** field, enter a unique name for the variant.
   - If you would like to use a different page template, in the **Page template** field, select the page template.
   - Select **Save** to keep the changes.

     If you do not want to make any updates, select **Cancel** or select **Delete** to delete the variant.
7. Select the menu icon ( ) and select **Edit conditions**.
   - To add or edit conditions for the variant, in the **Variant Conditions** field, and add your preferred conditions for the variant.
   - To display the variant in Workforce Optimization for ITSM, in the **Order** field, set the preferred order number.
8. Select **Done**.

### Related topics

Configuring the Next Experience UI

## Configure filters for ITSM Manager Workspace

Define filter configurations for Schedule, Coaching, and Channels applications. You can use these filters to refine your search and view targeted results.

### Before you begin

Role required: sn_wfo_cfg_ws.admin

### About this task

### Procedure

1. Navigate to **All** > **Workforce Optimization for ITSM** > **Manager Workspace Configurations** > **Filter Configurations**.
2. Click **New**.
3. On the form, fill in the fields.

#### Filter Configuration form

| Name | Description |
|---|---|
| Filter Name | Unique name for the filter configuration. |

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| Name | Description |
|---|---|
| Table | Table that is used for the filter configuration.<br>**Note:**<br>○ You can filter only on specific tables or database views for each module.<br>○ For a list of tables and database views that you can use for each module, see the Filter Configuration Tables section in Workforce Optimization for ITSM components. |
| Field | Field on which to filter. |
| Filter Query | Query to narrow down the filter options. |
| Type | Type of field to choose from:<br>○ Choice: choice type field.<br>○ Reference: reference type field. |
| Order | Filter that you can use to see the display order in Manager Workspace. |
| Workspace Module | Workforce Optimization for ITSM module that displays the filter configuration. |
| Active | Option that enables the filter configuration in Manager Workspace. |

4. Click **Submit**.

## Add or remove access to assignment groups in Workforce Optimization for ITSM manager workspace

Include or exclude access to assignment group data to display only the groups that are relevant for the logged-in user in the Workforce Optimization for ITSM manager workspace.

As a manager, by default, you can see all groups that you directly or additionally manage. You can add access to additional groups or remove access to any of the groups displayed by default.

- To add access to more groups, use an extension point.
- To remove access, use filter conditions to exclude groups for which you don't need visibility.

### Using extension points to include access for specific groups in Workforce Optimization for ITSM manager workspace

Use scripted extension points to add access for managers to view assignment groups data other than the default groups that they manage in Workforce Optimization for ITSM manager workspace.

To see a list of extension points that you can use for Workforce Optimization for ITSM, navigate to **System Extension Points** > **Scripted Extension Points**. In the Extension Points list, open the `sn_wfo_common.ApplicableGroupsDefinitionManager` extension point.

Use scripted extension points to integrate customizations without altering the core components in the application code. When customizing a base application, you implement the scripted extension points by creating the custom script includes and registering them against the scripted extension points.

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### Extension points to include access for specific groups

| Extension point name | Description |
|---|---|
| `sn_wfo_common.ApplicableGroupsDefinitionManager` | Implement this extension point to customize the logic to include access for managers to see assignment groups other than the default groups that they manage in the Workforce Optimization for ITSM manager workspace. |

**Related topics**

Using scripted extension points in server-side scripts

### Exclude access for specific groups in Workforce Optimization for ITSM manager workspace

You can exclude access to assignment group data and display only the assignment groups that are relevant for the logged-in user in the Workforce Optimization for ITSM manager workspace.

## Before you begin

Role required: admin

## Procedure

1. Navigate to **All** > **Workforce Optimization for ITSM** > **Manager Workspace Configuration** > **Group Exclusions**.
2. On the **Groups not included in WFO** form, select **New**.
3. In the **Name** field, enter a meaningful name for one or more groups you want to exclude from displaying in the Workforce Optimization for ITSM manager workspace.
4. Set the filter conditions to exclude the groups.

   For example, if you define a condition as **[Name] [does not contain][Support]**, then the Workforce Optimization for ITSM manager workspace doesn't display any groups that contain Support in the group name.

   For information on configuring condition builders, see Condition builder.
5. Select **Submit**.

   **Note:**
   You can also use scripted extension points to extend the definition of the groups that you manage in the Workforce Optimization for ITSM manager workspace. For information, see Using extension points to include access for specific groups in Workforce Optimization for ITSM manager workspace.

6. **Optional:** Verify that the user logged in as the Manager Workspace Manager (sn_wfo_cfg_ws.manager) can access the correct assignment groups data.
   a. Impersonate the manager for which you want to verify access.
   b. Select **All** and in the filter navigator, enter `sys_user_grmember.list`.
   c. Select the filter icon and set the condition as **[Group] [is(dynamic)][MYWFOGroups]**.
   d. Select **Run**.

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(Optional) The output displays all assignment groups that have access to the manager workspace. This output is based on the configurations in the **Group Exclusions** filter and the implementations using the extension points.

If the assignment groups listed are missing any groups that the logged-in user must have access to, verify that the **Group Exclusions** filter, and the extension points are configured correctly.

### Verify the display of the right groups in Workforce Optimization for ITSM

Verify that the logged in user can access the correct assignment groups data.

**Before you begin**
Role required: sn_wfo_cfg_ws.manager or admin

**Procedure**

1. Impersonate the manager for which you want to verify access.
2. Select **All** and in the filter navigator, enter `sys_user_grmember.list`.
3. Select the filter icon and set the condition as **[Group] [is(dynamic)][MYWFOGroups]**.

   The output displays all assignment groups that have access to the manager workspace. This output is based on the configurations in the **Group Exclusions** filter and the implementations using the extension points.

   If the assignment groups listed are missing any groups that the logged-in user must have access to, verify that the **Group Exclusions** filter, and the extension points are configured correctly.

# Incident Communications Management

The ServiceNow® Incident Communications Management application enables organizations to create and manage communications related to major business issues or incidents.

## Get started

| Explore | Configure |
| --- | --- |
|  |  |
| Learn about Incident Communications Management concepts and features. | Configure environment, tools, and user access. |

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Manage Incident Communications



Learn about defining and managing communication process for an incident.

Reference



Get details about Incident Communications Management components such as roles and dependent applications.

### Troubleshoot and get help

- Ask or answer questions in the Incident Communications Management community
- Search the Known Error Portal for known error articles
- Contact Customer Service and Support

## Exploring Incident Communications Management

The ServiceNow® Incident Communications Management application enables organizations to create and manage communications related to major business issues or incidents.

### Incident Communications Management overview

Incident Communications Management allows incident communications administrators to bring together all involved users during these events and establish quick and easy communication within this group.

For example, a major issue occurs in a server room, which leads to a high-priority incident to be raised. The incident can potentially impact all users, so it is important to bring together key representatives and communicate quickly and effectively. An incident communication plan can facilitate this communication process and help resolve the source incident.

### Incident Communications Management benefits

ServiceNow® Incident Communications Management supports the incident communications management process in the following ways:

- Create an incident communication plan when a crisis occurs.
- Set up contact responsibilities to identify the individuals who receive automatic notifications when incident communication plans are created. If they want to receive notifications, Self-Service users can subscribe to incident communication plans.
- Manage incident communication plans to improve communication while dealing with the crisis.
- Use the optional Notify feature to send notifications by SMS messages and voice mails, and to set up conference calls.
- Monitor events and results with the incident communication plan dashboard and reports.

### Incident communication plan state model

Incident communication plan state model helps you to understand the different states through which a plan can progress and track the plan through its states.

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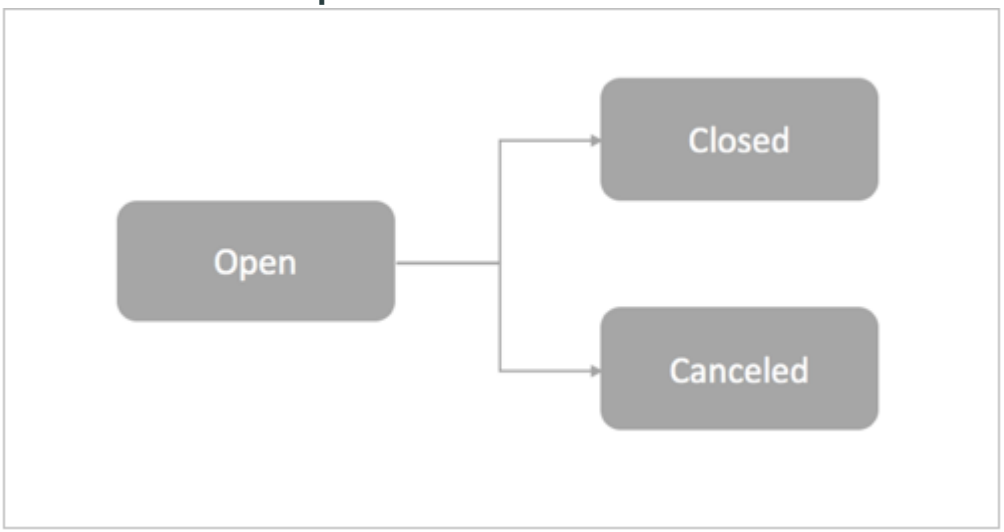
Incident communication plans are created with an **Open** state. They follow a process that finishes with the **Closed** or **Canceled** state. The following state model is applicable to new customers starting the Madrid release.

**Incident communication plan state model**




The following two properties are responsible for different actions that take place on Incident Communication Plan and Incident Communication Task:

- The **Close open Incident Communication Plans when Incident is closed or canceled** property (*com.snc.incident.incident_alert.closure*) is responsible for the following action:
  - When incident is closed, any open Incident Communication Plan is closed.
  - When an incident is canceled, any open Incident Communication Plan is canceled.
- The **Close open Incident Communication Tasks when an Incident Communication Plan is closed or canceled** property (*com.snc.iam.incident_alert_task.closure*) is responsible for the following actions:
  - If an Incident Communication Plan is **Closed** or **Canceled**, then the state of any open Incident Communication Task on which communication is not yet performed, is set to **Skipped**.
  - If an Incident Communication Plan is **Closed** or **Canceled**, then the state of any open Incident Communication Task on which communication is performed at least once, is set to **Complete**.

**Note:**
The **Close open Incident Communication Plans when Incident is closed or canceled** and **Close open Incident Communication Tasks when an Incident Communication Plan is closed or canceled** property is visible when you activate the Incident Communications Management plugin (com.snc.iam). This property is set to false for both new and existing customers.

For more information on the old Incident Communications Plan state model, see Incident communication plan state model (old).

### Incident communication plan state model (old)

Incident communication plan state model helps you to understand the different states through which a plan can progress and also to track the plan through its states.

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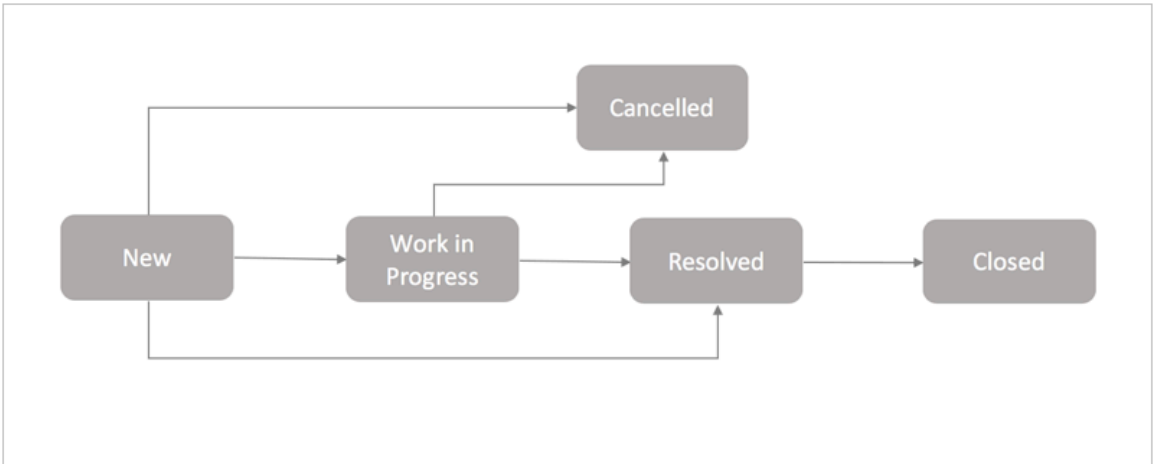
Incident alerts are created with a **New** state. They follow a process that finishes with the **Closed** or **Canceled** state.

**Note:**
The state model shown below is available only for customers prior to the London release. Beginning London release, customers who have upgraded to the latest release, can refer to Incident communication plan state model.

**Incident communication plan stages**




The incident communication plan changes from the **New** state to the **Work in Progress** state when you update the **Actions Taken** field. Only the incident communication plan creator or a user with the admin role can cancel an incident communication plan.

The following two properties are responsible for different actions that take place on Incident Communication Plan and Incident Communication Task:

- The **Close open Incident Communication Plans when Incident is closed or canceled** property (*com.snc.incident.incident_alert.closure*) is responsible for the following actions:
  - If an incident is closed or canceled when the incident communication plan state is **New** or **Work in Progress**, the incident communication plan state is set to **Canceled**.
  - If an incident is closed or canceled when the incident communication plan state is **Resolved**, the incident communication plan state is set to **Closed**.
- The **Close open Incident Communication Tasks when an Incident Communication Plan is closed or canceled** property (*com.snc.iam.incident_alert_task.closure*) is responsible for the following actions:
  - If an incident communication plan is closed, the state of all open incident communication tasks is set to **Closed Incomplete**.
  - If an incident communication plan is canceled, the state of all open incident communication tasks is set to **Closed Skipped**.

**Note:**
The **Close open Incident Communication Plans when Incident is closed or canceled** and **Close open Incident Communication Tasks when an Incident Communication Plan is closed or canceled** property is visible when you activate the Incident Communications Management plugin (com.snc.iam). This property is set to false for both new and existing customers.

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# Configuring Incident Communications Management

You can configure Incident Communications Management to create and manage communications related to major business issues or incidents.

## Configuration overview

Configure Incident Communications Management by installing and activating the Incident Communications Management (com.snc.iam) plugin.

## Install and activate Incident Communications Management

Install and activate the Incident Communications Management (com.snc.iam) plugin if you have the admin role.

### Before you begin

Role required: major_incident_manager, ia_admin, or admin

### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.
3. Select **Install** to start the installation process.

   **Note:**
   When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

   You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

### Related topics

Incident Communications Management

# Managing Incident Communications

Incident Communications Management provides a framework for defining and managing a communication process for an incident. It helps you to streamline a communication process by creating designated incident communication plans for effective communication during an event.

## Communication plan definition

An incident communication plan helps you to streamline a communication process with regards to an incident. It defines the stakeholders who should be informed, what information should be shared, when the information should be delivered, and the methods of communication.

For information on how to create a communication plan definition, refer to Create communication plan definition .

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**Important:**
While creating the Communication Plan definition, ensure that the table is Incident [incident]. If you have upgraded to London or a higher release and you use communication plan to streamline the communication process, deactivate the Major Incident Response and Resolution flow designer.

## Communication task definition

Each communication plan involves a series of communication tasks. A communication task definition helps you to specify the mode of communication (channel) and the frequency at which the communication must be carried out.

For information on how to create a communication task definition, refer to Create communication task definition.

## Communication contact definition

Communication contact definition helps you to define the recipients of a particular communication plan. The contact determines the target audience involved in each communication task and the responsibilities they are expected to handle. A notification for a task is sent to all individuals specified for that task. You can add or remove any particular communication contact manually.

For information on how to create a communication contact definition, refer to Create communication contact definitions .

## Communication channel definition

You can define a communication channel for each communication task. The communication channel determines which mode of communication to use for the task when a plan is attached to an incident. The modes of communication available are: email, SMS, conference, and Slack.

For information on how to create a communication channel definition, refer to Create communication channel definition .

## Create adhoc incident communication plan

Create an adhoc incident communication plan to manage and track communications around a high-priority incident or other issues.

The adhoc incident communication plan can be created in the following ways:

- Create adhoc incident communication plan from Incident Communications Management.
- Create adhoc incident communication plan from an incident.

### Create adhoc incident communication plan from Incident Communications Management

Create an incident communication plan from Incident Communications Management when an issue is not considered earlier. If you need collaboration on that issue, you can create an incident communication plan.

#### Before you begin
Role required: major_incident_manager, ia_admin, or admin

#### Procedure

1. Navigate to **All** > **Incident Communications Management** > **Create New**.
2. On the form, fill in the fields.

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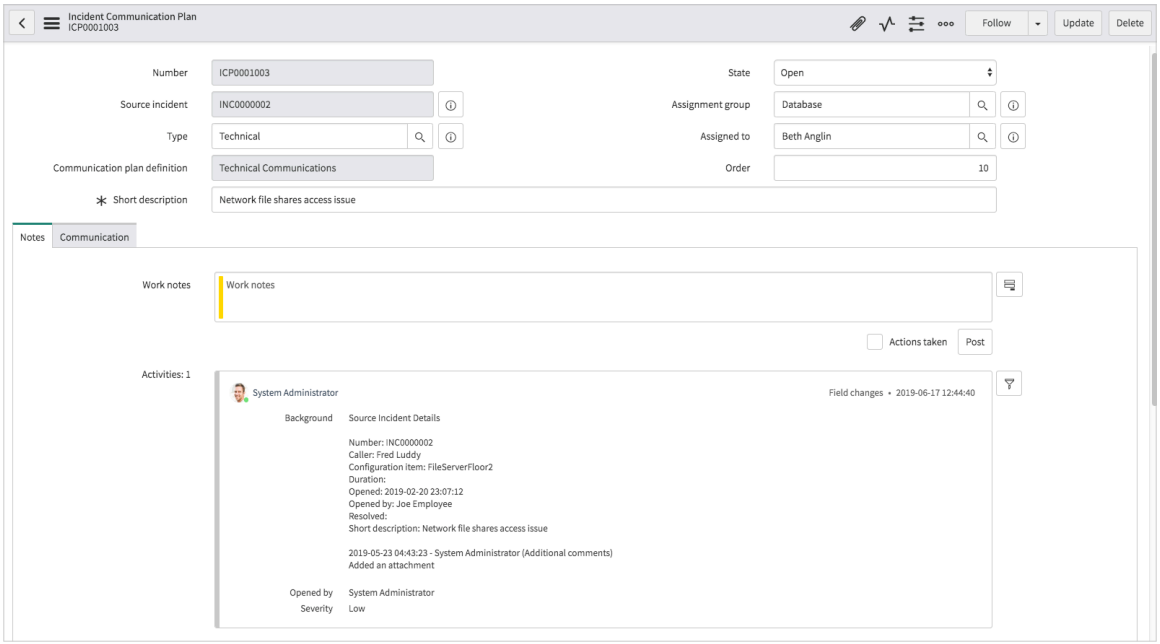
## Incident Communication Plan form




| Field | Description |
|---|---|
| Number | Unique incident communication plan ID, in the ICPxxxxxxxx format. |
| Source incident | The source incident for this communication plan, if any. If you select a source incident, the **Background** field is populated with data from this incident, unless there is existing data in this field. |
| Type | Type of communication plan available are Ad hoc, End User, Stakeholder, and Technical. |
| Communication plan definition | The communication plan definition based on which this incident communication plan is attached. |
| State | The state of the communication plan. The available values are **Open**, **Closed**, or **Canceled**. |
| Assignment group | The assignment group, if any, for that incident communication plan. For example, there might be a group that represents a crisis management team, including several Incident Managers, Duty Directors, and Duty Managers. |
| Assigned to | The assigned user for the communication plan. By default, the assigned to user is the one who creates the communication plan. The communication plan can also be assigned to an ITIL user or an incident communication plan administrator. |
| Order | Order in which the communication plan appears in the incident. If there are multiple communication plans, this field indicates which communication plan to execute first. |
| Short description | A brief summary of the communication plan. |
| Description | A detailed description of the communication plan. |
| Notes | Work notes, activities, and background information regarding the incident communication plan. |

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3. Click **Submit**.
   An incident communication plan is created. The **Communication** tab lists the communication tasks that have email, SMS, or slack as the communication channel. The **Conference** tab lists the communication tasks that have conference as the communication channel.

### Create adhoc incident communication plan from incident

Create an adhoc incident communication plan from an incident when an issue related to the incident is not considered earlier. The incident automatically populates the required information in the adhoc communication plan, saving you time and effort.

## Before you begin

Role required: major_incident_manager, ia_admin, or admin

## Procedure

1. Navigate to **All** > **Self-Service** > **Incident** > **Open**.
2. Open an existing incident.
3. Click the Incident Communication Plans related list.
4. Click **New**.
   The original incident becomes the source incident of this communication plan.
5. On the form, fill in the fields.

### Incident Communication Plan form

| Field | Description |
|---|---|
| Number | Automatically generated unique incident communication plan ID, in the ICPxxxxxxxx format. |
| Source incident | The source incident for this communication plan, if any. If you select a source incident, the **Background** field is populated with data from this incident, unless there is existing data in this field. |
| Type | Type of communication plan available are Ad hoc, End User, Stakeholder, and Technical. |
| Communication plan definition | The communication plan definition based on which this incident communication plan is attached. |
| State | The state of the communication plan. The available values are **Open**, **Closed**, or **Canceled**. |
| Assignment group | The assignment group, if any, for that incident communication plan. For example, there might be a group that represents a crisis management team, including several Incident Managers, Duty Directors, and Duty Managers. |
| Assigned to | The assigned user for the communication plan. By default, the assigned to user is the one who creates the communication plan. The communication plan can also be assigned to an ITIL user or an incident communication plan administrator. |
| Order | Order in which the communication plan appears in the incident. If there are multiple communication plans, this field indicates which communication plan to execute first. |
| Short description | A brief summary of the communication plan. |

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| Field | Description |
|---|---|
| Description | A detailed description of the communication plan. |
| Notes | Work notes, activities, and background information regarding the incident communication plan. |

6. Click **Submit**.
   An incident communication plan is created. The **Communication** tab lists the communication tasks that have email, SMS, or slack as the communication channel. The **Conference** tab lists the communication tasks that have conference as the communication channel.

## Create adhoc incident communication task from Incident Communications Management

Create an adhoc incident communication task while you are working on the communication plan. The communication task helps you to specify the mode of communication (channel) and the frequency at which the communication must be carried out.

### Before you begin

Role required: major_incident_manager, ia_admin, or admin

### Procedure

1. Navigate to **All** > **Incident Communications Management** > **Open**.
2. Open the incident communication plan for which you want to create the communication task.
3. In the Incident Communication Tasks related list and click **New**.
4. On the form, fill in the fields.

#### Incident Communication Task form

| | |
|---|---|
| Number | Unique incident communication task ID, in the ICTxxxxxxxx format. |
| Incident Communication Plan | [Read-only field] Incident communication plan for which you create the task. |
| Source incident | [Read-only field] Lookup icon to select the incident on which you want the plan to be attached. |
| Type | Lookup icon to select the type of task such as internal communication. |
| Communication task definition | [Read-only field] Unique name of the communication task definition for which you are creating the task. |
| State | The state of the communication plan. The available values are **Pending**, **Open**, **In Progress**, **Complete**, and **Skipped**. |
| Assignment group | The assignment group, if any, for that incident communication task. |
| Assigned to | The assigned user for the communication task. |

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| | |
|---|---|
| Order | Order in which the communication task appears in the communication plan. If there are multiple communication tasks, this field indicates which communication task to execute first. |
| Communication frequency | Frequency of the communication task execution. You can send the notification once or the notification can be repeated. |
| Due in | Time by which the communication task must be completed. |
| Last communication sent | The date and time when the last communication is sent to the user or the group. |
| Short description | A brief summary of the communication task. |
| Description | Detailed description of the communication task. |

5. Click **Submit**.

### What to do next

Create adhoc incident communication channel. For more information on how to define a communication channel, refer Define a communication channel.

## Incident Communications Management and Contacts

You can define contacts to associate users or groups to an incident communication plan. The users or groups are contacted to complete the tasks included in a communication plan.

If you have the ia_admin role, you can assign users or groups to an incident communication plan based on the information provided in these records:

- Contact responsibilities: Provides a name, such as Incident Duty Manager, for a set of tasks related to incident communication plan. The contact responsibility record also indicates whether the tasks are performed by an individual user or a group of users. Contact responsibilities can also be used to manually add contacts to an incident communication plan.
- Contact definitions: Identifies a set of conditions to determine which specific user or group is assigned to handle a particular responsibility for an incident communication plan. For example, All P1 Incidents must have an Incident manager, assigned to US Incident Management group.

Contact responsibilities and contact definitions allow you to define and modify data-driven contact information for automatic notifications. You do not have to specify individual users or groups directly for each incident communication plan.

You can use group contacts. You can use the Group contacts functionality when you have on-call scheduling, Notify, and Incident Communications Management. Group contacts include the people that are on-call. The group contacts can be included when initiating a conference call that is a result of an incident communication plan. By default, the primary and secondary on-call persons are available. To modify this behavior, set the system property `com.snc.iam.on_call_escalation_level`.

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### Responsibilities for Incident Communication Plan

Contact responsibilities helps you to identify contacts by their responsibilities and to understand what you can expect from the user throughout the life cycle of the communication plan.

There are two types of responsibilities available for use with incident communication plans:

- Default Responsibilities: Contacts who are notified by default.
- Other Responsibilities: Contacts who can be selected for notification.

Use contact definitions to view and modify the rules that determine the specific users associated with contact responsibilities.

## Default Responsibilities

By default, contacts with the following responsibilities are notified when an incident communication plan is created:

- Duty Manager
- Incident Manager
- Duty Director

These roles are involved with resolving the source incident or original event that the incident communication plan relates to. They are seen as key contacts for the incident communication plan.

The following sections describe typical operational roles for these responsibilities.

### Contact Administration Default Responsibilities

| Responsibility | Description |
|---|---|
| Duty Manager | The senior point of presence in the monitoring environment at the time an incident occurs. The Duty Manager assesses the incident against standard operating procedures, escalation triggers, and personal knowledge and experience, to take corrective actions. To clarify the urgency and impact of an incident, the Duty Manager can contact the Incident Manager for advice. |
| Incident Manager | A senior technician, accountable for coordinating and managing all technical resources required to resolve incidents. After being notified by the Duty Manager of a serious incident, the Incident Manager assesses the seriousness and associated business impact. Based on this assessment, the Incident Manager decides whether to escalate the incident to the Duty Director. The Incident Manager may escalate to the Duty Director to gain access to resources outside of the department, if necessary. |
| Duty Director | The escalation point for all issues that affect critical services. The Duty Director works in partnership with the business directors in the organization to approve recovery plans developed by the Incident Manager. The Duty Director also manages the senior level communications for the source incident. |

## Other Responsibilities

Incident Communications Management provides the following additional responsibilities that can be added to incident communication plans. You can also create contact responsibilities, as needed. The associated users receive notifications about the incident communication plan.

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### Contact Administration Other Responsibilities

| Responsibility | Description |
|---|---|
| Business Director | Director within the business who is identified as a potential contact when an incident communication plan occurs. |
| Communication Manager | Business-facing role in the event communication is required in an incident communication plan. |
| Crisis Action Manager | Overall responsibility and accountability for managing incident communication plans. |
| Crisis Action Team Member | Nominated department heads who are involved when an incident communication plan occurs. |
| Development personnel | Development personnel involved in the troubleshooting and resolving an incident communication plan. |
| Operations support personnel | Personnel involved in the second or third level of support in troubleshooting and resolving an incident communication plan. |
| Service Owner | Service owner or manager who is identified as a potential contact when an incident communication plan relates to one or more of their services. |
| Technical Support | Second or third level technical support personnel involved in troubleshooting and resolving an incident communication plan. |

## Define contact responsibilities

Define the different contacts or target audience involved in the communication process and their responsibility to understand the expectations from those contacts throughout the process.

### Before you begin

Role required: ia_admin or admin

### Procedure

1. Navigate to **All** > **Incident Communications Management** > **Contact Administration** > **Contact Responsibilities**.
2. Click **New**.
3. On the form, fill in the fields.

### Contact Responsibility form

| Field | Description |
|---|---|
| Global | Check box to determine whether the contact responsibility is available for all tables or for a specific table. If the check box is not selected, the **Table** field appears where you can select the table for which you are defining the contact responsibility. |
| Name | Unique name of the contact, such as Business Director or Communication Manager, involved in the communication process. |
| Type | Type of contact such as user, group, or recipient list. |

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| Field | Description |
|---|---|
| Table | Table on which contact is activated when a communication plan is attached. |

4. Click **Submit**.
   Contact responsibilities are defined.

### Create a contact definition

Define the recipients of a particular incident communication plan to determine the target audience involved in each communication task and the responsibilities the recipients are expected to handle.

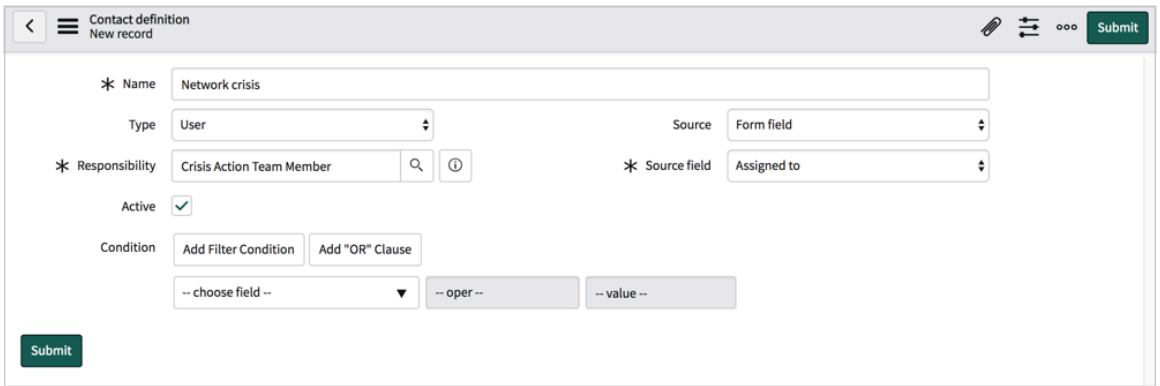
## Before you begin

Role required: ia_admin or admin

## Procedure

1. Navigate to **All** > **Incident Communications Management** > **Contact Administration** > **Contact Definitions**.
2. Click **New**.

**Contact definition form**




3. On the form, fill in the fields.

**Contact definition form**

| Field | Description |
|---|---|
| Name | Unique name for the contact definition. |
| Type | Type of contact such as user or group that you want to involve in the plan. |
| Responsibility | Responsibility that the user or group is expected to handle. |
| Source | Method to determine the user or group to associate with this definition.<br><br>The source can be: |

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| Field | Description |
|---|---|
| | ○ **None**: Use no association. You should associate users or groups manually within the Incident Communication Plan form.<br>○ **Default Override**: Use default override to associate users or groups based on conditions.<br>○ **Form Field**: Use information from the incident communication plan form based on the value specified in the **Source field**. |
| Quantity | The maximum number of contacts that can be associated with the selected responsibility for each incident communication plan record.<br>**Note:** The **Quantity** field appears only when you select **None** as the value for the **Source** field. |
| Source field | The field on the Incident Communication Plan form whose value is considered to be the contact associated with the selected contact responsibility.<br>○ For contact type as **User**, the values are **Assigned to**, **Closed by**, **Opened by**, or **Resolved by**.<br>○ For contact type as **Group**, the value is **Assignment group**.<br>**Note:** The **Source field** appears only when you select **Form field** as the value for the **Source** field. |
| Active | Check box to indicate whether the definition is active or not. |
| Condition | The conditions that must be met to associate this contact definition to a particular user or group. If multiple conditions are defined, each condition is evaluated in the order listed. |

4. Click **Submit**.

### Create a default override

Create a default override to specify user or group for a contact definition of an incident communication plan. It helps you to set multiple conditions based on which a user or a group is considered as a contact.

#### Before you begin
Role required: ia_admin or admin

#### About this task
The Default overrides related list is available only if you select **Default override** as the value of the **Source** field in the Contact definition form.

#### Procedure
1. Navigate to **All** > **Incident Communications Management** > **Contact Administration** > **Contact Definitions**.
2. Open the contact definition record.
3. In the Default override section, click **New**.

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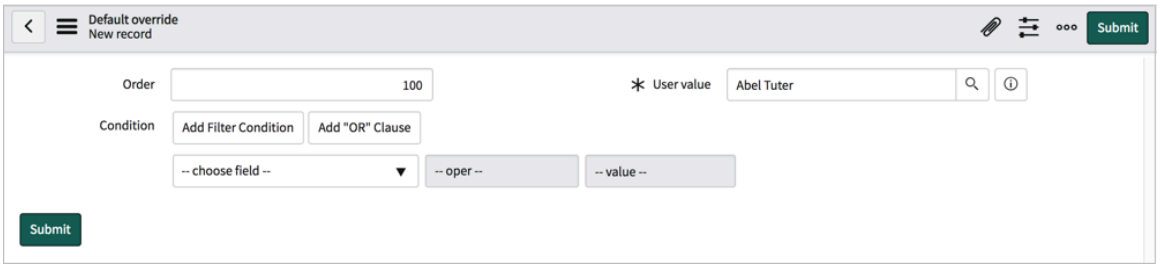


4. On the form, fill the fields.

**Default override form**

| Field | Description |
|---|---|
| Order | The order in which the condition in default override should be evaluated. |
| User value | User specified in the **User value** field is assigned as the contact if the condition in the default override matches.<br>**Note:**<br>The **User value** field appears if the value of the **Type** field in the Contact definition form is **User**. |
| Group value | Group specified in the **Group value** field is assigned as the contact if the condition in the default override matches.<br>**Note:**<br>The **Group value** field appears if the value of the **Type** field in the Contact definition form is **Group**. |
| Condition | The conditions defining whether the default override values are to be applied. If multiple conditions are defined, each condition is evaluated as per the listed order. If no conditions match, the default override is not applied. |

5. Click **Submit**.
   Default override and its conditions are defined for a contact definition.

### Add a user as a contact

Add a user to a communication plan if you have not added the user earlier in the contact. You can assign a communication task to the user to resolve an issue.

#### Before you begin

Role required: ia_admin or admin

#### Procedure

1. Navigate to **All** > **Incident Communications Management** > **Open**.
2. Open an incident communications plan record.

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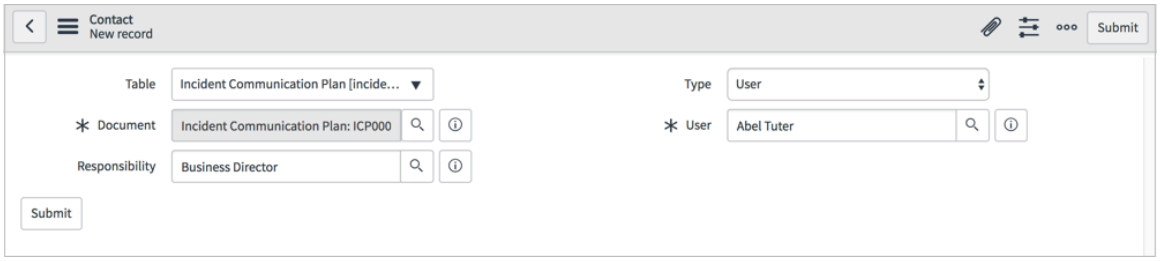
3. Click the **Users** related list and click **New**.




4. On the form, fill in the fields.

**Contact form**

| Field | Description |
|---|---|
| Table | Task table for which you are creating the contact. |
| Document | The incident communication plan for which you are creating the contact. |
| Responsibility | Responsibility that the user is expected to handle throughout the communication process. |
| Type | Type of contact such as user, group, or recipient list that you want to involve in the plan.<br>**Note:**<br>To add a user, select **User** for the **Type** field. |
| User | Name of the user who is considered as the contact. |

5. Click **Submit**.
The contact information appears in the Users related list.

## Close an incident communication plan

Close an incident communication plan after its execution or if it is no longer needed.

### Before you begin

Role required: itil, ia_admin, or admin

### About this task

- The business rule *IA_State_Management* allows any user with the ia_admin role or an itil user who is assigned to the incident communication plan, to close or cancel an incident communication plan.
- If a user with the itil role closes or cancels a parent incident, all related incident communication plans are closed or canceled.

**Note:**
Use the incident management property **Close open Incident Communication Plans when Incident is closed or canceled** (*com.snc.incident.incident_alert.closure*) to control this behavior.

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### Procedure

1. Navigate to **All** > **Incident Communications Management** > **Open**.
2. Open the incident communications plan record that you want to close.
3. In the **State** field, select **Closed**.
4. Right-click on the form header and click **Save**.

## Initiate conference call on incident communication task

Initiate a conference call and include all the required stakeholders to discuss on the resolution of the incident and the communication task.

### Before you begin

Role required: sn_comm_management.comm_plan_manager or sn_comm_management.comm_plan_admin

Activate the Notify plugin (com.snc.notify), configure the Twilio account, configure the *com.snc.iam.notify_number* property and create a default provider selector. You can also create a provider selector on the Incident Communication Task table [incident_alert_task]. The provider selector specifies the Notify group containing the Notify phone numbers or conference provider to make outgoing calls.

### Procedure

1. Navigate to **Incident** > **All**.
2. Open an incident record.
3. From the Incident Communication Plan related list, open the incident communication plan.
4. From the Incident Communication Tasks related list, open the incident communication task.
5. In the related link, click **Initiate Conference Call**.
6. Select the conference bridge number and the participants for the conference call and click **Start Call**.

## Join or end conference call on incident communication task

After a conference call is initiated, join the call to participate in the discussion or end the call when the conference is no longer required.

### Before you begin

Role required:

- Join conference call: ia_admin, itil, or sn_incident_write
- End conference call: sn_comm_management.comm_plan_manager or sn_comm_management.comm_plan_admin

### Procedure

1. Navigate to **Incident** > **All**.
2. Open an incident record.
3. From the Incident Communication Plan related list, open the incident communication plan.
4. From the Incident Communication Tasks related list, open the incident communication task.
5. In the related links, perform any of the following actions.

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## Send communication updates

Update users on the latest communication on an incident through selected communication channels.

### Before you begin

- Role required: itil (itil user is assigned to incident communication task) or ia_admin or mim_manager or admin.
- Activate the Notify plugin (com.snc.notify) if you want to send communication through SMS.
- Set atleast one communication channel of a communication task as SMS or email.

### Procedure

1. Navigate to **Incident Communications Management** > **All**.
2. Open an incident communication plan record.
3. From the Incident Communication Tasks related list, open the incident communication task for which you want to send updates.
4. In the related links, click **Send Updates**.
5. Fill in the required information and click **Compose**.
   For sending an SMS communication, in the **From** list, select a number from which you want to send the communication. It contains a list of phone numbers derived from the selected **Provider selector** column which is a reference to the Provider selector table [notify_group_selector]. The **From** list displays phone numbers of all the groups associated with the Provider selector only when the following conditions are met:
   - The **Manual selector** check box in the Provider selector form is selected.
   - The value of the **Source table** field in the Provider selector is either empty or the same table that you have selected.
6. Click **Compose**.

## Run an incident communication plan report

Run an incident communication plan report to view the status of communication plans. You can track the progress of the plan and intervene to improve the overall efficiency and effectiveness of the communication process.

### Before you begin

Role required: ia_admin or admin

### Procedure

1. Navigate to **All** > **Reports** > **View / Run**.
2. Click **Create a report**.
3. Under **Data**, fill in the fields.

| Fields | Description |
|---|---|
| Report name | Unique name for the report. |
| Source type | Source from which the data is populated. The default value is Table. |
| Table | Table from which the data is retrieved. |

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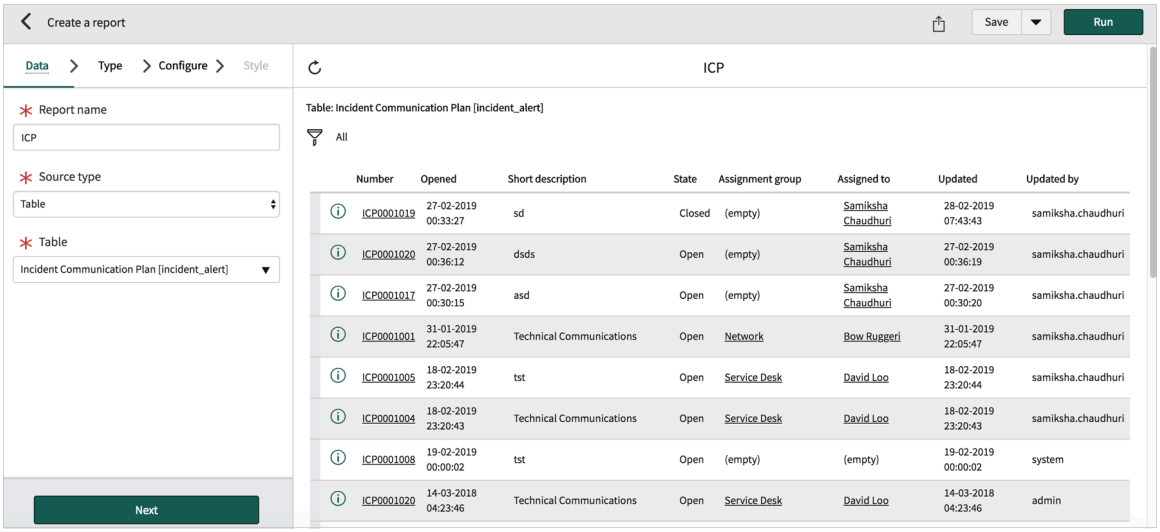
4. Click **Run**.




**Note:**
You can also choose a graphical representation for the report or narrow down the result using the **Type** and **Configure** options.

## Subscribe to incident communication notifications

Subscribe to incident communication notifications to get periodic information about issues related to incident communication plans.

### Before you begin

Role required: itil, ia_admin, or admin

### Procedure

1. Navigate to **All** > **Self-Service** > **My Notification Preferences**.
2. Under System Settings, select **Notifications**.
3. Under **Notifications By Category**, select **Incident Communication Plan**.
   The following notification options appear for incident communication plan: **IA Actions Taken**, **IA Cancelled**, **IA Resolved Or Closed**, and **New IA Raised**.
4. Click the notification option for which you want to receive notifications.
5. Under **NOTIFICATION CHANNELS**, right-swipe or left-swipe the toggle button to subscribe or unsubscribe from a notification.
6. Click the channel name to add a schedule for the notification and to filter the notification conditions as required.

**Note:**
Apply filter to your notification channel to avoid receiving every notification for the subscription.

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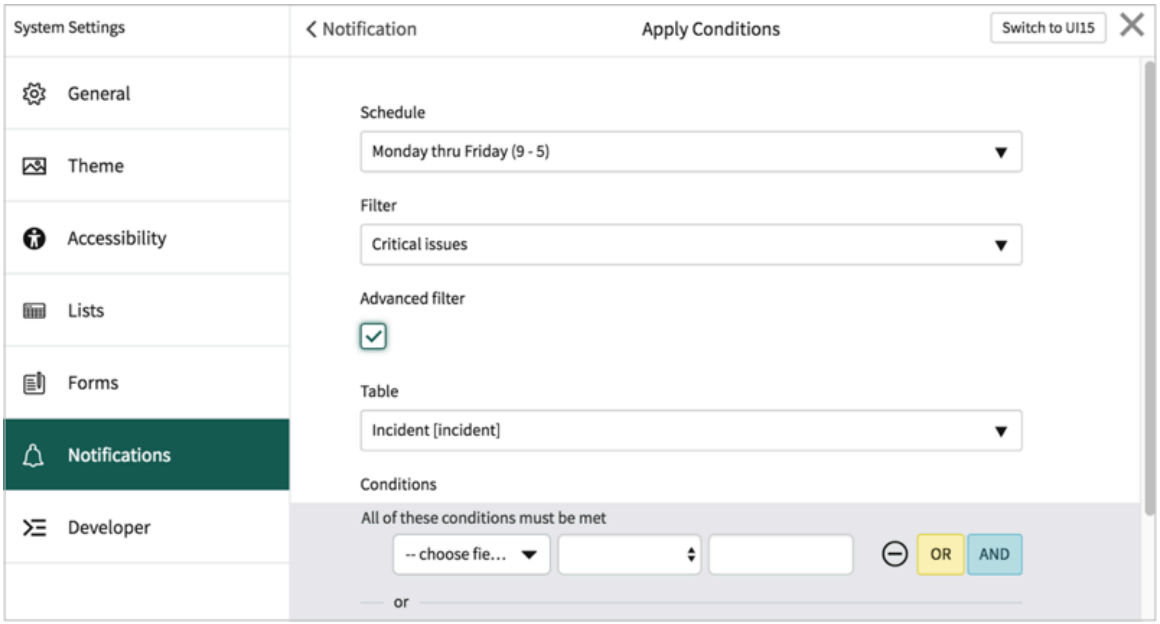


7. Click **Save**.
   You are subscribed to incident communication notification.

## Incident Communications Management reference

Reference sections provide additional information about components installed with Incident Communications Management.

### Components installed with Incident Communications Management

Several types of components are installed with activation of the Incident Communications Management plugin (com.snc.iam), including tables and user roles.

**Note:**
The Application Files table lists the components that are installed with this application. For instructions on how to access this table, see Find components installed with an application.

Demo data is available for this feature.

### Roles installed

| Role title | Description | Contains roles |
|---|---|---|
| ia_admin | Can create, edit, or cancel incident communication plan, incident communication task, and manage contact information. | • contact_admin<br>• sn_comm_management.comm_plan_manager<br>• notify_view |

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| Role title | Description | Contains roles |
|---|---|---|
| | **Note:** The role is available when you activate the Notify plugin. | |
| contact_admin | Can create and edit contact definitions and contact responsibilities. | contact_user |
| contact_user | Can view contacts, contact definitions, contact responsibilities, and default overrides. | NA |

### Tables installed

| Table | Description |
|---|---|
| Impacted CI<br><br>[impacted_ci] | The CIs impacted by the source CI in the incident communication plan. |
| Incident Communication Plan<br><br>[incident_alert] | The Incident Communication Plan table extends from the Communication Plan table [comm_plan] so that the incident communication plan inherits any future enhancements made to the communication object. |
| Incident Communication Task<br><br>[incident_alert_task] | The Incident Communication Task table extends the Communication Task table [comm_task]. |

## Domain separation and Incident Communications Management

Domain separation is supported in Incident Communications Management. Domain separation enables you to separate data, processes, and administrative tasks into logical groupings called domains. You can control several aspects of this separation, including which users can see and access data.

### Support level: Standard

- Includes all aspects of **Basic** level support.
- Application properties are domain-aware as needed.
- Business logic: The service provider (SP) creates or modifies processes per customer. The use cases reflect proper use of the application by multiple SP customers in a single instance.
- The instance owner must configure the minimum viable product (MVP) business logic and data parameters per tenant as expected for the specific application.

Sample use case: An admin must be able to make comments required when a record closes for one tenant, but not for another.

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For more information on support levels, see Application support for domain separation.

### Incident Communications Management overview

- The Incident Communications Management application enables organizations to create and manage communications related to major business issues or incidents. Incident communication plan administrators can bring together all involved users during these events and establish quick and easy communication within this group.
- Typically, Incident Communication Plan Admin or Major Incident Manager creates incident communication plans for an existing incident. Multiple incident communication plans can be created against the same incident.
- The incident communication plan and incident communication task tables support domain separation. Therefore, an Itil/Fulfiller sees only incident communication plans or incident communication tasks that have been created within the (tenant) domain that they belong to.

### How domain separation works in Incident Communications Management

Fulfillers see only incident communication plan and incident communication plan tasks that have been created within the (tenant) domain that they belong to.

### Domain separated tables

- Incident Communication Plan [incident_alert]
- Incident Communication Task [incident_alert_task]

### Use cases

An Incident Communication Plan Admin or Major Incident Manager is able to view incidents only of those domains that they have access to. They can create incident communication plans against only those incidents.

**Related topics**

Domain separation for service providers

### Incident Communications Management integrations

Incident Communications Management is integrated with other applications such as Notify to improve the overall communication process.

#### Notify with Incident Communications Management

Notify allows you to integrate with the Twilio telephony service to send and receive phone calls and SMS from within your instance. In Incident Communications Management, Notify provides you with SMS and conference as channels.

For more information on how notify works with Incident Communications Management, refer Using Notify with Incident Communications Management.

## Incident Management

Incident Management restores normal service operation while minimizing impact to business operations and maintaining quality.

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## Incident Management overview

Introduction to incident management

## Get started

| | | |
|---|---|---|
| Explore<br>  <br>Learn about Incident Management concepts and features. | Configure<br>  <br>Configure environment, tools, and user access. | Manage incidents<br>  <br>Learn about managing incidents that involves diagnosing, investigating and escalating or promoting the incident. |
| Manage major incidents<br>  <br>Learn about managing major incidents that involves creating major incidents and working with major incident overview dashboard and workbench. | Report<br>  <br>Learn to use dashboards and reports to monitor and track incident status and service levels. | Reference<br>  <br>Get details about Incident Management components such as roles and dependent applications. |

## Troubleshoot and get help

- Ask or answer questions in the Incident Management community
- Search the Known Error Portal for known error articles
- Contact Customer Service and Support

# Exploring Incident Management

ServiceNow Incident Management supports the incident management process with the ability to identify and log incidents, classify and prioritize incidents, assign incidents to appropriate users or groups, escalate, resolve, and report incidents.

## Incident Management overview

Any user can record an incident and track it until service is restored and the issue is resolved. Each incident is generated as a task record that contains pertinent information. Incidents can be assigned to appropriate service desk members, who resolve the task and document the investigation. After the incident is resolved, you can manually close the incident. You can also

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close incidents automatically based on the last updated date or the resolution date of the incident. For more information about auto-closing incidents, see Configure incidents to close automatically.

Any user can log an incident within the system using the following methods.

## Incident Management workflow

ServiceNow Incident Management process follows these steps:

1. Incident identification - The first step in the life of an incident is incident identification. You can report incidents through emails, sms, phone call, support chats, walk-ups, and applications. The service desk decides if the issue is truly an incident or if it is a request.
2. Incident logging - Once identified as an incident, the service desk logs the incident. The incident should include information, such as the caller, business service, configuration item, and contact type. The logging process includes:
   - Incident categorization - Incident categorization is a vital step in the incident management process. Categorization involves assigning a category and at least one subcategory to the incident.
   - Incident prioritization - Incident prioritization is important for SLA response adherence. The priority of an incident is determined by its impact on users or business and its urgency.
3. Incident response - Once identified, categorized, prioritized, and logged, the service desk can handle and resolve the incident. Incident resolution involves the following steps:
   - Initial diagnosis - Occurs when the user describes the problem and answers troubleshooting questions.
   - Incident escalation - Happens when an incident requires advanced support, such as sending an on-site technician or assistance from certified support staff.
   - Investigation and diagnosis - Takes place during troubleshooting when the initial incident hypothesis is confirmed as being correct. Once the incident is diagnosed, service desk can apply a solution, such as changing software settings, applying a software patch, or ordering new hardware.
   - Resolution and recovery - Happens the service desk confirms that the service of the user is restored within the stipulated SLA time.
   - Incident closure - At this point, the incident is considered closed and the incident process ends.

## Incident Management benefits

ServiceNow Incident Management supports the incident management process in the following ways:

- Log incidents in the instance or by sending email.
- Classify incidents by impact and urgency to prioritize work.
- Assign to appropriate groups for quick resolution.
- Escalate as necessary for further investigation.
- Resolve the incident and notify the user who logged it.
- Use reports to monitor, track, and analyze service levels and improvement.

Any user can record an incident and track it through the entire incident life cycle until service is restored and the issue is resolved.

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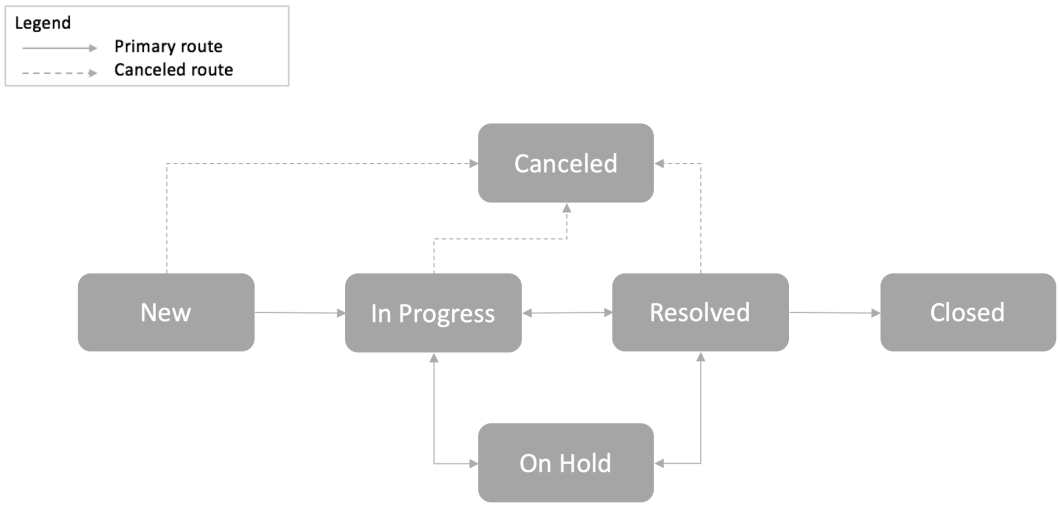
## Life cycle of an Incident

Incident Management is responsible for managing the life cycle of incidents, from creation to closure.

The Incident Management process has many states, and each is vitally important to the success of the process and the quality of service delivered. The different states can be represented in a diagram as follows:

### Incident management state model flow




### Incident states

| State | Description |
|---|---|
| New | Incident is logged but not yet investigated. |
| In Progress | Incident is assigned and is being investigated. |
| On Hold | The responsibility for the incident shifts temporarily to another entity to provide further information, evidence, or a resolution. When you select the **On Hold** option, the following **On hold reason** list appears.<br>• Awaiting Caller<br>• Awaiting Change<br>• Awaiting Problem<br>• Awaiting vendor<br><br>If the **On hold reason** is **Awaiting Caller**, the **Additional comments** becomes mandatory. |

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**Incident states (continued)**

| State | Description |
| --- | --- |
| | **Note:** If the caller updates the incident, the **On hold reason** field is cleared and the state of the incident is changed to **In Progress**. An email notification is sent to the user whose name is mentioned in the **Assigned to** field as well as to the users in the **Watch list**. An incident can be placed in the **On hold** state one or more times prior to being closed. |
| Resolved | A satisfactory fix is provided for the incident to ensure that it does not occur again. |
| Closed | Incident is marked **Closed** after it is in the **Resolved** state for a specific duration and it is confirmed that the incident is satisfactorily resolved. |
| Canceled | Incident was triaged but found to be a duplicate incident, an unnecessary incident, or not an incident at all. |

# Configuring Incident Management

You can configure the incident form and other incident features, such as incident categories and UI behavior. The ITSM guided setup helps you configure incident management on your ServiceNow instance.

## Configuration overview

Configure the Incident form in the base system to follow ITIL best practices. The administrator can configure the incident form and use the form designer to customize it. You can copy or create child incident to reduce the effort of configuring the functionality of an open incident.

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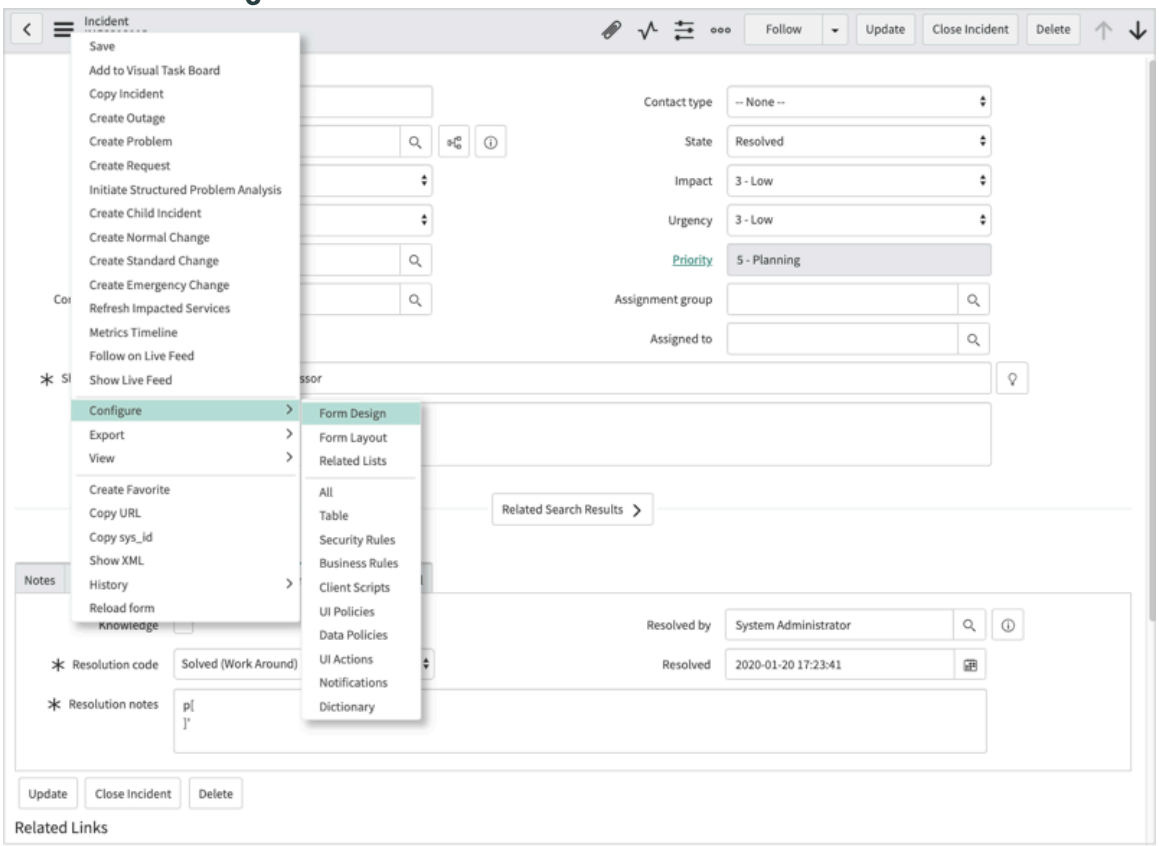
### Incident form configuration




### Form configuration and design

| Menu option | Description |
|---|---|
| Form design | Administrators or users with the personalize_form role can use the form design feature to quickly create new or change existing form views. Form design is an alternative to configuring forms that combines several configuration options into one tool. |
| Form layout | Administrators or users with the personalize_form role can configure a form to show or hide fields from a view. You can create new fields on the table associated with the form. |
| Related lists | Related lists display records in another table that have a relationship with the current record. Administrators or users with the personalize_form role can configure related lists to appear on the form. |

## Using guided setup to implement Incident Management

IT Service Management guided setup provides a sequence of tasks that help you configure Incident Management on your ServiceNow instance. To open ITSM guided setup, navigate to **Guided Setup** > **ITSM Guided Setup**. For more information about using the guided setup interface, see Using guided setup.

## Quick start tests for Incident Management

Validate that Incident Management still works after you make any configuration change such as apply an upgrade or develop an application. Copy and customize these quick start tests to pass when using your instance-specific data.

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Incident Management quick start tests require activating the Incident Management - ATF Tests plugin (com.snc.incident.atf).

### Incident Management test suite

| Test | Description | Release version |
|---|---|---|
| INCIDENT MGMT: Incident Resolution SLA | Test to verify the Incident Resolution SLA baseline functionality. | Madrid |
| INCIDENT MGMT: Incident Response SLA | Test to verify the Incident Response SLA baseline functionality. | Madrid |
| INCIDENT MGMT: Copy Incident | Test to verify whether the fields from the original Incident are copied correctly to the new Incident. | Madrid |
| INCIDENT MGMT: Copy Incident from a Closed Incident | Test to verify that the **Copy Incident** UI action is visible for closed Incidents. | Madrid |
| INCIDENT MGMT: Create Standard Change from Incident | Test to verify the creation of a Standard Change from an Incident. | Madrid |
| INCIDENT MGMT: Create of Emergency Change from an Incident | Test to verify the creation of an Emergency Change from an Incident. | Madrid |
| INCIDENT MGMT: Create Normal Change from an Incident | Test to verify the creation of a Normal Change from an Incident. | Madrid |
| INCIDENT MGMT: Create Problem from an Incident | Test to verify the creation of a Problem from an Incident. | Madrid |
| INCIDENT MGMT: Create Knowledge from an Incident | Test to verify the creation of a Knowledge from an Incident. | Madrid |
| INCIDENT MGMT: Incident State flow | Test to verify the state flow of an incident. | Madrid |
| INCIDENT MGMT: Reopening an Incident | Test to verify the reopen incident functionality. | Madrid |
| INCIDENT MGMT: Incident Assignment | Test to verify the incident assignment functionality. | Madrid |
| INCIDENT MGMT: Create child Incident using UI action and verify its fields | Test to verify the creation of a child Incident from an Incident through the **Create Child Incident** UI action. The test also verifies that the fields of the child Incident get copied correctly from the parent incident to the child incident. | Madrid |

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**Incident Management test suite (continued)**

| Test | Description | Release version |
|---|---|---|
| INCIDENT MGMT: Incident creation — Self Service | Test to verify the creation of an Incident using the **Create Incident** catalog item. | Madrid |
| INCIDENT MGMT: Parent and Child Incident state sync up | Test to verify that the state of a child Incident synchronizes with the parent Incident when the child Incident is created. | Madrid |
| INCIDENT MGMT: Parent and child Incident state sync up after reopening an Incident | Test to verify that the state of a child Incident synchronizes with the parent Incident when the parent Incident is reopened. | Madrid |
| INCIDENT MGMT: Verify creation of knowledge article from an Incident | Test to verify the creation of a knowledge article from an Incident using the **Create Knowledge** UI action on the Incident form. The UI action is visible when you activate the KCS Integration for Incident Management plugin (com.snc.incident.knowledge). | Orlando |

**Related topics**

Quick start tests

## Incident Management properties

Incident Management properties are used to control features such as copying and creating child incidents. The major incident properties control the promotion of major incident candidates to major incidents.

These properties are available at **Incident** > **Administration** > **Incident Properties**.

**Properties for Incident Management**

| Property | Description |
|---|---|
| Incident closure properties | |
| Enable auto closure of incidents based on Resolution date. Setting this to 'No' will make auto closure to run based on the Updated date.<br><br>(com.snc.incident.autoclose.basedon.resolved_at) | Select the check box to auto-close incidents based on the resolution date of the incident instead of the last updated date. |

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**Properties for Incident Management (continued)**

| Property | Description |
|---|---|
| | **Note:** Starting with the Madrid release, this property is automatically set to **true** for new customers. Existing customers have to set the property to **true** manually. |
| Number of days (integer) after which Resolved incidents are automatically closed. Zero (0) disables this feature<br><br>(glide.ui.autoclose.time) | Set the duration of the incident auto-close function. |
| Close open Incident Tasks when Incident is closed or canceled<br><br>(com.snc.incident.incident_task.closure) | Select the check box to close an open incident task when an incident is closed or canceled.<br><br>**Note:** Starting with the Madrid release, this property is automatically set to **true** by default only for the new customers. |
| Close open Incident Communication Plans when Incident is closed or canceled<br><br>(com.snc.incident.incident_alert.closure) | Select the check box to close an open incident communication plan when an incident is closed or canceled.<br><br>**Note:** This property is visible when the Incident Communications Management plugin (com.snc.iam) is enabled. This property is set to **false** for both new and existing customers. |
| Close open Incident Communication Tasks when an Incident Communication Plan is closed or canceled<br><br>(com.snc.iam.incident_alert_task.closure) | Select the check box to close an open incident communication task when an incident communication plan is closed or canceled. |

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**Properties for Incident Management (continued)**

| Property | Description |
|---|---|
| | **Note:** This property is visible when the Incident Communications Management plugin (com.snc.iam) is enabled. This property is set to **false** for both new and existing customers. |
| Incident reopen properties | |
| List of fields (comma-separated) to copy from the original incident when an incident is reopened by email<br><br>(com.snc.incident.clone_fields_on_reopen) | Enter the name of the fields that you want to be copied from the original incident to the new incident when you reopen an incident through email.<br><br>**Note:** When an incident is reopened, a new incident is created. |
| Copy incident and create child incident properties | |
| Enable copy incident feature<br><br>(com.snc.incident.copy.enable) | Select the check box to enable the **Copy Incident** option in the context menu. |
| Enable create child incident feature<br><br>(com.snc.incident.create.child.enable) | Select the check box to enable the **Create Incident** option in the context menu. |
| Copy attachments from originating incident<br><br>(com.snc.incident.copy.attach) | Select the check box to be able to copy attachments from original incidents when an incident is copied for created. |
| List of attributes (comma-separated) that will be copied from the originating incident<br><br>(com.snc.incident.copy.attributes) | Enter the name of the attributes that you want to be copied from the original incident to the new incident when you copy or create an incident.<br><br>**Note:** The knowledge article or the resolution section information such as resolution code, notes, and resolved by, isn't copied. |

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### Properties for Incident Management (continued)

| Property | Description |
|---|---|
| Related lists (comma-separated) that will be copied from the originating incident<br><br>(com.snc.incident.copy.related_lists) | Enter the name of the related lists that you want to be copied from the original incident to the new incident when you copy or create an incident. |
| List of attributes (comma-separated) from Affected CIs (task_ci) related list that will be copied from the originating incident<br><br>(com.snc.incident.copy.rl.task_ci.attributes) | Enter the name of the attributes from the Affected CIs related list that you want to be copied from the original incident to the new incident when you copy or create an incident. |
| List of attributes (comma-separated) from Impacted Services (task_cmdb_ci_service) related list that will be copied from the originating incident<br><br>(com.snc.incident.copy.rl.task_cmdb_ci_services.attributes) | Enter the name of the attributes from the Impacted Services related list that you want to be copied from the original incident to the new incident when you copy or create an incident. |
| Incident form fields configuration properties | |
| List of fields (comma-separated) that appear in the activity formatter for Incident<br><br>(glide.ui.incident_activity.fields) | Enter the names of the fields that become visible in the activity formatter. If the activities are personalized, this property updates automatically. |
| Additional comments icon used in Task Activity formatter<br><br>(glide.ui.incident_activity.image.comments) | Enter the path of the icon that is used for additional comments. |
| Work notes icon used in Task Activity formatter<br><br>(glide.ui.incident_activity.image.work_notes) | Enter the path of the icon that is used for work notes. |
| Incident additional comments style<br><br>(glide.ui.incident_activity.style.comments) | Enter the HTML syntax of comment style for incident additional comments. |
| Incident work notes style<br><br>(glide.ui.incident_activity.style.work_notes) | Enter the HTML syntax of work notes style for incident additional comments. |
| Incident created from interaction properties | |
| Create Incident in saved state from Interaction<br><br>(com.snc.incident.create_from_interaction.save) | Select the check box to create an incident with a saved state from an interaction record.<br><br>Type: Boolean |

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**Properties for Incident Management (continued)**

| Property | Description |
| --- | --- |
| | **Note:** Starting with the Washington DC release, this property is automatically set to **true** for new customers. Existing customers have to set the property to **true** manually. |
| Copy attachments from Interaction to Incident, when created from Interaction<br><br>(com.snc.incident.create_from_interaction.copy_attachments) | Select the check box to copy the attachments from the interaction record to a new incident record when it's created from the interaction record.<br><br>Type: Boolean<br><br>**Note:** Starting with the Washington DC release, this property is automatically set to **true** for new customers. Existing customers have to set the property to **true** manually. |

## Major Incident Management

If you have the admin or incident_manager role, you can edit the major incident properties. You can define whether a new major incident must be created or whether a major incident candidate must be promoted to a major incident. The properties are available only when you activate the Incident Management - Major Incident Management plugin (com.snc.incident.mim).

These properties are available at **Incident** > **Administration** > **Major Incident Properties**.

**Properties for Major Incident Management**

| Property | Description |
| --- | --- |
| Create major incident from candidate<br><br>(sn_major_inc_mgmt.com.snc.incident .min.major_incident_creation) | Create a new major incident or promote a major incident candidate to a major incident. |

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**Properties for Major Incident Management (continued)**

| Property | Description |
| --- | --- |
| | **Note:** When a new major incident is created from an incident, the current incident is marked as a child of the new major incident. |
| Compose Email on Major Incident Overview<br><br>(sn_major_inc_mgmt.com.snc.incident.mim.compose_email_on_iatasks) | Provide a comma-separated list of incident communication task types that can have the **Compose Email** option on the Major Incident Workbench. |
| PIR export ui page url<br><br>(sn_major_inc_mgmt.pir_export_pdf_ui_page) | Associate a custom UI page to an exported post incident report. |
| Major Incident Management Group (sys_id) to whom the Major Incident should be re-assigned on promotion to 'Major Incident'<br><br>(sn_major_inc_mgmt.major_incident_management_group) | Auto-assign a major incident to different assignment groups based on the actions taken on the incidents and the conditions related to the assignment group. |
| Default recipient location of emails for Communication Tasks<br><br>(sn_comm_management.default_email_recipient_field) | Select the default recipient location of emails for communication tasks. The default value is **BCC**. |
| Property to toggle support for Recipient List on Email Client, on Communication Tasks<br><br>(sn_comm_management.email_client_recipient_items_enabled) | Use the recipient list to send emails as part of the communication tasks. |
| List of attributes (comma-separated) that will be copied from the child Incident when creating a Major Incident<br><br>(sn_major_inc_mgmt.com.snc.major_incident.create.copy.attributes) | Select the fields that must be copied from the incident when creating a major incident. |

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## Incident categories and subcategories

Categorization of incidents helps in routing to the right team and saves a lot of time in troubleshooting and bringing the service to normalcy.

One of the KPIs (Key Performance Indicators) of the Incident Management process is to identify how many times the Incident is sent to different teams. It also helps in analyzing incidents based on the classification to do proactive Problem Management which, in turn, helps to reduce Incidents. Proper incident classification is very important to identify and prioritize on which Incidents to work on first.

Using categories and subcategories also improves the clarity and granularity of report data. The following categories and associated subcategories are in the base system. An administrator can add additional categories and subcategories, and use them in assignment rules and notifications.

### Incident categories

| Category | Subcategory |
|---|---|
| Inquiry / Help | • Antivirus<br>• Email<br>• Internal Application |
| Software | • Email<br>• Operating System |
| Hardware | • CPU<br>• Disk<br>• Keyboard<br>• Memory<br>• Monitor<br>• Mouse |
| Network | • DHCP<br>• DNS<br>• IP Address<br>• VPN<br>• Wireless |
| Database | • DB2<br>• MS SQL Server<br>• Oracle |

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### Configure incident category or subcategory

Configure incident category and subcategory for easy classification of incidents which helps in routing incidents to the right team. You can also generate reports based on category and subcategory of incidents.

**Before you begin**
Role required: admin

**Procedure**

1. Navigate to **Incident** > **All**.
2. Open an incident record.
3. Do any of the following:
   - Right-click on the **Category** field name and select **Configure Choices**.
   - Right-click on the **Subcategory** field name and select **Configure Choices**.
4. Move the required category or subcategory from the **Available** list to the **Selected** list.
5. Click **Save**.

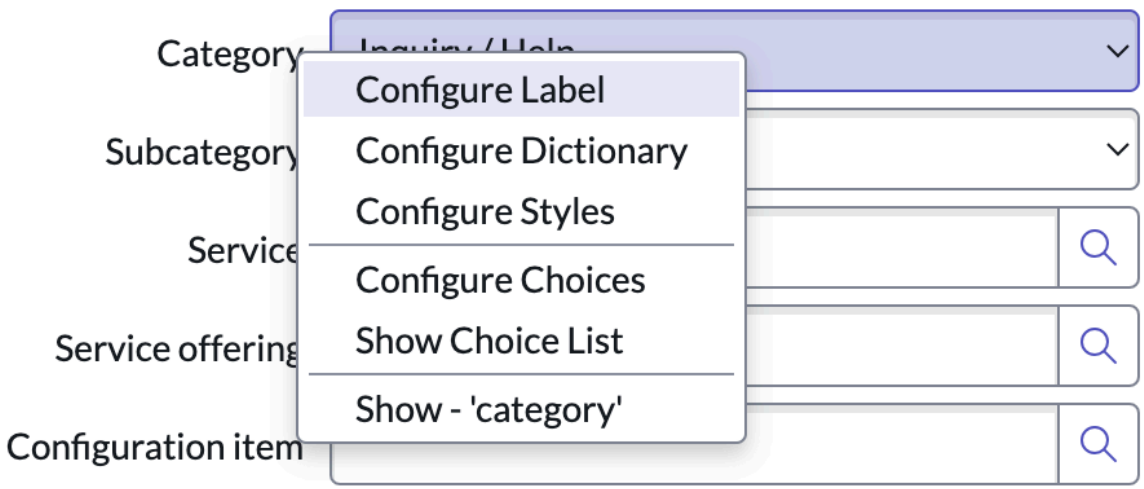
### Add a category or a subcategory

Add category or subcategory to assign incidents to the correct team and save time in troubleshooting and bringing the service to normalcy.

**Before you begin**
Role required: admin

**Procedure**

1. Navigate to **All** > **Incident** > **All**.
2. Open an incident record.
3. Do any of the following:
   - Right-click **Category** > **Configure Choices**.

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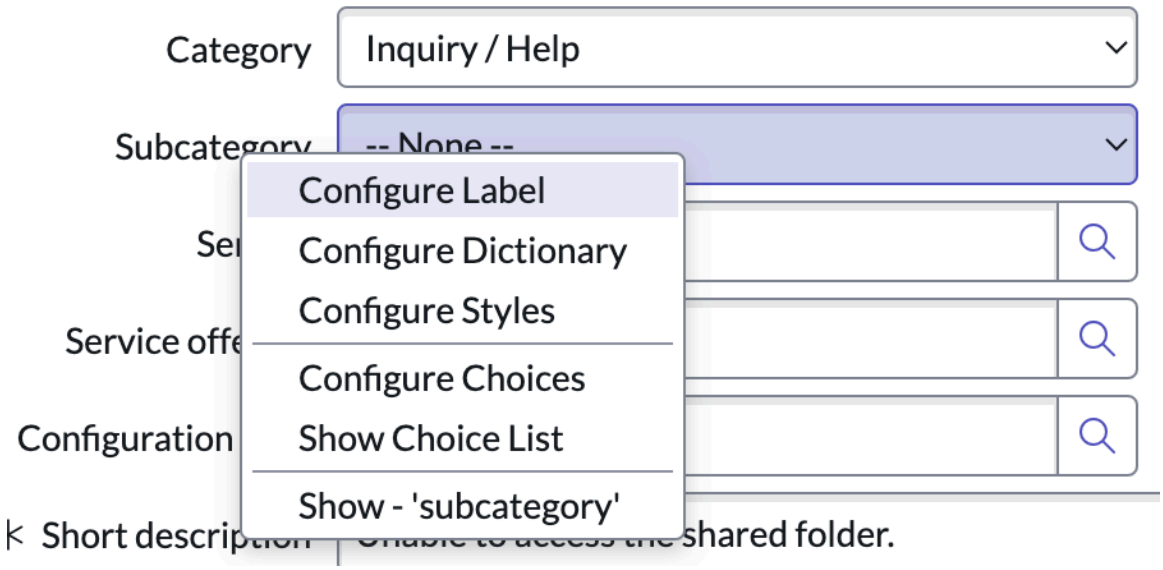
- Right-click **Subcategory** > **Configure Choices**.




4. In the **Enter new item** field, enter the new category or the subcategory name.
5. Click **Add**.
   The new category or subcategory is added under the **Selected** list.

### Delete a category or a subcategory

Delete a category or subcategory if your organization no longer uses the category or subcategory.

**Before you begin**
Role required: admin

**Procedure**

1. Navigate to **Incident** > **All**.
2. Open an incident record.
3. Do any of the following activities:
   - Right-click on the **Category** field name and select **Configure Dictionary**.
   - Right-click on the **Subcategory** field name and select **Configure Dictionary**.
4. Click the Choices related list.
5. Select the category or the subcategory record that you want to delete.
6. Click **Actions on selected rows** menu and select **Delete**.

## Define priority lookup rules

Define impact and urgency of an incident to calculate the priority. The priority calculation can then be used to prioritize work and drive service level agreements.

**Before you begin**
Role required: data_lookup_admin, or admin

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### Procedure

1. Navigate to **All** > **System Policy** > **Rules** > **Priority Lookup Rules**.
2. Click **New**.
3. On the form, fill in the fields.

| Field | Description |
|---|---|
| Impact | Impact is a measure of the effect of an incident, problem, or change on business processes. |
| Urgency | Urgency is a measure of how long the resolution can be delayed until an incident, problem, or change has a significant business impact. |
| Priority | Priority is based on impact and urgency, and it identifies how quickly the service desk should address the task. |
| Application | Application scope of the rules. The scope defines whether the rules are available for all applications or for scoped applications. |
| Active | Option to define whether the rule is active or not. |
| Order | Sequence in which the rules appear in the priority lookup list. This field indicates the sequence of the rule that is executed first. |

**Note:**

Priority is calculated according to the following sample data lookup rules:

**Priority Data lookup rules**

| Impact | Urgency | Priority |
|---|---|---|
| 1 - High | 1 - High | 1 - Critical |
| 1 - High | 2 - Medium | 2 - High |
| 1 - High | 3 - Low | 3 - Moderate |
| 2 - Medium | 1 - High | 2 - High |
| 2 - Medium | 2 - Medium | 3 - Moderate |
| 2 - Medium | 3 - Low | 4 - Low |
| 3 - Low | 1 - High | 3 - Moderate |
| 3 - Low | 2 - Medium | 4 - Low |
| 3 - Low | 3 - Low | 5 - Planning |

By default, the **Priority** field is read-only and must be set by selecting the **Impact** and **Urgency** values. To change how the priority is calculated, you can either alter the priority lookup rules or

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disable the **Priority is managed by Data Lookup - set as read-only** UI policy and create their own business logic.

4. Click **Submit**.

## Define assignment rules for incidents

Define assignment rules to identify the right group or the user which is skilled to work on an incident.

### Before you begin

Role required: assignment_rule_admin or admin

### Procedure

1. Navigate to **All** > **System Policy** > **Rules** > **Assignment**.
2. Create assignment rules by following the steps provided in Create an assignment rule.
3. Click **Submit**.

## Incident templates and record producers

Templates simplify the process of submitting new records by populating fields automatically. A template ensures consistency in the way information about the incident is captured. A record producer is a specific type of catalog item that allows end users to create task-based records, such as incident records, from the service catalog.

You can use incident templates to quickly create incidents for similar issues.

- An administrator or user with the template_editor_global role can create templates that are available to everyone.
- An administrator can enable the global option for any personal template that a user creates so that all other users can access the template.
- A user with the itil role can create their own templates for incidents they log frequently.

ESS users typically log incidents using a record producer in the service catalog. A template can be used to create an incident record producer. The template automatically populates fields in the incident form.

For example, an incident record producer can be created to request account access to a network server. The user who submits the incident enters variable values, such as the server name, level of access needed, and due date. The incident template assigned to the record producer populates the incident **Category**, **Subcategory**, and **Assignment Group**. These fields and values applied from the template do not appear in the record producer form.

### Create incident template

Create an incident template to ensure consistency in the way information about the incident request is captured. A template also helps you to create incident easily and accurately.

#### Before you begin

Role required: admin

#### About this task

Let us consider an example where you want to create a template to log an incident when you are denied access to the Bond Trading application.

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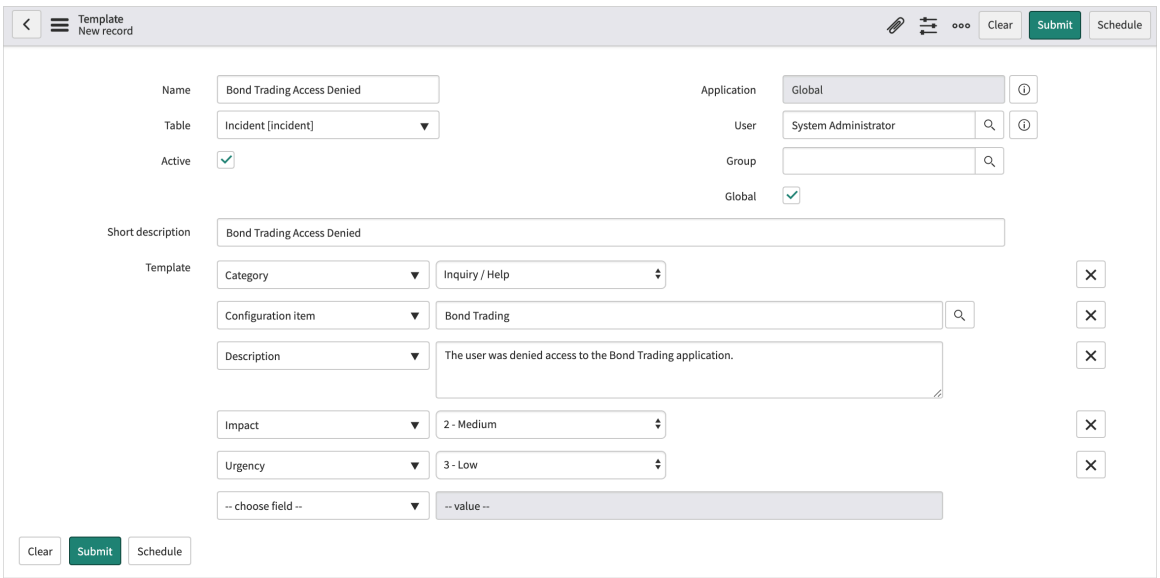
### Procedure

1. Navigate to **All** > **System Definition** > **Templates**.
   You can also Create a template from the incident form.
2. Complete the steps in Create a template using the Template form using the following information:
   - **Name**: `Bond Trading Access Denied`
   - **Table**: Incident [incident]
   - **Global**: Select the check box. The **Global** option allows any user to use the template, not just the template creator.
   - **Short Description**: `Bond Trading Access Denied`
   - **Template**: Add the following values to define the fields that are filled in when the template is used:
     - **[Category]: [Inquiry / Help]**
     - **[Configuration Item]: [Bond Trading]**
     - **[Description]: [The user was denied access to the Bond Trading application]**
     - **[Impact]: [2 - Medium]**
     - **[Urgency]: [3 - Low]**




3. Click **Submit**.

## Create a module that uses incident template

Create a module to log an incident with pre-filled field values from an existing template.

### Before you begin

Role required: admin

### About this task

In the Create incident template topic, you have created the Bond Trade Access Denied template. In this topic, you can use the template with a module in the Self-Service application.

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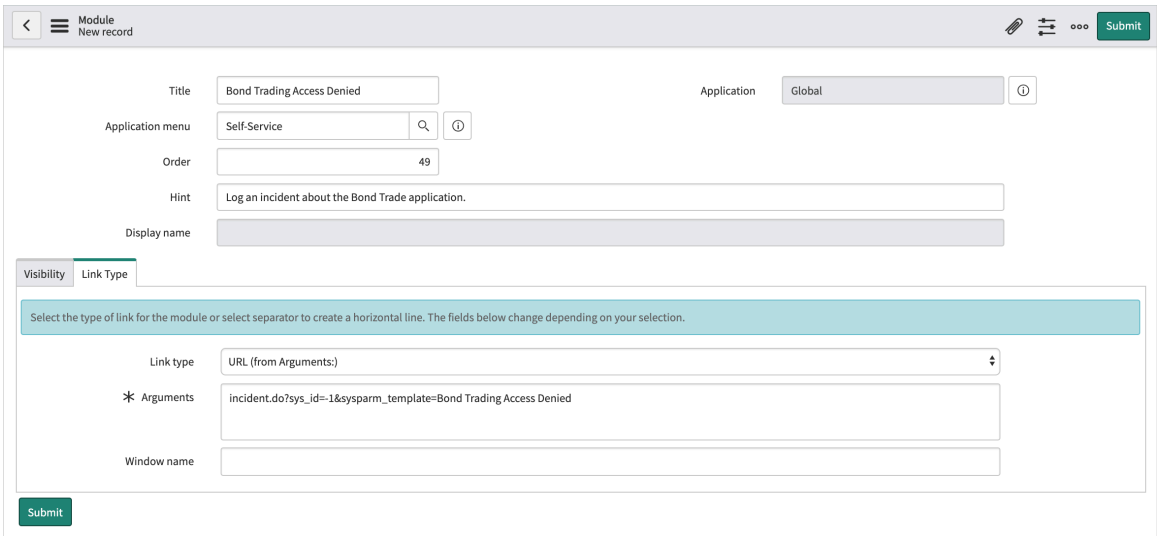
### Procedure

1. Point to **Self-Service** and click the edit icon .
2. In the Modules related list, click **New**.
3. On the form, fill in the fields.
   - **Title**: `Bond Trading Access Denied`.
   - **Order**: In the Module records list, view the order numbers and enter a number that is appropriate. For example, if the order number of **Homepage** is 50 and the order number of **Business Applications** is 52, and you want to place the new module between **Homepage** and **Business Applications**, enter the order number as 51.
   - **Hint**: `Log an incident about the Bond Trade application.`

   Link Type section:

   - **Link Type**: URL (from Arguments:)
   - **Arguments**: `incident.do?sys_id=-1&sysparm_template=Bond Trading Access Denied`

   **Note:**
   This path deploys the template in the new incident record.




4. Click **Submit**.
   The new module appears in the Self-Service application.

### What to do next

Click the module to open a new incident record with the applied Bond Trading Access Denied template.

## Create a record producer to log incidents

Create record producers to log incidents directly from Service Catalog.

### Before you begin

Role required: catalog_admin or admin

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## About this task

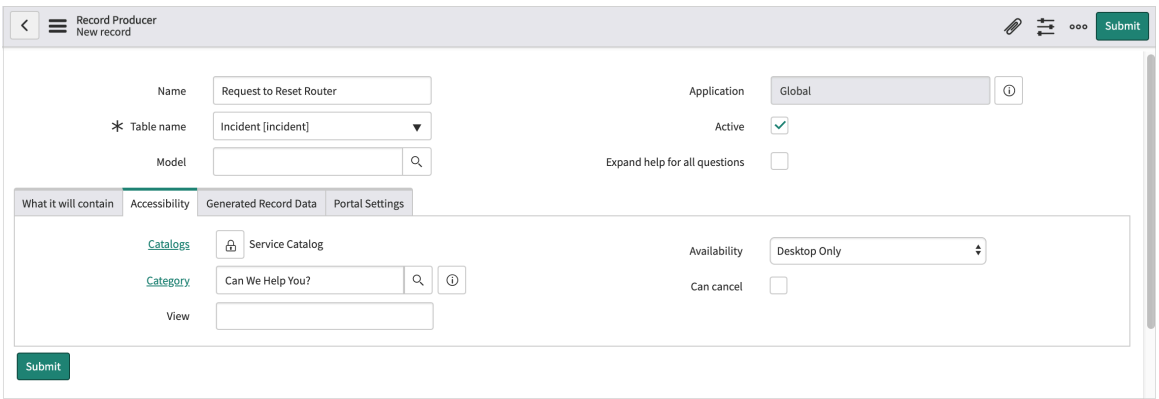
Incident record producers provide users with an interface from which user can log an incident. For example, the default **Can We Help You?** category features record producers such as **Create Incident** to enable users to log incidents from the catalog.

The following example demonstrates how to create a record producer to request a wireless router reset.

## Procedure

1. Navigate to **All** > **Service Catalog** > **Catalog Definitions** > **Record Producers**.
2. Click **New** and complete the steps in Create a record producer using the following information:

| Field | Entry |
|---|---|
| Name | `Request to Reset Router` |
| Table name | Incident [incident] |
| What it will contain | |
| Short description | `Reset wireless router request` |
| Description | `Please reset the building's router` |
| Accessibility | |
| Catalogs | Service Catalog |
| Category | Can We Help You? |




3. Right-click on the form header and from the context menu select **Save**.
   Several related lists appear at the end of the form, including Variables and Variable Sets.
4. In the Variables related list, click **New**.
5. On the form, fill in the fields.

| Field | Entry |
|---|---|
| Type | Reference |
| Question | |
| Question | `Which router needs to be reset?` |

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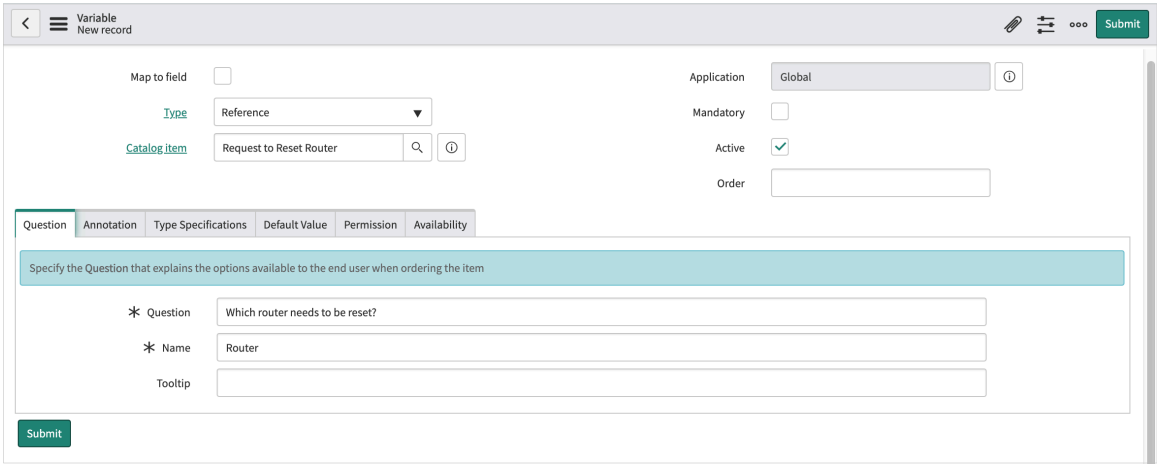
| Field | Entry |
|---|---|
| Name | Router |
| Type Specifications | |
| Reference | IP Router [cmdb_ci_ip_router] |




6. Click **Submit**.
7. **Optional:** To view the new record producer, click **Try It** in the form header.

   (Optional) In Service Catalog, the new catalog item appears and any user can select it.

### Create a record producer using a template

If a predefined incident template exists, it can be used with the record producer to fill in standard information for the incident.

#### Before you begin
Role required: catalog_admin or admin

#### Procedure
1. Navigate to **All** > **Service Catalog** > **Catalog Definitions** > **Record Producers**.
2. Click **New** and complete the steps in Create a record producer.
3. Click **Generated Record Data** and select the incident template to populate fields when the record producer is submitted.
4. Right-click on the form header and click **Save**.

## View incident notifications

View incident notifications that are sent during specific events in an incident life cycle. These notifications are sent to various recipients including the ESS and the ITIL users.

#### Before you begin
Role required: admin

#### About this task
Incident notifications use the email notification layout and template that are shipped with the Employee Experience Foundation plugin (com.snc.sn_ex_emp_fd). The plugin delivers notifications that are consistent and built with the industry best practices for layouts.

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**Note:**
If you are an upgrade customer, to use the latest email layout, install the Employee Experience Foundation app (com.snc.sn_ex_emp_fd) from the ServiceNow® Store. Activate the default incident notifications that use the latest template.

### Procedure

1. Navigate to **All** > **System Notification** > **Email** > **notifications**.
2. Filter the list of notifications by **[Table] [is] [incident]**.
3. View the list of default notifications for incidents.
4. Click the notification name to view the details.

### What to do next

To receive these notifications, the end user must enable notifications. For more information, see Subscription-based notifications.

### Related topics

Create an email notification

## Configure default user for auto-closing incidents

Change the default user who last updated an incident to the user you mention for auto-closing incidents.

### Before you begin

Role required: admin

### Procedure

1. Navigate to **All** > **System Scheduler** > **Scheduled Jobs** > **Scheduled Jobs**.
2. Open the **Autoclose Incidents** schedule job.
3. In the **Job context**, add the following:

```
fcRunAs=<user_name>
fcScriptName=incident autoclose
```

For example, if you add `fcRunAs=admin`, the code places **System Administrator** in the **Updated by** field.

## Applying CSDM guidelines to Incident Management

Incident Management supports the incident management process with the ability to identify and log incidents, classify and prioritize incidents, assign incidents to appropriate users or groups, escalate, resolve, and report incidents. The goal of this product view is to help you to understand how Incident Management key entities work with the core CSDM framework.

Features of Incident Management that get the most benefit from the CSDM include:

- Agent Workspace gives agents the information they need to quickly prioritize and resolve incidents.
- The major incident workbench includes a single-pane view you can use to identify, track, and resolve high-impact incidents.
- The native mobile app allows agents to quickly view and respond to tasks on-the-go, and can approve the requests with a single swipe.

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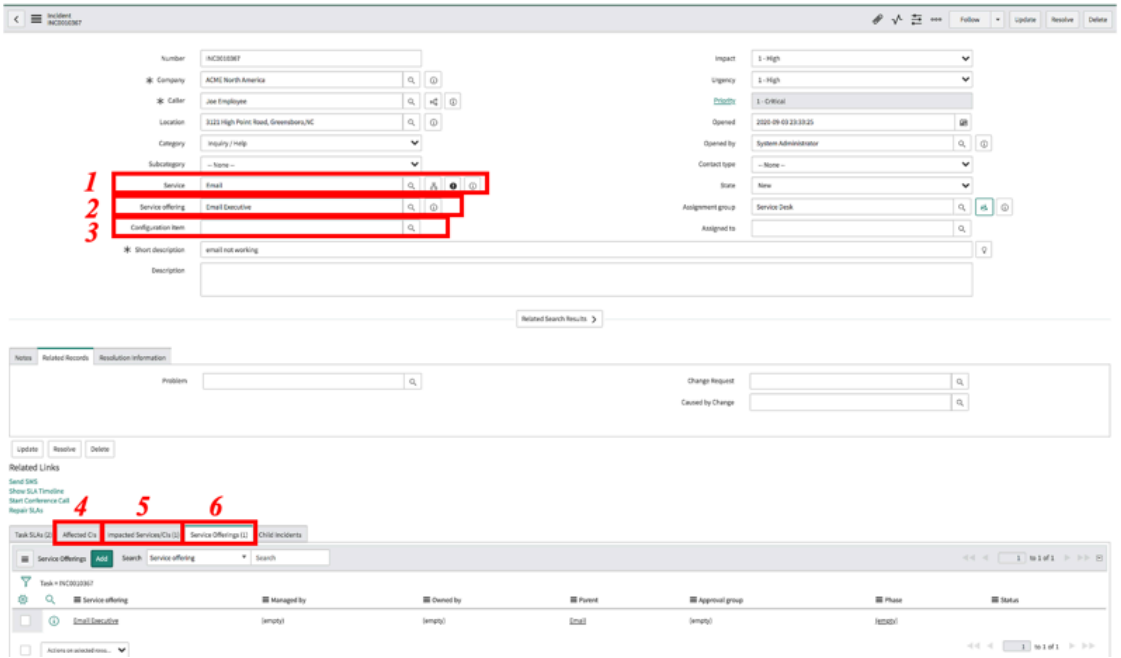
- Incident deflection encourage self-help by suggesting related knowledge base articles.
- Improves collaboration on incident tasks by using drag-and-drop functionality on visual task boards.
- Performance analytics provide detailed insights into performance trends.

Incident Management includes a form you can use to report incidents.

**Incident form**




The incident form references the following attributes and related lists.

1. Service — References the [cmdb_ci_service_business] table.

   **Note:**
   Earlier ServiceNow releases labeled this attribute Business Service.

2. Service Offering (attribute) — References the [service_offering] table. Displays the service offerings affected by the incident in the Service Offerings related list.
3. Configuration Items — References the [cmdb_ci] table
4. Affected/Causal CIs — Related list [task_ci] table. (The Incident form allows Application Services to be chosen as CIs)
5. Impacted Services — Related list [task_cmdb_ci_service] table
6. Service Offering — Related list [task_service_offering] table

## For more information

For more details about Incident Management, see Incident Management.

### Incident Management and CSDM tables

Incident Management manages and uses CSDM tables. Several ServiceNow products benefit from and add value to Incident Management.

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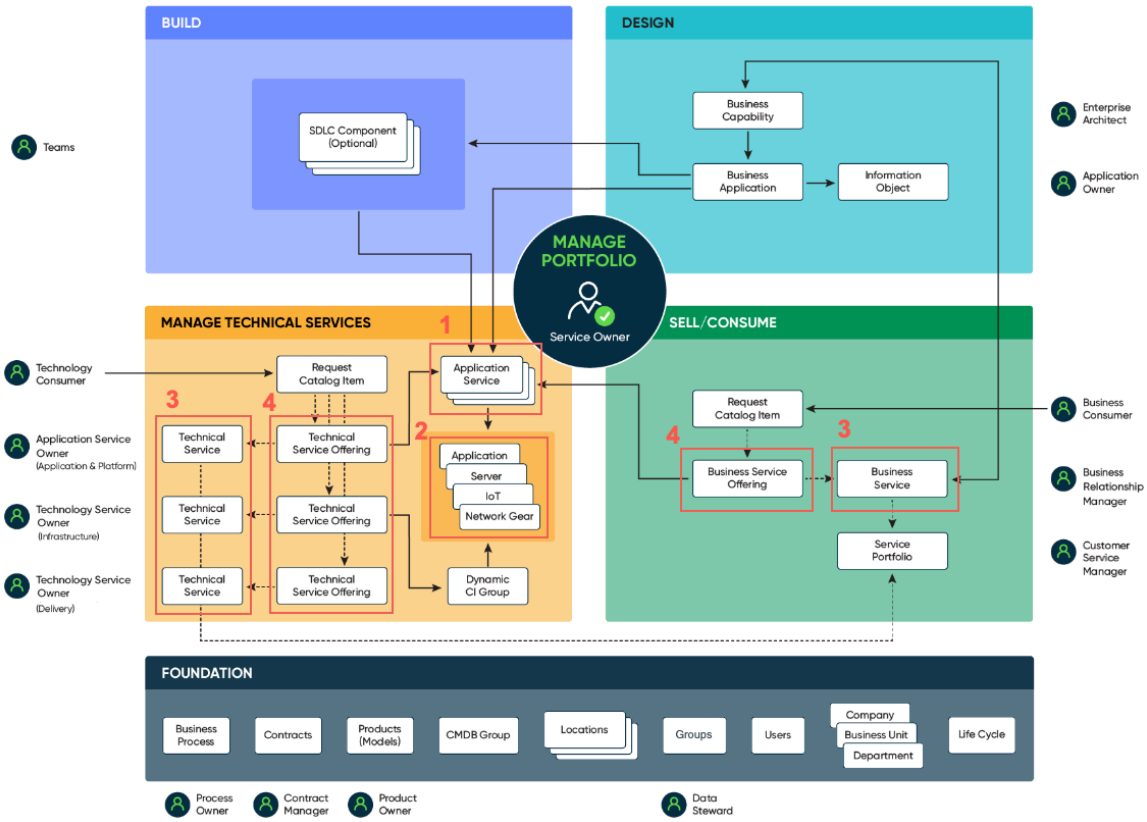
## CSDM tables used by Incident Management

The Incident form references the following CSDM tables:

1. Application Service [cmdb_ci_service_discovered] table or any infrastructure CI.
2. Configuration Item tables [cmdb_ci*]
3. Business Service [cmdb_ci_service_business] table and Technical service [cmdb_ci_service_technical] table: Use the service classification attribute to identify business services, technical services, and application services as types of services.
4. Service Offering [service_offering] table: Uses the service classification attribute to identify business services, technical services, and application services as types of service offerings.

   See the Incident Management documentation for information about service commitments on a service offering (for example, resolution time for incident).

### Tables used by Incident Management




## Products that add value to Incident Management

When you use Incident Management with other ServiceNow products, you increase the value you get from Incident Management. These other ServiceNow products include:

**Discovery**

Discovery provides details about the hardware and software CIs you are using.

**Service Portfolio Management (Service Portfolio Management)**

Provides life-cycle information for a service.

**Asset Management**

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Provides the related product model. Software Asset Management (SAM Foundation ) and Hardware Asset Management (HAM) provide lifecycle data for Incident Management.

**Security Management**

Provide initial information that helps in containing, eradicating, and recovery of security related incidents.

**Risk Management**

Provides IT risk and financial risk information.

## Products that benefit from Incident Management

**IT Service Management (ITSM)**

Services have the context of the business and applications, along with the information and technologies layered beneath them.

**Information Technology Operations Management (ITOM)**

Understands the business context for the application services along with the hardware and software being managed.

**Governance, Risk, and Compliance (GRC)**

Auditors can leverage the business applications and related Information Objects. This helps auditors understand the design-time data sensitivity for scoping audits, measuring risks, and managing audit activities.

**Asset Management**

Manages the software and hardware life cycles for business applications and business services.

**Customer Service Management (CSM)**

### Incident Management use case

Incident Management restores normal service operation, while also minimizing impact to your business and maintaining the quality of your data.

## Incident Management Use Case

Use Incident Management to create an incident that captures information about the asset-related CIs. An incident keeps a record of the updated, repaired, swapped, or retired CIs.

By keeping track of the assets, you can tell where the assets are located, how they are used, and when changes were made to them. This information helps you systematically monitor and manage the assets in your company.

A CI generates an incident. Use a dependency view to identify other CIs that are affected by the incident. Associate the affected CIs with an incident record to find out how the incident affects other dependent CIs.

Following the CSDM framework provides value to Incident Management in the following ways:

- Incident Management understands the impact of the Incident on services and service offerings.
- Incident Management dynamically routes incidents.
- Incident Management identifies all affected services.

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## Results of the use case

The CSDM framework provides context for incidents—both the CIs involved in the incident and the services that it affects.

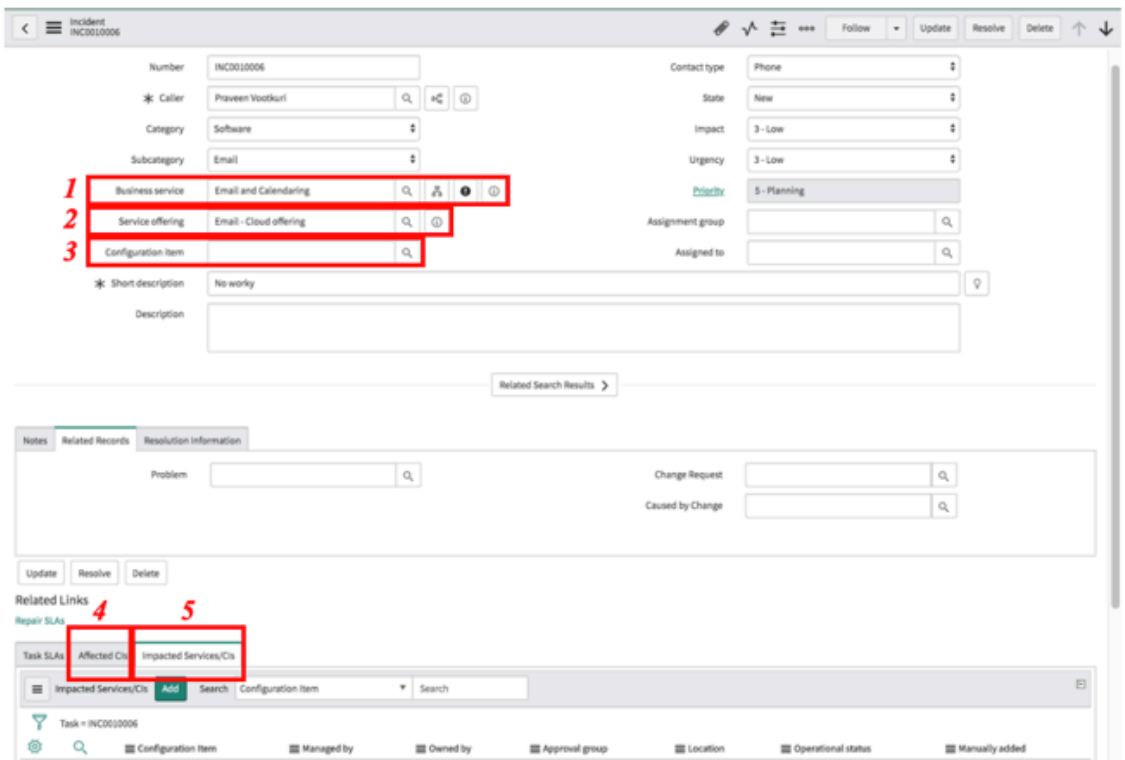
Use the Incident form to see the impact of an incident and restore affected services. Complete the following steps:

1. Populate the **Impacted Services** related list with the services and service offerings that are related to the populated CI.
2. (Optional) Use the **Service** and **Service Offering** attributes to help narrow the list of available CIs.

> **Note:**
> Narrowing the list of available CIs is not a feature of the base system. To narrow the list, you need to configure the Incident form.

3. Populate the **Configuration Item** attribute [configuration_item] with the CI or the affected service. You can then use the CI to identify details for incident routing. For example, you can use the CI data like Support Group and provide information about the service impact by using dependency relationships.
4. (Optional) Add the **Affected CI** related list [task_ci] to identify the CIs that might have caused the incident.
5. (Optional) Add the **Impacted Services** related list [task_cmdb_ci_service] to see the services and CIs that are impacted by the incident.

### Incident form for use case




## Set up the Incident Management form

Configure the Incident form to see the impact of an incident and then restore affected services. The CSDM framework enables you to view rich context for incidents: the CIs involved in the

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incident and the service offerings, business applications, and business services that the incident affects.

### Before you begin
Role required: admin

### About this task
Incident Management leverages the CSDM data structure to display information that assists in solving the incident.

Go to the 1:00:00 mark on this video to learn about setting up the Incident form to include the related lists that leverage the CSDM framework.

### Procedure
1. Navigate to **All** > **Incident** > **Administration** > **Incident Properties**.
2. In the Incident Related List Properties section, enable the following properties and then select **Save**.
   - **Populate Impacted Services based on Affected CIs**. This property enables display and update of the **Impacted Services/CIs** related list when you perform the **Refresh Impacted Services** action.
   - **Populate the Business Application related list for incidents**
   - **Populate the Service Offering related list for incidents**

   The properties are fully described in Incident Management properties.
3. Ensure that the **Principle Class** option is selected for the CI or CI class as described in Create a CI class and Update the list of classes in the Principal Class filter.
4. Navigate to **All** > **Incident** > **Open** and fill in the following fields:

**Incident form**

| | |
|---|---|
| Service | The business service or technical service associated with the incident. The value that you specify narrows the list of available CIs that appear for selection in the **Configuration Item** field.<br>**Note:** Narrowing the list of available CIs isn't a feature of the base system. To narrow the list, you must specify values for **Service** and **Service Offering**. |
| Service Offering | The business service offering (product) or technical service offering associated with the incident. The value that you specify narrows the list of available CIs that appear for selection in the **Configuration Item** field. |

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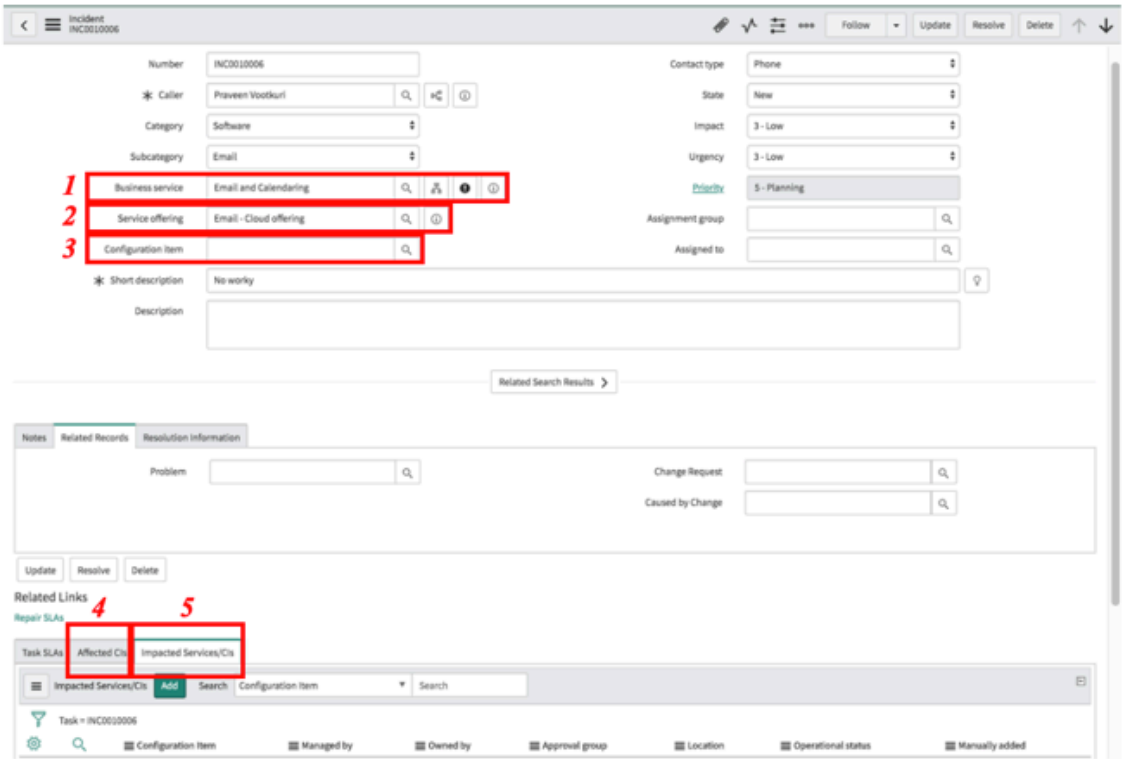
| | |
|---|---|
| | **Note:** Narrowing the list of available CIs isn't a feature of the base system. To narrow the list, you must specify values for **Service** and **Service Offering**. |
| Configuration Item | The CI or the affected service. (Hardware, application, and cloud [physical CIs] or application service [logical CIs])<br><br>You can then use the CI to identify details for incident routing. For example, you can use the CI data like Support Group and provide information about the service impact by using dependency relationships. |




5. Review the information.
   - The CIs that may have caused the incident appear in the **Affected CIs** related list [task_ci].
   - The services and service offerings that are related to the populated CI appear in the **Impacted Services/CIs** related list [task_cmdb_ci_service].
   - The services and CIs affected by the incident appear in the **Impacted Services/CIs** related list [task_cmdb_ci_service].

### Incident Management considerations

Consider these points while implementing the CSDM framework.

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## Incident Management considerations

### Business applications are not referenced in Incident Management

Business applications are portfolio objects used for designing and planning your enterprise architecture. Business applications don't contain attribute-level details such as version, environment, and localization (for any deployments using one or more applications).

### Application service

An application service is an operational CI and a unique instance of an application.

An application service is the logical representation of the underlying hardware and software CIs that work together to implement a business application or system. The application service represents an instance of the business application or system.

### Using application service on an Incident form

You can use the application service CI on the Incident form in scenarios like the following:

- The incident is for an application-related issue. On the Incident form, you can enter Application Service in the **Configuration Item** field to represent the application. For example, you can report the application service called MyApp 3.0 Production as unavailable.
- The incident is for an infrastructure CI that is affecting one or more services. On the Incident form, the **Impacted Services/CIs** related list identifies the application service affecting services. For example, the Server Acme42 CI might be identified as affecting the MyApp 3.0 Production and other related services.

## Incident ticketing integrations

An incident ticketing integration exchanges ticket data between your ServiceNow instance and a third-party system.

The advantages of an incident ticketing integration include the following items.

- Establishing a ticket number that provides a unique key between systems.
- Synchronizing the systems so that notifications can be triggered.
- Transforming data for more uniform processing.
- Tracking ticket activity for accurate reporting.

The level of data and the direction of the data that is exchanged categorizes the integration as uni-directional or bi-directional. In a uni-directional integration, a third-party system creates an incident ticket, passes data to your instance, and receives a ticket ID back as confirmation. In a bi-directional integration, incident data is exchanged, synchronized, and updated while data is sent between the systems.

For both integration types, a good practice is to implement a record-based log of the individual transactions for a given time period. If an outage occurs, a record-based log can tell you what data was exchanged, how it was transformed, when processing occurred, and if there were any errors. Record-based logs also allow you to run all the validation and transformation logic away from the main form, helping performance.

Before implementing your project, develop an integration plan in which all the implementation aspects and requirements are defined. Developing the integration plan helps you to review the current data, plan for future requirements, and identify and sequence project tasks.

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### Uni-directional incident ticketing integrations

Consider the requirements for an external, third-party system to create tickets. Define the data that must be sent to create a ticket, and what validation is required.

In this way, a standard web service interface can be created and published. This integration responds with a ticket number on success, or with a structured error message for validation failures and processing issues. An advantage of this implementation is that you can publish once and reuse for multiple applications, provided the additional integrations follow the integration specifications. A good practice is to create a dedicated account for each interface. Accounts provide accountability and report user statistics, and use a simple connectivity Point of Contact (POC).

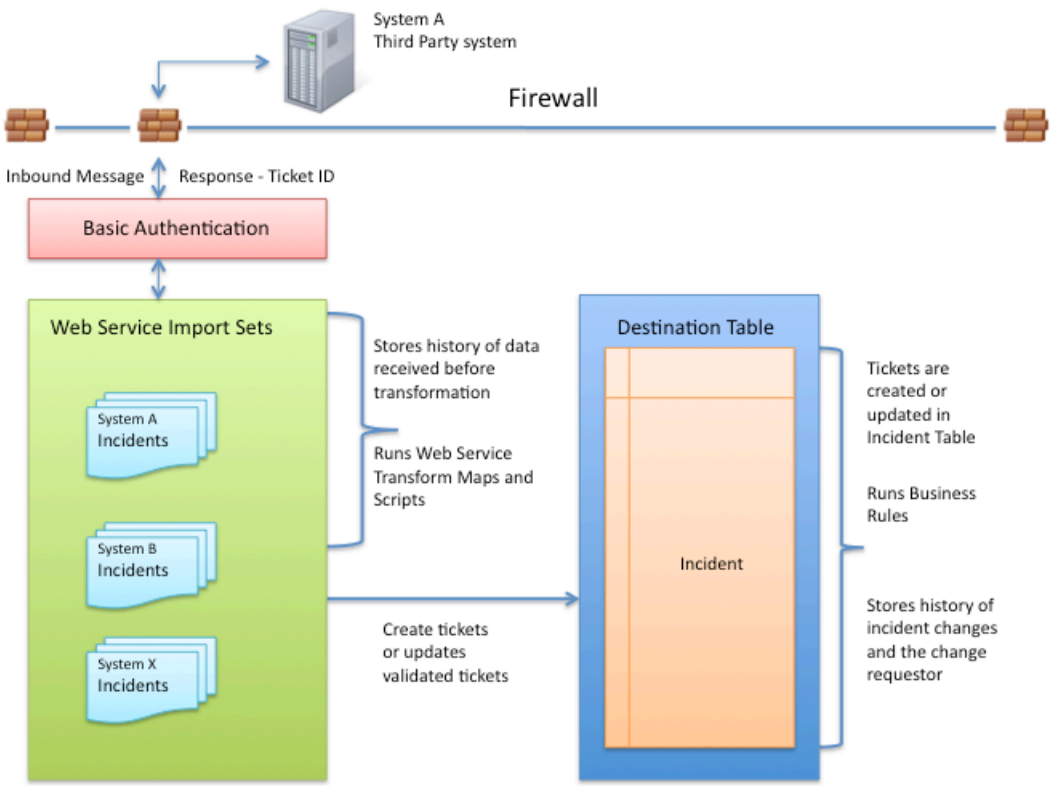
## Integration plan contents

- Firewall requirements
- Protocols to be used
- Required middleware (for example, MS Biztalk)
- Error messages
- Validation rules

## Example using basic authentication

This implementation responds to the third-party system with the ticket ID. The Import Set tables function as a staging area for your data.

### Uni-directional ticketing integration using basic authentication

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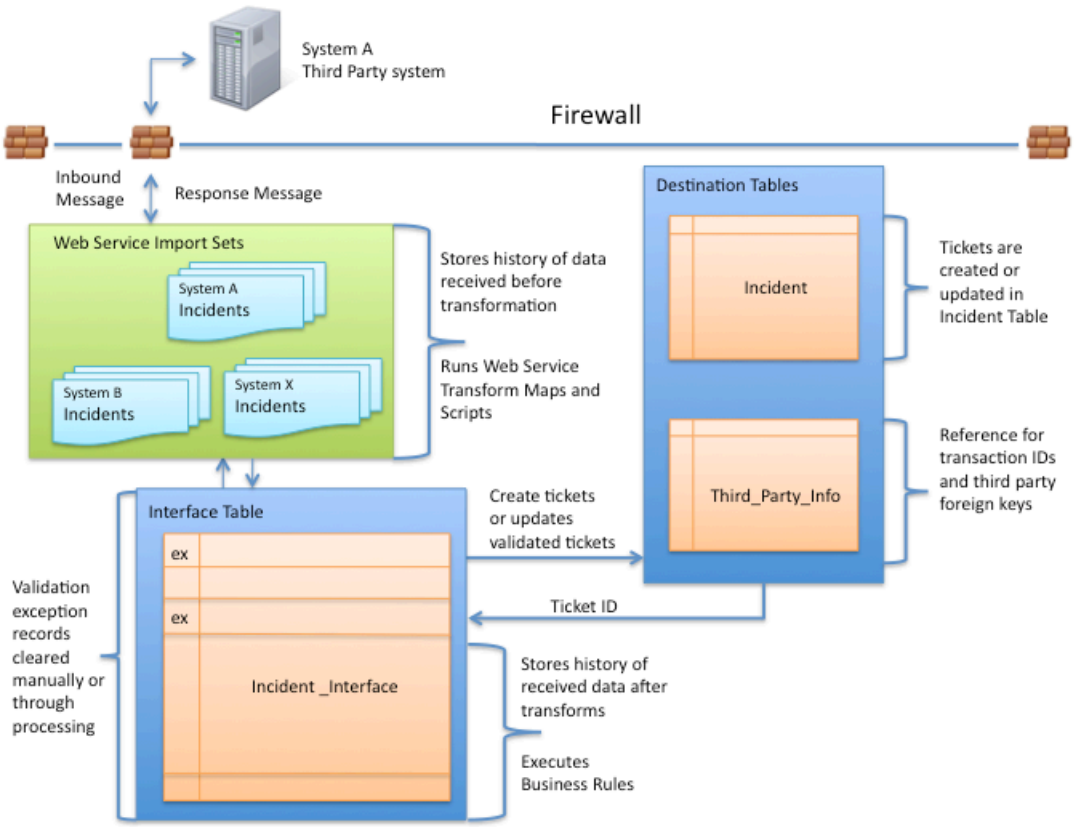
## Example using import sets

An implementation variation for the inbound path would be to use the Import Set Tables as interface tables. In this example, the Incident_Interface Table stores a history of data as it was received and before the data was transformed. The destination Incident Table could store a history of how the incident has changed over time and who changed it. The transform scripts would process the import set and the business rules would run on the target table.

### Uni-directional ticketing integration using import sets




## Bi-directional incident ticketing integrations

A bi-directional integration exchanges data between your ServiceNow instance and a third-party system so that incident information is synchronized between the systems.

This integration is more complex than a uni-directional integration because it has the following requirements.

- Comprehensive definitions of field mappings.
- Standardization of where transformations take place: inbound, outbound, or both.
- Consideration of the ownership of reference data.
- How updates are performed on an ongoing basis.

Implement error handling. Include all these implementations in the integration plan.

While bi-directional implementations are developed on their own merits, you can develop a framework in the ServiceNow AI Platform that can be reused, for example, data driven validation rules.

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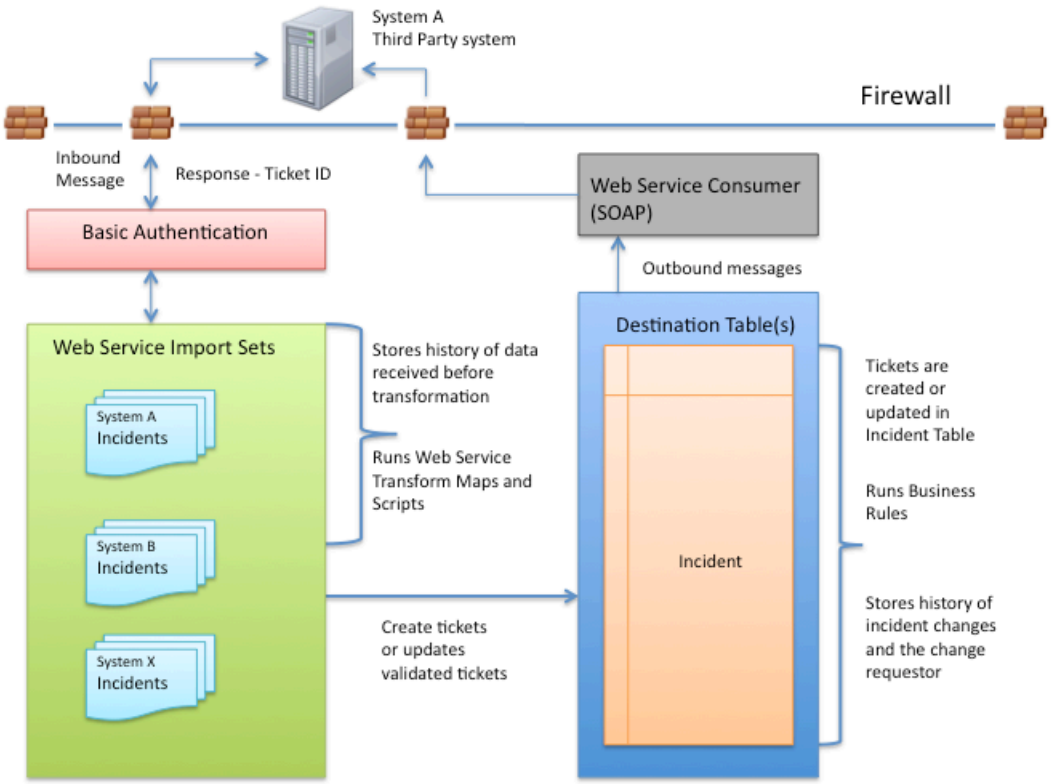
## Integration plan contents

- Plan contents for all the aspects needed for a bi-directional integration.
- State models for each organization.
- Business rule definitions for keeping the tickets synchronized.
- Requirements to store history of individual transactions. If this form of audit is a requirement, consider creating an interface table which is populated prior to creating and updating the destination table.
- Transformation rules for all data elements.
- Time lines for when reference data is transported to the information system. Include requirements to perform transformations before sending the data to and from each system.
- Statement of reference data ownership at all stages.
- Update schema definitions.

## Example using import sets and web services

In this implementation, data authentication is done before insertion into the import set. Transform maps and scripts execute before the data reaches the Incident table. The Incident table is used to store the history of the incident records. For the outbound data path, the target table could trigger business rules before the data is queued in the outbound web service.

### Bi-directional ticketing integration using import sets and web services




## Example using import sets and the ECC queue

An implementation variation for the inbound path would be to use an import set table (in our example, the Incident Interface table) to store historical data. Data validation is also done now,

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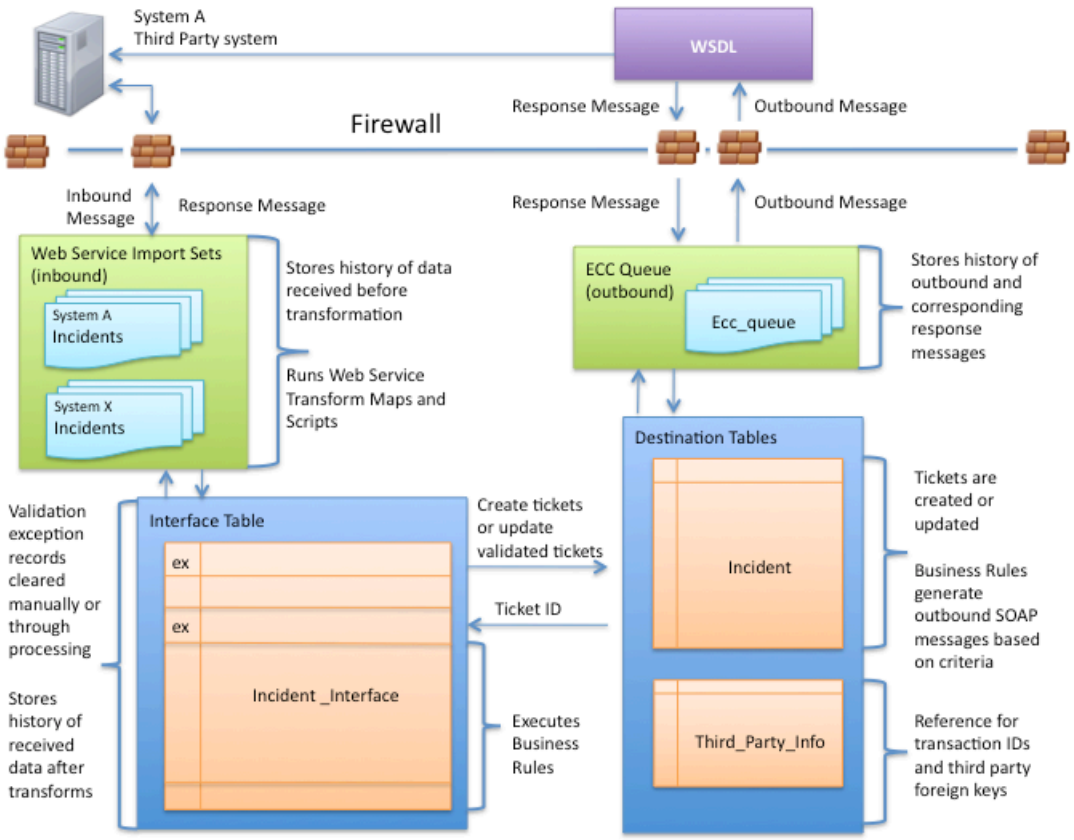
and you can clear exceptions with processing or manual intervention. The Incident table uses a Third-Party Information table as a reference, and messages are generated based on business rules.

Implementing this type of integration involves a web-service component for third-party applications for inbound data. The ECC queue is recommended for outbound data.

**Bi-directional ticketing integration using import sets and the ECC queue**




## Configuring Microsoft Outlook to create incidents and VTB tasks

To create incidents and VTB tasks, or to chat with a virtual agent from within your Outlook email, activate and deploy the ServiceNow Add-in for Microsoft Outlook.

The ServiceNow Add-in for Microsoft Outlook lets you engage with IT directly from an email or, for IT users, quickly create an incident from an email and immediately assign it to the correct team. It also lets you create a VTB task.

### Activate the ServiceNow Add-in for Microsoft Office

You can activate the ServiceNow Add-in for Microsoft Office plugin (com.sn_outlook_addin) if you have the admin role.

#### Before you begin

Role required: admin

#### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

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You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.

3. Select **Install** to start the installation process.

**Note:**
When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

**Related topics**

List of Washington DC plugins

### Deploy the ServiceNow Add-in for Microsoft Outlook

Deploy the ServiceNow add-in for Microsoft Outlook to chat with a virtual agent, create incidents and VTB tasks from within the Microsoft Outlook.

**Before you begin**
In addition to having one of the following roles on the ServiceNow instance, you must be an Office365 administrator to deploy the ServiceNow add-in.

Role required: admin, sn_outlook_addin.outlook_addin_setup

**About this task**
Deploy the ServiceNow add-in to Microsoft Outlook using the instructions in this Microsoft article: Publish Office Add-ins using Centralized Deployment via the Office 365 admin center.

**Note:**
You must be an Office365 administrator to deploy the ServiceNow add-in.

The ServiceNow add-in is only supported for use with Outlook for Mac and Outlook for Windows (Requirement set 1.4).

You can add or remove fields directly on the Incident form for users with the itil role by customizing the Outlook view form layout. For users that do not have the itil role, you can configure a Service Catalog record producer to use for creating new incidents.

**Procedure**

1. Navigate to **All** > **ServiceNow Add-Ins for Office** > **Office Add-In Manifests**.
2. Click **New** on the **Office Manifests** page.
3. On the form, fill in the fields.

**Deploy MS Outlook add-in form**

| Field | Description |
|---|---|
| Add-in Name | A user-friendly name for the add-in. For example, if the add-in needs to be deployed only for administrators, you can choose to name it accordingly. |

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| Field | Description |
|---|---|
| Description | A short description of the add-in. For example, if the add-in is for a help desk, you can write a short description accordingly. |
| Plugin ID | A unique identification string for the add-in you are deploying. You can change the plugin ID value to a new UUID to allow usage of multiple instances of the add-in. |
| Version | Version of the plugin execution. |
| Icon URL | HTTPS URL or relative URL for ServiceNow icon to be displayed in Microsoft Outlook. |
| Active | Indicates that the add-in is active. |

4. Click **Submit**.

   **Note:**
   The Office Controls related list shows the menu and menu items associated with the add-in.

5. Click **Download Manifest** to download the add-in manifest file and follow the instructions in the Microsoft article for deployment. Microsoft article: Publish Office Add-ins using Centralized Deployment via the Office 365 admin center page.
6. **Optional:** You can also customize the add-in by clicking **Clone Manifest** from the context menu.
   This option clones the current manifest into a new record that allows customizing the labels, icons, menus, and menu items.
7. To customize the Incident form for users with the itil role, configure the Incident form layout directly.
   a. Click the context menu icon ( ) on the form and select **View** > **Outlook**.
   b. Click the context menu again and select **Configure** > **Form Layout**.
   c. Add or remove fields, as needed.
8. To customize the Incident form for users that do not have the itil role, use a Service Catalog record producer to configure the Incident form.
   a. Navigate to **Service Catalog** > **Record Producers**.
   b. Right-click the record producer to use for creating new incidents and select **Copy sys_id**.
   c. Paste the copied sys_id into the **Value** field of the **Provide sys_id of the record producer for create incident action from Outlook Add-In** (*sn_outlook_addin.create_incident_cat_item*) system property.

## Managing incidents

Working on incidents involves diagnosing and investigating the incident, recording results, and sometimes escalating or promoting the incident.

Initial diagnosis of incidents is largely a human process. The service desk agent looks at the details of the incident and communicates with the user to diagnose the issue.

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To aid in the diagnosis, the service desk agent can query the configuration management database, or CMDB. The CMDB contains information about hardware and software within a network and the relationships between them. The CMDB can be populated by: Discovery . Discovery is available as a separate product.

## Incident investigation

Incident investigation is also a human process. The service desk continues to use the information in the Incident form as well as the CMDB to solve the issue. Work notes are added to the incident as the service desk evaluates the incident, facilitating communication between the concerned parties. Work notes and other updates can be communicated to the concerned parties through email notifications .

One way to investigate incidents is to determine whether related records exist, using one of the following features.

**Related incidents icon**

The show related incidents icon ( ) appears beside the **Caller** field when it is populated. Click the icon to view the list of incidents for the same caller.

**Note:**
Administrators can add this icon to any reference field by modifying the dictionary entry and adding the *ref_contributions=user_show_incidents* dictionary attribute. The icon appears only for users who have read or write access to the field. A UI macro named *user_show_incidents* defines the behavior. The UI macro must be active to view the related incidents icon.

**Incidents by Same Caller related list**

Another way to research related incidents is to use the **Incidents by Same Caller** related list. The administrator may need to configure the form to display this related list.

**Dependency views**

Dependency views can help find related incidents based on configuration items (CI). If a configuration item is attached to an incident, click the map icon ( ) to display the dependency views map. In the dependency map, if you want to view the tasks that are attached to the CI, click the down arrow next to the CI and from the menu, select **View Related Tasks**.

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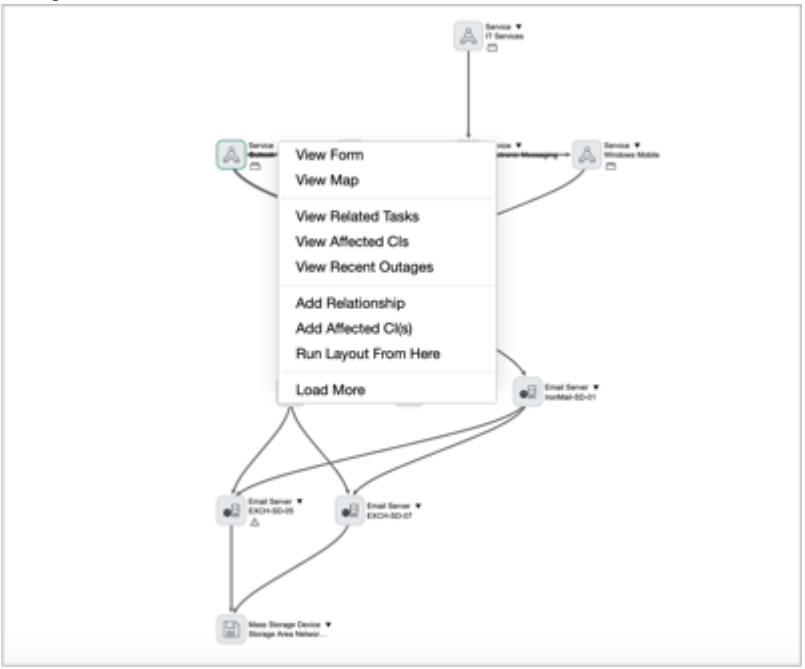
**CI options**




## Incident promotion

When the incident management team has determined that the cause of an incident is an error or widespread problem, the team initiates the problem management process. When the issue requires a change to the infrastructure or a business service, the team initiates the change management process.

A menu item on the Incident form lets you create a problem or change record easily and associate the incident with the problem or change record. For more information, refer Create a record from incident

**Note:**
If the incident already has an associated problem or change record, you cannot create another record of the same task type.

Sometimes, the resolution for the user is to request hardware or software for them. For example, a user may report a problem that requires a new mouse device or keyboard. The service desk agent can create a request from the incident. The incident is associated with the requested item.

**Note:**
This feature is available only in new instances starting with Jakarta or a later release. The Problem Management Best Practice – Jakarta plugin (com.snc.best_practice.problem.jakarta) plugin must be activate.

## Incident escalation

There are two escalation methods the platform uses to track and report on incidents that are not being resolved according to your organization standards.

**Service level agreements (SLAs)**

SLAs monitor the progress of an incident according to a set of agreements between a service provider and customer that define the scope, quality, and speed of the services being provided. As time passes, the SLA escalates the priority of the incident and leaves a marker as to its progress. SLAs are also used as a performance indicator for the service desk.

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### Inactivity monitor

The inactivity monitor generates an event to prevent incidents from going unnoticed. When a certain amount of time has passed without an update to the incident, the event creates an email notification or triggers a script.

## Logging an incident

Log incident records from sources such as email, service desk, service catalog, or external applications as per your convenience. You can also generate incident using business rules or SOAP messaging.

| Where | How |
|---|---|
| Service desk | User can call a service desk agent and the agent can log an incident based on the information provided by the user. Service desk (ITIL) agents can log an incident from the **Self-Service** > **Incidents** > **Create New** module. |
| Service catalog | User can log an incident in service catalog from the **Self-Service** > **Service Catalog** > **Can We Help You?** > **Create Incident** record producer. |
| Email | User can send an email to the instance mailbox. An incident is created according to the inbound email actions. |
| SMS | User can send an SMS to ServiceNow Customer Service number and an incident is automatically created for the user.<br>**Note:** The user must install the Notify plugin (com.snc.notify) and set up a Twilio account in order to avail the messaging service. |
| Chat window | User can request to create an incident using the Connect chat icon ( ) that appears on the upper-right corner of the instance. On the chat window, the user can add an ITIL user and also provide a short description of the issue. Based on the description, the ITIL user creates an appropriate incident. |

**Note:** If you want to create a security incident, first activate the Security Incident Response Dependencies plugin (com.snc.si_dep). You can then click **Create Security Incident** on a new incident form to create a security incident from the currently displayed incident.

ESS users can:

- View the incidents they have opened. By default, the **Watch list**, **State**, and **Urgency** fields are available on the ESS view of the **Incident** form.
- Update the **Watch list** and **Short Description** fields, and enter **Additional comments**. The administrator can configure other fields to be editable.

User who do not have the itil role can view an incident only if the user is the caller for that incident, has opened the incident, or is included in the watchlist. The *incident query* business rule controls this function.

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## Automatically generated incidents

- Incidents can be automatically generated using business rules. Business rules use JavaScript to generate an incident if pre-defined conditions are met.
- Incidents can be generated from outside the platform with SOAP messaging. For more information, refer to SOAP messaging .

## Create an incident

Create an incident record to document a deviation from an expected standard of operation.

### Before you begin

Role required: itil, sn_incident_write, or admin

### About this task

This procedure describes how an ITIL agent completes the Incident form. Incidents are also logged when a user fills out a record producer in the service catalog, or sends an email to the instance.

### Procedure

1. Navigate to **All** > **Incident** > **Create New**.
   You can also click **New** from the Incident list view.
2. **Optional:** Use a template, if one exists for the type of incident that you are logging.
   If the organization uses form templates, then you can apply a template to pre-populate some of the fields for specific types of incidents.
3. On the form, fill in the fields.
   Your organization has configured the Incident form to adhere to its incident management process. Enter information in the form field is based on the process. The following table describes typical Incident form fields.

**Incident form**

| Field | Description |
|---|---|
| Number | Unique system-generated incident number. |
| Caller | User who contacted you with an issue. |
| Category and Subcategory | Type of issue. After selecting the category, select the subcategory, if applicable. |
| Service | Affected business service, if applicable. |

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| Field | Description |
| --- | --- |
| | **Note:**<br>If you select a business service as the configuration item and if that business service is also listed as the configuration item in any other active task, then the active tasks icon (  ) appears. Click the icon to view the list of all the other active tasks that are affecting the business service.<br>You can view the BSM map (dependency view) of the selected business service by clicking the dependency icon (  ). |
| Service Offering | Service offering consists of one or more service commitments that uniquely define the level of service in terms of availability, scope, pricing, and packaging options. This field enables you to receive different features and their levels of performance for a given service. |
| Configuration item | Affected CI, if applicable.<br>After a CI is selected, you can click the open dependency views icon (  ) next to the field to see how the CI maps into the infrastructure. The dependency view shows you what is impacted and whether other CIs or services are experiencing issues. To capture information on the affected CIs, refer to Capture information on affected configuration items in an incident. |
| Channel | Communication method that is used by the user to create the incident. Following are the available options:<br>○ Chat<br>○ Email<br>○ Phone<br>○ Monitoring<br>○ Self-service<br>○ Virtual agent<br>○ Walk-in |
| Origin | Source of the incident. For example, if an incident is created from alert, this field contains the value Alert. This is a auto-populated field and you cannot fill the value manually. |
| State | State of the incident. The state moves and tracks incidents through several stages of resolution. |

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| Field | Description |
| --- | --- |
| | **Tip:**<br>Use the **State** field, rather than the **Incident State** or **Problem State** fields, as your primary means of tracking the state of an incident because this state progresses through the entire processing cycle. To learn more, see Life cycle of an Incident. |
| Impact | Impact is a measure of the effect of an incident, problem, or change on business processes. |
| Urgency | Urgency is a measure of how long the resolution can be delayed until an incident, problem, or change has a significant business impact. |
| Priority | Priority is based on impact and urgency, and it identifies how quickly the service desk should address the task. |
| Assignment group | Group who will work on the incident.<br><br>The business rule *Populate Assignment Group based on CI/SO* populates the **Assignment group** field based on the support group available for the configuration item (CI) or the Service offering consecutively.<br><br>**Note:**<br>The business rule is triggered when an incident is created or updated, and when the **Assignment group** and the **Assigned to** fields are empty.<br><br>If you want to override the default value, then you need to create new properties and provide the field in the property value that must be used to populate the **Assignment group** field. Create the properties in the following order of preference:<br>○ *com.snc.incident.ci_assignment_group.field_name* Identifies which CI field populates the **Assignment group** field.<br>○ *com.snc.incident.service_offering_assignment_gi* Identifies which service offering field populates the **Assignment group** field. |

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| Field | Description |
| --- | --- |
| | **Note:**<br>○ The sys_user_group *read* ACL calls the *SNCRoleUtil* function. The function verifies whether the group that is reviewed contains either the admin role or security_admin role. The function enables the user to view the group only if the user has the same role. As a result, a user with the itil role cannot assign an incident to a group that has the admin role or security_admin role, nor to any group whose parent has those roles.<br>○ Other than using the read ACLs, you can also restrict incidents with specific assignment group(s) for visibility only to the group members using before-query business rule. For details, see How to restrict a specific group incidents to only its group members [KB0790987] article in the Now Support Knowledge Base. You must log in to view the article. |
| Assigned to | User who works on this incident. If the **Assignment group** changes, the **Assigned to** field is cleared. |
| Short description | Brief description of the incident. |
| Description | Detailed explanation on the incident. |
| Attachments | Attachments related to the incident that helps in incident resolution such as screenshots or pdfs.<br>Select the Attachment ( ) to add and manage the attachments. |
| Notes | |
| Watch list | Users who receive notifications about this incident when comments are added. Click the add me icon ( ) to add yourself to the watch list. |
| Work notes list | Users who receive notifications about this incident when work notes are added. Click the add me icon ( ) to add yourself to the work notes list.<br>**Note:**<br>The administrator must create an email notification for the work notes list. |
| Additional comments | More information about the issue as needed. All users who can view incidents see additional comments. |
| Work notes | Information about how to resolve the incident, or steps taken to resolve it, if applicable. |

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| Field | Description |
|---|---|
| Actions taken | A journal field where you can enter details of the actions taken for a major incident. This field is for only internal users.<br><br>**Note:**<br>This field is only visible when you activate the Major Incident Management plugin (com.snc.incident.mim). |
| Related Records | |
| Parent Incident | Unique number of the parent incident for this incident record. |
| Problem | Unique number of any related problem record that is related to the incident. |
| Change Request | Unique number of any related change request that is related to the incident. |
| Caused by Change | Unique number of the change request that resulted in the creation of the incident. |

**Note:**
The **Caller** and **Company** fields are optional for the following situations:

- An incident is created from an alert.
- An incident is created from a change request. In such case, the change request number is populated in the **Caused by Change** field.

4. Click **Submit**.

### Result
The incident is created.

### What to do next

- If you want to mail the incident record, click the more options icon ( ) in the title bar and select **Email**.

  The user who requested the incident and the user who is assigned to the incident are automatically populated in the list of recipients.

- When an incident is created from a case, the Customer Service with Service Management plugin (com.sn_cs_sm) is installed and you have a customer service agent (sn_customerservice_agent) role, you can view the **Customer Cases** tab in the Related Links section of the Incident form. This tab contains the list of the customer cases associated with the incident record.
- When there are one or more interaction records associated with the incident record, you can view the **Interaction** tab in the Related Links section of the Incident form that contains the list of the interaction records.
- A **Primary device health** link appears on the Related Links section of the Incident form. Select to launch the Digital End-User Experience application and device health page for the selected CI in Service Operations Workspace on a separate browser tab. This tab enables agents to view all the available metrics and the device health for the selected CI, which were collected

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by DEX. You can also access this feature using the **View device health** option on the classic U16 CI record.

**Note:**

- DEX requires a separate entitlement.
- This link is available to the agent only if the following conditions are met:
  - The selected CI is of type Device, which is also known as Endpoint.
  - The DEX plugin is installed on the instance. For more information on DEX, see Digital End-User Experience.
  - The DEX agent is installed on the selected CI.

**Related topics**

Create a record from incident

Managing major incidents

## Capture information on affected configuration items in an incident

Capture information on affected configuration items (CIs), with type as asset, in an incident to keep a record of the updated, repaired, swapped, or retired configuration items.

### Before you begin

Role required: itil or admin

Activate the Hardware Asset Management Professional plugin (com.sn_hamp).

### About this task

You can tell where the assets are located, by keeping track of the assets, how they are used, and when changes were made to them. This information helps you to monitor and manage the assets in your company using a systematic approach.

If you are not the caller of the incident and have a CI value in the affected CIs list, it is mandatory to provide information on the CI before changing the state of the incident to **Resolved**.

You can enter CI information either from the **Affected CIs** related list or from the form layout of the Affected CIs. You need to manually add the **Asset Action** and the **Swapped CI** fields in the related list.

#### Add fields in the related list

| Where | How |
|---|---|
| Related list | • In the **Affected CIs** related list, click the settings icon .<br>• Move the **Asset Action** and the **Swapped CI** fields from the **Available** column to the **Selected** column.<br>• Click **OK**. |

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**Note:**
The CI value is updated only if the incident state is updated to **Resolved** by any user excluding the caller. The CI value is not updated if:

- The incident state is updated as **Resolved** by the caller even if the **Asset Action** is populated.
- The incident is directly moved to **Closed** state.

### Procedure

1. Navigate to **All** > **Incident** > **Open**.
2. Open an incident.
3. Navigate to the **Affected CIs** related list before resolving the incident.
4. **Optional:** If you want to enter information in the form layout, click the CI.
5. On the related list or the form, fill in the fields.

#### Information on Affected CIs

| Field | Description |
|---|---|
| Asset Action | Information on whether a CI is updated or repaired, swapped with another CI, or retired from the system. The options available are: No action, Update/Repair, Swap, and Retire.<br>**Note:**<br>If you swap or retire a CI, the sn_hamp_asset.swap or sn_hamp_asset.retire events are generated respectively. |
| Swapped CI | Information on the new CI that is swapped with the existing CI.<br>**Note:**<br>○ This field appears only when you select the value of the **Asset Action** field as **Swap**.<br>○ The CI values available for swapped CI are the ones with asset CI class as hardware.<br>○ The Swapped CI is assigned to the Caller. If the Caller is an Asset Manager, they have the option to reassign it to the appropriate user. |

6. Click **Update**.
The record is saved and the information about CI is stored in the [task_ci] table.

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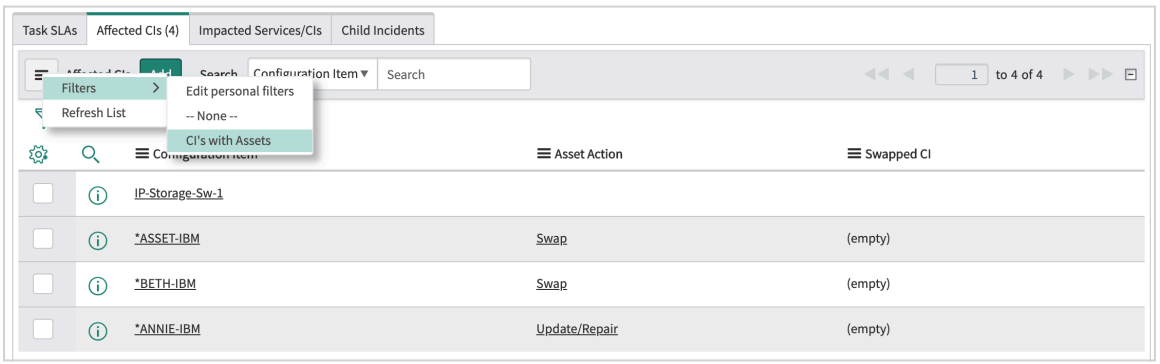
**Note:**
You can filter the **Affected CIs** related list to have the list of affected CIs with class as Asset.




## Create a template from the incident form

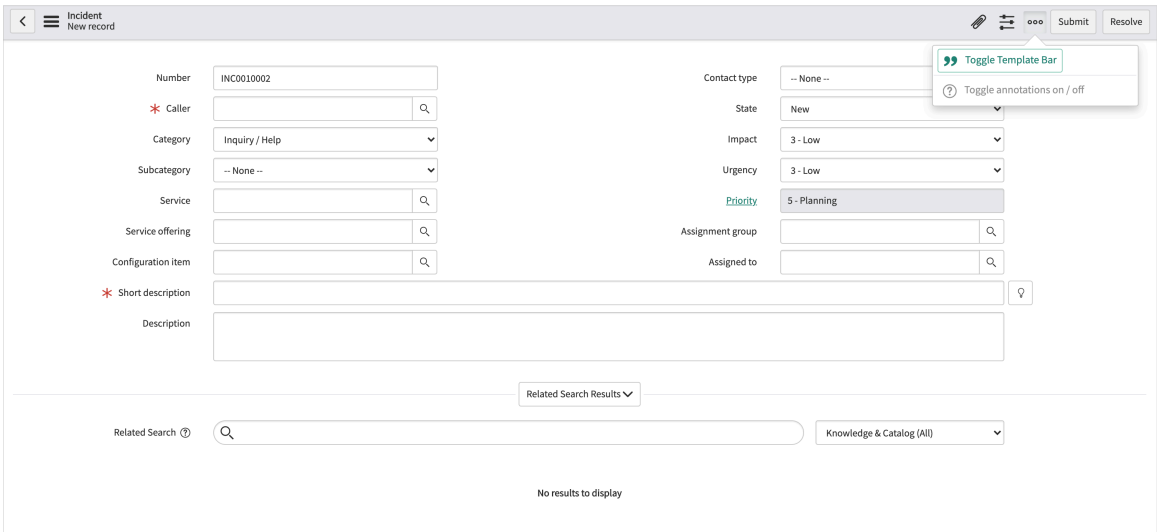
Create a template that define default values for forms so that users can easily create incident. You need to have appropriate permissions before creating templates.

### Before you begin

Role required: itil, sn_incident_write, or admin

### Procedure

1. Navigate to **All** > **Incident** > **Create**.
2. Click the more options icon and then click **Toggle Template Bar** to see the template bar.




3. On the template bar, click the add icon ( ).

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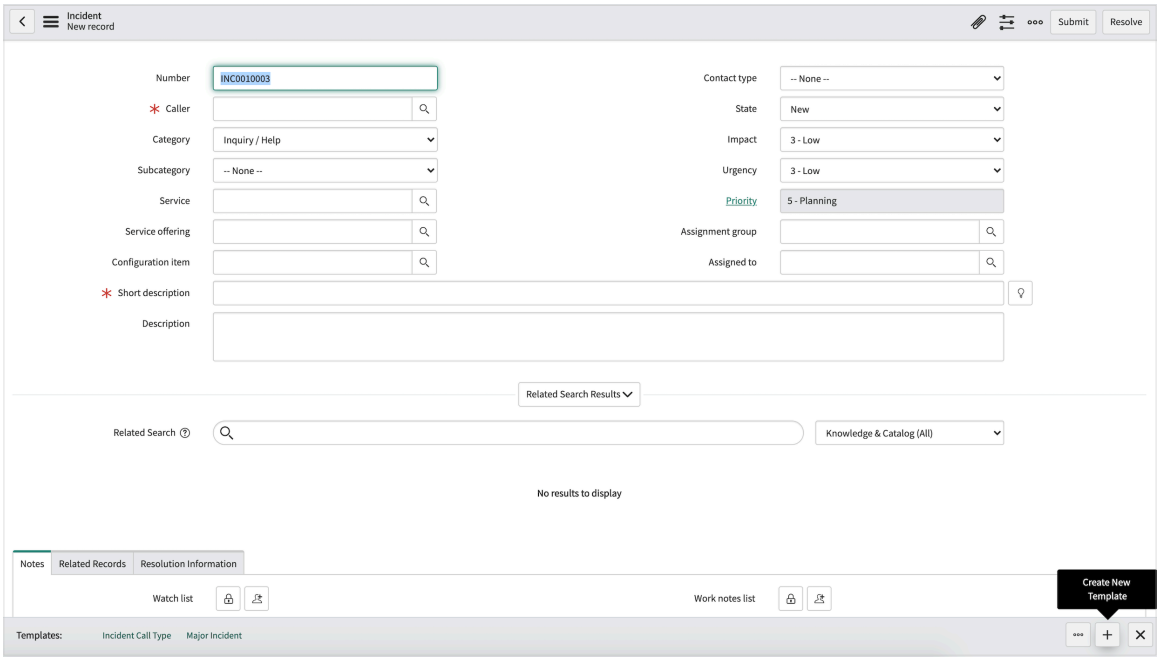


**4.** On the form, fill in the fields.

### Create New Template form

| Fields | Description |
|---|---|
| Name | Name of the template. |
| Table | Table that this template applies to. Select **Global** to make the template available for use with all tables.<br><br>**Note:**<br>The table list shows only the tables and database views that are in the same scope as the template. |
| Active | Option for making the template available for use. A template must be active to be used. |
| Application | Application scope of the rules. The scope defines whether the rules are available for all applications or for scoped applications. |
| User | User who can configure and apply the template. If you define a user, no other users can see the template unless you select the **Global** option. |
| Groups | Group whose members can configure and apply the template. If you define a group, no other groups can see the template unless you select the **Global** option. |
| Global | Option for allowing any user who can access the templates to view and apply this template. |

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| Fields | Description |
| --- | --- |
| Short description | Description of the template.<br><br>**Note:**<br>Adding content to this field does not add that content to the **Short description** field of the forms that use this template. |
| Template | Content that automatically populates records that are based on this template. Select a field from the specified table in the left column and then enter the data to automatically populate in the right column.<br><br>**Note:**<br>Even though you can select dot-walked fields in the template, they do not apply to fields that are on the form. |

5. Click **Submit**.
   The template is created and you can find it on the template bar.

## Apply a template in the Incident form

Apply a template to a new incident record if the pre-populated information in the template is applicable to the incident record. It saves your time and effort to enter values in the incident record fields individually.

### Before you begin

You must create a template before applying the template in the incident form. For more information, see Create a template from the incident form.

Role required: itil, sn_incident_write, or admin

### Procedure

1. Navigate to **All** > **Incident** > **Create New**.
2. Click the more options icon and then click **Toggle Template Bar** to see all templates in the template bar.

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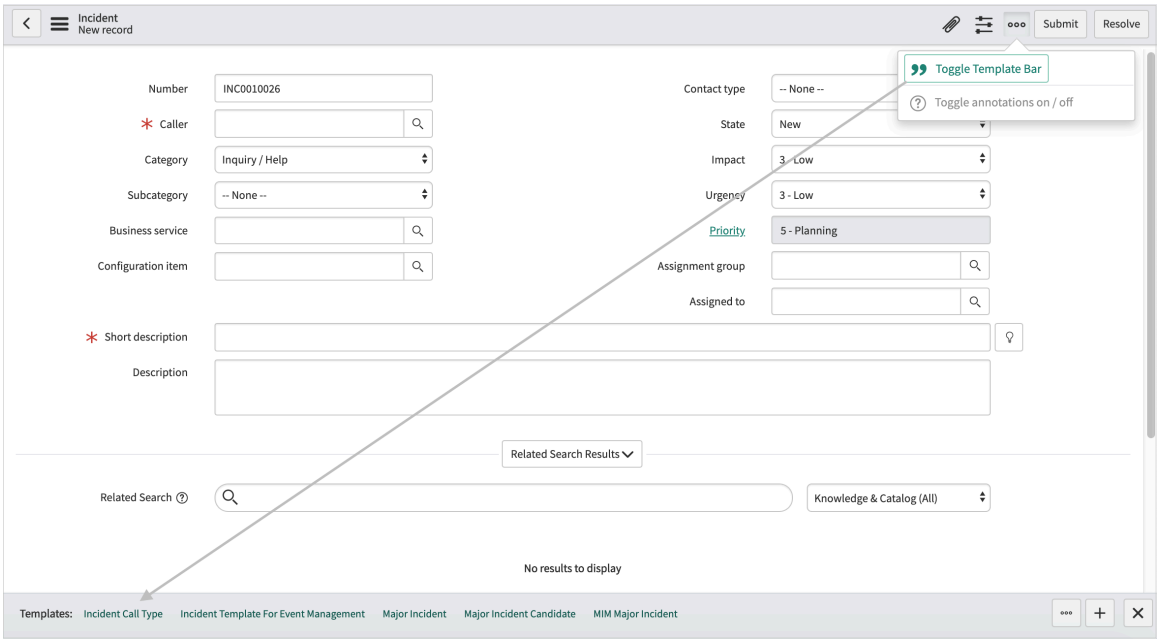


3. Click a template to apply the template on the incident record.

### Related topics

Create incident template

## Create an incident task

Create an incident task to communicate with and request work from assignment groups other than the one that is mentioned for the incident.

### Before you begin

Role required: itil, sn_incident_write, or admin

### Procedure

1. Navigate to **All** > **Incident** > **Open**.
2. Open the incident record.
3. In the **Incident Tasks** related list, click **New**.

   If you do not see the **Incident Tasks** related list, you need to add it. For information on how to a related list, refer Add a related list to a form .

   Alternatively, you can also right-click on the header form and on the context menu, select the **Create Incident Task**.

4. On the form, fill in the fields.

| Field | Description |
|---|---|
| Number | Unique system-generated incident task number. |
| Incident | Incident with which the task is associated. |
| Configuration item | The affected CI. |

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| Field | Description |
|---|---|
| State | The state moves and tracks incident task through several stages of resolution. |
| Priority | |
| Assignment group | The group who works on the incident task. If you leave it blank, the incident is automatically assigned. |
| Assigned to | The user to whom the incident task is assigned to work on.<br>**Note:**<br>If the **Assignment group** changes, the **Assigned to** field is cleared. |
| Short description | A brief description of the incident task. |
| Description | Detailed explanation on the incident task. |
| Notes | |
| Work notes list | Users who receive notifications about this incident task when work notes are added.<br>**Note:**<br>You can the add me icon to add yourself to the work notes list. |
| Work notes | Information about how to resolve the incident task, or steps taken to resolve it, if applicable. |

5. Click **Submit**.

## Use Microsoft Outlook to create incidents and VTB tasks

Create an incident or VTB task or chat with a virtual agent directly from within Microsoft Outlook using ServiceNow icons.

### Before you begin

You must activate and deploy the ServiceNow Add-in for Microsoft outlook. For more information, see Configuring Microsoft Outlook to create incidents and VTB tasks

Role required: none

### Procedure

1. On the Microsoft Outlook Home tab, click the **ServiceNow** icon ( ServiceNow ) and select **Create Incident** or **Create VTB Task**.
2. In the ServiceNow IT Service Management pane, click **Login** and enter your ServiceNow credentials.
   You may need to reauthenticate if your session has expired.
3. For an incident record, fill in the following fields and click **Submit**.

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**Incident form**

| Field | Description |
|---|---|
| Number | Auto-generated incident number. |
| Caller | Current logged in user (default). |
| Short description | Subject of the current email (default). |
| Additional comments | Email body in text format (default). |
| Category | Category of incident.<br>○ Inquiry / Help<br>○ Software<br>○ Hardware<br>○ Network<br>○ Database |

You can add or remove fields directly on the Incident form for users with the itil role by customizing the Outlook view form layout.

**Note:**
For users that do not have the itil role, the configured Service Catalog form for creating new incidents is shown.

4. For a task record, see fill in the following fields and click **Create**.

**VTB Task form**

| Field | Description |
|---|---|
| Select Board | VTB board to which task belongs. |
| Select Lane | Lane of the VTB board. |
| Short Description | Short description of the task. |

5. To chat with a virtual agent, select the **Chat with Virtual Agent** UI action to open the chat window.

## Synchronization between an incident and its incident tasks

Use incident tasks to collaborate with and request work from other stakeholders. An incident and its tasks are synchronized such that the state of incident tasks changes depending on the state of the incident.

**Note:**
The **Close open Incident Tasks when Incident is closed or canceled** property (`com.snc.incident.incident_task.closure`) is responsible for different actions that take place on incident tasks based on the state of the incident.

The synchronization between an incident and its open incident task is as follows:

- When an incident is closed, the state of any open incident task is set to **Closed Incomplete**.
- When an incident is canceled, the state of any open incident task is set to **Closed Skipped**.

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## View VIP status for a caller in incident

View the callers with VIP status on the incident records list view as well as incident form. Organizations commonly designate VIP status in the user record for some of their VIP users.

### Before you begin

Role required: personalize_list or admin

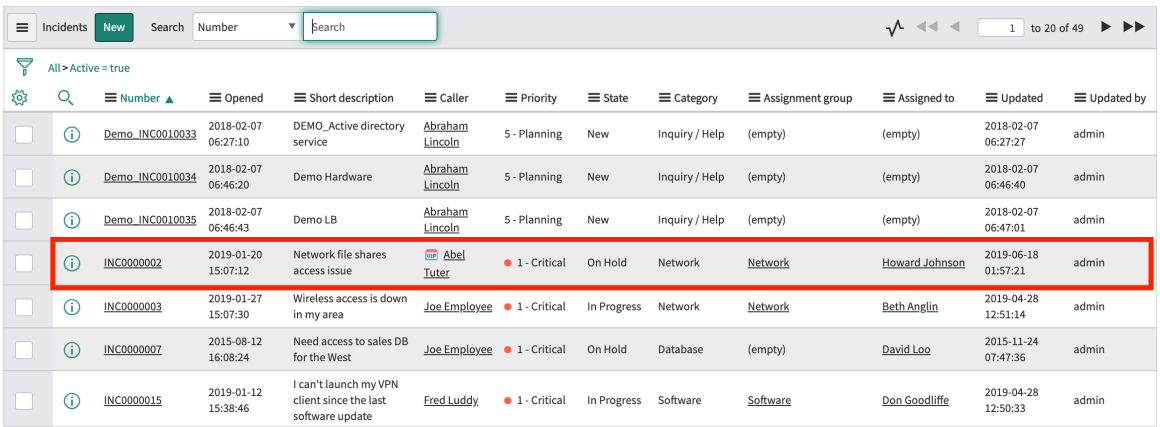
### About this task

When a caller is assigned to an incident, the user record is automatically checked for VIP status. If the caller is a VIP caller, an icon appears beside the caller name in the list view or the caller field in the form view.

To set the status of the VIP caller manually, navigate to **All** > **System Security** > **Users** or select on the required caller name from the list of incident record. On the User form, select the **VIP** check box to set the VIP status of the caller.

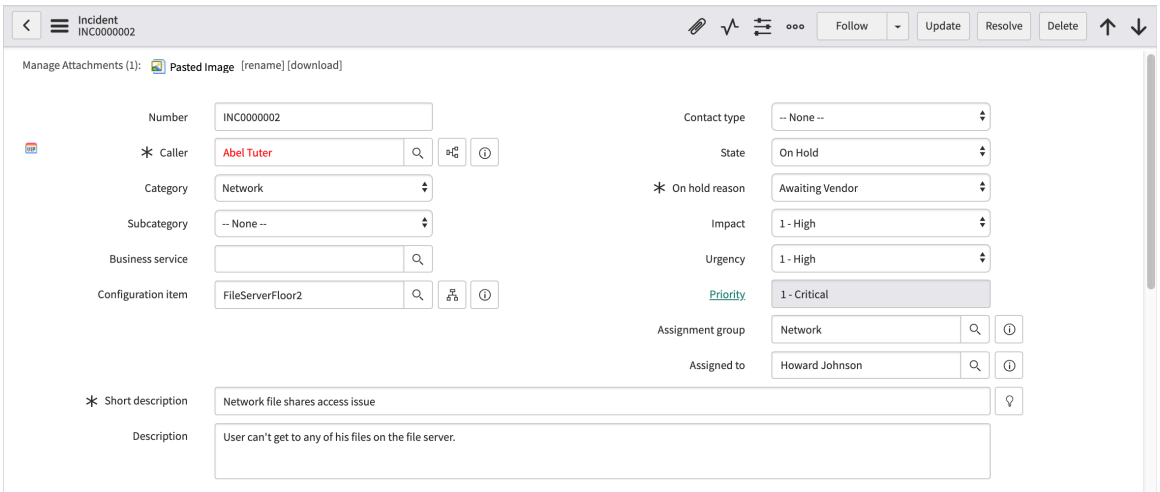
### Procedure

1. Navigate to **All** > **Incident** > **Open**.
2. View the record for the VIP caller in the list of incident records.




| Number | Opened | Short description | Caller | Priority | State | Category | Assignment group | Assigned to | Updated | Updated by |
|---|---|---|---|---|---|---|---|---|---|---|
| Demo_INC0010033 | 2018-02-07 06:27:10 | DEMO_Active directory service | Abraham Lincoln | 5 - Planning | New | Inquiry / Help | (empty) | (empty) | 2018-02-07 06:27:27 | admin |
| Demo_INC0010034 | 2018-02-07 06:46:20 | Demo Hardware | Abraham Lincoln | 5 - Planning | New | Inquiry / Help | (empty) | (empty) | 2018-02-07 06:46:40 | admin |
| Demo_INC0010035 | 2018-02-07 06:46:43 | Demo LB | Abraham Lincoln | 5 - Planning | New | Inquiry / Help | (empty) | (empty) | 2018-02-07 06:47:01 | admin |
| INC0000002 | 2019-01-20 15:07:12 | Network file shares access issue | Abel Tuter | 1 - Critical | On Hold | Network | Network | Howard Johnson | 2019-06-18 01:57:21 | admin |
| INC0000003 | 2019-01-27 15:07:30 | Wireless access is down in my area | Joe Employee | 1 - Critical | In Progress | Network | Network | Beth Anglin | 2019-04-28 12:51:14 | admin |
| INC0000007 | 2015-08-12 16:08:24 | Need access to sales DB for the West | Joe Employee | 1 - Critical | On Hold | Database | (empty) | David Loo | 2015-11-24 07:47:36 | admin |
| INC0000015 | 2019-01-12 15:38:46 | I can't launch my VPN client since the last software update | Fred Luddy | 1 - Critical | In Progress | Software | Software | Don Goodliffe | 2019-04-28 12:50:33 | admin |

3. Click the record to view the VIP status in the **Caller** field.




## Create a record from incident

Create a problem, change, or request record from an incident.

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### Before you begin
Role required: itil, itil_admin, or admin

### About this task
When the cause of an incident is an error or widespread issue, a problem is generated from the incident. When the issue requires a change to the infrastructure or a business service, a change record is created from the incident. When the resolution for the user is to request hardware or software, a request is created from an incident.

### Procedure
1. Navigate to **All** > **Incident** > **Open**.
2. Open the incident record.
3. Right-click on the header form and on the context menu, select the appropriate option.
   The form for the new record appears and is already saved. Some specific fields are copied to the newly generated record from the incident. You can find reference of the newly created task record in the Related Records section of the Incident form.
4. **Optional:** Complete the Problem, Change, or Request form with additional information and click **Update**.

## Create a request from an incident

When you work on an incident and determine that the user needs one or more catalog items, such as an application or a new laptop, you can create a request from the incident. It helps you in tracking the requests associated with an incident and vice versa.

### Before you begin
Role required: itil or sn_incident_write

The Best Practice - Incident Resolution Workflow plugin (com.snc.bestpractice.incident) should be active for creating a request from an incident. To associate a parent incident with the request created for a record producer, the catalog_admin should add the following script in the script block of the record incident.

To associate a parent incident with the request created for a record producer, the administrator should add the following script in the script block of the record producer:

```
var incRPUtil = new LinkRecordProducerToIncident();
incRPUtil.linkRecordProducerToParentIncident(RP.getParameterValu
e('sysparm_req_parent'), current);
```

**Note:**
If you set the **Use the sc_layout driven cart macros (default true)** (*glide.sc.use_cart_layouts*) property to **false** and create a request from an incident, the request is not associated with the incident.

### Procedure
1. Navigate to **Incident** > **All**.
2. Select the required open incident.
3. Click the additional actions menu icon and select **Create Request**.
   The Catalogs home page is displayed with all active catalogs that you can access.

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**Note:**
If there is only one active catalog, then that catalog page is displayed with available categories.

4. Select the required catalog and navigate through its categories and items.
5. Check out the required catalog item, order guide, or record producer.
   For information on checkout models, see Service Catalog checkout models.
   For a catalog item or order guide, a request is created and displayed under the **Requests** tab of the incident. For a record producer, the corresponding task is created and displayed under the **Problems** tab of the incident.

**Note:**

- The associated incident is specified in the annotation message throughout the request process.
- Both for the one-step and two-step checkout, the caller of the incident is automatically set as the **Requested For** user for the request. If the two-step checkout is enabled, the fulfiller can change the **Requested For**.
- You cannot add items to the wish list, or save a record producer in this flow.

## Copy an incident or create a child incident

Copy an incident or create a child incident without manually entering the value of all the fields in the new incident.

### Before you begin

- Role required: itil, sn_incident_write, or admin
- Select the **Enable copy incident feature** (*com.snc.incident.copy.enable*) and the **Enable create child incident feature** (*com.snc.incident.create.child.enable*) incident properties at **Incident** > **Incident Properties**.

**Note:**
An itil user can copy or create a child of any incident whereas a user without any role can copy only the incident which the user has created.

### About this task

The Copy Incident functionality copies the details of an existing incident record to a new incident record. The Create Child Incident functionality copies the details of the parent incident and links the new incident to the parent incident. You can enable the options as well as add or remove fields or related list using the copy incident and create child incident properties.

### Procedure

1. Navigate to **Incident** > **Open**.
2. Open an existing incident that you want to copy or from which you want to create a child incident.
3. Perform one of the following actions.

4. Fill out the other fields, as required.
5. Click **Submit**.

The default fields and related lists that are copied from the parent incident are:

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| From where | What are copied |
| --- | --- |
| Fields | ○ Category<br>○ Subcategory<br>○ Business Service<br>○ Configuration item<br>○ Impact<br>○ Urgency<br>○ Assignment group<br>○ Short Description<br>○ Description<br>○ Related lists<br>○ Caused by Change<br>○ Location<br>○ Company<br>○ Problem<br>○ Change Request<br>○ Parent incident<br>**Note:**<br>If the problem, change, or the parent incident is not active, then details of those fields are not copied. |
| Related lists | ○ Affected CIs<br>○ Impacted Services<br>○ Service Offerings<br>**Note:**<br>The supported related tables are:<br>○ Affected CIs (task_ci)<br>○ Impacted Services (task_cmdb_ci_service)<br>○ Service Offerings (task_service_offering)<br>○ Business Applications (task_cmdb_ci_business_app)<br>You cannot add any other table in this field but you can remove any of the default values. |

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## Synchronization between a parent and a child incident

The parent and the child incidents are synchronized such that the state of a child incident changes depending on the state of the parent incident.

### Parent-Child state synchronization

| Parent State | On Hold Reason (Parent) | Child State | On Hold Reason (Child) |
|---|---|---|---|
| In Progress | NA | In Progress | NA |
| On Hold | Awaiting Change/ Awaiting Problem/ Awaiting Vendor | Same as parent | Same as parent |
| On Hold | Awaiting caller | Not updated | Not updated |
| Resolved | NA | Resolved.<br><br>The Activity log in the child incident form is updated with the resolution notes copied from the parent Incident. | NA |
| Closed | NA | Not closed.<br><br>Child incidents must always be closed by the caller or by the system based on the auto-closure property. | NA |
| Canceled | NA | NA | NA |

**Note:**

When an incident has a child incident, the following actions take place:

- If an ITIL user reopens the parent incident, then the parent incident as well as the child incident reopens. Both the parent and the child incident state is set to **In Progress**.
- If an ESS user reopens the parent incident, the parent incident state is set to **In Progress** but the child incident is not reopened.

## Enable the display of incident special handling notes

Enable the display of informative notes for a specific record or for a set of records that meet one or more conditions. Use these notes to help users understand the action that was taken for the incident or the next course of action to be taken.

### Before you begin

Role required: admin

Activate the Special Handling Notes plugin (com.sn_shn) to add the **Create Special Handling Notes** related link from which you can create the notes.

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### Procedure

1. Navigate to **Incident** > **All**.
2. Open any incident record.
3. Click the Additional actions icon and select **Configure** > **Form Layout**.
4. From the **Available** list, select **Special Handling Notes Pop Up** and move it to the **Selected** list.
5. Click **Save**.
   The Incident form can now display special handling notes.

### Related topics

Create a special handling note

## Create a knowledge article from an incident using an article template

Provide a resolution for an issue by creating a knowledge article from an incident with fields defined in an article template.

### Before you begin

Role required: itil, sn_incident_write, or admin

Activate the KCS Integration for Incident Management plugin (com.snc.incident.knowledge).

### About this task

You can create a knowledge article only when the incident is resolved and you have not already created a knowledge article from that incident.

**Note:**
Incident managers with the sn_km_ml.knowledge_curation_user role can use the Demand Insights for Incidents dashboard to identify which incidents have no or insufficient knowledge coverage. For more information, refer Demand Insights for Incidents dashboard.

### Procedure

1. Navigate to **All** > **Incidents** > **Resolved**.
2. Open a resolved incident record.
3. Access the Incident-KCS article - HTML form using one of the following methods:
   - Under Related Links, click **Create Knowledge**.
   - Right-click the form header and click **Create Knowledge**.

   The Incident-KCS article - HTML template provided with the base system appears. If you want to create your own article template, refer to Create an article template.
4. On the form, fill in the fields.

#### Incident KCS Article form fields

| Field | Description |
|---|---|
| Number | [Auto-generated] Unique number to identify the knowledge article. |
| Knowledge base | Knowledge base in which the article is stored. The Incident KCS Article is stored in the [kb_template_incident_kcs_article] table. |

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| Field | Description |
|---|---|
| Category | [Auto-generated] The value of this field is automatically provided from the **Category** field of the knowledge. |
| Valid to | Date after which the knowledge article is deleted from the database. After this date, the article does not appear in the search result. |
| Confidence | Maturity of an article based on its completeness and reusability. |
| Version | [Auto-generated] Displays the article version number, which is incremented when changes are made to a published article. |
| Workflow | [Auto-generated] Workflow that is followed for creating the knowledge article. For more information, refer Knowledge workflows . |
| Source Task | [Auto-generated] Incident record from which you have created the article. |
| Attachment link | Check box to automatically download an attached article instead of opening the article, when you access an article. |
| Display attachments | Check box to display attachments in the knowledge article. The attachments appear below the article text. |
| Governance | An attribute of an article that enables you to control sensitive, critical, or regulated information. Not all articles have the same requirement for compliance reviews. Some articles are based on the collective experience of the people who use the articles (experience-based). Other articles have policy or legal information that require tight control (compliance-based). |
| Short description | Brief description of the knowledge article. |
| Issue | Information on the cause of the incident. |
| Resolution | Method used to resolve the incident. |

**Note:**
The **Confidence** and **Governance** fields appear when the Knowledge Management KCS Capabilities plugin (com.snc.knowledge_kcs_capabilities) is activated. For more information, see Managing the KCS article state .

5. Click **Submit**.
   A knowledge article is created. The article record is listed in the Knowledge related list.

### Create a knowledge article from an incident

When you are ready to close an incident, you can create a knowledge article so the next time the issue comes up the resolution is easy to find.

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### Before you begin

KCS Integration for Incident Management plugin (com.snc.incident.knowledge) must be activated. When activated, **Incident Create Knowledge** business rule does not run. For more information, see Activate KCS Integration for Incident Management.

Role required: itil, sn_incident_write, or admin

### About this task

When an incident is closed automatically or by the caller, a draft knowledge article is created.

### Procedure

1. Open a resolved incident that you want to close.
2. Perform one of the following methods to create a knowledge article from an incident:
   - Under Related Links, click **Create Knowledge**.
   - Right-click the form header and click **Create Knowledge**.

   **Note:**
   The **Create Knowledge** related link is visible only if:
   - Incident must be in **Resolved** state.
   - A knowledge article does not exist for the same incident.
3. Click **Close incident**.
   A new draft knowledge article is created. The content in the fields listed in the following table is copied from the Incident form to the Knowledge form.

| Field on Incident form | Field on Knowledge form |
|---|---|
| Short description | Short description |
| Additional comments | Text |
| Number | Source |

The **Knowledge** related list on the Incident form is populated with the new draft knowledge article. The draft article does not appear in the knowledge base (KB) for users until it is reviewed and published.

If the **Knowledge submission** workflow (glide.knowman.submission.workflow) is enabled from the System Properties [sys_properties] table, the content in the **Short description** and **Additional comments** fields of the incident form become a knowledge submission instead of an article. The **KB Submissions** related list on the Incident form is populated with the new knowledge submission. For more information on creating a knowledge article and workflows, see Create knowledge from incident and Knowledge workflows.

When the KCS Integration for Incident Management plugin (com.snc.incident.knowledge) is not activated, **Knowledge** check box is visible instead of **Create Knowledge** related link. You can select the check box and enter a resolution in the**Additional comments (Customer visible)** field and then close the incident. In such case, a knowledge article is created automatically using the **Incident Create Knowledge** business rule.

### What to do next

To see the draft articles, navigate to **Knowledge** > **My Knowledge Articles** and then open the draft article by its KB number in the Knowledge form.

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## View affected CIs in the dependency views map

A configuration item (CI) can result in an incident. Use dependency view to identify other configuration items (CIs) that are affected by the CI that resulted in the incident.

### Before you begin

Role required: Itil, itil_admin sn_incident_write, or admin

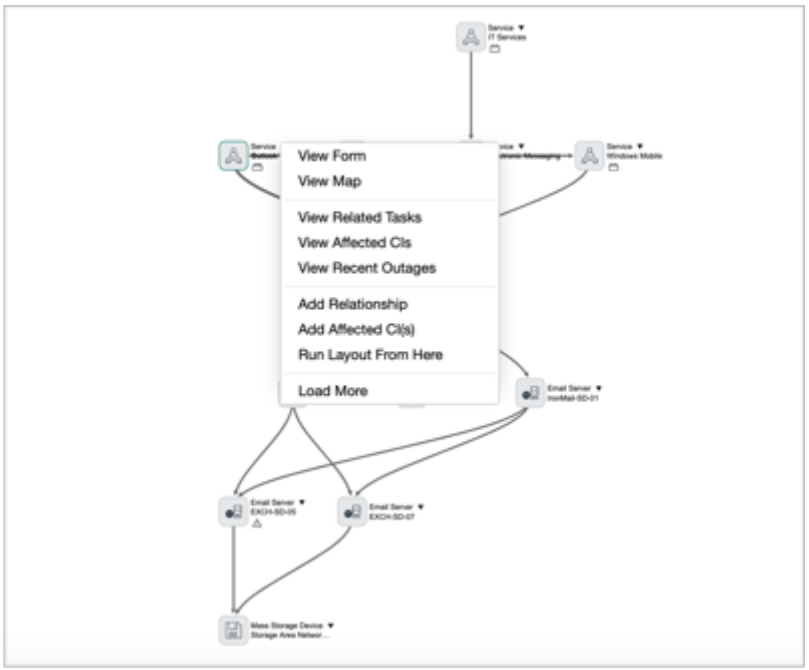
### About this task

Often, an incident is related to one or more specific configuration items (CIs). If the configuration management database (CMDB) is populated, the CI records hold valuable information to help resolve incidents. You can associate configuration items to an incident to see how the incident affects dependent CIs.

Use the **Configuration Item** field when a single CI is the cause of the incident and use the **Affected CIs** related list when multiple CIs are affected by the incident. For example, suppose a load-balancer in a data center is no longer operational. The **Configuration Item** field lists the specific server which is out of memory. The **Affected CI** related list contains the load-balancer, the data center, the servers that depend on the load-balancer, and business services that are impacted by the missing server.

### Procedure

1. On the Incident form, associate the CIs.
2. Click the dependency views icon ( ) beside the **Configuration item** field.
   The Dependency Views map opens in a new tab or window.
3. To see items that this CI affects, click the down arrow and select **View Affected CIs**.




To add another affected CI to the incident, click the down arrow beside the CI and click **Add Affected CI(s)**.

### Related topics

Dependency Views map

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## Refresh impacted services and CIs for incident

The impacted services and CIs related list refreshes its records and also the records listed in the Service Offerings and Business Applications related lists based on the affected CIs. You can identify the impacted services and CIs and take necessary action.

### Before you begin

Role required: itil, incident_manager, sn_incident_write, or admin

Ensure that you have configured the Business Applications related list.

### About this task

When you refresh impacted services, the Impacted Services/CIs, Business Applications, and the Service Offerings related lists get updated based on the affected CIs. The records in each of the related list are unique even though the impact can be from a single affected CI. The following properties are responsible for this functionality:

- **Populate Impacted Services based on Affected CIs. Note: This requires any Business Service identified to have previously been converted to an Application Service.** (*com.snc.incident.refresh_impacted.include_affected_cis*)
- **Impacted CIs/Services related list is generated via events. When enabled the refresh will be executed in the background and the user will be notified on completion.** (*com.snc.incident.refresh_impacted.event*)
- **Populate the Business Application related list for incidents** (*com.snc.incident.populate_business_application*)
- **Populate the Service Offering related list for incidents** (*com.snc.incident.populate_service_offering*)
- **Populate the Refresh impacted services has been initiated message that is displayed on the UI when the Refresh impacted services UI action is clicked.** (*com.snc.incident.refresh_impacted_services.message.show*)

  **Note:**
  By default, the property is set to true.

- **Control and refresh the creation of live feed messages** (*com.snc.incident.refresh_impacted_notify_user*)

  **Note:**
  By default, the property is marked true.

### Procedure

1. Navigate to **All** > **Incident** > **Open**.
2. Open the incident record for which you want to refresh the related lists those values are based on affected CIs.
3. Click the Additional actions icon and then select **Refresh Impacted Services**.
   The records in the Impacted Services/CIs, Business Applications, and Service Offerings related lists are updated.

## Associate CIs with incident

Associate affected or impacted configuration items (CIs) with an incident record to find out how the incident affects other CIs with dependent relationships.

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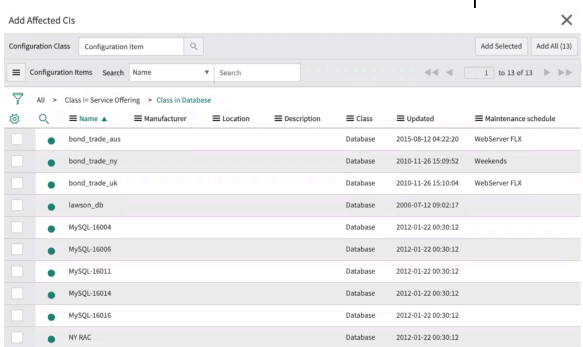
### Before you begin
Role required: admin

### About this task
Use the **Configuration Item** field when there is a single, primary CI that is the cause of the incident and the **Affected CIs** or the **Impacted Services/CIs** related list when multiple CIs are affected by the incident.

### Procedure
1. Navigate to **All** > **Incident** > **Open**.
2. Open the incident record to which you want to associate CI items.
3. Perform the following actions:

#### Associate CI items

| Options | Procedures |
|---|---|
| Configuration item | **a.** Click the lookup icon ( ).<br>**b.** Select configuration item.<br>**Note:** By default, Service Offering is filtered out and CIs with Principal Class are selected. The Principal Class filter functionality is applicable to the new customers starting the Paris release. |
| Affected CIs | **a.** Click **Add**.<br>**b.** Select configuration items.<br>**Note:** By default, Service Offering is filtered out and CIs with Principal Class are selected. The Principal Class filter functionality is applicable to the new customers starting the Paris release.<br>  <br>**c.** Click **Add Selected**. |
| Impacted Services/CIs | **a.** Click **Add**.<br>**b.** Select configuration items. |

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| Options | Procedures |
| --- | --- |
| | **Note:** By default, Service Offering is filtered out.<br><br>**c.** Click **Add Selected**. |

## Update the resolved incident notification template

Modify the content of the email template that is sent to the user when you resolve an incident.

### Before you begin

Role required: admin

### Procedure

1. Navigate to **All** > **System Notification** > **Templates**.
2. Open the **incident.ess.resolve** template.
3. Manually update the template content.
4. Click **Update**.

## Incident resolution and closure

An incident is considered resolved when you provide the user with a temporary workaround or a permanent solution for the issue.

When an incident is resolved, the escalators stop, and the caller can review the resolution. If the caller is satisfied with the resolution, the caller can close the incident or the incident is auto-closed after a certain time based on the incident auto-close properties.

If the cause of an incident is understood but cannot be fixed, the service desk can create a problem from the incident to find the root cause of the issue. The problem is then evaluated through the problem management process.

If the incident creates the need for a change in IT services, the service desk can generate a change from the incident, which is evaluated through the change management process.

## Incident closure

You can configure incident properties to auto-close an incident.

Your organization can also generate customer satisfaction surveys when incidents are closed. Surveys allow the service desk to gather information about the quality of their service directly from the user.

### Resolve and close an incident

When the service is restored by rectifying the issue that resulted for an incident, you can set the incident state as resolved. If the user is satisfied with the resolution, the user can close the incident or the incident is auto-closed after a certain time based on the incident auto-close properties.

### Before you begin

Role required:

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- For resolution: itil, list_updater, sn_incident_write, or admin
- For closure: itil_admin or admin

### Procedure

1. Navigate to **All** > **Incident** > **Open**.
2. Open the incident that you want to resolve and close.
3. In the Resolution Information section, fill in the fields.

**Resolution Information fields**

| Field | Description |
|---|---|
| Resolved by | The user who resolved the issue and the date and time the incident was closed. |
| Resolved | The date and time when the incident was resolved. |
| Resolution code | Information to categorize resolved cases. |
| Resolution notes | Document how an incident is resolved. |

4. Click **Resolve**.
   The incident is in the resolved state.
5. Click **Close Incident**.
   The incident is closed.

> **Note:**
> Even when an incident is closed or canceled, you can edit the following fields on the Incident form, if you have an admin role: **Subcategory**, **Service**, **Service Offerings**, **Description**, **Contact type**, **Watch list**, **Work notes list, Parent Incident**, **Problem**, **Change Request**, **Caused by Change**, **Resolved by**, **Resolved**, **Reassignment count**.

## Configure incidents to close automatically

Close incidents automatically based on the last updated date or the resolution date of the incident by configuring incident properties. You can also mention the number of days system must wait before initiating the auto-closing functionality.

### Before you begin

Role required: admin

### About this task

You can auto-close incident based on the last updated date or the resolution date of the incident using the property **Enable auto closure of incidents based on Resolution date. Setting this to 'No' will make auto closure to run based on the Updated date** (*com.snc.incident.autoclose.basedon.resolved_at*). This property is set to true only for the new customers starting the London release. Existing customers before the London release have to manually set the property to true.

> **Note:**
> You cannot auto-close a major incident based on the incident auto-closure property. For more information, refer Close a major incident.

A scheduled job called *Autoclose Incidents* (**System Scheduler** > **Scheduled Jobs** > **Scheduled Jobs**) runs the *Incident Autoclose* business rule to close incidents as

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described. By default, it assigns the name of the administrator, who is logged in when the *Autoclose Incidents* job runs, to the **Updated by** field.

### Procedure

1. Navigate to **Incident** > **Administration** > **Incident Properties**.
2. Select the **Enable auto closure of incidents based on Resolution date. Setting this to 'No' will make auto closure to run based on the Updated date** check box if you want the incident to be auto-closed based on the resolution date.
3. In the **Number of days (integer) after which Resolved incidents are automatically closed. Zero (0) disables this feature** (*glide.ui.autoclose.time*) property, enter the number of days.

> **Note:**
> If you have an inactivity monitor triggering on your incident, it resets this auto-close clock each time it triggers, preventing your incident to be closed. To prevent this reset, set a **Reset Condition** on your inactivity monitor to **[Incident state] [is not] [Resolved]**.

4. Click **Save**.

### Related topics

Configure default user for auto-closing incidents

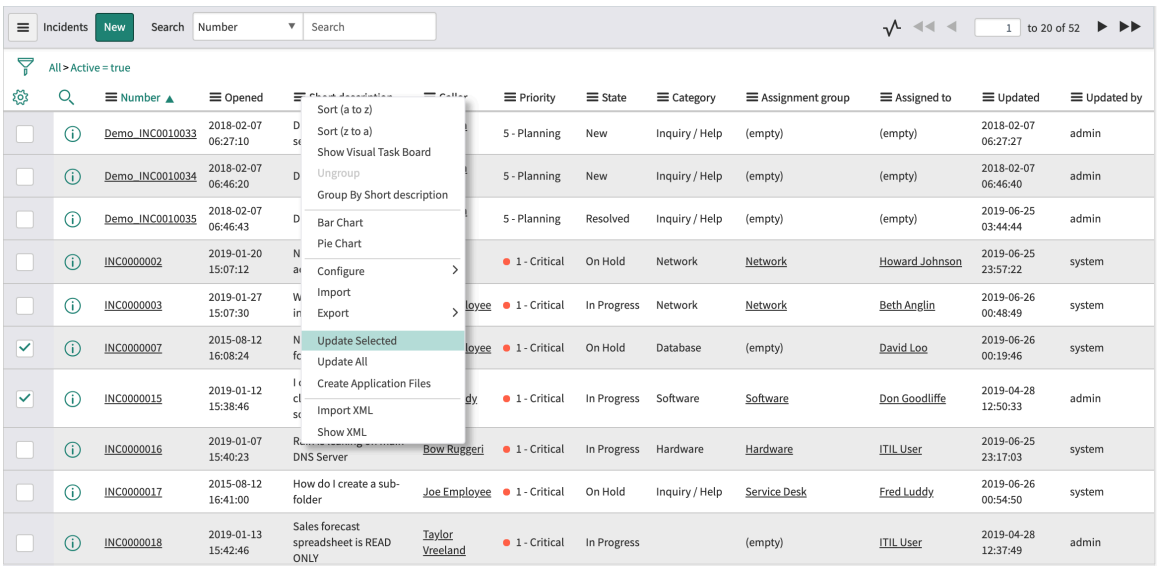
## Close multiple incidents from list

Close multiple incidents from the incident list simultaneously that can have the same resolution code.

### Before you begin
Role required: itil, list_updater, sn_incident_write, or admin

### Procedure

1. Select the check box beside each incident that you want to close.
2. Right-click on any list column header and click **Update Selected**.




3. Set the value of **State** to **Closed**.

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4. In the Resolution Information section, select a **Resolution code** and enter your notes in **Resolution notes**.
5. Click **Update**.
   The changes apply to all the selected records.

### Create a UI action to close multiple incidents

Create a UI action to close multiple incidents at once from the **Actions** list in the list view.

#### Before you begin

Role required: business_rule_admin (for business rule), ui_action_admin (for UI action), or admin

#### About this task

Closing an incident from **Actions** list adds the same close note to all the incidents that are closed and does not require the list_updater role. Implementing this process requires a script include that is referred from a UI action and a custom UI page.

#### Procedure

1. Navigate to **All** > **System Definition** > **Script Includes** and click **New**.
2. Create the script includes with the following information.
   - **Name**: IncidentClosure
   - **Client callable**: Select the check box
   - **Active**: Select the check box
   - **Script**: Paste the following information:

```
var IncidentClosure = Class.create();
IncidentClosure.prototype =
 Object.extendsObject(AbstractAjaxProcessor, {
    closeIncidents: function() {
        var selectedIncidents =
 this.getParameter("sysparm_incidents");
        var notes = this.getParameter("sysparm_closeNote");
        var code = this.getParameter("sysparm_closeCode");
        var incidentGr = new GlideRecord('incident');
        incidentGr.addQuery('sys_id', 'IN',
 selectedIncidents);
        incidentGr.query();
        while (incidentGr.next()) {
            incidentGr.setValue('state', 7);
            incidentGr.setValue('close_notes', notes);
            incidentGr.setValue('close_code', code);
            incidentGr.update();
        }
        return true;
    },

   type: 'IncidentClosure'
});
```

3. Save the record.
4. Create the following steps to create a UI page.

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- **Name**: mandatory_fields_to_close_incident_ui
- **HTML**: Paste the following information:

```
<?xml version="1.0" encoding="utf-8" ?>
<j:jelly trim="false" xmlns:j="jelly:core" xmlns:g="glide"
 xmlns:j2="null" xmlns:g2="null">
   <style>
       #content_row .reference-label {
           padding-right: 15px;
       }

       #page_timing_div {
           display: none;
       }
   </style>
   <form class="form-horizontal">
       <div class="form-group">
           <label class="col-xs-4 control-label">
               <span style="padding-right: 5px;"></span>
               <span
class="label-text">${gs.getMessage('Resolution
code')}</span>
           </label>
           <div class="col-xs-5 form-field input_controls"
style="line-height: 32px;">
               <select name="closeCode" id="closeCode">
                   <option value="" selected="SELECTED"
role="option">-- None --</option>
                   <option value="Solved (Work Around)"
role="option">Solved (Work Around)</option>
                   <option value="Solved (Permanently)"
role="option">Solved (Permanently)</option>
                   <option value="Solved Remotely
(Work Around)" role="option">Solved Remotely (Work
Around)</option>
                   <option value="Solved Remotely
(Permanently)" role="option">Solved Remotely
(Permanently)</option>
                   <option value="Not Solved
(Not Reproducible)" role="option">Not Solved (Not
Reproducible)</option>
                   <option value="Not Solved (Too Costly)"
role="option">Not Solved (Too Costly)</option>
                   <option value="Closed/Resolved by Caller"
role="option">Closed/Resolved by Caller</option>
               </select>
           </div>
       </div>
       <div class="form-group">
           <label class="col-xs-4 control-label">
               <span class="label-text"
style="">${gs.getMessage('Resolution Notes')}</span>
           </label>
           <div class="col-xs-7 form-field input_controls">
```

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```
                <textarea required="true"
 class="form-control" value="closeNotes" id="closeNotes"
 type="text"></textarea>
            </div>
        </div>
        <div class="form-group"
 style="padding-right:20px;margin-bottom:0;padding-left: 75%;
 line-height: 45px;">
            <g:dialog_button id="cancel_button"
 type="button" style_class="$btn btn-default"
 onclick="actionCancel()" style="min-width:
 5em;">${gs.getMessage('Cancel')}</g:dialog_button>

            <g:dialog_button id="ok_button"
 type="button" onclick="actionOK()"
 style_class="btn btn-primary" style="min-width:
 5em;">${gs.getMessage('OK')}</g:dialog_button>
            <div class="clearfix"></div>
        </div>
    </form>
</j:jelly>
```

- **Client script**: Paste the following information:

```
function actionOK() {
    var modal =
 GlideModal.prototype.get("mandatory_fields_to_close_incident
_ui");
    var incidents =
 modal.getPreference("selected_incidents");
    if (incidents) {
        //close the incidents
        var glideAjax = new GlideAjax("IncidentClosure");
        glideAjax.addParam("sysparm_name", "closeIncidents");
        glideAjax.addParam("sysparm_incidents", incidents);
        glideAjax.addParam("sysparm_closeCode",
 $("closeCode").value);
        glideAjax.addParam("sysparm_closeNote",
 $("closeNotes").value);
        glideAjax.getXMLAnswer(function(answer) {

 GlideModal.prototype.get("mandatory_fields_to_close_incident
_ui").destroy();
            GlideList2.get('incident').refresh();
        });
    }
}

function actionCancel() {

 GlideModal.prototype.get("mandatory_fields_to_close_incident
_ui").destroy();
}

(function() {
    var okButton = gel('ok_button');
    var closeCodeEl = gel('closeCode');
```

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```
    var closeNotesEl = gel('closeNotes');
    okButton.disabled = true;
    closeNotesEl.value = "";
    closeCodeEl.on('change', function() {
        if (closeCodeEl.value !=="" &&
 closeNotesEl.value !=="")
            okButton.disabled = false;
        else
            okButton.disabled = true;
    });
    closeNotesEl.on('input', function() {
        if (closeCodeEl.value !=="" &&
 closeNotesEl.value !=="")
            okButton.disabled = false;
        else
            okButton.disabled = true;
    });
})();
```

5. Save the record.
6. Complete the following steps to create the UI action for closing multiple incidents.

   a. Navigate to **System Definition** > **UI Actions** and click **New**.

   b. Create the UI actions with the following information:
      - **Name**: Close incidents
      - **Table**: Incident [incident]
      - **Show update**: Select the check box
      - **List choice**: Select the check box
      - **List v2 Compatible**: Select the check box
      - **Client**: Select the check box
      - **Onclick**: closeIncidents()
      - **Condition**: current.getValue('state') !== '7'
      - **Script**: paste the following information

```
function closeIncidents() {
    var list = GlideList2.get('incident');
    var title = list.getTitle();
    var incidents = list.getChecked();
    if (incidents) {
        var o = new
 GlideModal('mandatory_fields_to_close_incident_ui');
            getMessage("Close Incidents", function(msg) {
                o.setTitle(msg);
                o.setPreference('selected_incidents',
 incidents);
                o.render();
            });
        }
```

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```
}
```

**7.** Save the record.

**Result**
Service desk agents can close multiple incidents using **Close incidents** in the **Actions** list below the Incident list.

## Reopening an incident

Reopen an incident from the resolution notification email or from the incident to get answer for your query.

If you are not satisfied with the resolution of your incident, request to reopen the incident from the resolution notification email. You can also reopen the incident itself. The state of the incident is then changed from **Resolved** to **In Progress**.

If the incident is already closed and you request to reopen the incident by replying to the resolution notification email, a new incident is opened with selected field values from the closed incident. The values of the fields that you mention in the **List of fields (comma-separated) to copy from the original incident when an incident is reopened by email** property (*com.snc.incident.clone_fields_on_reopen*) are copied from the closed incident to the new incident. Add the text `Please reopen` to the subject line of the email.

- If an incident is reopened by a user after it was resolved, the **Last reopened by** and the **Last reopened at** fields are automatically populated with the name of the person who reopened it and the date and time when the incident is reopened. During audit, this information helps you to generate various reports for reopened incidents.
- On the Incident form, there is an existing field named **Reopen count**. Incidents that were reopened prior to the Kingston release, may already have some non-zero values in the **Reopen count** field while the values in the new fields, **Last reopened by** and the **Last reopened at** are null. For incidents that are reopened after the Kingston release, the **Last reopened by** and the **Last reopened at** fields are populated.
- If you do not have any roles in the system (ESS) and you change the incident state to **Resolved**, you receive a notification with a **Reopen incident** link.
- If you do not have any roles in the system (ESS) and you are the caller, you can click **Reopen incident** on the incident form to reopen the incident. Add the text `Please reopen` to the subject line of the email.

> **Note:**
> An ESS user is not able to resolve, reopen, or close a major incident even if the user is the caller.

## Incident standard ticket page

The Incident standard ticket page is where you and your employees can view the details of an incident and can be used with service portal.

You can access the Incident ticket page in Service Portal using the **Requests** option from the main menu header of Service Portal. The Incident ticket page is available by default for new as well as upgrade users. The Incident standard ticket page shows the details of an Incident, such as the short description, caller, and urgency. It also shows the **Actions** list from where you can resolve, close, or reopen incident.

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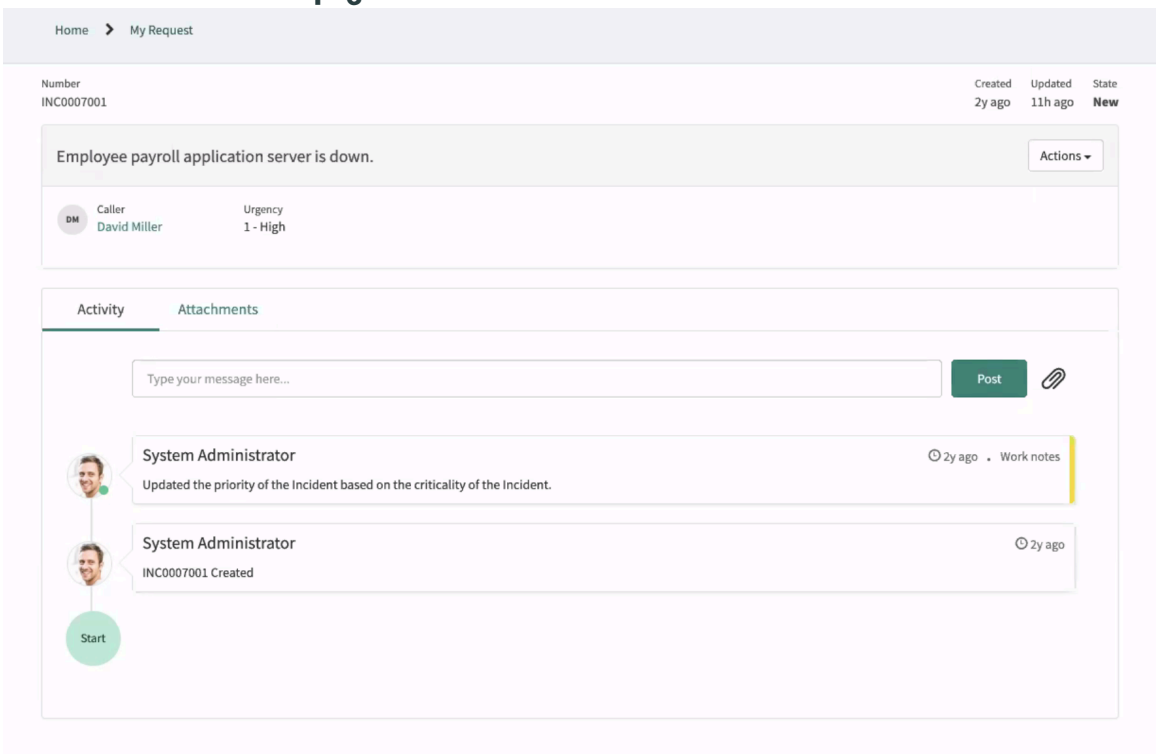
### Incident standard ticket page




## Incident standard ticket page configuration

You can configure the appearance of the Incident standard ticket page header and tabs from **Standard Ticket** > **Standard Ticket Configuration** > **Incident**. For more information, refer Configure incident ticket page.

### Configure incident ticket page

Configure the Incident ticket page from where users can view the details of an Incident in Service Portal.

**Before you begin**
Role required: admin

**Procedure**

1. Navigate to **All** > **Standard Ticket** > **Standard Ticket Configuration** > **Incident**.
2. Click the Incident record.
3. On the form, configure the fields.

#### Ticket Configuration form

| Field | Description |
|---|---|
| Table | Task-extended table for which you want to configure the standard ticket page. |
| Active | Option to specify if the ticket configuration is active. |
| Application | Application associated with the ticket configuration. |
| State field | Any field of the task-extended table. By default, this field is mapped to the **State** field of the task-extended table. You have to configure the form to add this field. |

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| Field | Description |
| --- | --- |
| | **Note:**<br>You cannot add fields for any of the following information:<br>○ Number<br>○ Short description<br>○ Created date<br>○ Updated date<br>○ Watch list<br>○ Any user input such as comments and work notes |
| Info Region | |
| Show 'Description' | Scenario where the request description should be displayed. Possible options are:<br>○ None<br>○ Always<br>○ When no variables<br>**Note:**<br>When displayed, you can expand and collapse the description. |
| Advanced | Option to specify that a widget should be displayed in the info region. |
| Info widget | Widget that should be displayed in the info region. This field appears only when the **Advanced** check box is selected. |
| Info widget parameters | Comma-separated list of info widget parameters. This field appears only when the **Advanced** check box is selected. |
| Info fields | Fields that should be displayed in the info region. This field disappears when you select the **Advanced** check box.<br>**Note:**<br>You cannot add fields for any of the following information:<br>○ Number<br>○ Short description<br>○ Created date<br>○ Updated date<br>○ Watch list<br>○ State<br>○ Any user input such as comments and work notes |
| Action Region | |
| Action widget | Widget to specify the actions available in the info region. |

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| Field | Description |
|---|---|
| Action widget parameters | Comma-separated list of action widget parameters. |

**Note:**

- By default, the Activity and Attachments type tab configurations are available for all standard configurations.
- You cannot duplicate any tab type other than Custom.
- You can configure a maximum of five tabs.
- You can add only one of these tab types:
  - Variable Editor (Read-Only)
  - Variable Summarizer

4. Right-click the header menu and click **Save**.
5. On the Tab Configurations related list, configure the fields.

**Tab Configuration form**

| Field | Description |
|---|---|
| Type | Tab type based on which a widget is displayed. Possible options are:<br>○ None<br>○ Activity<br>○ Attachments<br>○ Custom<br>○ Variable Editor (Read-Only)<br>○ Variable Summarizer |
| Tab name | Name of the tab. |
| Application | Application associated with the ticket configuration. |
| Order | Order in which the tab should be displayed in the tabs section. |
| Visible | Conditions for the tab visibility. |
| Widget | Widget that should be displayed in the tabs section. This field appears only when **Custom** is selected from **Type**. |
| Widget parameters | Comma-separated list of tab widget parameters. This field appears only when **Custom** is selected from **Type**. |

6. On the Ticket Configuration form, click **Update**.

## Managing major incidents

A major incident (MI) is an incident that results in significant disruption to the business. A major incident demands a response beyond the routine incident management process. Major incidents have a separate procedure with shorter timescales and higher priority, so that there is a faster resolution process for incidents with high business impact.

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The definition of what constitutes a major incident must be determined and agreed on. For example, a major incident can be created if a critical business service is impacted or if there is a service outage that affects many users.

There are multiple ways to create a major incident candidate, such as the following:

- Propose an incident as a major incident candidate by clicking **Propose Major Incident** from the context menu of the Incident form.
- Create a new major incident candidate by clicking **Create Major Incident Candidate** from the left navigation pane.
- Mark an incident as a major incident candidate based on the major incident trigger rules.

**Note:**
When a major incident is created from a major incident candidate, the new major incident is considered as a parent record for the current major incident candidate. In such case, the **Caller** and **Company** fields are optional.

As a major incident manager, you can do the following:

- Promote a candidate to a major incident by clicking **Promote to Major Incident** from the context menu.
- Create a new major incident by clicking **Create Major Incident** from the left navigation pane.
- Promote an incident to a major incident without going through the proposal process.

When responding to a major incident, some crucial actions involve finding the right resources, communicating updates to users and stakeholders, setting up conference calls to investigate and resolve the incident, and escalating the incident when required. Using Task Communications Management, you can define communication plans that are associated with a major incident based on pre-defined conditions. Incident communication plans and related communication tasks are created for a major incident based on the communication plan definitions. Thereafter, tasks get executed as defined in the attached incident communication.

## Major Incident Management process

A major incident is a highest-impact, highest-urgency incident that affects a large number of users, depriving the business of one or more crucial services. Given the urgency of the situation, a well-coordinated response process is required to accelerate the resolution and minimize the business impact.

The goal of an organization is to have an effective and efficient system for responding to major incidents. The requirements are to:

- Minimize the impact of service interruptions.
- Ensure that an appropriate Incident Manager/Major Incident Team/Management Group are in place to manage a major incident.
- Ensure that stakeholders are well-informed of service interruptions, degradations, and resolutions.
- Conduct a review of each major incident once service is restored. Its purpose is to analyze the incident, and understand what can be done to prevent a similar incident in the future. This review also provides an opportunity to evaluate the incident response process and identify areas for improvement.
- Create a problem for root cause analysis.

Keeping the goals in mind, a major incident management process can be broadly classified into the following phases:

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### Identification

The first step in the process is to identify a potential major incident. A potential major incident can be identified automatically based on trigger rules or an existing incident can be proposed as a major incident candidate. These incidents are classified as major incident candidates and are reviewed by major incident managers who initiate the major incident response process.

### Communication and Collaboration

Timely communication during a major incident is crucial to ensure that the IT teams, business stakeholders, end users, and customers are informed about the impact and progress of the incident. An occurrence of a major incident requires a comprehensive communication plan that includes who is contacted, the methods and frequency of communication, messaging, and so on. The communication plan enables the incident response team to focus their efforts on the resolution process and sets expectations for any future communications.

You can define one or more communication plans based on the type, priority of the incident, or the target audience. For example, communication plans for a P1 major incident could have more frequent communication than a communication plan for a P2 major incident.

Throughout the life cycle of the major incident, notifications and status updates are sent to the stakeholders to keep them informed and involved.

### Resolution

In this phase, the agreed upon path to resolution is followed to resolve the issue. Resolving a major incident resolves all associated child incidents, and the individual callers receive a notification about incident resolution.

### Post incident review

This is the final phase of a major incident life cycle. After the major incident is resolved, a post-incident review is conducted. Its purpose is to analyze the incident and understand what can be done to prevent a similar incident in the future. This review also provides an opportunity to evaluate the incident response process and identify areas for improvement.

To streamline the process, a post-incident report is created when an incident is resolved. The post-incident report can be reviewed and updated during the review process before it is shared with stakeholders.

A major incident progresses through different states during its life cycle. The following diagram illustrates the different states involved in a major incident management:

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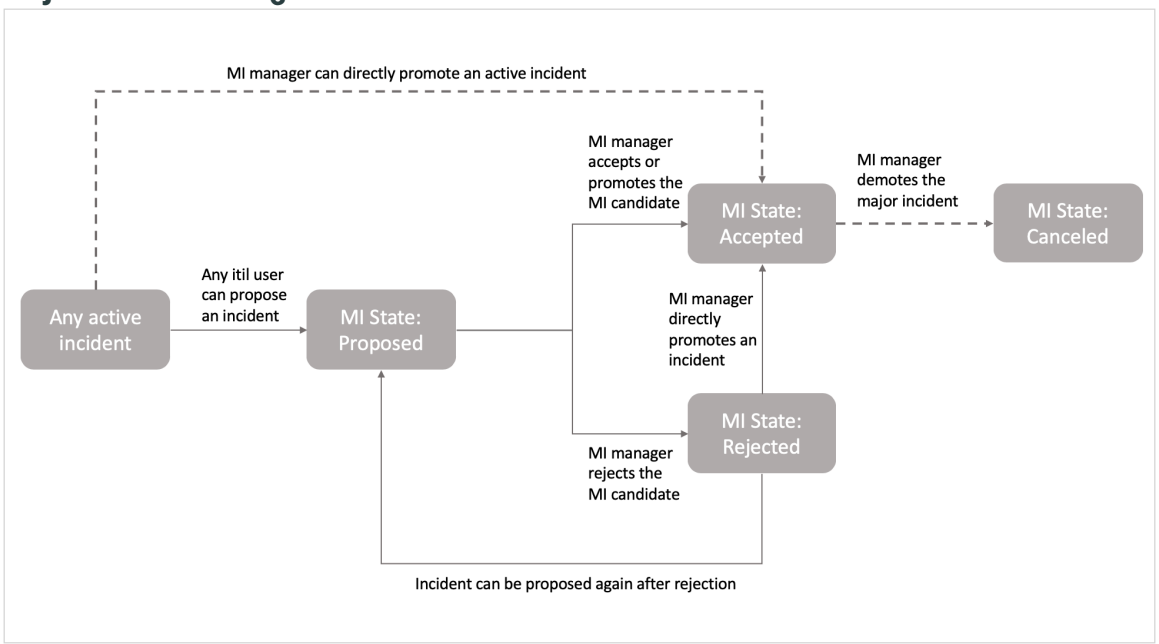
### Major Incident Management state flow




## Major Incident Management plugins

You can activate the Major Incident Management plugins if you have the admin role.

### Activate Incident Management - Major Incident Management

You can activate the Incident Management - Major Incident Management plugin (com.snc.incident.mim) if you have the admin role. This plugin includes demo data and activates related plugins if they are not already active.

#### Before you begin

Role required: admin

#### About this task

Incident Management - Major Incident Management plugin (com.snc.incident.mim) must be manually activated for new and existing customers.

Incident Management - Major Incident Management plugin activates these related plugins if they are not already active:

- Incident Communications Management (com.snc.iam)
- Incident Updates (com.snc.incident.updates)
- Task-Outage Relationship (com.snc.task_outage)

#### Additional plugins for Incident Management - Major Incident Management

| Plugin | Description |
|---|---|
| Notify<br><br>[com.snc.notify] | Provides platform features for workflow-driven voice calls, conference calls, and SMS messages. Requires the Twilio Direct Driver and a separate contract with Twilio for SMS and Voice capabilities. |

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**Additional plugins for Incident Management - Major Incident Management (continued)**

| Plugin | Description |
|---|---|
| | **Note:** Existing users already using Twilio Driver need to migrate to Twilio Direct Driver. |
| On-Call Scheduling<br><br>[com.snc.on_call_rotation] | Provides the ability to create on-call schedules and escalation trees. When an incident is created, dynamically route the escalation to an on-call resource. On-Call Scheduling enables you to configure and build different on-call schedules per process and assignment group. |

### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.
3. Select **Install** to start the installation process.

   **Note:**
   When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

   You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

### Related topics

- Managing major incidents
- Major incident overview (dashboard)
- Major incident workbench
- List of Washington DC plugins

### Components installed with Incident Management - Major Incident Management

Several types of components are installed with activation of the Incident Management - Major Incident Management plugin, including tables and user roles.

**Note:**
The Application Files table lists the components that are installed with this application. For instructions on how to access this table, see Find components installed with an application.

Demo data is available for this feature.

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## Roles installed

| Role title [name] | Description | Contains roles |
|---|---|---|
| Major incident manager<br>[major_incident_manager] | A major incident manager can:<br>• Initiate the major incident process by assessing and approving major incident candidates or creating a major incident.<br>• Reject a major incident candidate.<br>• Demote a major incident after it is accepted so that the incident can be handled as a regular incident.<br>• Maintain the ownership and accountability for the life cycle of the incident.<br>• Identifies the users and groups to be involved in the resolution activities.<br>• Creates adhoc communication plans and tasks.<br>• Edits a communication plan that is attached to a major incident.<br>• Close a major incident. | This role inherits the ia_admin role. |
| Communications manager<br>[communication_manager] | • Manages communications for major incidents and is responsible for communicating with all stakeholders.<br>• Creates adhoc communication plans and tasks.<br>• Edits a communication plan that is attached to a major incident. | This role inherits the ia_admin role. |
| Incident Manager<br>[incident_manager]<br>(Existing role with added responsibilities) | • Manages incident properties and major incident trigger rules.<br>• Can create and edit Communication Plan Definitions. | None |

## Tables installed

| Table | Description |
|---|---|
| Major Incident Trigger Rules<br>[major_incident_trigger_rule] | This table extends the Application File [sys_metadata] table and stores the major incident trigger rules. |

### Slack notification installed with Major Incident Management

Slack notifications are added with activation of Incident Management – Major Incident Management.

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| Slack notification | Description |
|---|---|
| Major Incident Candidate assigned | Notifies Major Incident Management Group when **Major Incident State** changes to **Proposed**. |
| IAT conference notification | When conference call is initiated, a slack notification is sent to all the participants of the conference call. |

## Quick start tests for Major Incident Management

Validate that Major Incident Management still works after you make any configuration change such as apply an upgrade or develop an application. Copy and customize these quick start tests to pass when using your instance-specific data.

## Major Incident Major Incident Management

Major Incident Management quick start tests require activating the Incident Management - Major Incident Management plugin (com.snc.incident.mim).

### MIM: Major Incident Management test suite

| Test | Description | Release version |
|---|---|---|
| MIM: Create a Major Incident | Test to verify the creation of major incident from the application navigation module. | Orlando |
| MIM: Create a Major Incident Candidate | Test to verify the **Create a Major Incident Candidate** module from navigation menu. | Orlando |
| MIM: Create a Major Incident from a Major Incident Candidate | Test to verify the creation of a major incident from a major incident candidate. | Orlando |
| MIM: Major Incident Candidate creation when it matches Major Incident Management trigger rule | Test to verify the creation of a major incident candidate when conditions to create a major incident match the major incident management trigger rule. | Orlando |
| MIM: Propose a major Incident (Assignment group empty) | Test to verify auto assignment of major incident candidate when an incident is proposed as a major incident and the **Assignment group** and the **Assigned to** fields are empty. | Orlando |
| MIM: Propose a major Incident (Assignment group is not empty) | Test to verify the auto assignment of a major incident when an incident is proposed as major incident and the **Assignment Group** and the **Assigned to** fields are not empty. | Orlando |

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**MIM: Major Incident Management test suite (continued)**

| Test | Description | Release version |
|---|---|---|
| MIM: Promote a candidate to major Incident (Assignment group is empty) | Test to verify auto assignment of major incident when a candidate is promoted to a major incident and the **Assignment Group** is empty. | Orlando |
| MIM: Promote a candidate to major Incident (Assignment group is not empty) | Test to verify auto assignment of major incident when a candidate is promoted to a major incident and the **Assignment group** is not empty. | Orlando |
| MIM: Reject a Major Incident Candidate | Test to verify the rejection of a major incident candidate. | Orlando |
| MIM: Demote a Major Incident | Test to verify whether a major incident gets demoted to an incident. | Orlando |
| MIM: Major Incident closure | Test to validate the major incident closure functionality. | Orlando |
| MIM: State sync up with ICP and ICT | Test is to verify the state sync up with Incident Communication Plan and Incident Communication Task. | Orlando |
| MIM: ICP attached to an Incident based on conditions and its state sync up with ICT | Test is to verify Incident Communication Plan attached to an Incident based on defined conditions. | Orlando |
| MIM: Resolving MI and PIR | Test is to verify resolving a Major Incident and Post Incident Report. | Orlando |
| MIM: Major Incident workbench layout verification | Test is to verify Major Incident workbench layout verification. | Orlando |
| MIM: Verify communication task from MI workbench | Test is to verify communication task from MI workbench. | Orlando |

To learn more about Major Incident Management, see Major Incident Management.

**Related topics**

Quick start tests

## Create trigger rules for major incidents

Create trigger rules to define the conditions under which a trigger action is executed. You can create major incident trigger rules to define the conditions under which an incident is automatically considered as a major incident candidate.

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### Before you begin
Role required: incident_manager or admin

### About this task
Major incident trigger rules are evaluated asynchronously each time an incident is created or updated provided the following conditions are met:

- The incident record doesn't have the Parent Incident populated, which means that the current incident isn't a child incident.
- The major incident isn't proposed or accepted.
- The incident is active.

**Note:**
The base system major incident trigger rules are inactive by default.

### Procedure
1. Navigate to **All** > **Major Incidents** > **Administration** > **Major Incident Trigger Rules**.
2. Select **New**.
3. On the form, fill in the fields.

| Field | Description |
|---|---|
| Name | Unique name of the trigger rule. |
| Table | Table on which the trigger rule executes. |
| Application | Application scope of the trigger rule. The trigger rule is available for all applications or for scoped applications. |
| Execution Order | The rule with lowest execution order is triggered first. In the following example, the rule with order = 100 is executed first.<br><br>Example:<br>○ If business criticality of business service is 1-most critical or 2-somewhat critical, Order = 100.<br>○ If the number of child incidents is greater than 20, then Order = 200.<br>○ For a P1 incident, Order = 300.<br><br>**Note:**<br>If any of the existing trigger rule conditions are met, the incident is considered to be a major incident candidate. Verification of the remaining rules isn't required. Otherwise, all the rules are verified based on the execution order. |
| Action to take | Action taken on the incident when the trigger rule is executed. The possible values are the following: |

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| Field | Description |
| --- | --- |
| | ○ **Propose Major Incident**: Incident is proposed as a major incident candidate when the trigger rule is executed. After it's approved, the incident is promoted to a major incident.<br>○ **Promote Major Incident**: Incident is promoted directly to a major incident when the trigger rule is executed.<br>○<br>**Note:**<br>The **Create major incident from candidate** (*sn_major_inc_mgmt.com.snc.incident .min.major* system property creates different behaviors depending on which options are selected.<br>When the system property is set to **Create new**, the following behaviors occur in relation to the **Action to take** values:<br>○ **Propose Major Incident**: The incident is proposed as a major incident candidate. After it's approved, a new major incident is created and the incident is marked as its child.<br>○ **Promote Major Incident**: A new incident is created and promoted to a major incident. The existing incident is marked as its child.<br>When the system property is set to **Promote**, the following behaviors occur in relation to the **Action to take** values:<br>○ **Propose Major Incident**: The incident is proposed as a major incident candidate. After it's approved, a new major incident is created and the incident is marked as its child.<br>○ **Promote Major Incident**: The existing incident is promoted to a major incident. |
| Active | Option to activate the trigger rule. |
| Conditions | Conditions that must be met to execute the trigger rule. |

4. Select **Submit**.

## Working on major incident management

The section covers topics that help you with a variety of technical concepts related to major incident management such as the different ways to create a major incident, ways to reject a major incident candidate, demote a major incident, or close a major incident.

### Create a major incident candidate

You can create a major incident candidate in multiple ways. After a major incident candidate is created, the major incident manager evaluates the candidate and decides whether the candidate should be promoted to a major incident.

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### Before you begin
Role required: itil, sn_incident_write, or admin

### About this task
A major incident manager can accept or reject a major incident candidate.

### Procedure

Perform any of the following actions.

**Note:**

- When an incident is proposed as a major incident candidate, the Major incident **State** field in the incident form under the Major incident section is set to **Proposed**.
- When you create a new major incident from a candidate, a new incident is created and becomes the major incident. The candidate is added as the child of the major incident. To get this behavior, the incident manager needs to set the major incident management property **Create major incident from candidate** (*sn_major_inc_mgmt.com.snc.incident.mim.major_incident_creation*). A new incident is created from a candidate as a major incident. The candidate is associated with the new incident as a child.
- System automatically assigns the newly created parent major incident to a user when the On-Call Scheduling plugin (com.snc.on_call_rotation) is activated, a shift is defined for the major incident management group, and a user is available for the on-call shift. If no on-call shift exists, the major incident manager decides the user for the **Assigned to** field.

#### Create a major incident

Create a major incident directly or review the candidates and promote the candidates to major incidents.

### Before you begin
Role required: major_incident_manager

### Procedure

Perform any of the following actions.

#### Major incident assignment

A major incident is assigned to a group automatically at the time of proposal and promotion based on the value of the property **Major Incident Management Group (sys_id) to whom the Major Incident should be re-assigned on promotion to 'Major Incident'** (*sn_major_inc_mgmt.major_incident_management_group*). The assigned group works on the major incident and resolves it.

The incident is assigned to an individual if the On-Call Scheduling plugin (com.snc.on_call_rotation) is activated and a shift is defined for the group. The following table illustrates the different conditions under which a major incident is assigned to a group and a user.

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### Assignment of major incident

| Action | Condition | Assignment group | Assigned to |
|---|---|---|---|
| Incident is proposed as a candidate manually or based on major incident trigger rules | Assignment Group is empty | Group based on the property value | • If on-call is activated, shift is defined and a user is available on-call then the incident is assigned to the on-call user<br>• If on-call is not activated, the **Assigned to** field remains empty |
| | Assignment Group is not empty | No change - incident retains the current value of the assignment group | No change - incident remains with the current value in the **Assigned to** field |
| Incident is manually promoted to a major incident | Assignment Group is empty | Group based on the property value | The value for the **Assigned to** field is the user who promoted the incident to a major incident |
| | Assignment Group is not empty | • Incident reassigned to group based on the property value<br>• Send a notification to the original Assignment Group members about the latest incident reassignment. | • **Assigned to** value is overwritten by the user who promoted the major incident candidate<br>• Send a notification to the user to whom the major incident was previously assigned |
| Major incident is created | Assignment Group is empty | Group based on the property value | The value of the **Assigned to** field is the user who has created the major incident |
| | Assignment Group is not empty | No change - incident retains the current value of the assignment group | No change - incident remains with the current value in the **Assigned to** field |

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### Assignment of incident communication plan and communication task

| Action | Condition | Assignment group | Assigned to |
|---|---|---|---|
| Incident communication plan is created with source as major incident | Assignment Group is empty | The value for the **Assignment group** field is copied from the source incident | The value of the **Assigned to** field is copied from the source incident |
| | Assignment Group is not empty | No change - incident communication plan retains the current value of the assignment group | No change - incident communication plan retains the current value of the **Assigned to** field |
| Incident communication task is created from incident communication plan whose source is major incident | Assignment Group is empty | The value for the **Assignment group** field is copied from the incident communication plan | The value of the **Assigned to** field is copied from the incident communication plan |
| | Assignment Group is not empty | No change - incident communication plan retains the current value of the assignment group | No change - incident communication task retains the current value of the **Assigned to** field |

## Accept or reject a major incident candidate

When an incident is proposed as a major incident candidate, a major incident manager can accept or reject the candidate. The manager accepts a candidate as a major incident if the incident requires accelerated resolution.

### Before you begin

Role required: major_incident_manager

### Procedure

Perform any of the following actions.

## Associate multiple incidents with a major incident

You can associate one or more incidents with a major incident using the Actions menu.

### Before you begin

Role required: itil, sn_incident_write, or admin

### About this task

When a major incident occurs, there are usually multiple incidents created for the same issue and there might be multiple major incident candidates created for a single issue. All the incidents for a single issue can be associated with the appropriate major incident.

### Procedure

1. Navigate to **All** > **Incident** > **Open**.
2. Select the incidents that need to be associated with a major incident.
3. On the Actions menu, click **Link to Major Incident**.

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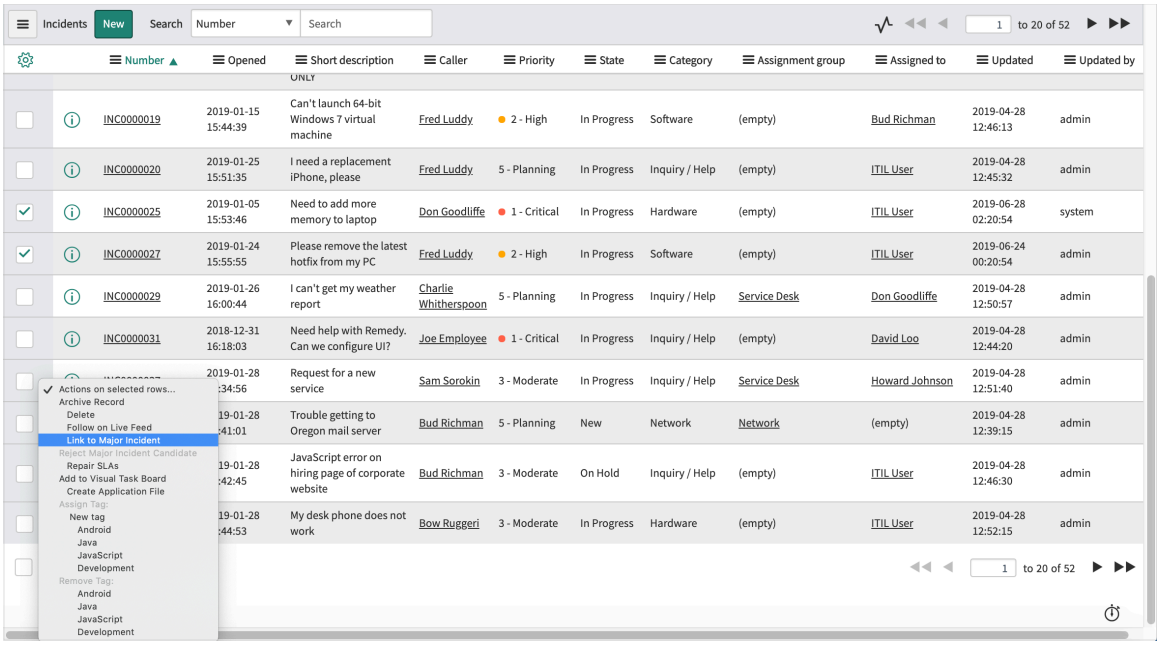



4. In the Choose a Major Incident dialog box, select the major incident with which you want to associate the incidents.
5. Click **OK**.
   The incidents are added as a child to the major incident.

## Reject multiple major incident candidates using the Actions menu

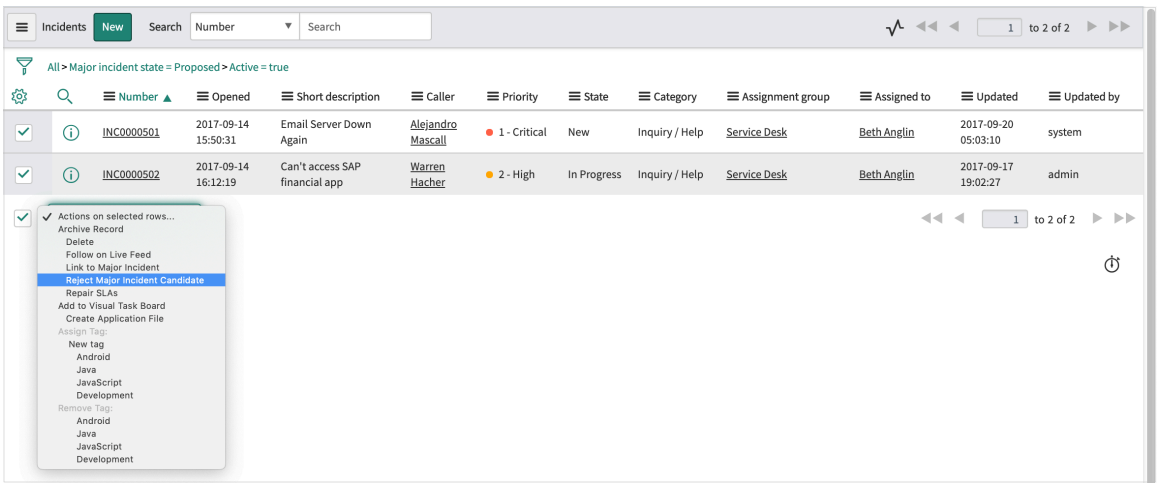
You can reject one or more major incident candidates using the Actions menu. If you decide that the candidates do not qualify to be major incidents, then you can reject multiple candidates at once and provide the rejection reason.

### Before you begin

Role required: major_incident_manager

### Procedure

1. Navigate to **All** > **Incident** > **Major Incidents** > **Candidates**.
2. Select the candidates that you need to reject.
3. On the Actions menu, click **Reject Major Incident Candidate**.

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4. On the Rejection Reason dialog box, enter the reason why you decided not to accept the candidates as major incident.
5. Click **Reject**.
   The major incident candidates are rejected.

### Demote a major incident

When an incident is incorrectly evaluated to be a major incident, you can demote the major incident even after it is accepted so that the incident can be handled as a regular incident.

#### Before you begin

Role required: major_incident_manager

#### Procedure

1. Navigate to **All** > **Major Incidents** > **Open**.
2. Open the major incident that you want to demote.
3. Click the additional actions icon and select **Demote Major Incident**.
4. Enter the reason for the demotion.
   The major incident state is set to **Canceled** but the incident state remains the same.

### Close a major incident

You can close a major incident manually after validating the resolution and when the major incident is in the **Resolved** state.

#### Before you begin

- Role required: major_incident_manager or admin
- Major incident is in resolved state

#### Procedure

1. Navigate to **All** > **Major Incidents** > **Open**.
2. Open the major incident that you want to close.
3. Click **Close Incident**.

**Note:**

- If you cancel an incident and the major incident state is in **Proposed** or **Accepted** state, the major incident state changes to **Canceled**.
- The incident auto-closure property **Enable auto closure of incidents based on Resolution date. Setting this to 'No' will make auto closure to run based on the Updated date** does not close any incident record that is accepted as a major incident. Users with the major_incident_manager or admin role must close a major incident manually, after validating the resolution and when the major incident is in the **Resolved** state.
- If an incident was promoted as a major incident, then an ESS user cannot resolve, close, or reopen the incident.

### View major incident information on the Incident form

When an incident enters the major incident life cycle, the **Major Incident** and the **Post Incident Report** tab appears on the incident form.

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### Before you begin

Role required: itil, sn_incident_read, or admin

Incident is in the major incident life cycle.

### Procedure

1. Navigate to **All** > **Incident** > **Open**.
2. Select the incident which is in the major incident life cycle.
3. Click the **Major Incident** tab.

| Field | Description |
|---|---|
| Major incident state | A major incident state can be one of the following:<br>○ **Proposed**: The initial state when a major incident candidate is created or proposed.<br>○ **Accepted**: The state when a major incident is directly created by a major incident manager or when a candidate is promoted to a major incident by a major incident manager.<br>○ **Rejected**: The major incident candidate is rejected by a major incident manager.<br>○ **Canceled**: The major incident is demote by a major incident manager. |
| Proposed by | The user who proposed the incident as a major incident candidate. |
| Proposed | Date and time when the incident was proposed as a major incident candidate. |
| Promoted by | The user who promoted the incident to a major incident. |
| Promoted | Date and time when the incident was promoted to a major incident. |
| Business impact | The business impact of the issue identified in the major incident. |
| Probable cause | The probable cause of the issue identified in the major incident. |

4. Click the **Post Incident Report** tab.
   If you have already filled the post incident report information in the major incident workbench, the same information appears in the following fields:

| Field | Description |
|---|---|
| Overview | Summary of the incident. |
| Findings | Information on what caused the major incident and any lessons learnt in the process. |

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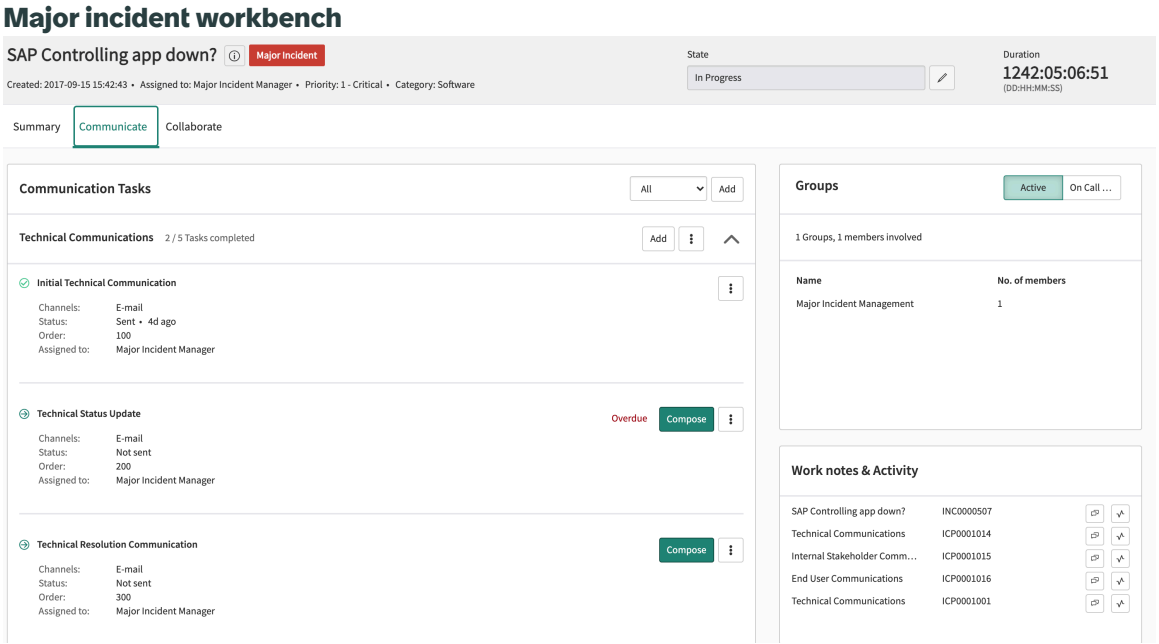
| Field | Description |
| --- | --- |
| Timeline | Information of all the activity feeds not only of the incident but also of the incident communication plan and incident communication tasks related to the incident. |

## Major incident workbench

The major incident workbench is a single pane view designed for major incident managers, communication managers, and resolver groups. The workbench helps to manage major incidents by aggregating and providing actionable information.

To navigate to the major incident workbench, open a major incident or a major incident candidate, and click **View Workbench** on the form header.




**Note:**
Groups and number of members involved in the groups widget are populated from the **Assignment group** and the **Assigned to** fields of incident, incident communication plan, incident task, as well as the members involved in an active conference call.

## Header components

- From the workbench, to navigate back to the incident form, click **View Form** that appears on the header of the workbench.
- If an incident is not yet in the **Resolved** state, then the header displays the **Resolve** button. To resolve an incident, click **Resolve**.
- When an incident is not yet accepted as a major incident, then the workbench displays a choice list on the header. The list displays options to promote the incident to a major incident or to reject the incident.
- Use the chat icon ( ) on the header to initiate a chat on the incident level. The chat is a record feed — whatever you write in the chat appears in the activity stream.

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- You can click to change the state of the incident.
- Duration is an active timer that tracks the time since the creation of the incident. The timer stops when the incident is resolved.

### Major incident workbench UI elements

The major incident workbench provides UI elements which display the summary of tasks, progress of communication plan, conferencing information, and a report on the cause and resolution of the major incident.

The major incident workbench has the following UI elements: **Summary**, **Communicate**, **Collaborate**, and **Post Incident Report**.

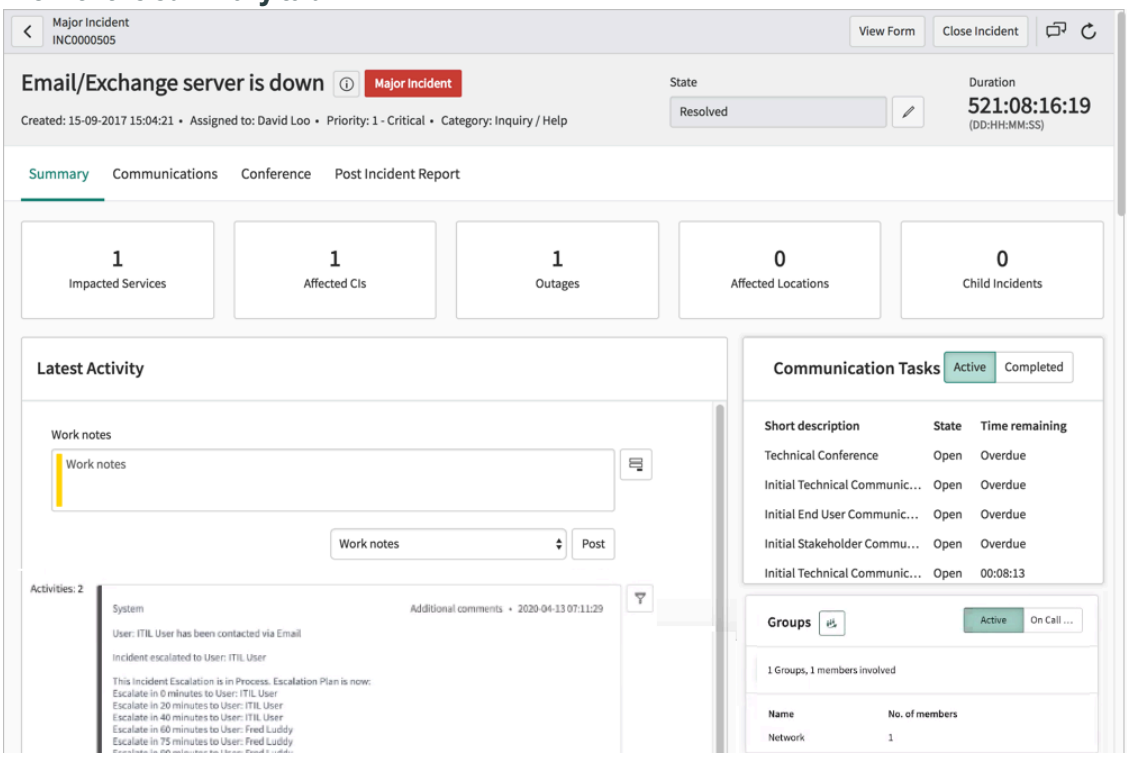
**Note:**
You need to activate the Notify plugin (com.snc.notify) for the **Collaborate** tab to appear. The **Post Incident Report** tab is visible only when the incident state is either **Resolved** or **Closed**.

### Major Incident workbench — Summary tab

The **Summary** tab provides a unified view of information in the form of a card layout. The information on impacted services, affected CIs, active outages, locations that are impacted, and child incidents helps to keep you informed about related records associated with an incident.

## Summary tab

### View of the summary tab




You can add, create, or edit each of the components. You can also view, post, or filter the latest activity on the major incident.

The tab also provides a quantitative summary of the active and completed tasks, as well as users or groups who are involved in resolving the major incident. The communication tasks are sorted in ascending order based on the order value.

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The **Time remaining** column provides information regarding the time when the communication task is due.

- If you do not perform the communication task within the set time, the value changes to **Overdue**.
- If you activate the On-call Scheduling plugin (com.snc.on_call_rotation): The user who is on-call for the respective group and the group name appear in the summary.

The Groups section displays On-Call information, including the On-Call Escalation Tracking icon ( ) that indicates the active status of the escalation. Green indicates an active escalation, and black indicates a finished escalation. Click the icon to view the On-Call Escalation Tracking pop-up.

Activate the Event Management plugin (com.glideapp.itom.snac) to add an **Alert** card under the **Summary** tab that keeps you up-to-date on the number of alerts for each incident. The count is the total of all primary and secondary alerts for the incident.

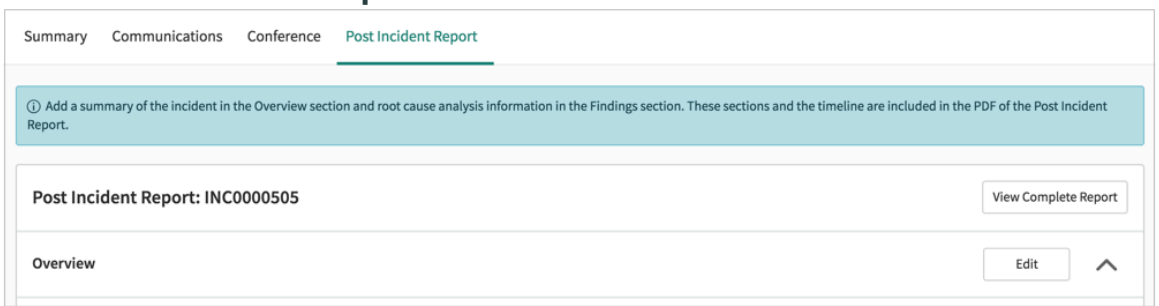
### Major Incident workbench — the Post Incident Report tab

The **Post Incident Report** tab helps you to understand the cause of the major incident, and the actions taken by the teams to resolve the incident.

The teams can assess the incident response and resolution process and determine follow-up action items. The post incident report is required to record the actions performed, the reasons for doing them, and findings.

**Note:**
The major incident manager can edit a report when the incident is in the **Resolved** state.

**View of the Post Incident Report tab**




The post incident report includes the following sections where a major incident manager can provide required information:

- **Overview**: Summary of the incident.
- **Findings**: Information on what caused the major incident and any lessons learned in the process.
- **Resolution**: Information on the resolution steps taken to resolve the issue. The major incident manager can also add or edit any related Problem or Change information by clicking **Add** or **Manage** respectively.
- **Timeline**: Information of all the activity feeds, not only of the incident but also of the incident communication plan and incident communication tasks related to the incident. You can update the timeline with the latest activity by clicking **Regenerate Timeline**.

**Note:**
The information that you provide for **Overview**, **Findings**, and **Timeline** gets updated in the Post Incident Report section on the Incident form.

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If you activate the Continual Improvement Management (CIM) plugin (com.sn_cim), the Related Improvement Records section is displayed in the report. This section displays the Inbound CIM Integrations records.

When you click **View Complete Report**, all the information entered by the major incident manager is compiled together and you can download the report in the .PDF format by clicking **Download Report PDF**.

The following links appear in the Incident form under the Related Links section:

- **Regenerate PIR Timeline**: This link appears when incident is in the **Resolved** state and the user has the major_incident_manager role.
- **Preview PIR**: This link appears when incident is in the **Resolved** or **Closed** state and the user has the itil role.

**Note:**
On the downloaded report, under **Incident Response Timeline**, the time displayed in the timing type **Time to Identify** is calculated in the following ways:

- If you propose the incident as a major incident: The time indicates the time from creation of the first related alert for this incident or creation of the incident (in case there is no alert or the Event Management plugin is inactive), whichever occurs first, until the time the incident is first proposed as a major incident.
- If you create a major incident directly: The time indicates the time from creation of the first related alert for this incident or creation of the incident (in case there is no alert or the Event Management plugin is inactive), whichever occurs first, until the time the incident is promoted as a major incident.

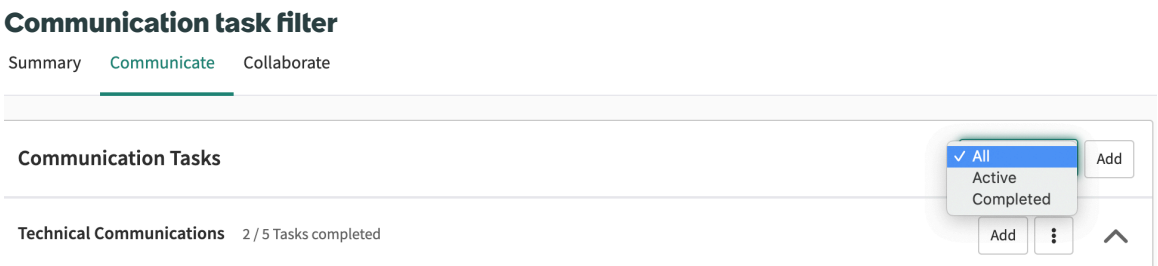
**Related topics**

Associate a new post incident report

### The Communicate tab in the Major Incident workbench

The **Communicate** tab helps you understand the progress of a communication plan and its related tasks.

If there are multiple communication tasks associated with a communication plan, all the tasks appear under the respective communication plan.




You can filter the communication task to view all tasks, active tasks, or completed tasks. You can also add a new communication plan by clicking **Add**. You can create a communication task for an existing plan by clicking **Add Task**. For more information, see Add communication plan from the major incident workbench. If you want to add or remove recipients from a particular plan after the plan is saved, click **Manage Recipients**.

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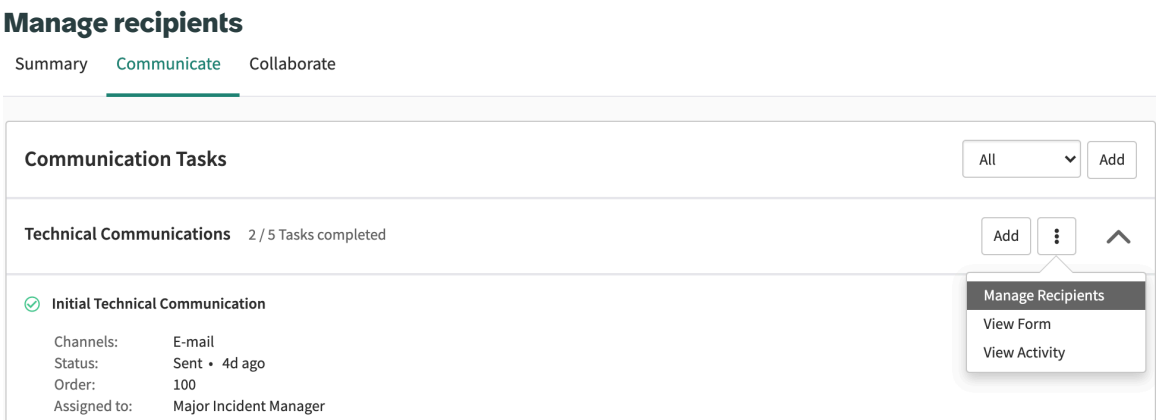
**Note:**
When you create a communication task for sending an email on the Major Incident Management Workbench and select a recipient list, the recipient list is added instead of individual users. The list of users in the recipient list is calculated by the system while processing the email request, thus improving the system performance. Also, you can add users, groups, and email addresses as required in the Recipients section. Activate this feature by selecting the **Property to toggle support for Recipient List on Email Client, on Communication Tasks** (*sn_comm_management.email_client_recipient_items_enabled*) option in the Major Incident Management Properties. You can create a recipient list using a script to retrieve a custom list of users or include a pre-defined list of users.




The following actions can be performed on a given communication task:

- **Close Task**: If the task is performed at least once, closes the communication task and changes the state to Complete. Otherwise, the state changes the state to Skipped.
- **Snooze**: Available only for recurring communication task. Enables the user to skip the communication task once and the due-in timer is refreshed.
- **View Form**: For each task in the plan, you can navigate back to the form.
- **View Activity**: Enables you to view activity history and post your work notes or additional comments for a communication task.




You can also view the due time of upcoming tasks and the overdue time in case the task isn't completed within the expected time.

To send a notification, click **Compose**. If the notification has to be send only once, then after sending the notification, the status of the task changes to Complete. If the task is recurring, the status of the task changes to Open. After a recurring communication task is performed, the status of the communication task changes to **Sent** followed by the number of times the recurring communication task is performed until that time. For example, Sent(2x) means that the communication task is performed twice.

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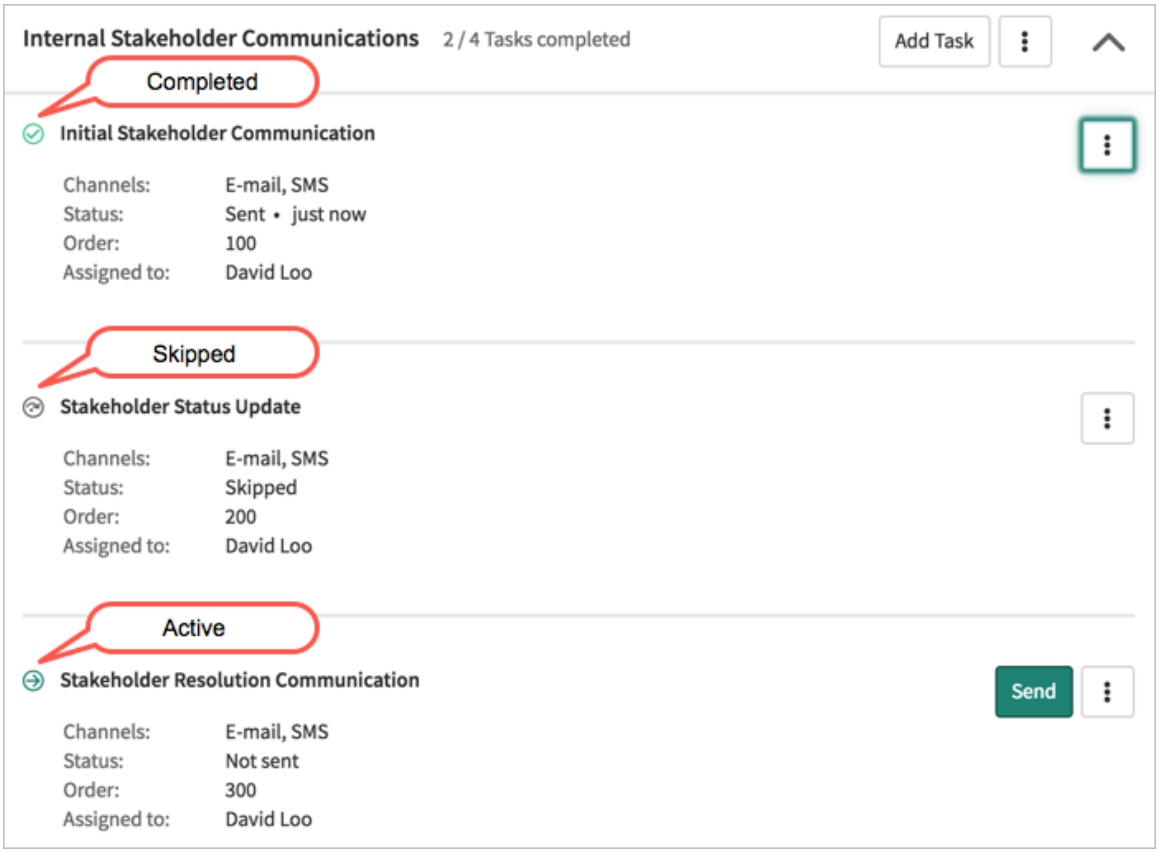
**Communication task state**




Icons to the left of the Communication Task name represent the state of the communication task such as completed, skipped, or active.

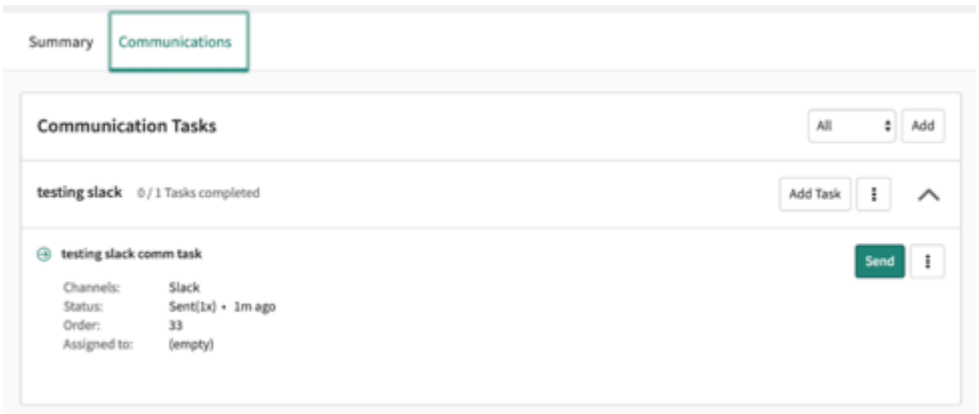
Under the Work Notes & Activity section, you can initiate a chat at the incident or incident communication plan level. You can also view the activity stream for that record.

## Messaging users through Slack

For Slack functionality, install Collaboration services from the ServiceNow Store.

When you add Slack as a communication channel, it appears as follows:

**View of the slack communication channel**




Click **Compose** to convey the Slack message to the contacts that you've already mentioned in the communication contact while defining the communication plan. The selected contacts will

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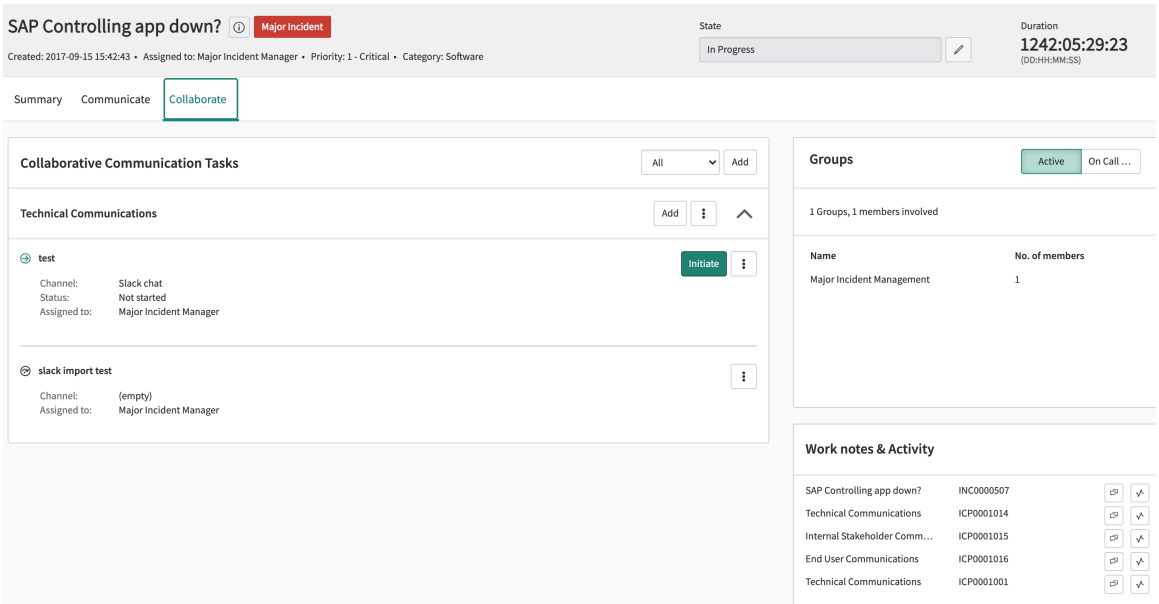
receive a direct message from the *Slack* bot. You can perform the communication task actions such as **Closed Task**, **Snooze**, **View Form**, and **View Activity**.

### Major Incident workbench — the Collaborate tab

The **Collaborate** tab helps you to view information about communication tasks that have conference as their communication channel. It also allows you to manage the participants in a conference call.

**View of the Collaborate tab**




Like the **Summary** tab, you can add a new communication plan by clicking **Add**. You can create communication task for an existing plan by clicking **Add Call**. For more information, see Add-communication-plan-from-mim-workbench. If you want to add or remove recipients from a particular plan after the plan is saved, click **Manage Participants**.

To initiate a conference call, click **Initiate**. If the communication task is a one-time task, then after the call is ended, the status of the task changes to **Complete**. If task is recurring, the status of the task changes to **Open** and it displays the number of times the conference call is initiated.

**Note:**
When you add a user group to the conference call, the group itself is added to the call, and the escalation hierarchy is automatically followed once you start the call. Set the *com.snc.iam.conference_call_follow_on_call_escalation* property to true. For more information about the property, see System properties for On-Call Scheduling.

Under each task, the Active participant section displays the active participants and the Inactive participant section displays the inactive participants.

If the call is in progress, the itil user, who has access to the workbench, can join the conference call by clicking **Join Call**. The participants can also add another user to an ongoing conference call by clicking **+ Participants**. The conference leader can end the conference call by clicking **End Call**. The conference leader can mute, unmute, or kick an active participant by hovering over the active participant and clicking .

Under the Work Notes & Activity section, you can send connect message at incident or incident communication plan level. You can also view the activity stream.

To initiate a call directly to the group members, click **Start a call**.

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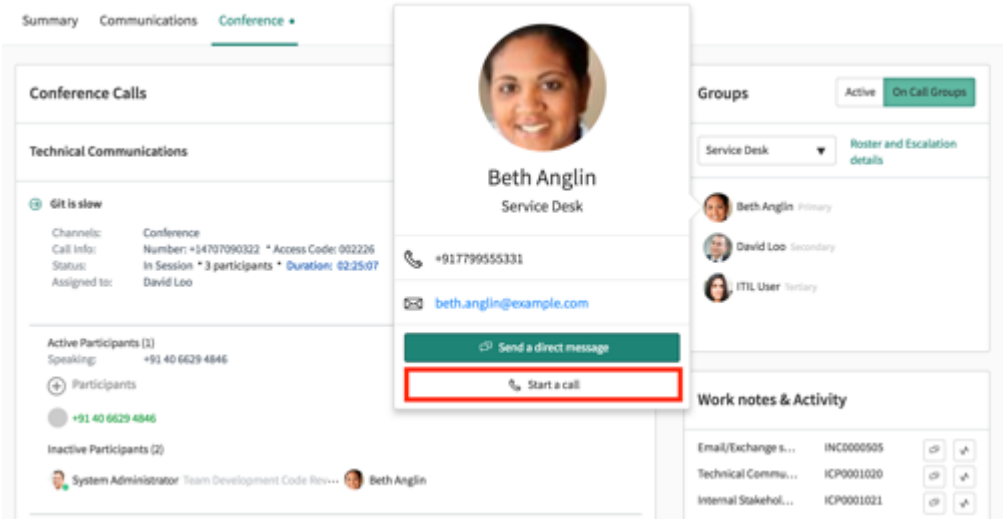


To start a call, populate the *sn_major_inc_mgmt.notify_webrtc_number* property with a valid notify number that has voice capability. For user who is already in an active conference call, **Start a call** is disabled. You can mute or unmute all the participants using the **Mute All** and **Unmute All** options. If you activate the Notify - Twilio Direct Driver plugin (com.snc.notify.twilio_direct), the active participants are highlighted in green.

For information on how to send a Microsoft Teams notification from major incident workbench, see Send a notification from Major incident management workbench.

For information on process flow for slack communication, see Process flow for Slack communication.

For information on how to add a collaborative communication task, see Add a collaborative communication task.

### Associate a new post incident report

Create your own post incident report and associate the UI page with the **View Complete Report** button under the **Post Incident Report** tab. Using the customized report, you can add information that is specific to your organization.

#### Before you begin

Role required: itil, major_incident_manager, or admin

#### About this task

For associating the **View Complete Report** button with your customized post incident report page, set the value of the **PIR export ui page url** major incident property to the new UI page.

#### Procedure

1. Navigate to **All** > **System UI** > **UI Pages** and click **New**.
2. Create a UI page.
   For information on how to create a UI page, refer UI pages.
3. Navigate to **Incident** > **Major Incident Properties**.
4. In the **PIR export ui page url** (*sn_major_inc_mgmt.pir_export_pdf_ui_page*) property, enter the link of the new UI page.
5. Click **Save**.
   When you click the **View Complete Report** button, the new UI page opens.

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### Add communication plan from the major incident workbench

You can create a new communication plan or add a new communication task to an existing communication plan from the workbench. This UI action is helpful when you do not have an existing well-defined communication plan in the system.

#### Before you begin

Role required: major_incident_manager

#### Procedure

1. Navigate to Major incident workbench.
2. Click the **Communications** tab and then click **Add** that appears in Communication Tasks section to display the Adhoc Communication pop-up window.
3. On the form, fill in the fields.

| Field | Description |
|---|---|
| Communication Plan | List to select a new communication plan or to select an existing plan and add communication tasks to the plan. |
| Plan Short description | Brief description of what the communication plan is all about. |
| Task Short description | Brief description of what the communication task is all about. |
| Channels | Check box to select email, SMS, slack, or conference as mode of communication for the plan. |
| Frequency | Frequency at which a specific task needs to be executed. A task can be executed only once or on specific durations. |
| Due in (Minutes) | Time span when the task must be executed after the task initiates. For recurring tasks, it also indicates the time span after which the task must repeat. |

### Add similar incidents from major incident workbench

Add similar incidents to a major incident so that the support teams can work on the parent record for a coordinated response process.

#### Before you begin

Role required: itil, major_incident_manager, communication_manager, incident_manager, or admin

- Activate the Predictive Intelligence plugin (com.glide.platform_ml).
  - Configure Predictive Intelligence and train the solution definition with the name *ml_sn_global_similar_incidents_mim*. For more information on how to train a solution definition, refer to Create and train a similarity solution.
- Ensure that there is an active ML solution at **Predictive Intelligence** > **Similarity** > **Solutions** with the solution name *ml_sn_global_similar_incidents_mim*.

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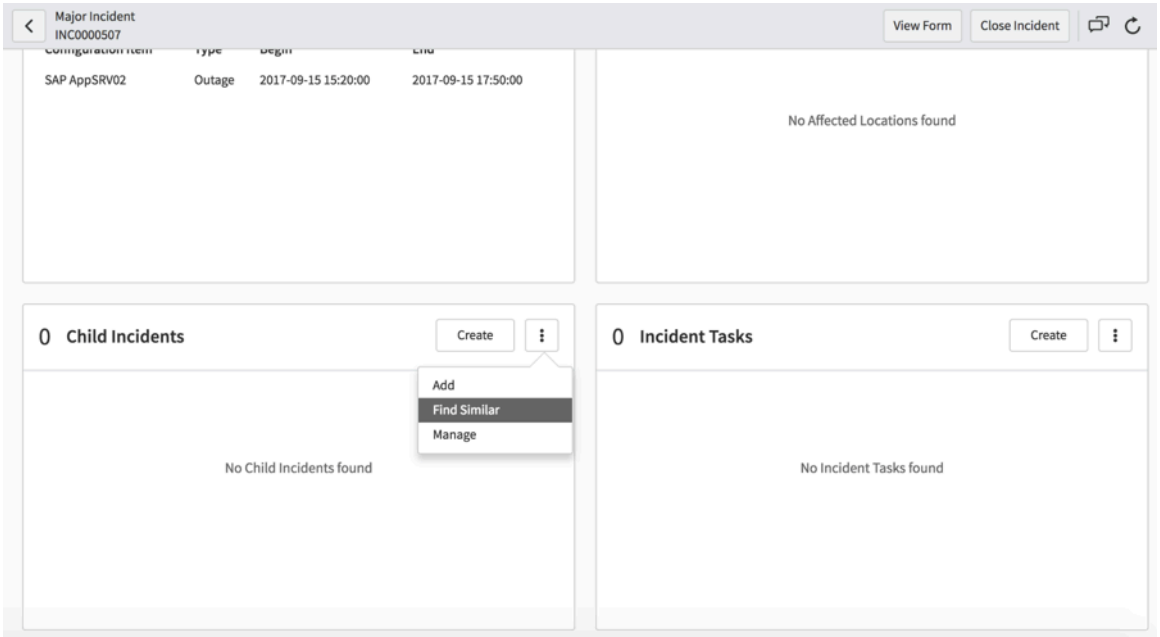
### Procedure

1. Navigate to Major incident workbench.
2. Click the **Summary** tab.
3. In the Child Incidents section, click ⋮ and then click **Find Similar**.




4. From the Add Similar Incidents dialog box, select the similar incidents that you want to relate to the major incident and then click **Add Selected**.
   The similar child incidents appear under the Child Incidents section.

## Access on-call escalation path from major incident workbench

Access on-call roster and escalation details from major incident workbench to reach out to a support group.

### Before you begin

Role required: itil, sn_incident_read, sn_incident_write, major_incident_manager, communication_manager, incident_manager, or admin

Activate the On-Call Scheduling plugin (com.snc.on_call_rotation).

### Procedure

1. Navigate to Major incident workbench.
2. Click the **Communications** tab.
3. Under the **Groups** section, click **On Call Groups**.
4. From the list, select a group.

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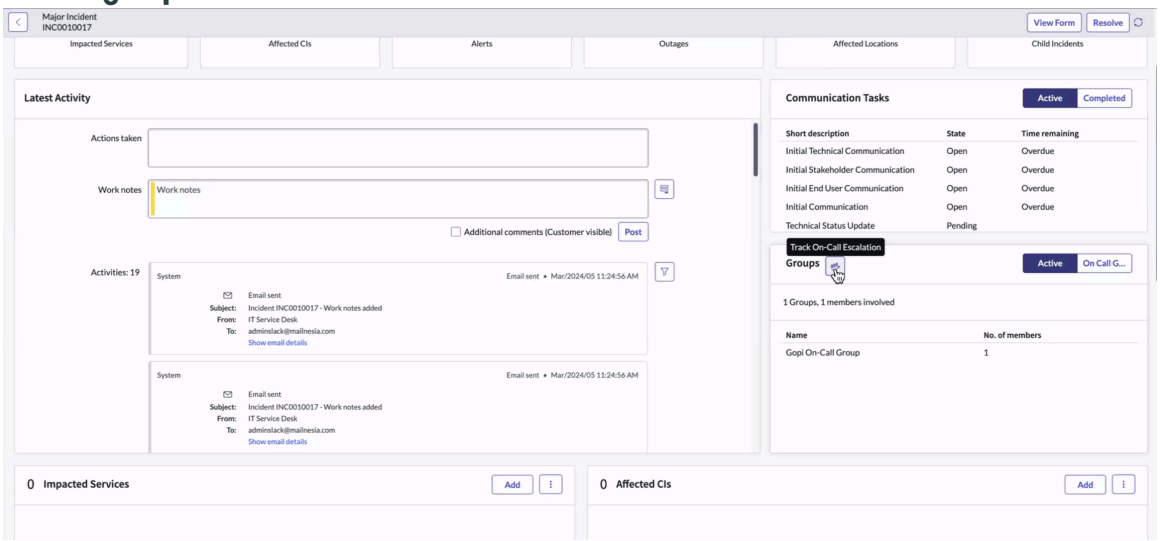
## On-call groups




5. Select **Track On-Call Escalation**.
6. In the escalation path section, select **Escalation**.

### Result

You can access the on-call escalation information.

## Major incident overview (dashboard)

Major Incident Overview module provides two versions of the Performance Analytics (PA) Dashboard to review major incident information at a glance.

Users with itil, sn_incident_write, major_incident_manager or communication_manager role can access the dashboard.

The two versions of the Performance Analytics (PA) Dashboard are normal and premium. You must activate the Incident Management - Major Incident Management plugin (com.snc.incident.mim) to view the normal dashboard. To access the premium version of Major Incident Overview dashboard, activate Performance Analytics – Content Pack for Major Incident Management (com.snc.pa.incident.mim).

You can navigate to the dashboard in the following ways:

- **Incident** > **Major Incidents** > **Overview**
- **Self – Service** > **Dashboard** > **Major Incident Overview**

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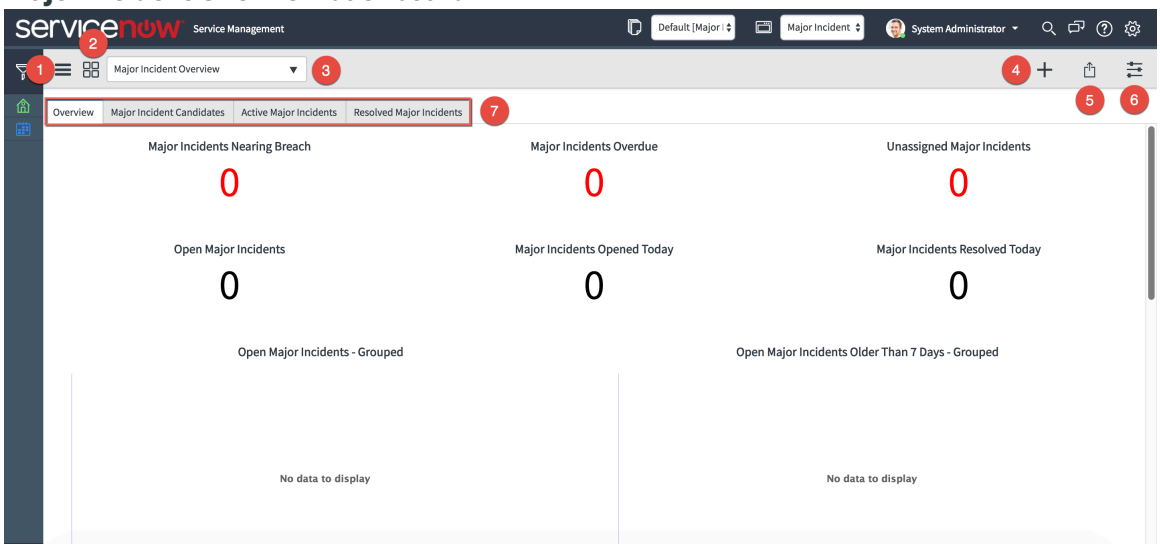
# Major incident overview

## Major Incident Overview dashboard




Major Incident Overview module provides information on the following content:

| # | UI component | Description |
|---|---|---|
| 1 | Dashboard controls | Provides options to create, duplicate, or delete a dashboard. You can copy the dashboard URL or duplicate the dashboard. In addition, you can add the dashboard in your favorite list, create a tab, or reset filters in the dashboard. |
| 2 | Dashboard overview | Takes you to the UI page where you view the recently accessed dashboard, dashboards owned or shared by you, or all the dashboards in the system. To create a new dashboard, click **New**. |
| 3 | Dashboard choice list | Provides options to select between different dashboards in the system. |
| 4 | Add widgets | Provides option to add widgets. You can drag to move or resize the widget on the dashboard. |
| 5 | Sharing | Provides option to specify groups, users, and roles for the dashboard. |
| 6 | Configuration | Provides the configuration pane to select a layout to snap the widgets against or to modify a layout as required. |
| 7 | Tabs | • **Major Incidents Nearing Breach**: Number of active major incidents where the Major incident state is **Accepted** and the response or resolution SLA has reached 75% of the allotted time.<br>• **Major Incidents Overdue**: Number of active major incidents where the Major incident state is **Accepted** and the response or resolution SLA has breached. |

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| # | UI component | Description |
|---|---|---|
| | | • **Unassigned Major Incidents**: Number of active major incidents where **Assigned to** is empty.<br>• **Open Major Incidents**: Major incidents which are open and has major incident state as **Accepted**.<br>• **Major Incidents Opened Today**: Major incident state is **Accepted** and the major incident is created on the current day.<br>**Note:** Major incidents opened for that day includes both active and inactive incidents.<br>• **Major Incidents Resolved Today**: Major incidents that are resolved on the current day and have the state as **Resolved**.<br>• **Open Major Incidents – Grouped**: You can filter these incidents based on **Group by** and **Stacked by**.<br>• **Open Major Incidents Older Than 7 Days – Grouped**: You can filter these incidents based on **Group by** and **Stacked by**.<br>• **Major Incidents by Priority and State**<br>• **Major Incidents by Priority and State Older than 7 Days**<br>• **Major Incidents Opened per Week**<br>• **Major Incidents Closed per Week** |

## Major Incident Overview – Premium

Major Incident Overview – Premium provides the following additional functions:

- **Process KPIs**: Provides information on **Active Major Incidents**, **Number of resolved major incidents**, **Average resolution time of Major Incidents**, and **New Major Incidents Vs Resolved**.
- Interactive filters: Helps to filter incidents based on category, priority, assignment group, and state.

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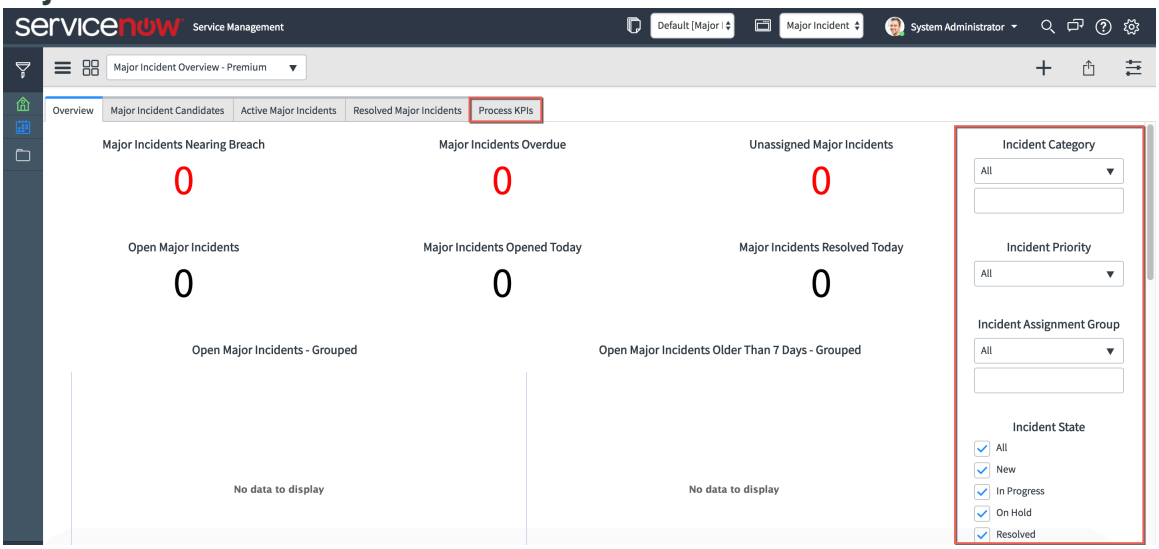
**Major Incident Overview – Premium dashboard**




### Related topics

- Create and use dashboards
- Major incident workbench

## Reporting incidents

Service desk and other IT managers can use dashboards and reports to monitor and track incident status and service levels.

### Incident Overview

The **Incident** > **Overview** dashboard provides a quick glance at the current state of open incidents. At the top, single score widgets enumerate the open incident statuses, such as critical incidents, unassigned incidents, and overdue incidents. Charts in the dashboard group incidents by factors such as priority and state. The incident overview is fully interactive and configurable.

### Incident reports

Various incident reports are available in the base system, and you can modify the existing reports or create new ones. Navigate to **Reports** > **View / Run** and enter `incident` in the search box to view all incident reports. Base system reports include the following:

- Basic bar or pie chart reports, such as incidents by assignment group, location, priority, or state. These reports help you analyze a specific data point, for example, whether enough staff is allocated to an assignment group.
- Time series reports, such as **Incident Trend by Configuration Item**. This report lets you analyze closed incidents by configuration item (CI) to identify potential problems.
- Multidimensional reports, such as **Incidents by Priority and State older than 30 Days**. This report can help you identify gaps in service levels. For example, if a high number of low-priority incidents are still in **New** state after being open more than 30 days.

### Incident metric definition

A metric measures and evaluates the effectiveness of IT service management processes. The service desk can improve the incident management process using information gathered

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within the platform. You can activate the Metric Definition plugin (com.glide.metrics) and define the metrics to monitor within the system. With these metrics, and the information within the database, it is possible to generate reports that can be added to dashboards or automatically generated and distributed.

Using this information, it is possible to refine automatic rules such as the assignment rules, service level agreements, or inactivity monitors to better suit the unique environment of the service desk. Unnecessary incidents can be avoided by encouraging users to consult the knowledge base before creating an incident. The related search results function in the Incident form assists with this strategy.

## Complimentary Performance Analytics for Incident Management

Complimentary Performance Analytics for Incident Management and aggregates data over time, and is enabled by default for Incident Management. Complimentary Performance Analytics for Incident Management provides an Incident Management dashboard with 15 indicators to help you assess organizational performance. For more information, see Performance Analytics for Incident Management.

If you subscribe to Performance Analytics, additional Platform Analytics Solutions are available for Incident Management. The Platform Analytics Solution for Incident Management contains preconfigured dashboards.

A subscription to Performance Analytics also gives you access to In-form analytics. In-form analytics integrate performance insights into Incident records so that users can access important metrics in context and make better decisions. For more information, see Text-To-Display.

**Related topics**

- Creating reports

## Incident Management Platform Analytics Solutions

Platform Analytics Solutions and in-form analytics contain preconfigured dashboards. These dashboards contain actionable data visualizations that help you improve your business processes and practices.

Platform Analytics data visualizations use Performance Analytics indicator data to show you data over time, helping you analyze your business processes and identify areas of improvement. With Platform Analytics Solutions, you can get value from Performance Analytics for your application with minimal setup. You can always create your own objects as well.

**Important:**
Set up and test Platform Analytics Solutions on a non-production instance before enabling them in production.

The Platform Analytics Solution for Incident Management is available by default as part of Complimentary Performance Analytics for Incident Management.

**Related topics**

- Platform Analytics Solutions
- Activate your Performance Analytics subscription

### ITIL dashboard

Use this dashboard to view, maintain, and track the tasks and incidents for operating the IT service desk.

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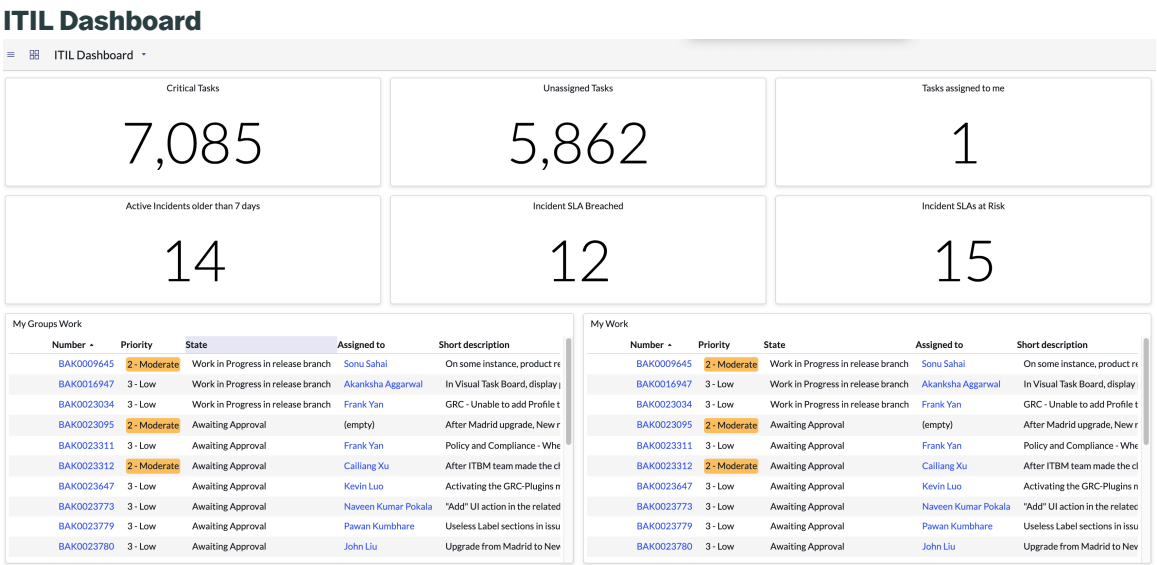
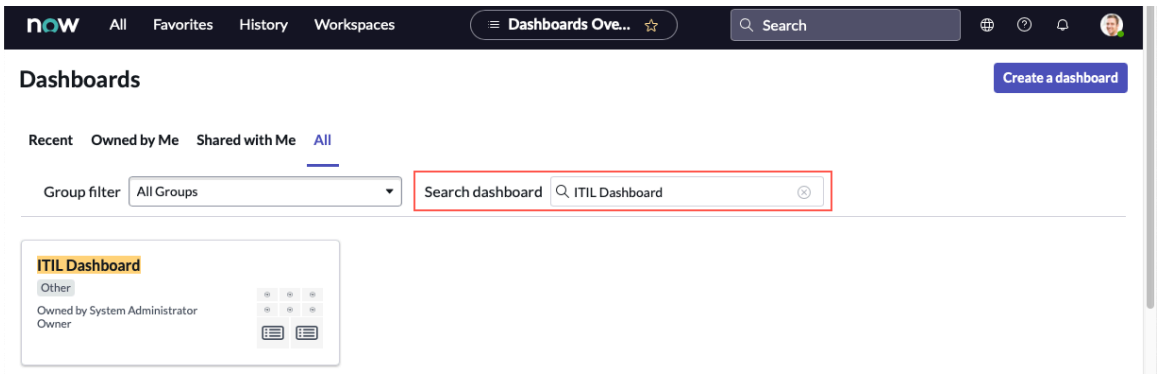



## Access the ITIL dashboard

To access the ITIL dashboard, navigate to **All** > **Self-Service** > **Dashboard**. On the Dashboards Overview, search for ITIL dashboard.




## End user and roles

| End User | Description | Required role |
|---|---|---|
| IT Agent | Views, opens, updates, tracks, and closes incidents and tasks for managing customer issues. | itil |
| IT Agent Admin | Can perform all the activities of an IT agent. In addition, the admin can also modify the data and layout. | itil_admin |

## Data visualizations

The dashboard includes the following visualizations:

| Title | Type | Description |
|---|---|---|
| Critical Tasks | Single score (42) | Total number of open critical task records for which **Priority** is set to **1**. |

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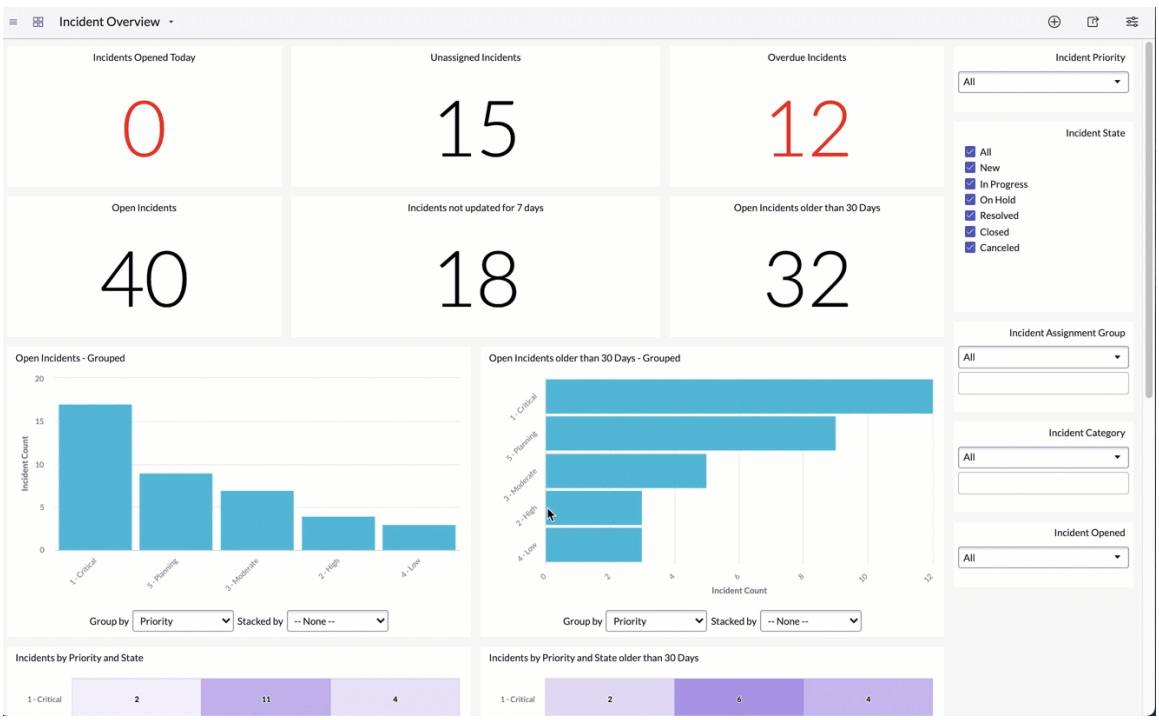
| Title | Type | Description |
|---|---|---|
| Unassigned Tasks | Single score (42) | Total number of open tasks that are still not assigned. |
| Tasks assigned to me | Single score (42) | Total number of tasks assigned to the logged-user of the dashboard. |
| Active Incidents older than 7 days | Single score (42) | Total number of active incidents logged before seven days. |
| Incident SLA Breached | Single score (42) | Total number of incidents that exceed its SLA. |
| Incident SLAs at Risk | Single score (42) | Total number of active incidents that have not yet exceeded an SLA but have elapsed 75% of the duration of the SLA. |
| My Groups Work | List | Outstanding work load (tasks) of the logged-in user's group. |
| My Work | List | The logged-in user's outstanding work load (tasks). |

### Incident Overview dashboard

Use this dashboard to view the status of the incidents for planning, prioritizing, and managing customer issues.

**Incident Overview Dashboard**




## Access the Incident Overview dashboard

To access the Incident Overview dashboard, navigate to **All** > **Incident** > **Overview**.

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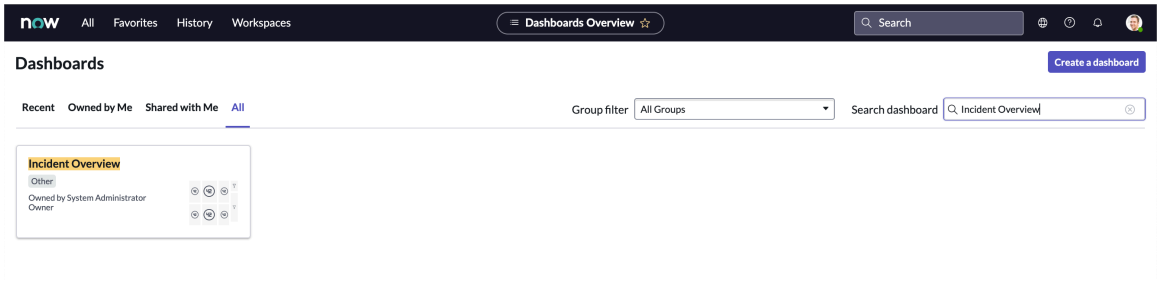
Alternatively, navigate to **All** > **Self-Service** > **Dashboard**. On the Dashboards Overview, search for Incident Overview dashboard.




## End user and roles

| End user | Description | Required role |
|---|---|---|
| IT Agent | Opens, views, updates, tracks, and closes the incidents for managing customer issues. | • itil<br>• sn_incident_read |

## Data visualizations

The dashboard includes the following visualizations:

| Title | Type | Description |
|---|---|---|
| Incidents Opened Today | Single score (42) | Total number of incidents created on the current date. |
| Unassigned Incidents | Single score (42) | Total number of incidents that are still not assigned. |
| Overdue Incidents | Single score (42) | Total number of incidents that exceed its SLA. |
| Open Incidents | Single score (42) | Total number of incidents that do not have a resolution date. |
| Incidents not updated for 7 days | Single score (42) | Total number of incidents that were updated more than 7 days ago. |
| Open Incidents older than 30 Days | Single score (42) | Total number of open incidents that were created 30 days ago. |
| Open Incidents-Grouped | Vertical bar | Total number of open incidents grouped by priority. |
| Open Incidents older than 30 Days-Grouped | Horizontal bar | Total number of open incidents that were created more than 30 days ago. |
| Incidents by Priority and State | Heatmap icon | Total number of incidents grouped by priority and state. |
| Incidents by Priority and State older than 30 Days | Heatmap icon | Total number of incidents grouped by priority and state |

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| Title | Type | Description |
|---|---|---|
| | | that were created more than 30 days ago. |
| Incidents per week | Area icon (  ) | Total number of incidents opened or closed in each week. |

## Filters

The dashboard includes the following filters:

| Name | Type | Description |
|---|---|---|
| Incident Priority | Choice list | Filter the report visualizations based on the **Priority** of the incident record. |
| Incident State | Choice list | Filter the report visualizations based on the **State** of the incident record. |
| Incident Assignment Group | Reference | Filter the report visualizations based on the **Assignment group** associated with the incident record. |
| Incident Category | Choice list | Filter the report visualizations based on the **Category** of the incident record. |
| Incident Opened | Date | Filter the report visualizations based on the date when the incident is created. |

**Note:**
This dashboard displays the incident-related information from the **Overview** tab of the Incident Premium dashboard.

### Incident Management Dashboard

The Incident Management dashboard lets you see recent trends in incident creation, duration, and resolution. Use the information on this dashboard to spot problem areas and plan your incident management strategy going forward.

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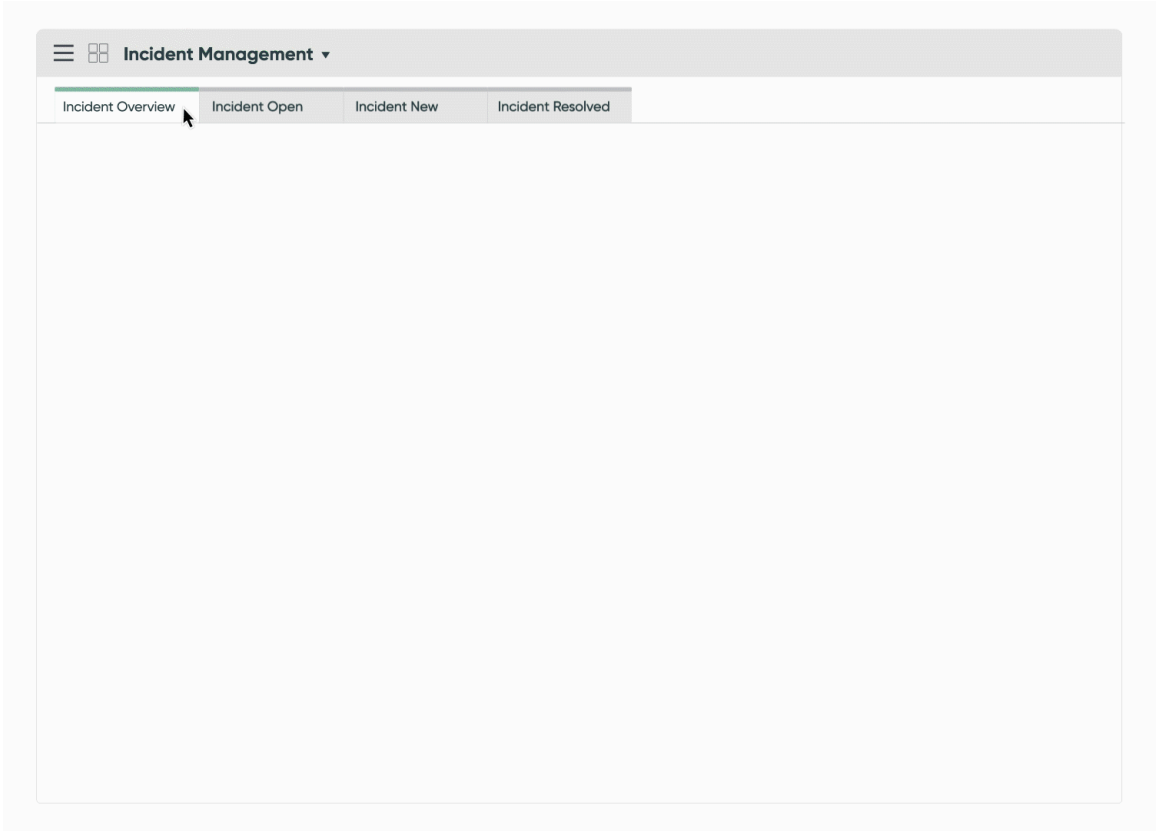
### Tabs of the Incident Management dashboard




## End user and roles

| End user and goal | Required role |
|---|---|
| Incident Manager: Needs to know how the incident management process is doing so they can plan for the future. | itil |

## Indicators

**Number of open incidents**

Daily count of the number of incidents that do not have a resolution date. This indicator is used as the basis of several other indicators on this dashboard.

**Number of open incidents not updated in last 5 days**

Daily count of the number of incidents last updated more than five days ago.

**Number of open incidents not updated in last 30 days**

Daily count of the number of incidents last updated more than 30 days ago.

**Number of new incidents**

Daily count of the number of incidents opened 'today.'

**Number of resolved incidents**

Daily count of indicators with State = Resolved.

**Incident Backlog Growth**

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Tracks the increase or decrease in open incidents. The score is calculated according to the formula [[Number of new incidents]] - [[Number of resolved incidents]].

**Average age of open incidents**

The average age in days in which an incident has been open. The score is calculated according to the formula [[Summed age of open incidents]]/([[Number of open incidents]]*24).

**% of new critical incidents**

The percentage of new incidents filtered on the Priority breakdown with the breakdown element 1 - Critical. The score is calculated according to the formula ( [[Number of new incidents > Priority = 1 - Critical]] / [[Number of new incidents]] ) * 100.

**Average resolution time of resolved incidents**

The average number of days it takes to resolve an incident, provided it is resolved. The score is calculated according to the formula [[Summed duration of resolved incidents]] / ([[Number of resolved incidents]] * 24).

The following indicators are not shown directly on the dashboard but are used in calculating formulas:

- Summed age of open incidents
- Summed duration of resolved incidents

## Breakdowns

- Category
- Priority
- Age

### Incident Premium dashboard

This dashboard uses Workbench widgets and other advanced Platform Analytics features to give you all the information about the Incident process in one place.

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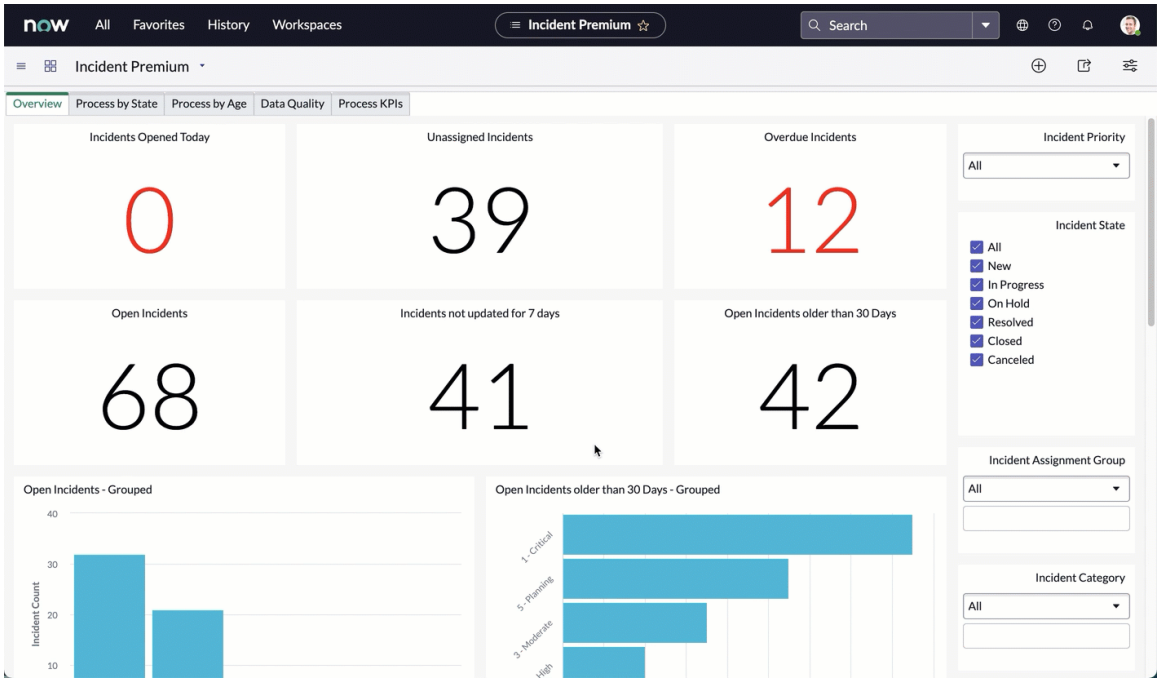
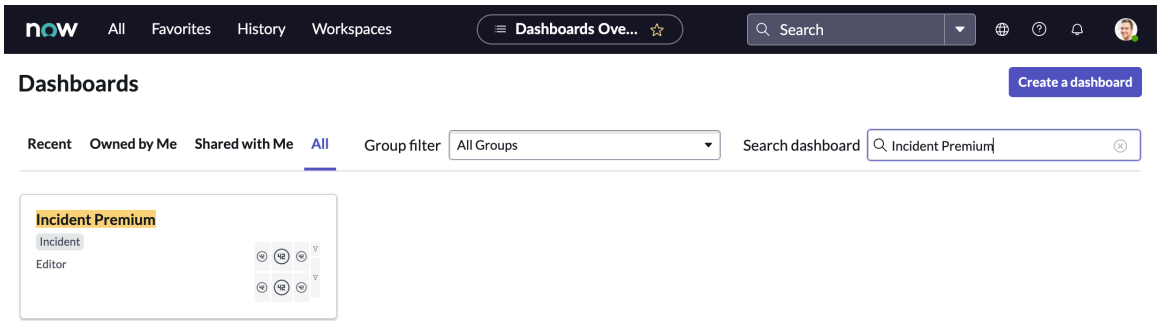
### Tabs of the Incident Premium dashboard




## Access the Incident Premium dashboard

To access the Incident Premium dashboard, navigate to **All** > **Self-Service** > **Dashboard**. On the Dashboards Overview, search for Incident Premium dashboard.




## End user and roles

| End user | Description | Required role |
|---|---|---|
| IT Agent | Views the assigned work and group work, reports, and prioritize workload | • itil<br>• sn_incident_read<br>• pa_contributor<br>• pa_viewer |
| IT Manager | Views the group work and reports and also can edit the required data and dashboard layout | • itil<br>• sn_incident_read<br>• pa_contributor<br>• pa_viewer |

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| End user | Description | Required role |
| --- | --- | --- |
| | | • pa_admin<br>• pa_power_user |

## Indicators

**Number of open incidents**

Daily count of the number of incidents that do not have a resolution date. This indicator is used as the basis of several other indicators on this dashboard.

**Number of new incidents**

Daily count of the number of incidents opened 'today.'

**Number of closed incidents**

Daily count of indicators with State = Closed.

**Number of resolved incidents**

Daily count of indicators with State = Resolved.

**Average age of open incidents**

The average age in days in which an incident has been open. The score is calculated according to the formula [[Summed age of open incidents]]/([[Number of open incidents]]*24).

**Average reassignment of open incidents**

The average number of times currently open incidents have been reassigned. This indicator is shown as 'Average re-assignment times' in the Process by State tab. The score is calculated according to the formula [[Summed re-assignment of open incidents]] / [[Number of open incidents]].

**Average age of last update of open incidents**

How long on average it has been since the last update to one of the currently open incidents, in days. The score is calculated according to the formula [[Summed age of last update of open incidents]] / ([[Number of open incidents]] * 24)

**% of incidents not updated in last 5 days**

The percentage of currently open incidents that have not been updated for the last five days. The score is calculated according to the formula ( [[Number of open incidents not updated in last 5 days]] / [[Number of open incidents]] ) * 100

**% of incidents not updated in last 30 days**

The percentage of currently open incidents that have not been updated for the last 30 days. The score is calculated according to the formula ( [[Number of open incidents not updated in last 30 days]] / [[Number of open incidents]] ) * 100

**% of new critical incidents**

The percentage of new incidents filtered on the Priority breakdown with the breakdown element 1 - Critical. The score is calculated according to the formula ( [[Number of new incidents > Priority = 1 - Critical]] / [[Number of new incidents]] ) * 100.

**Average close time of incidents**

The average amount of time in days it takes to close an incident. The score is calculated according to the formula [[Summed duration of closed incidents]] / ([[Number of closed incidents]] / 24)

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**% of incidents resolved without reassigning**

The percentage of incidents with a State of Resolved that were never reassigned from the first assignment group. The score is calculated according to the formula [[Number of resolved incidents by first assigned group]] / [[Number of resolved incidents]] * 100.

**% of incidents closed by self-service**

The percentage of incidents with State = Closed and Close code = Closed/ Resolved by Caller. The score is calculated according to the formula [[Number of incidents closed by self-service]] / [[Number of closed incidents]] * 100.

**% of open incidents reassigned at least once**

The percentage of incidents that are open and that have been transferred at least once. The score is calculated according to the formula [[Number of reassigned open incidents]] / [[Number of open incidents]] * 100

**% of incidents resolved same day opened**

The percentage of incidents with State = Resolved where the day in the Resolved field is the same as the day in the Opened field. The score is calculated according to the formula [[Number of incidents resolved on the same day opened]] / [[Number of resolved incidents]] * 100.

**% of incidents not solved**

The percentage of closed incidents where Close code = Not Solved (Not Reproducible) or Not Solved (Too Costly). The score is calculated according to the formula [[Number of incidents not solved]] / [[Number of closed incidents]] * 100.

The following indicators are not shown directly on the dashboard but are used in calculating formulas:

- Summed age of open incidents
- Summed re-assignment of open incidents
- Summed age of last update of open incidents
- Number of open incidents not updated in last 5 days
- Number of open incidents not updated in last 30 days
- Summed duration of closed incidents
- Number of resolved incidents by first assigned group
- Number of incidents closed by self-service
- Number of reassigned open incidents
- Number of incidents resolved on the same day opened
- Number of incidents not solved

## Breakdowns

- Priority
- Category
- Assignment Group
- State

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## Data visualizations

| Title | Type | Description |
|---|---|---|
| Incidents Opened Today | Single score (42) | Total number of incidents created on the current date. |
| Unassigned Incidents | Single score (42) | Total number of incidents that are still not assigned. |
| Overdue Incidents | Single score (42) | Total number of incidents that exceed its SLA. |
| Open Incidents | Single score (42) | Total number of incidents that do not have a resolution date. |
| Incidents not updated for 7 days | Single score (42) | Total number of incidents that were updated more than 7 days ago. |
| Open incidents older than 30 days | Single score (42) | Total number of open incidents that were created 30 days ago. |
| Open Incidents - Grouped | Vertical bar (  ) | Total number of open incidents grouped by priority. |
| Open incidents older than 30 days - Grouped | Horizontal bar (  ) | Total number of open incidents that were created more than 30 days ago. |
| Incidents by Priority and State | Heatmap icon (  ) | Total number of incidents grouped by priority and state. |
| Incidents by Priority and State older than 30 days | Heatmap icon (  ) | Total number of incidents grouped by priority and state that were created more than 30 days ago. |
| Incidents per week | Area icon (  ) | Total number of incidents opened or closed in each week. |
| Open Incidents older than 30 days by Assignment Group and State | Heatmap icon (  ) | Total number of incidents opened more than 30 days ago and that are grouped by assignment group and state of the incident. |
| Open Incidents Not Updated In Last 30 Days by Assignment Group and State | Heatmap icon (  ) | Total number of open incidents updated more than 30 days ago and that are grouped by assignment group and state of the incident. |
| Open Incidents where assignee is not active | Heatmap icon (  ) | Total number of incidents where the user in the **Assigned to** field have an inactive status. |
| Open Incidents with closed Problem | Heatmap icon (  ) | Total number of open incidents that have an |

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| Title | Type | Description |
|---|---|---|
| | | associated problem with closed status. |

## Filters

The dashboard includes the following filters:

| Name | Type | Description |
|---|---|---|
| Incident Priority | Choice list | Filter the report visualizations based on the **Priority** of the incident record. |
| Incident State | Choice list | Filter the report visualizations based on the **State** of the incident record. |
| Incident Assignment Group | Reference | Filter the report visualizations based on the **Assignment group** associated with the incident record. |
| Incident Category | Choice list | Filter the report visualizations based on the **Category** of the incident record. |
| Incident Opened | Date | Filter the report visualizations based on the date when the incident is created. |

### Incident Daily 7d - 28d dashboard

View the last 28 days of incidents as raw trends, as a 7-day running average, or as a 28-day running average. Filter the scores by assignment groups or by the category of incident.

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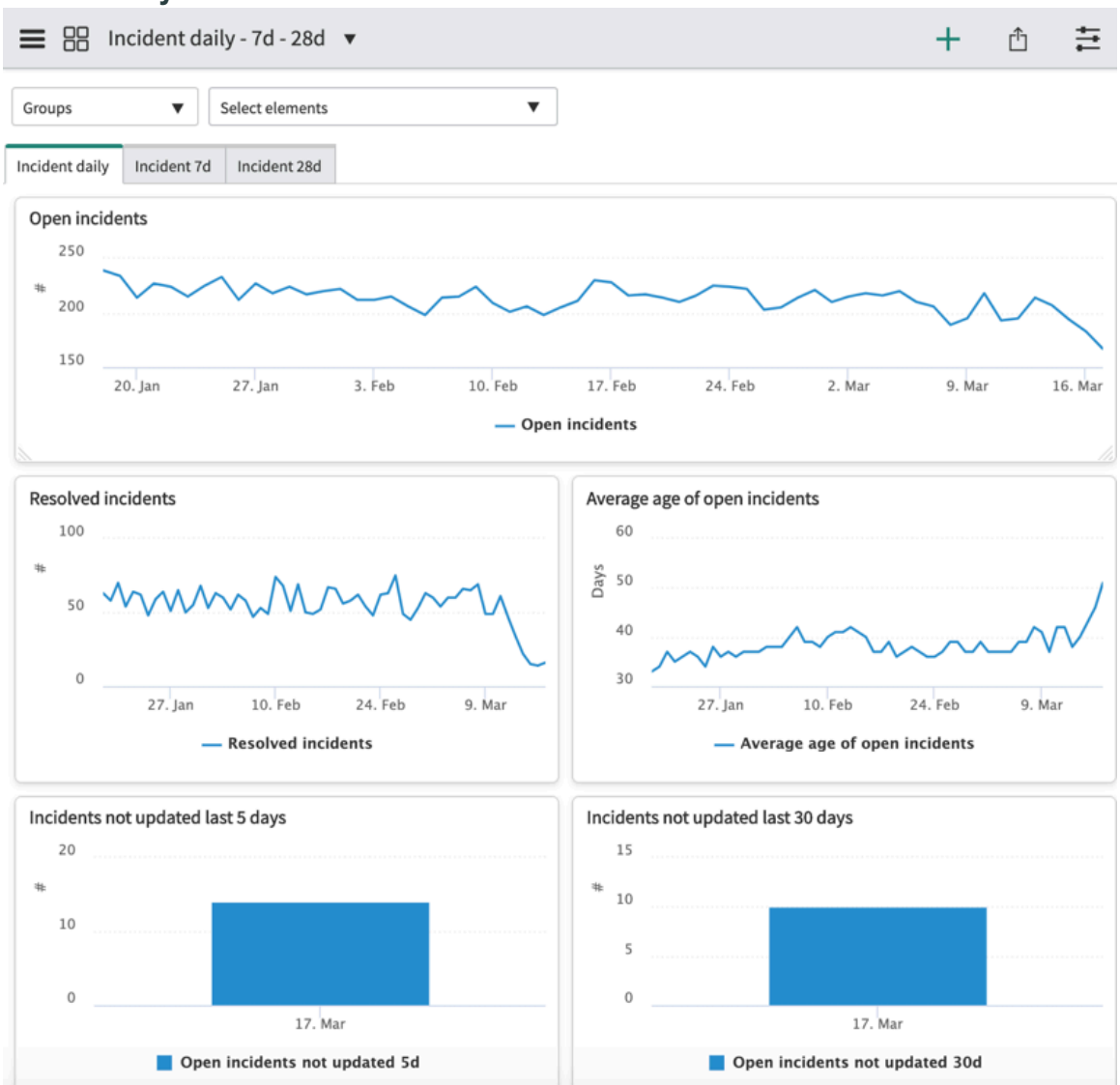
## Incident Daily tab

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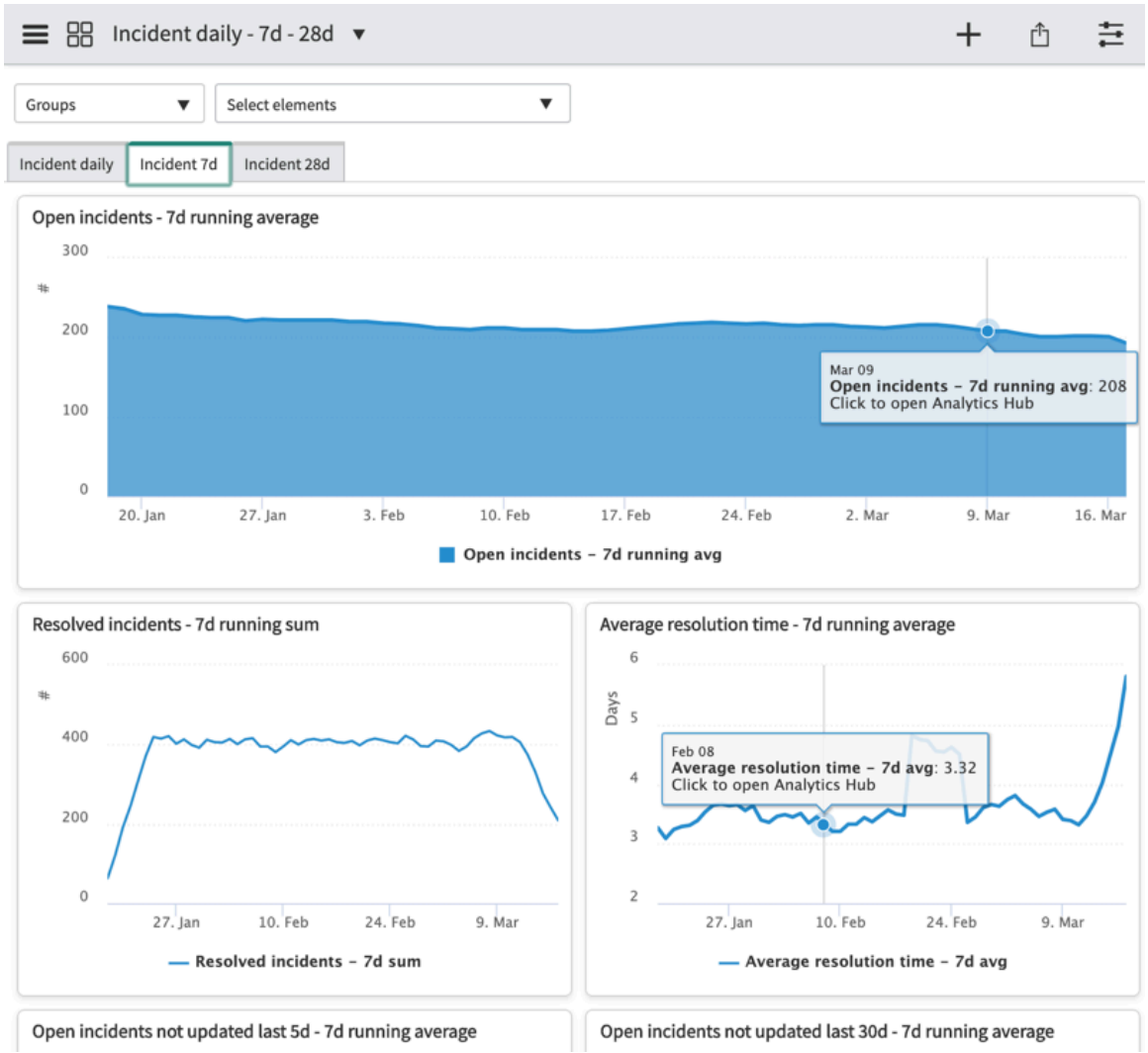
## Incident 7d tab

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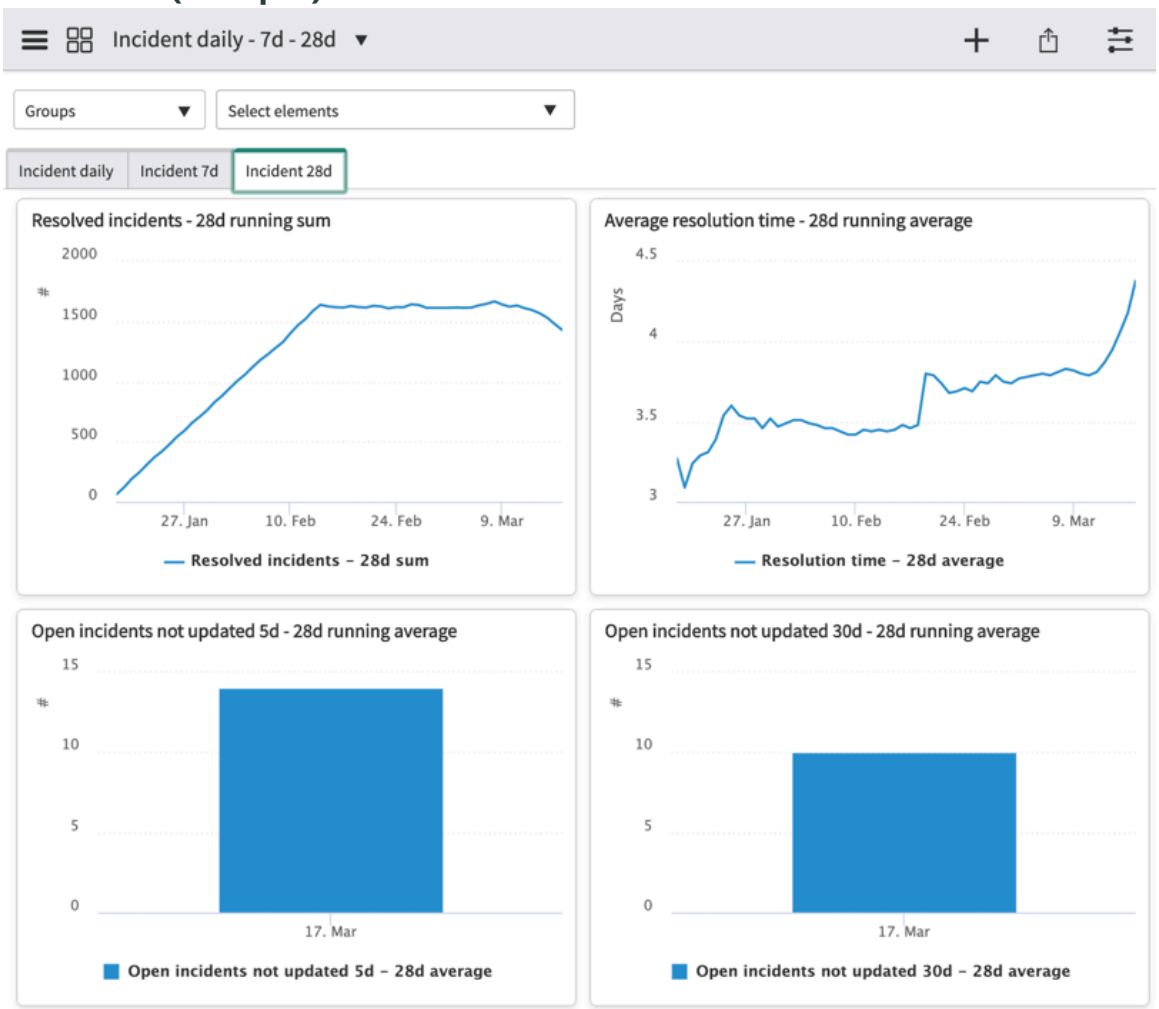
### Incident 28d (lower part)




| End user and goal | Required role |
| --- | --- |
| Incident Manager: Needs to know how the incident management process is doing so they can plan for the future. | itil |

## Indicators

**Number of open incidents**

Daily count of the number of incidents that do not have a resolution date. This indicator is used as the basis of several other indicators on this dashboard.

**Number of resolved incidents**

Daily count of indicators with State = Resolved.

**Average resolution time of resolved incidents**

The average number of days it takes to resolve an incident, provided it is resolved. The score is calculated according to the formula [[Summed duration of resolved incidents]] / ([[Number of resolved incidents]] * 24).

**Number of open incidents not updated in last 5 days**

Daily count of the number of incidents last updated more than five days ago.

**Number of open incidents not updated in last 30 days**

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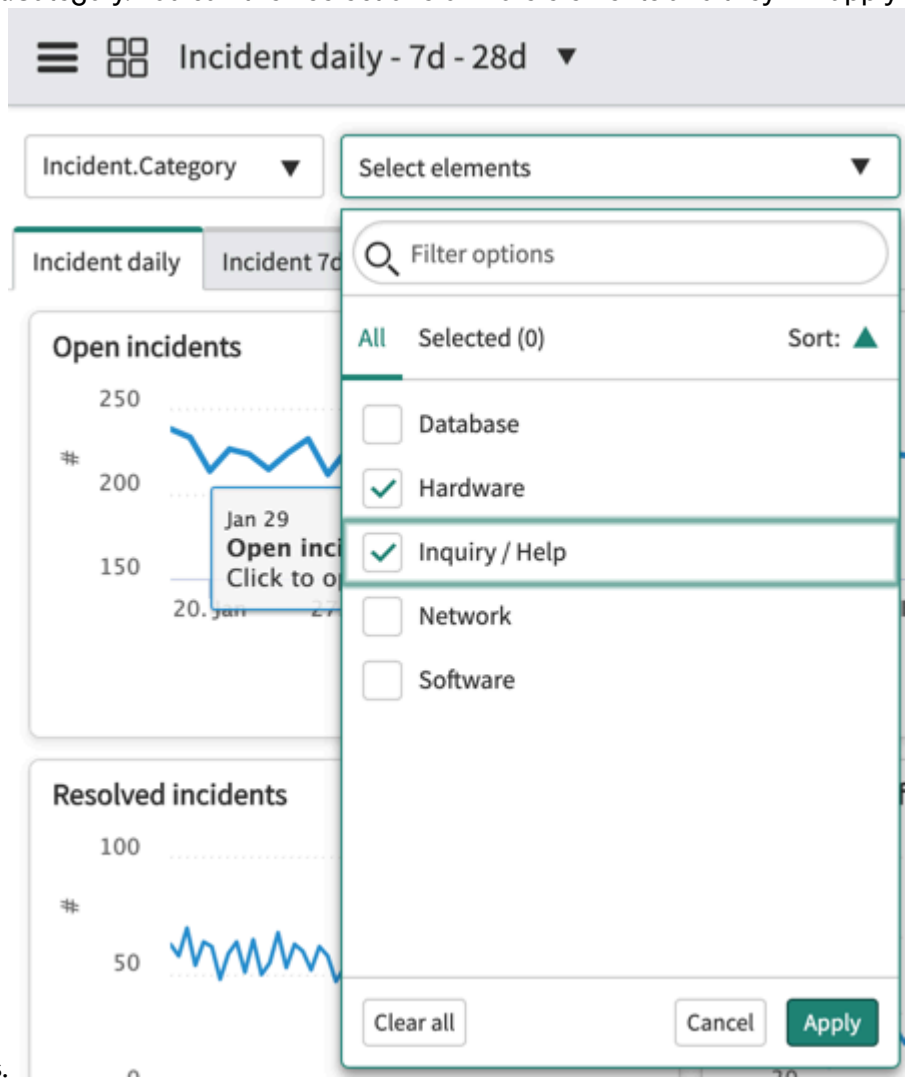
Daily count of the number of incidents last updated more than 30 days ago.

### Breakdowns

You can apply breakdown elements on this dashboard to all widgets simultaneously. Above the chart in the upper left, select either Groups or Incident.Category. You can then select one or more elements and they will apply to all widgets.




### Open Incidents Age Monitor dashboard

View average age and assignment times and breakdown incidents in different age buckets.

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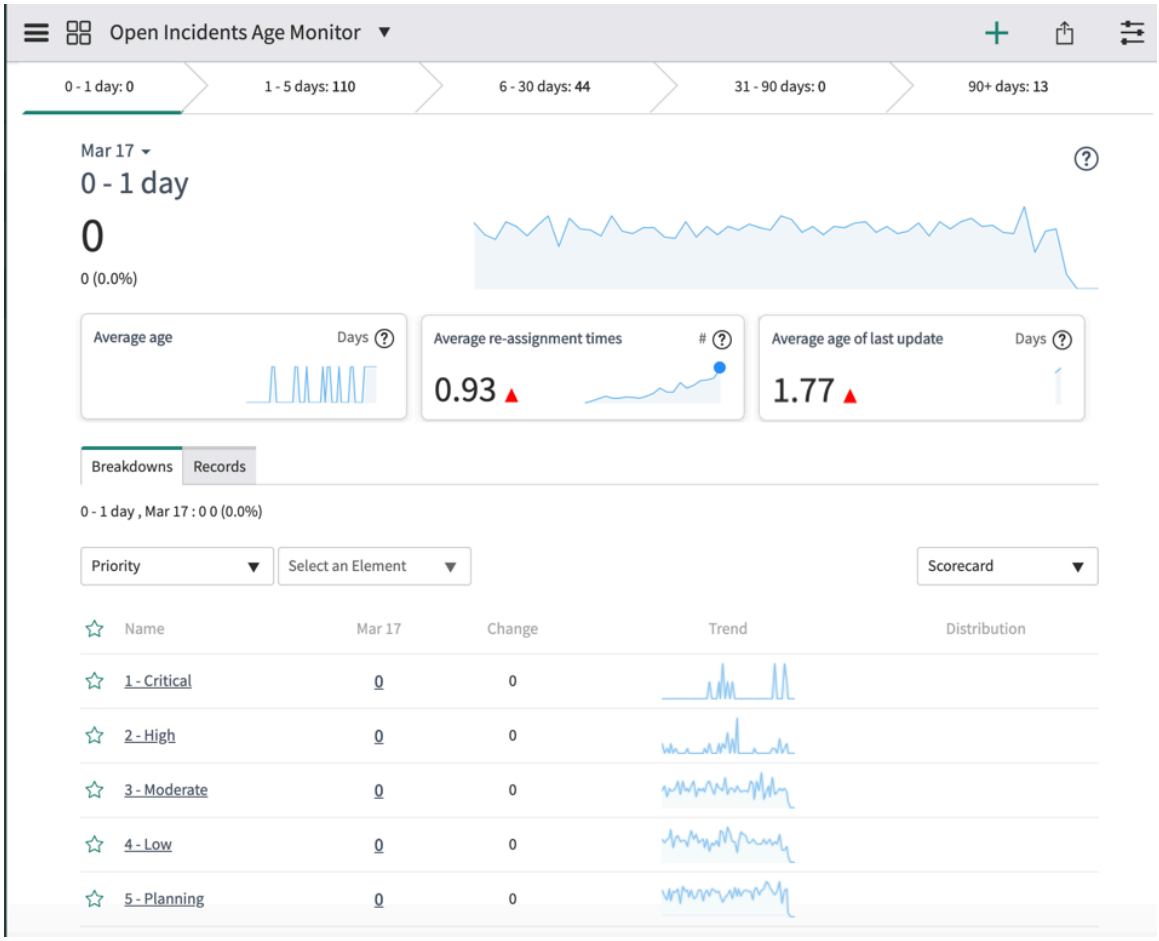


## End user and roles

| End user and goal | Required role |
|---|---|
| Incident Manager: Needs to know how the incident management process is doing so they can plan for the future. | itil |

## Indicators

### Number of open incidents

Daily count of the number of incidents that do not have a resolution date. This indicator is used as the basis of several other indicators on this dashboard.

### Average age of open incidents

The average age in days in which an incident has been open. The score is calculated according to the formula [[Summed age of open incidents]]/([[Number of open incidents]]*24).

### Average reassignment of open incidents

The average number of times currently open incidents have been reassigned. This indicator is shown as 'Average re-assignment times' in the Process by State tab. The score is calculated according to the formula [[Summed re-assignment of open incidents]] / [[Number of open incidents]].

### Average age of last update of open incidents

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How long on average it has been since the last update to one of the currently open incidents, in days. The score is calculated according to the formula [[Summed age of last update of open incidents]] / ([[Number of open incidents]] * 24)

The following indicators are not shown directly on the dashboard but are used in calculating formulas:

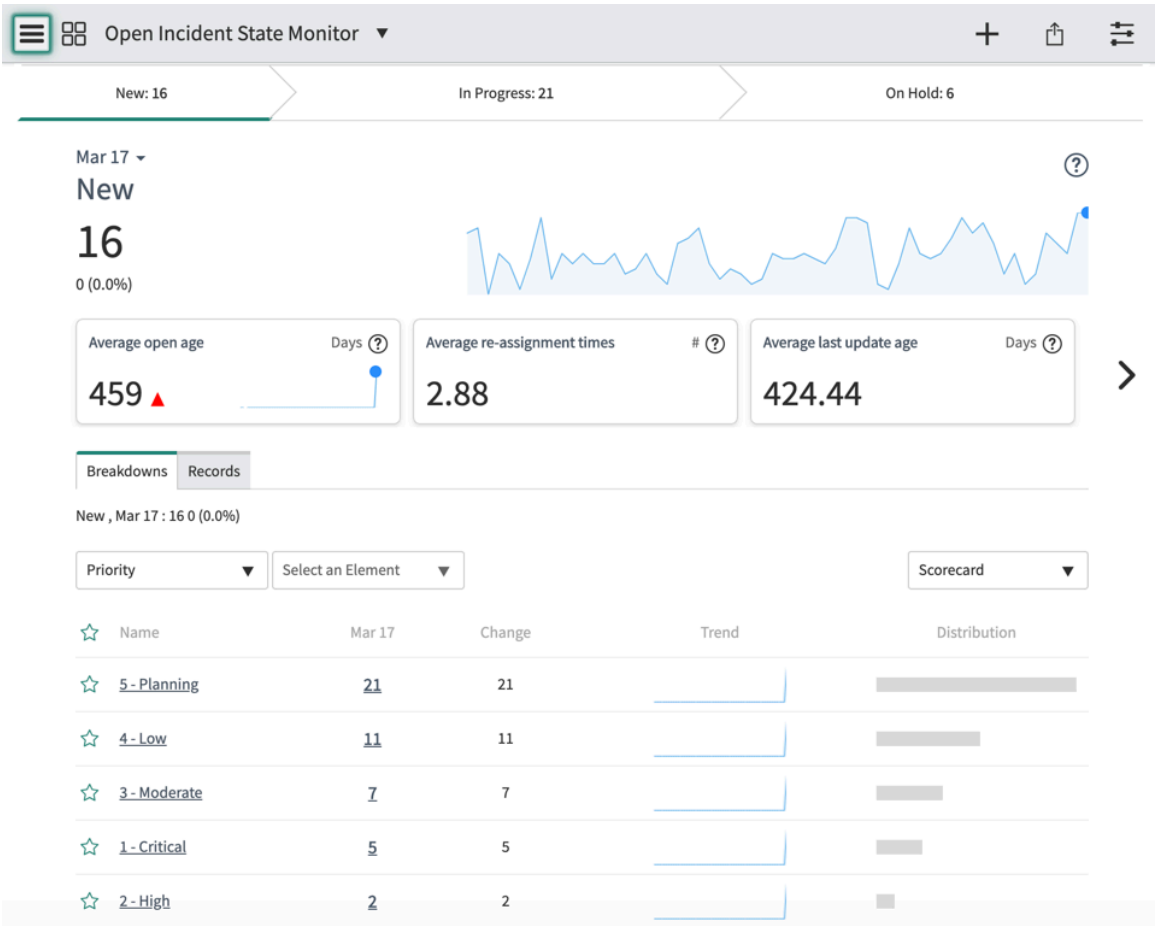
- Summed age of open incidents
- Summed re-assignment of open incidents
- Summed age of last update of open incidents

## Breakdowns

- Priority
- Category
- Assignment Group
- State

### Open Incident State Monitor dashboard

View average age and number of reassignments and breakdown incidents in the New, In Progress, and On Hold states.

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## End user and roles

| End user and goal | Required role |
| --- | --- |
| Incident Manager: Needs to know how the incident management process is doing so they can plan for the future. | itil |

## Indicators

**Number of open incidents**

Daily count of the number of incidents that do not have a resolution date. This indicator is used as the basis of several other indicators on this dashboard.

**Average age of open incidents**

The average age in days in which an incident has been open. The score is calculated according to the formula [[Summed age of open incidents]]/([[Number of open incidents]]*24).

**Average reassignment of open incidents**

The average number of times currently open incidents have been reassigned. This indicator is shown as 'Average re-assignment times' in the Process by State tab. The score is calculated according to the formula [[Summed re-assignment of open incidents]] / [[Number of open incidents]].

**Average age of last update of open incidents**

How long on average it has been since the last update to one of the currently open incidents, in days. The score is calculated according to the formula [[Summed age of last update of open incidents]] / ([[Number of open incidents]] * 24)

**% of incidents not updated in last 5 days**

The percentage of currently open incidents that have not been updated for the last five days. The score is calculated according to the formula ( [[Number of open incidents not updated in last 5 days]] / [[Number of open incidents]] ) * 100

The following indicators are not shown directly on the dashboard but are used in calculating formulas:

- Summed age of open incidents
- Summed re-assignment of open incidents
- Summed age of last update of open incidents
- Number of open incidents not updated in last 5 days

## Breakdowns

- Priority
- Category
- Assignment Group
- State

### Open Incidents Reports dashboard

View the current information about open incidents as a list, or as a heatmap or pivot table organized by breakdown.

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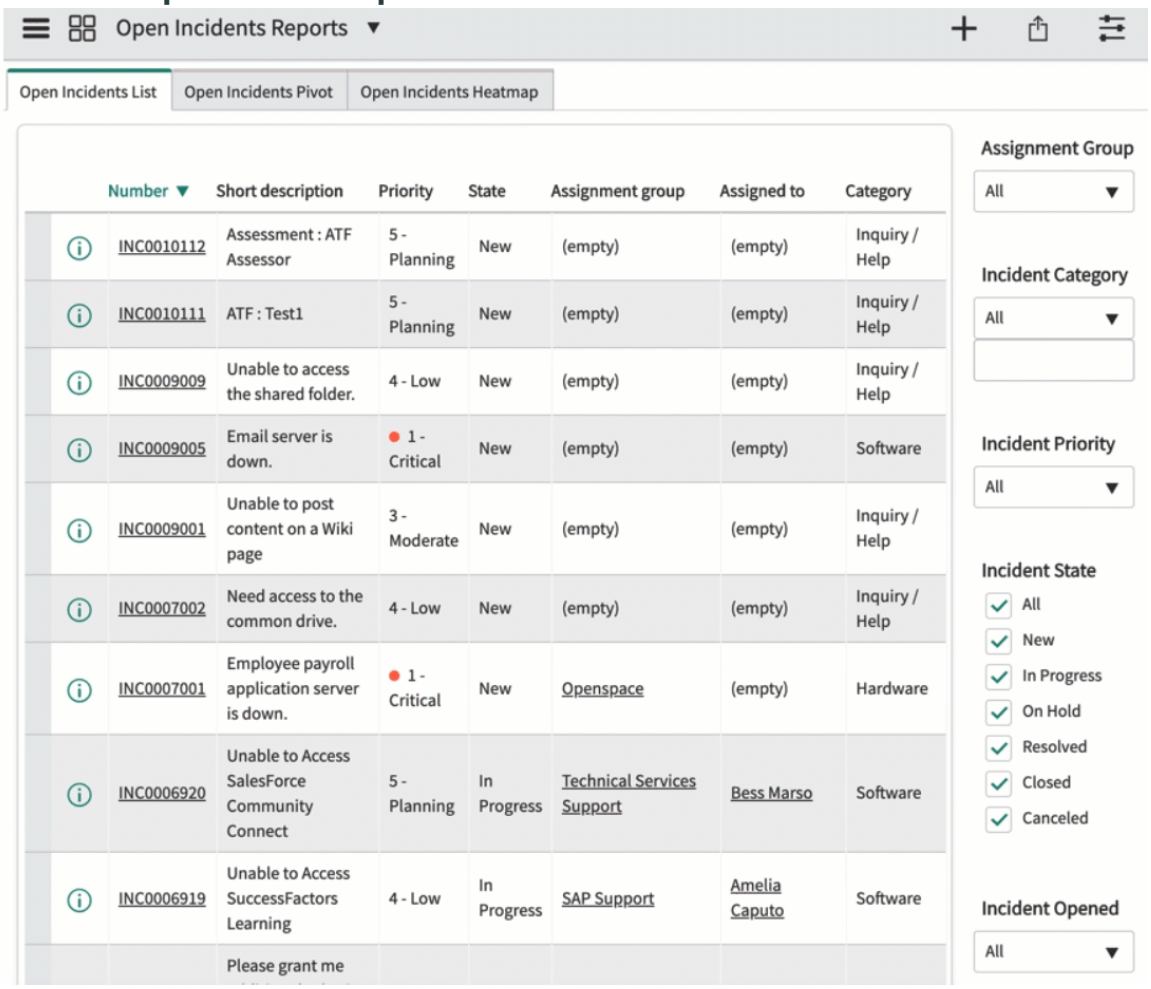
### Tabs of the Open Incidents Reports dashboard




## End user and roles

| End user and goal | Required role | Benefits |
|---|---|---|
| | | |
| | | |

## Interactive filters

- Priority
- Category
- Assignment Group
- State
- Age

## Data visualizations

| Title | Type | Description |
|---|---|---|
| Open Incidents List | List | List of all incident records for open incidents |

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| Title | Type | Description |
|---|---|---|
| Open Incidents Pivot | Pivot  | Table that lets you explore open incidents by combinations of state, assignment group, category, priority, and age. |
| Open Incidents Heatmap | Heatmap  | Heatmap that lets you explore the number of open incidents by combinations of state, assignment group, category, priority, and age. |

## Incident SLA Management Platform Analytics Solutions

Platform Analytics Solutions contain preconfigured dashboards. These dashboards contain actionable data visualizations that help you improve your business processes and practices.

Platform Analytics data visualizations use Performance Analytics indicator data to show you data over time, helping you analyze your business processes and identify areas of improvement. With Platform Analytics Solutions, you can get value from Performance Analytics for your application with minimal setup. You can always create your own objects as well.

**Important:**
Set up and test Platform Analytics Solutions on a non-production instance before enabling them in production.

To enable the solution for Incident SLA Management, an admin can navigate to **Performance Analytics** > **Guided Setup**. Click **Get Started** then scroll to the section for Incident SLA Management. The guided setup takes you through the entire setup and configuration process.

The dashboards in this content pack are inactive when installed. Complete configuration and run data collection jobs before you activate these dashboards. You can activate dashboards in Dashboard Properties, accessible from the context menu. You have to assign an owner to the dashboard to activate it. For more information about configuring Platform Analytics Solutions, see Configure Platform Analytics Solutions.

## Inactive dashboards

Some dashboards in this content pack are inactive when installed. Complete configuration and run data collection jobs before you activate these dashboards. You can activate dashboards in Dashboard Properties, accessible from the context menu. You have to assign an owner to the dashboard to activate it. For more information about configuring Platform Analytics Solutions, see Configure Platform Analytics Solutions

### Related topics

Platform Analytics Solutions

Activate your Performance Analytics subscription

### Incident SLA Management dashboard

See how well the incidents that are subject to a Service Level Agreement meet the deadlines of those SLAs.

The dashboard title indicates that it is inactive because you activate the solution after configuration and data collection.

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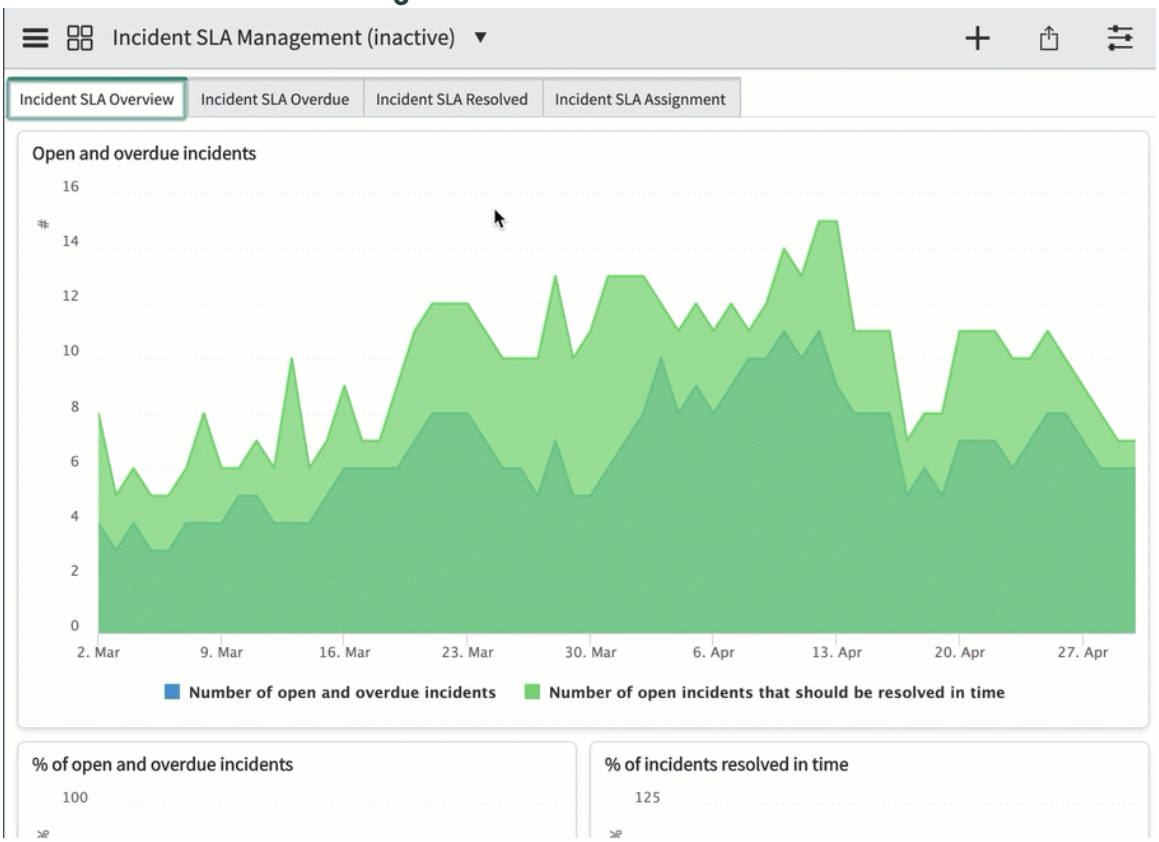
### Tabs of the Incident SLA Management dashboard




## End user and roles

| End user and goal | Required role |
|---|---|
| Service Level Manager who is responsible for seeing that incident resolution meets the service level agreements. | sla_manager, and pa_viewer for the Incident SLA Assignment tab |

## Indicators

### Number of open and overdue incidents

The number of open incidents with the following characteristics:

- Related to an SLA task of type 'SLA' (contract_sla.type)
- Not in stage 'Cancelled' (task_sla.stage)
- The amount of time taken to work on the task is over the SLA limit, determined by having an elapsed percentage (task_sla.percentage) value more than 100%.

### Number of open incidents that should be resolved in time

The number of open incidents with the following characteristics:

- Related to an SLA task of type 'SLA' (contract_sla.type)
- Not in stage 'Cancelled' (task_sla.stage)

### % open and overdue incidents

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The percentage of open incidents that are overdue. The score is calculated according to the formula ( [[Number of open and overdue incidents]] / [[Number of open incidents that should be resolved in time]] ) * 100.

**Number of incidents resolved in time**

The number of SLA tasks related to an incident with the following characteristics:

- The resolution date (incident.resolved_at) is the date that the score is collected.
- The type is 'SLA' (contract_sla.type).
- The stage is not 'cancelled' (task_sla.stage).
- The amount of time taken to close the task is under the SLA limit, determined by having an elapsed percentage (task_sla.percentage) value less than or equal to 100%.

**Number of incidents resolved that should have been resolved in time**

Number of incidents resolved that should have been resolved in time is measured daily as unit #.

The goal for this indicator is to maximize.

The score is the COUNT DISTINCT on the data source Incidents.SLA.Resolved, which is using the table Incident SLA [incident_sla] with the following conditions:

- The resolution date (incident.resolved_at) is the date that the score is collected.
- The type is 'SLA' (contract_sla.type).
- The stage is not 'cancelled' (task_sla.stage).

**% incidents resolved in time**

The percentage of resolved incidents that were resolved in time. The score is calculated according to the formula ( [[Number of incidents resolved in time]] / [[Number of resolved incidents that should be resolved in time]] ) * 100.

**Average Resolution Time In Hours For Resolved Incident SLA Tasks**

The score is calculated according to the following formula: [[Summed duration time of resolved incident SLA tasks in hours]]/[[Total resolved Incident SLA tasks]].

**Total resolved Incident SLA tasks**

The score is the COUNT on the data source Incidents.SLA.Resolved, which is using the table Incident SLA [incident_sla] with the following conditions:

- The resolution date (incident.resolved_at) is the date that the score is collected.
- The type is 'SLA' (contract_sla.type).
- The stage is not 'cancelled' (task_sla.stage).

**Number of incident assignments responded to in time**

The number of SLA tasks related to an incident with the following characteristics:

- The close date (task_sla.end_time) is the date that the score is collected.
- The type is 'OLA' (contract_sla.type), meaning that it is a response task.
- The stage is not 'cancelled' (task_sla.stage).
- The amount of time taken to close the task is under the SLA limit, determined by having an elapsed percentage (task_sla.percentage) value less than or equal to 100%.

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**Number of incident assignments that should have been responded to in time**

The number of SLA tasks related to an incident with the following characteristics:

- The close date (task_sla.end_time) is the date that the score is collected.
- The type is 'OLA' (contract_sla.type), meaning that it is a response task.
- The stage is not 'cancelled' (task_sla.stage).

**Number of open and overdue incident assignments**

The number of SLA tasks related to an incident with the following characteristics:

- The type is 'OLA' (contract_sla.type), meaning that it is a response task.
- The stage is not 'cancelled' (task_sla.stage).
- The amount of time taken to work on the task is over the SLA limit, determined by having an elapsed percentage (task_sla.percentage) value more than 100%.

**Number of open incident assignments that should be responded to in time**

The number of open incidents related to an SLA task with the following characteristics:

- The type is 'OLA' (contract_sla.type), meaning that it is a response task.
- The stage is not 'cancelled' (task_sla.stage).
- The response task is still open.

**% incident assignments responded to in time**

The percentage of response tasks that were responded to within the SLA limit. The score is calculated according to the following formula: ( [[Number of incident assignments responded to in time]] / [[Number of incident assignments that should have been responded to in time]] ) * 100.

**% open and overdue incident assignments**

The percentage of open incident assignments that are overdue according to the SLA limit. The score is calculated according to the following formula: ( [[Number of open and overdue incident assignments]] / [[Number of open incident assignments that should be responded to in time]] ) * 100.

**Summed duration time of resolved incident SLA tasks in hours**

This indicator sums the results of a script run on the Incident SLA [incident_sla] table that calculates the time it took for an incident SLA task to be resolved. This indicator is used to calculate formulas but is not displayed directly on the dashboard:

## Breakdowns

- State
- Priority
- Category
- Assignment Group
- Task SLA Breached Status

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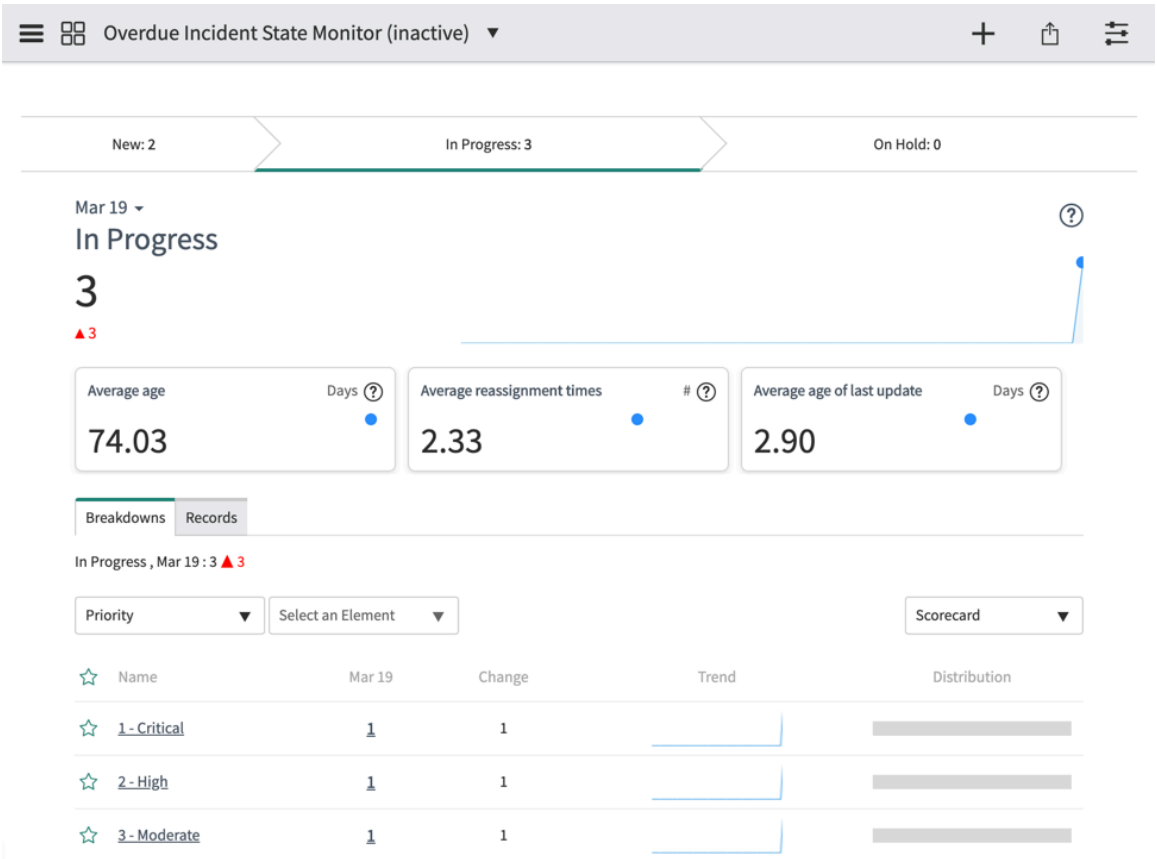
### Overdue by State dashboard

This dashboard lets you see incidents that are overdue according to an SLA, divided by the New, In Progress, and On Hold states.

You use this dashboard to view the average age of the incidents, the average number of times they have been reassigned, and how long on average since the last update. You can also group them by standard breakdowns like Priority and Assignment Group. This dashboard is inactive by default. Before using this dashboard, a Performance Analytics administrator or power user must open the Dashboard Properties, assign an owner, and select **Active**.




## End user and roles

| End user and goal | Required role |
|---|---|
| Service Level Manager who is responsible for seeing that incident resolution meets the service level agreements. | sla_manager |

## Indicators

### Number of open and overdue incidents

The number of incidents on the Incident.SLA.Open indicator source with the following characteristics:

- Related to an SLA task of type 'SLA' (contract_sla.type)
- Not in stage 'Cancelled' (task_sla.stage)
- The amount of time taken to work on the task is over the SLA limit, determined by having an elapsed percentage (task_sla.percentage) value more than 100%.

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**Average age open and overdue incidents**

The score is calculated according to the following formula: [[Summed age of open and overdue incidents]] / [[Number of open incidents that should be resolved in time]]

**Average reassignments of open and overdue incidents**

The score is calculated according to the following formula: [[Summed reassignments of open and overdue incidents]] / [[Number of open and overdue incidents]]

**Average age of updated since of open and overdue incidents**

The average length of time in days since the last update of open, overdue incidents. The score is calculated according to the following formula: [[Summed age of updated since of open and overdue incidents]] / [[Number of open and overdue incidents]] / 24

The following indicators are used to calculate formulas but are not displayed directly on the dashboard:

**Number of open incidents that should be resolved in time**

The number of open incidents with the following characteristics:

- Related to an SLA task of type 'SLA' (contract_sla.type)
- Not in stage 'Cancelled' (task_sla.stage)

**Summed age of open and overdue incidents**

Summed age of open incidents related to an SLA task with the following characteristics:

- Related to an SLA task of type 'SLA' (contract_sla.type)
- Not in stage 'Cancelled' (task_sla.stage)
- The amount of time taken to work on the task is over the SLA limit, determined by having an elapsed percentage (task_sla.percentage) value more than 100%.

**Summed age of updated since of open and overdue incidents**

Sum of hours since the last update of all open and overdue incidents.

**Summed reassignments of open and overdue incidents**

The sum of the Reassignment Count field of all open and overdue incidents.

## Breakdowns

- State
- Priority
- Age
- Assignment Group
- SLA

### Overdue by Age dashboard

This dashboard lets you see incidents that are overdue according to an SLA, divided by age buckets. You can see the average age of the incidents, the average number of times they have been reassigned, and how long on average since the last update. You can also group them by standard breakdowns like Priority and Assignment Group.

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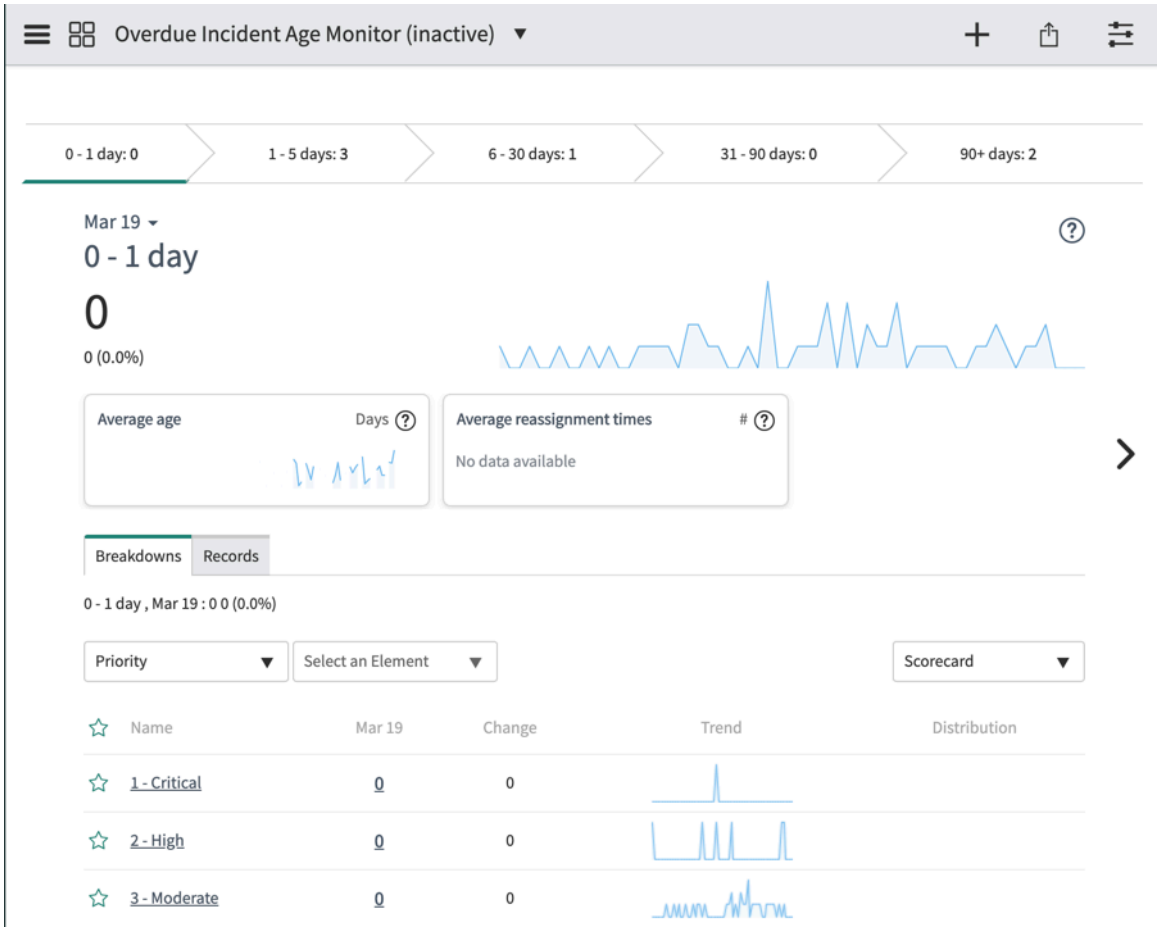
This dashboard is inactive by default. Before using this dashboard, a Performance Analytics administrator or power user must open the Dashboard Properties, assign an owner, and select **Active**.




## End user and roles

| End user and goal | Required role |
|---|---|
| Service Level Manager who is responsible for seeing that incident resolution meets the service level agreements. | sla_manager |

## Indicators

### Number of open and overdue incidents

The number of incidents on the Incident.SLA.Open indicator source with the following characteristics:

- Related to an SLA task of type 'SLA' (contract_sla.type)
- Not in stage 'Cancelled' (task_sla.stage)
- The amount of time taken to work on the task is over the SLA limit, determined by having an elapsed percentage (task_sla.percentage) value more than 100%.

### Average age open and overdue incidents

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The score is calculated according to the following formula: [[Summed age of open and overdue incidents]] / [[Number of open incidents that should be resolved in time]]

**Average reassignments of open and overdue incidents**

The score is calculated according to the following formula: [[Summed reassignments of open and overdue incidents]] / [[Number of open and overdue incidents]]

**Average age of updated since of open and overdue incidents**

The average length of time in days since the last update of open, overdue incidents. The score is calculated according to the following formula: [[Summed age of updated since of open and overdue incidents]] / [[Number of open and overdue incidents]] / 24

## Breakdowns

- State
- Priority
- Age
- Assignment Group
- SLA

### Overdue Reports dashboard

See the currently open incidents that are subject to an SLA. You can view a list of the incidents or see how they break down in a heatmap or a pivot table.

This dashboard is inactive by default. Before using this dashboard, a Performance Analytics administrator or power user must open the Dashboard Properties, assign an owner, and select **Active**.

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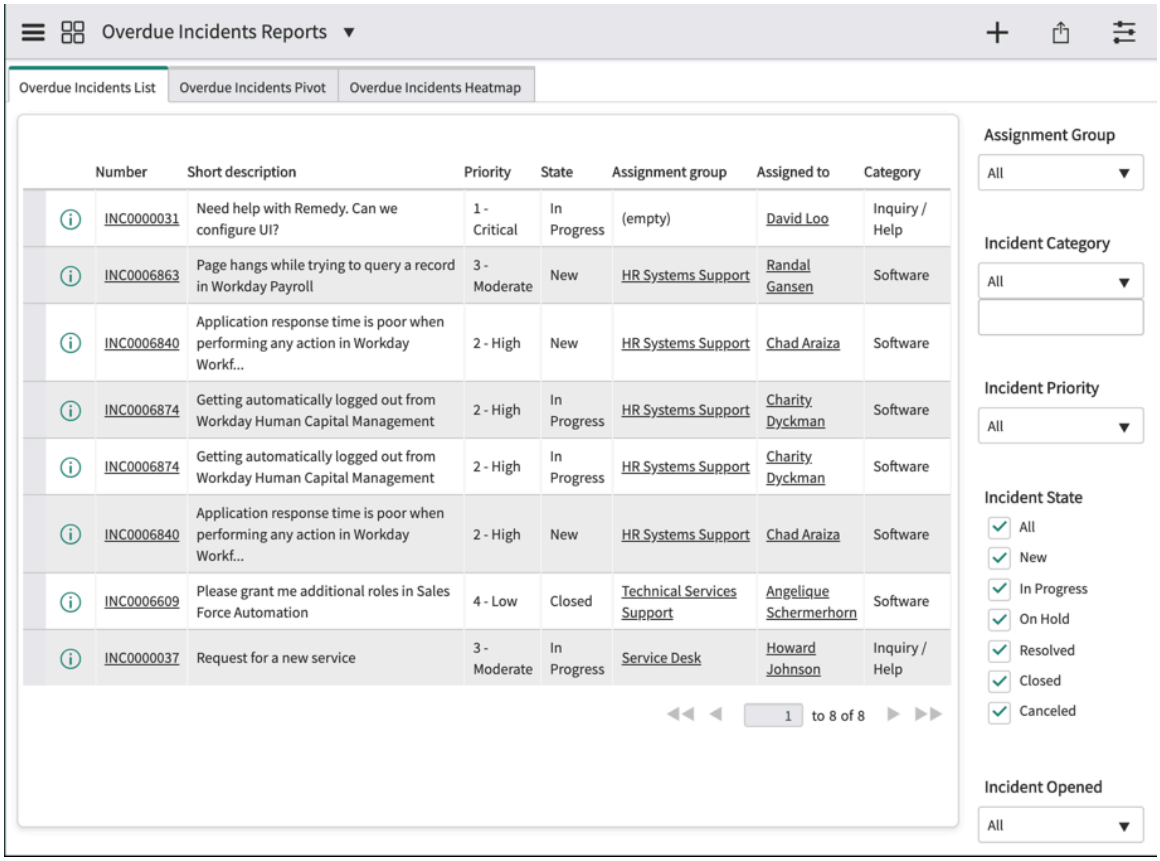
## Overdue List tab

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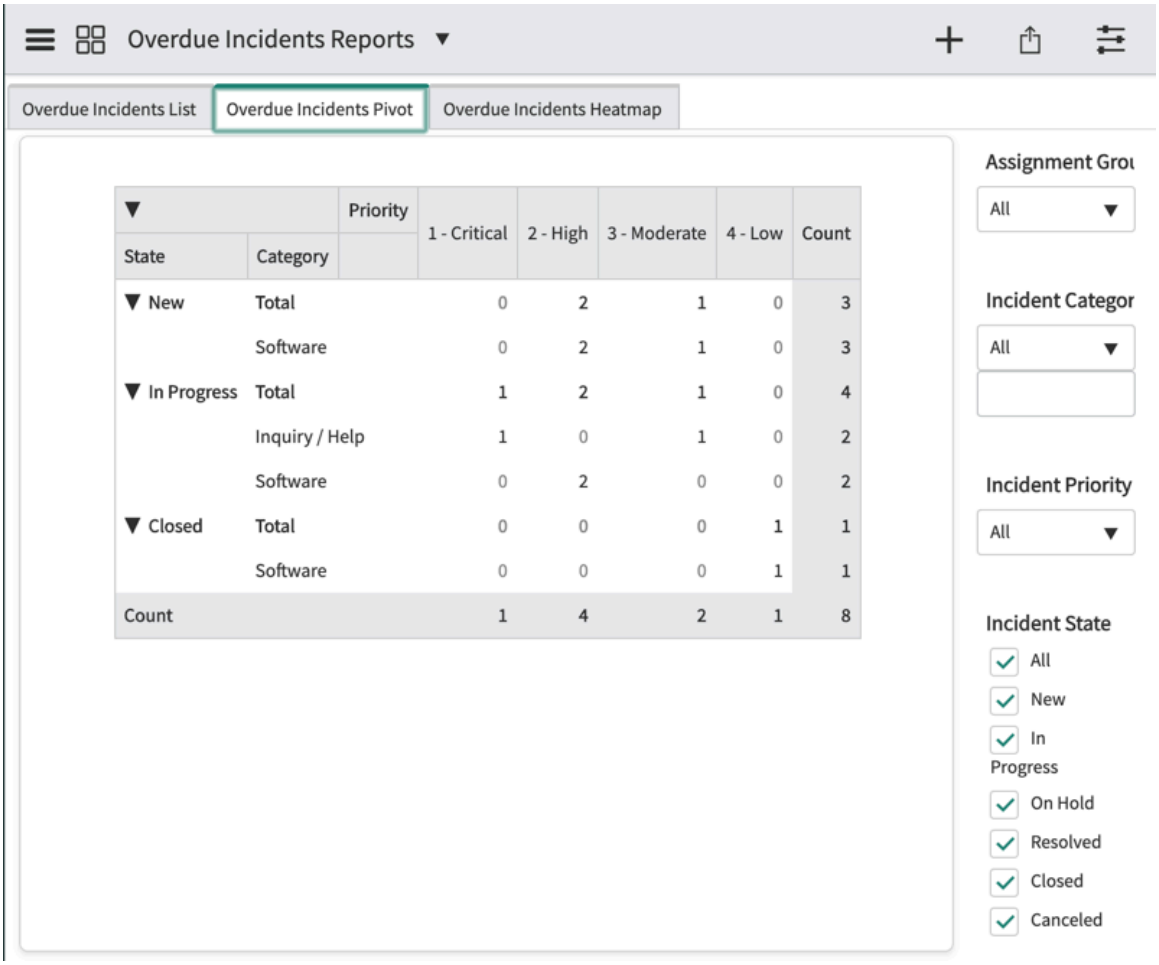
## Overdue Pivot tab




| ▼ | | Priority | 1 - Critical | 2 - High | 3 - Moderate | 4 - Low | Count |
|---|---|---|---|---|---|---|---|
| State | Category | | | | | | |
| ▼ New | Total | | 0 | 2 | 1 | 0 | 3 |
| | Software | | 0 | 2 | 1 | 0 | 3 |
| ▼ In Progress | Total | | 1 | 2 | 1 | 0 | 4 |
| | Inquiry / Help | | 1 | 0 | 1 | 0 | 2 |
| | Software | | 0 | 2 | 0 | 0 | 2 |
| ▼ Closed | Total | | 0 | 0 | 0 | 1 | 1 |
| | Software | | 0 | 0 | 0 | 1 | 1 |
| Count | | | 1 | 4 | 2 | 1 | 8 |

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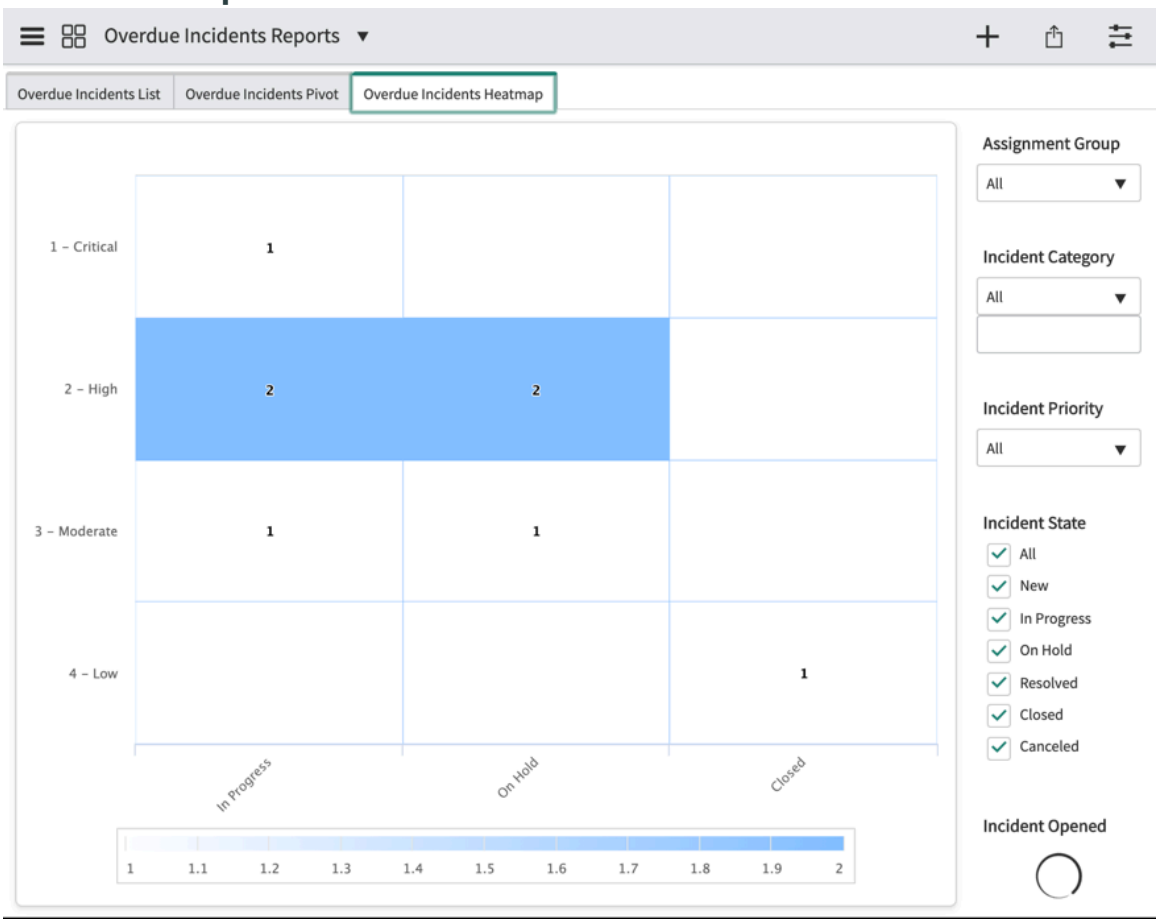
### Overdue Heatmap tab




## End user and roles

| End user and goal | Required role |
|---|---|
| Service Level Manager who is responsible for seeing that incident resolution meets the service level agreements. | sla_manager |

## Data visualizations

| Title | Type | Description |
|---|---|---|
| Overdue list | List | List of all incident records for overdue open incidents |
| Overdue pivot | Pivot | Table letting you explore the number of open and overdue incidents by any combination of state, assignment group, category, and priority, for any age bucket or for all ages. |
| Overdue heatmap | Heatmap | Heatmap letting you explore the number of open and overdue incidents by any combination of state, |

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| Title | Type | Description |
| --- | --- | --- |
| | | assignment group, category, and priority, for any age bucket or for all ages. |

# Reference section for Incident Management

Reference sections provide additional information about components installed with Incident Management.

## Domain separation and Incident Management

Domain separation is supported in Incident Management. Domain separation enables you to separate data, processes, and administrative tasks into logical groupings called domains. You can control several aspects of this separation, including which users can see and access data.

## Support level: Standard

- Includes all aspects of **Basic** level support.
- Application properties are domain-aware as needed.
- Business logic: The service provider (SP) creates or modifies processes per customer. The use cases reflect proper use of the application by multiple SP customers in a single instance.
- The instance owner must configure the minimum viable product (MVP) business logic and data parameters per tenant as expected for the specific application.

Sample use case: An admin must be able to make comments required when a record closes for one tenant, but not for another.

For more information on support levels, see Application support for domain separation.

## Incident Management overview

- The goal of Incident Management is to restore normal service operation as quickly as possible, while minimizing impact to business operations and ensuring quality is maintained.
- Typically, end users log incidents when a service they are using is impacted or not available. ITIL / Fulfiller users in your organization classify these incidents, route them as appropriate and work on resolving the incident.
- The incident and incident task tables support domain separation. Therefore, a Fulfiller sees only incidents or incident tasks that have been created within the (tenant) domain that they belong to.

## How domain separation works in Incident Management

Fulfillers see only incidents and incident tasks that have been created within the (tenant) domain that they belong to.

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## Incident Management domain separated tables

- Incident [incident]
- Incident Task [incident_task]

## Incident Management use cases

- An ESS user belonging to “Initech” domain, creates an incident. Only those ITIL users belonging to “Initech” domain or global domain can see this incident.
- An ITIL user belonging to a parent domain can see incidents of all its child domains as well.
- An ITIL user belonging to a specific domain can create incidents only on behalf of the domains that they have access to.
- An ITIL user can associate child incidents only of those domains that they have access to.
- If a user has access to multiple domains, the domain specified on the current record drives the functionality of that record and reference fields.

**Related topics**

Domain separation for service providers

## Incident Management plugins

Many of the Incident Management plugins are activated in the base system. Others, you can activate when you are ready to use them. Some plugins include demo data.

### Incident Management Best Practice – San Diego

The Incident management best practice -San Diego plugin (com.snc.best_practice.incident.sandiego) enhances the integration and workflows for incidents and problems. This plugin enables you to update the progress of the reported incident and problem to the agent and caller.

## Requirements and dependencies

Install these additional plugins to use the Incident management best practice — San Diego plugin:

- Problem Management Best Practice — Madrid plugin (com.snc.best_practice.problem.madrid).

  For more information on this plugin and the activation process, see Activate Problem Management Best Practice — Madrid.

- Problem Management Best Practice — Madrid – Knowledge Integration plugin (com.snc.best_practice.problem.madrid.knowledge).

  For more information on this plugin and the activation process, see Activate Problem Management Best Practice — Madrid — Knowledge Integration.

- Problem Management Best Practice – Jakarta plugin (com.snc.best_practice.problem.jakarta).

  This plugin is not installed by default for zBoot customers. Install the plugin manually. This plugin is responsible for known error article behavior in the incident or problem workflow. For more information on this plugin and the activation process, see Activate Problem Management Best Practice — Jakarta.

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All the plugins except for com.snc.best_practice.problem.jakarta are activated by default for the new customers. Existing or upgrading customers must request the plugin or install the plugin manually. For more information, see Request a plugin.

## Impacts on upgrading customers

For the existing or upgrade customers, if they install the Incident management best practice -San Diego (com.snc.best_practice.incident.sandiego) plugin, the existing configured workflows might get changed. If the customer wants to install the plugin, they must install the plugin in the sub-production or testing environment and test the workflows before using the plugin in the production environment to ensure the desired workflow is maintained.

When the plugin is installed:

- New options are populated along with the old (existing or already configured) options.
- These files are affected:
  - Business rule: Close Code
  - ML Solution Definition: Similar Resolved Incidents -> The Filter must be updated
  - Script Action: Update Incident when Problem closes -> Update the resolution code to proper choice

  **Note:**
  Files are overridden if no customizations or configurations are done. In such case, new options are populated.

- Customer must manually remove the old (existing) options. If customer has configured a combination of the old (existing) and new options, then the necessary workflows must be updated.

## Enhancements

This plugin enhances the incident and problem workflow to support the following activities:

**Create a problem**

When you create a problem from an existing incident, the incident **State** is set to **On Hold** and the **Reason** is set to **Awaiting Problem** until the linked problem is resolved.

**Attach a Known Error (KE) article**

- When you associate a Known Error (KE) article to the incident, and if the KE article has a problem associated to it, then the problem also gets associated with the incident.
- When you select **Known error** as **Resolution code** to resolve an incident but the incident contains no associated KE articles, then the system prompts you to select a KE article.

**Communicate Workaround**

If a workaround is added to the problem, and if you click the **Communicate Workaround** related link, then the following occurs:

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- The workaround is copied to the **Work notes** field. A notification is sent to the users listed in the **Assigned to** and **Work notes list** fields. The notification is sent only when the incident state is New, On Hold, or In Progress.
- The workaround is copied to the **Additional Comments** field. If **Known error** is selected from the **Resolution code** field of the incident, then a notification is sent to the caller and to the users listed in the **Assigned to** and **Watch list** fields.

#### Communicate Fix

If a fix is added to a problem and if you click the **Communicate Fix** related link, then the following occurs:

- The fix is copied to the **Work Notes** field.
- A notification is sent to the users listed in the **Assigned to** and **Work notes list** fields of the problem record. The notification is sent only when the incident state is New, On Hold, or In Progress.

### Activate Incident Management Best Practice – San Diego

Activate the Incident Management Best Practice — San Diego plugin (com.snc.best_practice.incident.sandiego) if you have the admin role. This plugin includes demo data and activates related plugins if they are not already active.

#### Before you begin
Role required: admin

#### About this task
The Incident Management Best Practice – San Diego plugin modifies the problem and incident management workflows to enhance the customer experience.

#### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.

3. Select **Install** to start the installation process.

   **Note:**
   When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

   You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

### Activate Incident

You can activate the Incident plugin (com.snc.incident) if you have the admin role. This plugin includes demo data and activates related plugins if they are not already active.

#### Before you begin
Role required: admin

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### About this task

Incident plugin activates these related plugins if they are not already active.

#### Plugins for Incident

| Plugin | Description |
|---|---|
| Service Management Basics<br><br>[com.snc.service] | Provides the baseline for Service Management functionality. |
| Incident Management Notification<br><br>[com.snc.incident_notification] | Provides notification functionality for Incident Management. |
| Incident Overview Homepage<br><br>[com.glideapp.report.itsm.incident.overview] | Incident Overview Homepage |

### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.
3. Select **Install** to start the installation process.

   **Note:**
   When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

   You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

### Related topics

List of Washington DC plugins

#### Components installed with the Incident plugin

Several types of components are installed with activation of the Incident plugin in Incident Management.

**Note:**
The Application Files table lists the components that are installed with this application. For instructions on how to access this table, see Find components installed with an application.

Demo data is available for this feature.

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## Roles installed

| Role title [role name] | Description |
|---|---|
| Incident task assigned user<br><br>[sn_incident_task_assigned_user] | Provides read and write operation privileges to an incident task record for an agent when the record is assigned to the agent.<br><br>**Note:**<br>• You must install and activate the ITSM Roles plugin (com.snc.itsm.roles) to use the base system ACLs related to this role.<br>• When the ITSM Roles plugin (com.snc.itsm.roles) isn't installed and activated on the instance, you can still use the Assigned incident user role [sn_incident_task_assigned_user] but with the following limitations:<br>  ○ The agent has the read access to the assigned incident task record except for the **Work notes** and **Work notes list** fields.<br>  ○ The agent has the write access to the assigned task record except for the following fields:<br>  ▪ Assigned to<br>  ▪ Short description<br>  ▪ Description<br>  ▪ Priority<br>  ▪ State<br>  ▪ Work notes<br>  ▪ Work notes list |

## Tables installed

| Table | Description |
|---|---|
| Incident<br><br>[incident] | The Incident table is extended from the Task [task] table. It inherits all the fields, rules, and policies from the Task table. |

### Request Incident Management — Core

Incident Management - Core plugin (com.snc.incident_management) is a new incident state model that includes demo data and activates related plugins if they are not already active.

#### Before you begin

Role required: admin

#### About this task

Incident Management - Core (com.snc.incident_management) is available by default in new instances. Customers upgrading from Geneva or earlier versions must request the plugin. For more information, see KB0564465.

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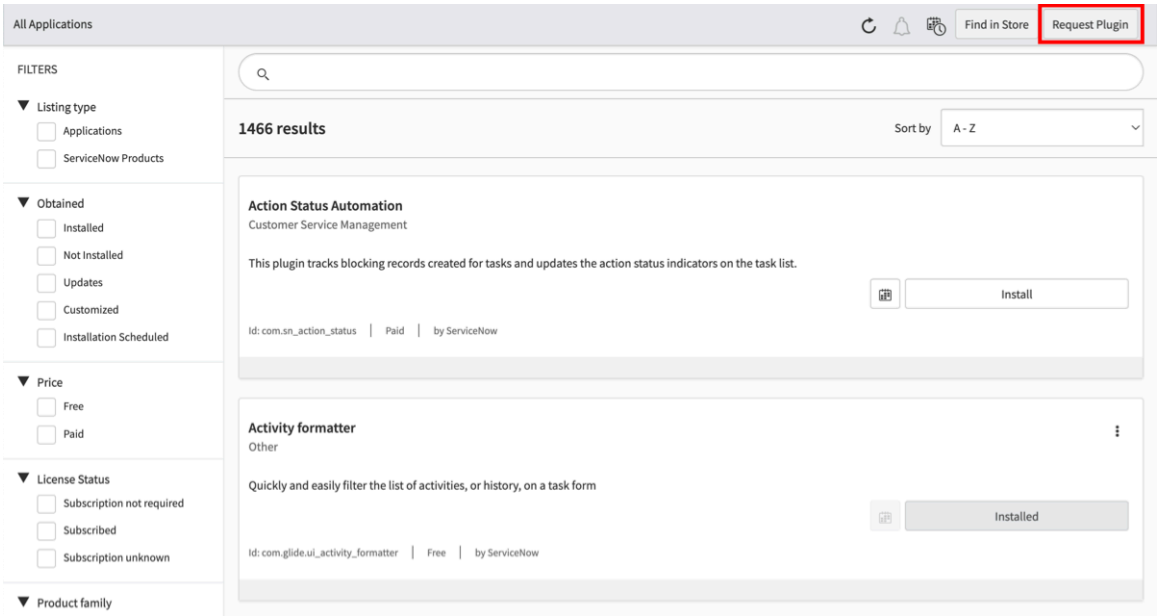
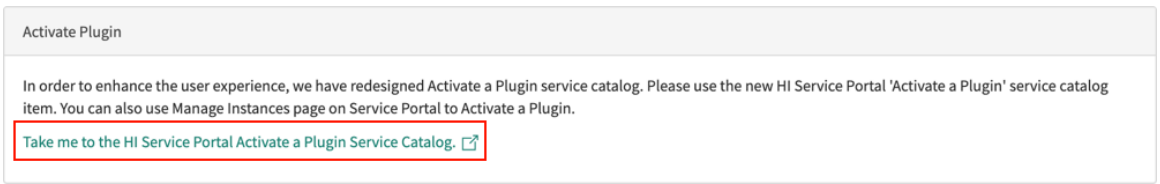
**Note:**
If the new state model is installed on upgraded instances, then ensure that the old states are mapped to the new ones. The mapping is especially important if you have made customizations, implemented workflows, added script includes, and added business rules.

## Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. On the All Applications page, select **Request Plugin** to open the **Activate Plugin** form on Now Support.




3. On Now Support, select the link to access the Now Support Service Portal Service Catalog.




4. Select your instance.
5. Select **Actions > Activate Plugin**.
6. On the **Activate Plugin** form, provide the following information.

### Activate Plugin form

| Field | Description |
|---|---|
| What is your target instance | Instance on which to activate the plugin. |
| Which plugin would you like to activate | Name of the plugin to activate. |

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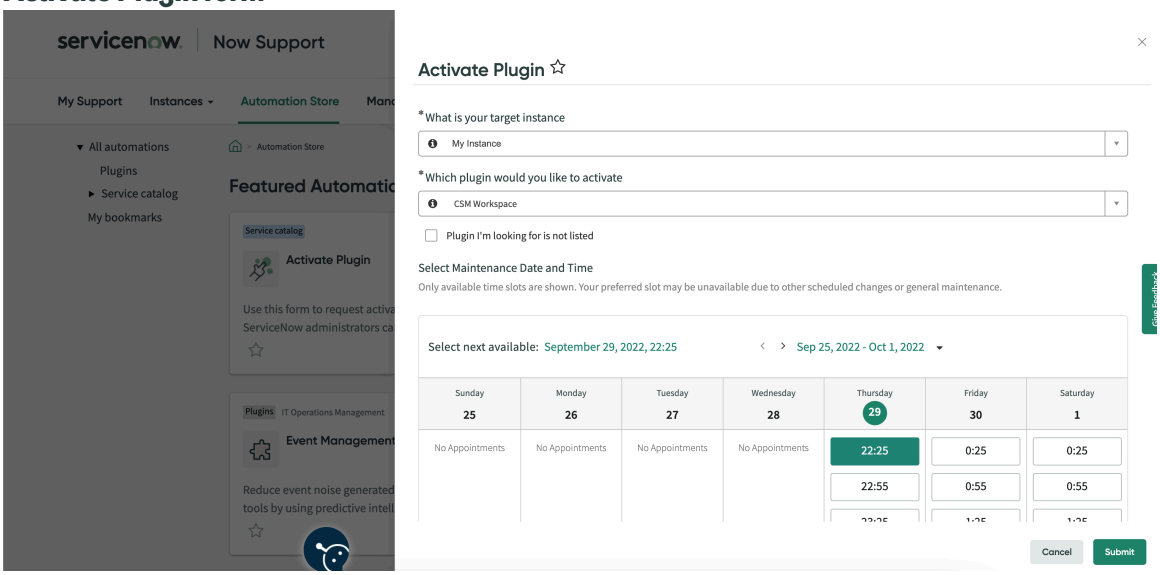
| Field | Description |
| --- | --- |
| | **Note:** If the system does not list the plugin you want or if you are activating the plugin on an OEM or on-premise instance, select the **Plugin I'm looking for is not listed** check box and then enter the name of the plugin. |
| Select Maintenance Date and Time | The date and time to activate the plugin.<br>**Note:** Plugins are activated in two batches, once in the morning and once in the evening, on every business day in the US Pacific time zone. If the plugin must be activated at a specific time, enter the request in the **Reason/Comments** field. |

### Example

For example, see the following form to activate the CSM Workspace plugin on an instance named My Instance.

**Activate Plugin form**




7. Select **Submit**.
   For additional details about requesting a plugin, see Requesting a Plugin from the Service Catalog [KB0751715] article in the Now Support Knowledge Base.

### Related topics

List of Washington DC plugins

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### Request ITSM Roles — Incident Management

Request the ITSM Roles plugin (com.snc.itsm.roles) to activate the ITSM Roles — Incident Management plugin (com.snc.itsm.roles.incident_management) to gain more control over the access that different service desk agents, technicians, and managers have within your Incident Management process.

## Before you begin

Role required: admin

## About this task

The ITSM Roles plugin (com.snc.itsm.roles) includes an additional security model. The security model provides more granular roles across ITSM applications as well as within them, allowing you flexibility in setting up access controls. The ITSM Roles plugin is available by default in new instances. Users upgrading from Madrid or earlier versions must request the plugin.

### Plugins for ITSM Roles

| Plugin | Adds roles |
|---|---|
| Business Stakeholder<br><br>[com.snc.business_stakeholder] | business_stakeholder<br><br>**Note:** The business_stakeholder role contains the sn_incident_read, sn_problem_read, sn_change_read, sn_request_read, and approver_user roles. |
| ITSM Roles — Incident Management [com.snc.itsm.roles.incident_management] | • sn_incident_read<br>• sn_incident_write |
| ITSM Roles — Problem Management [com.snc.itsm.roles.problem_management] | • sn_problem_read<br>• sn_problem_write |
| ITSM Roles — Change Management [com.snc.itsm.roles.change_management] | • sn_change_read<br>• sn_change_write |
| ITSM Roles — Request Management [com.snc.service_management.roles.request_management] | • sn_request_read<br><br>**Note:** As there are future updates expected for the sn_request_read role, do not assign it to users without the business_stakeholder role.<br><br>• sn_request_write |

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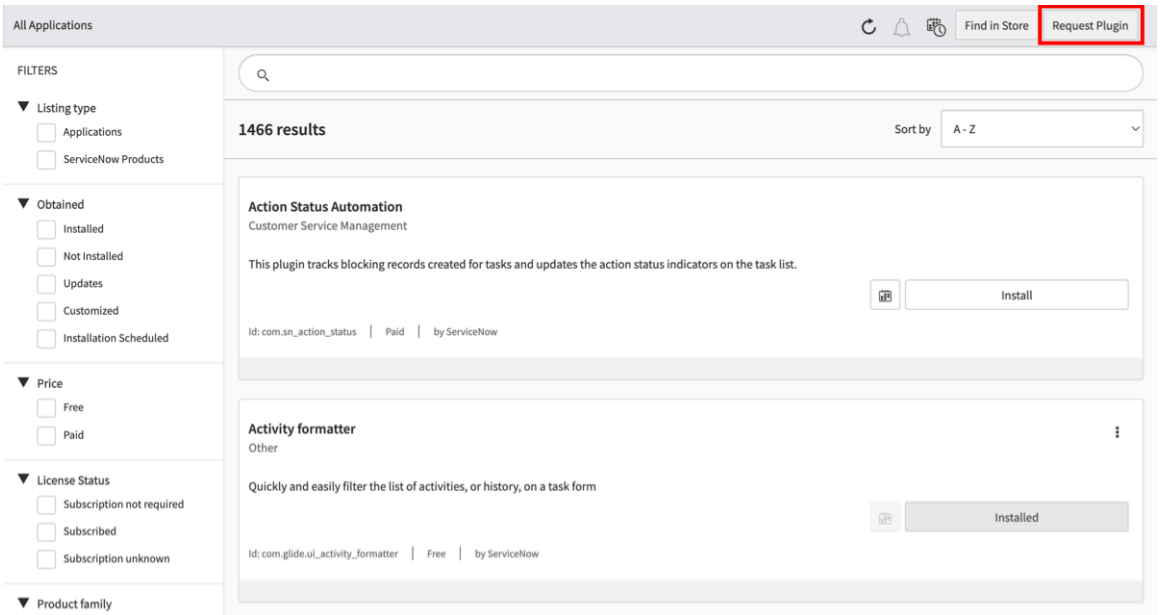
To purchase a subscription, contact your ServiceNow account manager. The account manager can arrange to have the plugin activated on your organization's production and subproduction instances, generally within a few days.

If you don't have an account manager, decide to delay activation after purchase, or want to evaluate the product on a subproduction instance without charge, follow these steps.

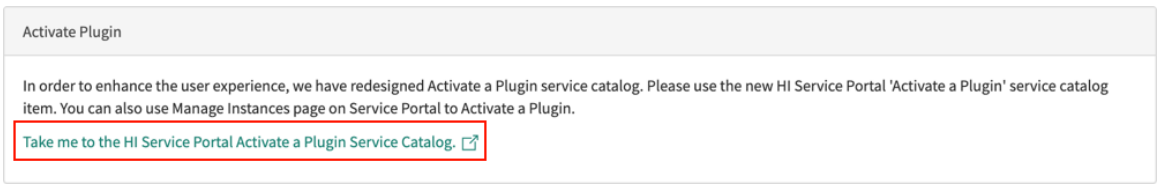
**Note:**
Activate the ITSM Roles plugin on a subproduction environment and test the functionality before requesting activation in the production environment. For assistance, contact the ServiceNow Professional Services team.

### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. On the All Applications page, select **Request Plugin** to open the **Activate Plugin** form on Now Support.




3. On Now Support, select the link to access the Now Support Service Portal Service Catalog.




4. Select your instance.
5. Select **Actions > Activate Plugin**.
6. On the **Activate Plugin** form, provide the following information.

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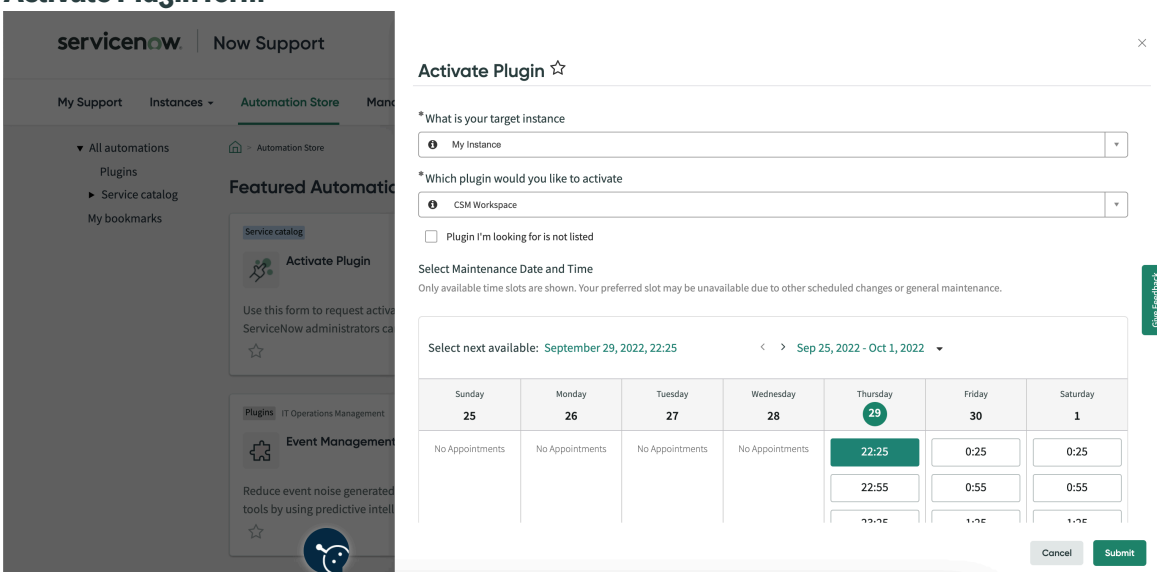
### Activate Plugin form

| Field | Description |
| --- | --- |
| What is your target instance | Instance on which to activate the plugin. |
| Which plugin would you like to activate | Name of the plugin to activate.<br><br>**Note:**<br>If the system does not list the plugin you want or if you are activating the plugin on an OEM or on-premise instance, select the **Plugin I'm looking for is not listed** check box and then enter the name of the plugin. |
| Select Maintenance Date and Time | The date and time to activate the plugin.<br><br>**Note:**<br>Plugins are activated in two batches, once in the morning and once in the evening, on every business day in the US Pacific time zone. If the plugin must be activated at a specific time, enter the request in the **Reason/Comments** field. |

**Example**

For example, see the following form to activate the CSM Workspace plugin on an instance named My Instance.

**Activate Plugin form**

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7. Select **Submit**.
   For additional details about requesting a plugin, see Requesting a Plugin from the Service Catalog [KB0751715] article in the Now Support Knowledge Base.

**Related topics**

List of Washington DC plugins

### Components installed with ITSM Roles — Incident Management

Several user roles are installed with activation of the ITSM Roles — Incident Management plugin (com.snc.itsm.roles.incident_management).

**Note:**
The Application Files table lists the components that are installed with this application. For instructions on how to access this table, see Find components installed with an application.

## Roles installed

| Role title [name] | Description | Contains roles |
|---|---|---|
| Incident read<br><br>[sn_incident_read] | Read access to the Incident Management application and related records.<br><br>**Note:**<br>An ESS user (user with no role) can view only those incidents that they create or someone else creates on their behalf. A user with the sn_incident_read role can view all incidents as well as the major incident workbench. | • dependency_views<br>• agent_workspace_user<br>• view_changer<br>• cmdb_read<br>• cmdb_query_builder_read |
| Incident write<br><br>[sn_incident_write] | Write access to the Incident Management application and related records. | • sn_incident_read<br>• template_editor |

### Activate Business Stakeholder

Activate the Business Stakeholder plugin (com.snc.business_stakeholder) if you have an admin role. This plugin installs the Business Stakeholder role. Users with this role can view and approve records at all ITSM product levels.

### Before you begin

Role required: admin

**Note:**
Ensure that ITSM Roles plugin (com.snc.itsm.roles) is activated before you activate the Business Stakeholder plugin. For more information to activate ITSM Roles plugin, refer Request ITSM Roles- Change Management.

### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

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You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.

3. Select **Install** to start the installation process.

**Note:**
When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

**Related topics**

List of plugins (Washington DC)

### Installed with Business Stakeholder

The Business Stakeholder plugin (com.snc.business_stakeholder) installs the Business Stakeholder role when activated.

**Note:**
The Application Files table lists the components that are installed with this application. For instructions on how to access this table, see Find components installed with an application.

## Roles installed

| Role title [name] | Description | Contains roles |
|---|---|---|
| Business Stakeholder<br><br>[business_stakeholde | Users with this role can view and approve records within all products of ITSM.<br><br>**Note:**<br>The business_stakeholder role contains the following ITSM roles sn_incident_read, sn_problem_read, sn_change_read, sn_request_read, and approver_user roles. | • pa_viewer.business_stakeholder<br>• approver_user.business_stakeholder<br>• cmdb_read.business_stakeholder |

### Activate KCS Integration for Incident Management

Activate the KCS Integration for Incident Management plugin (com.snc.incident.knowledge) if you have the admin role. This plugin provides integration of Incident Management with the Advanced Knowledge Management features.

**Before you begin**
Role required: admin

**About this task**
The KCS Integration for Incident Management plugin (com.snc.incident.knowledge) activates the Knowledge Management Advanced Installer plugin.

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### Plugin for KCS Integration for Incident Management

| Plugin | Description |
|---|---|
| Knowledge Management Advanced Installer<br><br>[com.snc.knowledge_advanced.installer] | Use this plugin to install the Knowledge Management Advanced plugin. Activating or upgrading this plugin validates knowledge articles and knowledge bases to ensure that the Knowledge Management Advanced plugin can be successfully installed. |

#### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.
3. Select **Install** to start the installation process.

   **Note:**
   When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

   You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

#### Related topics

List of Washington DC plugins

### Component installed with KCS Integration for Incident Management plugin

The Incident KCS Article table is installed with the activation of the KCS Integration for Incident Management plugin (com.snc.incident.knowledge).

**Note:**
The Application Files table lists the components that are installed with this application. For instructions on how to access this table, see Find components installed with an application.

## Tables installed

| Table | Description |
|---|---|
| Incident KCS Article<br><br>[kb_template_incident_kcs_article] | The table is used to store knowledge articles created from the Incident KCS template. |

### Activate Incident Management Notification

You can activate the Incident Management Notification plugin (com.snc.incident_notification) if you have the admin role. This plugin includes demo data and activates related plugins if they are not already active.

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### Before you begin
Role required: admin

### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.
3. Select **Install** to start the installation process.

   **Note:**
   When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

   You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

### Related topics

List of Washington DC plugins

## Activate Incident Updates

You can activate the Incident Updates plugin (com.snc.incident.updates) to receive the incident notification updates if you have the admin role. This plugin includes demo data and activates related plugins if they are not already active.

### Before you begin
Role required: admin

### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.
3. Select **Install** to start the installation process.

   **Note:**
   When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

   You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

### Related topics

List of Washington DC plugins

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### Activate Incident Management — ATF Tests

You can activate the Incident Management — ATF Tests plugin (com.snc.incident.atf) if you have the admin role. The plugin delivers ATF tests for Incident Management. This plugin includes demo data.

#### Before you begin

Role required: admin

#### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.
3. Select **Install** to start the installation process.

   **Note:**
   When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

   You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

#### Related topics

List of Washington DC plugins

## Incident Management integrations

Users of an incident management solution need to have access to a multitude of features so that they can address specific challenges directly. Incident Management integrations aims to fully integrate and automate your incident response system.

### Universal Request integration - Incident Management

Incident Management integrates with Universal Request to provide incident-related service as unified services to users. The integration helps users to have a single service desk.

Install and configure the Universal Request Integration for the Incident Management plugin (com.snc.incident.universal_request). The integration provides the following configurations and functionalities:

## Features of the Incident Management integration with Universal Request

The integration of Incident Management with Universal Request provides the following features:

- The Universal Request form has the UI action to create an incident. The following fields are copied by default from the universal request record to the incident record when a new incident is created:
  - universal_request
  - short_description
  - description

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  - caller_id
  - opened_by

  An incident manager can customize the fields using the system property *sn_inc_uni_req.incident.universal_request.copy_fields*.
- The **Universal Request** field appears on the Incident form only when an incident is associated with a universal request record.
- The **Routing reason** field appears on the incident form when an itil agent routes an incident back to the universal request.
- On the record producer, if you select the **Create Universal Request** check box, a new incident created from that record producer automatically creates a universal request record. This universal request record is associated with the incident record.
- You can activate the *Create Universal Request for Incident* business rule and create incidents using any channel, such as record producer, virtual agent support, email, and so on. When you do this, a universal request record is automatically created. This universal request record is associated with the incident record. The incident is added as a primary ticket to the universal request record. By default, this business rule works as follows:
  - The rule is inactive. To activate this business rule, navigate to **System Defination** > **Business Rules** > **Create Universal Request for Incident**, and then select **Active** check box to activate this business rule.
  - The rule is not applicable to child incidents for which the parent incident is associated as a primary ticket to the universal request record.
- When a universal request record is automatically created based on the incident, Incident record information is copied from the incident record fields to the universal request record fields. An incident manager with admin role can customize and configure the fields using the **Create UR Mappings** and **Create UR Information** tabs in the Mapping Configuration form for incidents in Universal Request. For more information, see Mapping configuration.

## Visibility of Incidents to a requester

The requesters cannot view the incidents that are associated with the Universal Request records. Instead, the requesters can only view the Universal Request record using the following ways:

- On ServiceNow AI Platform, you can access the universal request records under **Self-Service** > **Universal Requests**.
- On Service Portal, you can access the universal request records under **Service Portal** > **Requests**.

## Suppression of email notifications

If any incident is a part of Universal Request, then the notifications sent to the caller from an Incident are suppressed. In all other incident email notifications, the universal request number is displayed instead of the incident number.

## Requester Actions on Service Portal

For an Universal Request record that has an incident-related as its primary task, an Actions widget with the requester actions is displayed. The actions can be **Resolve**, **Reopen**, or **Close** depending on the state of the incident.

### Request Universal Request integration for Incident Management

To activate the integration between Incident Management and Universal Request, request the Universal Request: Integration for Incident management plugin

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(com.snc.incident.universal_request) through the Now Support Customer Service system. This plugin includes demo data and activates related plugins if they are not already active.

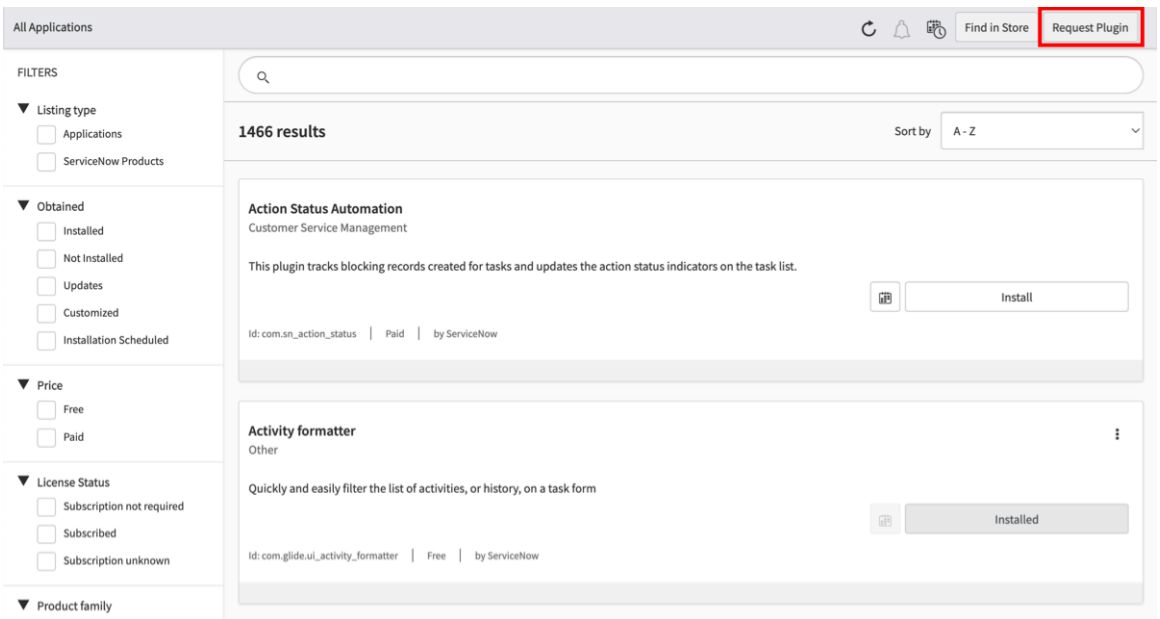
### Before you begin
Role required: none

### About this task
The Universal Request Integration for Incident management plugin activates these related plugins if they are not already active.

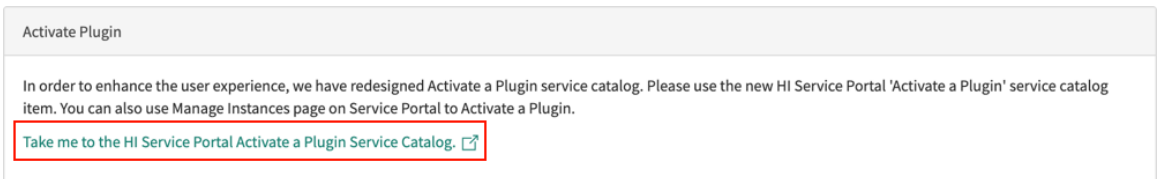
**Plugins for Universal Request Integration for Incident management**

| Plugin | Description |
|---|---|
| Universal Request<br><br>[com.snc.universal_request] | Enables seamless service experience across different groups and task types. |

### Procedure
1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. On the All Applications page, select **Request Plugin** to open the **Activate Plugin** form on Now Support.




3. On Now Support, select the link to access the Now Support Service Portal Service Catalog.




4. Select your instance.
5. Select **Actions > Activate Plugin**.
6. On the **Activate Plugin** form, provide the following information.

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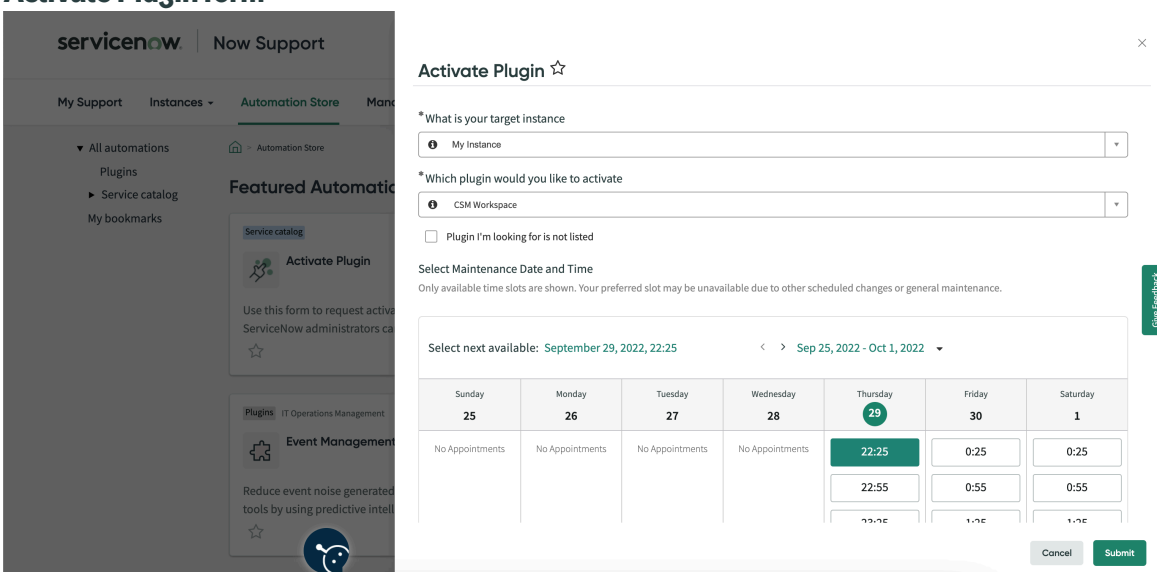
### Activate Plugin form

| Field | Description |
|---|---|
| What is your target instance | Instance on which to activate the plugin. |
| Which plugin would you like to activate | Name of the plugin to activate.<br><br>**Note:**<br>If the system does not list the plugin you want or if you are activating the plugin on an OEM or on-premise instance, select the **Plugin I'm looking for is not listed** check box and then enter the name of the plugin. |
| Select Maintenance Date and Time | The date and time to activate the plugin.<br><br>**Note:**<br>Plugins are activated in two batches, once in the morning and once in the evening, on every business day in the US Pacific time zone. If the plugin must be activated at a specific time, enter the request in the **Reason/Comments** field. |

#### Example

For example, see the following form to activate the CSM Workspace plugin on an instance named My Instance.

**Activate Plugin form**

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7. Select **Submit**.
   For additional details about requesting a plugin, see Requesting a Plugin from the Service Catalog [KB0751715] article in the Now Support Knowledge Base.

**Related topics**

List of plugins (Washington DC)

### Create incident from Universal Request

Create an incident from a universal request record to restore service to a customer as soon as possible. After creating the incident record, you can investigate potential solutions.

## Before you begin

Role required: routing_agent and ITIL or admin

Activate the Universal Request (sn_uni_req) and the Universal Request Integration for Incident Management (sn_inc_uni_req) plugins.

## Procedure

1. Navigate to **Universal Requests** > **All**.
2. Open the universal request record from which you want to create an incident.
3. Click **Create Incident**.
   An incident record is created and associated with universal request. The incident record is not saved until you submit the record.
4. Fill in the fields on the incident form and click **Submit**.
   The universal request number from which the incident is created appears in the **Universal Request** field on the Incident form. The incident number appears in the **Primary Ticket** field and also in the **Associated Tickets** related list of the Universal Request form.

### Transfer incident

Transfer the back to the Universal Request queue, or to another department with or without resolution. When you realise that the issue is not incident related, transfer the incident without any resolution to the relevant department or service. If you resolve the issue, you can transfer the incident with the resolution.

## Before you begin

Role required: agent to whom the ticket is assigned to

Associate an incident with a Universal Request record.

## Procedure

1. Open the incident that you want to transfer.
2. Click **Transfer**.

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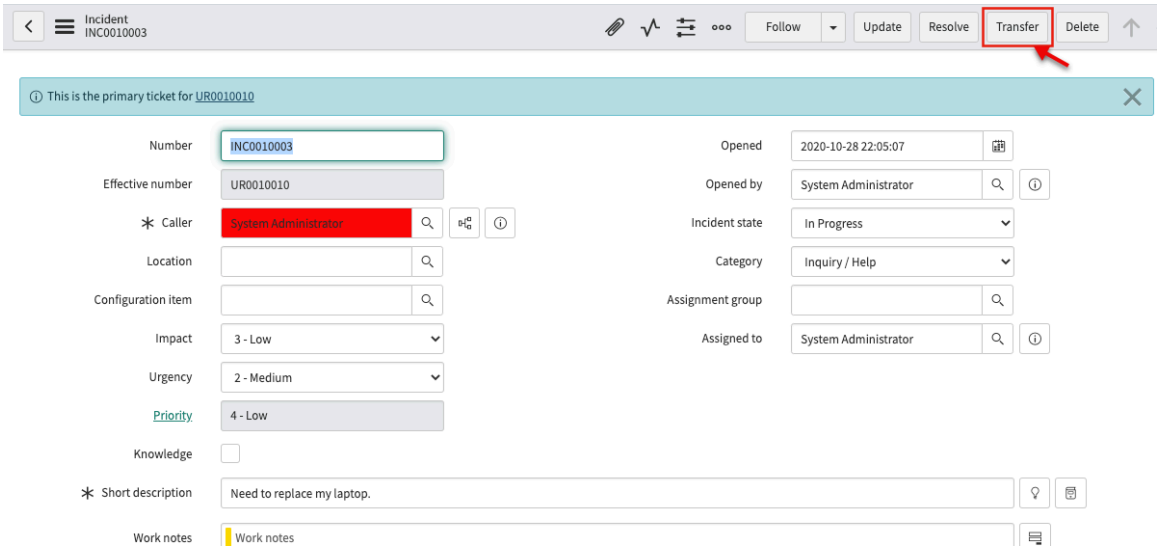


3. In the **Transfer Ticket** dialog box, provide the following details.

> **Note:**
> Based on your transfer type configuration, the given fields are displayed. For more information, see Universal Request properties.

- **Action**: Select if the case should be transferred to another department or back to Universal Request
- **Department**: Select the department from the list.
- **Service**: Select the specific service of the chosen department.

> **Note:**
> This field does not appear if you have selected **Transfer to Department** in **Action**

- **Transfer reason**: Select the reason from the list.
- **Transfer notes**: A brief description for routing the primary ticket that you want to pass to the UR Routing agent.
- **Copy additional comments and attachments**: Deselect if you do not want to transfer the ticket with additional comments and attachments. By default, all attachments and comments are transferred.

> **Note:**
> Work notes are not copied while transferring.

4. Click **Transfer**.

### Create an associated ticket from an incident

Create an associated ticket for another relevant department from an incident (primary ticket) when you realize that the issue can be resolved in that department.

**Before you begin**
Ensure that the incident has an associated Universal Request record.

Role required: Ensure you have one of the following roles.

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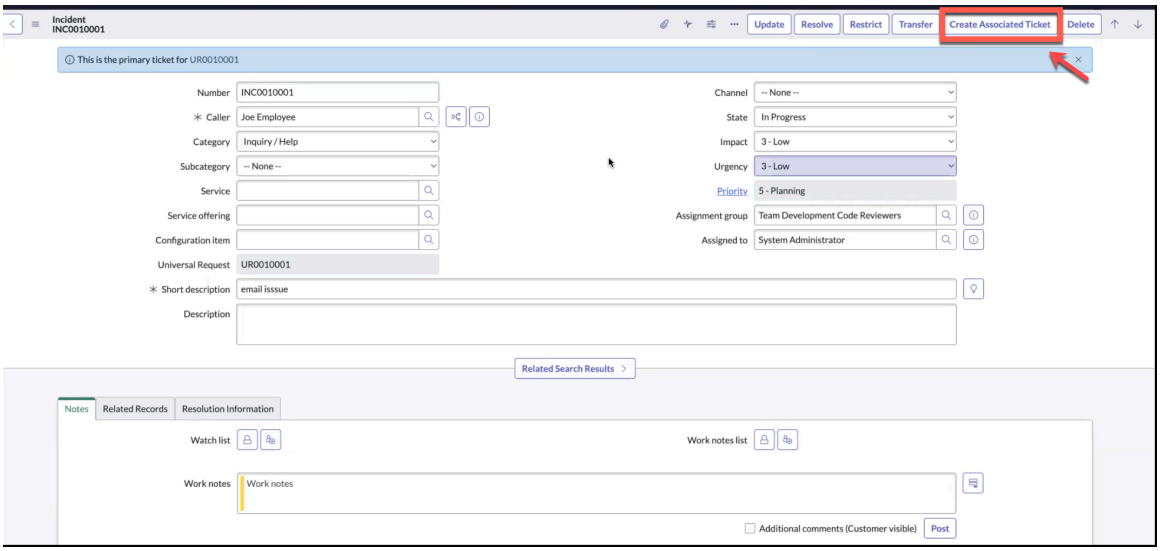
- The agent to whom the incident is assigned.
- The agent who belongs to the assignment group to whom the incident is assigned

### Procedure

1. Navigate to **Incidents** > **All**.
2. Open the incident record from which you want to create an associated ticket.
3. Click **Create Associated Ticket**.




4. In the Create Associated Ticket dialog box, fill in the fields.

**Create Associated Ticket dialog box**

| Field | Description |
|---|---|
| Department | Department for which you want to create an associated ticket. |
| Short description | A brief description of the issue for which the associated ticket is created. |
| Description | A detailed description of the issue for which the associated ticket is created. |
| Work notes | A brief description of the issue. You can communicate this issue to the Universal Request Routing agent or to the agent of the department for which the associated ticket is created. |

5. Click **Create**.

### Result

The ticket is created for the relevant department and is associated with the universal request record. You can view the associated tickets in the Associated Tickets related list of the Universal Request form.

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**Note:**
When an associated ticket is created, the information is copied from the fields of the universal request record to the fields of the associated ticket record. You can use the **Associated Ticket Information** and **Associated Ticket Mappings** tabs of the Mapping Configuration form for incidents. For more information, see Mapping configuration.

### Resolve, reopen, or close incident associated with universal request

Resolve, reopen, or close are actions from the **Incident Actions** widget that is available on the universal request record for the requester. The **Incident Actions** widget is available only when an incident is the primary task of a Universal Request record.

#### Before you begin
Role required: none

Associate an incident with a Universal request.

#### Procedure

1. Navigate to your portal page.
2. Click **Requests**.
3. Open the universal request that is associated with the incident.
4. Perform any of the following actions from the **Actions** widget.

**Note:**
The state of Universal Request record is updated based on the configuration provided on the State Mapping [universal_request_state_mapping] table.

### Customize fields copied from Universal Request to incident

Customize fields so that the values of some fields in the universal request automatically get copied to an incident record when an incident is associated with a universal request record. It saves your time from manually entering the information every time you create an incident.

#### Before you begin
Role required: incident_manager or admin

#### Procedure

1. In the left navigation pane, enter `sys_properties.list` and press the Enter key.
2. Search and open the system property *`sn_inc_uni_req.incident.universal_request.copy_fields`*.
3. In the **Value** field enter the universal request and the incident field.
   For example, `caller_id=opened_for` means that the value of the field called_id from the universal request form is copied to the opened_for field in the incident form.

### Restrict an incident access

You can restrict an incident ticket that contains sensitive information. By marking an incident as restricted, you limit its access for the agents.

#### Before you begin
Role required: admin or user

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### About this task

Both agents and users can mark an incident as restricted. Users can mark an incident as restricted while creating it. An agent can also mark an incident a restricted while triaging it or while working on it. Cases marked as restricted can only be accessed by

- Routing agents who are part of the assignment group and has sensitive agent role.
- All primary ticket agents.

### Procedure

1. Navigate to **All** > **Incident** > **All**.
2. Open the incident record that you want to restrict.
3. On the form, click **Restrict**.
   The restricted fields are hidden, and the form is only for view purpose.

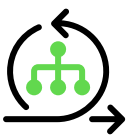
   **Note:**
   To mark the request as unrestricted only agents with the access role can modify.

4. Click **Update**.

# Now Assist for IT Service Management (ITSM)

Use the ServiceNow® Now Assist for IT Service Management (ITSM) application to summarize the incident information, generate incident resolution notes, and summarize the chat for an interaction. You can enable your agents to understand the chat and incident context so that they can propose quicker resolutions to your requesters.

## Get started

| Explore | Configure | Use |
|---|---|---|
|  |  |  |
| Learn more about Now Assist for ITSM | Configure the Now Assist for ITSM application to get started | Use generative AI capabilities offered by Now Assist for ITSM |

**Important:**
Some Now Assist products/features are currently unavailable for customers in the FedRAMP, NSC DOD IL5, or Australia IRAP-Protected data centers, self-hosted customers, or in other restricted environments. For more information, see the KB0743854 article in the Now Support Knowledge Base. Please check for availability updates in future releases.

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## Troubleshoot and get help

- ServiceNow Community on AI and Intelligence
- Search the Known Error Portal for known error articles
- Contact Customer Service and Support

### AI limitations

This application uses artificial intelligence (AI) and machine learning, which are rapidly evolving fields of study that generate predictions based on patterns in data. As a result, this application may not always produce accurate, complete, or appropriate information. Further, there is no guarantee that this application has been fully trained or tested for your use case. To mitigate these issues, it is your responsibility to test and evaluate your use of this application for accuracy, harm, and appropriateness for your use case, employ human oversight of output, and refrain from relying solely on AI-generated outputs for decision-making purposes. This is especially important if you choose to deploy this application in areas with consequential impacts such as healthcare, finance, legal, employment, security, or infrastructure. You agree to abide by ServiceNow's AI Acceptable Use Policy, which may be updated by ServiceNow.

### Data processing

This application requires data to be transferred from ServiceNow customers' individual instances to a centralized ServiceNow environment, which may be located in a different data center region from the one where your instance is, and potentially to a third-party cloud provider, such as Microsoft Azure. This data is handled per ServiceNow's internal policies and procedures, including our policies available through our CORE Compliance Portal.

### Data collection

ServiceNow collects and uses the inputs, outputs, and edits to outputs of this application to develop and improve ServiceNow technologies including ServiceNow models and AI products. In addition, this application will collect incident data (for Incident Assist and Knowledge Assist) and chat transcripts (for Chat Assist). Customers can opt out of future data collection at any time, as described in the Now Assist Opt-Out page.

For more information, see the Now Assist documentation.

# Exploring Now Assist for IT Service Management (ITSM)

With the Now Assist for IT Service Management (ITSM) application, your agents can summarize the chat conversations and incident details, generate the incident resolution notes to share with other agents, and wrap up incidents faster.

## Now Assist for IT Service Management (ITSM) overview

The following generative AI capabilities are available for an agent:

- An incident summary enables your agents to understand the incident context.
- The incident resolution notes provide the context to other agents who might encounter similar incidents.
- An interaction chat summary provides the context about the chat conversation to an agent by specifying all points of the handoff, including the Virtual Agent conversation.

## Now Assist for IT Service Management (ITSM) skills

The Now Assist for ITSM application includes the generative AI skills and features that enable your agents to understand the chat and incident context so that they can propose quicker resolutions to the requester.

### Chat summarization

Provides an agent with a summary of a requester's Virtual Agent chat history. An agent can also generate a summary of the entire interaction when the chat ends or when an incident is created for further troubleshooting before or after the chat ends.

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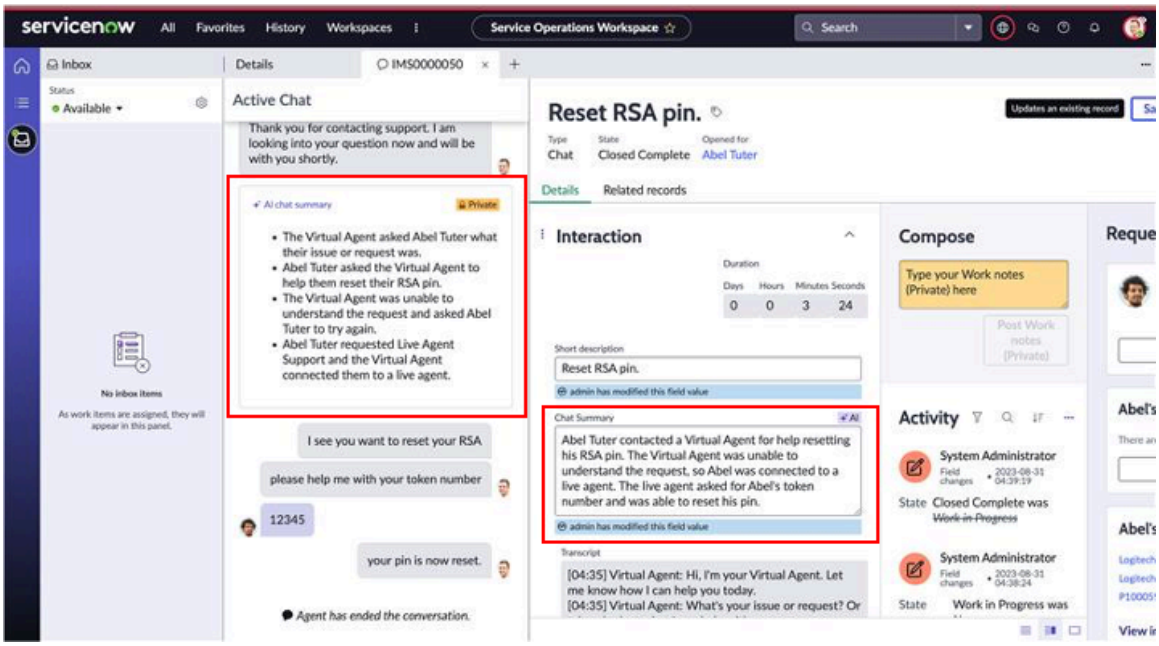


### Incident summarization

Enables an agent to expedite the incident troubleshooting process by reviewing its summary that includes the issue, actions taken, and resolution. Your agent can generate an incident summary for active incidents to understand the incident context. Your agent can also refresh the summary, post the summary to the incident work notes, copy the summary, and provide feedback about the summary.

The incident summary includes the information that an agent enters in the following incident record fields:

- Short description
- Description
- Work notes
- Additional comments
- Email

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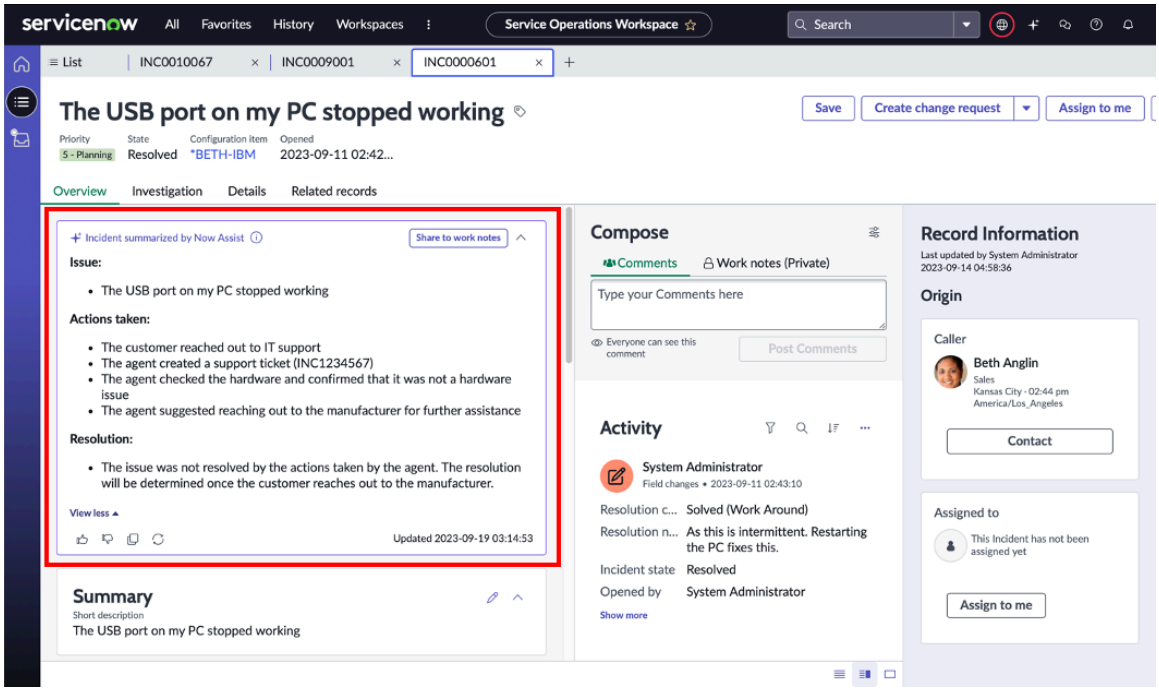
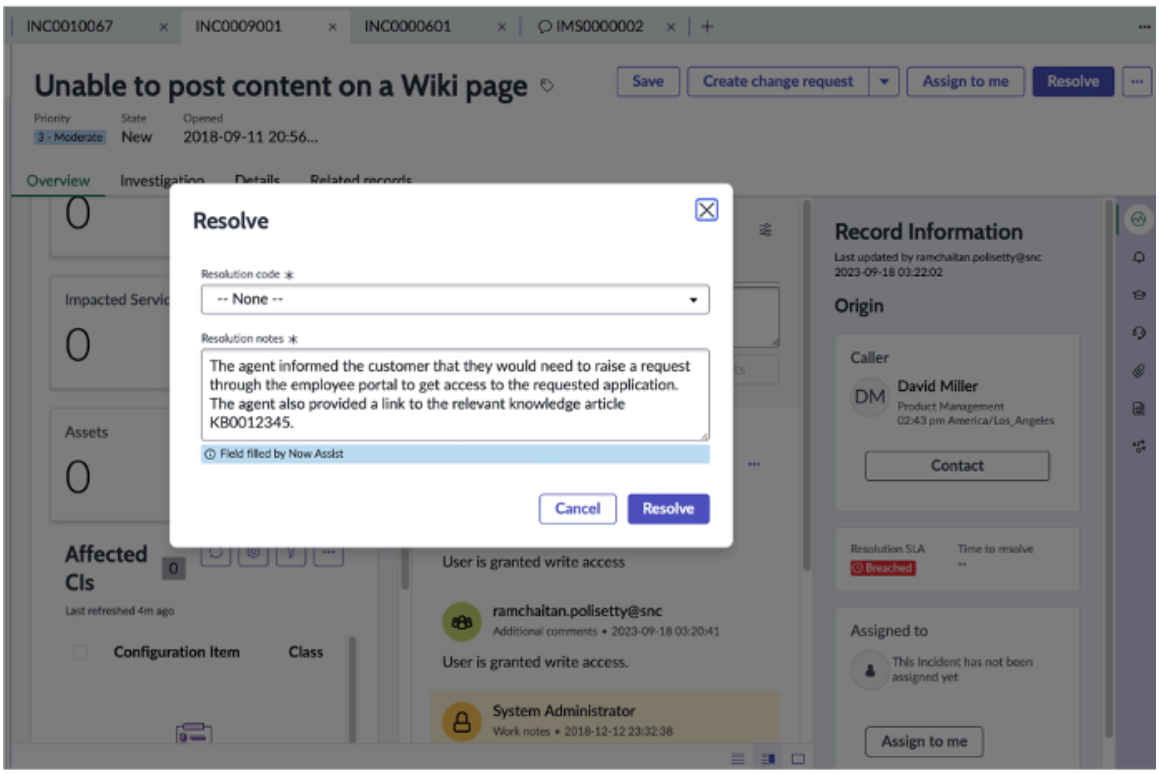



## Resolution notes generation

Automatically generates the resolution notes for an incident and provides context to the other agents who might encounter similar incidents.




## Knowledge generation

Enables an agent to generate a knowledge article from an incident after proposing a resolution or closing the incident.

The knowledge generation skill displays a pop-up window that an agent can use to generate a knowledge article and review it before publishing the knowledge article draft.

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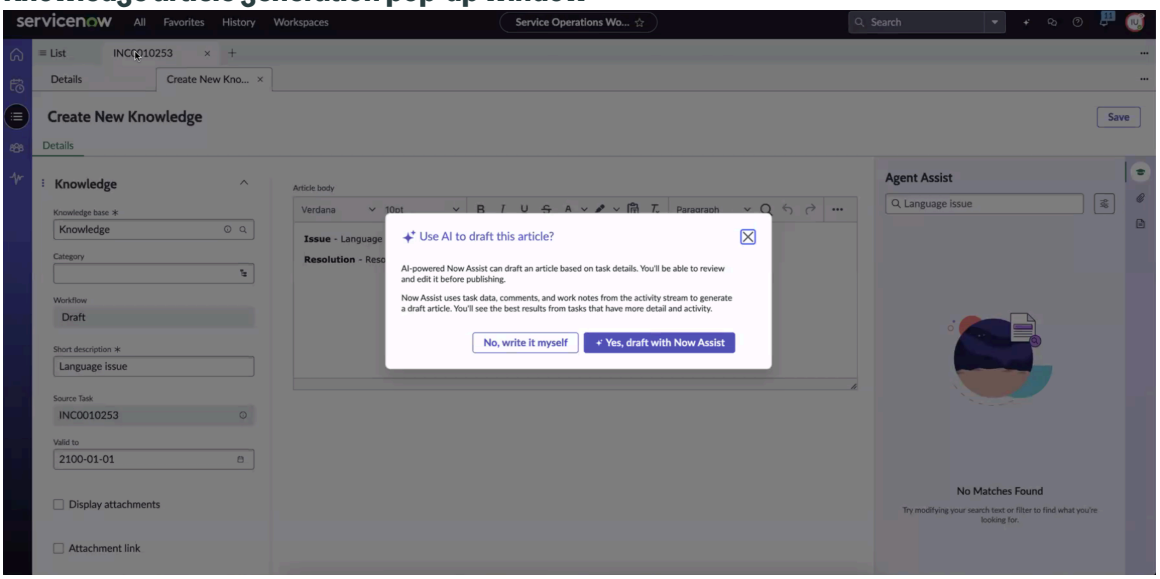
**Knowledge article generation pop-up window**




## Now Assist panel in Service Operations Workspace for ITSM

An agent can use the Now Assist panel in Service Operations Workspace for ITSM. This conversational interface enables an agent to request a chat summary or incident summary and generate the incident resolution notes. For more information about the Now Assist panel, see Now Assist panel.

### Related topics

Exploring Now Assist

## Supporting information for Now Assist for IT Service Management (ITSM)

Get a quick overview of the important information that is related to the Now Assist for IT Service Management (ITSM) application.

## Supported versions

- For Core UI: Starting with Vancouver Patch 2
- For Service Operations Workspace for ITSM: Starting with version 5.0.0

## Supported user interfaces

The Now Assist for ITSM application includes the skills that are listed in the following table.

**Now Assist for ITSM supported interfaces**

| Interface | Features |
|---|---|
| Service Operations Workspace for ITSM | • Incident summarization<br>• Resolution notes generation<br>• Chat summarization<br>• Now Assist panel<br>• Knowledge article generation |

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**Now Assist for ITSM supported interfaces (continued)**

| Interface | Features |
|---|---|
| Core UI | • Incident summarization<br>• Resolution notes generation<br>• Now Assist panel<br>• Knowledge article generation |

## Configure Now Assist for IT Service Management (ITSM)

If you have the admin role, you can configure the Now Assist for IT Service Management (ITSM) application so that agents can use the generative AI capabilities in Service Operations Workspace for ITSM and in Core UI.

### Before you begin

Role required: admin

### About this task

Use the Now Assist Admin console to configure Now Assist for IT Service Management (ITSM). This console contains everything that you need to install the plugins and configure the generative AI skills. For additional information, see Now Assist Admin console.

The following table lists the features and skills that you can access from the Now Assist Admin console.

**ITSM features and skills in the Now Assist Admin console**

| ITSM features | Skills |
|---|---|
| Chat Assist | Chat summarization |
| Incident Assist | • Resolution notes generation<br>• Incident summarization<br>**Note:** The incident summarization is applicable only for incidents in the New, In progress, On-hold, and Resolved states as long as the incident state mappings that are provided in the base system aren't customized. |
| Knowledge Assist | Knowledge article generation |

**Note:**

Now LLM Service is currently the only provider for this Now Assist application's skills.

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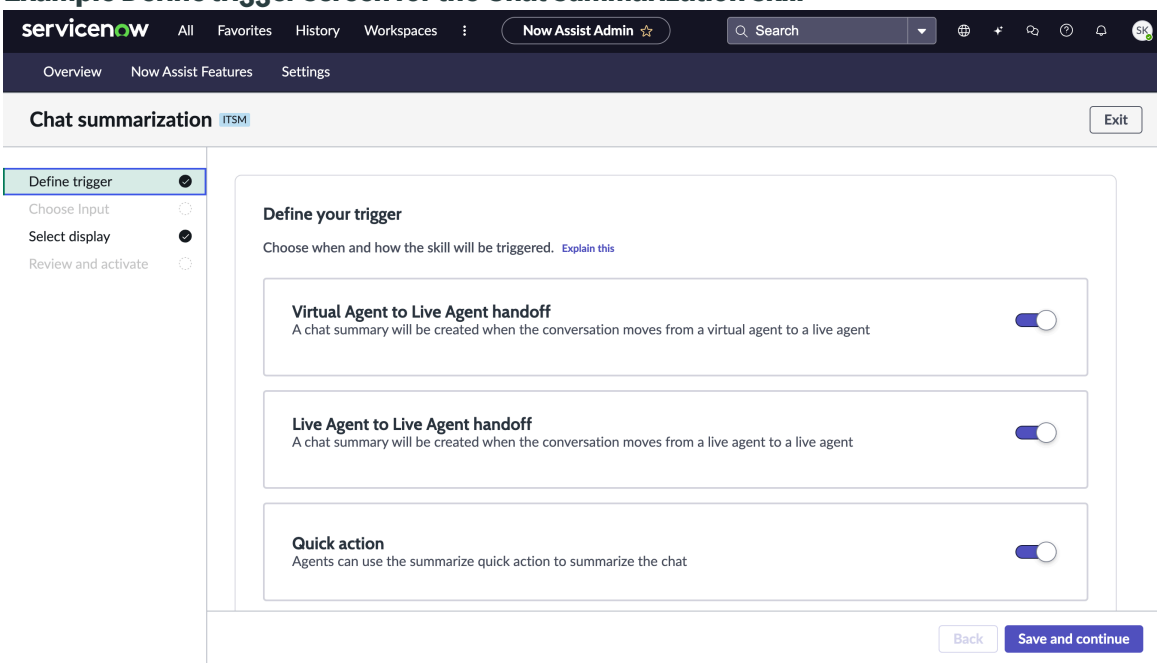
## Procedure

1. Install the Now Assist for IT Service Management plugin (sn_itsm_gen_ai).
   - For information about the application dependencies, see Supporting information for Now Assist for IT Service Management (ITSM).
   - For information about the installation process, see Install Now Assist plugins.
2. Navigate to **All** > **Now Assist Admin** > **Features** to access the **Features** tab of the Now Assist Admin console.
3. Activate and configure the skills for the Now Assist for ITSM features.
   These features are grouped under the **Technology** workflow group. Each feature has its associated skills.
4. On the feature card that is associated with the skill that you'd like to activate, select **View details**.
5. In the All available skills section, select **Activate skill**.
6. Select the inputs or triggers for the selected skill.

   For information about the inputs and triggers for each skill, see Skill inputs and triggers for Now Assist for IT Service Management (ITSM).

**Example Define trigger screen for the Chat summarization skill**




7. After you've configured the inputs or triggers for the selected skill, select **Save and continue** to go to the next step.
   You can return to a previous step by using the **Back** button.
8. Select where you'd like to display the skill.
   - **In-product**: When selected, the Now Assist skills are displayed on forms and workspaces.
   - **Now Assist panel**: When selected, the Now Assist skills are available in the Now Assist panel. If you don't see this option, you must activate the Now Assist panel. For more information, see Turn on the Now Assist panel.

     For the skills that appear in the Now Assist panel, select the down arrow to identify the roles that can use the skill.

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9. After you've configured the display for the selected skill, select **Save and continue** to go to the next step.
10. Review your choices and select **Activate** to complete the configuration.
Your skill is configured.

**Related topics**

- Now Assist Admin console
- Configuring Now Assist settings and features
- Record summarization
- Chat summarization
- Resolution notes generation

## Skill inputs and triggers for Now Assist for IT Service Management (ITSM)

Get a quick overview of the skill inputs and triggers for Now Assist for IT Service Management (ITSM). By configuring the inputs or triggers for a skill, you can determine how and when a skill is used.

## Now Assist for IT Service Management (ITSM) overview

Depending on the selected skill, you can configure the inputs or triggers. These settings determine how and when a skill is used. An input identifies the data that is used for a skill, such as the table and fields that are used to generate an incident summary. A trigger initiates an action, such as when the system generates a chat summary.

## Chat summarization skill

For the chat summarization skill, select the triggers that determine when a chat summary is generated. You can also select the properties that control how a chat summary is displayed.

The following table lists the triggers that determine when a chat summary is generated and how a chat summary is displayed.

### Triggers for the chat summarization skill

| Trigger | Description |
|---|---|
| Virtual Agent to Live Agent handoff | Chat summary that is generated when the chat handoff is done from Virtual Agent to a live agent. |
| Quick action | Chat summary that is generated when the live agent performs the `/summarize` quick action. |
| Chat wrap-up | Chat summary that is generated when the live agent ends the chat. The **Chat Summary** field is updated for the interaction. |
| Short description | **Short description** field that is updated for the interaction when the live agent ends the chat. |
| Task creation | **Short description** and **Description** fields that are auto-populated on the task record when a task is created. |

The following table lists the property for the chat summarization skill.

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#### Property for the chat summarization skill

| Property | Description |
|---|---|
| Bulleted list | If selected, the chat summary is displayed as an unordered list. |

## Incident summarization skill

The incident summarization skill includes the inputs that identify the table and fields that are used when an incident summary is generated.

In this release, you can't modify a skill's input data source. The data source contains the tables and fields that the skill relies on.

The following table lists the inputs for the incident summarization skill.

#### Inputs for the incident summarization skill

| Input | Description |
|---|---|
| Input table | Incident [incident] |
| Input fields | • Description<br>• Short description<br>• Work notes<br>• Additional comments<br>• Email |

## Resolution notes generation skill

The resolution notes generation skill includes the inputs that identify the table and fields that are used when the resolution notes are generated for an incident.

In this release, you can't modify a skill's input data source. The data source contains the tables and fields that the skill relies on.

The following table lists the inputs for the resolution notes generation skill.

#### Inputs for the resolution notes generation skill

| Input | Description |
|---|---|
| Input table | Incident [incident] |
| Input fields | • Description<br>• Short description<br>• Work notes<br>• Additional comments |

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## Knowledge article generation skill

The knowledge article generation skill includes the inputs that identify the table and fields that are used when the knowledge article draft is generated for an incident.

In this release, you can't modify a skill's input data source. The data source contains the tables and fields that the skill relies on.

The following table lists the inputs for the knowledge article generation skill.

**Inputs for the knowledge article generation skill**

| Input | Description |
|---|---|
| Input table | Incident [incident] |
| Input fields | • Short description<br>• Description<br>• Resolution notes<br>• Work notes<br>• Comments |
| State | • Resolved<br>• Closed |

## Configure generative AI Virtual Agent for ITSM

Enable your requesters to have a streamlined, conversational experience that is based on generative AI as they submit a catalog item request in Virtual Agent. By offering this generative AI experience, your organization can provide an additional self-service tool.

### Before you begin

Role required: admin

### About this task

The generative AI capabilities can provide a human-like catalog request experience over the Virtual Agent conversational interface. By using the generative AI capabilities with Virtual Agent, your organization can provide a conversational experience for request submissions.

When you configure generative AI for catalog item request submissions, your requesters get the following experience:

- Contextual question prompts that enable a more human-like conversation that is based on answers to previous questions.
- Slot filling that recognizes the answers to one or more questions on the requester's input.
- Ability to answer catalog item questions.
- Ability to exit the request submission process at any point.

Although the following catalog item question types are supported in the conversation mode, natural language responses aren't supported for them:

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- Reference
- Lookup select box
- Lookup multiple choice
- Requested For
- Attachment
- Multiple choice question with more than 10 choices

### Procedure

1. Turn on the required Virtual Agent skills: **Now Assist Multi-Turn Catalog Ordering**, **Now-Assist Q&A Genius Results**, or **Now Assist Topics**.
2. Set up Now Assist in Virtual Agent.
   For more information on how to turn on the skills and set up generative AI for Virtual Agent, see Configuring Now Assist in Virtual Agent.

**Note:**

- Configure the required conditions for the Virtual Agent skills.
- ITSM Virtual Agent is now replaced with generative AI for Virtual Agent.

### ITSM Virtual Agent pre-built LLM topics

ITSM Virtual Agent includes pre-built Large Language Model (LLM) topic conversations designed to help your users complete the common IT-related tasks such as checking and resetting a password.

LLMs are used to identify and trigger the action that a user wants to perform.

ITSM Virtual Agent pre-built LLM topics are read only and have **(Template)** as the suffix in their name. To use them, duplicate the topic in the ITSM Virtual Agent conversation scope and rename it according to your company naming conventions.

For ITSM Virtual Agent pre-built Natural Language Understanding (NLU) topics, see Using ITSM Virtual Agent pre-built topics.

| | |
|---|---|
| Check Ticket and Support Status | Check the status of your IT tickets and support cases.<br><br>Once the conversation is initiated, it progresses by collecting data about the ticket one question at a time. |

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| | |
|---|---|
| | **Note:**<br>For HR cases, an Admin must allow Core RCA records for Read operation and Write operation.<br>• sys_scope = Now Assist in Virtual Agent<br>• target_scope = Human Resources: Core<br>• target = Table: HR Case<br>• status = Allowed<br>• source = Script Include: ITSMTopicsHelper<br>See Requested restricted caller access (RCA) for more information. |
| Show Pending Approvals | Check pending approvals that are needed to take action upon and pick those to be processed.<br>You can either Approve or Reject your tickets by picking the list numbers provided to you by the Virtual Agent. |

## Core ITSM topics

| | |
|---|---|
| Check IT Ticket Status | Check the status of your IT ticket.<br>Once the conversation is initiated, it progresses by collecting data about the ticket one question at a time. |
| Escalate IT Ticket | Raise the urgency of your IT ticket for a faster resolution. Escalating a ticket priority requires choosing the incident and verifying the escalation.<br>Users must provide a justification to escalate the incident. Virtual Agent escalates the incident to the next urgency level. For example, from low to medium, or from medium to high.<br>If an incident is already at high-level urgency, Virtual Agent alerts the user to this and asks if the user would like to add a comment to help expedite resolution. |

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| | |
|---|---|
| Open IT Ticket | Open a ticket leveraging machine-learning algorithms with application logic for predicting similar open tickets.<br><br>Prevent users from opening duplicate incidents by finding similar incidents and asking if the user wants to add comments to the similar incident. |
| Service Disruptions | Access all known outage information.<br><br>When a user asks if a particular system is down, Virtual Agent returns a list of links displaying planned or unplanned outages and any system degradations.<br><br>Users can click the links for more detailed information about a specific outage or degradation, as well as click **Show more** when additional outages are known. |

## Password reset topics

End users can initiate a password management conversation with Virtual Agent by entering the keywords `Reset`, `Change`, `Unlock`, or `Password`.

Users who are not logged in can perform the Reset Password and Unlock Account actions. Users who are logged in can perform the Change Password, Reset Password, and Unlock Password actions.

Requirements:

- Password Reset (com.glideapp.password_reset) plugin
- Password Reset Virtual Agent Conversations (com.snc.password_reset.virtual_agent) plugin

**Note:**
In order for the password reset process to be available in Virtual Agent, ensure that you selected the **Enabled on Virtual Agent** check box in the Password Reset process configuration page.

For more information about the password reset process, see Password Reset for Virtual Agent.

| | |
|---|---|
| Change Password | Request to change your user password.<br><br>User must be logged in. |
| Reset Password | Request to reset your user password. |
| Unlock Account | Request to verify your locked user account. |

The following identity verification options are supported for password reset in Virtual Agent conversations. Custom verifications are not supported in Virtual Agent.

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- Personal data verification: User provides specific pieces of personal data.
- Google Authenticator verification: User enters the generated code from the Google service Authenticator mobile app.
- SMS code verification: User enters the code received via mobile text message.
- Email code verification: User enters the code received via email.
- Security question verification: User enters the configured security question answers.

For more information, see Configure your Password Reset process.

## Customize a Now Assist for IT Service Management (ITSM) skill

If you have the admin role, you can customize a Now Assist for IT Service Management (ITSM) skill so that agents can use the generative AI skills in Service Operations Workspace for ITSM and in Core UI.

### Before you begin

Role required: sn_nowassist_admin.nsa_admin

### About this task

From the Now Assist Admin console, you can select the input tables, related lists, and fields for each input template of the incident summarization skill. You can then configure prompt headers to include in the generated summary.

### Procedure

1. Navigate to **All** > **Now Assist Admin** > **Features** to access the **Now Assist Features** tab of the Now Assist Admin console.
2. In the **Technology** feature group, select **ITSM** from the product list.
3. Activate and copy the Now Assist for ITSM feature skill for customization.

   a. On the feature card that is associated with the skill that you would like to activate, select **View details**.

   b. In the All available skills section, locate the skill that you would like to activate and select **Activate skill**.
   You can choose to make a copy of the skill before activating it.

   c. Select the More actions icon ... for the skill in the Active skills section, and create a copy that you can customize by selecting **Make a copy**.
   The copy that you make is listed in the Active skills section.

   d. Select the copied skill from the Active skills section to open it.
   A guided setup leads you through the configuration of the general details, input, prompt, availability, display, review, and activation of the customized skill.

4. In the General details step, fill in the fields.
   For information about the inputs and triggers for each skill, see Skill inputs and triggers for Now Assist for IT Service Management (ITSM).

   a. Enter a name and description for the skill.

   b. Select **Save and continue** to go to the next step.

5. Choose input data.

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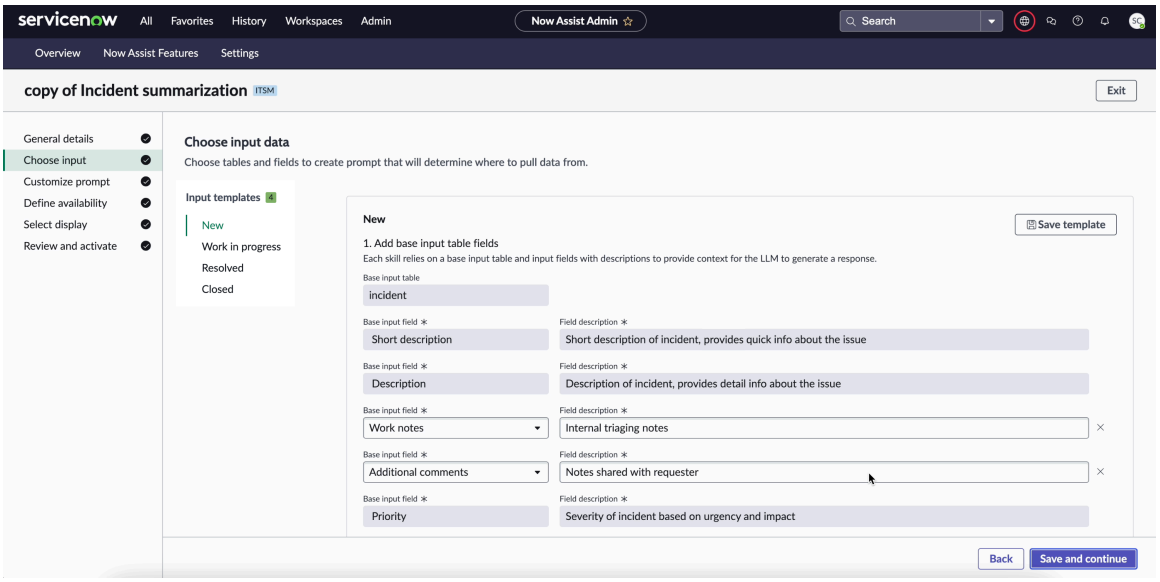
Configure the base input table fields and related lists for the different input templates (New, WIP, Resolved, and Closed states) for the skill.

Each skill relies on a base input table and input fields with descriptions to provide context for the Now LLM Service to generate a response.

Select only those related tables that are offered with the base system as part of the input data.

**a.** For each input template state (New, WIP, Resolved, and Closed), select **+New related table field** and configure the base input table fields.

Add multiple base input fields if more inputs are needed.




The following table lists the base input table fields and descriptions, including a relevant example.

### Base input fields

| Field | Description |
|---|---|
| Base input field | Field in the Incident table whose value this skill uses in its response.<br><br>For example, `Short description`. |
| Field description | Description of the base input field value.<br><br>For example, `Short description of incident, provides quick info about the issue.` |

**b.** For each input template state (New, WIP, Resolved, and Closed), configure the rule conditions by using the condition builder to filter the data further.

The rule conditions determine when the input template is used. By default, the record state determines the input template that the Now LLM Service uses.

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You can build the condition out further by selecting **+New condition** and configuring additional parameters.

The following table lists the input template states.

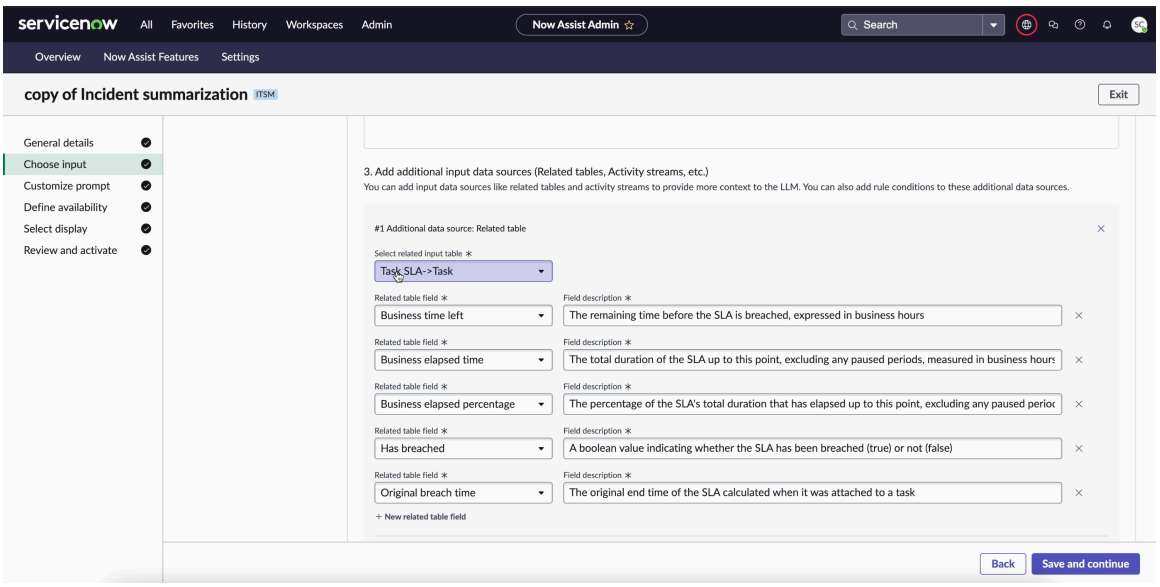
### Input template states

| State | Description |
|---|---|
| New | State is New. |
| WIP | State is Work in Progress. |
| Resolved | State is Resolved. |
| Closed | State is Closed. |

**c.** For each input template state (New, WIP, Resolved, and Closed), select **+New data source** to configure the additional related table and activity stream data, as needed.

Adding the input data sources, such as the related tables and activity streams, provide more context to the Now LLM Service in a related list.

You can also add the rule conditions to these additional related table and activity stream data sources.




The following table lists the data sources you can add to the input data.

### Additional data sources

| Data source | Description |
|---|---|
| Related Table | Fields for a related list:<br>▪ Select related input table<br>▪ Related table field<br>▪ Field description |

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| Data source | Description |
|---|---|
| | Configuring the related table fields follows the same format as the base input table fields in the Choose input step. |
| Activity: Email | Email that is attached to the incident in the incident summarization. |

**d.** Select **Save and continue** to go to the next step.

**6.** Customize the prompt.

Review and test the prompt for each input template configuration. You can edit the prompt by adding new predefined sections and ordering the sections, as needed.

**a.** For each input template state (New, WIP, Resolved, and Closed), select the prompt sections from the list of available sections to include in the generated summary.

To add a section, you must configure the relevant input data in the Choose input data step before you do this step.

The available prompt sections that you can select:

- **Issue**
- **Key Actions Taken**
- **Resolution**
- **Service Level Agreement**
- **Affected CIs and Impacted Services**
- **Child Incidents**

> **Note:**
> When there are too many child incidents and the size of the data goes beyond the LLM token limit, the child incidents section shows the "Too much information and cannot be shown" message.

The following table lists the mandatory prompt headers.

### Mandatory prompt headers

| Input template state | Mandatory prompt header |
|---|---|
| New | Issue |
| Work in progress | ▪ Issue<br>▪ Key Actions Taken |
| Resolved | ▪ Issue<br>▪ Key Actions Taken<br>▪ Resolution |

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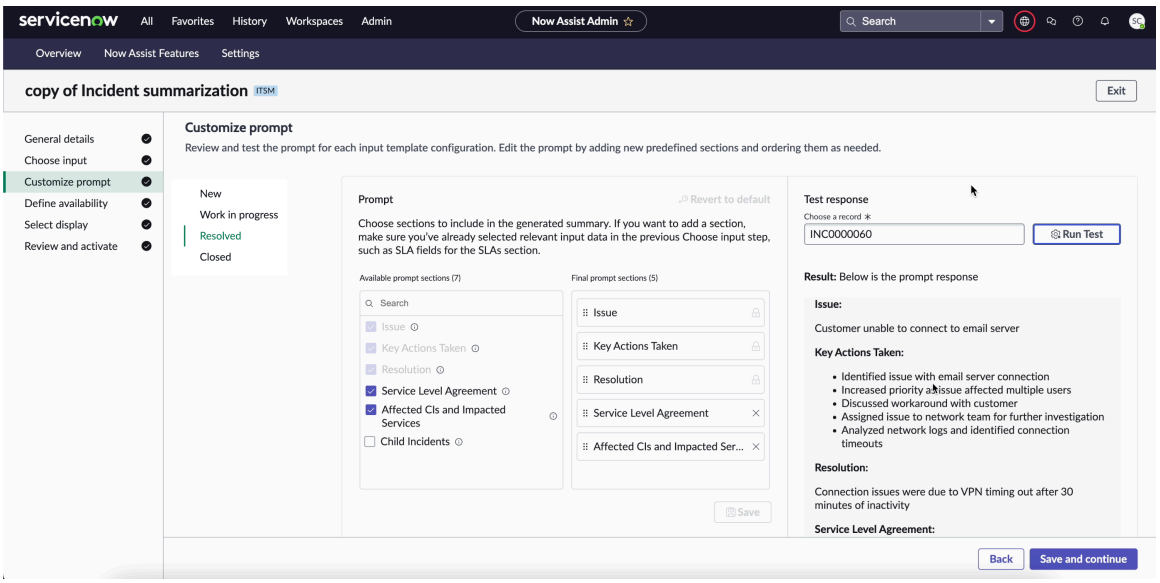
| Input template state | Mandatory prompt header |
| --- | --- |
| Closed | ▪ Issue<br>▪ Key Actions Taken<br>▪ Resolution |

**b.** Select **Save** to continue to the test response.

**c.** Select the incident record in the Test response section, and test the prompt response output format by selecting **Run Test**.




The prompt response is shown. You can make changes to your selections and retest as needed.

**d.** Select **Save and continue** to go to the next step.

**7.** Define availability.

Define how the skill will be available to users.

**a.** Configure the skill to be always available to users, or select the conditions that must be met before the skill is available.
Selecting **Customize skill availability** displays a condition builder to filter the data further.

**b.** Select **Save and continue** to go to the next step.

**8.** Select display.
Configure where to display the incident summarization.

**a.** Select either **In-product**, or **Now Assist panel**.

- **In-product**: When selected, Now Assist skills are displayed in all ITSM products (on forms and in workspaces).

  For the skills that appear in-product, select the down arrow to identify the roles that can use the skill.

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- **Now Assist panel**: When selected, Now Assist skills are available in the Now Assist panel.

  If you don't see this option, you must activate the Now Assist panel. For more information, see Turn on the Now Assist panel.

  For the skills that appear in the Now Assist panel, select the down arrow to identify the roles that can use the skill.

**b.** Select **Save and continue** to go to the next step.

**9.** Review and activate.
Review your choices and select **Activate** to complete the skill customization.
You can now select **Summarize** in an incident and generate the custom incident summary.

## Using Now Assist for IT Service Management (ITSM)

If you have the itil role, you can summarize the chat interactions with a requester, summarize an incident, and generate resolution notes by using the Now Assist for IT Service Management (ITSM) application. You can also understand the chat and incident context and propose resolutions more quickly to the requester.

### Summarize a chat conversation by using Now Assist for IT Service Management (ITSM)

Summarize the Virtual Agent chat conversation between a live agent and a requester in Service Operations Workspace for ITSM. You can generate the summary by using the chat summarization skill in Now Assist for IT Service Management (ITSM).

#### Before you begin
Role required: itil

#### About this task
In a Virtual Agent conversation, when a requester chooses to connect to a live agent, a chat interaction appears in your inbox. When you accept the interaction, a summary of the Virtual Agent conversation is generated. You can request more details from the requester to resolve the issue.

You can also summarize the chat interaction when the chat ends or when an incident is created for further troubleshooting before or after the chat ends. The summary includes all points of the handoff, including the Virtual Agent conversation, and provides a context of the interaction to you and the other agents who might want to refer to it.

#### Procedure

1. Navigate to **Workspaces** > **Service Operations Workspace**.
2. Open the inbox and accept the chat interaction.
   In the **Active Chat** section of the interaction, a summary of the Virtual Agent conversation is generated. The summary includes the actions taken before the requester engaged with the live agent. With this information, you can get an overview of what the requester has already mentioned in the Virtual Agent conversation and troubleshoot the issue.
3. Chat with the requester to get any additional details about their question or issue.
   For example, if the requester is having an issue with hardware, you may need the hardware model number and serial number.
4. Summarize the chat while interacting with the requester by using the `/summarize` quick action in the **Active Chat** section.

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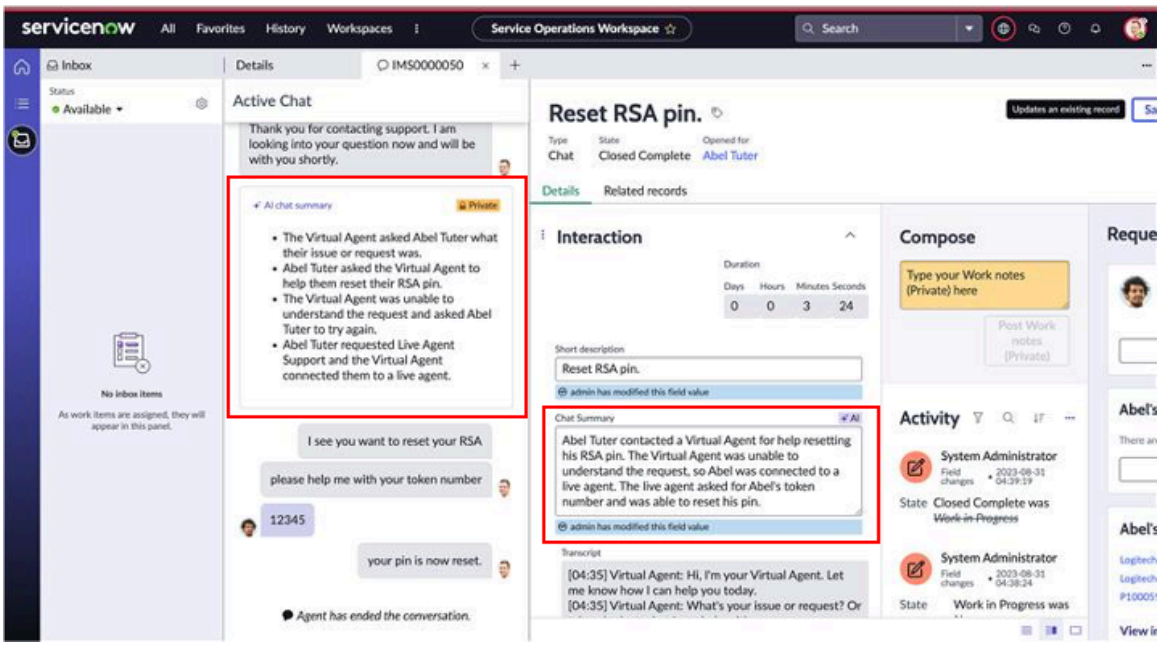
For more information, see Chat summarization.

5. End the chat by selecting **End Chat**.
   The **Short description** and **Chat Summary** fields are updated for the interaction.




6. **Optional:** Review the text in the **Short description** or **Chat Summary** fields and edit if necessary.

   (Optional) For example, you might want to make the summary more descriptive.

   **Note:**
   Because the information in these fields is automatically generated, it's a good idea to review the text and make sure it's accurate.

7. Select **Save**.
8. **Optional:** If you think that you need further help after the initial troubleshooting before or after ending the chat, create an incident from the interaction by selecting **Create incident**.
   - When you create an incident before ending the chat, the **Short Description** and **Description** fields of the incident are updated with the interaction summary and saved.
   - When you create an incident after ending the chat, the following information is generated:
     - The **Chat summary** field of the interaction is updated with the interaction summary.
     - The **Short Description** and **Description** fields of the incident are updated with the interaction summary and saved.

## Summarize an incident by using Now Assist for IT Service Management (ITSM)

Quickly understand the incident context and respond to a requester's inquiries by using the incident summarization skill in the Now Assist for IT Service Management (ITSM) application.

### Before you begin

Role required: itil

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### About this task

An incident summary provides you with a concise summary of an incident. The summary is based on the incident state and is generated from the information that you enter in the following fields:

- Short description
- Description
- State
- Priority
- Work notes
- Additional comments
- Resolution notes (for a resolved incident)

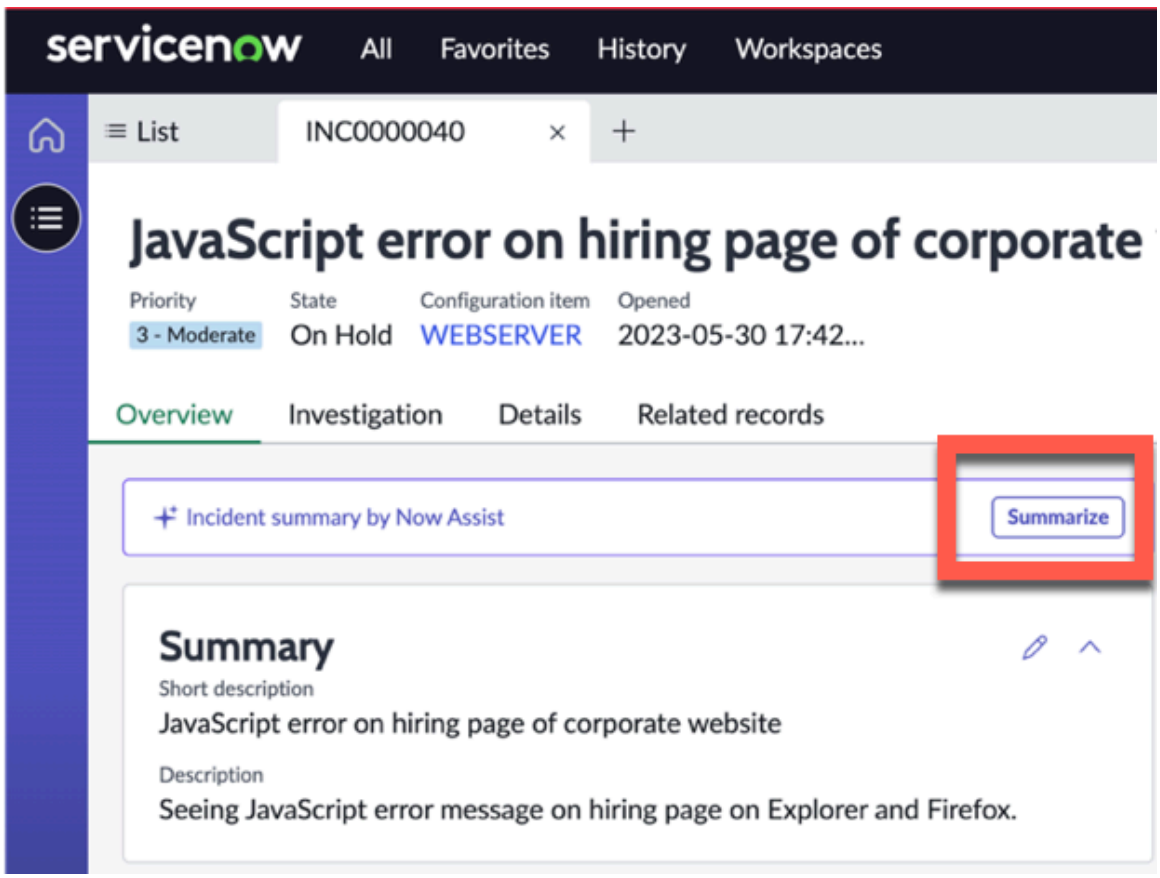
For information about the incident states, see Life cycle of an Incident.

You can summarize an incident in Core UI and Service Operations Workspace for ITSM.

There must be at least 200 words in the fields that are used for the input data to summarize an incident.

### Procedure

1. In Core UI or Service Operations Workspace for ITSM, open an incident that is assigned to you.
2. Select **Summarize**.

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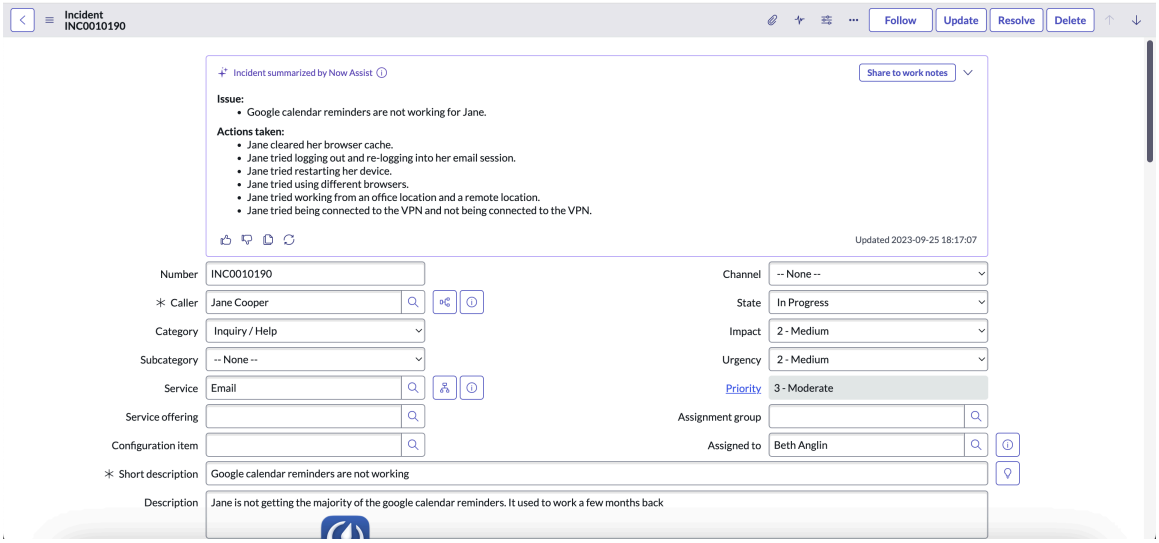
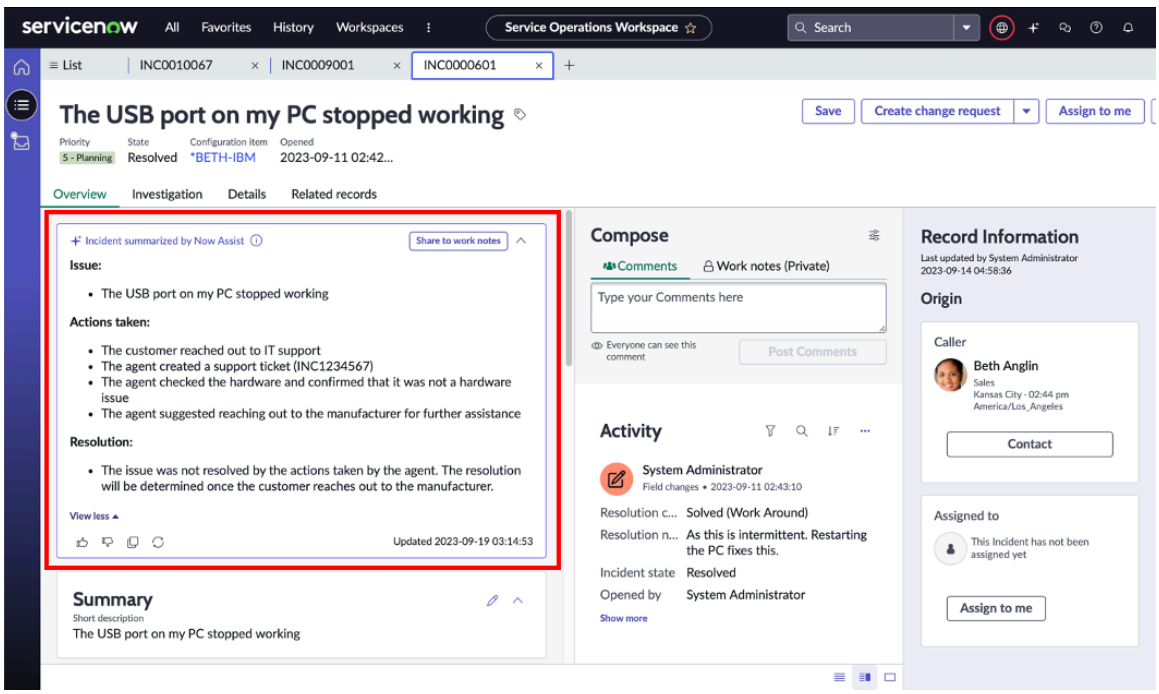
- In Core UI, the summary appears in a banner of the incident record.




- In Service Operations Workspace for ITSM, the summary is generated in the **Overview** tab.




3. **Optional:** When you're finished summarizing an incident, you can add it to the work notes, expand or collapse it, provide feedback, copy it, or view information about it.

## Generate the resolution notes for an incident by using Now Assist for IT Service Management (ITSM)

Automatically update the resolution notes for an incident. You can improve the quality of the resolution notes by providing a summary of the steps taken to resolve the issue. By generating the resolution notes, you can provide information about the incident resolution to other agents who might encounter similar issues.

### Before you begin

Role required: itil

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### About this task

Incident resolution notes are generated from the information that you enter in the following fields:

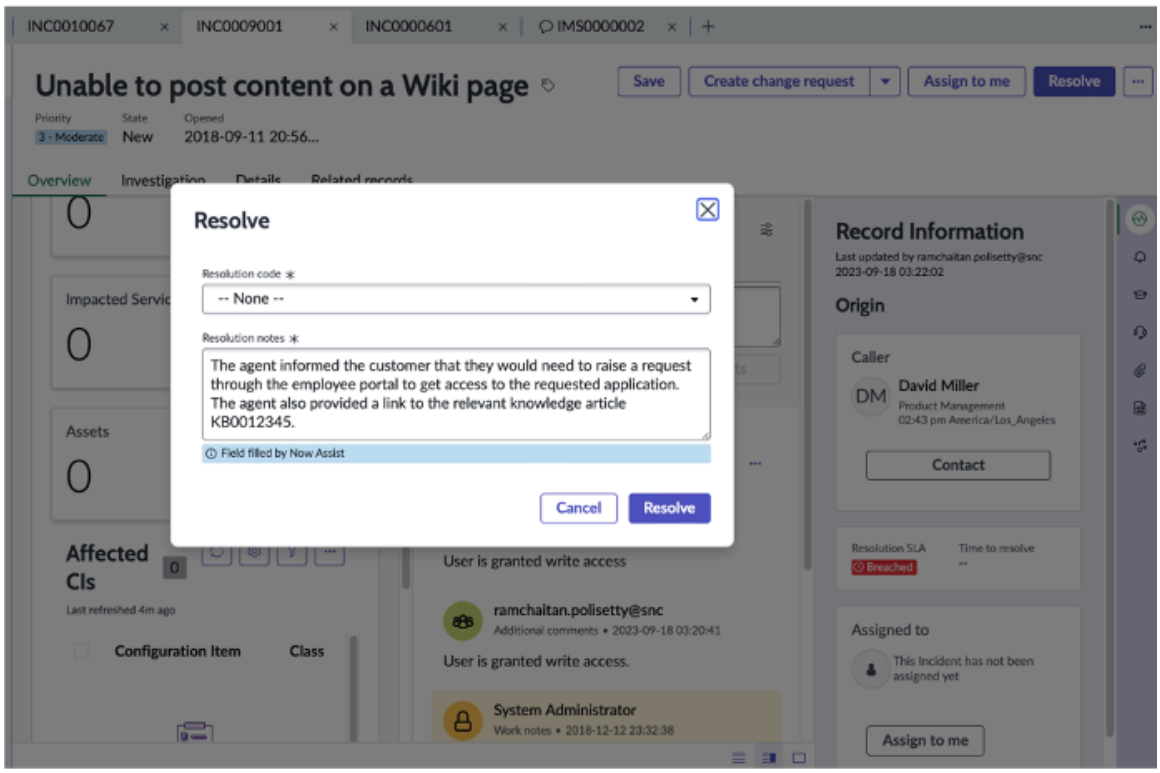
- Short description
- Description
- State
- Work notes
- Additional comments

You can generate the incident resolution notes in Core UI and Service Operations Workspace for ITSM.

### Procedure

1. In Core UI or Service Operations Workspace for ITSM, open an incident that is assigned to you.
2. Resolve the incident by using the UI action.

   a. Select **Resolve**.
   In the Resolve dialog box, the **Resolution notes** field is updated with the resolution summary.




   b. **Optional:** If necessary, review the resolution summary in the **Resolution notes** field and make any necessary corrections.

   **Note:**
   Because the information in these fields is automatically generated, it's a good idea to review the text and make sure it's accurate.

   c. Update the resolution code in the **Resolution code** field and select **Resolve**.

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A resolution code categorizes how the incident is resolved. For example, Known error and Solved (Permanently).
The resolution information is updated and the state of the incident is set to Resolved.

3. In Core UI or Service Operations Workspace for ITSM, resolve the incident by changing its state.

## Generate a knowledge article from the Service Operations Workspace for ITSM and classic environment with Now Assist

As an agent or knowledge writer, quickly generate knowledge articles from resolved and closed incidents within the Service Operations Workspace for ITSM and classic environment with Now Assist.

### Before you begin

To generate a knowledge article for an incident, the incident must be in the resolved or closed state, and not have an existing knowledge article associated with it.

Install the following applications and plugins before configuring the Knowledge Generation skill.

- For knowledge management, you must install and update the following store apps to the indicated version:
  - Now Assist in Knowledge Management [app-knowledge-gen-ai] (25.2.4)

    (com.sn.km.gen.ai, sn_km_gen_ai)
  - Knowledge Capabilities in UI Builder [app-knowledge-uib] (25.5.4)

    (com.snc.uib.knowledge, sn_km_uib)
- For ITSM Service Operations Workspace, you must install and update the following plugins to the version that is listed in the following table.

| Plugin ID | Version number |
|---|---|
| sn_sow_itsm_cont | 5.0+ |
| sn_itsm_gen_ai | 4.0+ |
| app-sow | 5.0+ |
| app-sow-record | 5.0+ |
| app-sow-itsm-common | 5.0+ |
| app-sow-incident | 5.0+ |
| app-sow-interaction | 5.0+ |

- So that ITSM Service Operations Workspace can use the Knowledge Centered Services (KCS) template (Incident-KCS article - HTML), you must install the KCS Integration for Incident Management plugin. Otherwise, Now Assist uses the Standard article.

To enable an agent to see the Now Assist experience on the Create Article page, you should configure the following knowledge base generation criteria:

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- Install the knowledge skills. For more information, see Configure Now Assist for IT Service Management (ITSM).
- In the Now Assist Admin console, ensure that the following criteria are in place:
  - Specify the table record and input fields.
  - Specify the conditions for the skill availability from the list of attributes.
  - Specify that the knowledge base generation feature for the In-product or Now Assist panel is displayed.
- Configure the **Create Article** to apply the supported template, Incident-KCS article - HTML, or Standard article.
- Currently, only the Create Article experience is available.

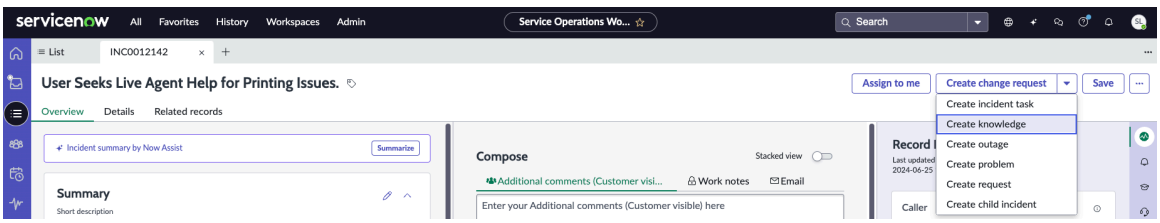
Role required: agent

## About this task

In the Service Operations Workspace for ITSM and classic environment, you can generate the knowledge article information for an incident by selecting **Create Knowledge** on the incident record. This UI action displays the Use AI to draft this article modal. By using this modal, you can choose to write the article yourself or draft an article and then you can review and edit the knowledge article text.

## Procedure

1. Navigate to **Workspaces** > **Service Operations Workspace**.
2. Open an incident that is assigned to you.
   In the incident record, resolve and close the incident.
3. Create the article by selecting the **Create knowledge** option from the UI action drop-down menu in the incident.




> **Note:**
> The **Create Knowledge** UI action is only visible when an incident doesn't have an existing knowledge article associated with it.

4. In the Create article modal, select a Knowledge Base and an Article template, if displayed.

   The KCS template (Incident-KCS article - HTML) is used to generate the article only if the KCS plugin is installed. If the plugin isn't installed, the article is generated by using the Standard article.

   The Knowledge Base is selected based on your administrator's configuration in the Now Assist Admin console.

5. Select **Create article**.
6. In the Use AI to draft this article? modal, choose to write the article yourself, or draft an article with Now Assist.

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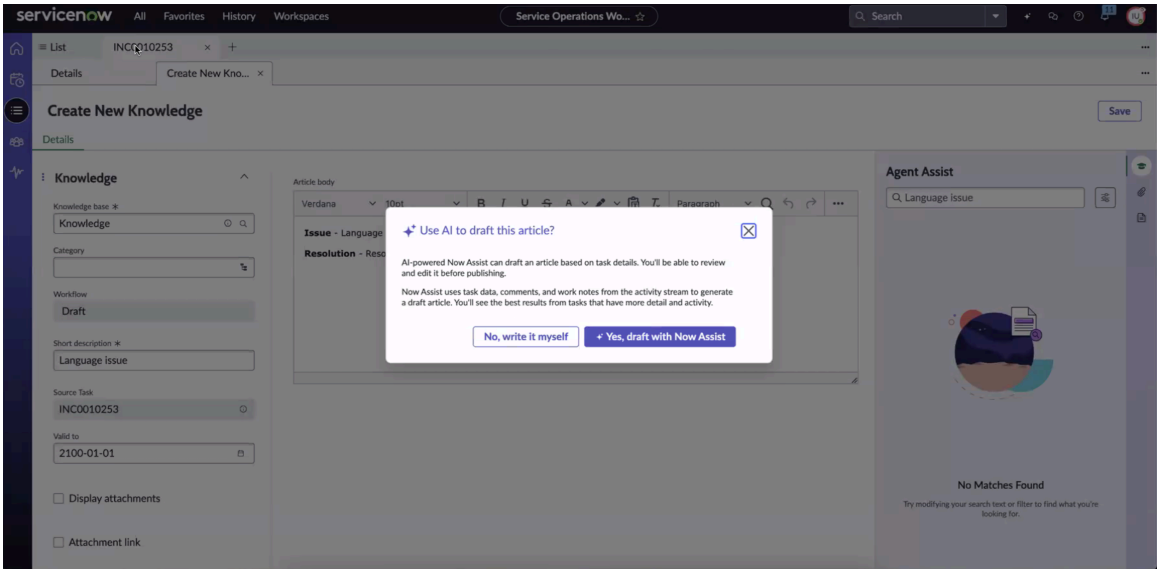
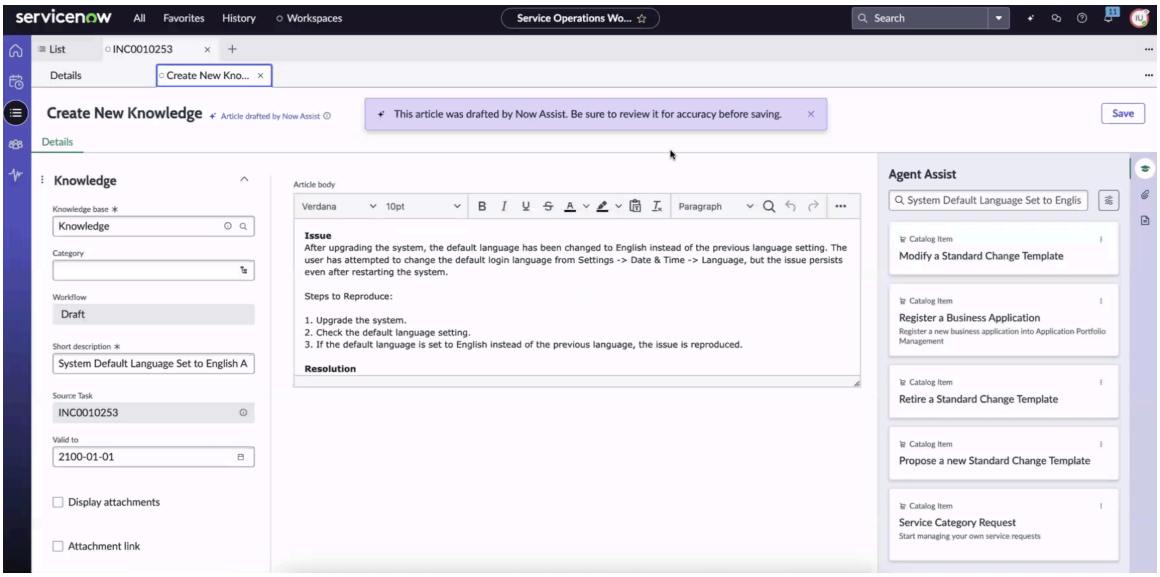



The article appears in a new tab with a unique ID number for the knowledge article and is attached to the parent record.

7. Review the article and edit it if necessary.




8. Select **Save** or **Publish**.

The Now Assist success message disappears indicating that it's no longer a Now Assist generated article.

If Now LLM Service fails to generate a result, you see an error message.

When creating an article using Now Assist, the process once triggered can't be stopped. Now Assist continues to generate the article even if you close the dialog box.

### Related topics

Now Assist in Knowledge Management

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## Summarize an incident when reassigning it by using Now Assist for IT Service Management (ITSM)

Provide information about the incident when assigning it to another agent or assignment group by summarizing all actions until hand off. For example, an agent can summarize an incident when reassigning it to another agent if the incident is incorrectly assigned or needs troubleshooting by another agent or assignment group.

### Before you begin

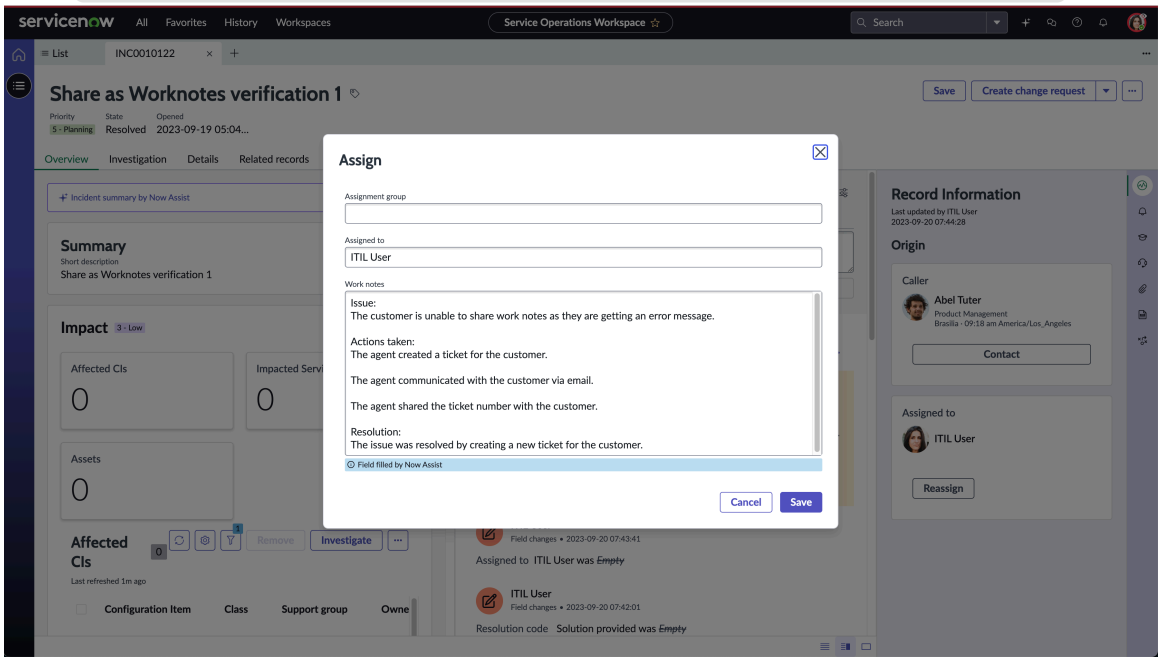
Role required: itil

### About this task

You can reassign an incident in Core UI and Service Operations Workspace for ITSM.

### Procedure

1. In Core UI or Service Operations Workspace for ITSM, open an incident that is assigned to you.
2. Perform one of the following steps.
   A summary of the incident is generated in the **Work notes** field in the Assign dialog box.




> **Note:**
> If the incident is saved without any changes to the **Assigned to** or **Assignment group** fields, the Assign dialog box isn't displayed and the incident is saved directly.

3. Edit the **Assigned to** or **Assignment group** fields if necessary.
4. Select **Save**.
   The generated incident summary is posted as work notes for the incident.

## Request the generative AI capabilities in ITSM by using the Now Assist panel

Use the Now Assist panel to request the contextual generative AI capabilities in ITSM such as a chat summary, incident summary, or incident resolution notes in a conversational manner. These capabilities provide you with a quick resolution to issues.

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### Before you begin

Make sure that Next Experience is enabled in the instance. For information about enabling Next Experience, see Considerations for activating Next Experience. For information about Next Experience, see Next Experience UI.

Role required: itil

### About this task

You can access the Now Assist panel from Core UI or Service Operations Workspace for ITSM to request generative AI capabilities for Now Assist for ITSM skills. For information about these skills, see Skill inputs and triggers for Now Assist for IT Service Management (ITSM).

Using the Now Assist panel saves time for an agent, for example, the agent can quickly learn the details of an incident by reading the incident summarization. The summarization gives enough details about the associated interaction so that the requester doesn't have to repeat the same information to the agent. For information about the Now Assist panel, see Now Assist panel.

For information about how to activate the Now Assist panel, see Turn on the Now Assist panel.

### Procedure

1. Log in to an instance where Now Assist for IT Service Management (ITSM) is installed.
2. Request generative AI capabilities to summarize a chat for an interaction, summarize a chat for an incident that was created from an interaction, summarize an incident, or generate incident resolution notes.

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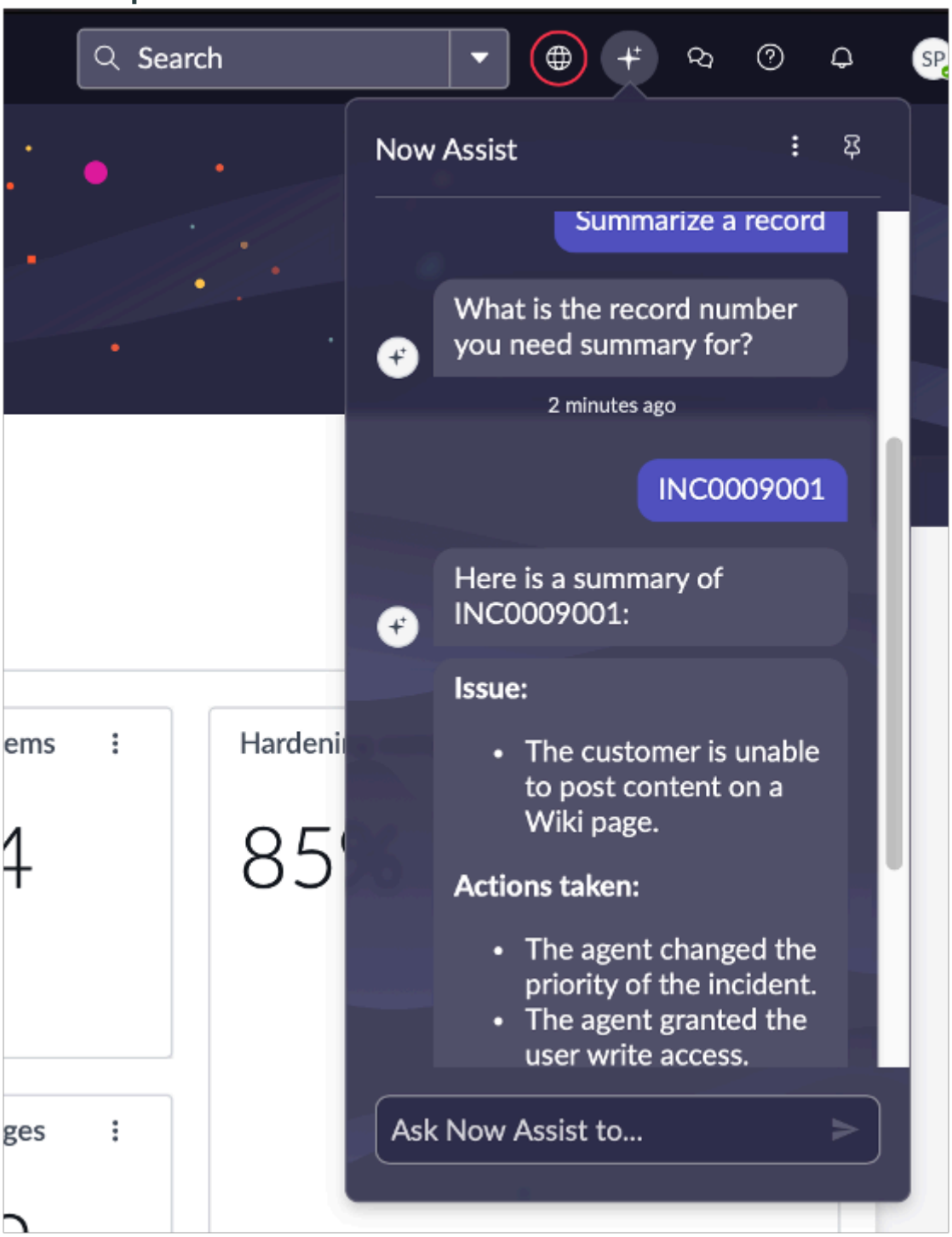
**Now Assist panel for ITSM skills**




## On-Call Scheduling

The On-Call Scheduling application identifies the assigned and available member of a support group, for example, when assigning an incident.

### Get started

The On-Call Scheduling application helps you to ensure that dedicated support team members are available to resolve issues as they arise. You can set up on-call schedules, roster rotations,

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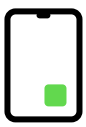
and escalation policies, escalate notifications for a group, and determine the current contact for an escalation.

| | | | |
|---|---|---|---|
| Explore<br>  <br>Learn about On-Call Scheduling concepts and features. | Configure<br>  <br>Configure environment, tools, and user access. | View Schedules<br>  <br>Learn how to view schedules and request time-off. | Manage<br>  <br>Manage shifts and time-off requests. |
| View On-Call Scheduling reports<br>  <br>Generate and view reports. Premium dashboard user can view performance report. | Define On-Call Scheduling escalation process<br>  <br>Define escalation trigger rules and policies. | Mobile experience for On-Call Scheduling<br>  <br>View and manage schedules. Request and manage time-off request with Mobile Agent. | Reference<br>  <br>Get details about On-Call Scheduling components such as roles and dependent applications. |

### Troubleshoot and get help

- Ask or answer questions in the IT Service Management community
- Search the Known Error Portal for known error articles
- Contact Customer Service and Support

## Exploring On-Call Scheduling

The On-Call Scheduling application helps you ensure that dedicated support team members are available to resolve issues as they arise. Learn more about On-Call Scheduling and the benefits it can provide for the different user roles in your organization.

### On-Call Scheduling overview

On-Call Scheduling provides a way to determine which member of a user group is available to work on a task.

On-Call Scheduling finds the right person to assign an incident to, by rotation through a hierarchy of duty rosters. The automated process relieves the administrative burden on resource

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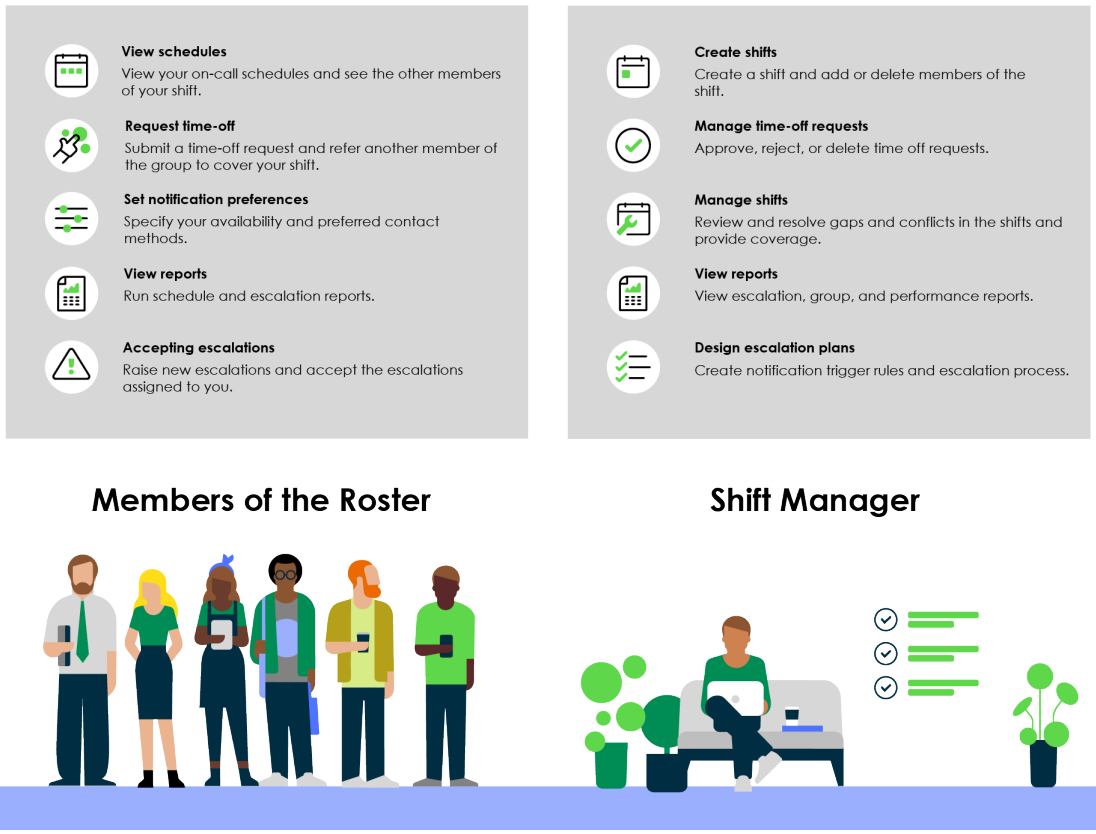
managers and makes it easy for the incident managers to bring the right resources to the table when needed.

On-Call Scheduling can be used by process owners and support managers who want to collaborate more effectively. On-Call Scheduling simplifies the manual shift maintenance and administration efforts while improving the mean time to resolve (MTTR) efficiencies.

## On-Call Scheduling workflow

The various members of an organisation use On-Call Scheduling to work together. See a sample end-to-end




workflow:

1. Shift admin creates shift and group templates.
2. Shift admin assigns role and configures escalation trigger rules.
3. The shift manager creates a shift and add or delete members to the shift.
4. Shift manager designs the entire escalation process for the new shift.
5. Roster member views their on-call schedules and find out who the other members on their shift are.
6. Roster member can specify their availability and preferred contact methods from the methods set up by Shift admin.
7. Roster members can submit a time-off request and refer another member of the group to cover the shift.
8. Roster members views the roster and escalation details for a shift.
9. Roster members view on-call reports and receive reminders.
10. The shift manager approves or rejects the time-off requests.
11. Shift manager reviews the on-call schedules for their groups for any gaps and time-off requests.

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12. Shift manager provides, replace, or delete coverage and time-off requests.
13. Roster members receive on-call escalation notifications to acknowledge tasks or conference requests.
14. Shift manager views escalation, group, and performance reports of their on-call teams.

## On-Call Scheduling benefits

| Benefit | Feature | Users |
|---|---|---|
| Use the calendar to view or select a shift. You can set a day, week, or month view as your preference. The calendar also allows you to set your preferred start day of the week. | View my On-Call calendar on my calendar app | itil, rota_manager |
| Create your own escalation policies and path. On-Call Scheduling allows you to create an escalation trigger rule using the templates available, based on your requirement. | Designing an escalation process | itil, rota_manager, rota_admin |
| Use any one of the multiple channels such as Slack, Microsoft Teams, mobile push messages, SMS, and voice messages to set as the preferred contact method for receiving notifications. | Configure my availability and contact preferences | itil, rota_manager, rota_admin, admin |
| Generate escalation reports, shift reports, and performance reports. | Viewing On-Call Scheduling reports | itil, rota_manager, rota_admin |
| Access the performance reports that are available for premium dashboard users. | Viewing the Performance reports for escalations | premium dashboard user |
| Download and use the Mobile agent to perform all these activities on the go. | Getting started with the On-Call Scheduling mobile app | itil, rota_manager |

## On-Call Scheduling capabilities

The key features and capabilities of On-Call Scheduling can be used by the various user roles.

On-Call Scheduling supports the Members of the roster (itil role), Shift Manager (rota_manager role), shift administrator (rota_admin role). Based on the user role, you can perform the following actions:

### itil role

- View your on-call schedules and see the other members of your shift.
- Submit a time-off request and refer another member of the group to cover your shift.
- Specify your availability and your preferred contact methods.
- View the roster and escalation details for a shift.

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- Run schedule and escalation reports.
- Use the ITSM Mobile Agent for viewing schedules and requesting time off.

### rota_manager role

- View the on-call schedule including any gaps and time-off requests for your group.
- Approve or reject time-off requests
- Review and manage gaps and conflicts.
- Provide, replace, or delete coverage and delete time-off requests.
- Create a shift and add or delete members to the shift.
- View escalation, group, and performance reports.
- Use the Mobile Agent for viewing the schedule of your groups and approve or reject time-off requests.

### rota_admin role

- Set up Slack, Microsoft Teams, text and voice messages, as a contact method for an on-call escalation.
- Assign roles and configure escalation trigger rules.
- Create shift and group templates.
- Design the entire escalation process.

## Configuring On-Call Scheduling

Plan and configure On-Call Scheduling properties, templates, trigger rules, escalation policies, rosters, and schedules.

As an administrator, you can configure preferences and application behavior and create tools that improve the effectiveness of roster members and shift managers. These are some of the tasks you can perform as an administrator.

### Activate On-Call Scheduling

You can activate the On-Call Scheduling (com.snc.on_call_rotation) plugin if you have the admin role.

### Set up contact methods

You can configure the following contact methods and enable users to receive notifications for escalations.

- Slack: You can also configure a template and subflow for user responses to the notifications.
- Text and voice messages: You can configure phone number and workflows to drive escalation via text and voice message.
- Microsoft Teams: Ensure that your ServiceNow instance is configured to integrate with Virtual Agent and IT Service Management integration with Microsoft Teams plugin (sn_now_teams_it) is active.
- Mobile push notifications: Configure ServiceNow Agent and enable mobile push notifications

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## Activate On-Call Scheduling

You can activate the On-Call Scheduling (com.snc.on_call_rotation) plugin if you have the admin role.

### Before you begin

Role required: admin

### About this task

Activating the On-Call Scheduling plugin activates the following third-party libraries:

- Subscription-based notifications
- Advanced Schedules support
- NG shared components
- ServiceNow common calendar
- Fullcalendar library

**Note:**
The On-Call Scheduling plugin (com.snc.on_call_rotation) is active by default for zBoot customers.

### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.

3. Select **Install** to start the installation process.

   **Note:**
   When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

   You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

### Related topics

On-Call Scheduling

## Setting up Slack as a contact method

You configure Slack to enable users to receive Slack notifications for escalations. To offer Slack as a contact method for shift members, you install the IntegrationHub spoke for Slack.

## Configuring Slack for On-Call Scheduling

The Slack spoke automates On-Call Scheduling notifications and responds to them. The following configurations support On-Call Scheduling notifications:

## Outbound Configurations

**Slack > Outbound Configurations > On-Call: Assign by Acknowledgement**

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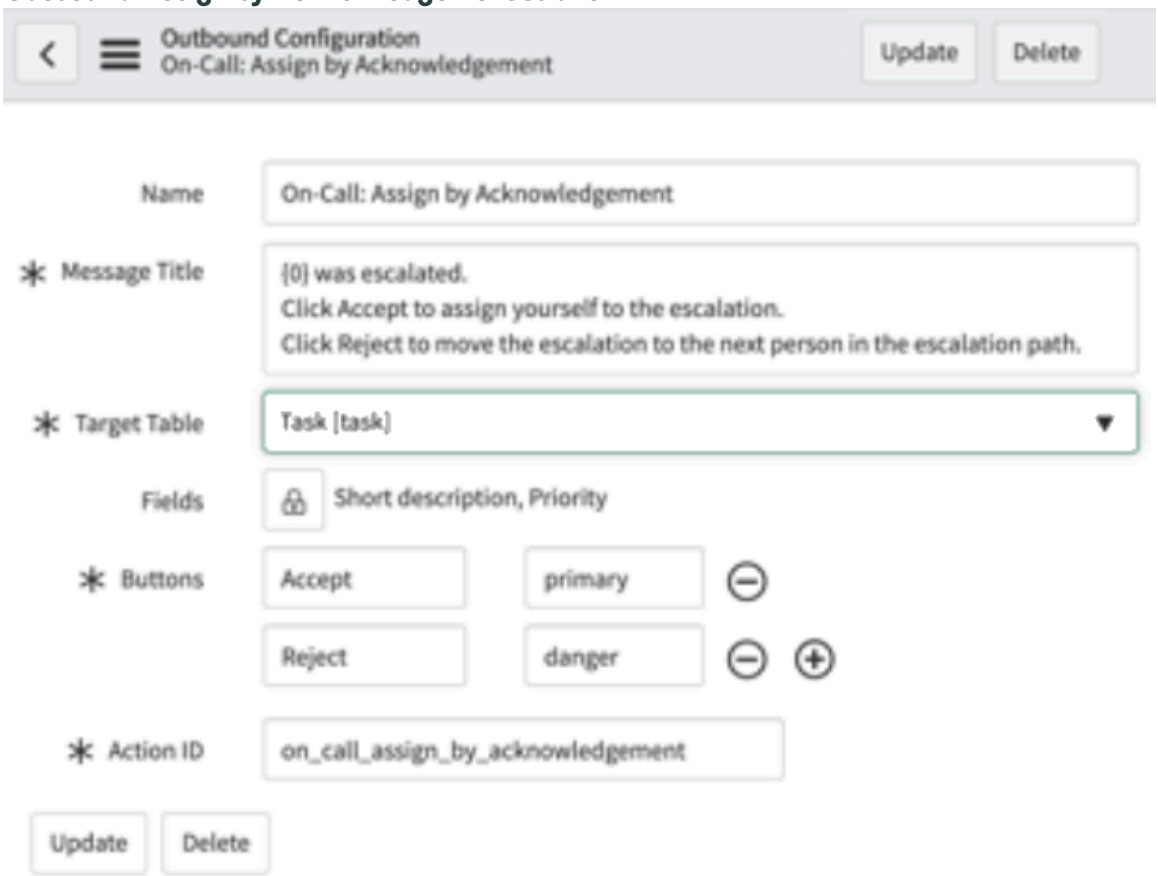
Generates a general escalation message. Modify the record to customize the message template.

**Outbound Assign by Acknowledgement subflow**




**Slack > Outbound Configurations > On-Call: Assign by Acknowledgement Catch All**

Generates a catch-all escalation message. Modify this record to customize the message template.

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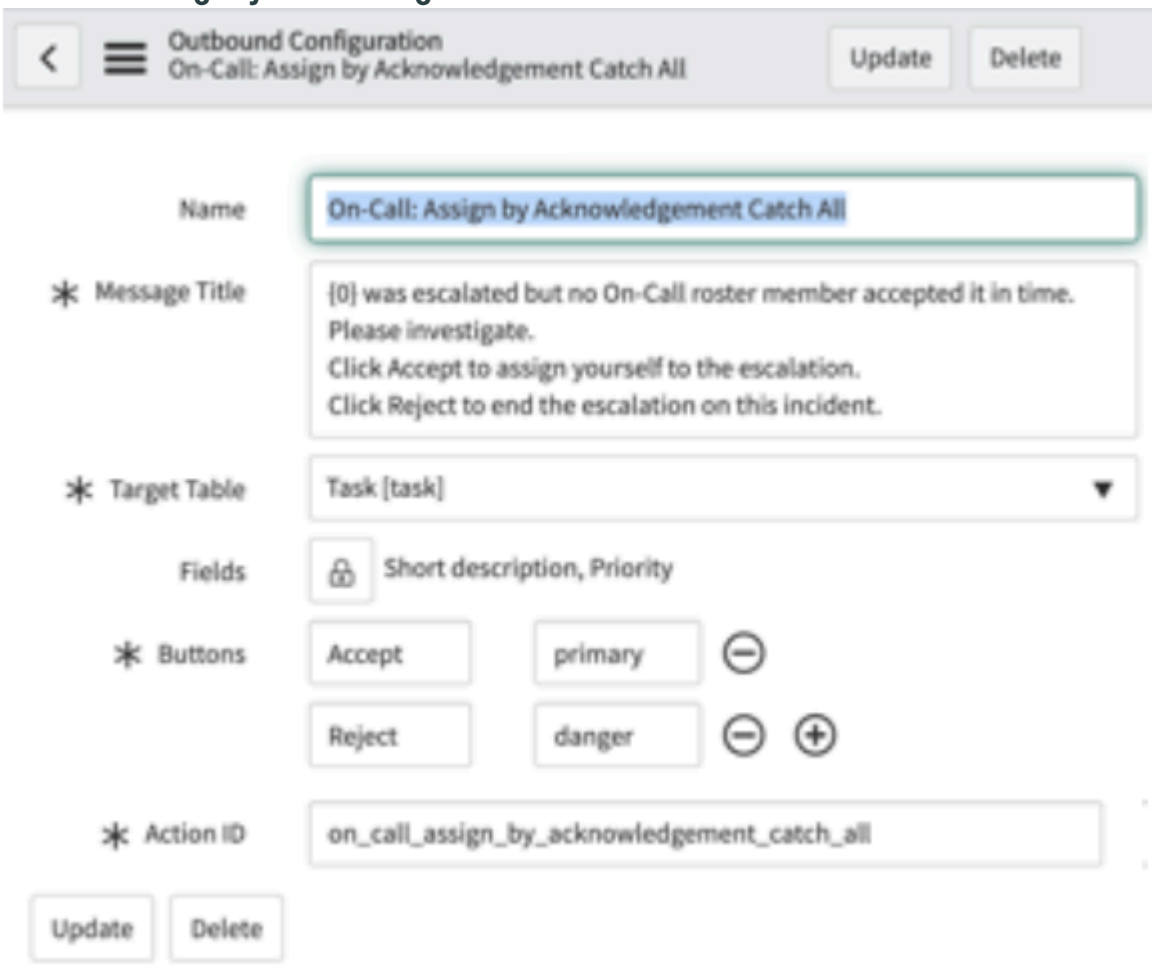
### Outbound Assign by Acknowledgement Catch All subflow




## Inbound Decisions

**Slack > Inbound Decisions > On-Call: Assign by Acknowledgement Decision**

Defines inbound configuration for general response handling for Accept or Reject escalation messages. Use *`action_id`* as the key to map outbound configuration and inbound decisions for general escalations. The answer points to the subflow that is executed when the user clicks **Accept** or **Reject**. Modify the record to change the response handling behavior.

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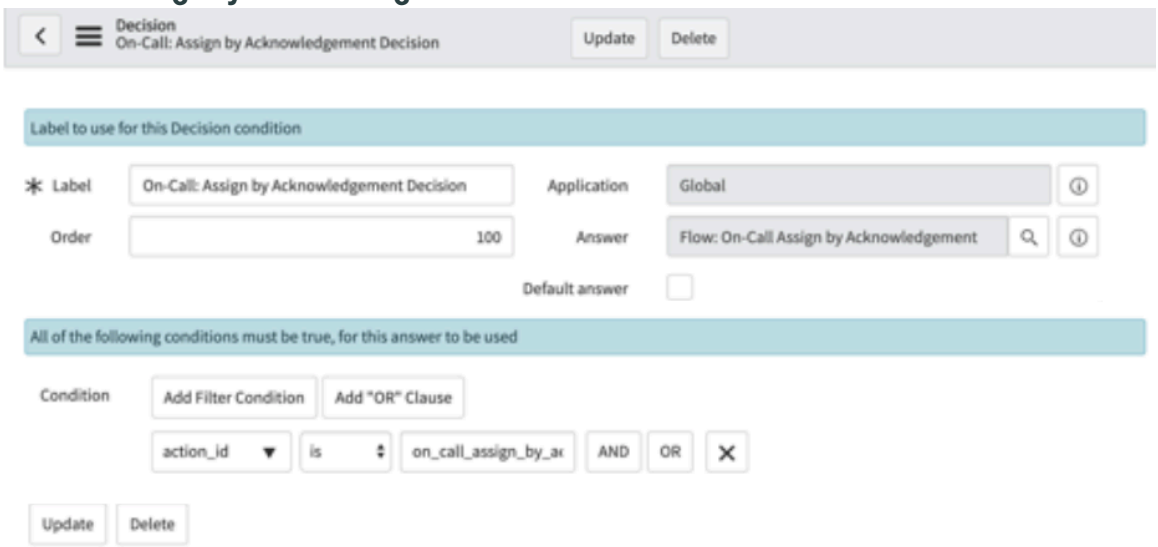
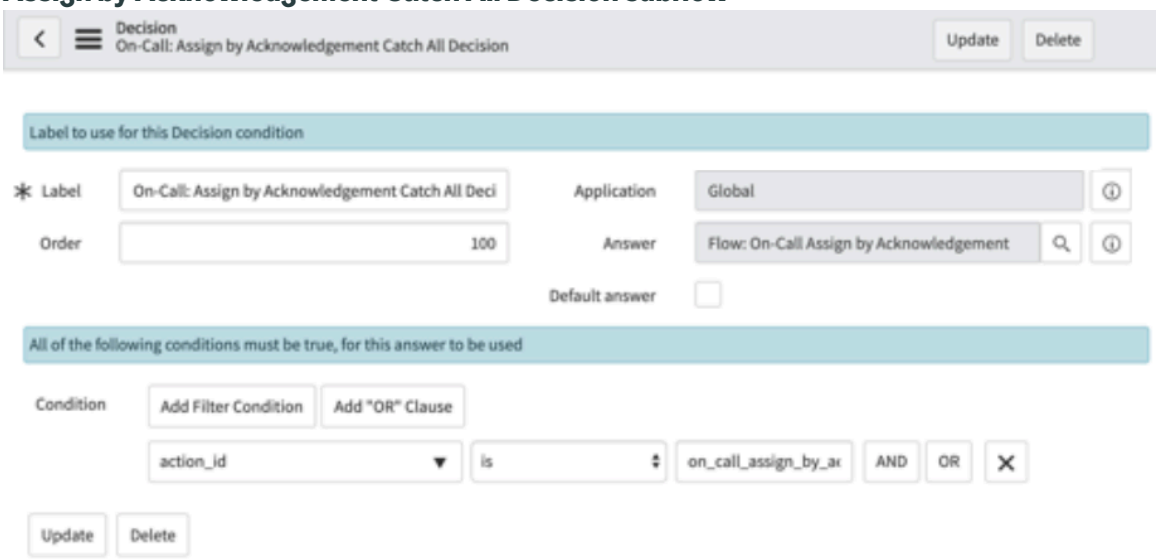
### Inbound Assign by Acknowledgement Decision subflow




## Slack > Inbound Decisions > On-Call: Assign by Acknowledgement Catch All Decision

Inbound configuration for catch-all response handling for escalation for Accept or Reject messages. Use *`action_id`* as the key to map outbound configuration and inbound decisions for catch-all situations. The answer points to the subflow that is executed when the user clicks **Accept** or **Reject**. Modify the record to change response handling behavior.

### Assign by Acknowledgement Catch All Decision subflow

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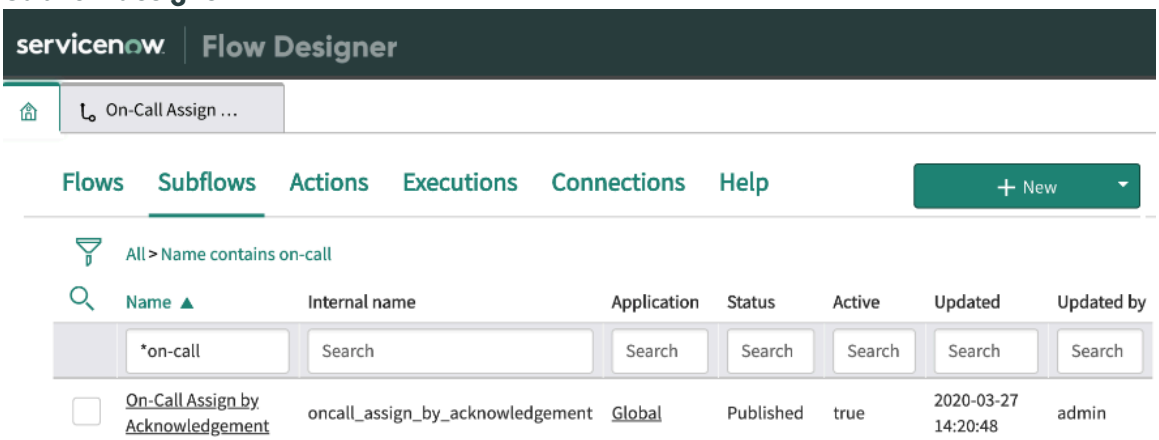
## Subflows

### Subflow designer




**On-Call Assign by Acknowledgement**

This subflow handles incoming responses from Slack and then acts. For example, assign a task to a user and return an acknowledgement message. In case of rejection, the subflow logs the response and moves the escalation to the next escalatee.

**Insert Slack Response**

This action creates a record in the [sn_slack_ah_v2_inbound] table for incoming Slack responses. You can reference the response by workflow based on `context_id`.

**On-Call Response Controller**

This action performs appropriate operations when the user clicks **Accept** or **Reject** from Slack. It invokes the utility methods to perform actions from the `OnCallSlackUtils` script include.

## Setting up SMS and voice messaging as contact methods

To send On-call escalation notifications as SMS or voice messages, you must configure Notify.

Configure the following items to use Notify with On-Call Scheduling:

- You must add at least one Notify phone number to the On-Call Group number group. This group is configured by default to handle inbound SMS responses (via On-Call: Check Assignment Response) that accepts or rejects an on-call assignment and to handle outbound voice calls (via On-Call: Assign by Acknowledgement Voice) to accept or reject assignments.
- You must configure workflows, such as the On-Call: Assign by Acknowledgement to drive escalations via SMS and Voice.

To set up SMS and voice message as contact methods, see Set up Notify with On-Call Scheduling

**Related topics**

On-Call Assign by Acknowledgement workflow

Controlling the on-call communication channel with Notify

## Set up Microsoft Teams as a contact method for an on-call escalation

Enable users to receive Microsoft Teams notifications for an on-call escalation.

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### Before you begin

User should have Microsoft 365 user credentials.

Role required: admin

### Procedure

1. Ensure that your ServiceNow instance is configured for Conversational Integration with Microsoft Teams and the IT Service Management integration with Microsoft 365 plugin (sn_now_teams_it) is active.

   For information on Virtual Agent permission policies, see Manage Now Virtual Agent permission policies.

2. Select **Microsoft Teams** as your preferred notification channel while defining the escalation settings for a user group.
   For information on escalation settings, see Escalation and reminder settings for rosters.
3. For the required user group, create a trigger rule that uses the On-Call: Assign by Acknowledgement trigger workflow.

   If a user or shift manager sets the preferred contact channel as Microsoft Teams, a notification is sent to the user in Microsoft Teams along with the actions that a user can perform.

   For information on creating a trigger rule, see Create an escalation trigger rule.

## Set up mobile push as a contact method for an on-call escalation

Enable users to receive mobile push notifications for on-call escalations.

### Before you begin

Role required: admin

### Procedure

1. Install ServiceNow Agent and enable mobile push notifications from the **Notifications** tab.
   For information on this tab, see Base system functionality for ServiceNow mobile.
   The mobile push appears as a communication channel in the ServiceNow instance.
2. Select **Mobile push** as your preferred notification channel while defining the escalation settings for a user group.
   For information on escalation settings, see Escalation and reminder settings for rosters.
3. For the required user group, create a trigger rule that uses the On-Call: Assign by Acknowledgement trigger workflow.

   If a user or shift manager sets the preferred contact channel as mobile push, a mobile push notification is sent to the user along with the actions that a user can perform.

   For information on creating a trigger rule, see Create an escalation trigger rule.

# Viewing schedules and request time-off

View your schedule, see the members of your group, request time off, and set your preferences for contact methods.

As an itil user you can perform these tasks:

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- View On-Call schedules
- Configure my availability and contact preferences
- Request time off and suggest who can cover

## View On-Call schedules

The tiled grouping of on-call shift schedules helps you to review shifts rather than having to search through all shifts in the system.

### Before you begin

Role required: itil, rota_manager, or rota_admin

### About this task

Each card on the On-Call Schedules page represents a shift and identifies the on-call members. A card displays the group name, the shift name, and rosters (Primary and Secondary).
On-Call schedules enable you to view the presence of on-call members. For more information on presence, see User presence.

**Note:**
By default, On-Call schedules are loaded in batches of 20. You can use the *com.snc.on_call_rotation.landing_page.group_limit* property update the setting. For details, see System properties for On-Call Scheduling.

### Procedure

1. Navigate to **All** > **On-Call Scheduling** > **On-Call Schedules**.

   **Note:**
   For a group with overlapping shifts, shift cards are displayed based on the escalation setting.

   The following tabs appear:

   - **Pinned On-Call Schedules**: Displays a personalized list of who is on-call for the groups you are most interested in. Pin groups here for fast access.
   - **My On-Call Schedules**: Displays only the On-Call schedules that you manage or are a member of.
   - **All On-Call Schedules**: Displays the list of all groups that have active On-Call schedules. You can also find who is on-call for groups that you have not pinned.

   Use the filter to display On-call schedules by group, schedule, or username.

2. **Optional:** In the **All On-Call Schedules** tab, pin a shift card by pointing to the card and clicking the Pin icon ( ).

   **Note:**
   When you pin a shift card of a group with overlapping shifts, all other shift cards of that group are also pinned.

3. **Optional:** In the **Pinned On-Call Schedules** tab, unpin a shift card by clicking the Pin icon.
4. To view details of a shift, click the shift card.

   **Note:**
   Each shift card displays only the first two rosters.

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If you are a shift manager or roster member, the schedule opens. For more information, see Updating an On-Call schedule. In all other cases, you are redirected to the calendar view. For more information on on-call scheduling calendars, see Manage shifts from the Calendar view.

5. **Optional:** To view roster and escalation details, click **Roster and escalation details** on the shift card.
   A dialog box displays the following tabs:
   - Roster: Displays a list of all rosters and contact number, email address, group, and the shift for the active On-Call member.
   - Escalation Path: Displays the escalation path defined for the shift.

   **Note:**
   By default, the details of the on-call member of the primary roster are displayed. Click **Send a direct message** to send a direct message to the on-call member. Alternatively, call the member if the Notify WebRTC is configured. For more information on real-time messaging, see Connect. For information on Notify WebRTC, see Forward to notify client workflow activity. For information on the **Specify a valid Notify Number with voice capability** property that enables the Notify WebRTC for on-call, see System properties for On-Call Scheduling.

6. **Optional:** To view gaps and conflicts in a shift, click the info badge on the shift card.
   - This is applicable only for group managers, shift managers, and delegated shift managers.
   - This information is displayed based on the setting of the `com.snc.on_call_rotation.landing_page.show_pending_actions` property. For more information, see System properties for On-Call Scheduling.

## Configure my availability and contact preferences

You specify your availability and the methods to use to contact you for On-Call escalations. The instance notifies you if an admin overrides your settings for some reason.

### Before you begin

Role required: itil or admin

### Procedure

1. Navigate to **All** > **On-Call Scheduling** > **My Preferences**
2. On the **Contact Attempts** tab, click the + icon and fill in the **Availability** form.

**Availability form**

| | |
|---|---|
| Name | A unique and meaningful name for this record of your availability settings. |
| User | The user for whom you are creating the availability (typically yourself). |
| Active | Option to enable this availability record. Select the check box to activate your availability. |
| Schedule type | Select an existing availability schedule or create a custom schedule. |
| Use these fields to create a custom availability schedule: | |

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| | |
|---|---|
| Start time | If this shift is not an all-day shift, then specify the start time of your availability. |
| End time | The end time of your availability. |
| Repeat on | The time of a single duration. For example, if you select weekly repetitions, specify the days of the week when you are available. |
| Time zone | The time zone of your availability.<br>**Note:** The time zone is not editable and is taken from your user's profile. |

3. Click **Submit.**
4. On the **Contact Preferences** tab, click the contact **Attempt** method to configure.
   The **Contact Preferences** dialog box appears.
5. Select the contact methods that the instance should use to contact you while you are on-call.
   The methods you select are the contact methods that the instance should use for this contact attempt. Depending on your instance configuration, you can specify any or all of the following notification methods:
   - SMS text
   - Email
   - Slack
   - Voice
   - Microsoft Teams. For information on setting up this channel, see Set up Microsoft Teams as a contact method for an on-call escalation.
   - Mobile push. For information on setting up this channel, see Set up mobile push as a contact method for an on-call escalation.
6. Repeat the process for each contact attempt.

**Note:**
Admins can specify overrides of your contact methods for all members of your group. Override settings appear on the **Contact Overrides** tab.

## View my group schedules

You can see the on-call schedules for your groups.

### Before you begin

Role required: itil

### Procedure

1. Navigate to **All** > **On-Call Scheduling** > **My Group Schedules**.
2. Open a schedule.
3. **Optional:** To view a roster, click its order number in the **Rosters** related list.

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## View my personal schedule on the My Schedule report

You can view when you are on call and the escalation lineup for a particular date range.

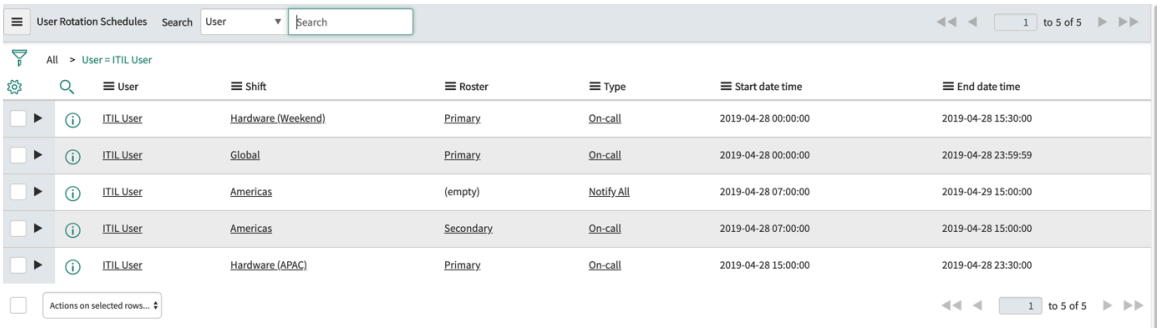
### Before you begin

Role required: itil

### Procedure

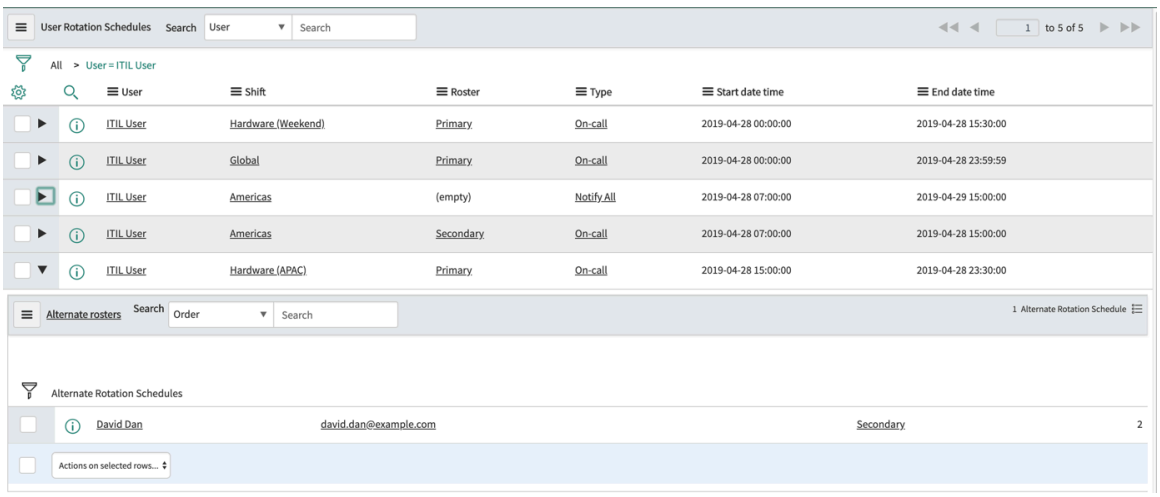
1. Navigate to **All** > **On-Call Scheduling** > **Reports** > **My Schedule Report**.
2. In the **Show for** field, select a date range and then click **Submit**.

   The User Rotation Schedules list shows the shift, the roster, and the start and end times for each timeslot.




3. To view alternate rosters, expand an entry by clicking the arrow.

   The alternate roster appears for that timeslot. For example, if you are the primary contact, this list shows secondary and tertiary contacts for the timeslot.




## Request time off and suggest who can cover

You can schedule your own time off and suggest a suitable cover from among fellow roster members.

### Before you begin

To use this feature, the system administrator must enable the **Configuration to determine if PTO requests need approval** system property (*com.snc.on_call_rotation.pto.configuration*).

The time-off requests are updated to *sys_user.schedule* record.

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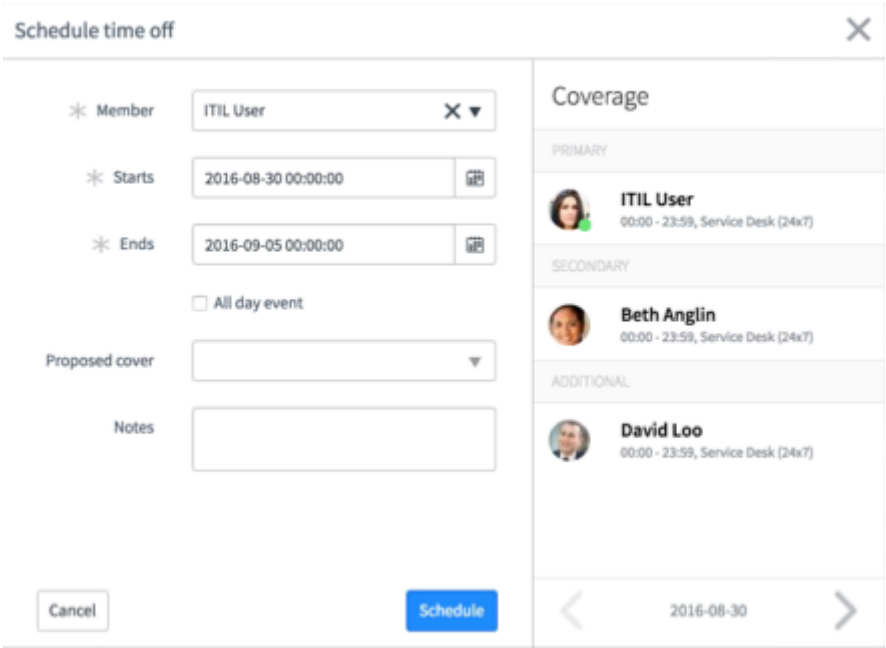
Role required: itil

### Procedure

1. Navigate to **On-call Scheduling** > **On-call Calendar**.
2. Select the shift entry for the time off.
3. Click **Schedule Time Off** and fill in the form.




#### Schedule time off form

| Field | Description |
|---|---|
| Member | The member getting time off (typically, yourself). |
| Starts and Ends | Start and end dates for the time off. |
| Propose cover | Name of a roster member who can provide cover in the absence. |
| All day event | Option to specify that the time-off period involves full workdays. |
| Notes | Optional. Comments to help the shift manager understand the request. |

4. Click **Schedule**.
   The time off is tentatively scheduled in your On-Call calendar.

## View my On-Call calendar on my calendar app

You can subscribe to your On-Call calendar using your personal calendar client.

### Before you begin

1. Ensure that your calendar client uses and supports the iCalendar format.
2. Ensure that your calendar client can subscribe to an external calendar.
3. If calendar client meets the requirements, ask your shift manager to send your On-Call calendar subscription URL by email notification.

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**Important:**
You must provide your instance credentials to authenticate yourself to use the subscription URL to view On-Call events. Currently, only the Calendar application on Mac OS X 8.0 and newer and the Outlook application on Windows 2013 and newer support authenticated calendar subscriptions.

Role required: rota_admin, itil, rota_manager, or admin

### Procedure

1. On your calendar client, add a new external calendar subscription.
2. Enter the On-Call calendar subscription URL that you received.
3. Click **Subscribe**.
4. Enter your login details for your instance.
5. Specify additional details such as how frequently to update the calendar.

### Related topics

Assigning On-Call Scheduling roles

## Managing schedules and shifts

You can configure and manage an On-call schedule and shift. Add or remove members to a shift and override their contact preferences.

you can configure roster, shift and on-call schedule details. Add or remove members to a shift and override their contact preferences.

As a rota_manager or rota_admin you can perform most of these tasks for the members of your group.

- Configure or update an On-Call shift
- Configure or update an On-Call schedule
- Managing roster members
- Manage requests for time off
- Override contact preferences for a shift
- Configure preferences for a user group
- Delegate the shift manager [rota_admin] role

### Enable users to subscribe to the On-Call calendar

Configure an On-Call calendar subscription URL and send it to the members of a shift. The URL is an iCal link that enables users to subscribe to their on-call calendar from their preferred calendar client.

#### Before you begin
Role required: admin, rota_admin, or rota_manager

#### About this task
The Subscription URL supports SSO authentication to view and download on-call calendar.

**Note:**
Do not share the subscription URL for security reasons.

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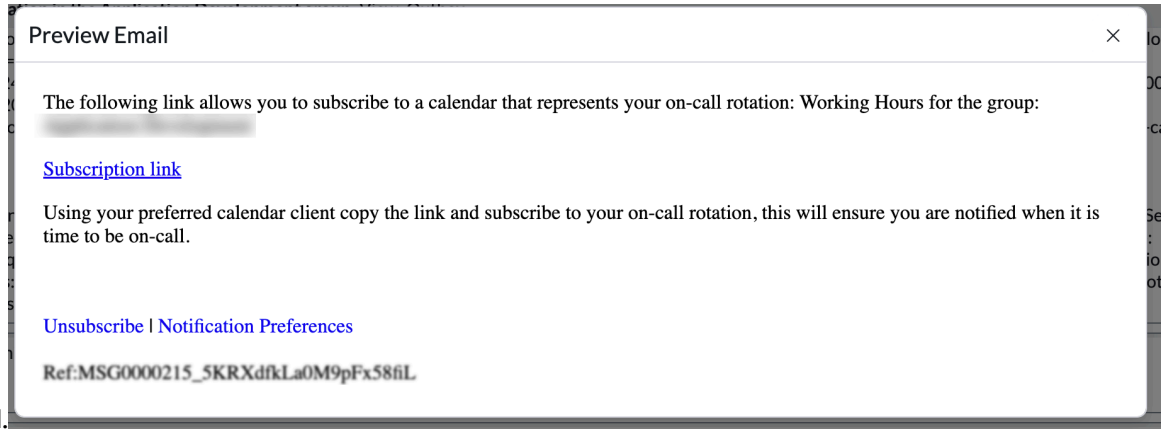
### Procedure

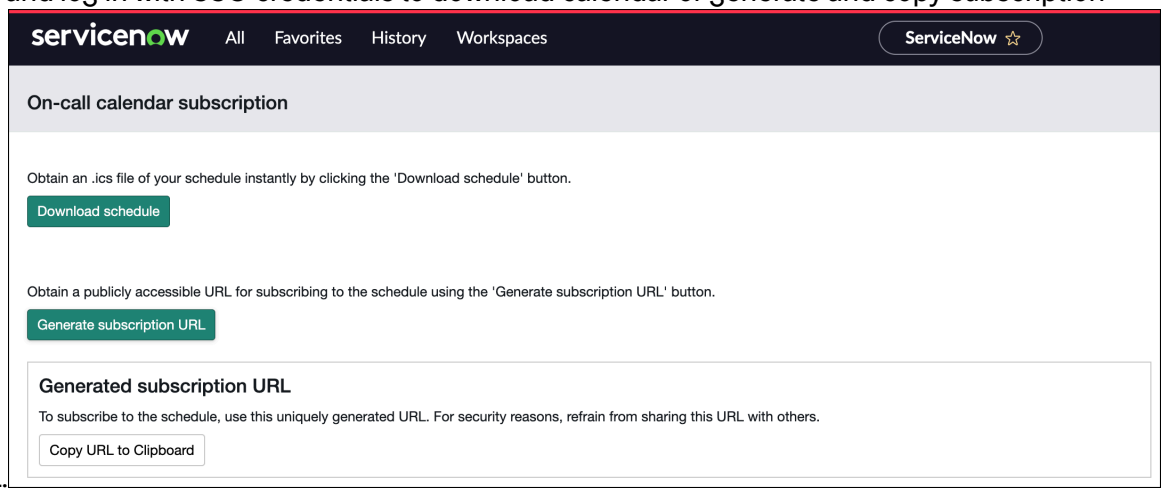
1. Navigate to **All** > **On-Call Scheduling** > **My Group Schedules**.
2. Select the shift for which you want to send the on-call calendar subscription URL.
3. Specify the following details in the **Calendar Subscription** section.

| Name | Definition |
|---|---|
| Coverage interval | Select if you want to update the subscribed calendar with weekly or daily coverage details. |
| Get coverage for | Based on your coverage interval selection, select the number of weeks or days for which you want to update the subscribed calendar. |

4. Select **Update**.
5. Select **Send Subscriptions** to send the calendar subscription URL to all members of the shift by email.




Members of the shift will receive an email with the subscription link. Select the **Subscription link** and log in with SSO credentials to download calendar or generate and copy subscription URL.




## Configure preferences for a user group

Specify the On-Call preferences for a user group.

### Before you begin

Role required: admin, rota_admin, or rota_manager.

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### Procedure

1. Navigate to **All** > **On-Call Scheduling** > **Administration** > **Group Preferences** and then set the values as needed.

**On-Call Group Preference form fields**

| Field | Description |
|---|---|
| Group | User group for which the On-Call preferences should apply. |
| Shift managers | Users who can manage the shift in addition to group managers, shift administrator [rota_admin], and delegated shift managers. You can also select the current group members. |
| Allow Shift Schedule Overlap | Specifies if overlapping schedules are allowed for shifts within the group. When set to `Default`, the value selected for the **Configuration to control whether to allow overlapping Shift schedules** (*com.snc.on_call_rotation.allow_rota_overlap*) property is applied.<br>**Note:** Shift overlap is required to have a hand-off period between shifts. With this, multiple shifts can be on-call for the same duration. On-call members from multiple shifts can be contacted. |
| Escalation rule on Shift overlap | Escalation rule that applies when there is a shift overlap. When set to `Default`, the value selected for the **Escalation rule which applies when Shifts overlap** (*com.snc.on_call_rotation.escalation_rule_rota_over*) property is applied. |
| PTO approval preferences | Specifies if an On-Call member in the group can create time-off request (PTO). When set to **Default**, the value selected for the sys property *com.snc.on_call_rotation.pto.configuration* (**This property governs if an On-Call user (Not "admin, rota_manager, group manager or rota_admin") is allowed to create PTO**) is applied. |
| First Day of the Week | Select a preferred start day of the week for the selected group |

2. To view On-Call property settings, click **View Global Settings**.
3. Click **Submit** to configure the settings or **Delete** to delete the preference.

## Override contact preferences for a shift

Override all shift members' contact preferences to enforce a communication channel, for example, in case of an emergency.

### Before you begin

Role required: rota_admin, rota_manager

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### Procedure

1. Use one of the following methods to open the Edit Escalation and Contact Preferences page:
   - **a.** Navigate to **On-Call Scheduling** > **On-Call Schedules**. The On-Call Schedules page opens to the All On-Call Schedules tab.
     **b.** Click a schedule card.
     **c.** On the **Shifts** tab, click the Actions icon ( ) for the shift and select **Edit Escalation and Contact Preferences**.
   - **a.** Navigate to **On-Call Scheduling** > **My Group Schedules**.
     **b.** Select the shift.
     **c.** Click **Edit Escalation and Contact Preferences**
2. On the **Contact Preferences** tab, click the contact **Attempt** method to configure.
   The **Contact Preferences** dialog box appears.
3. Select the contact methods that the instance should use for all shift members for the selected contact attempt.
   Depending on your instance configuration, you can specify any or all of the following notification methods:
   - SMS text
   - Email
   - Slack
   - Voice
   - Microsoft Teams. For information on setting up this channel, see Set up Microsoft Teams as a contact method for an on-call escalation.
   - Mobile push. For information on setting up this channel, see Set up mobile push as a contact method for an on-call escalation.

   **Note:**
   SMS and voice require that Notify is active.
4. Enable the **Override user preference** option.

## Configure or update an On-Call shift

You can add extra coverage, specify extra times for when a shift is active, and schedule time off.

### Before you begin
Role required: rota_admin or rota_manager

### About this task
You can update the calendar only for the time zone specified in your user profile.

### Procedure

1. Navigate to **All** > **On-Call Scheduling** > **On-Call Calendars**.
   The on-call calendar opens.
2. Click the Timeline view icon ( ).
3. Click the Filters icon ( ) and then select the group.
   The calendar displays the selected group.

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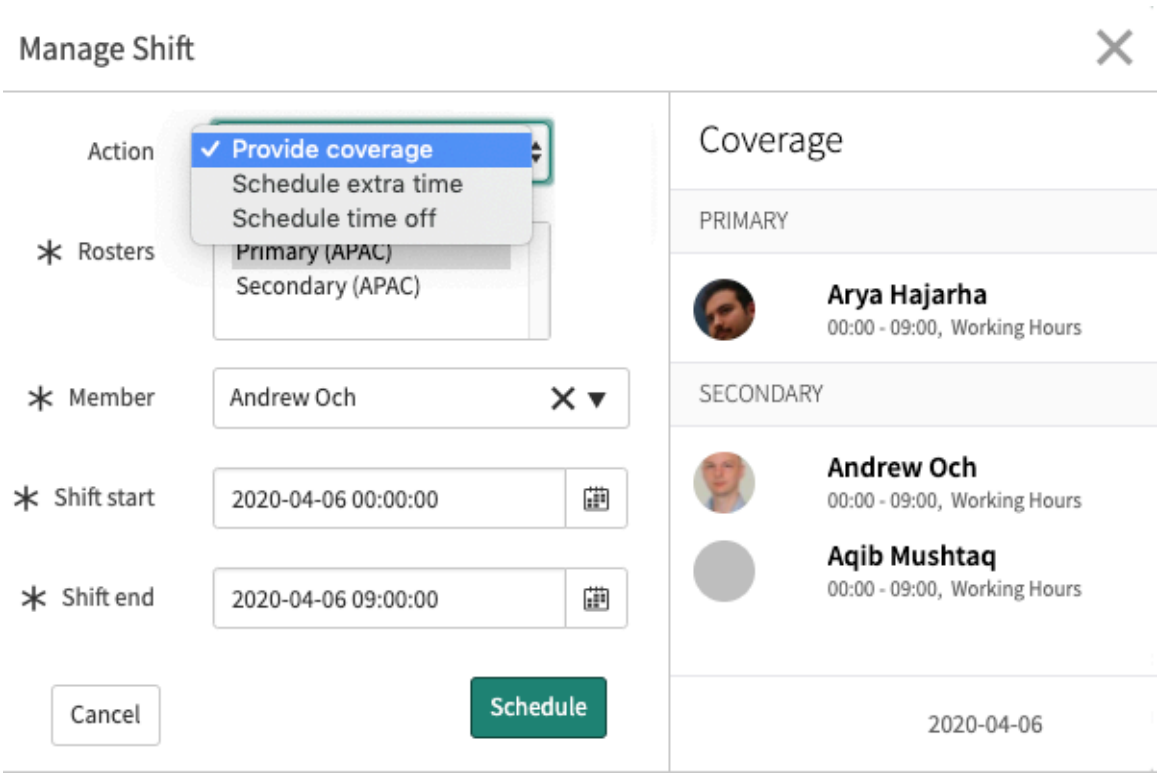
4. Right-click a block that represents a member of the shift and select **Manage Shift**.
The Manage Shift dialog box displays the current shift settings.




5. Select an **Action**, as appropriate.

| Option | Description |
|---|---|
| **Provide coverage** | Select details of the member who will provide on-call coverage for an other roster member. The following options appear when you select this option:<br>○ Rosters: Select one or more rosters for which the member will pro vide coverage.<br>○ Member: Select the member to provide extra coverage.<br>○ Shift start: Select the date from which the coverage will start.<br>○ Shift end: Select the date on which the coverage will end.<br>**Note:** The coverage is created between the start and end date of the shift based on its schedule time. |
| **Schedule extra time** | Specify extra coverage for the selected shift. The following options ap pear when you select this option:<br>○ Shift: Select the shift for which you want to specify extra time.<br>○ Shift start: Select the date from which the extra time will start.<br>○ Shift end: Select the date on which the extra time will end. |
| **Schedule time off** | Specify the group member who will take scheduled time off during the selected time frame. The following options appear when you select this option: |

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| Option | Description |
| --- | --- |
| | ○ Member: Select the member who requested time off.<br>○ Starts: Select the date and time from which the time-off period will start.<br>○ Ends: Select the date and time on which the time-off period will end.<br>○ All day event: Select if the time-off period is a total of one working day.<br>○ Proposed cover: Select the name of the shift member who you would like to provide cover in your absence. |

6. Click **Schedule** to schedule the update.
7. To save the view settings, click the Bookmark this filter icon ( ☆ ).

**Related topics**

View On-Call schedules

Manage shifts from the Calendar view

### Configure a roster

Edit a roster to specify its reminder and escalation settings and to identify a subset of group members to participate in the On-Call roster.

## Before you begin

Role required: rota_admin or admin

## Procedure

1. Navigate to **All** > **On-Call Scheduling** > **On-Call Calendars**.
2. Right-click a shift and select **Edit Shift** from the **Actions** list.
3. In the **Rosters** related list, select a roster and then fill the form.

### Roster form fields

| Field | Description |
| --- | --- |
| Name | Name of the roster. |
| Shift | Shift associated with the current roster. |
| Active | If selected, the roster is active for on-call operations. |
| Order | Order of the roster. |
| Rotation interval | Type of the rotation interval. |
| Day of week for rotation | Weekday on which the roster rotation should start. When this field is specified, roster rotation happens based on the specified frequency and the weekday.<br>**Note:**<br>This field is displayed only if the **Rotation interval** field is set to **Weekly**. |

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| Field | Description |
|---|---|
| Rotate every | Frequency of the rotation interval. |
| Rotation start date | Start date of the rotation. |
| Rotation start time | Start time of the rotation. |
| All day rotation | If selected, roster rotation happens throughout the day.<br><br>To specify a particular time of day for roster rotation, for example 08:00 instead of midnight, deselect the check box and specify the time. |
| Escalation Settings | |
| # reminders | Number of times that reminders are sent to a user who does not reply within the time frame defined in **Time between reminders**. |
| Time between reminders | Time between each reminder. |
| Time before escalation | Values in the**Number of reminders** and **Time between reminders** fields determine the value in the **Time before escalation** field.<br><br>For example, if **Number of reminders** is 2 and **Time between reminders** is 10 minutes, then the **Time before escalation** is 30 minutes. That is, the time that passes between the first notification of a non-responsive roster member and the first notification of the next member in the escalation path. |
| Reminder Communication | |
| Send on-call reminders | If selected, a reminder is sent to the email address specified in the user record, unless it is specified somewhere else in the notification preferences. Notification preferences take precedence over the user record. |
| Reminder lead time (days) | Lead time for email reminders.<br><br>**Note:**<br>This field is displayed only when the **Send On-Call Reminders** check box is selected. |

4. Click **Update**.

**Note:**

- Initially, roster members are automatically populated from the user group.
- All members of a roster must be members of the same user group.

**Related topics**

Escalation and reminder settings for rosters

### Update shift details from the On-Call calendar

To save time, update shift details directly from an on-call calendar.

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### Before you begin
Role required: rota_admin or admin

### Procedure
1. Navigate to **All** > **On-Call Scheduling** > **On-Call Calendars**.
2. In the title bar, click the toggle filters icon and select a user group.
3. Click the shift name on the calendar.
   A dialog box displays the **Actions** list and information about the primary and secondary rosters. For each listed user, you have an option to either connect through phone, email, or chat. The application that is launched for phone or email is dependent on the client that is installed in the local machine.
4. Navigate to **Actions** > **Edit Shift**.

#### Edit Shift form fields

| Question | Description |
|---|---|
| Name | The name of the shift. |
| Group | Select **Yes**, and then select one of the predefined options in the next question. Select **No** to set up the schedule's configuration manually. |
| Active | Shows the state of the shift |
| Schedule | The shift is a part of this schedule. Choose from a predefined list of schedules using the lookup if you want to change the schedule. Click the calendar to view the complete schedule. |
| Based on | The template that the schedule is based on |
| Background Color | Use this field to specify the background color of the shift or to change from an existing color. Differentiate between groups with the colors. |
| Catch All | Specify who should receive notifications in case none of the people who are on-call accepted the incident assignment. It can be none, a group manager, a shift manager, an individual, or any or all roster members.<br>○ Select **Notify Individual** to specify a member of the group to notify.<br>○ Select **Notify All** to specify a shift. All shift members are notified. |
| Manager | The user with the shift manager [rota_admin] role. |
| Override user preference | User preferences are overridden with contact preferences when set to true. |
| Send On-Call Reminders | If selected, on-call reminders are sent. |
| Reminder lead time (days) | Lead time for email reminders.<br>**Note:**<br>This field is displayed only when the **Send On-Call Reminders** check box is selected. |

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| Question | Description |
|---|---|
| Coverage interval | Update interval for the subscribed calendar: Weekly or daily coverage details. |
| Get coverage for | Number of weeks or days for which you want to update the subscribed calendar. |

### Send or resend reminders of an upcoming shift

Remind roster members of an upcoming shift by sending an email notification. You specify the number of days before their shift starts for the email.

#### Before you begin
Role required: rota_admin or admin

#### About this task
The reminder is sent to the email address specified in the user record, unless the address is specified in other notification preferences. Notification preferences take precedence over the user record.

#### Procedure

1. Navigate to **All** > **On-Call Scheduling** > **My Group Schedules**.
   The option is also available when you edit a shift in an On-Call calendar.
2. Select the shift.
3. On the Shift form, select the **Send on-call reminders** check box and then specify the number of days in the **Reminder lead time** field.

   **Note:**
   If you set the value of **Reminder lead time (days)** to more than one day and also set the roster to daily rotation, the instance does not send reminder emails.

4. To resend a reminder, click **Resend**.
5. Click **Update**.

#### Related topics

Assigning On-Call Scheduling roles

Manage shifts from the Calendar view

### Configure the lead time for email reminders

On-Call Scheduling includes a scheduled job that checks if any shift members should be notified about upcoming On-Call commitments. Modify the lead time for the reminder to be sent.

#### Before you begin
Role required: rota_manager or rota_admin

#### Procedure

1. Navigate to **All** > **On-Call Scheduling** > **On-Call Calendars**.
2. Right-click the shift and select **Edit Shift**.
3. Update the **Reminder lead time (days)** value for the on-call schedule record or for any of its rosters.

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The reminder lead time defined on a roster is always respected. If no lead time is defined, the instance uses the schedule reminder lead time. If the reminder lead time is not defined for either the schedule or its rosters, then the instance uses a default of 2 days.

**Note:**
The **Reminder lead time** on the Roster form is different from the **# reminders** and **Time between reminders** values in the Escalation Settings section of the form.

The escalation settings are used only to configure reminders for escalations. The **Reminder lead time** is in the Reminder Communication section of the Roster form, and is used to email reminders for upcoming on-call commitments.

### Manage requests for time off

As a shift manager, you can review and approve time-off requests from shift members. You also specify the roster member who can cover for the time.

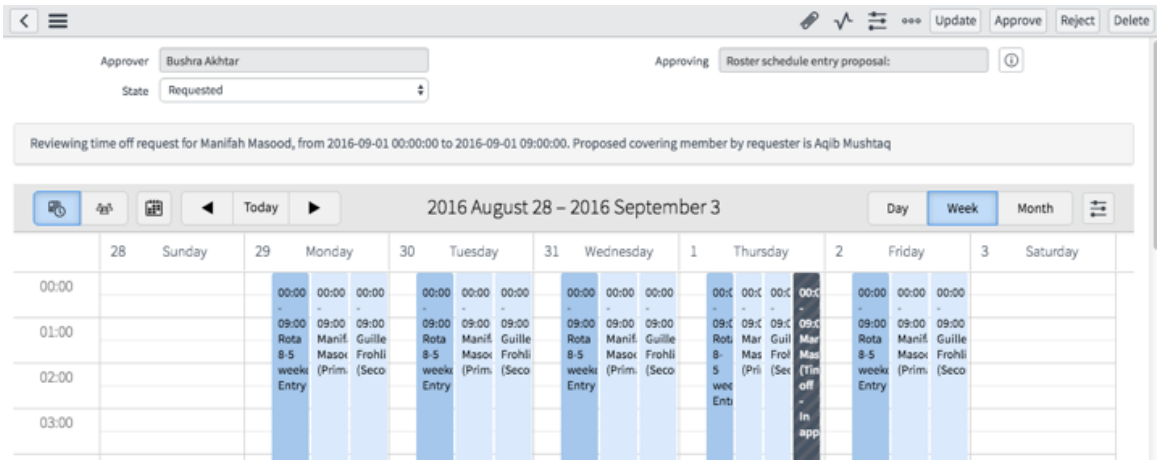
### Before you begin

Role required: rota_manager

### Procedure

1. Navigate to **All** > **Self-Service** > **My Approvals**.
2. Select the time-off request record to approve.

   The time-off request displays the details of the time-off requested by the member of your team. In this example, the dark blue shade with stripes represents the requested time-off. A message also gives you the request details including that of the proposed cover.




3. **Optional:** Enter comments in the **Comments** section.
4. Select **Approve** or **Reject**.

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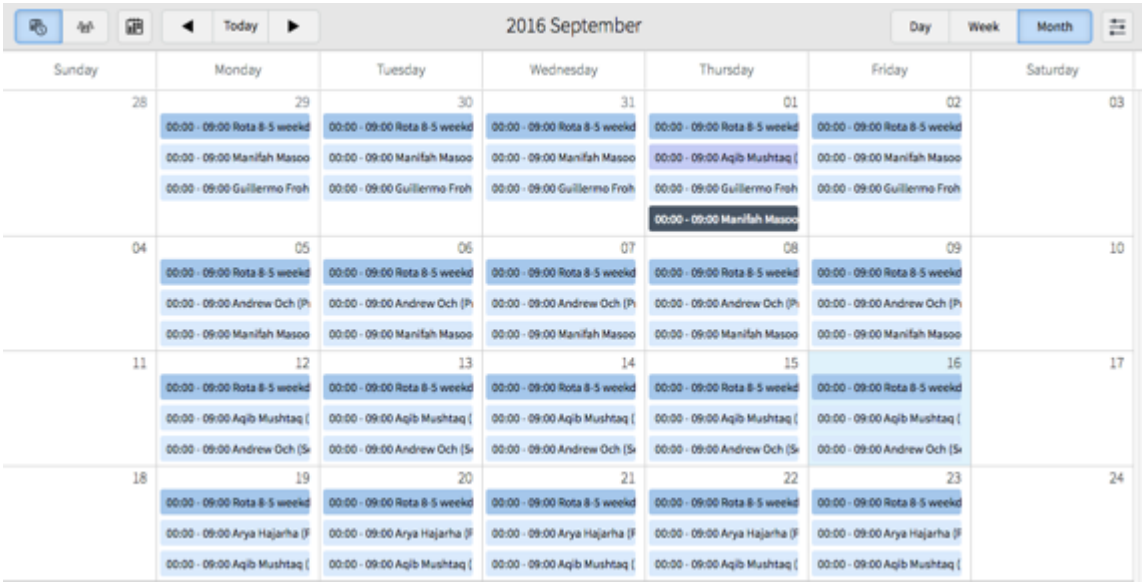
- For rejection, the On-Call calendar no longer indicates the time-off details and the requester receives email notification.
- For approval, the On-Call calendar indicates the time-off details and the requester receives email notification.




**Related topics**

Assigning On-Call Scheduling roles

### Resolve gaps, conflicts, and time-off requests in a shift

Review and resolve gaps and conflicts. Find a replacement on-call member for time-off requests to ensure proper support coverage.

## Before you begin

Role required: rota_manager

## About this task

Possible reasons for gaps are:

- Time off without coverage
- User has been moved out of the group
- User is marked as inactive

A conflict is possible if a user is assigned as both the primary and secondary point of contact for a shift.

## Procedure

1. Navigate to **All** > **On-Call Scheduling** > **On-Call Schedules**.
2. Click a shift card.

**Note:**
If you are a shift manager or roster member, the schedule view opens. In all other cases, you are redirected to the calendar view. For more information on on-call scheduling calendars, see Manage shifts from the Calendar view.

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- The On-Call Schedules page open. For more information, see Updating an On-Call schedule
- The pending actions for the current shift appear in the **Pending Actions** section.

.

3. To resolve gaps or conflicts, perform the following steps.

   a. Click **Review** in the **Pending Actions** section.
   The calendar view appears, and gaps or conflicts are highlighted.

   b. Click the Information icon ( ) to view gaps.

   c. Right-click the shift and select **Edit shift** from the **Actions** list.

   d. Scroll down to the **Rosters** list and select the roster where the user is unavailable.

   e. In the **Members** related list, add a **To** value for the unavailable user.

   f. Add a new member with a **From** value to close the gap.

4. To resolve a time-off request, perform the following steps.

   a. Click **Review** in the **Pending Actions** section.
   The calendar view appears, and time-off requests are highlighted.

   b. Right-click the shift and select **Manage shift** from the **Actions** list.
   The Manage Shift dialog box appears.

   c. Approve the time-off requests.

### Managing roster members

You can manage roster members by adding and removing users to or from the roster as needed. You can also modify the order number for a member without affecting the past shift schedule.

### Add a new or returning employee to a roster

You can add a new employee or an employee who had previously been a member to a roster.

#### Before you begin

Role required: rota_manager, rota_admin, or admin

#### Procedure

1. Navigate to **All** > **On-Call Scheduling** > **My Group Schedules**.
2. Open the required shift form.
3. In the Rosters related list, click the information icon ( ) for the roster to which you want to add a member.
4. Click **Open Record**.
5. On the Roster form, click **Add** in the Members related list.
6. On the form, fill in the fields.

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### On-Call Add Member form

| Field | Description |
|---|---|
| From date | Date on which the employee will join the roster.<br>**Note:**<br>The member will be active on the roster in the next rotation. |
| Add after member | Name of the member after whom the new member will be in the order. The order number determines where the member starts on the rotation cycle. |
| Shift | Name of the shift. |
| Member | Name of the member to add to the roster. |
| Rosters | Rosters affected after modifying the order of a member. This field is auto-populated by comparing the members in the rosters. If a member exists in more than one roster, both the rosters are auto-populated to avoid conflicts in schedule. |
| Current roster | Roster from which you navigated to the form. |

7. Click **Submit**.
   The instance adds the employee to the roster.

   **Note:**
   For a returning employee: The instance displays two shift member records for the same employee with different start and end validity dates.

## Modify the order of a member in a roster

You can modify the order number for a member without affecting the past shift schedule.

### Before you begin

Role required: rota_admin, rota_manager, or admin

### Procedure

1. Navigate to **All** > **On-Call Scheduling** > **My Group Schedules**.
2. Open the required shift form.
3. In the Rosters related list, click the information icon ( ) for the roster in which you want to modify the order of a member.
4. Click **Open Record**.
5. On the Roster form, click **Move** in the Members related list.
6. On the form, fill in the fields.

### On-Call Move Member form

| Field | Description |
|---|---|
| From date | Date from when the order change applies to the member. |

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| Field | Description |
|---|---|
| | **Note:** The member's order will be active on the roster in the next rotation. |
| Member | Name of the member to update the order. |
| Current roster | Roster from which you navigated to the form. |
| Shift | Name of the shift. |
| Move type | Type of move.<br>○ **Move after**: Moves the order of the member after the target member.<br>○ **Swap**: Swaps the order of the member with the target member. |
| Target member | Name of the member with whom the order is swapped or after whom the member will be in the execution order. |
| Rosters | Rosters affected after modifying the order of a member. This field is auto-populated by comparing the members in the rosters. If a member exists in more than one roster, both the rosters are auto-populated to avoid conflicts in schedule. |

7. Click **Submit**.
   The member appears in the new order. The original record has a **To** date for the end of validity and the new record has the current date as the **From** date for the start of validity.

### Remove a member from a roster

You might remove a member from a roster, for example, if they are no longer a member of the organization or of the group.

#### Before you begin

Role required: rota_manager, rota_admin, or admin

#### Procedure

1. Navigate to **All** > **On-Call Scheduling** > **My Group Schedules**.
2. Open the required shift form.
3. In the Rosters related list, click the information icon ( ) for the roster from which you want to remove a member.
4. Click **Open Record**.
5. On the Roster form, click **Remove** in the Members related list.
6. On the form, fill in the fields.

#### On-Call Remove Member form

| Field | Description |
|---|---|
| From date | Date from when the member is removed. |
| Rosters | Rosters affected after modifying the order of a member. This field is auto-populated by comparing the members in the rosters. If a member exists in more than one roster, |

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| Field | Description |
|---|---|
| | both the rosters are auto-populated to avoid conflicts in schedule. |
| Delete member | Option to delete the member record.<br>**Warning:** When you enable this option to delete the member record, the deleted member rotation history is removed, and the rotation history of other members is affected. |
| Member | Name of the member to remove from the roster. |
| Current roster | Roster from which you navigated to the form. |
| Shift | Name of the shift. |

7. Click **Submit**.

**Related topics**

Assigning On-Call Scheduling roles

## Configure or update an On-Call schedule

Create an On-Call schedule or edit an existing schedule by defining shifts and rosters.

Set up an on-call schedule

### Before you begin
Role required: rota_admin, rota_manager

### About this task
You can use the wizard to create an on-call schedule using an existing template or you can create shifts from scratch. You can create multiple shifts at given time and can preview shifts while creating them. This enables you to create rosters, define escalation policies, and review and publish shifts.

After running the wizard, you can adjust individual roster, escalation, and reminder settings to fine-tune the setup. You can also enable on-call notifications by setting up rotation workflow triggers.

### Procedure

1. Navigate to **All** > **On-Call Scheduling** > **Create/Edit Schedule**.
2. **Optional:** Navigate to **All** > **On-Call Scheduling** > **My Group Schedules** and click **New**.
3. In the **Define Schedule**, from the **Select Group** choice list, select the group for which you are defining the schedule.
   You can edit an existing shift for a selected group. If you want to create a new schedule, click **Add shift** button.

   **Note:** When creating a new on-call group schedule, you are redirected to oc_creation_wizard page instead of expert_shell page which is no longer supported.

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4. Choose an existing template for the shifts or create a new shift.
5. **Optional:** Select an option from the **Allow Shift Schedule overlap** drop-down list to allow or prevent overlapping schedules for shifts within the group.
   For example, if a group has a 24x7 schedule, you can create multiple schedules for the group. Shift overlap is required to have a hand-off period between shifts so that multiple shifts can be on-call for the same duration.

   (Optional) If you select **Allow Shift Schedule overlap**, then the **Escalation rule on Shift overlap** drop-down field appears.
6. **Optional:** Select an option from the **Escalation rule on Shift overlap** drop-down list to specify which shift needs to be notified of an escalation during a shift overlap.
   You can escalate to an incoming, an outgoing, or to all shifts.
7. Fill in the form fields.

**Define Schedule**

| Question | Description |
|---|---|
| Name | Name of the shift that appears on the **On-call calendar** page. |
| Would you like to use an existing schedule? | Option to use an existing schedule.<br>○ Select **Yes** to use an existing or predefined shift.<br>○ Select **No** to create a new schedule. |
| Schedule | Select the value to base your schedule on. Some options are available in the base system, for example, 24x7, Workday 8-5.<br><br>This option appears only if you answer **Yes** to **Would you like to use an existing schedule?**.<br><br>The logged-in user's time zone is used as the basis for these schedules. If the logged-in user does not have a time zone specified, the instance time zone is used. |
| Start date | The date on which the shift is scheduled to begin. |
| Specify holidays | Option to define holidays.<br>○ Select **Yes** to define holidays for the on-call shift. You can select an existing holiday schedule.<br>○ Select **No** to not specify holidays for the shift. |
| Holiday Schedule | Specify a holiday schedule for the group. |
| Additional fields<br><br>**Note:**<br>The following fields are displayed only when the **Would you like to use an existing schedule?** field is set to **No**. | |
| Time Zone | The time zone in which the shift operates. |
| Is the shift for this schedule all day? | List of options. Specify whether this shift is an all-day shift. |

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| Question | Description |
|---|---|
| Start | The time of day the shift is scheduled to start. The start and end time represent one shift. The date is different only if the shift spans midnight. |
| End | The time of day the shift is scheduled to end. The start and end time represent one shift. The the date is different only if the shift spans midnight.<br><br>For example, for the 8 a.m. to 8 p.m. shift, the start is 2014-01-01 08:00:00 and the end is 2014-01-01 19:59:59. For the 8 p.m. to 8 a.m. shift, the start is 2014-01-01 20:00:00 and the end is 2014-01-02 07:59:59. |
| Repeats | The days that the shift repeats.<br><br>**Note:**<br>The wizard does not provide a monthly or yearly option. Creating a monthly or a yearly shift by editing the schedule manually is not advised because it is hard to determine the on-call person over a long period. In this case, create a yearly or a monthly schedule with only one roster and one member so that the same person is always on-call. Make any exceptions as a one-time change in the roster for the shift. |
| Send On-Call Reminders | Option to send on-call reminders to members of the roster. |
| Reminder lead time (days) | Lead time for email reminders.<br><br>**Note:**<br>This field is displayed only when the **Send On-Call Reminders** option is selected. |
| Coverage interval | Interval for updates of coverage details. Specifies whether you want to update the subscribed calendar with weekly or daily coverage details. |
| Get coverage for | Number of weeks or days for which you want to update the subscribed calendar. |

**Note:**
The instance saves the schedule and adds it to the list of existing schedules.

8. Click **Next**.
9. **Optional:** Click **Add Shift** to add another shift to the schedule if needed.
10. Use the **Members** page to specify members for a shift and rosters.

### Configure Members

| Field | Description |
|---|---|
| Roster Name | Use the edit icon to edit the name of the roster that you are adding members to. |

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| Field | Description |
|---|---|
| Which members would you like to be in your schedule? | Move the members you want to add from Available list to Selected list. |
| Rotation start date | Date on which the rotation needs to start. |
| Rotation interval | Type of the rotation interval. |
| Rotate every | Frequency of the rotation interval.<br>**Note:**<br>This field appears only if the **Rotation interval** field is set to **Weekly**. |
| Day of week for rotation | Day of the week on which the roster rotation should start. When this field is specified, roster rotation happens based on the specified frequency and the day of the week.<br>**Note:**<br>This field appears only if the **Rotation interval** field is set to **Weekly**. |
| Send On-Call Reminders | If selected, on-call reminders are sent to the members of the roster. |
| Reminder lead time (days) | Lead time for email reminders.<br>**Note:**<br>This field is displayed only when the **Send On-Call Reminders** option is selected. |

11. Click **Next Step**.
12. Use the Escalation Setup form to specify escalation settings.

### Escalation Setup steps

| Field | Description |
|---|---|
| Escalation type | Method used to determine who receives an escalation notification. Its value is automatically set to **Rotate Through Members** if a shift has only one roster. The escalation path goes through all members of that roster. If a shift has more than one roster, the default value is **Rotate Through Rosters**. The escalation path goes through all the rosters to determine who to notify. Click **Override escalation** to change the default setting. |
| Catch-All | Specifies users who receive a notification when no other on-call users have acknowledged the escalation. The value can be none, a group manager, a shift manager, an individual, or any or all roster members.<br>○ Select **Notify Individual** to specify a member of the group to notify.<br>○ Select **Notify All** to specify a shift. All shift members are notified. |

13. Click **Next Step**.
14. Click **Edit Reminder** to edit the reminder settings for an escalation.

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15. Use the Edit Reminder form to edit the reminder settings for a schedule.

**Escalation Reminder form fields**

| Field | Description |
|---|---|
| # reminders | When escalations are configured for this group, the instance first sends this number of reminders before notifying the backup personnel. |
| Time between reminders | The interval of time between reminders.<br>Default: 15 minutes<br>If your choice is not in the list, select the closest value. Edit the roster to update the number of reminders after the schedule is generated. |
| Time before escalation | The interval of time to wait before escalating a task. |

16. Review the schedule and then click **Save**.
The schedule is saved in Draft mode.
17. Select **Send subscriptions** to send a subscription URL to an on-call member after the shift is published.
18. After the schedule is complete, click **Finish** to save and publish the schedule.

### What to do next

Perform one of the following procedures to update the schedule.

#### Updating an On-Call schedule

Shift managers and members can use the **Schedules** tabs to view and update the on-call schedules of a group. Shift managers can review, manage, and resolve gaps or conflicts in your On-Call schedule from a single view.

## Opening the Schedules page

To open and start working on a schedule, navigate to **On-Call Scheduling** > **On-Call Schedules** and then click the card for the group.

Edit an on-call schedule

## Overview tab

This tab gives an overview of the current shift. The following sections are available:

- **On-Call**: Displays information about the current on-call shift. From here, you can:
  - Navigate to the previous and next shifts.
  - View the roster and escalation details of the current shift. When you click **Roster and escalation details**, a dialog box displays the following tabs:
    - Roster: Displays a list of all rosters along with its active on-call member. Information of the on-call member such as the contact number, email address, group, and the shift to which the user belongs to is also available.
    - Escalation Path: Displays the escalation path defined for the shift.
    - Profile: Displays the user profile of the primary on-call member. You can send a direct message to the on-call member by clicking **Send a direct message** or call the member if Notify WebRTC for on-call is set up. For more information on real-time messaging, see

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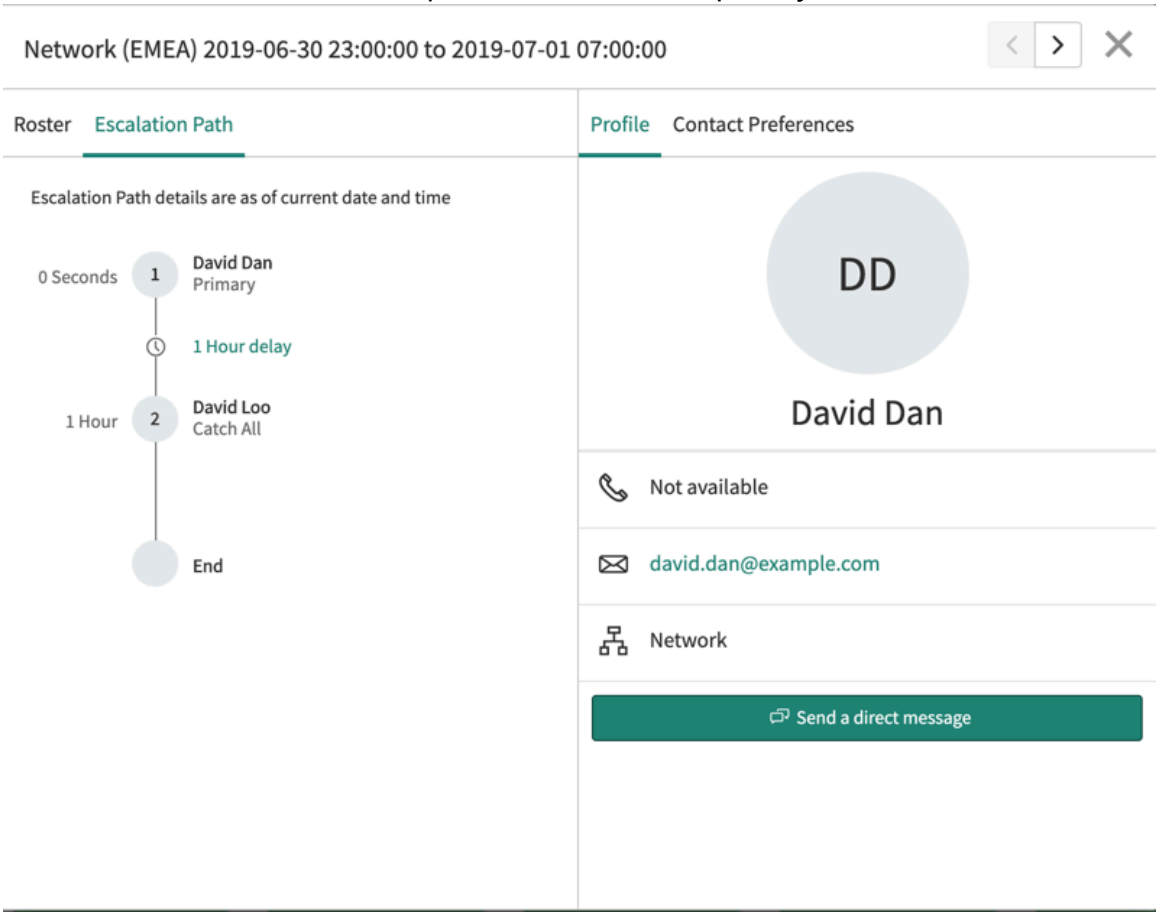
Connect. For information on Notify webrtc, see Forward to notify client workflow activity. For information on the **Specify a valid Notify Number with voice capability** property that enables the Notify WebRTC for on-call, see System properties for On-Call Scheduling.

- Contact Preferences: The contact preferences set for the primary on-call member.




- **Pending Actions**: Displays the pending actions for the group's on-call schedule. You can review gaps, conflicts, and time-off requests to find a replacement and ensure proper support coverage. For information on resolving the pending actions, see Resolve gaps, conflicts, and time-off requests in a shift and Resolve gaps, conflicts, and time-off requests in a shift.

  **Note:**
  This section is displayed only for a shift manager.

- **Your Upcoming Shifts**: Displays your upcoming shifts in a calendar view.

  **Note:**
  This section is displayed for a shift member or a Shift Manager who is a shift member.

- **On-call calendar**: This section displays the calendar view of all shifts of the group. By default, the week view is displayed. For more information on on-call calendar, see Manage shifts from the Calendar view.

### Shifts tab

This tab displays all shifts defined for the user group. From here, you can edit a shift or create a custom escalation policy to override the default policy. For information on editing the escalation type, see Create an escalation policy.

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You can also edit contact preferences from this tab. For more information on configuring a contact preference, see Configure my availability and contact preferences

## Settings tab

This tab displays the group preferences set for your group's on-call shift. If not already set, click **Create Custom Group Settings** to set the group preferences. For more information about group preferences, see Configure preferences for a user group.

**Note:**
The group preferences set here affect only this group. These settings override the global settings.

To view on-call properties, click **View Global Settings**.

**Note:**
**View Global Settings** is only visible to rota_admin.

### Update a schedule entry

You can deactivate a schedule entry or update setting like schedule entry type, date, or time.

#### Before you begin
Role required: rota_admin or rota_manager

#### Procedure

1. Navigate to **All** > **On-Call Scheduling** > **On-Call Calendars**.
   The on-call coverage for your group's calendar appears.
2. Click the shift name and navigate to **Actions** > **Edit span**.
   The **Schedule Entry** dialog box is displayed.

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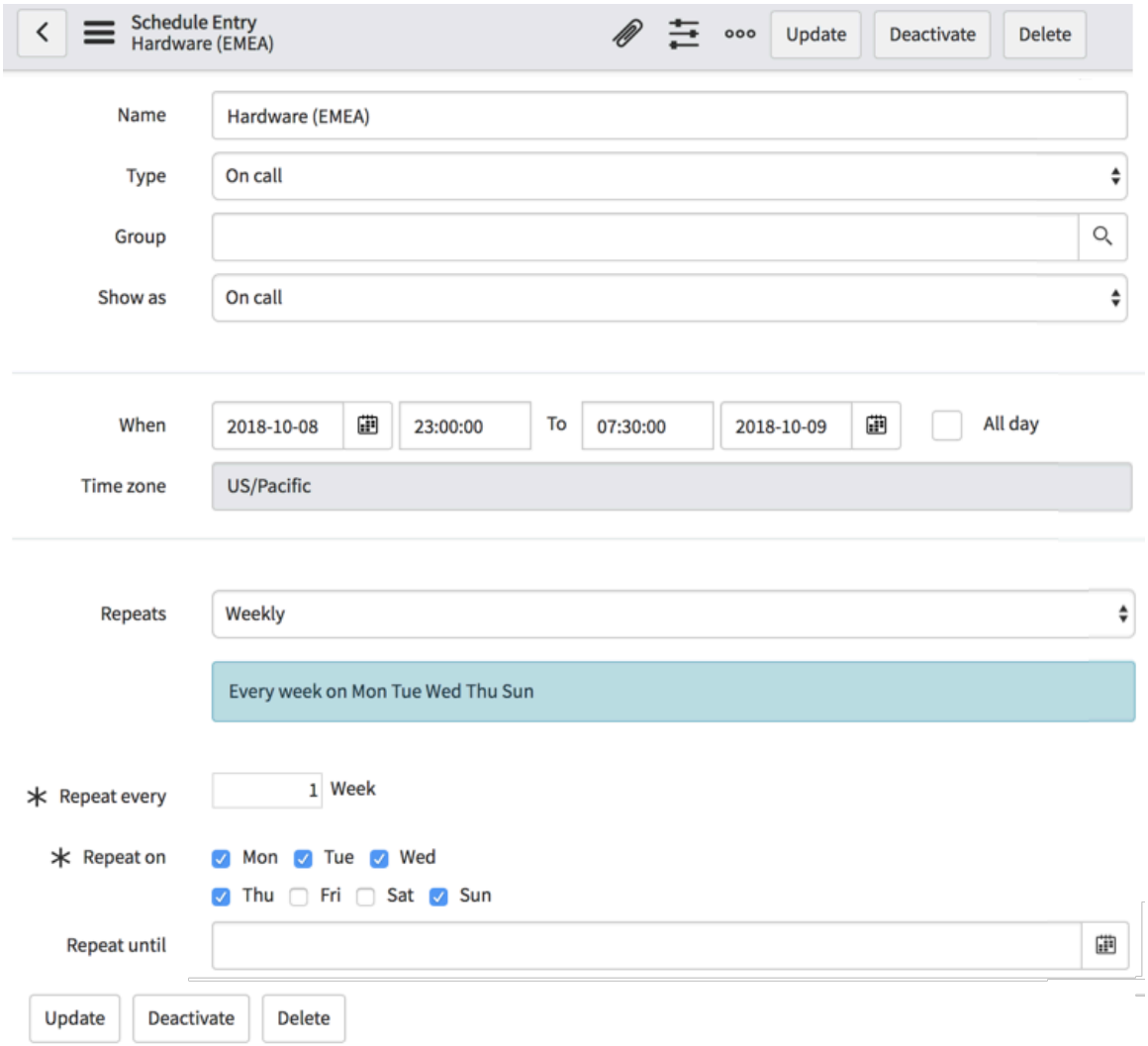


**3.** Update the fields as needed.

### Schedule Entry

| Field | Description |
|---|---|
| Name | Modify the name of the schedule entry, if required. |
| Type | Select the type of schedule entry. For example, on-call or time off. |
| Group | The **Group** field is empty by design.<br>**Warning:**<br>If the **Group** field is populated, then the spans for the entry are not displayed. |
| Show as | Select what the schedule entry must be displayed as. For example, busy or on-call. |
| When | Select the appropriate start and end date, and time for the schedule entry. |
| All day check box | Select the check box to make the schedule entry active for the entire duration. |
| Timezone | Displays the time zone for the schedule entry. This cannot be modified. |

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| Field | Description |
|---|---|
| Repeats | Select the frequency with which the schedule entry repeats. For example, daily or weekly.<br><br>The following fields appear if you select **Monthly**:<br><br>**Monthly type**: specify the date of the month when the schedule entry repeats.<br><br>The following fields appear if you select **Yearly**:<br><br>**Yearly type**: specify the date of the year when the schedule entry repeats or if it is floating. If you select the **Floating** option, then the following fields appear:<br>○ **Float week**: Select the week of the month when the schedule entry repeats.<br>○ **Float day**: Select the day of that week when the schedule entry repeats.<br>○ **Month**: Select the month when the schedule entry repeats. |
| Repeat every | If the schedule entry is selected to repeat, then specify how often it repeats. For example, if you select weekly repetitions, specify the frequency such as every week or every two weeks. |
| Repeat on | If the schedule entry is selected to repeat, then specify when it repeats. For example, if you select weekly repetitions, specify the days of the week when it would repeat. |
| Repeat until | If the schedule entry is scheduled to repeat, then specify an end date until which the schedule entry repeats itself. |
| Deactivate | Deactivate the schedule entry. A warning message appears. |
| Delete | Delete the schedule entry. A warning message appears. |

4. Click **Update**.

### Related topics

Assigning On-Call Scheduling roles

## Specify the sources of contact information for schedule notifications

Configure the communications methods that shift managers can choose from to send on-call schedule notifications. For example, add email and phone contact sources.

### Before you begin

Role required: admin

### Procedure

1. Navigate to **All** > **On-Call Scheduling** > **Administration** > **Contact Sources**.
2. Click **New** and then fill in the form.

#### On-Call Contact Source form

| | |
|---|---|
| Name | Unique and meaningful display label for the type of contact source. |
| Table | Table that contains the contact source. |

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| | |
|---|---|
| User Field | Reference field to the user table. This field appears only for some tables. |
| Active | Option to activate the contact source for use. |
| Source Type | Type of communication method. |
| Source | ○ For email, the source of the email address.<br>○ For phone numbers, the source of the phone number. |

3. Click **Submit**.

### Manage shifts from the Calendar view

The Calendar view displays all shifts for a user group for a specified time interval. Use the Calendar view of an On-Call schedule to update or manage shifts.

#### Before you begin

Role required:

- View and update: rota_admin, rota_manager, or admin
- View only: itil

#### About this task

- For information on updating a shift, see Update shift details from the On-Call calendar.
- For information on managing a shift, see Configure or update an On-Call shift.

#### Procedure

1. Navigate to **All** > **On-Call Scheduling** > **On-Call Calendars**.
2. Click the Calendar View icon ( ) to open the calendar view of shifts.
   By default, the calendar displays one month of shifts.

> **Important:**
> The Time Zone view displays shift members grouped by shift within the specified geographical time zone. To open the Time Zone view on this page, click the Time Zone icon ( ). See Manage shifts from the Timeline view.

3. Perform any of the following operations to organize the view for your needs:
   - Specify the time period that appears: View events for the current day, week, or month: In the title bar, click **Day**, **Week**, or **Month**.

     > **Note:**
     > You cannot view the calendar for a month in the Timeline view.

   - Navigate to the previous or the next occurrence of the time period: In the title bar, click the left or the right arrow next to **Today** ( ).
   - View the event of any specific day, week, or month: In the title bar, click the Calendar icon ( ) and specify the date.
   - View the list of navigation shortcuts: In the title bar, click the keyboard shortcuts icon .

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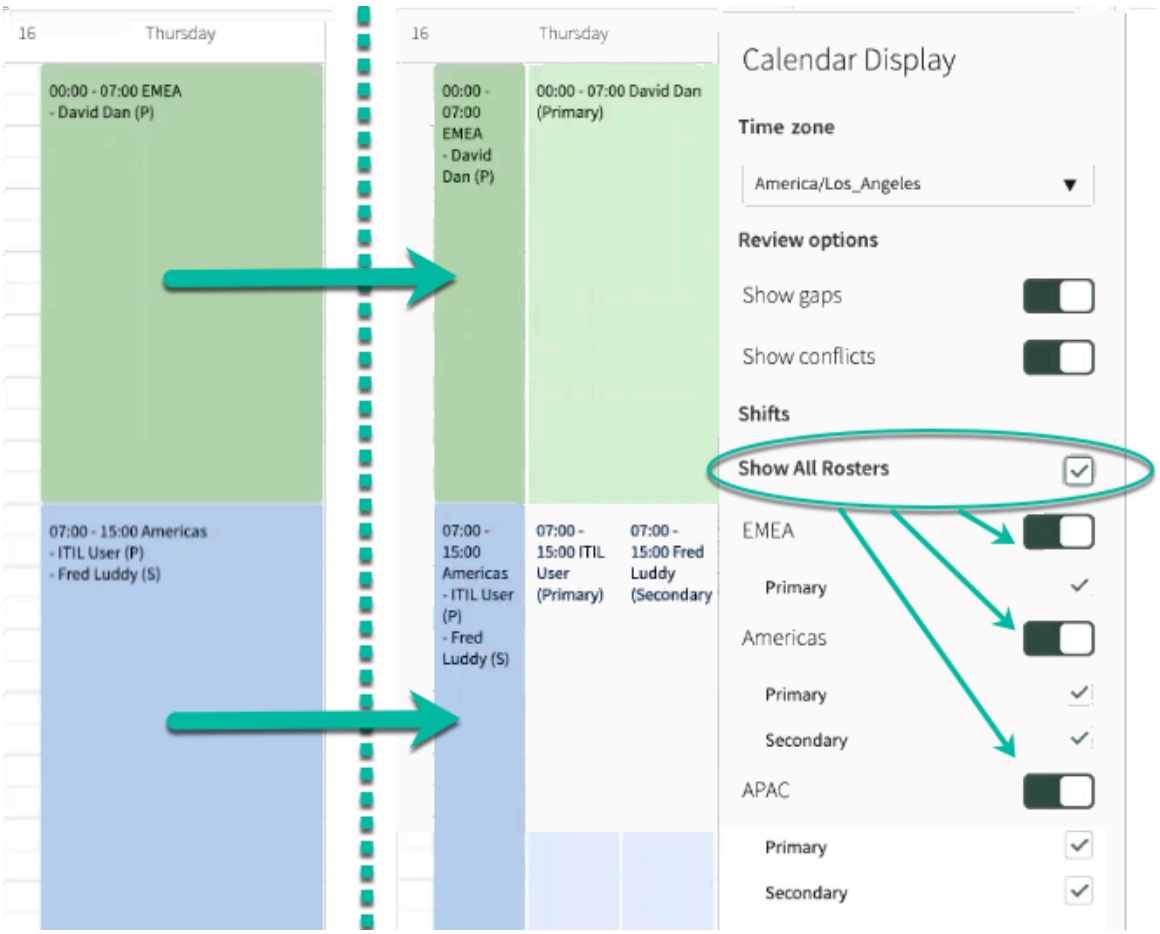
4. Configure the view: Click the Filter icon ( ).
   - To show working hours for a time zone, enable **Time zone**.
   - To view roster assignments within a time zone, click the **Primary**, **Secondary**, or **Tertiary** check box as needed.
   - To view roster assignments for all rosters in all time zones, select the **Show all rosters** check box.




   - To show gaps: In the **Review options** section, enable **Show gaps**. An info icon indicates a shift with gaps. Click the icon to view the gaps. Gaps occur when no one is on-call when support coverage is required. Possible reasons:
     - Time off without coverage.
     - User has been moved out of the group.
     - User is marked as inactive.

     For information on resolving gaps and conflicts, see Resolve gaps, conflicts, and time-off requests in a shift.
   - >To show conflicts: In the **Review options** > **Show conflicts**.

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For example, a conflict occurs when a user is assigned as both primary and secondary point of contact for a shift. An info icon indicates a shift with conflicts. Click the icon to view the conflicts.

For information on resolving gaps and conflicts, see Resolve gaps, conflicts, and time-off requests in a shift.

5. To save the view settings, click the Bookmark this filter icon ( ).

### Manage shifts from the Timeline view

Use the Timeline view of an On-Call schedule to update or manage shifts based on the geographical location of roster members.

#### Before you begin

Role required: rota_admin, itil, rota_manager, or admin

#### About this task

- For information on updating a shift, see Update shift details from the On-Call calendar.
- For information on managing a shift, see Configure or update an On-Call shift.

#### Procedure

1. Navigate to **All** > **On-Call Scheduling** > **On-Call Calendars**.
2. Click the Timeline view icon ( ).

**Important:**
The Calendar view on this page displays all shifts for a user group for a specified time interval. To open the Calendar view, click the Calendar View icon ( ). See Manage shifts from the Calendar view.

3. Perform any of the following operations to organize the view for your needs:
   - Specify the time period that appears: View events for the current day, week, or month: In the title bar, click **Day**, **Week**, or **Month**.

     **Note:**
     You cannot view the calendar for a month in the Timeline view.

   - Navigate to the previous or the next occurrence of the time period: In the title bar, click the left or the right arrow next to **Today** ( ).
   - View the event of any specific day, week, or month: In the title bar, click the Calendar icon ( ) and specify the date.
   - View the list of navigation shortcuts: In the title bar, click the keyboard shortcuts icon .
4. Configure the view: Click the Filter icon ( ).
   - To show working hours for a time zone, enable **Time zone**.
   - To view roster assignments within a time zone, click the **Primary**, **Secondary**, or **Tertiary** check box as needed.

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- To show gaps: In the **Review options** section, enable **Show gaps**. An info icon indicates a shift with gaps. Click the icon to view the gaps. Gaps occur when no one is on-call when support coverage is required. Possible reasons:
  - Time off without coverage.
  - User has been moved out of the group.
  - User is marked as inactive.

  For information on resolving gaps and conflicts, see Resolve gaps, conflicts, and time-off requests in a shift.

- >To show conflicts: In the **Review options** > **Show conflicts**.

  For example, a conflict occurs when a user is assigned as both primary and secondary point of contact for a shift. An info icon indicates a shift with conflicts. Click the icon to view the conflicts.

  For information on resolving gaps and conflicts, see Resolve gaps, conflicts, and time-off requests in a shift.

5. To save the view settings, click the Bookmark this filter icon ( ☆ ).

## Set a shift to Draft mode while waiting for info

If you do not have all the information that you need to define a shift, you can set the shift to Draft mode. Later, when all the information is available, you can publish the shift so you can add it to a schedule.

### Before you begin

Role required: rota_manager

### Procedure

1. Navigate to **All** > **On-Call Scheduling** > **My Group Schedules**.
2. Select the shift that will include the group.
3. On the **Shift** dialog box, click **Move to Draft**.
   A message confirms that the rotation schedule is updated for the shift that you moved to a draft mode.

## Delegate the shift manager [rota_admin] role

As a shift manager, you can delegate your role to a member of shift.

### Before you begin

Role required: rota_manager or admin

### Procedure

1. Navigate to **All** > **User Administration** > **Delegate Roles in Group**.
2. Follow the instructions to Delegating roles the shift manager role to a member of your shift.

   **Note:**
   Ensure that you select the shift group where you want to delegate the shift manager role.

3. Submit the role delegation request.

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**Related topics**

Assigning On-Call Scheduling roles

# Viewing On-Call Scheduling reports

Generate escalation and schedule reports. You can also view performance report.

All the users can generate and view the following reports:

- Escalation report
- Schedule report
- Escalation over report
- Group overview report

Users with premium dashboard access can view an additional performance tab. You can generate and view performance reports using the performance tab.

## Run an Escalations report to view who is on call

The Escalations report displays the escalation sequence and the rules that apply for a selected date. For each group that you are authorized to see, you can choose to show either the active roster members or the on-call person.

### Before you begin

Role required: itil

### Procedure

1. Navigate to **All** > **On-Call Scheduling** > **Reports** > **Escalations Report**.
2. Select a value for the **For each group, show** setting.
   - **Active escalation members**: Display the on-call persons and catch-all persons in the escalation order, along with their delay times.
   - **On-call person**: Determine who is on duty.
3. Select the start date for the report.
4. Move at least one group into the **Selected** list.
   Enter the first few letters of the group into the **Name starts with** field to see a list of groups that start with those letters. Or select the **All groups** check box to see the list of all groups.
5. Click **Run Report**.

## Run a Schedule report to view my schedule

An On-Call Rotation Schedule report shows users or groups that are on-call for a specified time period.

### Before you begin

Role required: itil, roster_admin, rota_admin, rota_manager

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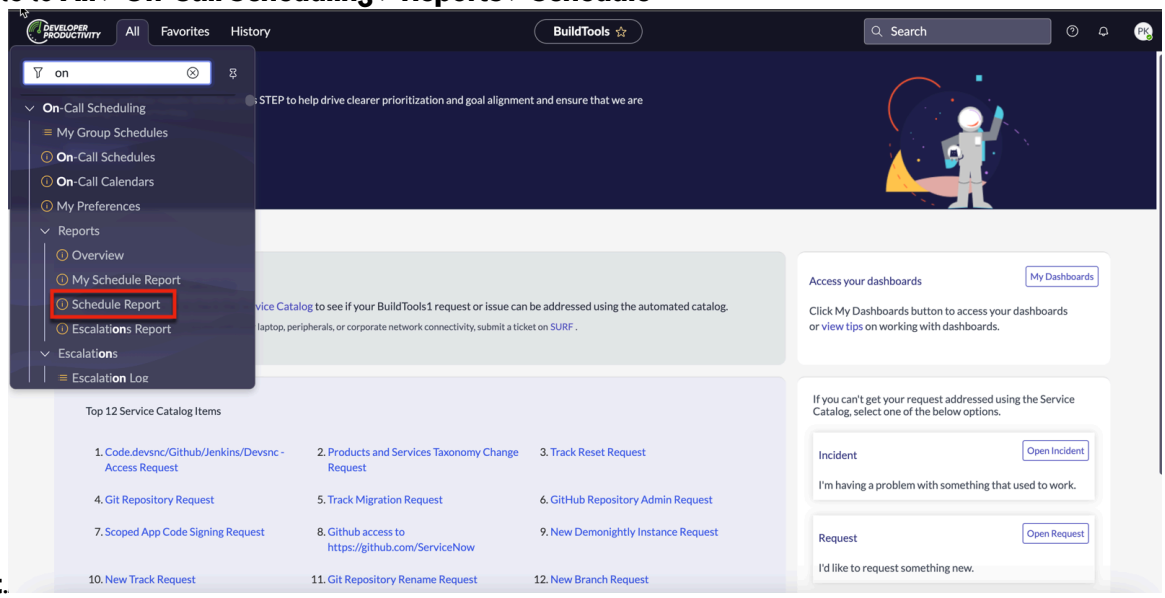
## Procedure

1. Navigate to **All** > **On-Call Scheduling** > **Reports** > **Schedule Report**.




2. Specify the **Report style**:
   - **Table**: Display a list that can be sorted, filtered, and configured.
   - **Formatted**: Generate a report in PDF format. Select **Click to Print** to print the report.
3. Select the start date for the report.
4. Move at least one group into the **Selected** list.
   Enter the first few letters of the group into the **Name starts with** field to see a list of groups that start with those letters. Or select the **All groups** check box to see the list of all groups.
5. Select **Run Report**.

### Example:

Example Formatted report: The report shows on-call commitments for all specified groups during the specified date range.

**Formatted Schedule report**

| Hardware On-Call Schedule | Roster | Shift | 2019-04-22 Monday | 2019-04-23 Tuesday | 2019-04-24 Wednesday | 2019-04-25 Thursday | 2019-04-26 Friday |
|---|---|---|---|---|---|---|---|
| Hardware (US) | Primary | 07:00:00-15:30:00 | Beth Anglin | Beth Anglin | Beth Anglin | Beth Anglin | Beth Anglin |
| | Secondary | 07:00:00-15:30:00 | David Loo | David Loo | David Loo | David Loo | David Loo |
| Hardware (APAC) | Primary | 15:00:00-23:30:00 | David Dan | David Dan | David Dan | David Dan | |
| | Secondary | 15:00:00-23:30:00 | Bow Ruggeri | Bow Ruggeri | Bow Ruggeri | Bow Ruggeri | |
| Hardware (Weekend) | Primary | 15:00:00-23:59:59 | | | | | ITIL User |

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## Viewing Escalation Overview reports

Run Escalation Overview reports to view count and rate information on escalations currently in progress, acknowledged and unacknowledged escalations, and Mean Time to Acknowledge (MTTA). You can view data for all groups or for one or more selected groups.

## Opening the reports

Any user with the itil role can view the reports. Use one of the following methods to open the reports:

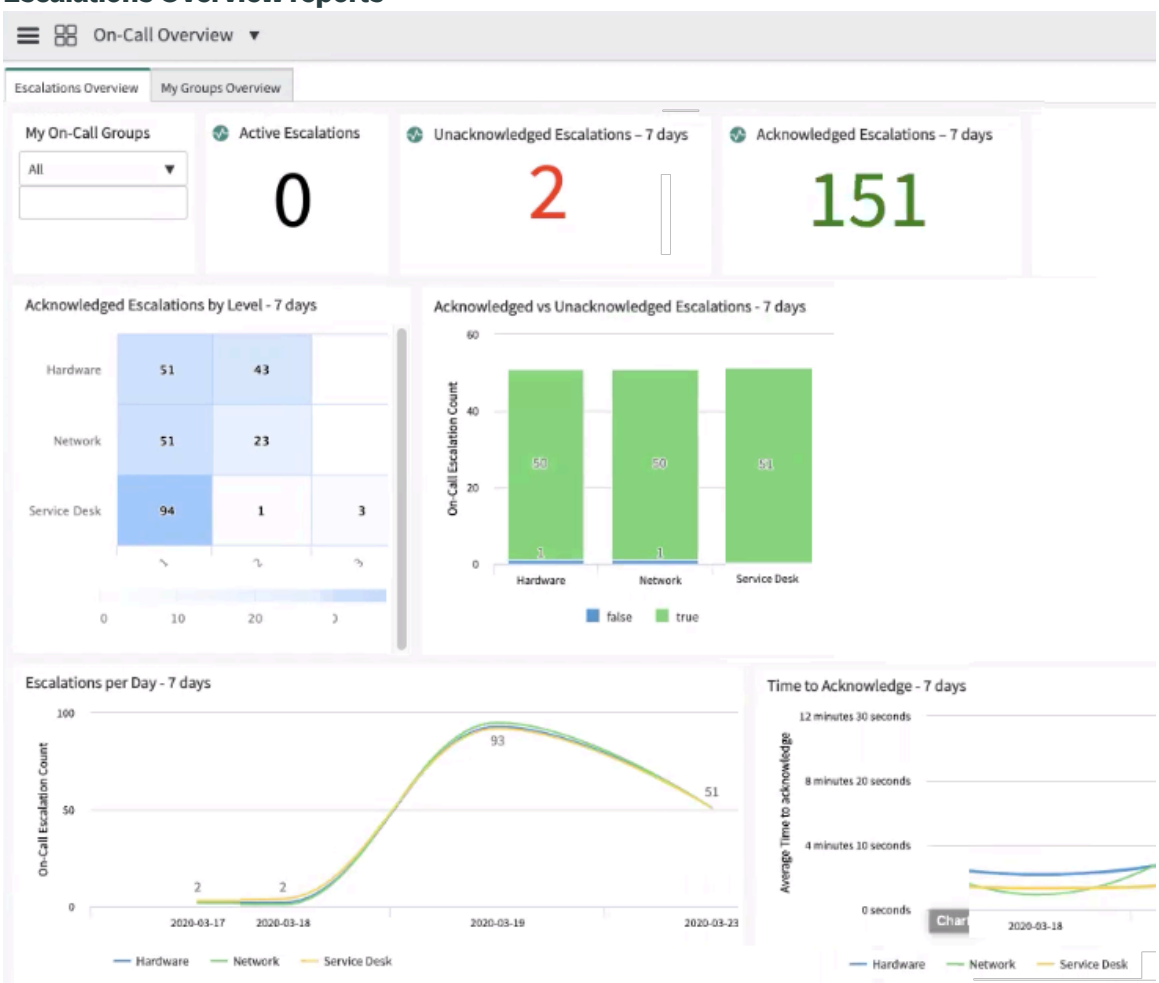
- Click **Self-Service** > **Dashboards** and select **On-Call Overview**. If you have licensed the premium version, then click **On-Call Overview - Premium**.
- Click **On-Call Scheduling** > **Reports** > **Overview**.

Click the **Escalations Overview** tab.

## Escalations Overview reports

- Acknowledged escalations are accepted by at least one user. The "true" value indicates acknowledged escalations.
- Unacknowledged escalations are not accepted by any user or are rejected by all users. The "false" value indicates unacknowledged escalations.

### Escalations Overview reports




### My On-Call Groups

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Select one or more groups. Only data for selected groups appears in the reports. If no group is specified, then data for all groups appears.

**Active Escalations - 7 days**

The number of escalations that are currently in progress.

**Unacknowledged Escalations - 7 days**

The number of escalations that nobody has yet acknowledged during the most recent seven-day period.

**Acknowledged Escalations**

The number of escalations that escalatees have acknowledged during the most recent seven-day period.

**Acknowledged Escalations by Level - 7 days**

The number of acknowledged escalations during the most recent seven-day period.

- The Y axis indicates groups.
- The X axis indicates escalation level.
- The color shade indicates the count of escalations in the box.

**Acknowledged and Unacknowledged Escalations by Group - 7 days**

The number of escalations by group during the most recent seven-day period.

- The "true" value indicates acknowledged escalations.
- The "false" value indicates unacknowledged escalations.

**Escalations per Day**

The number of escalations for the specified date.

- The Y axis represents the count of escalations.
- The X axis represents time by date.

**Mean Time to Acknowledge (MTTA) - 7 days**

The average time that it took a user to acknowledge an escalation during the most recent seven-day period.

- The Y axis indicates the time it took a user to acknowledge an escalation.
- The X axis indicates the group.

## Viewing the Performance reports for escalations

The Performance reports enable detailed review of how well escalations are being processed. You have precise control of the data that describes escalation progress using filters like group, priority, level, or escalation category.

### Opening the reports

You must have the Premium Dashboard user [rota_prem_dashboard_user] role to view the Performance reports. Use one of the following methods to open the reports:

- Click **Self-Service** > **Dashboards** and select **On-Call Overview - Premium**.
- Click **On-Call Scheduling** > **Reports** > **Overview**.

Click the **Performance** tab and then select the date of interest. The time line shows the time of day at which escalations happen. Use the tabs to control the type of data to view:

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### Breakdowns tab

Use the filters to segment the data into categories that suit your need. For example, if you are investigating your SMS costs, you can set filters to display how many notifications of the SMS type are sent and to which groups or users they are being sent. For example, you might notice that you sent 68 SMS messages to users in the Network group. The group, however, did not acknowledge any escalations. You might therefore consider that you can lower SMS costs by not sending SMS notifications to that group.

- Groups
- Escalation Category

### Records tab

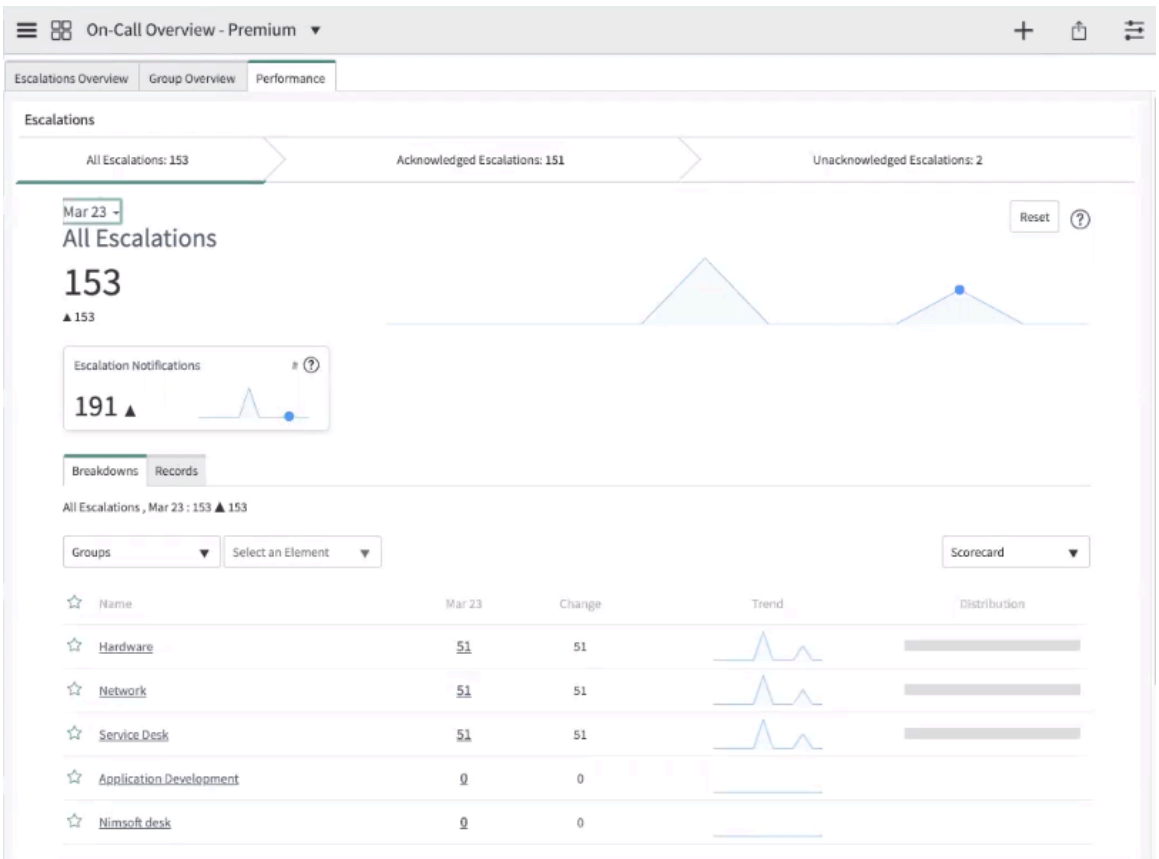
The **Records** tab lists the individual records that make up the results that you configured on the **Breakdowns** tab. Click a name to view record details.

> **Note:**
> Each record also appears in the appropriate escalation log. See View details in an escalation log.

## All Escalations tab

- Acknowledged escalations are accepted by at least one user.
- Unacknowledged escalations are not accepted by any user or are rejected by all users.
- All Escalations: Count of escalations that started on the selected date.
- Escalation Notifications: Count of notifications that were sent on the selected date. An escalation might have triggered several notifications.

### All Escalations tab

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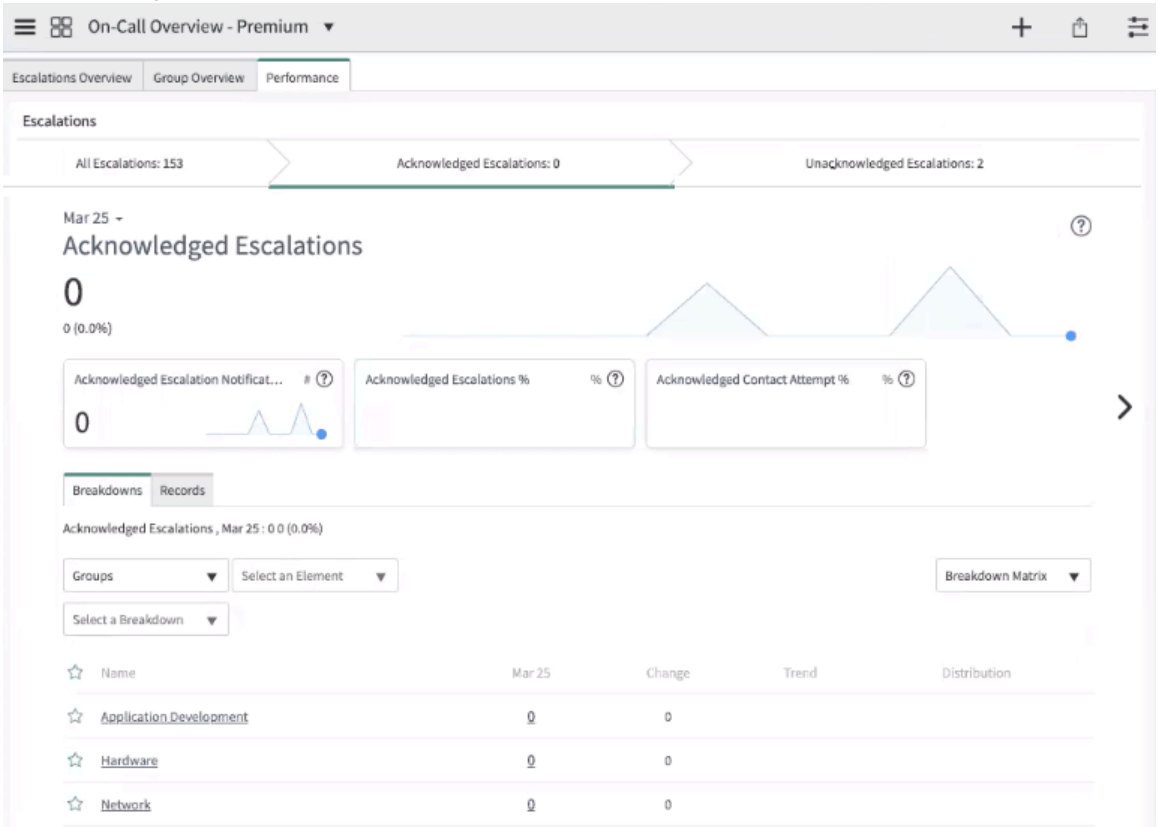
## Acknowledged Escalations tab

### Acknowledged Escalations tab




- Acknowledged Escalation Notifications: Count of escalations that had any of the following values in the **Response** field for the notification:
  - Accepted or Accepted from other device
  - Auto-assigned
- Acknowledged Escalation %: Percent of escalations that had a valid value in the **Response** field for the notification.
- Acknowledged Contact Attempt %: Percent of contact attempts that were acknowledged.

## Unacknowledged Escalations tab

Unacknowledged escalations have one of the following values for each member of an escalation path in the **Response** field for the escalation notification:

- Rejected
- Rejected from other device
- Invalid response
- [no response]

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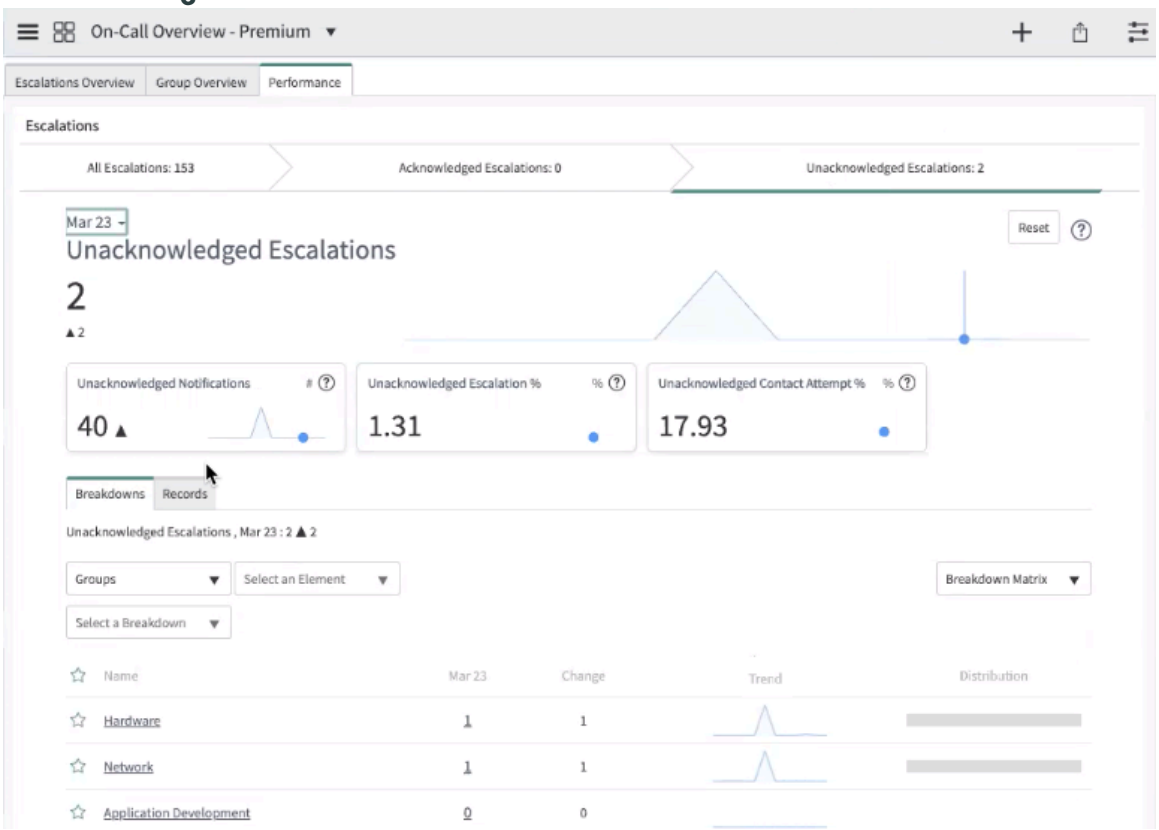
**Unacknowledged Escalations tab**




## Viewing Group Overview reports

Run My Groups Overview reports to view the activities of a selected group: Count information on acknowledged and unacknowledged escalations by shift, acknowledged escalations by user, and the hours for each user over seven days.

## Opening the reports

Any user with the itil role can view the reports. Use one of the following methods to open the reports:

- Click **Self-Service** > **Dashboards** and select **On-Call Overview**. If you have licensed the premium version, then click **On-Call Overview - Premium**.
- Click **On-Call Scheduling** > **Reports** > **Overview**.

Click the **My Groups Overview** tab and then specify the group in the **My On-Call Groups** list.

- Acknowledged escalations are accepted by at least one user. The "true" value indicates acknowledged escalations.
- Unacknowledged escalations are not accepted by any user or are rejected by all users. The "false" value indicates unacknowledged escalations.

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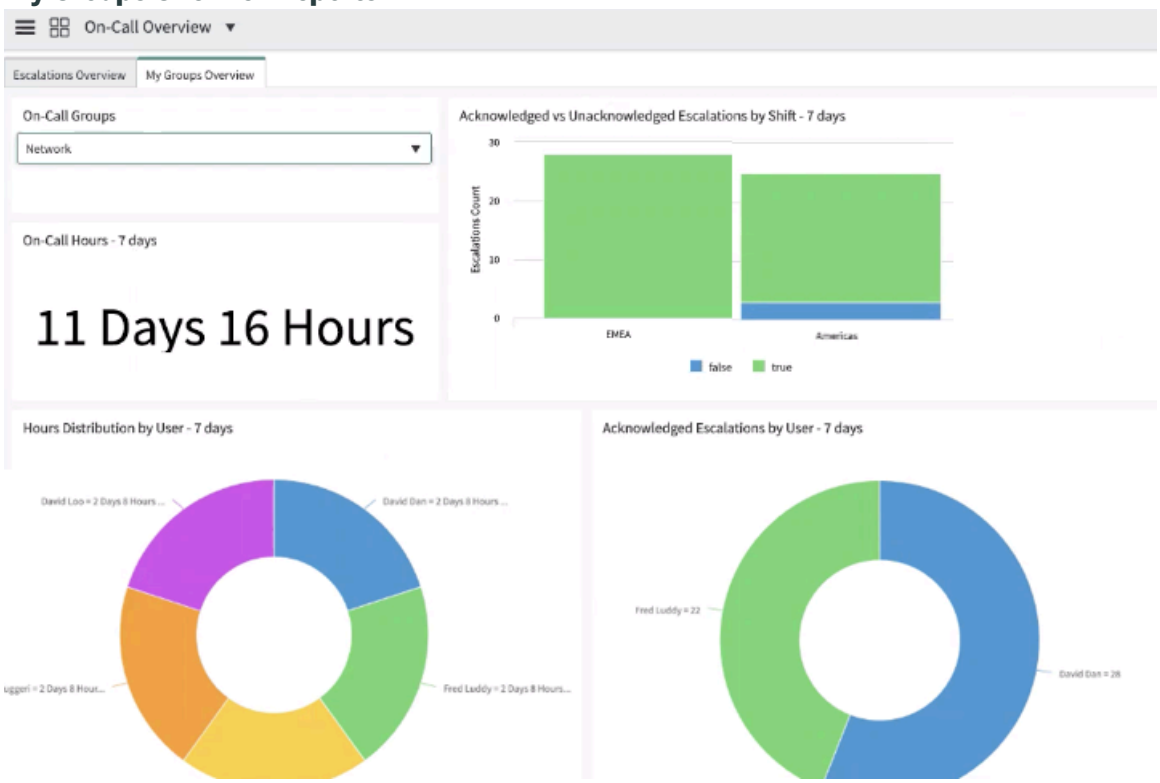
## My Groups Overview reports

### My Groups Overview reports




**On-Call Hours - 7 days**

The sum for each day over the last seven days: (Number of hours / roster member) * (number of roster members that worked on an escalation)

**Acknowledged and Unacknowledged Escalations by Shift - 7 days**

The number of escalations by shift during the most recent seven-day period.

- The Y axis represents the count of escalations.
- The X axis represents the shift.

- The "true" value indicates acknowledged escalations.
- The "false" value indicates unacknowledged escalations.

**Hours Distribution by User - 7 days**

Pie chart that displays the number of hours that each user in the group worked on escalations during the most recent seven-day period.

**Acknowledged Escalations by User - 7 days**

Pie chart that displays the number of acknowledged escalations that each user in the group worked on during the most recent seven-day period.

# Defining On-Call Scheduling escalation process

Create shift and group templates, escalation policies and trigger rules. Design escalation process and track progress of an escalation.

As rota_admin you can perform these tasks for your user groups.

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- Designing an escalation process
- Track the progress of an escalation
- Create a shift template to simplify configuring shifts
- Create a group template to simplify configuring schedules

## Escalations in On-Call Scheduling

An escalation is a mechanism that ensures that important issues are addressed in a timely manner.

On-Call Scheduling monitors response time for a task. You can define the actions to take when a task is not acknowledged. The actions, like sending out an email or an SMS, are fired by trigger rules. You define a trigger rule by specifying the conditions that trigger the actions and the actions to take when the conditions are met.

For example, a critical incident is raised for Acme Pharmaceuticals regarding a problem with their network access. An SMS task notification is sent to Ken, the third-line support engineer who is on call for this type of incident. Ken is unavailable, however, and does not respond within the specified 30-minute response time.

A trigger rule that is defined for Acme Pharmaceuticals critical incidents starts an escalation if a task goes 30 minutes without a response. The person specified as the next point-of-contact is Nakul, Ken's line manager, so an SMS notification is sent to Nakul. Settings in the escalation policy specify how many notifications to send, how long to wait, and so on.

Shift administrators and shift managers can define trigger rules and configure escalation policies.

**Related topics**

Viewing Escalation Overview reports

Viewing the Performance reports for escalations

### Designing an escalation process

To design an escalation process for a task, you define a trigger rule and configure one or more escalation policies.

A trigger rule specifies both the conditions under which an escalation process should begin and the escalation actions (workflow or script) to perform. An escalation policy describes the order in which escalation notifications are sent, the escalation audience, and other aspects of the escalation.

## How a trigger rule works

When a task is created or updated, the instance compares the assignment rules with the rule's conditions to determine whether a condition is met. If there is a match, then the instance activates the workflow or script that is specified by the rule's action. Trigger rules are an extension of assignment rules and they have the same behavior as assignment rules.

For example, a trigger rule might specify:

- If (rule condition): An incident with level **Critical** or **High** is raised and is assigned to the **Network** group.
- Then (rule action): Run the **Assign and Notify** workflow. (The workflow sends an email notification to the current on-call roster member.)

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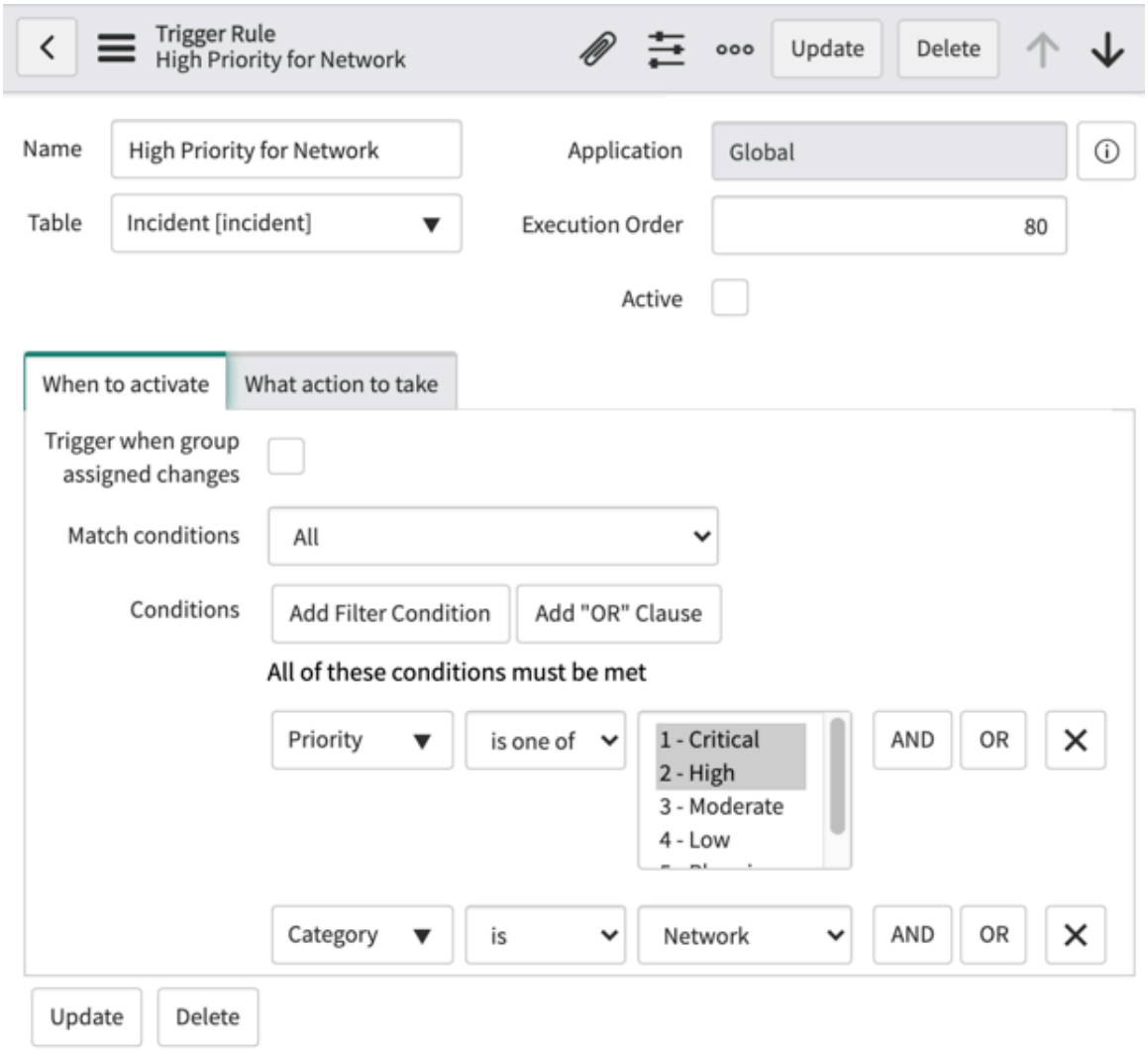
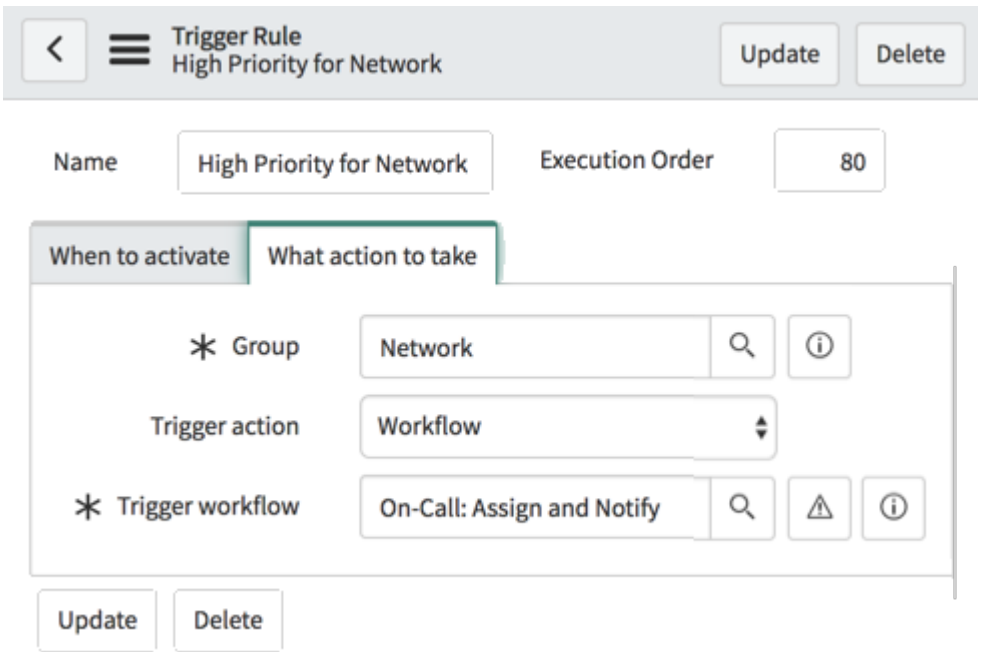
### Rule condition on the When to activate tab




### Rule action on the What action to take tab

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**Note:**
An on-call escalation is canceled when the assignment group of the associated task record, for example, an incident, changes to a different group without a matching trigger rule. It ensures that an existing irrelevant escalation workflow is no longer associated with that task record.

See Create an escalation trigger rule.

## About escalation policies

An escalation policy includes the following configurations:

- The escalation audience (roster members and managers).
- A policy type that defines the order in which rosters and roster members receive escalation notifications.
- Other aspects of the escalation process like the contact methods to use and the number of reminders to send for each notification.

You can create a custom escalation policy for a shift by overriding settings in a default escalation type, for example, by configuring custom delays between escalation steps.

### Configure a table for escalation trigger rules

Configure escalation trigger rules for the tables that do not extend tasks.

#### Before you begin
Role required: admin

#### About this task
Tables that are configured in the Trigger Rule Table Configuration [trigger_rule_table_cfg] table do appear in the **Table** field in the Trigger Rule form for creating an escalation trigger rule.

#### Procedure

1. Navigate to **All** > **On-Call Administration** > **Administration** > **Trigger Rule Table Configuration**.
2. Click **New**.
3. On the form, fill in the fields.

**Trigger Rule Table Configuration form**

| Field | Description |
|---|---|
| Table | Name of the table that will be enabled for creating escalation trigger rules. |
| Trigger group field | Group field value in the table based on which trigger rule processes. |
| Trigger user field | User field value in the table based on which trigger rule processes. |
| Journal field | The ongoing escalation activity. |

4. Click **Submit**.
The Trigger Rules related list shows the escalation trigger rules that are configured for the table.

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### Create an escalation trigger rule

Create a trigger rule to specify both the conditions under which an escalation process should begin and the actions (workflow or script) to perform for the escalation.

## Before you begin

Role required: rota_admin, admin, or rota_manager

## About this task

- Users with rota_manager role can create escalation trigger rules (with the **Trigger action** field set to **Workflow**) only for the groups that are managed by the rota_manager.
- Users with rota_admin role can create escalation trigger rules (with the **Trigger action** field set to **Workflow**) for all the groups.
- Users with admin role can create escalation trigger rules to execute both **Workflow** and **Script** for all the groups.

## Procedure

1. Navigate to **All** > **On-Call Scheduling** > **Administration** > **Trigger Rules**.
2. Click **New**.
3. On the form, fill in the fields.

### Trigger Rule form

| Field | Description |
|---|---|
| Name | Unique and meaningful name for the trigger rule. |
| Table | Task table that applies to the trigger rule.<br>**Note:**<br>○ Only tables and database views that are in the same scope as the trigger rule appear in the list.<br>○ Tables that do not extend tasks do appear in the list only if those tables are configured for trigger rules in the Trigger Rule Table Configuration [trigger_rule_table_cfg] table.<br>. |
| Execution order | Run order of the trigger rule. |
| Active | Option to activate the trigger rule. |
| **When to activate** | |
| Trigger when group assigned changes | Option to process the trigger rule only when the **Group** field value in the table is changed.<br>○ **False**: Trigger rules fire only if the**assigned_to** and **assignment_group** fields are not populated on a record.<br>○ **True**: Trigger rules fire only if group field populated or changes and **assigned_to** is not populated on a record. |
| Trigger when | Type of trigger for the table that is the default behavior or conditional.<br>This field is available only when the **Trigger when group assigned changes** check box is enabled. |

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| Field | Description |
|---|---|
| | ○ **Condition matches**: Triggers escalation when conditions match.<br>○ **Default**: Triggers escalation based on only the **Trigger action** field value. |
| Match conditions | Conditions type to match before triggering escalation.<br>○ **All**: Each condition must be met.<br>○ **Any**: Any one of the conditions can be met. |
| Conditions | Conditions that must be met for the trigger rule to fire (run the workflow or script that is the action for the rule). |
| **What action to take** | |
| Group | Group that becomes the **Task assignment group** when the trigger rule fires.<br>This field is available only when the **Trigger when group assigned changes** check box is cleared. |
| Trigger action | **Workflow** or **Script** (server-side JavaScript) to execute when the **Match conditions** and **Conditions** are met. |
| Trigger workflow | Workflow to execute. Available only if **Trigger action** is set to **Workflow**. |
| Trigger script | Script (server-side JavaScript) to execute. Available only if the **Trigger action** field is set to **Script**.<br>**Note:**<br>This action is available only for users with the rota_admin and admin roles. |

4. Click **Submit**.

### Create an escalation policy

An escalation policy includes the policy type that defines the order in which rosters and roster members receive escalation notifications. You can create a custom escalation policy for a shift by overriding settings in a default escalation type, for example, by configuring custom delays between escalation steps.

#### Before you begin
Role required: rota_admin, rota_manager, or admin

#### About this task
Users with rota_manager role can edit policies only for their groups. Users with rota_admin and admin role can edit policies for all the groups.

The escalation type determines the order in which members of a user group are notified about the escalation. The escalation type depends on the number of rosters.

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- If a shift has only one roster, the escalation type is automatically set to **Rotate through members** and the escalation path goes through the member list of a roster (primary, secondary, tertiary) to determine whom to notify.
- If the shift has multiple rosters, the escalation type is automatically set to **Rotate through rosters** and the escalation path goes through all rosters to determine whom to notify.
- If the shift has a customized escalation hierarchy, the escalation type is set to **Custom** and the escalation path goes through members as defined in the escalation hierarchy. See Create an escalation policy for details.

On-Call Scheduling supports multiple escalation policies per shift; for example, policies based on the priority of the incident or type of task record.

### Procedure

1. Create a custom escalation policy using the escalation designer.

| Option | Description |
|---|---|
| **Access the designer from the On-Call Schedules module** | **a.** Navigate to **On-Call Scheduling** > **On-Call Schedules**.<br>**b.** Click the required shift card.<br>**c.** In the **Shifts** tab, click the actions icon for the shift.<br>**d.** Click **Override escalation** and click **OK** in the confirmation window. |
| **Access the designer from the My Group Schedules module** | **a.** Navigate to **On-Call Scheduling** > **My Group Schedules**.<br>**b.** Open the required shift.<br>**c.** Click **Override Escalation Policy** and then click **Yes** in the confirmation dialog box. |

2. Click the Add Escalation Step icon and then fill in the Add Escalation Step form.

#### Add Escalation Step form

| Field | Description |
|---|---|
| Name | Name of the escalation step. |
| Escalation level | Hierarchy level of the step. |
| Time to next step | Wait time from the last reminder to run the next step. |
| Escalation set | Escalation set for the step. |
| Number of reminders | Number of reminders to send in this step. |
| Time between reminders | Time between each reminder of this step. |

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| Field | Description |
|---|---|
| Escalation audience | |
| Roster | Rosters to which escalation notifications and reminders are sent. |
| Groups | User groups to which escalation notifications and reminders are sent. |
| Users | Users to whom escalation notifications and reminders are sent. |
| Devices | Devices to which escalation notifications and reminders are sent. For example, a mobile phone that is rotated between group members. |
| Group manager | Option to send escalation notifications and reminders to the group manager. |
| Group manager field | Option to select group managers hierarchically to send escalation notifications and reminders.<br><br>This field is available only when the **Group manager** check box is selected. |

**Add Escalation set form**

| | |
|---|---|
| Name | Name the escalation policy. |
| Shift | The shift to which the escalation policy applies. |
| Default | Select the check box to mark the escalation policy as default. The default escalation policy is used for all on-call escalations in the case that none of the specified **Conditions** are met. |
| Table | Choose the table for which you want to set the escalation policy. |
| Condition | Use the condition section to add filters to the escalation criteria. |
| Description | Short description of the escalation policy. |
| Active | Select the check box to enable the escalation policy. |
| Override user preference | Select the check box to override the user's contact preferences. |
| Order | When there are multiple escalation policies defined for a shift, the order in which to apply this policy. Smaller numbers first. |

3. **Optional:** To edit an escalation step, click the edit escalation step icon and perform the edits.
4. **Optional:** Add multiple escalation steps if required.
5. **Optional:** To edit the escalation hierarchy for the shift, click the actions icon and click **Edit escalation**.
6. **Optional:** To reset to the default escalation type for the shift, click the actions icon and click **Reset escalation**.

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### Escalation and reminder settings for rosters

Use the escalation settings to specify how and when escalations occur and when reminder notifications are sent.

## Escalation and reminder settings

You can specify unique settings for each roster. When you configure a roster, you can specify

- **Forced communication channel**: You can specify a mandatory communication channel: SMS, voice, Slack, email, Microsoft Teams, or mobile push.
  - SMS and voice require that Notify is active.
  - An on-call member must have an SMS device to receive SMS notifications. If the member does not have an SMS device, then no further attempts are made and the lack of an SMS device is logged.

  For information on setting up MS Teams as a notification channel, see Set up Microsoft Teams as a contact method for an on-call escalation.

  For information on setting up mobile push as a notification channel, see Set up mobile push as a contact method for an on-call escalation.

- **Number of reminders**: The number of times the instance sends reminders to a person who does not reply within the time frame specified by **Time between reminders**.
- **Time between reminders**: The time interval between sending reminders.
- Values in the **Number of reminders** and **Time between reminders** fields determine the value in the **Time before escalation** field. For example, if **Number of reminders** is 2 and **Time between reminders** is 10 minutes, then the **Time before escalation** is 30 minutes. That is, the time that passes between the first notification of a non-responsive roster member and the first notification of the next member in the escalation path.

## Instructions

For detailed instructions, see Configure a roster.

### Example escalation reports

Because escalation reports depend on the escalation type, report content can vary greatly.

Because escalation reports depend on the escalation type, report content can vary greatly. Example reports follow:

**Example report for a Rotate through members escalation type**

In this example, users can see which shifts they are part of in My Schedule reports. Users who are not the first on-call person appear as well. This action enables the user to view the shift from a personal perspective, which is the preferred method for most users.

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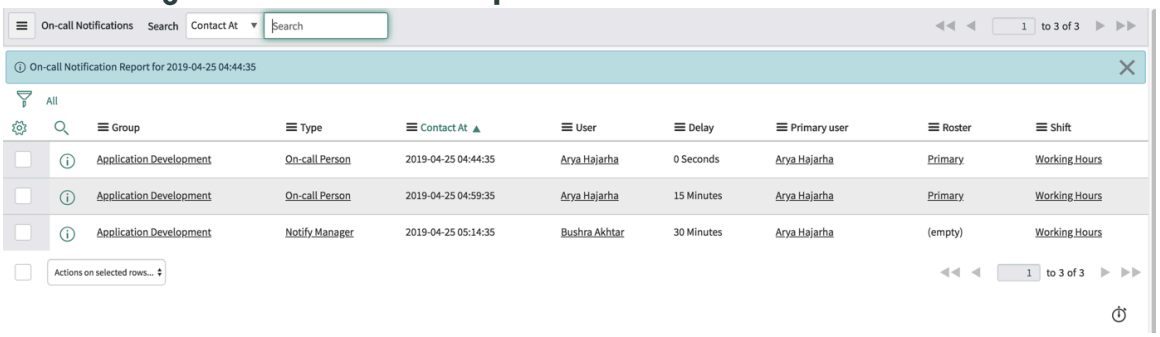
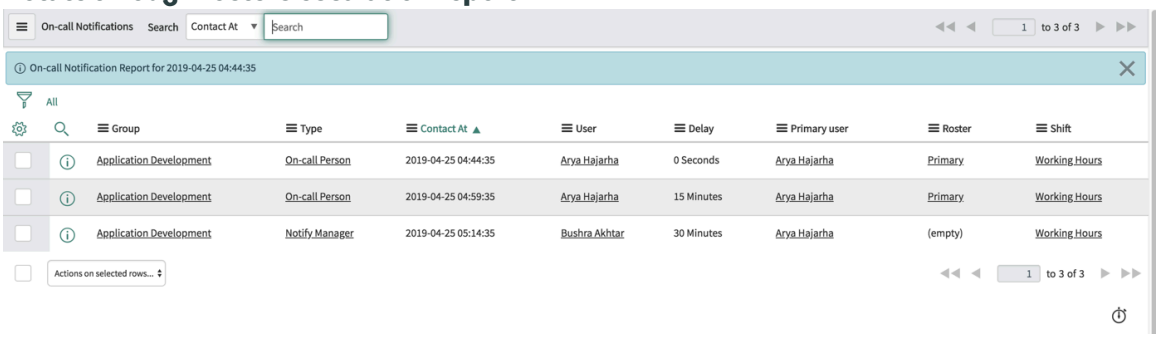
### Rotate through members escalation report




### Example report for a Rotate through rosters escalation type

In this example, reminders are defined for the **Primary**, **Secondary**, and **Tertiary** rosters. Members of the primary roster are notified first, then the members of the secondary, and so on, for all rosters.

### Rotate through rosters escalation report




## Track the progress of an escalation

Use the On-Call Escalation Tracking page for full visibility into the time line of an active or closed escalation as it progresses through its on-call escalation path.

### Before you begin

Role required: Any role that enables the user to read incidents.

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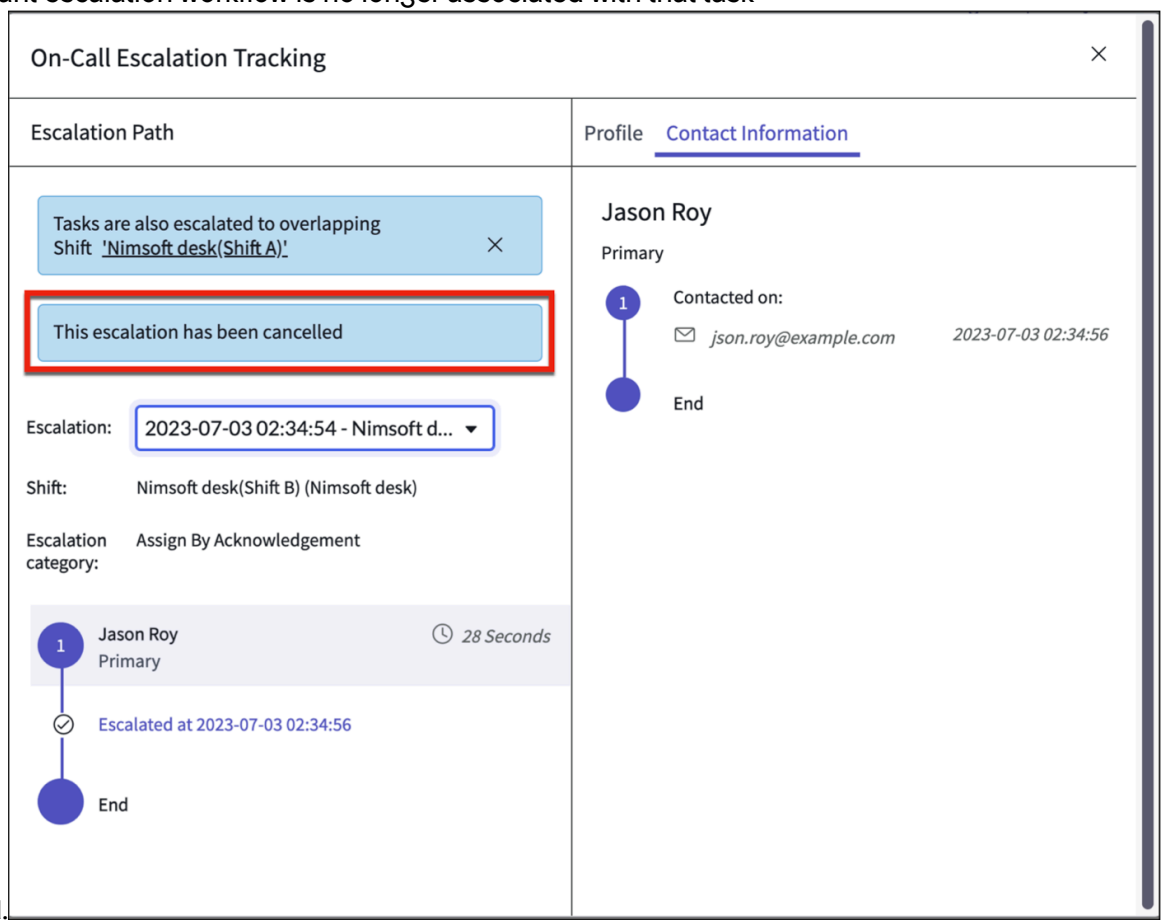
### About this task

**Note:**

- Escalation logging must be enabled to view the On-Call Escalation Tracking page. See the *com.snc.on_call_rotation.log_escalations* property in System properties for On-Call Scheduling.
- An on-call escalation is canceled when the assignment group of the associated task record, for example, an incident, changes to a different group without a matching trigger rule. It ensures that an existing irrelevant escalation workflow is no longer associated with that task record.




### Procedure

1. Navigate to **Incident** and open the incident.

   The **Assignment group** field includes the On-Call Escalation Tracking icon ( ) that indicates the active status of the escalation. Green indicates an active escalation, and black indicates a finished escalation.

2. Click the On-Call Escalation Tracking icon.

   The On-Call Escalation Tracking dialog box opens.

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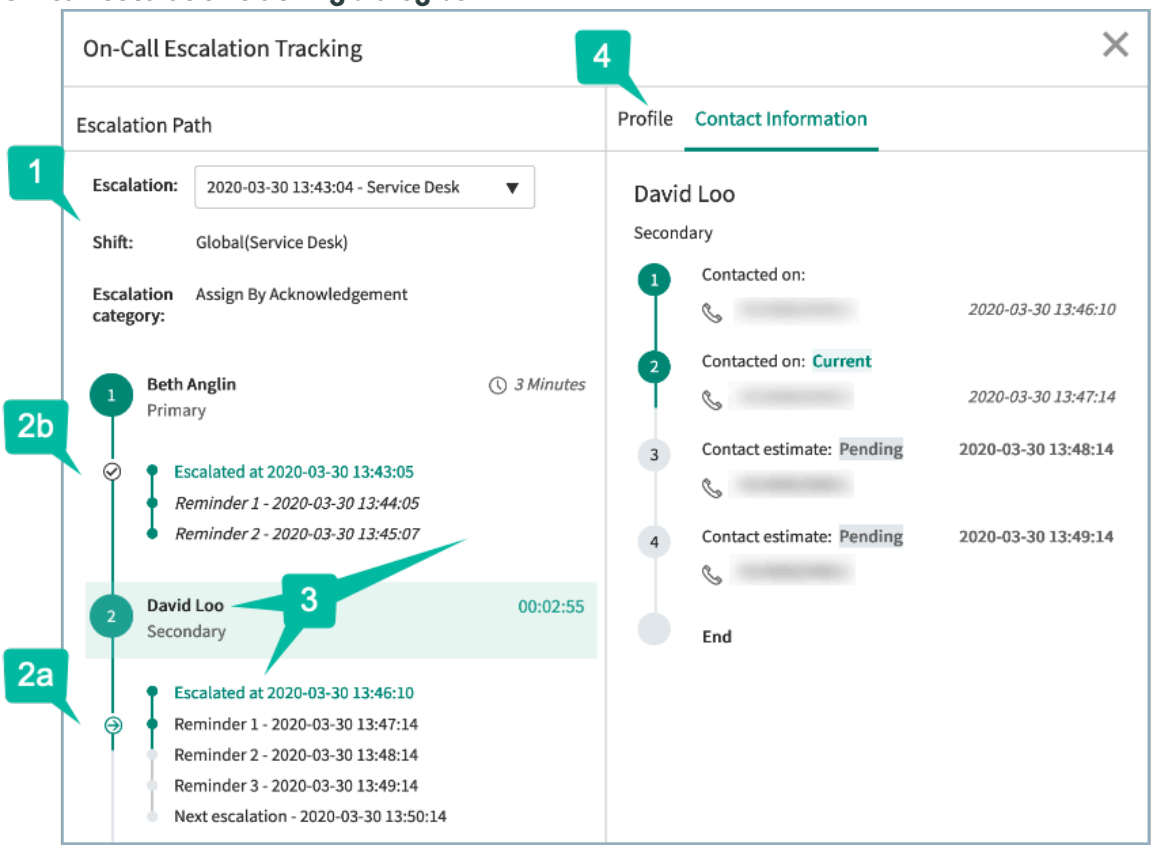
## Example: On-call escalation tracking

### On-call escalation tracking dialog box




1. The Escalation Path section identifies the escalation with start time, group, and shift that handles the escalation, and Escalation category.
2. Indicators on the time line show status:
   a. For active escalations, a green arrow on the path time line indicates the current active response phase.
   b. Unfilled check mark: Skipped response.
   c. Filled green check mark: Accepted response.
   d. Red X: Rejected response.
3. Click the escalation timestamp for an escalatee or escalatee's name to view timing details. The list on the **Contact Information** tab shows contact times, modes of contact, and responses for the associated escalation phase.

   The dots for the escalation timestamps indicate overall acceptance. Point to a dot to view further information. Color codes of the dots:

   - Green: At least one escalatee has accepted the escalation.
   - Orange: At least one escalatee has rejected the escalation.
   - Red: All escalatees have rejected the escalation.

**Note:**
To enhance the visual differences between dots, use the high-contrast user interface.

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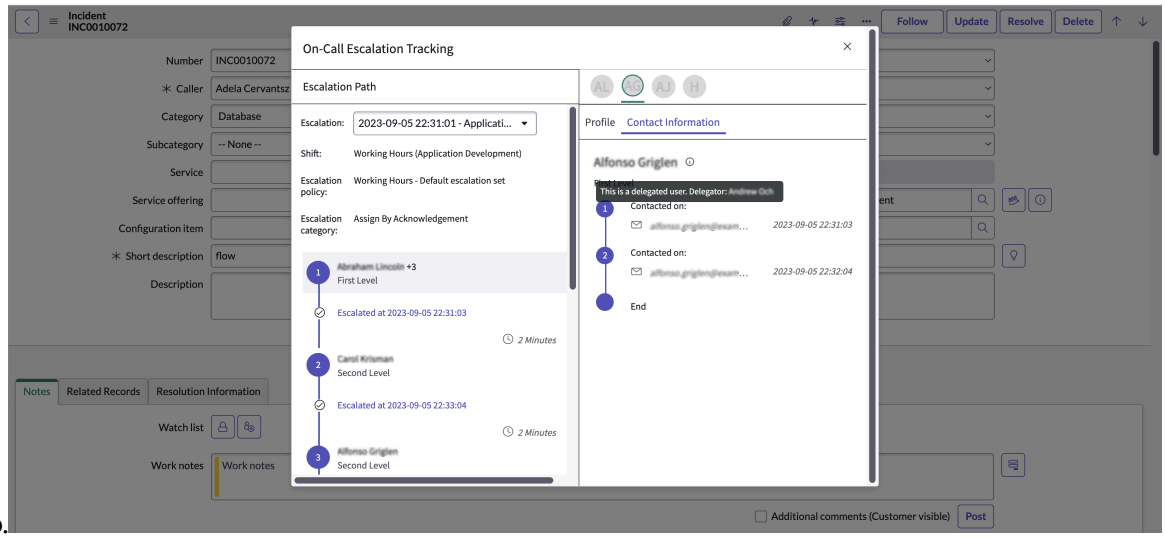
4. Depending on the contact settings, you can call or send a direct message to the person from the escalatee's **Profile** tab.




Select ⓘ to view delegator and delegated user's information.

## View details in an escalation log

View the escalation log record for full details on the time line and actions for an on-call escalation as it progressed through the on-call escalation path. You can also access escalation and escalation notification information from reports.

### Before you begin

Role required: rota_admin or admin

### About this task

This topic describes how to use the logs to access escalation information. You can also access escalation notification information from reports. See Viewing the Performance reports for escalations.

You can enable or disable logging using the *com.snc.on_call_rotation.log_escalations* property, as described in System properties for On-Call Scheduling.

### Procedure

1. Navigate to **All** > **On-Call Scheduling** > **Escalations** > **Escalation Logs** and open the incident. The On-Call Escalations [Escalation Logs view] opens.
2. Click the Information icon (ⓘ) to open the incident record.

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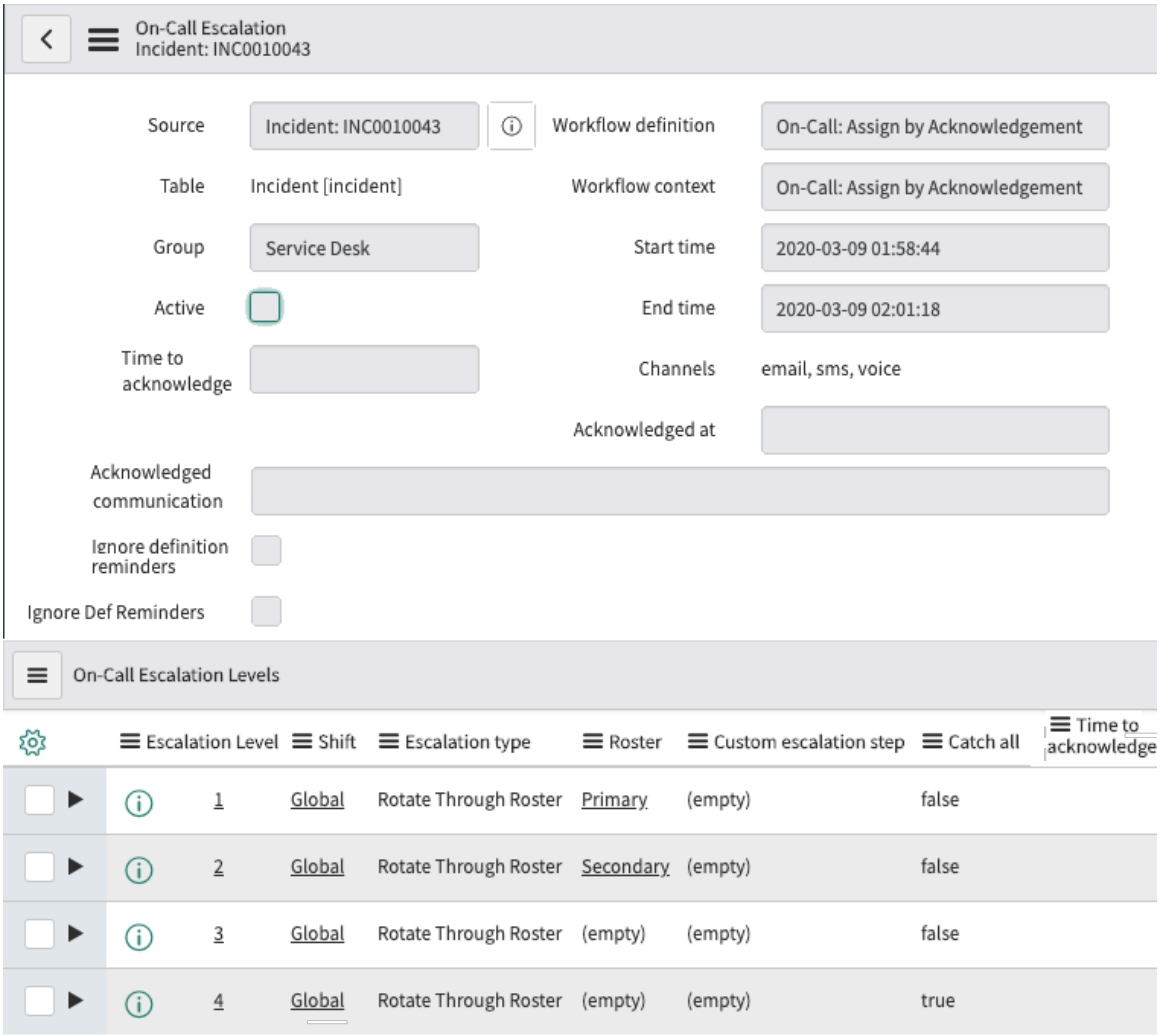


3. For each item in the related lists, you can click the Information icon ( ) to drill deeper into the details of the escalation (for example, to determine **Time to acknowledge** values).

## Assigning On-Call Scheduling roles

Admins can assign On-Call Scheduling roles to user groups and to individual users based on user activities and responsibilities.

## On-Call Scheduling roles tasks and access permissions

| Role | Tasks and access permissions |
|---|---|
| Shift administrator [rota_admin] | A user with the rota_admin role can create, read, update, and delete shifts. The rota_admin can create shifts using the Create new schedule wizard, modify shifts and rosters, and maintain coverage and time off on the Manage shifts from the Calendar view.<br><br>The rota_admin role contains the platform assignment_rule_admin role. |

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| Role | Tasks and access permissions |
| --- | --- |
| Shift manager [rota_manager] | The Shift manager role is for the manager of a group. The purpose of the role is to distinguish a member that has been delegated the role of managing shifts of a group. The role cannot be used to manage all groups on the instance.<br><br>The role can be delegated to the members of a group. See Delegating roles .<br><br>A user with the Shift manager role that meets any of the following requirements can manage shifts for their group:<br><br>• The user is the manager of the group.<br>• The user was delegated the rota_manager role. For information on delegating the shift manager role, see Delegate the shift manager [rota_admin] role. For information on role delegation, see Delegate roles .<br><br>**Note:** When a user is delegated a role on behalf of a group, the user can manage the shifts only for that group.<br><br>• The user is configured as a shift manager for a group. For information on configuring group preferences, see Configure preferences for a user group. |
| itil | A user with the itil role can view the Manage shifts from the Calendar view, on-call commitments on reports, and has general read-only access to their group's shifts. |
| Premium Dashboard user [rota_prem_dashboard_user] | Access to the On-Call Premium dashboard. The Premium dashboard displays performance metrics across groups. See Viewing the Performance reports for escalations. |
| DEPRECATED: roster_admin | **Warning:** Do not use this role for new users. This deprecated legacy role exists only to support customers that still use the role. |

**Related topics**

Base system Roles

Assign a role to a group

Assign a role to a user

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## Create a shift template to simplify configuring shifts

You can predefine sets of shift settings using shift templates. Shift templates are a subset of group templates.

### Before you begin

Role required: rota_admin

### Procedure

1. Navigate to **All** > **On-Call Scheduling** > **Administration** > **Group Templates**.
2. From the list of group schedule templates, select the template for which you want to create a new shift template.
3. On the related list of the shift templates, click **New** and then fill in the On-Call Shift Template form.

**New shift template fields**

| | |
|---|---|
| Shift name | The friendly name of the shift template. For example, US or EMEA. |
| Schedule type | The type of schedule. You can specify settings for a Simple schedule. Alternatively, you can select an existing template. |
| All day | Select the check box if the shift spans the full workday. |
| Start Time | If this is not an all-day shift, then specify the start time of the shift. |
| End time | The end time of the shift. |
| End time day | The day on which the shift should end. |
| Repeat on | For repeating shifts, the days of the week on which the shift should repeat. |
| On-Call Group Template | The group template to which the shift belongs. |
| Time zone | The time zone of the members of the rosters that will fill the shift. |
| Specify holiday Schedule | Select the check box to specify the holiday schedule for the shift. The setting is applied to the shift. |

4. Click **Submit**.

### Result

The template is now available for you to choose when creating or updating a shift.

## Create a group template to simplify configuring schedules

Create templates to help your group create on-call schedules. For example, use the 24/7 template, which is available in the on-call demo data, to create on-call schedules for continuous service.

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### Before you begin
Role required: rota_admin

### Procedure
1. Navigate to **All** > **On-Call Scheduling** > **Administration** > **Group Templates**.
2. Click **New**.
3. On the form, fill in the fields.

| Field | Description |
|---|---|
| Name | A name for the new template. For example, 8-5. |
| Description | A short description of the template. |

4. Click **Submit**.

## Mobile experience for On-Call Scheduling

View and manage on-call schedules from a mobile device with the On-Call Scheduling mobile applet.

On-call managers and shift managers can perform the following actions:

- View your group's on-call schedule including any gaps, time-off requests, and so on.
- View roster and escalation details for a shift.
- Review and act on gaps and conflicts.
- Approve/Reject time-off and shift swap requests.
- Provide, replace, or delete coverage and delete time-offs

Members of a roster can perform the following actions:

- View your on-call schedules, who else is on-call during a shift, and your role for the shift (primary/secondary).
- View the roster and escalation details for a shift.
- Submit time-off and shift swap requests.
- Send a message (Slack /MS teams/ Push notifications) to find a replacement.

### Getting started with the On-Call Scheduling mobile app

Use the ServiceNow Agent mobile app to access the On-Call Scheduling mobile application. Then log in to an instance and work on your schedules.

#### Before you begin
Depending on your device, go to the Apple App Store or the Google Play Store and download the ServiceNow Agent mobile app.

Role required: rota_manager

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### Procedure

1. Tap the mobile app icon on your device, and then tap **+** to open an instance.
2. In the instance address field, enter the instance address in one of two ways.

| Option | Description |
| --- | --- |
| **Manual input** | Type the instance address in the instance ad dress field.<br><br>**Note:**<br>You do not need to include `ser vice-now.com` at the end of the in stance name. |
| **Scan QR code** | Tap the QR icon (Scan a QR code), and then scan the QR code that was provided by your administrator. |

3. Tap **Login**.

## Mobile On-Call Scheduling overview

Members and managers of a shift can use the On-Call Scheduling applets and navigation menu on the Mobile Agent application to view and manage shifts and schedules.

## Applet launchers

Applet launchers serve as landing pages or home pages. When you log in to your instance, you see an applet launcher and the applets configured to display on that launcher. The system administrator configures the applet launcher and applets for the Now Agent mobile application.

## Navigation bar

The navigation bar appears at the bottom of the mobile application screen. This bar includes the following tabs that you can use to access different applets and application launch pages:

- *`My Work:`* As a member of a shift, view your upcoming shifts, request time off, and accomplish daily tasks related to your schedule.
- *`My Team:`* As an on-call manager, view your team's schedule and act upon important activities, like approving time-off requests and providing coverage.
- *`Notification:`* View a list of the notifications that have been pushed to an agent. Tap a notification in the list to see the details, then tap the details open the case.
- *`Settings:`* Manage settings for the mobile application.

## Manage work with ITSM Mobile Agent

As a member of a shift, view your upcoming shifts, request time off, and accomplish daily tasks related to your schedule.

My work application in the ITSM Mobile Agent app has the On-Call Scheduling applet to view your upcoming shifts and request time-off. You can also view the members of your group available on call.

For detailed procedure see Managing incidents and tasks using My Work applet.

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### On-call schedule actions- Upcoming shifts

| Action | Description |
|---|---|
| Tap on **Upcoming shifts** | View all upcoming shifts for the current month. The shift are grouped based on the events. Multiple-day event are displayed at the top. |
| Swipe left on the shift card | Request a time-off for the shift. |
| Tap on the shift card | View details for the shift like the group, roster, start time, and end time. |
| Tap **Request time-off** | Request a time-off for the shift. |
| Tap the  icon. | Changes the view of the calendar from monthly to daily. |

### On-call schedule- Time-off requests

| | |
|---|---|
| Tap on **Time-off requests** | View a list of time-off requests divided into pending and completed requests. |
| Tap the filter icon | Filter the time-off requests. |
| Tap the menu icon | Request time off from the Time-off requests screen. |
| Tap a pending time-off request | View the details of the request. |
| Tap **Cancel time-off** | Cancel the time-off by clicking **YES** on the confirmation message. |

### On-call schedule- Who is on-call

| | |
|---|---|
| Tap on **Who is on-call** | View a form that lets you select a group from a list of groups. |
| Tap the right arrow | View the list of groups that should be on-call in a schedule. |
| Select a group | Select a group from the list of groups and click the arrow to view who is on-call for the schedule. |

## Manage team with ITSM Mobile Agent

As a shift manager, view your team's schedule and perform activities like approving time-off requests and providing coverage.

### Upcoming shifts in On call schedule actions

| Action | Description |
|---|---|
| Tap **Upcoming shifts** | View all upcoming shifts for the current month. |
| Swipe left on the shift card | Request time off for this shift. |

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### Upcoming shifts in On call schedule actions (continued)

| Action | Description |
|---|---|
| Tap the shift card | View details for the shift (like group, roster, start time, and end time). |
| Tap **Request time-off** | Request a time-off for this shift by providing information on the Request time-off screen. |
| Tap **Provide Coverage** | Provide coverage for a shift member. |

### Time off requests in On-call schedule actions

| Action | Description |
|---|---|
| Tap **Time-off requests** | View a list of time-off requests divided into pending and completed requests. |
| Tap the filter icon | Filter the time-off requests using filters like End date or group. |
| Tap the menu icon | Request time off on the Time-off requests screen. |
| Tap a pending time-off request | View details of the request. |
| Tap **Approve** or **Reject** | Approve or reject a time-off request.<br>**Note:**<br>Add a reason for rejection of a time-off request. |

### Gaps and conflicts in On call schedule actions

| Action | Description |
|---|---|
| Tap **Gaps and conflicts** | View a list of all the gaps and conflicts for the shifts in your group. |
| Tap any day of the month | View all gaps and conflicts for shifts on that day. |
| Tap any of the shift cards | View gaps and conflicts for the shift. |
| Swipe left on any of the shift cards | Tap **Provide coverage** to provide coverage for the shift. |
| Tap **Provide Coverage** | Provide coverage for a gap in the shift. |

For detailed procedure see Managing teams and incidents using My Team applet.

## Reference for on-call scheduling

Reference section provides additional information about components installed with On-Call Scheduling

### Definitions of On-Call Scheduling terms

Some terms have specific meaning in the On-Call Scheduling application.

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**Shift**

A shift is the time period during which the members of a roster are on-call. You can view the details of any shift from the calendar.

**Roster**

A roster is a set of members that is on call for a shift. Because there is typically a roster for each escalation level (primary, secondary, tertiary), there are typically multiple rosters for a shift. The members of any roster are contacted in the order that is defined by the escalation policy.

**Roster members (members)**

The members of a roster are the users that have been added to a single roster. Roster members typically have the itil role. During an assigned shift, members must be available to act if notified of an escalation.

- Users must be members of the same group.
- The shift manager (rota_manager role) might or might not be a roster member.

**Rotation**

Rotation is the process of exchanging the turn of duty of members of a roster.

Members' From and To dates determine when they are members of the roster.

**Schedule**

A schedule specifies the times that shifts are active. For example, a company that wants coverage of tasks around the clock would use a 24-7 schedule. Companies that provide support around the globe could use a follow the sun schedule to cover time zones across continents.

**Escalation**

Escalations are a series of notifications to roster members for a task. The notifications happen in the order specified by the escalation path for the shift.

**Notification**

On-Call Scheduling sends escalation notifications to members of a shift. Notification methods include email, voice, Slack, SMS, Microsoft Teams, and mobile push.

**Holidays and time off**

Roster members can request time off. Managers can plan for and manage holidays and requests for time off.

**Related topics**

On-Call Scheduling

## Components installed with On-call scheduling

Several types of components are installed with activation of On-call scheduling, including tables and user roles.

### Tables installed with On-Call Scheduling

On-Call Scheduling adds the following tables.

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## Tables installed with On-Call Scheduling

**Note:**
Tables with prefix "v_" such as [v_alternate_rotation] are view-only tables used for generating on-call reports. Do not use these tables to create reports.

| Display name [Table name] | Description |
|---|---|
| On-call Member [cmn_rota_member] | Table of group members that are participating in the on-call schedule and escalations. |
| Roster [cmn_rota_roster] | Table that holds the members of the shift, the shift interval, and escalation settings. |
| Shift [cmn_rota] | The table that holds the on-call schedule for a shift. |
| Roster Schedule Span [roster_schedule_span] | Table that contains the schedule span definitions. On-Call Scheduling adds a group reference and the On-call type to the Type field. |
| Trigger Rule [trigger_rule] | Table that extends the Assignment Rule [sysrule_assignment] table and stores when the escalation process is triggered and what actions to take. |
| On-call Notifications [v_on_call] | Table that lists the reminder notifications that were sent. |
| Rotation Schedule [v_rotation] | Table that lists shift schedules by start date and time and includes user contact information, if available. |
| User Rotation Schedule [v_user_rotation] | Table that lists the shift schedule by user. |
| Alternate Rotation Schedule [v_alternate_rotation] | Table that lists the alternate user schedules by shift and roster and the start and end date and time stamps. |
| Rotation Escalation [cmn_rota_escalation] | Table that lists the escalations including the event and last updated time stamp. |
| Shift Contact Preference [cmn_rota_contact_preference] | Table that holds the contact preferences for default and custom escalations. |
| On-Call Communication Type [on_call_communication_type] | Table that lists the type of communication channel used. |
| On-Call Group Template [sys_on_call_group_template] | Table with information about the template used to create/edit a schedule of a group. |
| On-Call Shift Template [sys_on_call_shift_template] | Table with information about the template used to create/edit a schedule of a shift. |
| On-Call User Preference [on_call_user_preference] | Table with information on a member's preferences. |
| On-Call User Contact Preference [on_call_user_contact_preference] | Table with information on a member's contact preferences. |
| [sys_on_call_contact_source] | Table that lists the contact sources and devices |
| On-Call Escalation [on_call_escalation] | Table that records the source, group, and related details for escalation tracking. |
| On-Call Escalation Level [on_call_escalation_level] | Table that logs the escalation levels reached for an escalation and related details for escalation tracking. |

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| Display name [Table name] | Description |
|---|---|
| On-Call Escalation Contact Attempt [on_call_escalation_con_attempt] | Table that logs contact attempts at an escalation level and related details for escalation tracking. |
| On-Call Escalation Notification [on_call_escalation_comm] | Table that logs both the notifications and the responses for a contact attempt and related details for escalation tracking. |
| On-Call Escalation Response [on_call_escalation_response] | Table that tracks On-Call escalation responses by On-Call workflows. Once consumed, entries are deleted by the system. |
| Trigger Rule Table Configuration [trigger_rule_table_cfg] | Table that lists the tables that are enabled for creating escalation trigger rules. The table is used to enable the escalation trigger rules for the tables that do not extend tasks. |
| On-Call Add Member [on_call_add_member] | Table that records the member details for adding a member to the roster. |
| On-Call Remove Member [on_call_remove_member] | Table that records the member details for removing a member from the roster. |
| On-Call Move Member [on_call_swap_member] | Table that records the member details for swapping the order of a member with the target member or moving the order of a member after the target member in the roster. |

### Scheduled jobs installed with On-Call Scheduling

On-Call Scheduling includes scheduled jobs.

| Schedule job | Description |
|---|---|
| On-Call Reminders | Sends daily reminders to on-call roster members. |
| On-Call Gaps Conflicts Report | Sends a weekly report of gaps and conflicts in on-call schedules to shift managers, group managers, and admin. |

## Quick start tests for On-Call Scheduling

Validate that On-Call Scheduling still works after you make any configuration change such as apply an upgrade or develop an application. Copy and customize these quick start tests to pass when using your instance-specific data.

## On-Call Scheduling

Activate the On-Call Scheduling plugin (com.snc.on_call_rotation) to run the On-Call Scheduling quick start tests.

### On-Call: On-Call scheduling ATF Suites

| Test | Description | Release version |
|---|---|---|
| On-Call: Verify request time-off when PTO approval preferences is Not allowed | Verify whether you can request a time-off when PTO approval preferences is set to **Not allowed** | Orlando |

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### On-Call: On-Call scheduling ATF Suites (continued)

| Test | Description | Release version |
|---|---|---|
| On-Call: Create overlapping shifts without selecting a template | Verify whether you can create overlapping shifts without selecting a template. | Orlando |
| On-Call: Create overlapping shifts when allow shift overlap is set to No | Verify whether you can create overlapping shifts when **Allow overlap** is set to **No**. | Orlando |
| On-Call: Request time-off when PTO approval preferences is with approval | Verify whether you can request a time-off when PTO approval preference is **With approval**. | Orlando |
| On-Call: Assign shift managers for maintaining on-call schedules. | Verify whether shift managers can maintain on-call schedules. | Orlando |
| On-Call: Search on-call schedules by user name | Verify whether you can search for on-call schedules by user name. | Orlando |
| On-Call: Search on-call schedules by group name or schedule name | Verify whether you can search for on-call schedules by group name or schedule. | Orlando |
| On-Call: Roster details for overlapping shifts with the escalation rule 'Escalate to incoming shift' | Verify the roster details for overlapping shifts when the escalation rule is set to **Escalate to incoming shifts**. | Orlando |
| On-Call: Calendar preview with timezone options | Verify whether the calendar preview is available with the timezone options. | Orlando |
| On-Call: Create overlapping shifts by selecting a template | Verify whether you can create overlapping shifts by selecting a template. | Orlando |
| On-Call: Show active shifts | | Orlando |
| On-Call: Make shift draft/ publish form shift form | Verify whether you can publish/unpublish a shift and alternate between making the rota **Draft** and **Publish** state from the form. | Orlando |
| On-Call: Roster Details for overlapping shifts with the escalation rule 'Escalate to outgoing shift' | Verify the roster details for overlapping shifts when the escalation rule is set to **Escalate to outgoing shifts**. | Orlando |
| On-Call: Roster Details for overlapping shifts with the escalation rule 'Escalate to all shifts' | Verify the roster details for overlapping shifts when the escalation rule is set to **Escalate to all shifts**. | Orlando |
| On-call: Verify On-Call workbench | Test to verify the On-Call workbench layout. | Orlando |

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**On-Call: On-Call scheduling ATF Suites (continued)**

| Test | Description | Release version |
|---|---|---|
| On-call: Hide or show shifts | Verify whether you can hide or show shifts from On-Call calendar | Orlando |

To learn more about On-Call Scheduling, see On-Call Scheduling.

**Related topics**

Quick start tests

## System properties for On-Call Scheduling

The property settings configure On-Call Scheduling operations.

## Setting properties from the UI

You can set most property values from the On-Call Properties page at **On-Call Scheduling** > **Administration** > **On-Call Properties**.

| Property | Description |
|---|---|
| com.snc.on_call_rotation.calendar_macro | The name of the macro that provides a calend DHTMLX scheduler. Fullcalendar is set by ocf |
| com.snc.on_call_rotation.support_legacy_spans | Used to search for override or time-off records records and not the standard roster_schedule |
| com.snc.on_call_rotation.pto.approval.required | Configuration to determine if PTO requests ne |
| com.snc.on_call_rotation.factor_daily_rotation_interval_all_day | If true, mandates daily rotation to occur at mid roster start time for the next day.<br><br>Location: System Property [sys_properties] ta |
| com.snc.on_call_rotation.log.level | Enable logs for debugging.<br><br>Location: System Property [sys_properties] ta |
| com.snc.on_call_rotation.log_escalations | Enable logging of escalations. See View detai<br><br>Location: System Property [sys_properties] ta |
| com.snc.on_call_rotation.calendar_macro | The name of the macro that provides a calend scheduler. Fullcalendar is set by `ocf_calen`<br><br>Location: System Property [sys_properties] ta |
| com.snc.on_call_rotation.support_legacy_spans | Used to search for override or time-off records cmn_schedule_span table and not in the star<br><br>Location: System Property [sys_properties] ta |
| com.snc.on_call_rotation.pto.approval.required | Configuration to determine whether PTO requ<br><br>Location: System Property [sys_properties] ta |

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| Property | Description |
| --- | --- |
| com.snc.on_call_rotation.contrast | Sets text color to either white or black depend background color on the calendar. The follow<br>• ContrastYIQ<br>• ContrastPercent<br>• ContrastLuminance<br>**Note:** ContrastYIQ is used if the property is not<br>Location: System Property [sys_properties] ta |
| com.snc.on_call_rotation.access.debug | If true, enable general On-Call logs for debug<br>Location: System Property [sys_properties] ta |
| com.snc.on_call_rotation.reminders.showtz | Include a user's time zone in On-Call Shift Re<br>Location: System Property [sys_properties] ta |
| com.snc.on_call_rotation.show_legacy_calendar | Show the legacy On-Call calendar.<br>Location: System Property [sys_properties] ta |
| com.snc.on_call_rotation.calendar_read_roles | Comma-separated list of roles that can read t<br>Location: System Property [sys_properties] ta |
| com.snc.on_call_rotation.cover.color | Sets the color of the span for On-Call coverag<br>Location: System Property [sys_properties] ta |
| com.snc.on_call_rotation.timeoff.color | Sets the color of the span when the type is tir<br>Location: System Property [sys_properties] ta |
| com.snc.on_call_rotation.landing_page.group_limit | The number of On-Call schedules loaded per |
| com.snc.on_call_rotation.landing_page.max_groups | The maximum number of On-Call schedules t<br>**Note:** The default value is chosen as the limit o |
| com.snc.on_call_rotation.landing_page.pinned_notification | Displays a message when any schedule is pir |
| com.snc.on_call_rotation.landing_page.notification_timeout | Specifies the time (in milliseconds) until the m |
| com.snc.on_call_rotation.landing_page.show_wizard_btn | Displays the **New** button to open the On-Call |
| com.snc.iam.conference_call_follow_on_call_escalation | If selected, On-Call the escalation path is follo<br>This property is added when the Incident Con activated. |
| com.snc.iam.conference_call_escalation_workflow | If selected, custom escalation hierarchy is ap<br>This property is added when the Incident Con activated. |

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| Property | Description |
| --- | --- |
| com.snc.on_call_rotation.landing_page.show_pending_actions | If true, displays the pending actions on the O |
| com.snc.on_call_rotation.allow_rota_overlap | If true, overlapping shifts are allowed for a use |
| com.snc.on_call_rotation.escalation_rule_rota_overlap | Escalation rule that applies for shift overlap. C<br>• Escalate to outgoing Shift<br>• Escalate to incoming Shift<br>• Escalate to all Shifts |
| com.snc.on_call_rotation.pto.configuration | Specifies how a roster member can create va<br>• With approval<br>• Without approval<br>• Not allowed |
| com.snc.notify.default.conference_call_follow_on_call_escalation | If true, the On-Call escalation path is followed added to a conference call. Users can create types such as incident. Example: For Incident *com.snc.notify.incident.confere*<br>**Note:** The property is enabled only when the N |
| com.snc.notify.default.on_call_escalation_level | Fetches the number of users from the group e plan. A value of 1 fetches only the first level of<br>**Note:**<br>• This is the default property that is used configured. To use different workflows create a new property by replacing the<br>• This property is used only when the *com.snc.notify.default.con* sys property is false.<br>• The property is enabled only when the<br>• |
| com.snc.notify.default.conference_call_escalation_workflow | The sys_id of the default workflow that must b<br>**Note:**<br>• This is the default property that is used type is configured. To use different wor incident or problem), create a new prop in the key with the task type. Example: *com.snc.notify.incident.co*<br>• The property is enabled only when the |
| com.snc.on_call_rotation.use_slack_for_dm | If false, disables direct messaging via Slack o |
| com.snc.on_call_rotation.use_msteams_for_dm | If false, disables direct messaging via Microso |

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## On-Call Scheduling workflows

Workflows perform On-Call Scheduling operations.

## Workflows installed with On-Call Scheduling

### On-Call: Assign by Acknowledgement

The workflow uses data from escalation settings, including overlapping shifts and custom escalation settings for shifts and rosters. Depending on the settings, the workflow moves through the escalation path and sends notifications by SMS, voice, or email that ask users to accept a task.

To send notifications, a trigger rule is required. Trigger rules supersede some On-Call business rules in earlier releases. To define a trigger rule, you must deactivate business rules that you customized in earlier releases.

The workflow respects time off as specified in rosters. Roster members with time off are not included in the escalation path and no notifications are sent to them.

If **Force communication channel** is specified in the **Escalation settings** for rosters, the Subscription-based notifications is used: SMS, email, voice, Microsoft Teams, or mobile push. If the preferred method is SMS and the on-call member does not have an SMS device defined, the user is not contacted even if the user has an email address. When forcing a communication channel on an escalation level does not succeed, no further communication attempts are made. The failed contact attempt is logged. The setting **Force communication channel** is available only if Notify is installed.

- Until acknowledged, sends on-call notifications to escalatees based on the escalation policy and configured contact preference.
- Logs escalation details for each communication.
- Resumes the workflow immediately after rejection.
- Catch-all users are treated like all other escalation users: A response is expected and the incident might be assigned to them based on their response.

**Note:**
This workflow internally launches the On-Call: Assign by Acknowledgement per Rota workflow.

### On-Call: Escalations by Email

- Until acknowledged, sends on-call email notifications to escalatees based on the escalation policy and configured email contact preferences.
- Logs escalation details for each communication.
- Catch-all users are treated like all other escalation users: A response is expected and the incident might be assigned to them based on their response.

### On-Call: Assign

Assigns the task to the current primary roster member.

### On-Call: Check Assignment Response

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- Triggered when an inbound SMS message is received.
- Based on the response in the message, assigns the task to the roster member.
- Updates the response in the corresponding notification record.

**On-Call: Assign by Acknowledgement Voice**

- Triggered when an outbound call is made from the on-call number to any user or device.
- Based on the response to the voice call, assigns the task to the roster member.
- Updates the response in the corresponding notification record.

**On-Call: Time-off approval**

- Triggered when vacation time off (PTO) is requested by a user.
- Sends approval requests to appropriate managers.

**On-Call: Conference Call Escalation**

- Triggered when a conference call is initiated and a group is added to the call.
- Makes a voice call to the first group member in the escalation policy.
- If the member does not join the conference call, then escalates to next group member in the policy

### Workflow Activities for On-Call Scheduling

Workflow activities in On-Call Scheduling workflows.

## Escalation workflow activities

**On-Call: Log Escalation Start**

Creates an escalation record based on group, task, and workflow details.

**Note:**

The escalation that the workflow creates the `workflow.scratchpad.escalationSysId` sys_id. Use the sys_id in any of the other workflow activities.

| Setting | Description |
|---|---|
| Group | sys_id of the group that the escalation belongs to. |
| Table | Table name of the task record of the incident. |
| Source | sys_id of the task record on which the escalation happened. |
| WorkflowDefinition | sys_id of the workflow definition that is used to escalate. |
| WorkflowContext | sys_id of the workflow context. |
| ParentEscalationLevelId | sys_id of the parent escalation in the case that the escalation was triggered from another escalation. |

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| Setting | Description |
| --- | --- |
| Category | Category of the escalation. One of: [assign_by_acknowledgement, auto_assignment, notify_manual_assignmen,conferencing]. |
| Channels | Comma-separated list of the channels used to communicate during the escalation. Any or all of: [email, sms, voice, slack]. For example, sms,email,voice |
| IgnoreDefReminders | If true, the workflow sends notification reminders as specified by the workflow, rather than as specified in On-Call Escalation settings. For example, in Conference On-Call escalations, the workflow might to dial the on-call members at one-minute intervals instead of the standard 15-minute intervals. |

### On-Call: Log Escalation Level

Creates an escalation level record given escalation and level details.

| Setting | Description |
| --- | --- |
| EscalationId | sys_id of the escalation to which the level belongs. |
| RotaId | sys_id of the shift for which the escalation is happening. |
| Level | Current escalation level. For example, 2. |
| Escalatee | Escalatee object at current escalation level. For example, getEscalationPlan()[1]. |
| CatchAll | True if the escalation level belongs to a catch-all. |

### On-Call: Log Escalation Attempt

Creates a Contact attempt record given an escalation, level, and attempt details.

| Setting | Description |
| --- | --- |
| EscalationId | sys_id of the escalation to which the contact attempt belongs. |
| RotaId | sys_id of the shift for which the escalation is happening. |
| Level | Current escalation level. For example, 2. |
| ContactAttempt | Contact attempt number within the escalation level. For example, 1. |

### On-Call: Log Escalation Communication

Creates a communication record given escalation, level, attempt, and communication details.

| Setting | Description |
| --- | --- |
| EscalationId | sys_id of the escalation to which the communication belongs. |
| RotaId | sys_id of the shift for which escalation is happening. |

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| Setting | Description |
|---|---|
| Level | Current escalation level. For example, 2. |
| ContactAttempt | Contact attempt number within the escalation level. For example, 1. |
| EscalateeType | Type of escalatee to whom the communication is sent. One of: [user,device] |
| EscalateeId | sys_id of the user or device, depending on escalatee type. |
| CommType | Type of communication. One of: [sms, voice, email, slack] |
| CommValue | Phone number or email address, depending on communication type. For example, `abel.tuter@servicenow.com` |
| Status | Status of the communication. One of: [sent, failed]. |
| Escalatee | Escalatee object at current escalation level. For example, getEscalationPlan()[1]. |
| CatchAll | True if the escalation level belongs to a catch-all. |

### On-Call: Log Escalation End

Completes the escalation by setting active flag to false.

| Setting | Description |
|---|---|
| EscalationId | sys_id of the escalation. |

### On-Call: Send Notification

Sends notification to the current escalatee via voice, SMS, Slack, Microsoft Teams, or mobile push.

| Setting | Description |
|---|---|
| Notification type | Type of notification. One of: [sms, voice, slack]. |
| Message | Text of message to send to current escalatee if notification type is sms. |
| Notification detail | List of parameters that are required for a notification:<br>• SMS: notify_number, users, groups, numbers<br>• Voice: numberToCallFrom, numberToCall, user<br>• Slack: slack user, taskId, catchAllOption, wFContextId<br>• Microsoft Teams: user, taskId, catchAllOption, wFContextId<br>• Mobile push: userSysId, tablename, recordSysId |

### On-Call: Manage Escalation Response

Manage an escalation response record (insert escalation record, clean escalation records, update response to an escalation). An escalation response record keeps track of a response received for an escalation through the SMS, voice, email, or

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Slack notification channels. An escalation response record is used to resume the **On-Call: Assign by Acknowledgement** workflow upon rejection of an escalation.

| Setting | Description |
|---|---|
| Workflow Context | Workflow context ID. |
| Escalatee Id | UserID of the current escalatee. |
| Table Name | Table name of the task record. For example, `incident`. |
| Current Record Id | sys_id of the task record. |
| Action Type | Type of action. One of: [add,clean,update] |
| Response | Response by escalatee to an escalation. One of: [accepted,rejected] |

Example uses:

- Insert (add) - Workflow Context, Escalatee ID, Table Name, Current Record ID
- Clean - Workflow Context
- Update - Escalatee ID, Table Name, Current Record ID, Response

## Domain separation and On-Call Scheduling

Domain separation is supported in On-Call Scheduling. The On-Call Scheduling application helps you to ensure that dedicated support team members are available to resolve issues as they arise.Domain separation enables you to separate data, processes, and administrative tasks into logical groupings called domains. You can control several aspects of this separation, including which users can see and access data

## Support level: Standard

- Includes **Basic** level support.
- Business logic: The service provider (SP) creates or modifies processes per customer. The use cases reflect proper use of the application by multiple SP customers in a single instance.
- The instance owner must configure the minimum viable product (MVP) business logic and data parameters per tenant as expected for the specific application.

Sample use case: An admin must be able to make comments required when a record closes for one tenant, but not for another.

For more information on support levels, see Application support for domain separation.

## On-Call Scheduling overview

- On-Call Scheduling behaves the same with domain support as it does without domain support. Customers have the same ability to create and maintain on-call shifts.

- A shift includes a selection of users from a group. It uses the base-system Advanced Schedules Support plugin to specify when the shift is active.

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## How domain separation works in On-Call Scheduling

With domain separation enabled, a user with the rota_admin role uses the Create New Schedule wizard to generate schedules in the group's domain. All generated related records for the new schedule are created with a matching domain.

This setup is enforced with a combination of the domain field and the *domain_master* attribute. The attribute is used to derive the domain of the record from the master record. For the roster table, it derives the domain from the associated shift record.

## Domain-separated tables

- Shift [cmn_rota]
- Rotation Escalation [cmn_rota_escalation]
- Shift Escalation Set [cmn_rota_escalation_set]
- Shift Escalation Step Definition [cmn_rota_esc_step_def]
- On-Call Group Preference [on_call_group_preference]
- On-Call Contact Source [sys_on_call_contact_source]
- On-Call Group Template [sys_on_call_group_template]
- On-Call Shift Template [sys_on_call_shift_template]
- On-Call Template Contact Attempt [on_call_template_contact_attempt]
- On-Call Template Contact Preference [on_call_template_contact_preference]
- On-Call Template Escalation Policy [on_call_template_escalation_policy]
- On-Call Template Escalation Step [on_call_template_escalation_step]
- On-Call Escalation [on_call_escalation]
- On-Call Escalation Level [on_call_escalation_level]
- On-Call Escalation Contact Attempt [on_call_escalation_con_attempt]
- On-Call Escalation Notification [on_call_escalation_comm]

## Tables that use the domain_master attribute

- Roster [cmn_rota_roster]: *domain_master=rota*
- Rota Member [cmn_rota_member]: *domain_master=roster*
- Roster Schedule Span [roster_schedule_span]: *domain_master=schedule*
- Shift Escalation Set [cmn_rota_escalation_set]: *domain_master=cmn_rota*
- Shift Escalation Step Definition [cmn_rota_esc_step_def]: *domain_master=cmn_rota_escalation_set*
- On-Call Escalation Level [on_call_escalation_level]: *domain_master=escalation*
- On-Call Escalation Contact Attempt [on_call_escalation_con_attempt]: *domain_master=escalation_level*
- On-Call Escalation Notification [on_call_escalation_comm]: *domain_master=contact_attempt*

To learn more, see Domain support for schedules

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### Use cases

For the following On-Call Scheduling features, domain separation ensures that end users (whether they possess the itil or rota_admin role) are able to see only shifts accessible via their domain:

- On-Call calendars
- On-Call schedules
- My Schedule reports
- Schedule reports
- Escalations

#### Related topics

Domain separation for service providers

## Proactive Engagement

Proactive Engagement assists organizations to improve employee productivity and satisfaction by proactively detecting and enabling employees to self-solve digital experience issues on a day-to-day basis.

### Proactive Engagement overview

Proactive Engagement solution provides a self-resolution remediation process. Proactive Engagement eliminates the need for publishing all solution sets.

Visit the ServiceNow Store website to view all the available apps and for information about submitting requests to the store. For cumulative release notes information for all released apps, see the ServiceNow Store version history release notes.

### Get started

| Explore | Configure |
| --- | --- |
|  |  |
| Learn how Proactive Engagement can help you with its key features and benefits. | Plan and customize Proactive Engagement to meet your specific needs. |

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| Use | Reference |
| --- | --- |
|  |  |
| See how users can leverage Proactive Engagement framework to resolve issues. | Get additional information about Proactive Engagement. |

### Troubleshoot and get help

- Search the Known Error Portal for known error articles
- Contact Customer Service and Support

## Exploring Proactive Engagement

It is a framework where the self-resolution remediation process is proactive, seamless, and consistent without the organization having to publish all solution sets.

### Proactive Engagement overview

ServiceNow® Proactive Engagement helps an organization in improving employee digital experience, productivity, and satisfaction by proactively enabling employees to self-solve digital issues they experience on a day-to-day basis. The self-remediation process is seamless and consistent without the organization having to publish all solution sets.

Visit the ServiceNow Store website to view all the available apps and for information about submitting requests to the store. For cumulative release notes information for all released apps, see the ServiceNow Store version history release notes.

### Proactive Engagement Key features

- Enables employees to self-solve digital experience issues by leveraging the proactive issue detection and resolution capability of the ServiceNow Digital End-User Experience product.
- Engages employees to provide a seamless resolution experience through remedial actions (automations) and self-service content.
- Provides quick scaling and consistent support for increasing the range of applications.

### ServiceNow Digital End-User Experience integration with Proactive Engagement

ServiceNow Digital End-User Experience empowers IT to take proactive measures and offers a clear view of end-user applications, devices, and networks. It further along with Proactive Engagement enables employees to independently resolve issues, troubleshoot, and engage with the Virtual Agent.

ServiceNow Proactive Engagement integrates with ServiceNow Digital End-User Experience to define issue detection rules, resolution content, and engagement settings that help employees to self-solve digital experience issues by leveraging proactive identification of issues.

For information on the ServiceNow Digital End-User Experience, see Digital End-User Experience.

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## DEX Admin/Engagement admin experience

- A DEX or engagement admin is part of the customer's organization.
- Creates a metric rule for each device or application CI to enable DEX to detect specific issues and defines the specific alert action. An Alert action defines the action to be taken whenever a threshold in the metric rule is reached and it supports a configuration of resolution types like remedial actions, self-help instructions, URL, create incident. For example, resolution when an application crashes is to clear the application cache.
- Configure engagement settings such as channels to notify and engage with the organization's employees, notification content, and fallback options for unsuccessful resolution of issues.
- Captures and reports insights that reflect the usage patterns of Proactive Engagement in ITSM Success Dashboard.
- Customize the Proactive Engagement base system resolutions that are shipped by ServiceNow.
- Manage the Proactive Engagement resolutions through the Proactive Engagement workbench.

**Note:**
The Engagement Admin role is required to add an alert action.

## Employee experience

- Employee is a part of the customer's organization.
- When an employee experiences an issue for which the metric rule and resolution is already configured, the employee is proactively notified and engaged and offered a resolution for the issue in real-time over the configured engagement channel. The employee engagement occurs as soon as the issue is detected and even before the employee reaches out to the helpdesk.
- The employee can be more productive and efficient after virtually engaged while self-solving issues. It also reduces the number of incidents and load on agents due to this seamless digital experience.
- Virtual Agent installation and integration with a third-party messaging application to enable push notifications for proactive employee engagement.

## Proactive issue detection and Resolution

1. ServiceNow Digital End-User Experience application proactively detects a digital experience issue on an employee device by monitoring the metric rule threshold breach and creates an experience issue.
2. Proactive Engagement validates the experience issue and sends a notification (based on the notification settings) to the employee through configured channels such as Virtual Agent on Employee Centre/Service Portal, integration with any messaging application such as MS Teams. The employee can choose to accept help based on this notification or ignore it.

   **Note:**

   - When the employee accepts help, the employee is engaged through the configured engagement channel.
   - Currently, only Virtual Agent is the supported configured channel to send notifications to the employee.

3. Proactive Engagement retrieves the configured proactive resolution for the metric rule and engages the employee by providing solutions such as URLs, self-help instructions, or executes the relevant remedial action on the employees device with their consent.

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- If the resolution has successfully resolved the issue, the engagement is marked as successful.
- If the resolution has not resolved the issue, the employee is given fallback options such as incident creation or will be connected to an agent.

**Note:**
Fallback options are configured by the DEX or Engagement admin.

The ServiceNow Proactive Engagement provides base resolution content. You can create your own resolution content as well. For more information, on the base resolutions, see Proactive Engagement solution.

# Configuring Proactive Engagement

Configure a Self-remediation Framework so that employees can self-solve issues seamlessly.

## Configuration overview

The Proactive Engagement application helps you to configure and provide instructions as remedial actions. These remedial actions act as self-help instructions to resolve their digital issues proactively.

## Setting up Proactive Engagement

Setting up Proactive Engagement enables the organization to setup proactive engagement and issue resolution capabilities to help employees resolve their digital experience issues.

### Before you begin

**Note:**
Proactive Engagement integrates with ServiceNow DEX to proactively detect the digital experience issues.

- Activate the Glide Virtual Agent plugin (Id: com .glide.cs.chatbot).
- Install the ServiceNow Proactive Engagement application from the ServiceNow® Store.
- Activate the Remedial actions framework plugin to use remedial actions as a resolution type.
- Ensure that the application and all of its associated ServiceNow Store applications have valid ServiceNow entitlements. For more information, see Get entitlement for a ServiceNow product or application.
- Review the Proactive Engagement application listing in the ServiceNow® Store for information on dependencies, licensing or subscription requirements, and release compatibility.

**Note:**

To view the Virtual Agent notifications:

- Set the system property **com.glide.cs.notification_newuser_webclient** to **True**.
- Navigate to **sys_cs_live_agent_setup.do?sys_id=f0acbc4c5f091300e6333654de7313c8** and **enable** the notifications for all users.

Role required: admin

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### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the Proactive Engagement application (com.snc.proactive_engagement) using the filter criteria and search bar.

   **Note:**
   You can search for the application by its name or ID. If you cannot find the application, you must request it from the ServiceNow® Store. In the list next to the **Install**, the available versions are displayed.

3. Select a version from the list and select **Install**.

   **Note:**
   Any dependencies that are installed along with the application are also listed.

4. If you are prompted, follow the links to the ServiceNow Store to get any additional entitlements for dependencies.
5. **Optional:** If demo data is available and you want to install it, select the **Load demo data** check box.
   Demo data comprises the sample records that describe application features for the common use cases. Load the demo data when you first install the application on a development or test instance.

   **Important:**
   If you don't load the demo data during installation, it's unavailable to load later.

6. Select **Install**.

## Configuring Proactive Engagement resolutions with DEX

Metric rules help the organization by setting the criteria and trigger alerts when the device or the application monitored deviates from the specified metrics.

### Before you begin

Set the resolutions to help you proactively resolve the digital issue using the ServiceNow Digital End-User Experience. For details on the installation of the Digital End-User Experience application, see Install DEX.

Role required: admin

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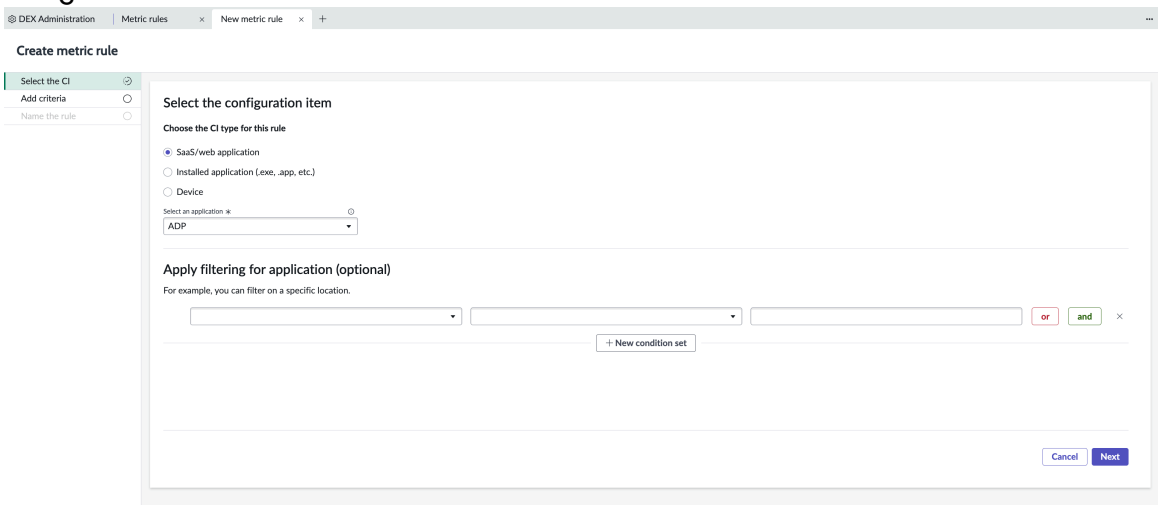
## Procedure

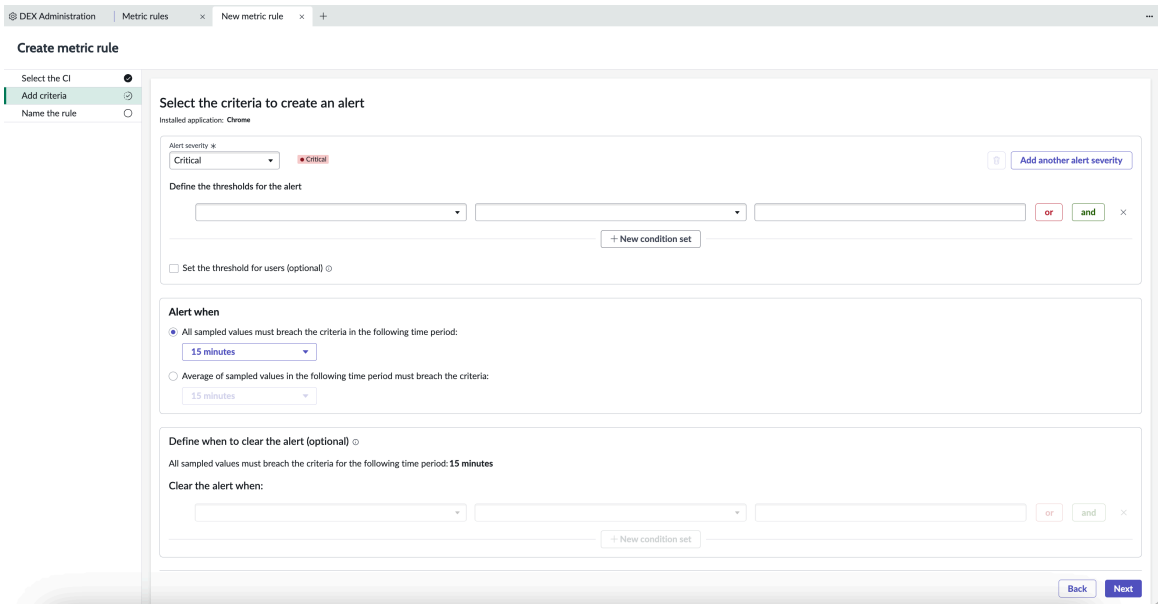
1. Navigate to **All** > **SOW** > **DEX Administration** > **Metric rules** > **Create metric rule**.




2. Select the device or type of application that you want to monitor and detect issues in the CI selection window.

   For more information on CI selection, see Specify the configuration item for metric rules.

3. Select **Next**.
4. Select the metric and criteria to create an alert.




   For more information on Alert criteria, see Define alert metric criteria.

5. Select **Next**.
6. Update the alert action to define the resolution for the metric rule.

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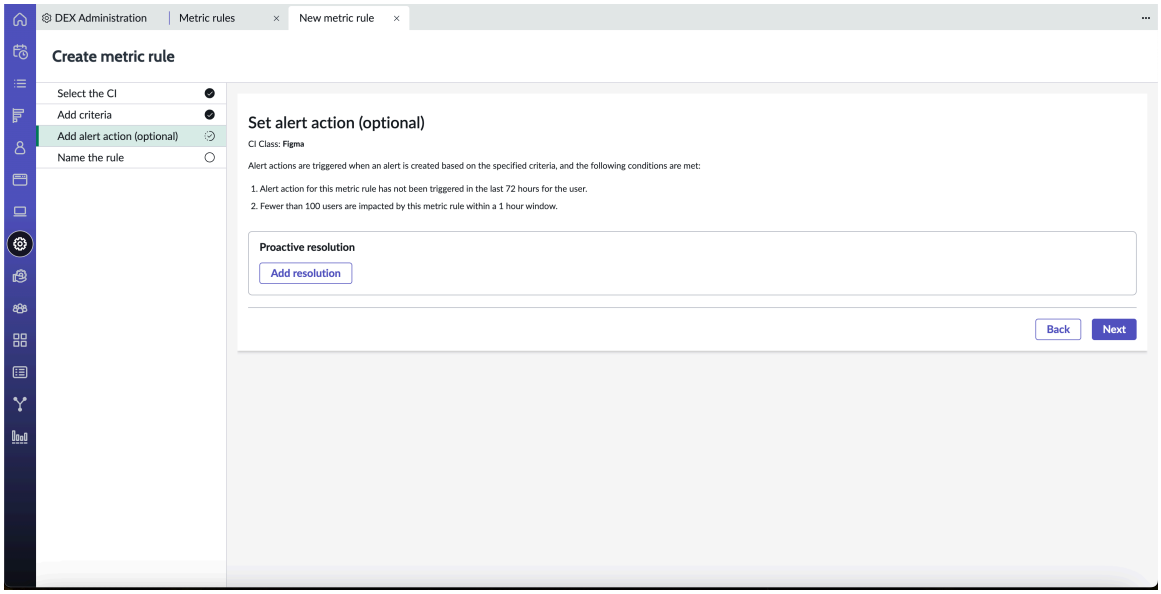
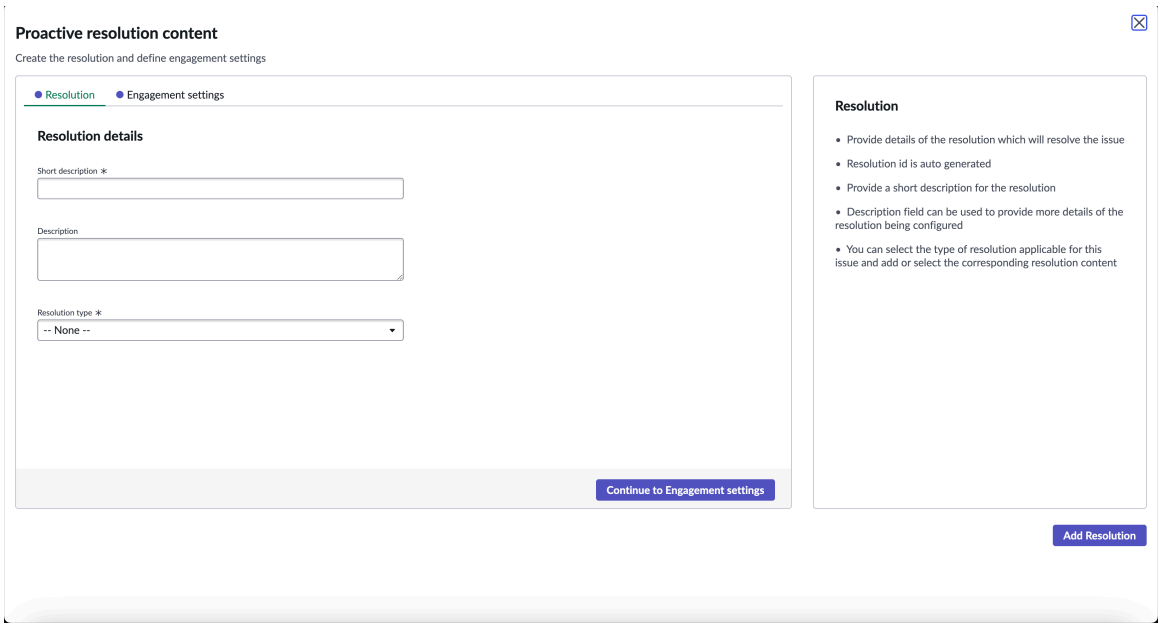



**Note:**
Remedial actions that require entering parameters are not supported and you won't be able to select when the resolution type is Remedial Action.

7. Select **Next**.
8. Select the type of resolution and update the resolution details.

   For more information about the different types of resolution, see Resolution for Proactive Engagement.




9. Select **Continue to Engagement Settings**.
10. Update the **Engagement settings**.

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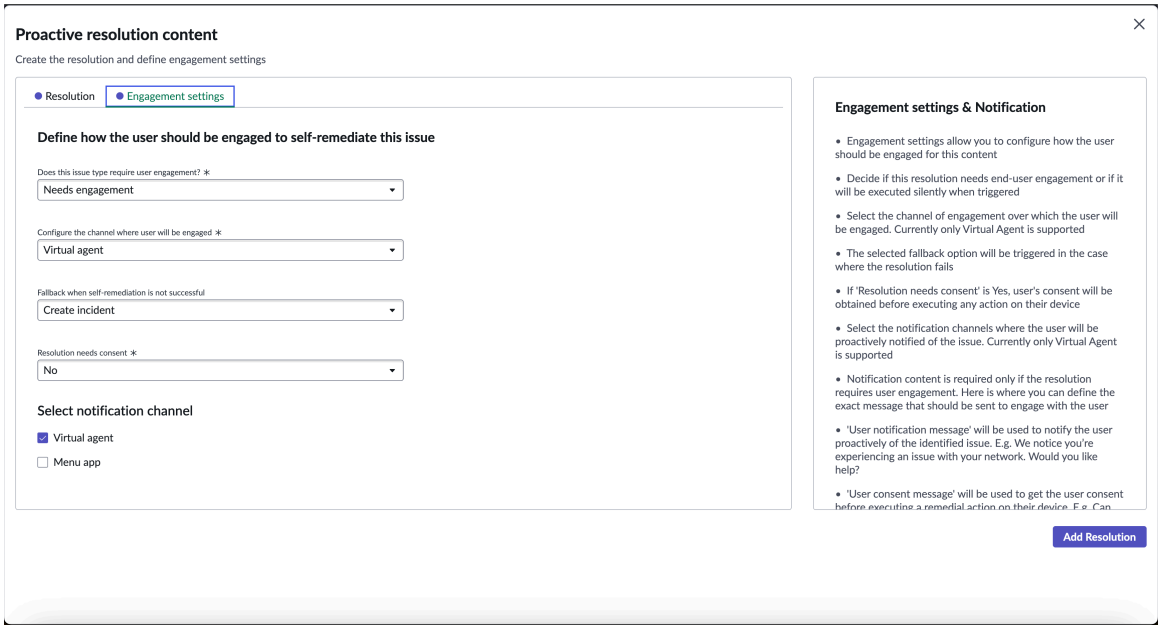


**Note:**
For information on updating the Engagement Settings, see Engagement Settings for Proactive Engagement.

11. Select **Add Resolution**.
12. Name and Activation

**Note:**
Every time the criteria set in the metric rule is met, it triggers the resolution and helps you resolve the issue.

## Using Proactive Engagement

Proactive Engagement helps you in proactive detection of digital issues and provides self-help instructions to resolve them.

### Employee engagement experience through Proactive Engagement

This experience details the employee engagement through the Proactive Engagement application.

Every Proactive Engagement trigger creates an experience issue record. When the metric rule with a Proactive Engagement resolution is triggered, it creates an experience issue record to start engaging with the end user. Once the engagement is triggered, you get a notification for the issue. If the end-user consents for help, they are engaged over a Virtual Agent to self-solve the issue. Once the resolution is executed successfully, end-user confirmation is requested. If the issue is not resolved, the configured fallback option is provided. If the issue is resolved, the end-user feedback on the experience is requested.

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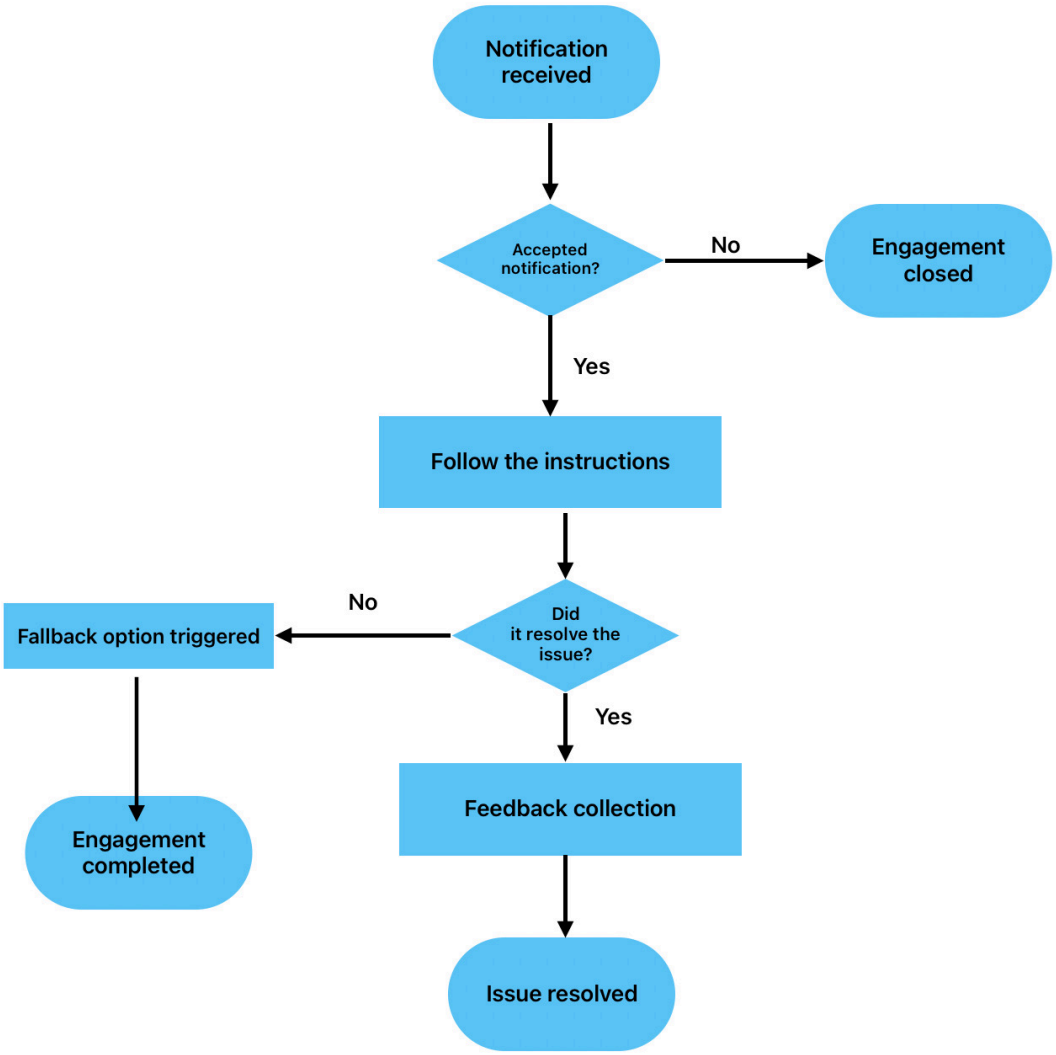


## Proactive Engagement solution

The base system solution detects and enables you to resolve high disk usage issues by providing a detailed self-help instruction specific to the operating system.

There are two base system resolutions provided by the ServiceNow Proactive Engagement.

- Check system disk usage for Windows
- Check system disk usage for Mac

These base system solutions can be accessed from the metric rule tab in the DEX Administration. These metric rules are created to monitor the disk usage on end-user devices and triggers the alert action when it exceeds the set criteria. To use this metric rule for issue detection and employee engagement to enable self-remediation, we need to activate the rule.

1. Navigate to **Workspaces** > **Service Operation Workspace** > **DEX Administration** > **Metric rules**.
2. Select **Name the rule**.
3. Select **Active** under rule status.

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## Metric rule triggering Proactive Engagement through alerts

Metric rules create an alert based on its trigger criteria.

Alert actions are triggered when an alert is created in the specified criteria. You can create an alert based on the values shared in the system properties. The system properties can be set as conditions based on which the alert action is triggered. Applications and devices need a different set of system properties to be set. The alert action is triggered when an alert is created based on the specified criteria and the conditions met. Through system properties, you can customize the values of these conditions.

- Alert action for this metric rule is not triggered in the last 72 hours for the user.
- Fewer than 100 users are impacted for this metric rule within an 8 hour window.

| System property | Condition | Description | Type |
| --- | --- | --- | --- |
| sn_pren.resolution_freeze_period | Metric rule not triggered in the last 72 hours (default). | The duration (in hours) for imposing a freeze period for a specific user for any unique metric rule configured in Proactive Engagement. Set this value to zero to disable the rule. | integer |
| sn_pren.device_resolution.user_limit_per_throttling_window | Fewer than 100 users (default) are impacted. | Maximum number of users for which a Proactive Engagement device-related resolution is triggered within a defined time period. The value of the time period configured in property sn_pren.device_resolution.throttling_window_duration. | integer |
| sn_pren.device_resolution.throttling_window_duration | Within an 8 hour (default) window | Time in minutes within which a Proactive Engagement device-related resolution is throttled. This resolution is throttled if the impacted number of users exceed the value in property sn_pren.device_resolution.user_limit_per_throttling_window. | integer |
| sn_pren.application_resolution.user_limit_per_throttling_window | Fewer than 100 users impacted | Maximum number of users for which a Proactive Engagement application-related resolution is triggered. This resolution is triggered within | string |

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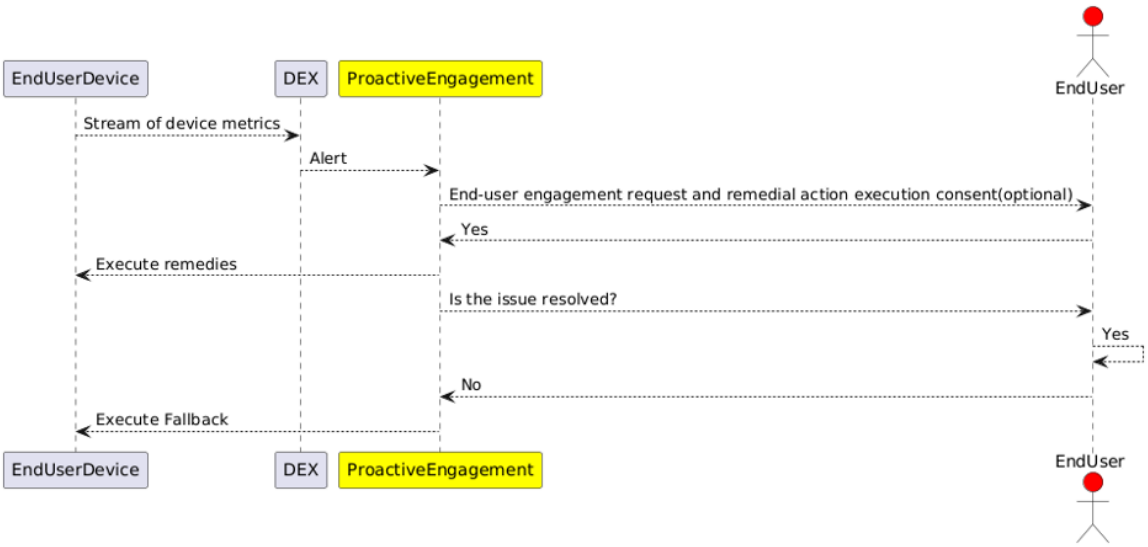
| System property | Condition | Description | Type |
|---|---|---|---|
| | | a defined time period (value of the time period configured in property sn_pren.application_resolution.throttling_window_duration). | |
| sn_pren.application_resolution.throttling_window_duration | Within a throttling window | The time period in minutes within which a Proactive Engagement application-related resolution is throttled. This resolution is throttled when the impacted number of users exceed the value in property sn_pren.application_resolution.user_limit_per_throttling_windo | integer |




## Alert closure in Proactive Engagement

There are different methods followed for closing the alerts in Proactive Engagement for devices and applications.

- Devices: Alerts generated from Metric rule triggered for devices, are closed once Proactive Engagement helps the impacted users to successfully resolve their issue.
- Applications: Alerts generated from Metric rule triggered for applications are not closed.

## Proactive Engagement life-cycle management

The Proactive Engagement application enables you to work in the life-cycle model to manage solutions that you own and to view solutions that may have an impact on services or products that you care about.

You can access the Proactive Engagement workbench by navigating to **All** > **SOW** > **Proactive Engagement workbench**.

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The Proactive Engagement Workbench provides an overview of all the Proactive Engagement solutions available on an instance. It displays the details of all the solutions available, deployed, and not deployed.

Deployed solutions, where the engagement settings are configured and are used within the organization. Proactive Engagement resolutions created through the metric rules are deployed by default. For more information, see the Configuring Proactive Engagement resolutions with DEX. Deployed solutions can be deployed as custom or original. Solutions created by using the metric rules are original. You can customize the resolution by selecting the deployed record and choosing a custom resolution. Engagement settings for the not deployed solutions are not configured.

### Review solutions for the available updates

For each custom solution where an update is available, the updates can be reviewed by either selecting **Review update** available on the card or when the record is opened on the card click. **Review update** provides a comparison between the updated and customised solutions for users to make an informed decision on the next steps. The following actions can be performed:

- *Auto update* Removes reference to the custom resolution and will be up to date with the provider solution. The update status is changed to Up to date.
- *Manual update* Users go back and manually make any changes required for the solution. The solution update status updates to Manual update pending. Once the changes are done select Solution updated option either on the card or on the Review update page to move the solution update status to Up to date.
- *Ignore update* - The update will be ignored, and the solution update status will move to Up to date.

Proactive Engagement will be triggered only for the deployed solutions. There are different **State** in the deployed solutions.

- **Update available** New updates for out-of-the-box deployed solutions are available.
- **Update up-to-date** Solution shipped by ServiceNow and is up to date.
- **Update ignored** Available updates in the provider out-of-the-box solution is ignored.
- **Pending manual update** Available updates were reviewed and manually updated the solution.

For custom resolutions, you can update them automatically or manually update them. Once the updates are completed, the status changes to Update up-to-date. The **Update provider data** updates or refreshes the solutions in the Proactive Engagement workbench.

## Proactive Engagement reference

Reference topics provide additional information about the cards, lists, and forms that help you configure and use Proactive Engagement.

### Components installed with Proactive Engagement

Several types of components are installed with activation of the Proactive Engagement application (com.snc.self_remediation_framework), including user roles.

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## Roles installed with ServiceNow Proactive Engagement

**Note:**
The Application Files table lists the components that are installed with this application. For instructions on how to access this table, see Find components installed with an application.

### Roles installed with Proactive Engagement

| Role title [name] | Contains Roles | Description |
|---|---|---|
| sn_pren.solution_provider | sn_pren.issue_registry_template_write | This persona is responsible for creating the Issue registry template, Resolution, and Resolution prompt records. |
| sn_pren.engagement_admin | sn_pren.issue_registry_write<br>sn_pren.experience_issue_read<br>sn_pren.issue_registry_template_write | • This persona is responsible for deploying the Issue registry templates.<br>• Configuring the engagement settings, notification channels and fallback.<br>• Create a custom resolution and notification for an existing template.<br>**Note:** SOW user role is required to access the Proactive Engagement workbench. |
| sn_pren.issue_registry_template_write | None | Can create/edit/read/delete the |

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**Roles installed with Proactive Engagement (continued)**

| Role title [name] | Contains Roles | Description |
|---|---|---|
| | | • Issue Registry Template records<br>• Resolution records<br>• Notification Content records |
| sn_pren.issue_registry_write | None | Can create/edit/read/delete the<br>• Issue Registry<br>• Issue Registry Template records<br>• Resolution records<br>• Notification Content records |
| sn_pren.solution_provider | None | Can read Experience Issue records |

## Tables installed

| Table | Table name | Description |
|---|---|---|
| Proactive engagement provider | sn_pren_provider | Record used to maintain the details of the DEX solution provider such as name and provider code. As of today, we only have Servicenow as the provider. |
| Issue Registry Templates | sn_pren_issue_registry_template | This table stores all the end-user issues for which a customer could potentially engage the end-user to self-solve in case of an issue occurrence. Issue registry template records can either come from a third-party DEX/DEX provider or be created directly by the customer, with a reference to the provider. This table specifies the resolution for the issue and how the end user should be engaged, and it holds descriptive fields for the issue, such as Short Description and Description. Additionally, it contains a Unique |

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| Table | Table name | Description |
|---|---|---|
| | | Issue Code, which is a combination of the Provider Code and Issue Code, ensuring uniqueness across all template records for a customer. |
| Issue Registries | sn_pren_issue_registry | This table holds all the issues that the customer has chosen for end-user self-solution. An Issue Registry record is created by deploying the Issue Registry template record. Simply having the Issue Registry template record does not make the issue eligible for self-solving; the Engagement Admin must deploy the template to create the Issue Registry record.<br><br>The table stores all the configurations deployed by the customer, including details on whether a custom resolution and notification were configured by the customer, engagement settings, notification channel settings, fallback options, and template parity status. |
| Resolutions | sn_pren_resolution | Record used to store the resolutions configured to be executed when a threshold breach occurs, as per the metric rule configuration. This record could include a self-help instruction with defined steps, a URL with a specified link, a remedial action with a reference to the configured remedial action, or of type incident creation. |
| Notification content | sn_pren_notification_content | Record used to maintain the notification settings such as notification prompt message and resolution consent prompt |
| Experience Issues | sn_pren_experience_issue | Experience issue record is created once the engagement is initiated with the end-user. This stores data such as user info, **State** of the resolution execution, end reason state, fallback result (if triggered), investigative details, etc. This record will be the source of truth for any proactive engagement with end-user. |
| Experience issue alert | sn_pren_experience_issue_m2m_alert | Record used to create a log of the alert that caused experience issue. This is a mapping table between alert and experience issues, with details on count of throttled users and throttling reason. |

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## Resolution for Proactive Engagement

Resolution is information provided to the end user to self-solve the issue, or execute a remedial action on the end user device.

The resolution information is provided to the end user through the following methods:

| Resolution Type | Description |
|---|---|
| URL | Link to any page (including KB articles) with details on how to resolve the issue. |
| Remedial Action | Remedial action triggers an action on the end user device. |
| Create Incident | Create incident to resolve the issue where ServiceNow Digital End-User Experience will detect the issue based on the metric rule and create an incident with details so the agent can resolve the issue. |
| Self-help instructions | Set of instructions for the user to follow and resolve the issue. |

## Engagement Settings for Proactive Engagement

It allows you to configure and define how an end user should be engaged to self-solve the issue. Virtual agent is the only notification channel used to engage with the user. As a fallback, an incident can be created or route to a live agent.

Virtual Agent is the only notification channel used to engage with the user. As a fallback, an incident can be created, or user is routed to a live agent. The following field names are displayed in the Engagement settings tab while creating a Proactive Engagement resolution from the metric rules.

| Field name | Description | Options |
|---|---|---|
| **Does this resolution require user engagement?** | Decide if this resolution needs end user engagement or could be executed silently when triggered. | Needs engagement/None |
| **Configure the channel where the user will be engaged.** | Select the channel of engagement. | Virtual Agent |
| **Fallback when self-remediation is not successful.** | Select the fallback option that will be triggered when the resolution fails. | Create incident/Route to live agent |
| **Resolution needs consent** | Decide if user's consent is needed for the resolution before executing any action on the end-user device. This option is available only for Remedial Action and Create Incident resolution types. | Yes/No |
| **Select notification channel** | Channel where the user will be proactively notified. | Virtual Agent |

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| Field name | Description | Options |
|---|---|---|
| **User Notification message** | Details the message that should be sent to engage the user. | Custom message<br><br>Example: Your device is running low on disk space. Would you like help to free up some space? |
| **User consent message** | Details the message where user consent is required. | Custom message<br><br>Example: Can we free up some disk space using Windows disk clean-up? This will only clear temp files and recycle bin. Your work will not be affected in any way. |

These engagement settings are furnished when you configure the metric rule. To configure a new metric rule, see Configuring Proactive Engagement resolutions with DEX.

### Remedial action

Remedial action is a framework. We need to install the remedial action framework to select remedial action as a resolution type.

Remedial action allows you to trigger an action on the end user device. With the user's consent, we share different remedial action types to resolve the issue.

- Execute an action on the end user device. The user can create their own remedial action and refer to the <remedial action framework>.
- If there are any existing Virtual Agent topics, these can be populated as a resolution to the end user.
- When the metric rule criteria is met, a catalog item is displayed for the user to fill and submits.

### Limitations in Proactive Engagement

You must be aware of a few limitations when you create a new metric rule and choose the remedial action.

Limitations in Proactive Engagement:

- Remedial action resolution type cannot be used if the remedial actions require any runtime parameters.
- Actionable notifications for LLM will be supported from WP3 and Xanadu. However, In Vancouver, the portal with NLU will get notifications.

## Problem Management

The ServiceNow® Problem Management application helps you identify the cause of errors in the IT infrastructure that are reported as occurrences of related incidents.

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## Get started

| Explore | Configure | Manage |
|---|---|---|
|  |  |  |
| Learn about Problem Management concepts and features. | Configure environment, tools, and user access. | Create and manage problems. |
| **Communicate** | **Analytics and Reporting Solutions** | **Reference** |
|  |  |  |
| Use Problem Management to communicate the outcome of the problem. | Take advantage of dashboards to visualize data over time, analyze your business processes, and identify areas for improvement. | Get details about Problem Management properties and various form fields. |

### Troubleshoot and get help

- Visit the ServiceNow Community: https://community.servicenow.com/community/it-service-management/content?filterID=contentstatus%5Bpublished%5D%7Ecategory%5Bproblem-management%5D
- Search the Known Error Portal for known error articles
- Contact Customer Service and Support

## Exploring Problem Management

Problem Management supports the ITIL process used to find and fix the root cause of issues that result in incidents. You can record problems, associate incidents, and assign them to the appropriate groups. You can document and communicate known errors and initiate actions to resolve the situation.

Problem Management is responsible for managing the life cycle of all problems and preventing problems and resulting incidents from happening. It also aims to eliminate recurring incidents and minimize the impact of incidents that can't be prevented. Resolving a problem includes the activities required to diagnose the root cause of incidents and determine the resolution for the problem. Problem resolution and elimination of the root cause often calls for applying a change to the configuration item in the existing IT environment.

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Problem Management also maintains information about problems and the appropriate workarounds and resolutions, enabling an organization to reduce the number and impact of incidents over time. Problem Management interfaces with Knowledge Management, which is used to document known error articles thoroughly for future reference.

## Problem Management workflow

The Problem Management workflow includes the following:

1. Problem Creation: You can create a problem to identify and permanently fix the underlying root cause when:
   - You've resolved a major incident.
   - You have recurring incidents.
2. Assign the problem: You can now assign the problem to be assessed.
3. Assess the problem: You can now assess the problem:
   - Find and relate any additional incidents that the problem represents.
   - If the problem was created from an incident, it has inherited fields from the incident that may not provide a specific description of the issue. In this case, update the **Problem Statement** and other fields to specifically describe this issue to help the team performing the root cause analysis during the later stages.
   - Do any of the following:
     - Confirm that you plan to work on this problem. This confirmation moves the problem to the Root Cause Analysis state.
     - Mark this problem as a duplicate of an existing problem to close the problem.
     - Cancel this problem if it's not a valid problem. Canceling it closes the problem.
4. Analyze the root cause of the problem:
   - If you're the subject matter expert, analyze the problem to uncover the root cause and identify a fix.
   - If you're not the subject matter expert, create a Root Cause Analysis Problem task to assign to the relevant team. Coordinate with that team as they analyze and uncover the root cause and fix.
   - If there's no permanent fix for the problem, or you don't have the sufficient budget to fix the problem at this time, accept the risk that it can't be fixed at this time. The problem enters the Closed state. It's a good idea to review risk-accepted problems periodically.
5. Communicate the outcome of the problem:
   - After you identify the fix or workaround of the problem, update the workaround or fix for the problem. Communicate updates to the related incidents.
   - If the problem is a known error, create a known error article that is primarily available to help others find information and deflect additional incidents. The known error article can also be referred to by agents who are facing similar problems and incidents.
6. Fix the underlying root cause if possible. If you can fix the root cause, create a change request and assign it to the relevant team. When the change request is completed, resolve the problem. If no new incidents come in, close the problem.
7. Reanalyze the problem if it resurfaces. If you're the problem manager and you're not satisfied with the analysis after resolving or closing the problem, or the problem resurfaces, you can decide to reanalyze the problem. The problem is reopened and the state is changed to#Root Cause Analysis.

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## Problem Management benefits

| Benefit | Feature | Users |
|---|---|---|
| Create a problem to identify the root cause of the incident. | Create a problem | Agent and Problem write users |
| Add multiple incidents to a problem to avoid creating multiple problems for incidents that have the same issue. | Add multiple incidents to a problem | Agent |
| Create a problem task to initiate the root cause analysis. | Create a problem task | Agent, Problem write users, and Problem task analyst |
| Document and communicate a workaround to restore service failures and lessen the impact of a problem that an actual resolution is not yet available. | Communicate workaround for Problem | Problem Coordinator |
| Create known error articles as reference material. | Create a known error article | Problem Coordinator |
| Implement a resolution to a problem by applying a standard change procedure and testing it to confirm service recovery. | Create change request from a problem | Problem Coordinator |
| Resolve the issue and add detailed notes for the resolution for future reference. | Resolve and complete a problem | Problem Coordinator |

## Understanding problem management

Understand the Problem Management process, the plugins that you activate, and the functionalities that you can validate after any configuration change.

### Problem Management process

Within the platform, problems are handled using the task record system. Each problem is generated as a task record through various means, and is populated with the pertinent information. These tasks are assigned to Problem Management team members to resolve and then close.

## Identify and log problems

A problem can be created in several ways. For detailed information, refer Create a problem.

Associating a problem with a configuration item using CMDB helps the Problem Management team see the affected items and its relationship to other configuration items.

A problem can be associated with one or more incidents in the **Incidents** related list. The association is automatic if the problem is generated from an incident. Associating incidents provides the Problem Management team with access to the information gathered during incident investigation.

## Investigate and update problems

If the Problem Management team has a problem model process for dealing with certain problems, they can be added to the system with workflows . Workflows standardize and automate a process.

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As a problem is updated, email notifications are sent to concerned parties. If inbound email actions are specified, the problem can be updated via email.

You can use the other active tasks icon next to **Configuration item** to look up active problem records. When you click the icon, it shows all active tasks linked to that configuration item.

The platform provides escalations rules to ensure that problems are handled promptly. Two types of escalation rules are available in the system.

- Service level agreements: SLAs can be used to ensure that problems are highlighted. As investigating and fixing a problem could be a long-term effort, it is not recommended that you apply SLAs to an overall problem. SLAs are also used as a performance indicator for the Problem Management team.
- Inactivity monitors : The inactivity monitors prevent problems from being overlooked by generating an event. When a problem has not been updated within a certain amount of time, the event can create an email notification or trigger a script.

## Resolve problems

If a problem needs a change request to be resolved, it is possible to request a change that goes through the change management process. After requesting a change, the problem appears on a related list on the Change Request form.

**Note:**
For Madrid Best Practices: The problem coordinator, whom the Problem is assigned to, is notified when all related change requests are completed or canceled.

The following information applies for London and prior releases:

- A business rule (*SNC - ITIL - Close - related*) automates the process of closing problems in **Pending Change** state when the change request is closed. If the problem is closed, another business rule (*SNC - ITIL - Resolve Related Incidents*) automatically sets the **State** to **Resolved** for all incidents associated with that problem whose **State** was **On Hold** and **On hold reason** was **Awaiting Problem**.
- If the cause of a problem has been determined but there is no permanent fix, change the problem state to **Known Error** to communicate this fact. IT agents can click the Known Errors module and look for the issue they are investigating to reduce time spent on a similar issue. To communicate information related to a problem, you can open the problem and describe a workaround, create a knowledge base article, or create a news item.

### Life cycle of a problem

Problem Management is responsible for managing the life cycle of underlying problems. State transition of a problem guides you through the stages of a problem life cycle, from creation to closure.

Problem Management has one single goal: Identifying and resolving the underlying issues that cause Incidents. Problem Management is a systematic, methodical process where time to resolution is less important than identifying and resolving the root cause.

**Note:**
The state-based information is available only in new instances starting from the Madrid release. Activate the Problem Management Best Practice — Madrid — State Model (com.snc.best_practice.problem.madrid.state_model) plugin. Existing users (London and prior releases) cannot activate this plugin.

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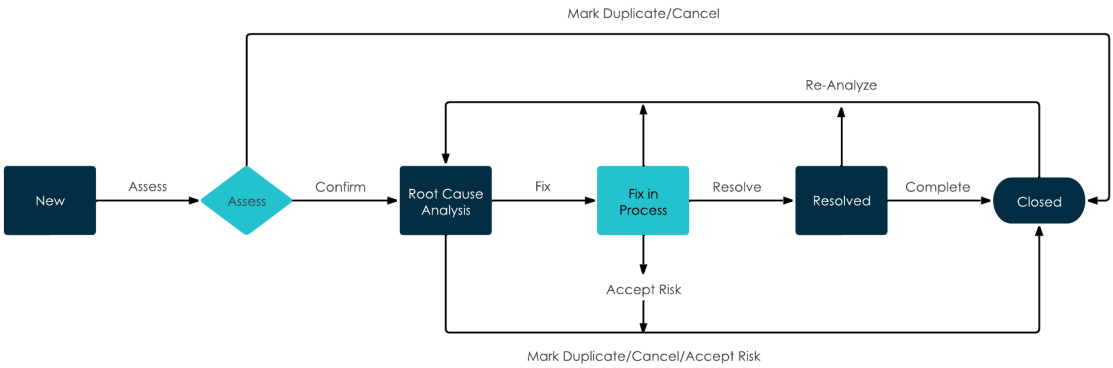
The Problem Management process has many states, and each is vitally important to the success of the process and the quality of service delivered. The different states can be represented in a diagram as follows:

### Problem Management state transitions




### Life cycle of a problem task

A problem task is the smallest unit of work that you should perform to complete a problem. State transition of a problem task guides you through the stages of a problem task life cycle, from creation to closure.

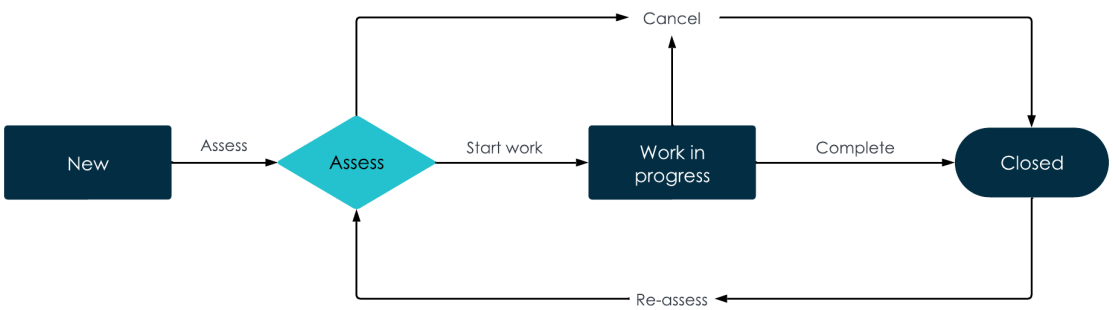
If a problem coordinator requires help to resolve a problem, the coordinator can create and assign problem tasks to assignment groups or users to complete those activities.

**Note:**
The state-based information is available only in new instances starting from the Madrid release. Activate the Problem Management Best Practice — Madrid — State Model (com.snc.best_practice.problem.madrid.state_model) plugin. Existing users cannot activate the plugin.

You can create the following types of tasks:

- **Root Cause Analysis**: When you need to investigate the root cause and the resolution for a problem
- **General**: For any other task

### Problem task state transitions




## Configuring Problem Management

Create or redesign problem form layouts to align them with the business process workflow of your organization. Categorize problems for monitoring and reporting. Use data lookup

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and assignment rules to automatically assign a task to a user or group based on predefined conditions.

**Note:**

- Use data lookup and assignment rules to automatically assign a task to a user or group based on predefined conditions. For more information, see Data lookup for prioritizing problems.
- Configure the Problem Management properties to control features such as creating a problem task on a closed problem and reanalyzing a closed or canceled problem. For more information, see Problem management properties.
- Use quick start tests to check if the Problem Management application still works after you make any configuration change such as applying an upgrade or developing an application. For more information, see Quick start tests for Problem Management.

## Migration Utility

The Problem Management Migration Utility, available in the ServiceNow® Store, is a guided setup application that helps you upgrade to adopt the base version of Problem Management using the guided problem life cycle.

**Important:**

- You only need to use the migration utility if you started using ServiceNow before the Madrid release and you want to adopt the guided problem life cycle, as that was included for new customers starting from Madrid.
- If you run into issues or need additional help with resolving your modifications, contact your ServiceNow Account Representative or ServiceNow Solution Consultant. You might need help from ServiceNow Customer Outcomes or a partner.

The migration utility consists of several guided activities:

**Introduction**

Describes the purpose of the Problem Management Best Practice State Model plugin and the migration utility. This activity also confirms that you have practiced or are practicing on a sub-production instance that is a clone of the production instance.

**Preparation**

Helps you prepare for your migration, including optional scenarios if you want to remove all of your existing problem and problem task records.

**Migrate**

Guides you through the Migration job.

**Clean-up**

The guided setup activity guides you through the manual clean-up activities after you have completed the main migration.

### Introducing activities for migration

The Introduction activity helps you to understand the purpose of the migration utility.

The activity helps you understand the Problem Management Best Practice State Model plugin and the new problem and task states. This activity also confirms that you have practiced or are practicing on a sub-production instance that is a clone of the production instance.

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### Preparing for migration

You can prepare your instance for migration before you start the migration activity.

Before you start the migration activity, if you want to optionally remove all of your problem records or all of your problem task records, take a backup of the records first before you remove them.

### Migration job

Get your instance ready for the Problem Management Best Practice — Madrid — State Model plugin (com.snc.best_practice.problem.madrid.state_model) and so you can update your existing records with the new states.

The stages to get your instance ready for the problem state model and to migrate your records are:

1. Resolve blocking modifications
2. Review warning modifications
3. Map problem states
4. Map problem task states
5. Activate Problem Management Best Practice — Madrid — State Model
6. Prepare base plugins
7. Restore base plugins
8. Resolve blocking and warning modifications
9. Migrate active records
10. Migrate inactive records

### Resolve blocking modifications

Blocking modifications that are detected in your instance are not compatible with the problem state model and you must resolve them before you activate the Problem Management Best Practice — Madrid — State Model plugin.

#### Before you begin

Role required: admin

#### Procedure

1. Review and resolve all blocking modifications.
   For more information about modifications that block the problem state model plugin from being activated, see the KB0819060 article in the HI Knowledge Base.
2. Click **Run Checks**.

#### What to do next

Review warning modifications.

### Review warning modifications

Warning modifications do not block the Problem Management Best Practice — Madrid — State Model plugin from being activated.

#### Before you begin

Role required: admin

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### About this task

For more information about warning and informational modifications and how to resolve them, see the Problem Management Migration Utility - How to resolve detected modifications [KB0819196] article in the HI Knowledge Base.

### Procedure

1. Review and resolve all warning modifications.
   Warning modifications, though initially are not blocking, can become blocking when you activate the problem state model plugin. You must resolve them before you can migrate your records.
2. View informational modifications.

   Informational modifications provide information about only the changes that you have made that do not impact the migration.
3. If you resolved any warnings, click **Run Checks**.
4. Click **Next**.

### What to do next

Map problem states.

## Map problem states

Define how problem records are updated when you migrate the records.

### Before you begin

Role required: admin

### Procedure

1. Provide information for all the mandatory fields at this stage.
   The required field values are used when you apply new states to the existing problem records.

   **Note:**

   - The **Assigned to** field is used when the new state is beyond **101 - New** and the problem is not already assigned to a user.
   - If you have activated the problem state model plugin, the **Assigned to** field is filtered to users with the problem_coordinator, problem_manager or problem_admin role.
   - The ${current.state} variable is replaced with the current state value and label.
2. Map all current problem states to the new states.
   The following table provides an example of state mapping for the base system version of the problem records:

**Mapping of the current states to the new states**

| Current state | New state |
|---|---|
| 1 - Open | 101 - New |
| 2 - Known Error | 107 - Closed as Risk Accepted |
| 3 - Pending Change | 104 - Fix in Progress |
| 4 - Closed/Resolved | 107 - Closed as Fix Applied |

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3. Click **Detect Unmapped States** to verify whether any state is not mapped.
   If any state is not mapped, you must provide a mapping.

### What to do next

Map problem task states.

## Map problem task states

Define how problem task records are updated when you migrate the records.

### Before you begin

Role required: admin

### Procedure

1. Provide the information for the mandatory fields at this stage.
   The mandatory field values are used when you apply new states to the existing problem task records.

   **Note:**

   - The **Assigned to** field is used when the new state is beyond **151 - New** and the problem task is not already assigned to a user.
   - If you have activated the problem state model plugin, you can assign only users with the problem_task_analyst, problem_coordinator, problem_manager or problem_admin role.
   - The ${current.state} variable is replaced with the current state value and label.

2. Map all current problem task states to the new states.
   The following table provides an example of state mapping for the base system version of the problem task records:

**Mapping of the current states to the new states**

| Current state | New state |
|---|---|
| -5 - Pending | 151 - New |
| 1 - Open | 151 - New |
| 2 - Work in Progress | 154 - Work in Progress |
| 3 - Closed Complete | 157 - Closed as Complete |
| 4 - Closed Incomplete | 157 - Closed as Canceled |
| 7 - Closed Skipped | 157 - Closed as Canceled |

3. Click **Detect Unmapped States** to verify whether any state is not mapped.
   If any state is not mapped, you must provide a mapping.

### What to do next

Activate Problem Management Best Practice — Madrid — State Model.

## Activate Problem Management Best Practice — Madrid — State Model

You can activate the Problem Management Best Practice — Madrid — State Model plugin (com.snc.best_practice.problem.madrid.state_model) on your instance using the Problem Management Migration Utility store app.

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### Before you begin

Before you activate the plugin, be sure to resolve blocking modifications. For more information, see Resolve blocking modifications.

Role required: admin

### About this task

An administrator must activate the Problem Management Best Practice — Madrid — State Model plugin (com.snc.best_practice.problem.madrid.state_model) (first introduced in the Madrid release) through the Migration Utility because the plugin includes features that are not compatible with the previous version of Problem Management.

New York Patch 9 or Orlando Patch 3 or later are required before the administrator can see and activate the problem state model plugin on an instance. If you do not have the required patch, you have to request the plugin as it is a development plugin.

### Procedure

1. Activate the plugin.
   If you have the required patch level, you have access to the plugin and can activate it. If you do not have the patch level, you must request it.

| Option | Description |
|---|---|
| **Activate the plugin (required patch level is installed)** | **a.** Click **Request Plugin** in the plugin activation stage of the migration utility migration job.<br>**b.** On the System Plugin page, click the **Activate/Repair** related link.<br>**c.** Click **Activate**.<br>**d.** Close and reload the form.<br>The plugin status changes to **Activated**. You can return to the Migration Utility and continue with the migration. |
| **Request the plugin** | **a.** Click **Request Plugin** in the plugin activation stage of the migration utility migration job.<br>**b.** On the page, provide the required details.<br>▪ Target instance: Instance on which to request the plugin<br>▪ Plugin Name: `com.snc.best_practice.problem.madrid.state_model`<br>▪ Reason/Comments: `Request from the Problem Management Migration Utility`<br>▪ Select Maintenance Start Time: Select your preferred start time |

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| Option | Description |
| --- | --- |
| | c. Click **Submit**.<br>d. Once the plugin is activated, return to the Migration Utility and continue with the mi gration. |

2. Continue with the migration process.

### What to do next
Prepare base plugins.

#### Prepare base plugins

Prepare to restore the base functionality that is required for the problem state model you have modified.

### Before you begin
Role required: admin

### About this task

**Note:**
You cannot move back to any earlier stage because in the previous stage you activated the Problem Management Best Practice — Madrid — State Model plugin (com.snc.best_practice.problem.madrid.state_model) on this instance and the old states are invalid.

### Procedure

1. Resolve blocking modifications.
   a. For each blocking modification, click **View Modification**.
   b. Select the **Replace on upgrade** check box.

      **Note:**
      If this option is not available, add the **Replace on update** field to the form using **Configure** > **Form Layout**.

   c. Click **Update**.
   d. Click **Back**.
2. Click **Run Checks**.

### What to do next
Restore base plugins.

#### Restore base plugins

Repair the plugins in the specified order to restore the base functionality that is required for the problem state model.

### Before you begin
Role required: admin

### About this task
New York Patch 9, or Orlando Patch 3 or later are required before you can see and repair the Problem Management Best Practice – Jakarta (com.snc.best_practice.problem.jakarta)

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and Problem Management Best Practice — Madrid — State Model (com.snc.best_practice.problem.madrid.state_model) plugins. Before the mentioned patches, these plugins were development plugins.

**Note:**
If you do not have the required patch, refer to Blocking modifications for required base functionality in the KB0819196 article in the HI Knowledge Base.

### Procedure

1. Repair the plugins, one at a time.
   a. Repair the plugin or apply the update set as required.

      **Note:**
      Certain plugins contain functionality for applications including Problem Management. For those plugins, refer to the specified knowledge article to restore the required problem functionality instead of repairing the plugin.

   b. Return to the migration job and mark that plugin as repaired.
2. Click **Run Checks**.

### What to do next
Resolve blocking and warning modifications.

## Resolve blocking and warning modifications

Resolve any blocking modifications and resolve or verify any warning modifications that are detected on your instance.

### Before you begin
Role required: admin

### About this task
For more information about blocking, warning, and informational modifications and how to resolve them, see the Problem Management Migration Utility - How to resolve detected modifications [KB0819196] article in the HI Knowledge Base.

### Procedure

1. Review and resolve all blocking modifications.
2. Review and resolve or verify warning modifications.
3. **Optional:** View informational modifications.
4. Click **Run Checks** after you have resolved all blocking modifications and you have either resolved or verified the warning modifications.

### What to do next
Migrate active records.

## Migrate active records

Migrate active records to apply the new mappings to your active problem and problem task records.

### Before you begin
Role required: admin

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### Procedure

Click **Migrate Active Records**.

If there are no active records to migrate, the migration job moves to the migrate inactive records stage.

> **Note:**
> Even if you close the migration window or navigate away from the migration job, the migration of records continues. If you click **Migrate Active Records**, the migration window displays the current progress.

If any record fails to migrate, it is listed in one of the related lists:

- Failed Active Problem Updates
- Failed Active Problem Task Updates

Verify the reason for their failure, resolve it, and migrate the records again.

### What to do next
Migrate inactive records.

#### Migrate inactive records

Migrate inactive records to apply the new mappings to all the remaining problem and problem task records.

### Before you begin
Role required: admin

### Procedure

Click **Migrate Inactive Records**.

If there are no inactive records to migrate, the migration job moves to the migrated stage.

> **Note:**
> Even if you close the migration window or navigate away from the migration job, the migration of records continues. If you click **Migrate Inactive Records**, the migration window displays the current progress.

If any record fails to migrate, it is listed in one of the related lists:

- Failed Inactive Problem Updates
- Failed Inactive Problem Task Updates

Verify the reason for their failure, resolve it, and migrate the records again.

### What to do next
View the Migrated topic.

#### Migrated

You have successfully activated the Problem Management Best Practice - Madrid - State Model plugin and updated your problem and problem task records to the new best practice states.

### Before you begin
Role required: admin

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### Procedure

1. **Optional:** View the records after migration in the related links.
   The records are listed in one of the following related lists:
   - Problems by State
   - Problem Tasks by State
2. **Optional:** If any record failed to migrate, verify the reason for the failure, resolve it, and migrate the records again.
   The failed records are listed in one of the following related lists:
   - Failed Active Problem Updates
   - Failed Active Problem Task Updates
   - Failed Inactive Problem Updates
   - Failed Inactive Problem Task Updates
3. Click **Finish** to return to guided setup to perform the clean-up tasks.

#### Modifications

A modification is any alteration such as addition, deletion, or update that you carry out on Problem Management. If you have made significant modifications, you will need to review and resolve some possible blocking modifications.

For more information on modifications, see the following KB articles:

- For more information about modifications that block the problem state model plugin from being activated, see the KB0819060 article in the HI Knowledge Base.
- For more information about other types of modification and how to resolve them, see the Problem Management Migration Utility - How to resolve detected modifications [KB0819196] article in the HI Knowledge Base.

#### Activities to clean up after migration

After you complete your main migration, you must do some manual clean-up to make your instance similar to the base version of problem management.

Manual clean-up involves the following activities:

- Reactivate problem state models
- Remove old module menus
- Remove old filters
- Remove old UI actions
- Remove old business rules
- Remove old UI policies
- Update the dashboard overview
- Reset problem form layouts

> **Note:**
> You can skip this action if you have not modified your form.

- Search for problems from incidents
- Remove old process fromatters

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### Update dashboard overview

When you activate the problem state model, you need to update the overview dashboard to use the new states.

#### Before you begin
Role required: admin

#### About this task
In the problem overview dashboard, refer to the closed problems by setting Active = false instead of state = 4.

**Note:**
If you have added your own custom dashboards or charts, you may need to manually update them as you have migrated to the problem state model.

#### Procedure

1. If you are prompted with the message `To edit this record click here`, then click **here**.
2. Click the configuration icon ( ).
3. Hover your mouse on **Problems Closed per Week** chart to view and select the Edit Content menu.
4. Select the filter to open the condition builder and update the condition from **Problem state** is **4** to **Active** is **false**.
5. Click **Run**.
6. Click **Save**.
7. Click **Back** to return to the dashboard.

## Problem Management plugins

Many of the Problem Management plugins are activated in the base system. Others, you can activate when you are ready to use them. Some plugins include demo data.

### Activate Problem Management

You can activate the Problem Management plugin (com.snc.problem) if you have the admin role. This plugin includes demo data and activates related plugins if they are not already active.

#### Before you begin
Role required: admin

#### About this task
The Problem Management plugin activates these related plugins if they are not already active.

**Plugins for Problem Management**

| Plugin | Description |
|---|---|
| Problem Overview Homepage<br><br>[com.glideapp.report.itsm.problem.overview] | This plugin delivers content for Problem Overview home page. |

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### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.
3. Select **Install** to start the installation process.

   **Note:**
   When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

   You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

### Related topics

List of plugins (Washington DC)

## Components installed with Problem Management

Several types of components are installed with activation of the Problem Management plugin, including tables.

### Tables installed

| Table | Description |
|---|---|
| Problem [problem] | The Problem table is extended from the Task [task] table. It inherits all the fields, rules and policies from task. |

## Activate Problem Management Best Practice — Jakarta

The Problem Management Best Practice - Jakarta plugin introduces lookups (impact, urgency and priority) for Problem Management.

### Before you begin

Role required: admin

### About this task

**Important:**
Do not activate this plugin if you have upgraded from a pre-Jakarta release.

If you have modified the base functionality required for the Problem Management Best Practice — Madrid — State Model plugin (com.snc.best_practice.problem.madrid.state_model), use the Migration Utility to repair the plugin.

### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

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You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.

3. Select **Install** to start the installation process.

   **Note:**
   When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

   You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

**Related topics**

List of plugins (Washington DC)

### Request ITSM Roles — Problem Management

Request the ITSM Roles plugin (com.snc.itsm.roles) to activate the ITSM Roles — Problem Management plugin (com.snc.itsm.roles.problem_management) to gain more control over the access that different service desk agents, technicians, and managers have within your Problem Management process.

## Before you begin

Role required: admin

## About this task

The ITSM Roles plugin activates several related plugins such as Business Stakeholder (com.snc_business_stakeholder), ITSM Roles — Incident Management (com.snc.itsm.roles.incident_management), ITSM Roles — Problem Management (com.snc.itsm.roles.problem_management), ITSM Roles — Change Management (com.snc.itsm.roles.change_management), and ITSM Roles — Request Management (com.snc.service_management.roles.request_management). The related plugins updates the security model and introduces roles for respective products.

With the introduction of the new roles, ITSM provides more control over the access that users have within the process.

## Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. On the All Applications page, select **Request Plugin** to open the **Activate Plugin** form on Now Support.

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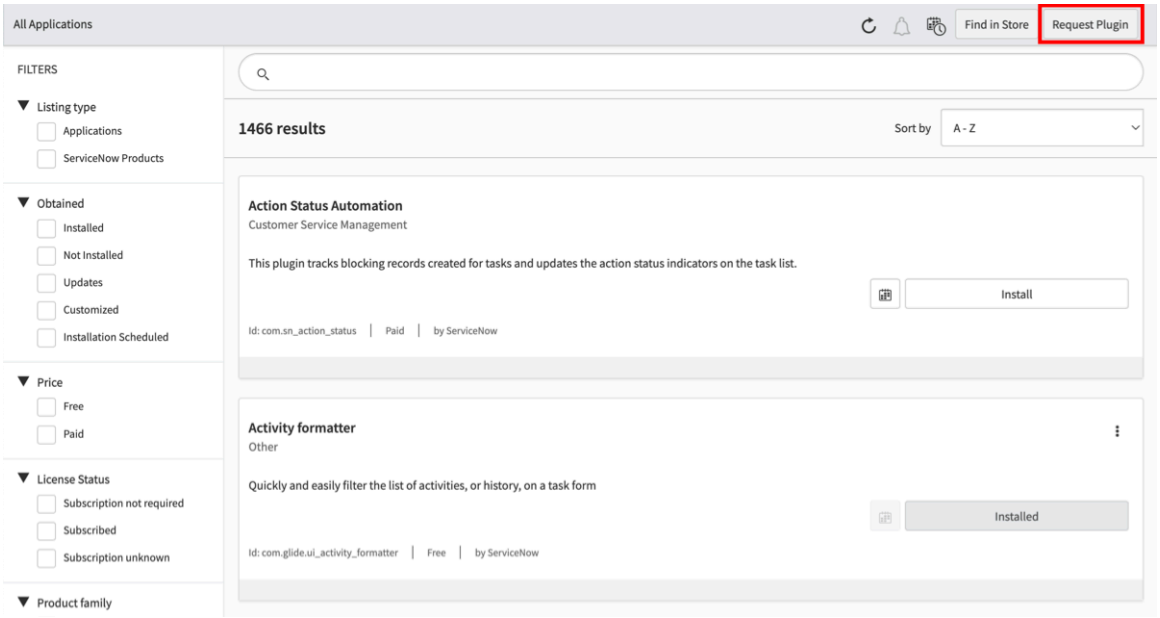
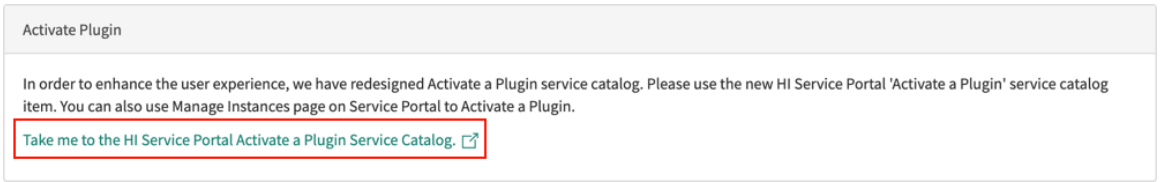



3. On Now Support, select the link to access the Now Support Service Portal Service Catalog.




4. Select your instance.
5. Select **Actions > Activate Plugin**.
6. On the **Activate Plugin** form, provide the following information.

### Activate Plugin form

| Field | Description |
|---|---|
| What is your target instance | Instance on which to activate the plugin. |
| Which plugin would you like to activate | Name of the plugin to activate.<br><br>**Note:**<br>If the system does not list the plugin you want or if you are activating the plugin on an OEM or on-premise instance, select the **Plugin I'm looking for is not listed** check box and then enter the name of the plugin. |
| Select Maintenance Date and Time | The date and time to activate the plugin. |

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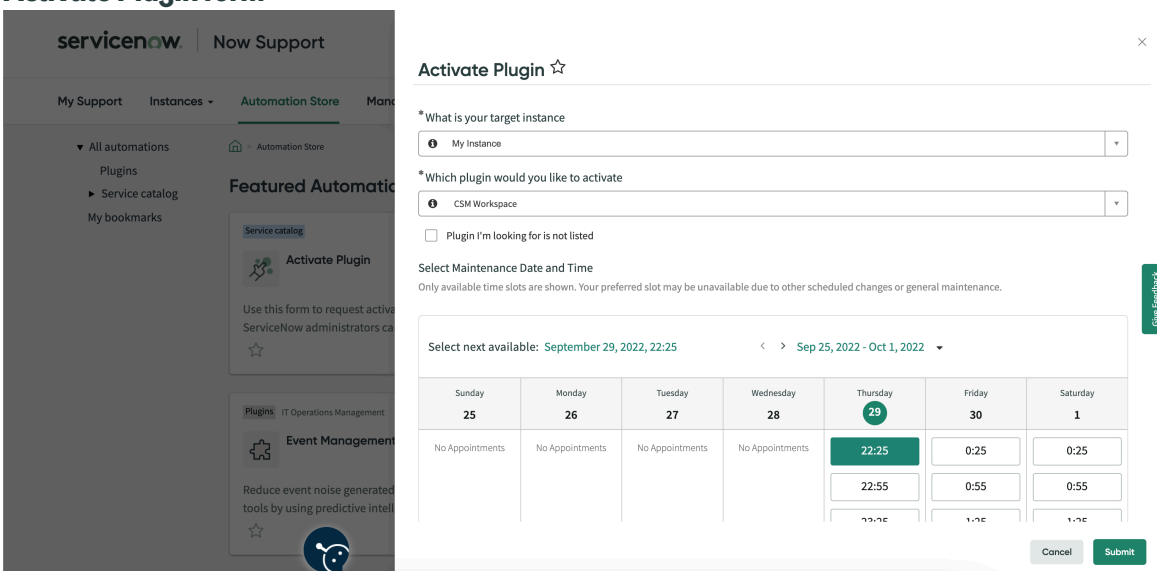
| Field | Description |
| --- | --- |
| | **Note:** Plugins are activated in two batches, once in the morning and once in the evening, on every business day in the US Pacific time zone. If the plugin must be activated at a specific time, enter the request in the **Reason/Comments** field. |

### Example

For example, see the following form to activate the CSM Workspace plugin on an instance named My Instance.

**Activate Plugin form**




7. Select **Submit**.
   For additional details about requesting a plugin, see Requesting a Plugin from the Service Catalog [KB0751715] article in the Now Support Knowledge Base.

### Related topics

List of Washington DC plugins

## Components installed with ITSM Roles — Problem Management

Several user roles are installed with activation of the ITSM Roles — Problem Management plugin (com.snc.itsm.roles.problem_management).

**Note:**
The Application Files table lists the components that are installed with this application. For instructions on how to access this table, see Find components installed with an application.

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## Roles installed

| Role title [name] | Description | Contains roles |
|---|---|---|
| Problem read<br><br>[sn_problem_read] | Read access to the Problem Management application and related records. | NA |
| Problem write<br><br>[sn_problem_write] | Write access to the Problem Management application and related records. | • sn_problem_read<br>• template_editor |

### Activate Problem Management Best Practice — Madrid

Activate the Problem Management Best Practice — Madrid (com.snc.best_practice.problem.madrid) plugin if you have the admin role. This plugin includes demo data and activates related plugins if they are not already active.

### Before you begin

Role required: admin

### About this task

The Problem Management Best Practice — Madrid plugin identifies the cause of a service interruption reported by a significant or recurring incidents. The plugin does the following activities:

- Provides roles for problem management including a problem task analyst, a problem coordinator, a problem manager, and a problem administrator.
- Provides fields to record the category where the issue was first reported, the workaround, the cause notes, and the fix notes.
- Searches for and attaches knowledge articles.
- Communicates when a workaround or fix is available.
- Clears the **Assigned to** field when changing the **Assignment Group**.

**Note:**
The plugin is activated by default for the new customers. Existing customers need to request the plugin.

### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.
3. Select **Install** to start the installation process.

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**Note:**
When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

**Related topics**

List of Washington DC plugins

### Components installed with Problem Management

Several types of components are installed with activation of the Problem Management Best Practice — Madrid plugin, including user roles.

Demo data is available for this feature.

## Roles installed

| Role title [name] | Description | Contains roles |
|---|---|---|
| Problem Task Analyst [problem_task_analyst] | Works on a problem task and manages it through its life cycle. | None |
| Problem Co-ordinator [problem_ coordinator] | Works on a problem or problem task and manages it through its life cycle. | problem_task_analyst and itil |
| Problem Manager [problem_ manager] | Responsible for the overall problem management process and can configure problem management settings as well as act as a problem coordinator. | problem_ coordinator |
| Problem Admin [problem_admin] | Responsible for the overall problem management process as well as delete problems and problem tasks. | problem_ manager |

### Activate Business Stakeholder

Activate the Business Stakeholder plugin (com.snc.business_stakeholder) if you have an admin role. This plugin installs the Business Stakeholder role. Users with this role can view and approve records at all ITSM product levels.

**Before you begin**
Role required: admin

**Note:**
Ensure that ITSM Roles plugin (com.snc.itsm.roles) is activated before you activate the Business Stakeholder plugin. For more information to activate ITSM Roles plugin, refer Request ITSM Roles- Change Management.

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### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.

3. Select **Install** to start the installation process.

   **Note:**
   When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

   You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

### Related topics

List of plugins (Washington DC)

#### Installed with Business Stakeholder

The Business Stakeholder plugin (com.snc.business_stakeholder) installs the Business Stakeholder role when activated.

**Note:**
The Application Files table lists the components that are installed with this application. For instructions on how to access this table, see Find components installed with an application.

## Roles installed

| Role title [name] | Description | Contains roles |
|---|---|---|
| Business Stakeholder<br><br>[business_stakeholde | Users with this role can view and approve records within all products of ITSM.<br><br>**Note:**<br>The business_stakeholder role contains the following ITSM roles sn_incident_read, sn_problem_read, sn_change_read, sn_request_read, and approver_user roles. | • pa_viewer.business_stakeholder<br>• approver_user.business_stakeholder<br>• cmdb_read.business_stakeholder |

#### Activate Problem Management Best Practice — Madrid — State Model

The Problem Management Best Practice — Madrid — State Model plugin (com.snc.best_practice.problem.madrid.state_model) introduces new best practice states and guided actions to navigate the life cycle of a problem.

### Before you begin

Role required: admin

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### About this task

The new best practice states are not compatible with the previous version of Problem Management and require verification before this plugin can be activated. The plugin is activated by default for the new customers.

Existing customers should use the Migration Utility to verify and migrate to this plugin.

### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.
3. Select **Install** to start the installation process.

   **Note:**
   When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

   You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

#### Related topics

List of Washington DC plugins

## Activate Problem Management Best Practice — Madrid — Knowledge Integration

Activate the Problem Management Best Practice — Madrid — Knowledge Integration (com.snc.best_practice.problem.madrid.knowledge) plugin if you have the admin role. This plugin includes demo data and activates related plugins if they are not already active.

### Before you begin

Role required: admin

### About this task

The Problem Management Best Practice — Madrid – Knowledge Integration plugin (com.snc.best_practice.problem.madrid.knowledge) helps you to create known error articles to help with incident deflection. The plugin helps in the following activities:

- Creating a known error article from a problem.
- Creating a knowledge base for known error articles.

### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.
3. Select **Install** to start the installation process.

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**Note:**
When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

**Related topics**

List of Washington DC plugins

### Components installed with Problem Management

Several types of components are installed with activation of the Problem Management Best Practice — Madrid — Knowledge Integration plugin, including tables.

Demo data is available for this feature.

## Tables installed

| Table | Description |
|---|---|
| Known Error article<br><br>[kb_template_known_error_article] | Table to store Known Error articles. |

### Activate Problem Management — ATF Tests

You can activate the Problem Management — ATF Tests plugin (com.snc.problem.atf) if you have the admin role. This plugin includes demo data.

**Before you begin**
Role required: admin

**Procedure**

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.
3. Select **Install** to start the installation process.

**Note:**
When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

**Related topics**

List of Washington DC plugins

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## Configure the problem form

Configure the problem form layout to conform to the workflow and the process of your organization. Add, remove, and customize fields and related lists, create problem categories, and modify links as needed.

### Before you begin

Role required: admin

### About this task

The Problem form in the base system is configured to follow recommended ITIL practices. Evaluate the form layout and design with your existing business processes, and plan the changes to make.
For additional form customization not described in this page, such as adding company-specific annotations or configuring related lists, see Form administration and Configuring the form layout.

By default, auditing is enabled for the problem table. The administrator can configure the form layout to add the Audit Records and Audit History related lists. For more information about options for auditing a table, see Enable auditing for a table.

### Procedure

Navigate to **Problem** > **Create New**.
Some of the following configuration activities are not accessed from within the problem form. These activities are noted in the procedure.

#### Configure the problem form layout

Configure the problem form so the information it collects is relevant to your organization's processes. You can easily modify the form to show only the fields, related lists, and other elements that you need.

### Before you begin

Role required: personalize_form

### Procedure

1. Navigate to **All** > **Problem** > **Create New**.
2. In the problem form context menu, select **Configure** > **Form Layout**.
3. Follow the steps in Configuring the form layout to perform any of the following layout modifications.
   Some of these modifications are illustrated in the example.
   - Show or hide fields on a form.
   - Add a related list to a form.

     The **Incidents** and **Problem Tasks** related lists appear by default. Review the available related lists and select appropriate lists. For example, if you enable auditing for the Problem table, add the **Audit History** related list.
   - Add an annotation to a form.
   - Create a form section.

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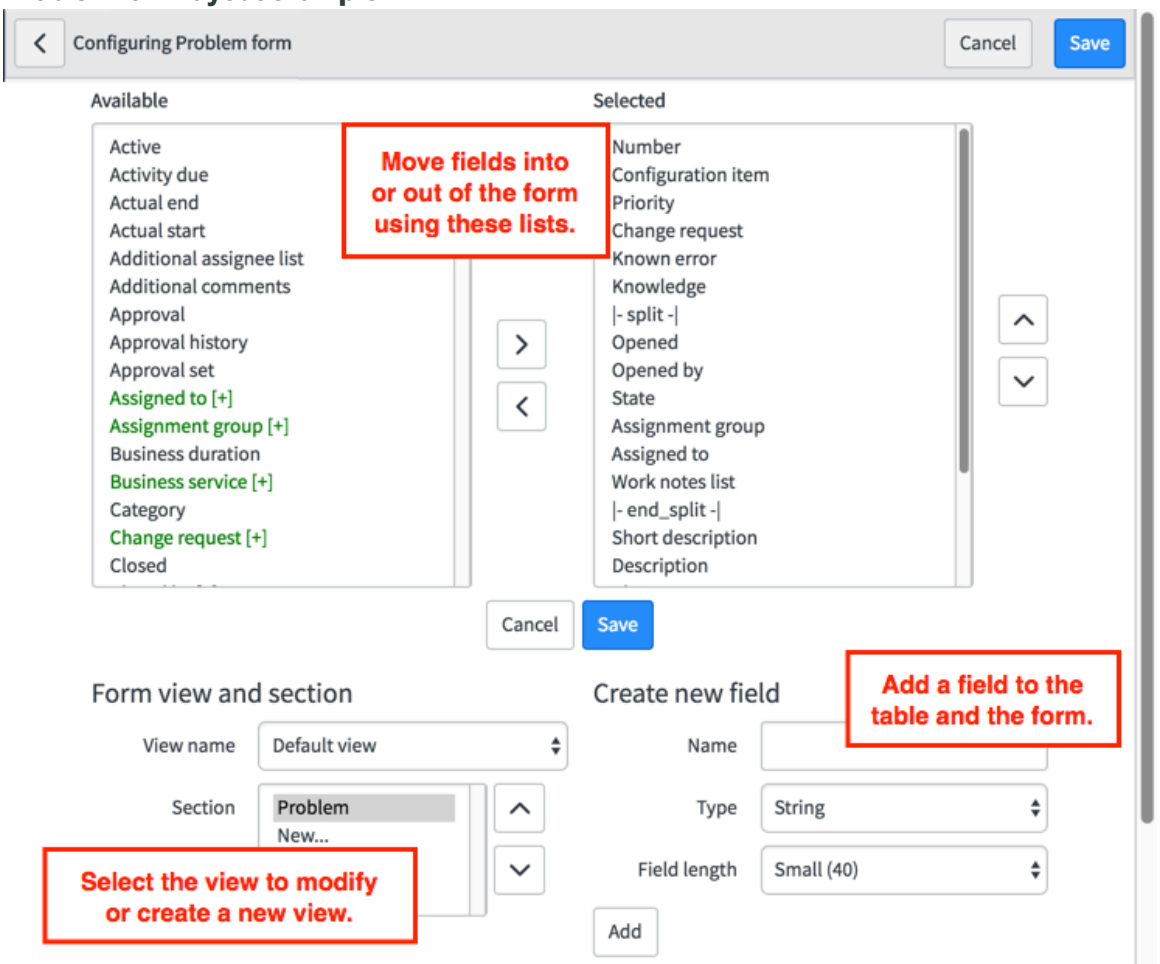
- Embed a list within a form.

  This activity allows the embedded list to be used like any other element on the form. In addition, technicians can create records in the list view. Changes made to the contents of the embedded list are saved when the form is saved.

**Note:**
There are other activities described in the form layout topic, but the items listed here are commonly configured during initial setup.

**Problem form layout example**




### Add a field in the assess mandatory field dialog

Add the mandatory fields necessary to move a problem or a problem task record from the **New** state to the **Assess** state in the assess dialog form. If you miss filling any of the fields, you can always fill those in the assess dialog form.

### Before you begin

Role required: admin

### Procedure

1. Navigate to **All** > **System UI** > **Form Sections**.
2. Search and open **Assess Dialog Form View** or **PTASK Assess Dialog View** for problem record or problem task record respectively.
3. Click the **Form Sections** tab.

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4. Click problem or problem_task from the list for problem record or problem task record respectively.
5. Click the **Section Elements** tab.
6. Click **New**.
7. On the form, fill in the fields.

**Section Element form**

| Field | Description |
|---|---|
| Element | Name of the field that you want in the assess dialog form. |
| Position | Position of the field in the assess dialog form. |
| Type | Type of the element that you want to enter in the form such as an element or a split. |
| Sys UI section | Name of the UI section under which the element appears. |
| Sys UI formatter | Name of the formatter that is used to display information.<br>**Note:** The formatter information is not the value of any field. |

8. Click **Submit**.

### Redesign the problem form

The form designer allows you to customize elements in the problem form to create different form views, display a field navigator, or provide field properties.

#### Before you begin
Role required: admin

#### About this task
Form design is an alternative to configuring forms that combines several configuration options into one tool. You can make and save changes, then return to the browser tab with the open problem form and reload the form to test your changes. Using the form designer lets you try out the changes you want to make for the best result.

#### Procedure

1. In the form context menu, select **Configure** > **Form Design** to open the form designer in a new browser tab.
2. Follow the directions in Form design to customize elements in the problem form.

### Configure problem categories

Configure problem categories to provide a refined way of monitoring and reporting problems. Add to or remove category and subcategory choices from the list of problem categories or subcategories.

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### Before you begin
Role required: admin

### Procedure

Follow the steps in Define an option for a choice list to enter your problem categories.

## Define an assignment rule for problems

After a problem is logged, it must be assigned to the appropriate group or individual to handle the problem. You can define assignment rules to automate the assignment process.

### Before you begin
Role required: assignment_rule_admin or admin

### About this task
Some assignment rules are predefined for Problem Management. Review the predefined assignment rules, and verify that the problem assignment rules you want to use are active. For example, the **Network Problem** assignment rule looks at the configuration item class for network problems and assigns the problem to the **Network** group.

In this procedure, define an assignment rule to assign database problems to the **Database** group. It is just an example to let you know how to define an assignment rule. The **Database Problem** assignment rule is already available in the base system.

### Procedure

1. Navigate to **All** > **System Policy** > **Assignment** and click **New**.
2. Complete the form using the following information.
   - **Name**: `Database Problems`
   - **Applies To** tab or section:
     - **Table**: Problem [problem]
     - **Conditions**: Dot-walk to **[Configuration Item.Class] [is] [Database]**.
   - **Group** in the **Assign To** tab or section: **Database**
3. Click **Submit**.
4. Test the assignment rule by completing the following steps.
   a. Navigate to **Problem** > **Create New**.
   b. Complete the problem form and select a configuration item with a class of **Database**.
   c. Click **Submit**.
   d. Open the problem and verify that the assignment group was added.

## Categorize a problem as a major problem

You can prioritize a problem and highlight that it needs a review.

### Before you begin
Role required: admin

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### About this task

**Note:**
This feature is available only in new instances starting with Jakarta or a later release. The Problem Management Best Practice – Jakarta plugin (com.snc.best_practice.problem.jakarta) plugin must be activate.

- If the Problem Management Best Practice – Madrid plugin (com.snc.best_practice.problem.madrid) is activated, configure the Problem form to include the **Major problem** check box and add the **Major problem review** field to the **Resolution Information** tab.
- If the Problem Management Best Practice – Madrid plugin (com.snc.best_practice.problem.madrid) is not activated, add the **Review outcome** field to the **Closure Information** tab.

### Procedure

1. Open a Problem record to categorize it as a major problem.
2. Select the **Major problem** check box.
   The **Work notes** field is mandatory. Either the **Major problem review** field is displayed in the **Resolution Information** tab, or the **Review outcome** field is displayed in the **Closure Information** section.
3. Fill out the **Review outcome** field to document review results and lessons learned.
4. Click **Update**.

## Managing Problems

Understand how Problem and Problem task is created, assessed, investigated, and fixed in a Problem or Problem task states.

### Create a problem

A problem is a cause of one or more incidents. Create a problem to identify the root cause of the incidents and try to prevent them from happening again.

#### Before you begin

Role required: itil, sn_problem_write, admin, problem_admin, problem_manager, or problem_coordinator
If you do not have Problem Management Best Practice — Madrid plugin (com.snc.best_practice.problem.madrid) activated, see Create a problem (legacy).

#### About this task

- You can generate a problem record manually from the problem module.
- You can generate a problem from an incident.
- You can create a record producer to log problems from the service catalog.
- You can also generate a problem from an email when an appropriate inbound email action is configured.

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## Procedure

1. Create the problem with one of these options.

| Option | Description |
| --- | --- |
| **From the Problem module** | Navigate to **Problem** > **Create New**. |
| **From an incident** | **a.** Open the incident.<br>**b.** On the context menu, click **Create Problem**.<br>**Note:** Use the property **List of attributes (comma-separated) that will be copied from the incident to create a new problem** (*com.snc.problem.create_from_incident.at* to specify fields on the Incident form. The values of these fields are copied to the respective fields on the Problem form. |

2. On the Problem form, fill in the fields.
   For a description of the field values, see Problem form
3. Click **Submit**.
   The problem enters the **New** state. If you have filled the mandatory fields that are necessary to move a problem record to the **Assess** state, the problem record directly moves to the **Assess** state. If you want to add any additional field for the assess state, you must add the field at **System UI** > **Form Sections**. For more information, refer Add a field in the assess mandatory field dialog.

**Note:**

When an incident is promoted as major incident, a problem record is created automatically if the following conditions are met:

- The incident does not have a problem record associated with it.
- Major Incident Management is installed along with problem management.
- The Problem Management Best Practice – Madrid plugin (com.snc.best_practice.problem.madrid) and Incident Management - Major Incident Management plugin (com.snc.incident.mim) must be active.
- You must activate **Create Problem from Major incident** flow, which is inactive when shipped in base system.

To configure the incident field information which must be copied to problem record, activate the **List of Attributes (comma-seperated) that will be copied from the incident to create a new problem** (com.snc.problem.create_from_incident.attributes) property.

You can copy attachments and knowledge articles if the Problem Management Best Practice – Madrid plugin (com.snc.best_practice.problem.madrid) is active and **com.snc.problem.create_from_incident.copy_attachments** property is true.

## What to do next

Assess the problem.

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### Create a problem (legacy)

A problem is a cause of one or more incidents. Create a problem to identify the root cause of the incidents and try to prevent them from happening again.

#### Before you begin

Role required: itil

#### Procedure

1. Create the problem with one of these options.

| Option | Description |
| --- | --- |
| **From the Problem module** | Navigate to **Problem** > **Create New**. |
| **From an incident** | **a.** Open the incident.<br>**b.** On the context menu, click **Create Problem**. |

2. Complete the form, as appropriate.
   For a description of the field values, see Legacy Problem form.
3. To enter work notes for the problem, click the **Notes** tab.
   When you initially create and save a problem, entering notes in the **Work notes** field is not mandatory. If you change the priority of the problem by selecting different **Impact** or **Urgency** values on an existing problem, the **Work notes** field becomes mandatory.

   **Note:**
   This feature is available only in new instances starting with Jakarta or a later release. The Problem Management Best Practice – Jakarta plugin (com.snc.best_practice.problem.jakarta) plugin must be activate.

4. To enter notes on why the problem is closed, click the **Closure Information** tab and enter the information.
   The date on which the problem was closed and the user who closed it populate automatically.
5. Click **Submit**.

#### What to do next

Assess the problem.

## Assess a problem

Assess a problem to determine whether the problem requires a thorough investigation.

#### Before you begin

- Role required: admin, problem_admin, problem_manager, or problem_coordinator
- Activate the Problem Management Best Practice — Madrid — State Model (com.snc.best_practice.problem.madrid.state_model) to get the new best practice states and guided actions to navigate the lifecycle of a problem. For details, see Activate Problem Management Best Practice — Madrid — State Model.

#### About this task

Assessing a problem involves analyzing the scale and extent of the problem, as well as its cause and effect.

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### Procedure

Click **Assess** and fill the mandatory fields.




After assessing the problem, you can perform any one of the following actions:

### What to do next
After you confirm that the problem needs investigation and a resolution, the problem enters the **Root Cause Analysis** state.

## Add multiple incidents to a problem

Add multiple incidents to a problem to avoid creating multiple problems for incidents that have the same issue.

### Before you begin
Role required: itil, admin, problem_admin, problem_coordinator or problem_manager

### About this task
The topic applies to problems where you've activated the Problem Management Best Practice — Madrid (com.snc.best_practice.problem.madrid) plugin.

### Procedure

1. Navigate to **All** > **Problem** > **Open**.
2. Open a problem record.
3. In the related list, click the **Incidents** tab.
4. Click **Add**.
5. From the list, select the records and click **Add Selected**.

   The selected incidents appear under the **Incidents** tab.

   You can use the `global.MRABulkAddRecordsFilter` extension point for an implementation of adding any one or multiple related incident records to a single problem.

#### Extension point for Problem Management

Extension points enable you to extend the functionality of an application and integrate customizations without altering the application code.

`global.MRABulkAddRecordsFilter` is a generic extension point that you can use to attach associated records. You can add its implementation to use a multi-record associator for attaching the records.

Navigate to **All** > **Scripted Extension Points** to add `global.MRABulkAddRecordsFilter` to the Extension Point [sys_extension_point] table.

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**Note:**
If you've already created implementations using the old extension point `global.BulkAddIncidentsFilter` in previous releases, you can still use that extension point for your existing customized implementations. But in the future, the `global.BulkAddIncidentsFilter` extension point will be deprecated. You're encouraged to migrate your implementation to the `global.MRABulkAddRecordsFilter` the extension point. If you're creating implementations, use the extension point `global.MRABulkAddRecordsFilter` for adding one or multiple incident records to a problem.

## Associate CIs with Problem

Associate multiple affected or impacted configuration items (CIs) to a problem to find out all the CIs that are affected by the same problem.

### Before you begin

Role required: itil, sn_problem_write, admin, problem_admin, problem_coordinator or problem_manager

### About this task

Use the **Configuration Item** field when there is a single, primary CI that is the cause of the problem and the **Affected CIs** or the **Impacted Services/CIs** related list when multiple CIs are affected by the problem.

### Procedure

1. Navigate to **All** > **Problem** > **Open**.
2. Open the problem record to which you want to associate CI items.
3. Perform the following actions:

**Associate CI items**

| Options | Procedures |
|---|---|
| Configuration item | **a.** Click the lookup icon ( ).<br>**b.** Select configuration item.<br>**Note:** By default, Service Offering is filtered out and CIs with Principal Class are selected. The Principal Class filter functionality is applicable to the new customers starting the Paris release. |
| Affected CIs | **a.** Click **Add**.<br>**b.** Select configuration items.<br>**Note:** By default, Service Offering is filtered out and CIs with Principal Class are selected. The Principal Class filter functionality is applicable to the new customers starting the Paris release. |

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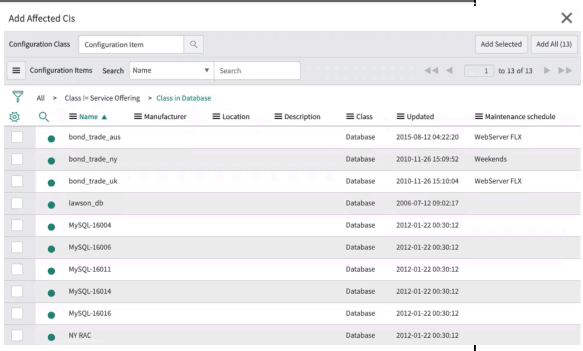
| Options | Procedures |
| --- | --- |
| |  <br>**c.** Click **Add Selected**. |
| Impacted Services/CIs | **a.** Click **Add**.<br>**b.** Select configuration items.<br>**Note:**<br>By default, Service Offering is filtered out.<br>**c.** Click **Add Selected**.<br>**Note:**<br>If the Impacted Services/CIs is not visible on the form, configure the form layout. |

## Investigate root cause of a problem

Identify the root cause of the problem to analyze, track, and resolve recurring incidents permanently.

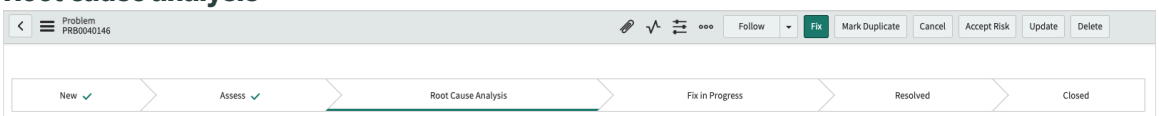
### Before you begin

Role required: problem_admin, problem_coordinator, problem_manager, or admin

### About this task

Activate the Problem Management Best Practice — Madrid — State Model (com.snc.best_practice.problem.madrid.state_model) to get the new best practice states and guided actions to navigate the life cycle of a problem. For details, see Activate Problem Management Best Practice — Madrid — State Model.

**Root cause analysis**




### Procedure

You can perform any one of the following tasks.

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If you had created any known error article for this problem or any similar problem, you can add the reference of that article in the **Primary Known Error article** field.

**Note:**
The **Primary Known Error article** field is available only when you activate the Problem Management Best Practice — Madrid — Knowledge Integration plugin (com.snc.best_practice.problem.madrid.knowledge).

### What to do next

You can resolve and complete the problem. You can also create a change request to implement a fix for the problem.

## Resolve and complete a problem

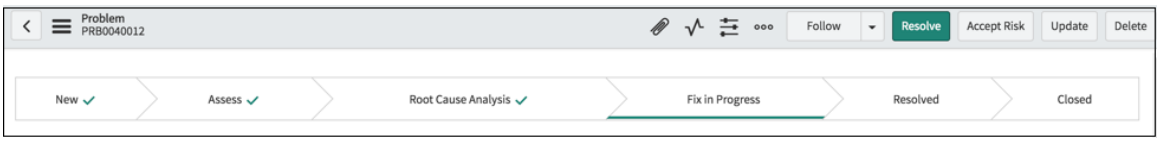
Resolve the issue and add detailed note of the resolution for future reference.

### Before you begin

- Role required: admin, problem_admin, problem_coordinator, or problem_manager
- Activate the Problem Management Best Practice — Madrid — State Model (com.snc.best_practice.problem.madrid.state_model) to get the new best practice states and guided actions to navigate the lifecycle of a problem. For details, see Activate Problem Management Best Practice — Madrid — State Model.

### Procedure

1. Click **Resolve**.




   The problem enters the **Resolved** state with **Resolution code** as **Fix Applied**.

2. Click **Complete**.




   The problem enters the **Closed** state with **Resolution code** as **Fix Applied**.

   **Note:**

   - When a problem is closed or canceled, all related open problem tasks are canceled provided you select the problem management property **Cancel open Problem Tasks when closing a Problem** (*problem.closed.cancel_open_tasks*).
   - When a problem is closed, you can still create problem tasks provided you select the problem management property **Can create a Problem Task on a Closed Problem?** (*problem.closed.can_create_tasks*).

   You can reanalyze the problem even after it is closed by clicking **Re-analyze**. The state of the problem changes from **Closed** to **Root Cause Analysis**. The following problem management properties controls who can reanalyze the problem:

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- **Who can Re-analyze a Canceled Problem?** (*problem.closed.role.reanalyze_from_canceled*)
- **Who can Re-analyze a Risk Accepted (Closed state) Problem?** (*problem.closed.role.reanalyze_from_closed_riskaccepted*)
- **Who can Re-analyze a Completed Problem?**(*problem.closed.role.reanalyze_from_completed*)

When all the related tasks mentioned in the problem management property **List of related task records (comma-separated) to track as fixes for this Problem. Used to notify the Coordinator when the all of the related fix records are Completed or Canceled. E.g. incident.problem_id, change_request.parent** (*problem.fix.records*) are completed, a notification is sent to the problem coordinator regarding the same.

**Note:**
Changing this property to include new tables also requires you to create a corresponding Business Rule for the overall functionality to work seamlessly. For example, for the Change request, the Business Rule is *Check Related Problem Fixes - Change Req*.

## Create change request from a problem

After you investigate and perform a root cause analysis of the Problem, you can understand whether the Problem can be resolved or you should find a temporary workaround for the Problem. If the Problem can be resolved, implement the fix, or the resolution for the Problem.

### Before you begin
Role required: problem_coordinator or admin

### About this task
You can implement a resolution to a problem by applying a standard change procedure and testing to confirm service recovery. For a normal change, you raise a Request For Change (RFC). The Change Advisory Board (CAB) needs to approve the RFC before a resolution is applied to the Problem.

### Procedure

1. Navigate to **All** > **Problem** > **Open** and open a problem record.
2. On the context menu, perform any one of the following activities.
   A change request is created to implement the solution for the problem.

## Add multiple change requests to a problem

Add multiple change requests to a problem to capture all the requests that you need to implement to fix the problem.

### Before you begin
Role required: itil, admin, problem_admin, problem_coordinator or problem_manager

### About this task
The topic applies to Problems where you have activated the Problem Management Best Practice — Madrid (com.snc.best_practice.problem.madrid) plugin.

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### Procedure

1. Navigate to **All** > **Problem** > **Open**.
2. Open a problem record.
3. In the related list, click the **Change Requests** tab.
4. Click **Add**.
5. From the list, select the records and click **Add Selected**.
   The selected change requests appear under the **Change Requests** tab.

## Create a problem task

Problem tasks are how the problem coordinator asks subject matter experts for help with identifying the root cause and proposed fix for a problem. Divide the problem into multiple problem tasks to help with the investigation. You can assign the problem tasks to different assignment groups or users.

### Before you begin

Role required: itil, sn_problem_write, admin, problem_admin, problem_coordinator, problem_manager, or problem_task_analyst

### Procedure

1. Navigate to **All** > **Problem** > **Open**.
2. Open the problem record for which you want to create a problem task.
3. In the related list of the problem record, click **Problem Tasks** and click **New**.
4. Select any one of the following problem tasks.
5. On the form, fill in the fields.
   For a description of the field values, see Problem Task form.
6. Click **Submit**.
   The problem task enters the **New** state. If you have filled the mandatory fields that are necessary to move a problem task record to the **Assess** state, the problem task record directly moves to the **Assess** state. If you want to add any additional field for the assess state, you must add the field at **System UI** > **Form Sections**. For more information, refer Add a field in the assess mandatory field dialog.

### What to do next

Assess the problem task.

## Assess a problem task

Assess a problem task to determine the feasibility of working on the task.

### Before you begin

Role required: problem_admin, problem_coordinator, problem_manager, problem_task_analyst, or admin

### About this task

Assessing a problem task involves analyzing the scale and extent of the task, as well as its cause and effect.

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### Procedure

1. Select **Assess**.




   The problem task enters the **Assess** state. You can confirm whether there's enough information to work on the task or if the task should be canceled.

2. After assessing the task, perform the action based on your option.

### What to do next
Complete the problem task as resolved.

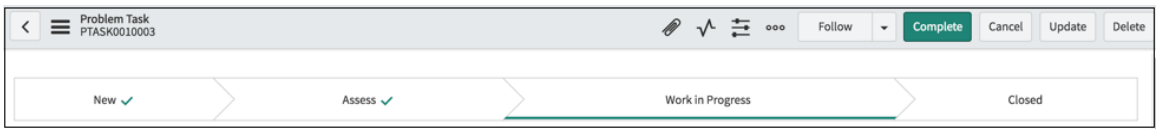
## Complete a problem task

Resolve and complete the problem task.

### Before you begin
Role required: admin, problem_admin, problem_coordinator, problem_manager, or problem_task_analyst

### Procedure

Click **Complete**.




The problem task enters the **Closed** state with **Close code** as **Complete**.

**Note:**
You can configure the Problem properties to reanalyze a task even after it is closed by clicking **Re-assess**. The state of the task changes from **Closed** to **Assess**. After all the problem tasks are completed or canceled, a notification is sent to the problem coordinator regarding the same.

## Resolve related incidents from a problem

After you consider a problem to be resolved, the incidents related to the problem with the state **On Hold** may be resolved using a UI action from the **Problem** form.

### Before you begin
Role required: itil

### About this task
The topic only applies to legacy problem — Jakarta to London.

### Procedure

1. Open a resolved problem that has associated incidents.
2. From the context menu, click **Resolve Incidents**.

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3. Enter values for mandatory fields.

**Note:**
Only the incidents in state **On Hold** and with **Awaiting Problem** as the on hold reason can be resolved.

The state of the incidents in the problem related list is changed to **Resolved** and work notes are added to the activity feed.

## Communicating the outcome of a problem

Document the cause and resolution of a problem to resolve incoming incidents quickly and avoid further problems to be raised on the same issue.

### Communicate workaround for Problem

Document and communicate workaround to let others know that you are aware of the issue. The workaround is a temporary way to restore service failures and lessen the impact of a Problem for which an actual resolution is not yet available.

#### Before you begin
Role required: admin, problem_admin, problem_manager or problem_coordinator

#### About this task
When you communicate a workaround, notification is sent to related incidents that a workaround is available. The Incident process is designed to use the workaround information or to notify the user of the same. For more information on notification, refer Synchronization between incident and problem records.

**Note:**
The topic applies to Problems where you have activated the Problem Management Best Practice — Madrid (com.snc.best_practice.problem.madrid) plugin.

#### Procedure

1. Navigate to **All** > **Problem** > **Open**.
2. Open the Problem record.
3. Enter the information in the **Analysis information** > **Workaround** field.
4. Save the record.
5. Under Related Links, click **Communicate Workaround**.

### Communicate workaround (legacy)

You can enter a workaround note into a problem record, and then post the information into every associated incident.

#### Before you begin
Role required: itil or admin

#### About this task
The **Communicate Workaround** related link on the Problem form eliminates the need to manually update each incident related to the Problem.

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### Procedure

1. Open the problem for which you have a workaround.
2. Enter the information in the **Workaround** field.
3. Click **Post**.
4. Click the **Communicate Workaround** related link.
   The problem number and the content of the **Workaround** field are added to the activity stream on all related incidents. By default, any entries made in an incident activity stream field generate an email notification to the **Caller** that you mention on the Incident form.

   If group on-call rotation scheduling is in effect when you communicate a workaround, the system stops the escalations on the associated incidents. Escalation stops because a workaround is available. This action effectively communicates knowledge to the appropriate audience, but does not create a knowledge article.

## Communicate a fix

After you have completed root cause analysis of a problem and have come up with a resolution or fix for that problem, submit change requests to get the problem fixed. Documenting and communicating fix helps user to know the solution to a problem.

### Before you begin

Role required: admin, problem_admin, problem_manager or problem_coordinator

### About this task

When you communicate a fix, notification is sent to related incidents that a fix is available. The Incident process is designed to use the fix information or to notify the user of the same. For more information on notification, refer Synchronization between incident and problem records.

**Note:**
The topic applies to Problems where you have activated the Problem Management Best Practice — Madrid (com.snc.best_practice.problem.madrid) plugin.

### Procedure

1. Navigate to **All** > **Problem** > **Open**.
2. Open the Problem record.
3. Enter the information in the **Resolution Information** > **Fix notes** field.
4. Save the record.
5. Under Related Links, click **Communicate Fix**.
   The fix information is copied from the **Fix notes** field on the Problem form to the **Additional Comments** field on the Incident form. An email notification is sent to the caller and the user who is assigned to the Incident.

## Knowledge articles from problems

Knowledge bases house the information an organization wants to keep and share. The Problem form includes four options for creating knowledge and communicating information.

**Note:**
If you have Problem Management Best Practice — Madrid — Knowledge Integration plugin (com.snc.best_practice.problem.madrid.knowledge) activated, see Create a known error article. The topic applies to legacy Problem (London or a prior release) only.

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- You can select the **Knowledge** check box and automatically submit a knowledge article when a problem is closed.
- You can enter a workaround note into a problem record, and then post the information into every associated incident.
- You can create a knowledge article from the problem immediately, and not wait for when the problem is closed.
- You can quickly create and publish a knowledge article in the News category.

By default, most new articles are created as drafts and move through a review state before they are published. An exception to the standard workflow is posting news from the Problem form.

If the administrator enables the optional knowledge submission workflow, articles created from incidents or problems become knowledge submissions, which are processed through a different path. For more information, see Knowledge workflows.

### Use the knowledge check box

As with incidents, problems often generate information that may be needed in the future. The system can automatically submit a knowledge article when a problem is closed.

#### Before you begin

Role required: itil

#### About this task

**Note:**
If you have Problem Management Best Practice — Madrid — Knowledge Integration plugin (com.snc.best_practice.problem.madrid.knowledge) activated, see Create a known error article. The topic applies to legacy Problem (London or a prior release) only.

You can select the **Knowledge** check box and automatically submit a knowledge article when a problem is closed.

#### Procedure

1. Select the **Knowledge** check box on the Problem form.
2. Resolve and close the problem.

   Closing the problem triggers the business rule *`Problem Create Knowledge`*. By default, the business rule creates a knowledge article in the **Draft** workflow state, ready for a knowledge team member to review and publish. The problem **Short description** becomes the article **Short description**, and the problem **Work notes** become the article **Text**.

   If the knowledge submission workflow is enabled, the problem **Work notes** become a knowledge submission instead of an article. For more information, see Knowledge workflows.

## Create a known error article

Create known error articles as reference material. The known error articles document the root cause and the workaround of the problem to help with deflecting incidents.

#### Before you begin

Role required: admin, problem_admin, problem_coordinator, or problem_manager
Activate the Problem Management Best Practice — Madrid (com.snc.best_practice.problem.madrid) and the Problem Management Best Practice — Madrid — Knowledge Integration (com.snc.best_practice.problem.madrid.knowledge) plugin.

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### About this task
After you create a known error article from a problem, the article is saved in the knowledge base and maintained in the Knowledge Management application. The publishing and retirement processes for a knowledge article are controlled by workflows defined for the knowledge base that the article belongs to. For more information, see Knowledge workflows.

### Procedure
1. Navigate to **All** > **Problem** > **Open**.
2. Open the Problem record.
3. Under **Related Links**, click **Create Known Error Article**.

   **Note:**
   The link appears when the **Primary Known Error article** field is empty under the **Analysis Information** tab on the Problem form.

4. Click **Submit**.

   **Note:**
   To read the content of the article, click **View Article** under **Related Links**.

5. On the form, fill in the fields.

   **Note:**
   Click **Search for Duplicates** to search for existing known error articles. The search is based on short description, category, and topic.

   For a description of the field values, see Known error article form.

### What to do next
Click **Publish** to send the article for review and approval. Depending on the Knowledge base where the article is stored and the Knowledge Base access controls, this Known Error article may be available to search for users outside of the IT team to help with Incident deflection.

## Post knowledge

You can create a knowledge article from the problem immediately, and not wait for when the problem is closed.

### Before you begin
Role required: itil, knowledge

### About this task
If you have Problem Management Best Practice — Madrid — Knowledge Integration plugin (com.snc.best_practice.problem.madrid.knowledge) activated, see Create a known error article. The topic applies to legacy Problem (London or a prior release) only.

### Procedure
1. Open a problem from which to post a knowledge article.
2. Click the **Post Knowledge** related link.
   The resulting knowledge article contains the following information.

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- The problem number and **Short description** become the knowledge article **Short description**.
- The problem **Description** and **Workaround** become the knowledge article **Text**.
- The problem **Configuration item** becomes the knowledge article **Configuration Item**.
- The article **Topic** is set to **Known Error**.

By default, the system creates a knowledge article in **Draft** workflow state. If the knowledge submission workflow is enabled, the problem **Short description** and **Work notes** are placed into a knowledge submission instead of an article. For more information, see Knowledge workflows.

## Problem Management Platform Analytics Solutions

Platform Analytics Solutions and in-form analytics contain preconfigured dashboards. These dashboards contain actionable data visualizations that help you improve your business processes and practices.

Platform Analytics data visualizations use Performance Analytics indicator data to show you data over time, helping you analyze your business processes and identify areas of improvement. With Platform Analytics Solutions, you can get value from Performance Analytics for your application with minimal setup. You can always create your own objects as well.

**Important:**
Set up and test Platform Analytics Solutions on a non-production instance before enabling them in production.

To enable the solution for Problem Management, an admin can navigate to **Performance Analytics** > **Guided Setup**. Click **Get Started** then scroll to the section for Problem Management. The guided setup takes you through the entire setup and configuration process.

Several of the dashboards in this content pack are inactive when installed. Complete configuration and run data collection jobs before you activate these dashboards. You can activate dashboards in Dashboard Properties, accessible from the context menu. You have to assign an owner to the dashboard to activate it. For more information about configuring Platform Analytics Solutions, see Configure Platform Analytics Solutions

### Inactive dashboards

Some dashboards in this content pack are inactive when installed. Complete configuration and run data collection jobs before you activate these dashboards. You can activate dashboards in Dashboard Properties, accessible from the context menu. You have to assign an owner to the dashboard to activate it. For more information about configuring Platform Analytics Solutions, see Configure Platform Analytics Solutions

**Related topics**

Platform Analytics Solutions

Activate your Performance Analytics subscription

### Problem Overview dashboard

This dashboard shows the current state of open problems.

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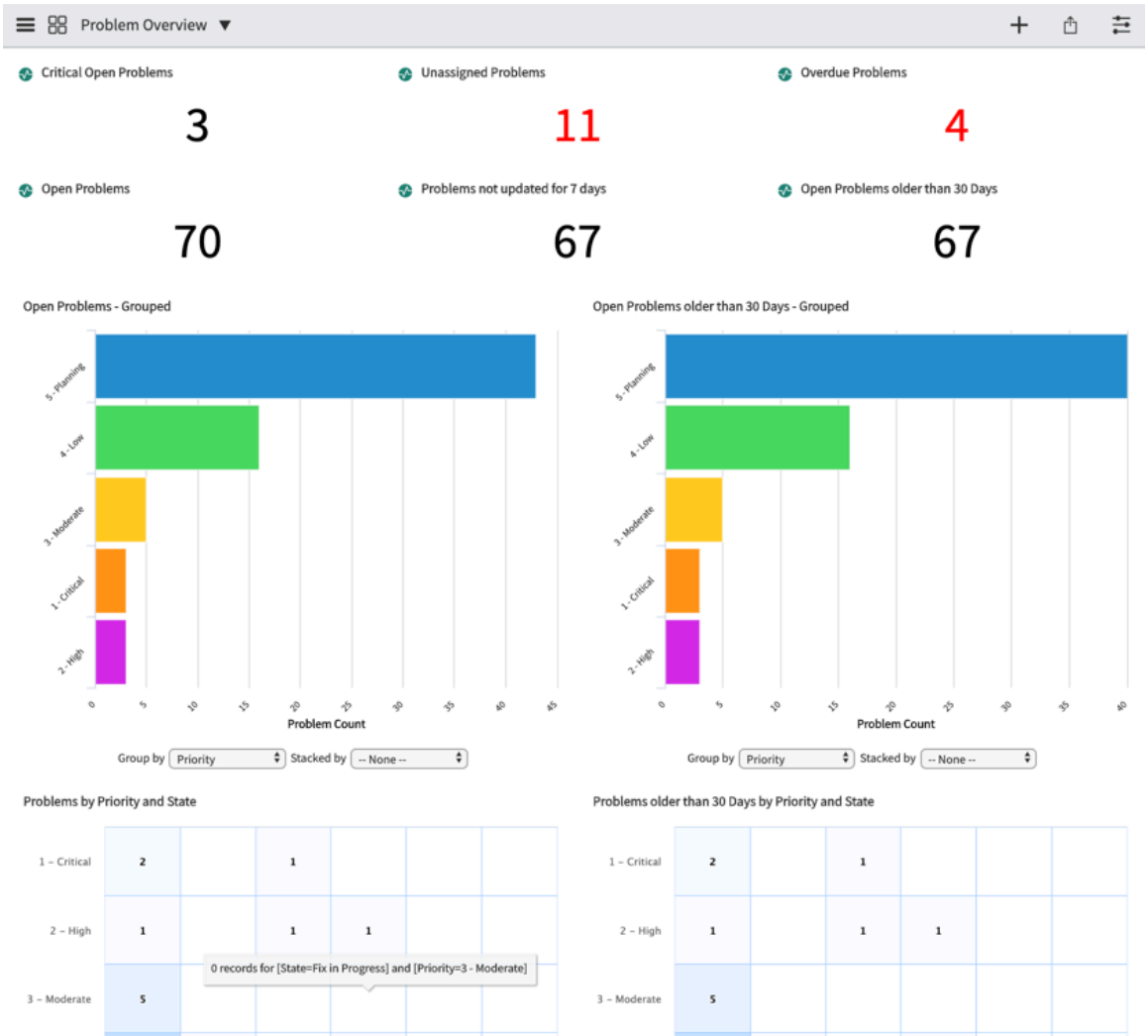


## End user and roles

| End user and goal | Required role |
|---|---|
| Problem manager and Problem agent - View the current number of critical, overdue, and unassigned problems to identify immediate action areas. | None |

## Data visualizations

| Title | Type | Description |
|---|---|---|
| Critical open problems | Single Score | All open problems where Priority is 1 - Critical. This report tells you at a glance how many top priority problems there are. |
| Unassigned problems | Single Score | All open problems where 'Assigned to' is empty. These are the problems you have to assign. |

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| Title | Type | Description |
|---|---|---|
| Overdue problems | Single Score | All open problems where Escalation = Overdue |
| Open problems | Single Score | All open problems |
| Problems not updated for 7 days | Single Score | Open problems where the value in the Updated field is more than 7 days ago |
| Open problems older than 30 days | Single Score | Open problems where the value in the Created field is more than 30 days ago |
| Open problems - Grouped | Horizontal Bar | Open problems grouped by Priority |
| Open problems older than 30 days - Grouped | Horizontal Bar | Open problems where the value in the Created field is more than 30 days ago, grouped by Priority |
| Problems by Priority and State | Heatmap | Open Problems grouped on a matrix of Priority and State |
| Open problems older than 30 days by Priority and State | Heatmap | Open problems where the value in the Created field is more than 30 days ago, grouped on a matrix of Priority and State |
| Problems Opened per Week | Line | Count of all problems opened this year, trending by Opened per Week |
| Problems Closed per Week | Line | Count of all problems closed this year, trending by Closed per Week |

## Problem Management dashboard

Use this dashboard to gain a high-level view across the problem management process, from opening to closing.

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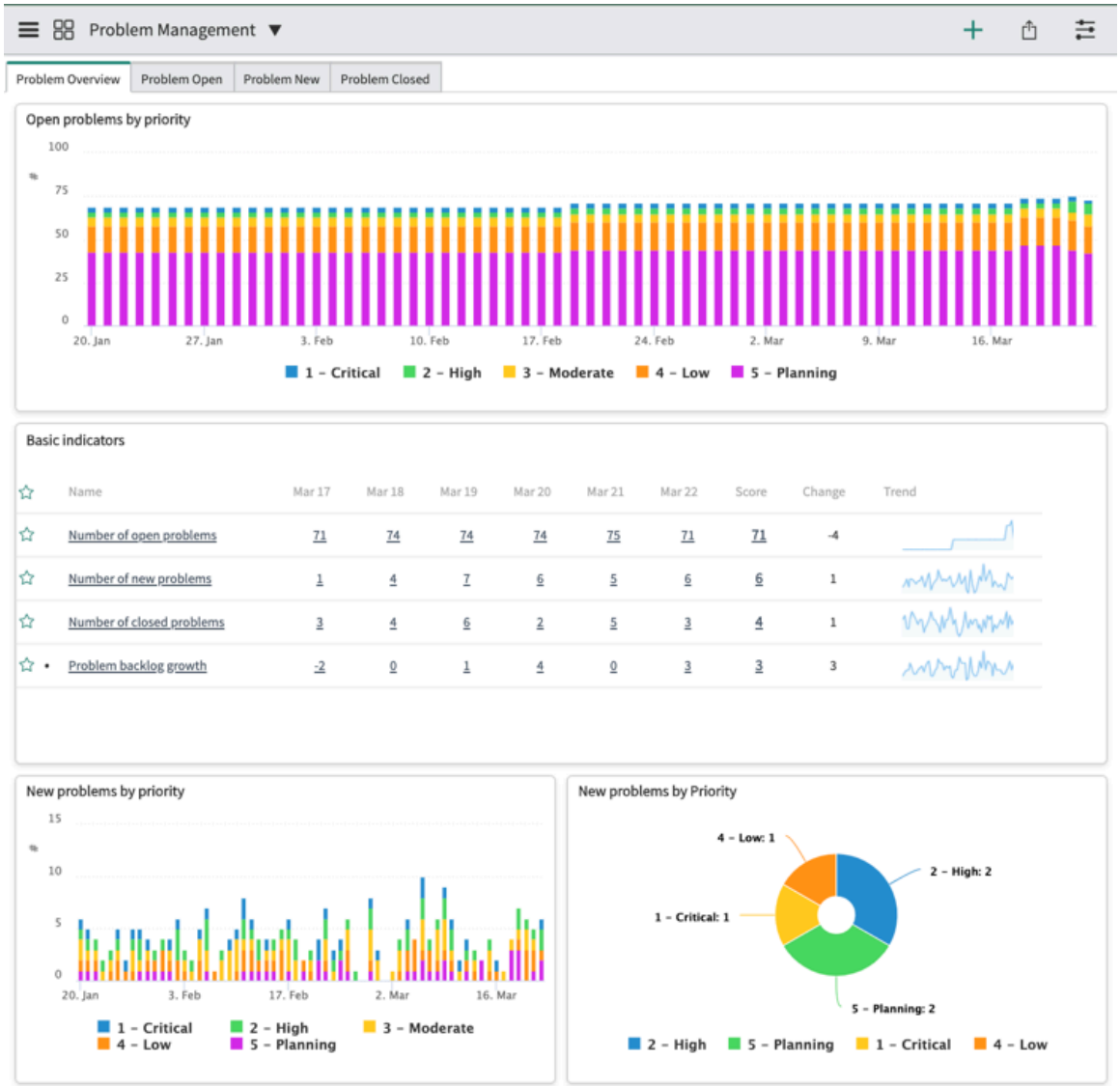
## Problem Overview tab

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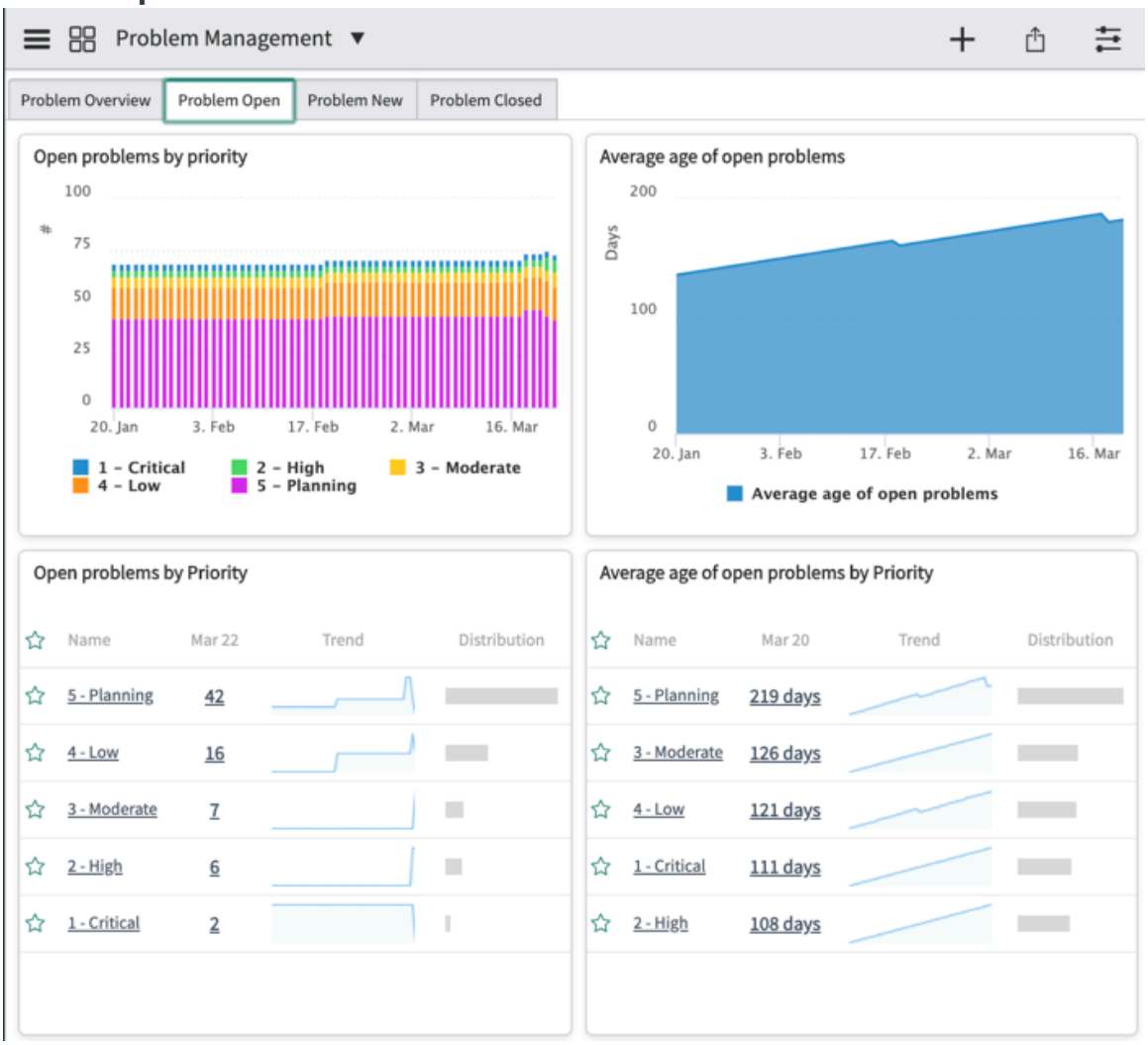
## Problem Open tab

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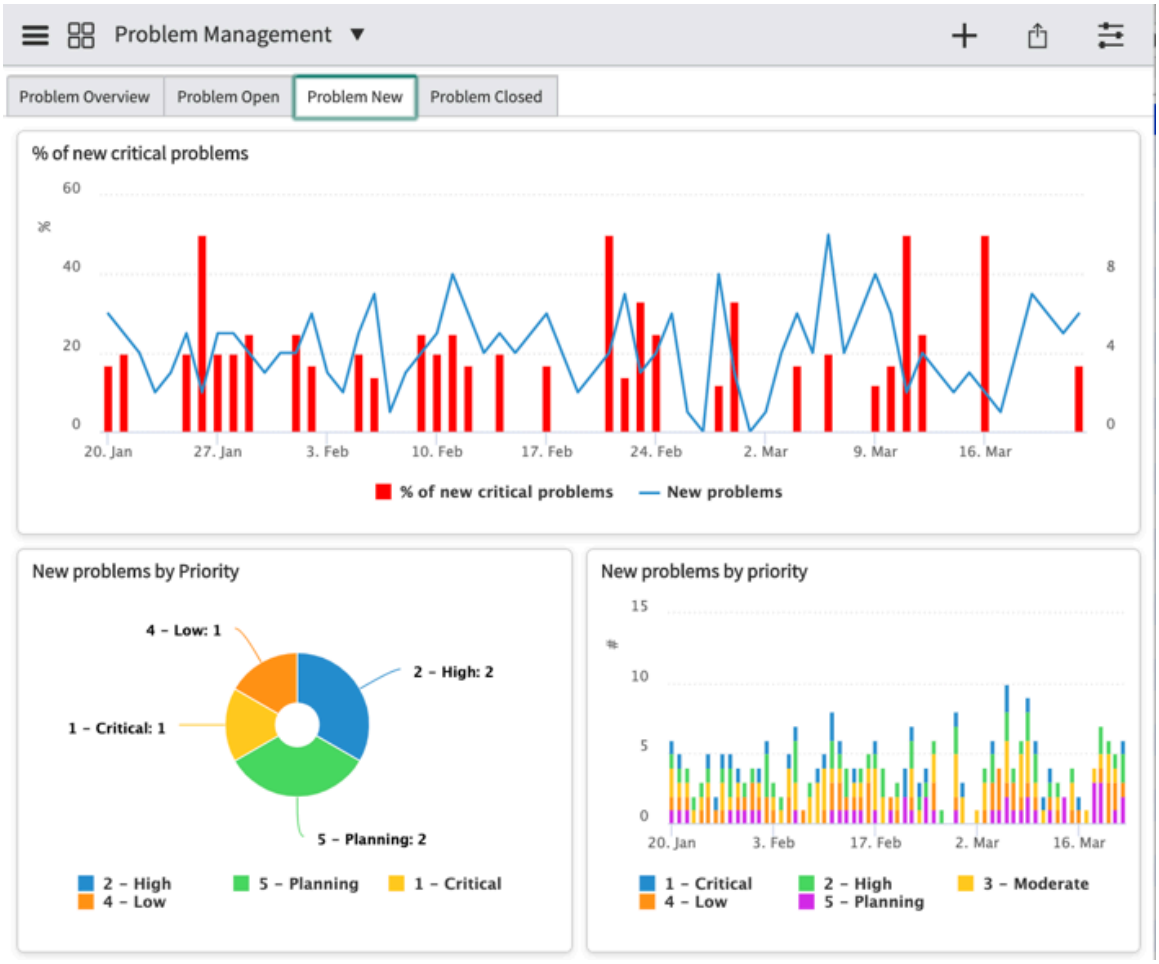
## Problem New tab

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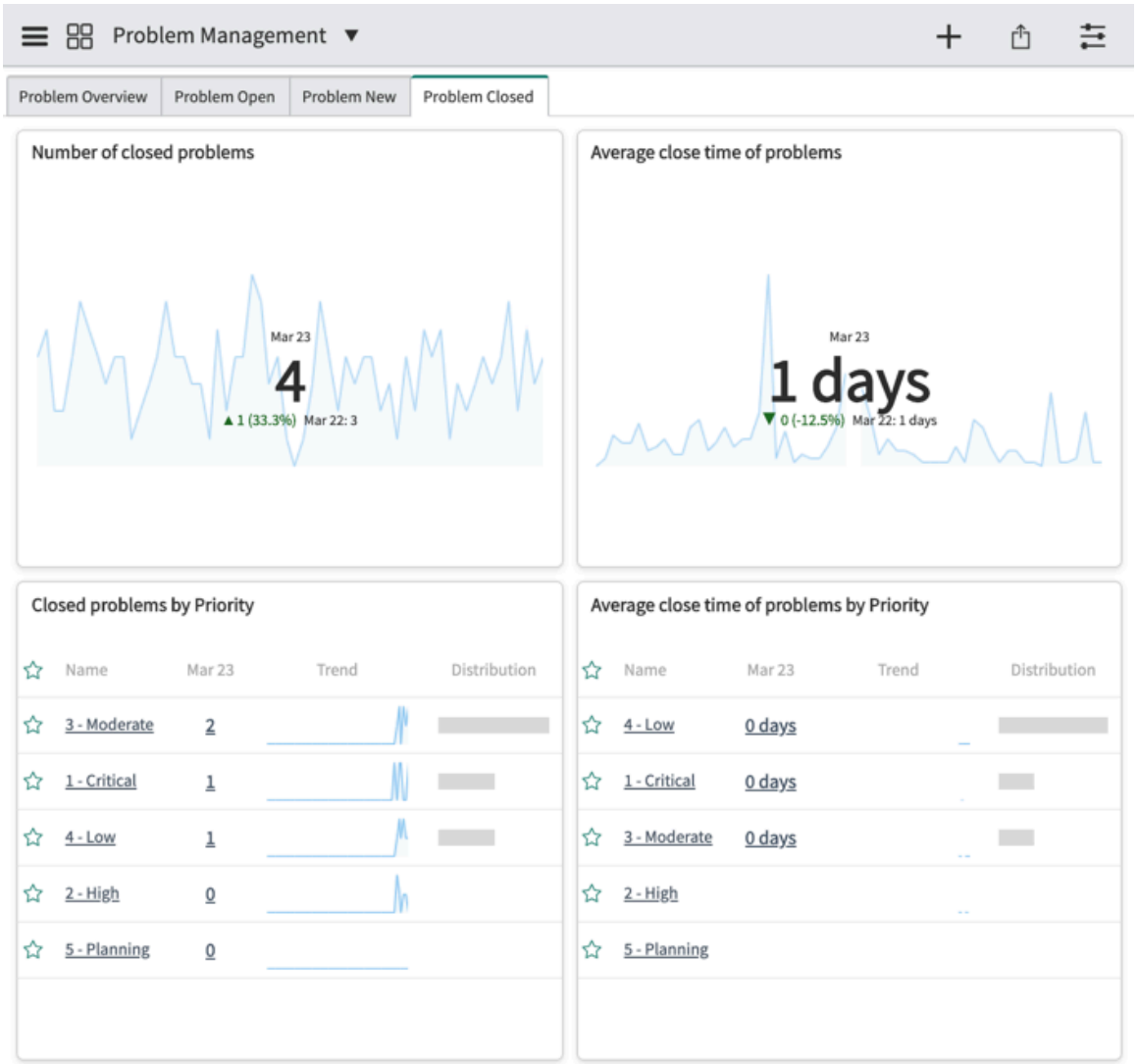
### Problem Closed tab




## End user and roles

| End user and goal | Required role |
|---|---|
| Problem manager | pa_viewer needed to view the Basic Indicators list |

## Indicators

**Number of open problems**

Problems on the Problem [problem] table created on or before today and with no Closed date. This indicator is used in several other indicators on the dashboard.

**Number of new problems**

Problems on the Problem [problem] table created today. This indicator is used in several other indicators on the dashboard.

**Number of closed problems**

Problems on the Problem [problem] table closed today. This indicator is used in several other indicators on the dashboard.

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**Problem backlog growth**

The score for this indicator is calculated according to the formula [[Number of new problems]] - [[Number of closed problems]].

**Average age of open problems**

The score for this indicator is calculated according to the formula [[Summed age of open problems]] / [[Number of open problems]] / 24

**% of new critical problems**

The score for this indicator is calculated according to the formula ( [[Number of new problems > Priority = 1 - Critical]] / [[Number of new problems]] ) * 100

**Average close time of problems**

The score for this indicator is calculated according to the formula [[Summed duration of closed problems]] / [[Number of closed problems]] / 24

The following indicators are not shown directly on the dashboard but are used in calculating formulas:

- Summed age of open problems
- Summed duration of closed problems

## Breakdowns

Priority.

## Problem Premium dashboard

This dashboard uses advanced features such as interactive filters and workbench widgets to provide a broad view of problem reports, both current and over time.

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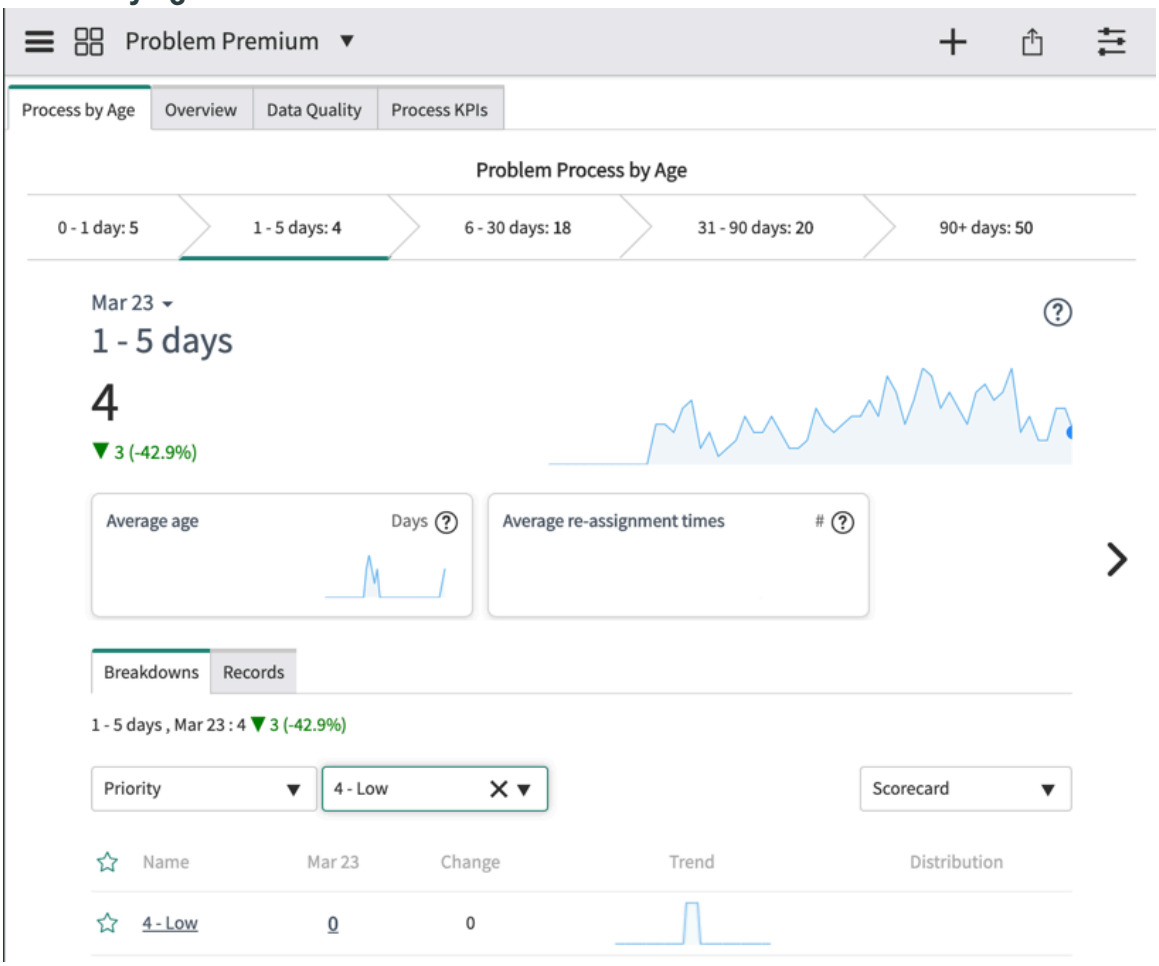
## Process by Age tab

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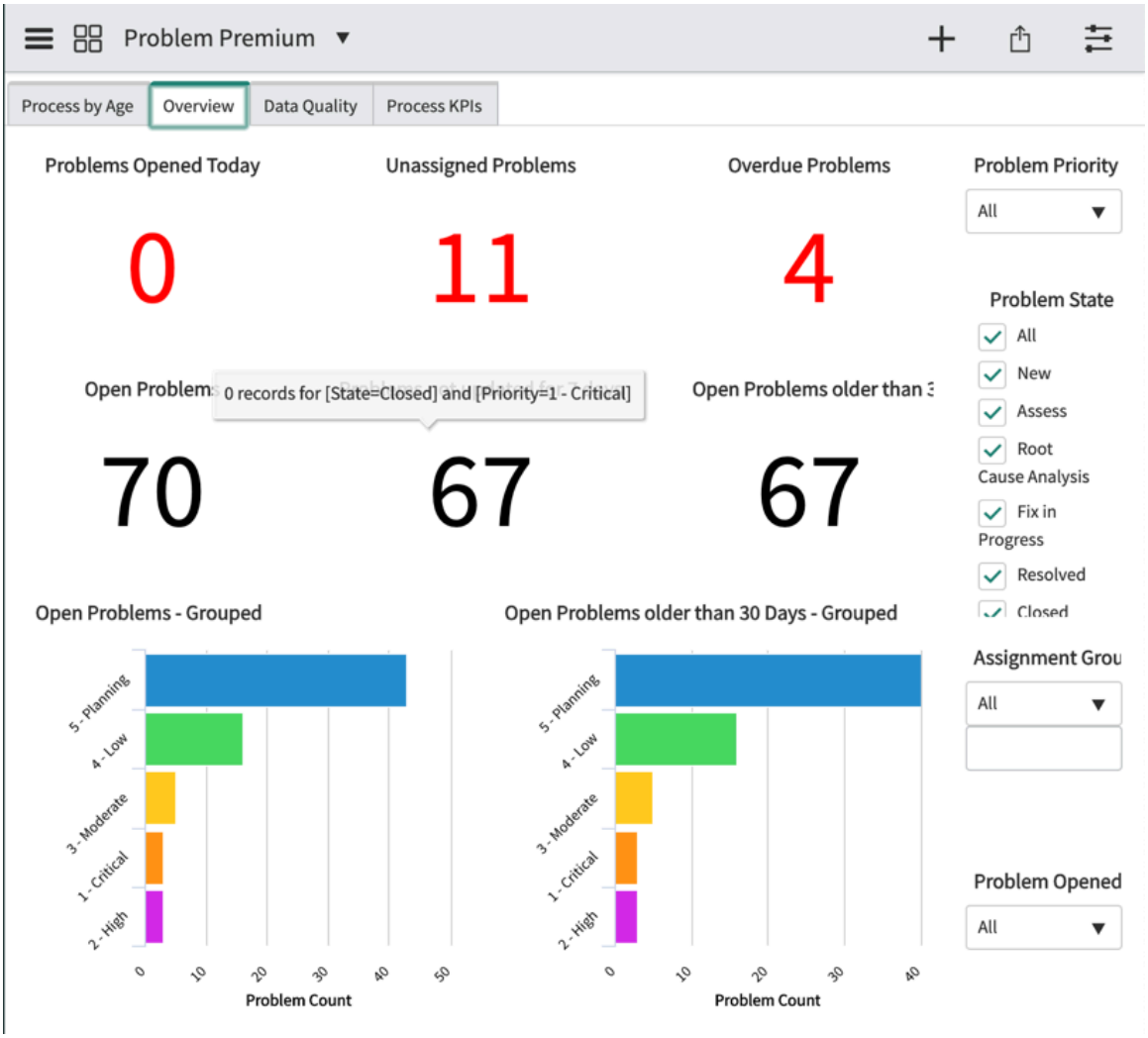
### Overview tab




**Note:**
The Overview tab has the same contents as the Problem Overview dashboard.

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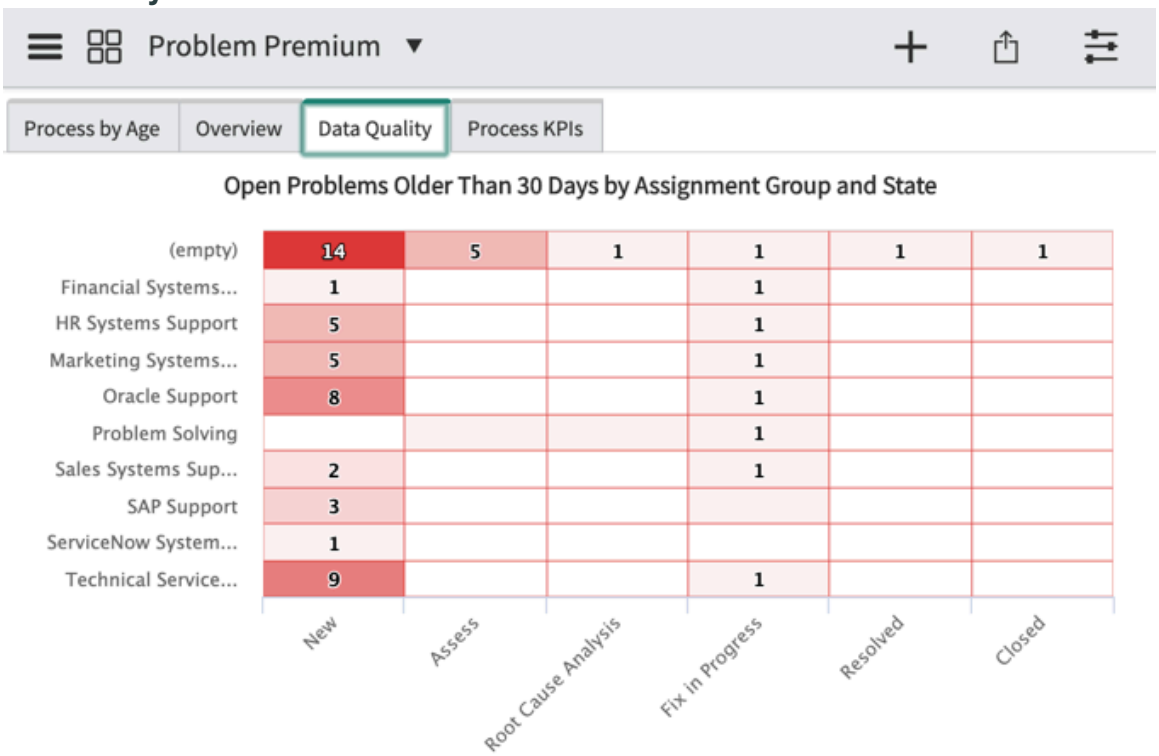
## Data Quality tab




### Open Problems Not Updated In Last 30 Days by Assignment Group and State

| | New | Assess | Root Cause Analysis | Fix in Progress | Resolved | Closed |
|---|---|---|---|---|---|---|
| (empty) | 14 | 5 | 1 | 1 | 1 | 1 |
| Financial Systems... | 1 | | | 1 | | |
| HR Systems Support | 5 | | | 1 | | |
| Marketing Systems... | 5 | | | 1 | | |
| Oracle Support | 8 | | | 1 | | |
| Problem Solving | | | | 1 | | |
| Sales Systems Sup... | 2 | | | 1 | | |
| SAP Support | 3 | | | | | |
| ServiceNow System... | 1 | | | | | |
| Technical Service... | 9 | | | 1 | | |

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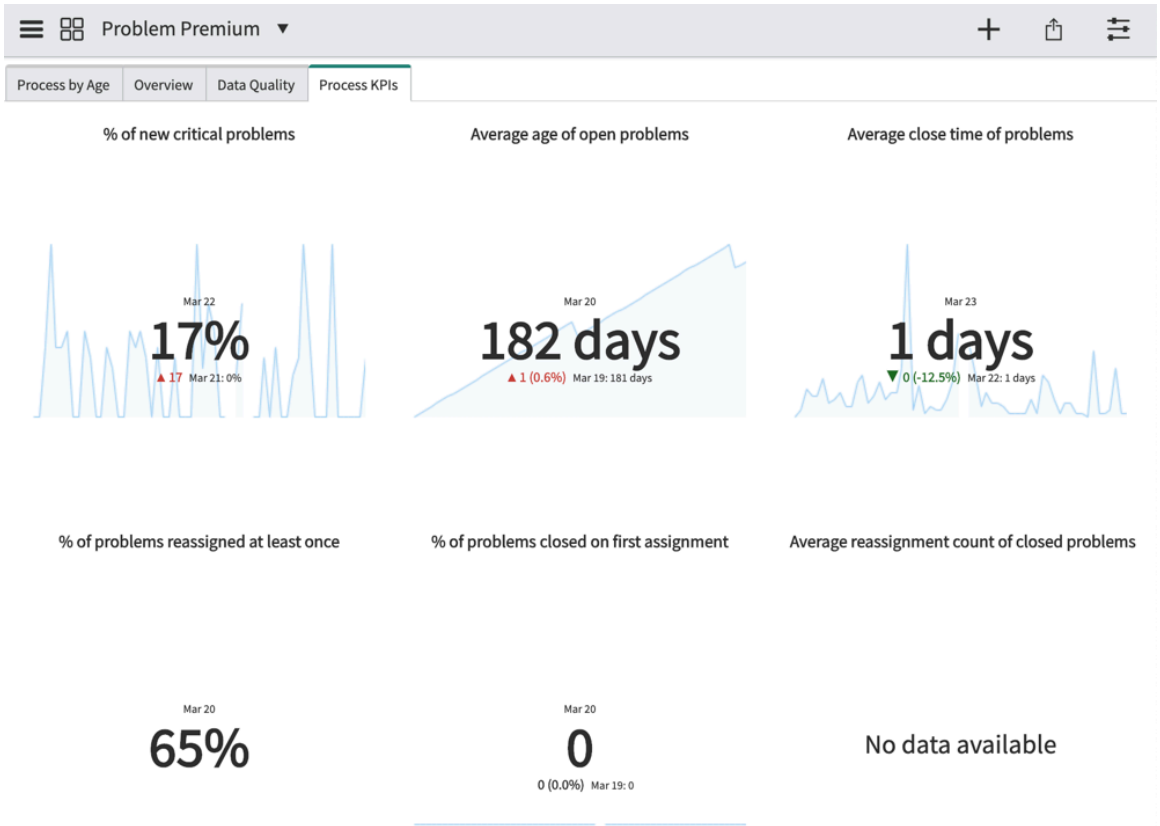
### Process KPIs tab




## End user and roles

| End user and goal | Required role |
|---|---|
| All roles concerned with Problem Management | itil to see the list of Problem records |

## Indicators

**Number of open problems**

Problems on the Problem [problem] table created on or before today and with no Closed date. This indicator is used in several other indicators on the dashboard.

**Number of closed problems**

Problems on the Problem [problem] table closed today. This indicator is used in several other indicators on the dashboard.

**Average age of open problems**

The score for this indicator is calculated according to the formula [[Summed age of open problems]] / [[Number of open problems]] / 24

**Average re-assignment of open problems**

The average number of times an open problem gets reassigned. The score for this indicator is calculated according to the formula [[Summed re-assignment of open problems]] / [[Number of open problems]].

**Average age of updated since of open problems**

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The average time in days since the last update of an open problem. The score for this indicator is calculated according to the formula [[Summed age of updated since of open problems]] / [[Number of open problems]] / 24.

**% of new critical problems**

The score for this indicator is calculated according to the formula ( [[Number of new problems > Priority = 1 - Critical]] / [[Number of new problems]] ) * 100

**Average close time of problems**

The score for this indicator is calculated according to the formula [[Summed duration of closed problems]] / [[Number of closed problems]] / 24

**% of problems reassigned at least once**

The score for this indicator is calculated according to the formula ( [[Number of reassigned open problems]] / [[Number of open problems]] * 100 ).

**% of problems closed on first assignment**

The score for this indicator is calculated according to the formula ( [[Number of problems closed on first assignment]] / [[Number of closed problems]] * 100 ).

**Average reassignment count of closed problems**

The average value of the Reassignment Count field on closed problems, where Reassignment Count is not empty.

**% of open problems classified as known error**

The score for this indicator is calculated according to the formula ( [[Number of open problems classified as known error]] / [[Number of open problems]] ) * 100.

**% of closed problems without any close notes**

The score for this indicator is calculated according to the formula ( [[Number of closed problems without close notes]] / [[Number of closed problems]] ) * 100.

**% of open problems with at least one incident**

The score for this indicator is calculated according to the formula ( [[Number of open problems with at least one incident]] / [[Number of open problems]] ) * 100.

The following indicators are not shown directly on the dashboard but are used in calculating formulas:

- Summed age of open problems
- Summed age of updated since of open problems
- Summed duration of closed problems
- Summed re-assignment of open problems
- Number of reassigned open problems
- Number of problems closed on first assignment
- Number of open problems classified as known error
- Number of closed problems without close notes
- Number of open problems with at least one incident

## Breakdowns

- Age
- Priority

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- State
- Assignment Group

## Data visualizations

| Title | Type | Description |
|---|---|---|
| Critical open problems | Single Score | All open problems where Priority is 1 - Critical. This report tells you at a glance how many top priority problems there are. |
| Unassigned problems | Single Score | All open problems where 'Assigned to' is empty. These are the problems you have to assign. |
| Overdue problems | Single Score | All open problems where Escalation = Overdue |
| Open problems | Single Score | All open problems |
| Problems not updated for 7 days | Single Score | Open problems where the value in the Updated field is more than 7 days ago |
| Open problems older than 30 days | Single Score | Open problems where the value in the Created field is more than 30 days ago |
| Open problems - Grouped | Horizontal Bar | Open problems grouped by Priority |
| Open problems older than 30 days - Grouped | Horizontal Bar | Open problems where the value in the Created field is more than 30 days ago, grouped by Priority |
| Problems by Priority and State | Heatmap | Open Problems grouped on a matrix of Priority and State |
| Open problems older than 30 days by Priority and State | Heatmap | Open problems where the value in the Created field is more than 30 days ago, grouped on a matrix of Priority and State |
| Open problems not updated in last 30 days by assignment group | Heatmap | Open problems where the value in the Updated field is more than 30 days ago, grouped on a matrix of State and Assignment Group |

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| Title | Type | Description |
| --- | --- | --- |
| Problems Opened per Week | Line | Count of all problems opened this year, trending by Opened per Week |
| Problems Closed per Week | Line | Count of all problems closed this year, trending by Closed per Week |
| Open Problems Where Assignee Is Not Active | Heatmap | Open problems where the value of Assigned to Active is false, grouped on a matrix of State and Assignment Group |
| Problems Pending a Change Request that is Already Closed | Heatmap | Open problems where the Change request has a State value of 3, meaning the request is closed, grouped on a matrix of State and Assignment Group |

## Problem daily 7d - 28d dashboard

Track the progress made by different assignment groups in resolving problems in the daily, weekly, and monthly time frames.

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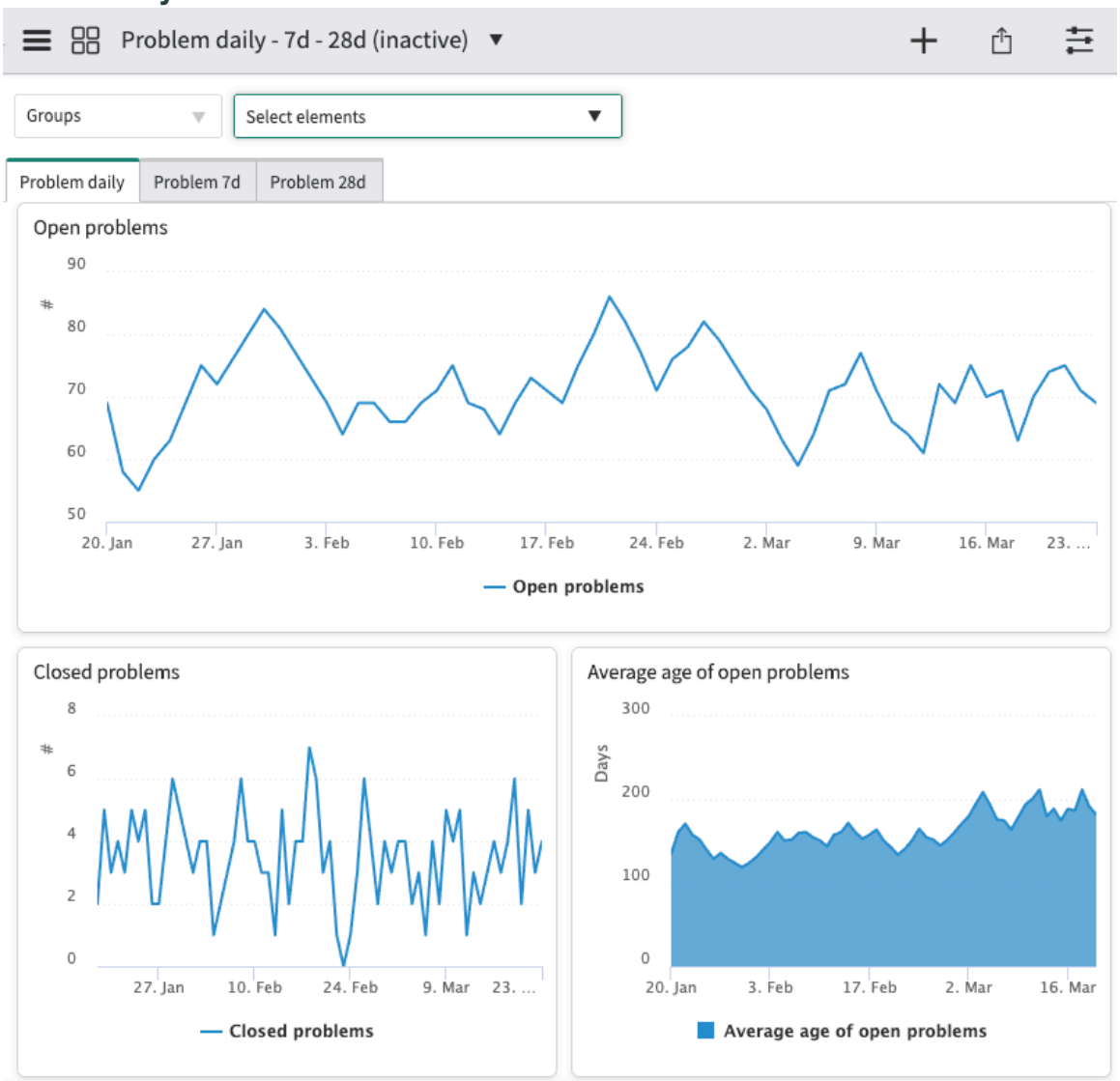
## Problem daily tab

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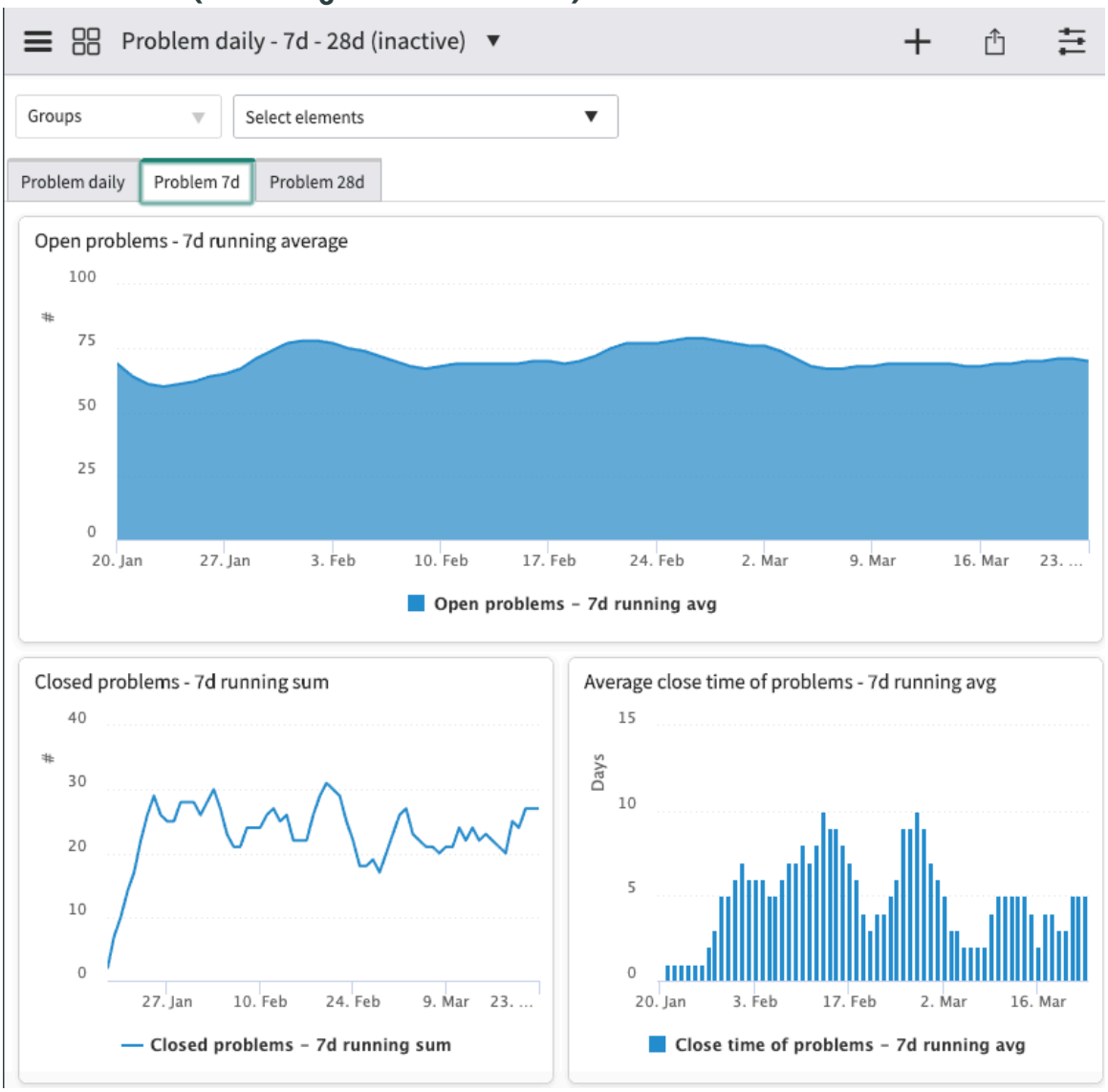
**Problem 7d tab (same widgets on Problem 28d)**




## End user and roles

| End user and goal | Required role |
|---|---|
| Problem manager - Track the progress of their groups in managing problems across daily, weekly, and monthly time frames | None |
| Problem agent - Track the progress of incidents they own across daily, weekly, and monthly timeframes | None |

## Indicators

In the 7 day and 28 day tabs, the widgets apply seven day and 28 day time series aggregations to the indicators.

**Number of open problems**

Problems on the Problem [problem] table created on or before today and with no Closed date. This indicator is used in several other indicators on the dashboard.

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**Number of closed problems**

Problems on the Problem [problem] table closed today. This indicator is used in several other indicators on the dashboard.

**Average age of open problems**

The score for this indicator is calculated according to the formula [[Summed age of open problems]] / [[Number of open problems]] / 24

**Number of open problems not updated in last 30 days**

The number of open problems with the value of the Updated field more than 30 days ago.

**Number of open problems not updated in last 90 days**

The number of open problems with the value of the Updated field more than 90 days ago.

**Average close time of problems**

The score for this indicator is calculated according to the formula [[Summed duration of closed problems]] / [[Number of closed problems]] / 24

The following indicators are not shown directly on the dashboard but are used in calculating formulas:

- Summed age of open problems
- Summed duration of closed problems

## Breakdowns

You can apply breakdown elements on this dashboard to all widgets simultaneously. Only Assignment Group elements are available. Select one or more assignment groups from the **Select elements** list.

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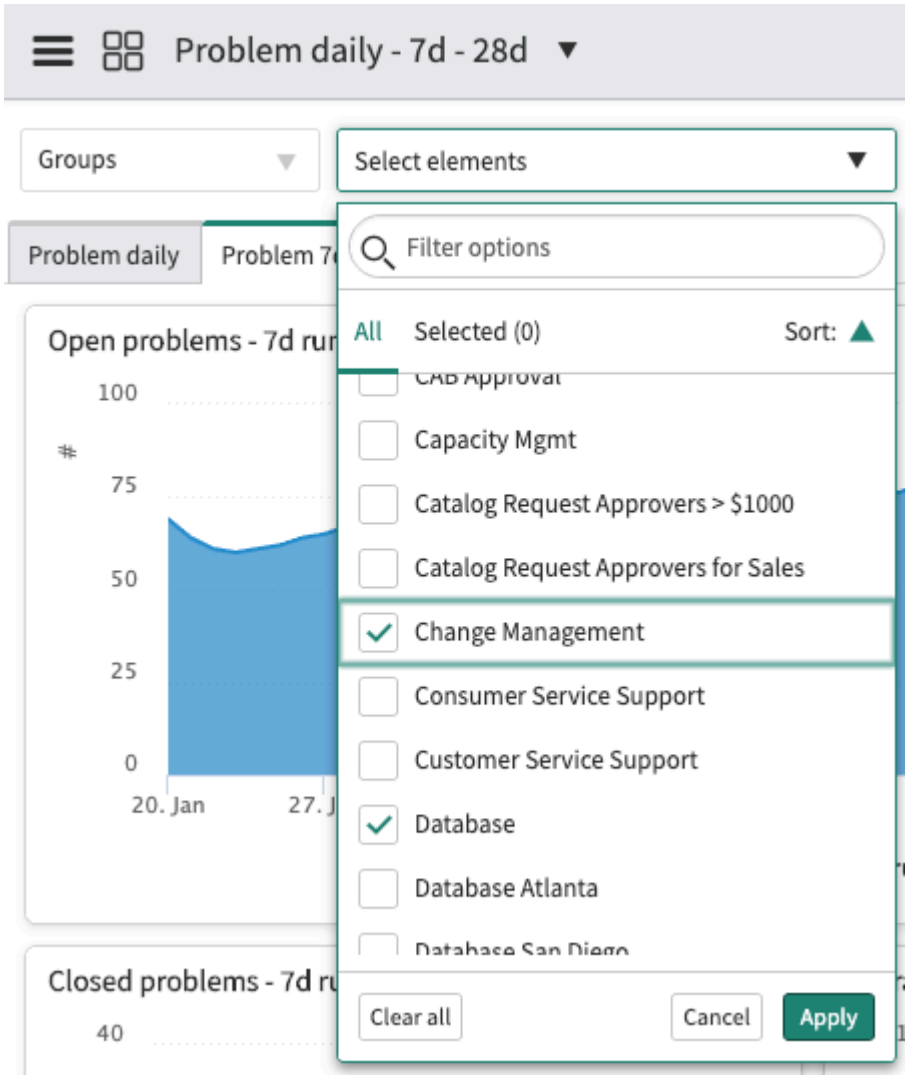


## Open Problem Age Monitor dashboard

Use this dashboard to track the progress of open problems across different age buckets. You can break down the problems by priority or assignment group.

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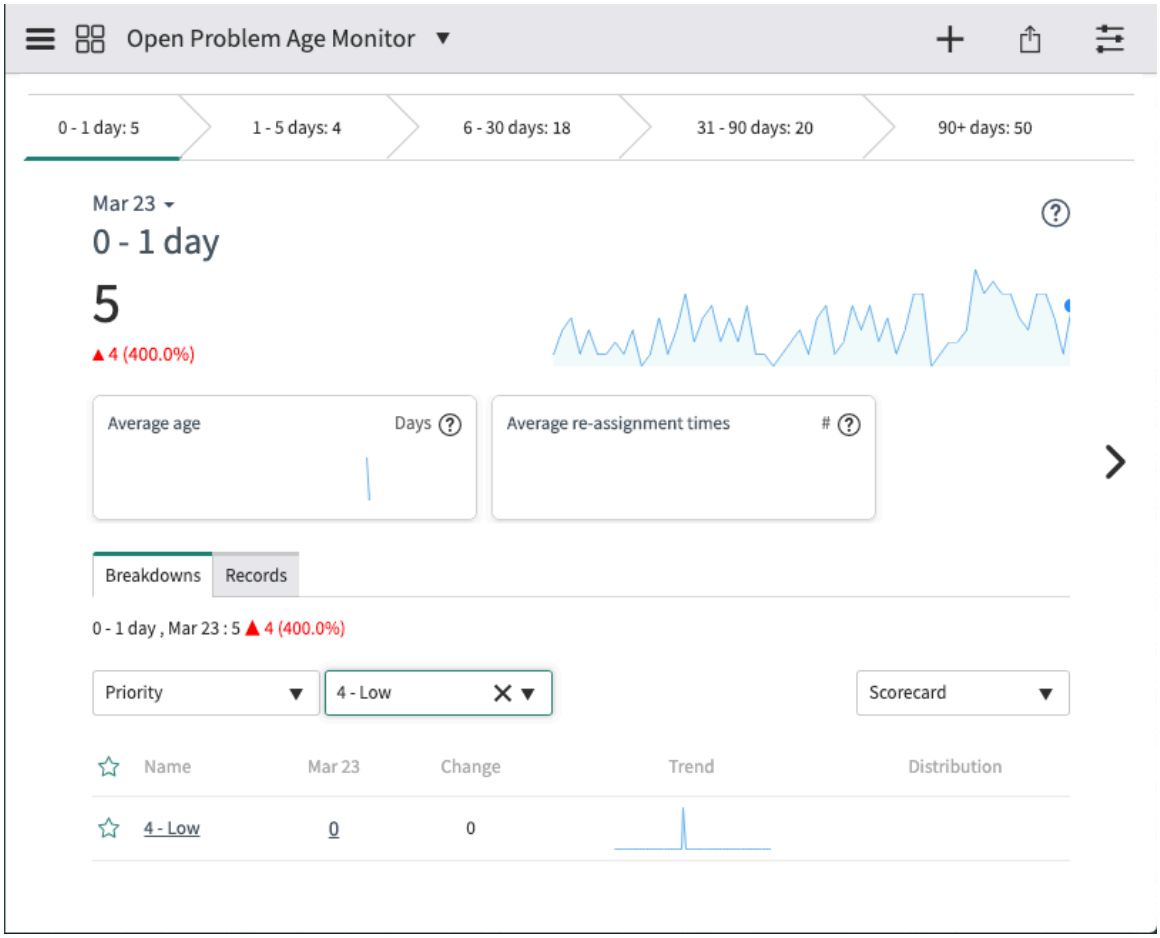


## End user and roles

| End user and goal | Required role |
|---|---|
| Problem manager - Track how their groups are managing long-standing problems | itil to read records, otherwise none |
| Problem agent - Track long-standing problems that they own | itil to read records, otherwise none |

## Indicators

**Number of open problems**

Problems on the Problem [problem] table created on or before today and with no Closed date. This indicator is used in several other indicators on the dashboard.

**Average age of open problems**

The score for this indicator is calculated according to the formula [[Summed age of open problems]] / [[Number of open problems]] / 24

**Average re-assignment of open problems**

The average number of times an open problem gets reassigned. The score for this indicator is calculated according to the formula [[Summed re-assignment of open problems]] / [[Number of open problems]].

**Average age of updated since of open problems**

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The average time in days since the last update of an open problem. The score for this indicator is calculated according to the formula [[Summed age of updated since of open problems]] / [[Number of open problems]] / 24.

The following indicators are not shown directly on the dashboard but are used in calculating formulas:

- Summed age of open problems
- Summed re-assignment of open problems
- Summed age of updated since of open problems

### Breakdowns

- Priority
- State
- Assignment Group

## Reference section for Problem Management

Reference topics provides field descriptions of various forms.

### Problem form

Description of the field values for the problem form.

**Problem form**

| Name | Definition |
|---|---|
| Number | Read-only field. Unique number to identify the problem. |
| First reported by | Task that first identified this Problem. |
| Category | Group to which the problem belongs to such as software, hardware. After selecting the category, select the subcategory, if applicable. |
| Service | Business service that the problem applies to.<br><br>If you select a business service as the configuration item and that business service is also listed as the configuration item in any other active task, the active tasks icon (  ) appears. Click the icon to view the list of all the other active tasks that are affecting the business service.<br><br>You can view the BSM map (dependency view) of the selected business service by clicking the dependency icon  . |
| Service Offering | Consists of one or more service commitments that uniquely define the level of service in terms of availability, scope, pricing, and packaging options. Service offering |

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**Problem form (continued)**

| Name | Definition |
|---|---|
| | enables you to receive different features and their levels of performance for a given service. |
| Configuration item | Configuration item (CI) that the problem applies to. The CI class of the selected configuration item identifies the type of problem, for example, hardware, network, or database. |
| State | For existing customers, the available states are: **Open**, **Pending Change**, **Known Error**, and **Closed** or **Resolved**.<br><br>For new customers from Madrid, the state management process is applied. This state field is a read-only field. The field value changes as the problem proceeds from one state to another state. The states available are: **New**, **Assess**, **Root Cause Analysis**, **Fix in Progress**, **Resolved**, and **Closed**. |
| Resolution code | Indicates whether the problem is resolved, a fix is applied, a duplicate is available, or the problem coordinator accepts the risk.<br><br>**Note:**<br>This field appears only for new customers from Madrid or a later release as it is part of the state management process. |
| Duplicate of | When **Resolution code** is **Duplicate**, the **Duplicate of** field is the reference to the Problem from which the current Problem is duplicated. |
| Impact | Effect that the problem has on business. Select the appropriate impact level (**High**, **Medium**, or **Low**). |
| Urgency | Extent to which the problem resolution can bear delay. Select the appropriate urgency level (**High**, **Medium**, or**Low**). |
| Priority | How quickly the service desk should address the problem (**Critical**, **High**, **Moderate**, **Low**, or **Planning**). The **Priority** field is read-only and is set according to the **Impact** and **Urgency** values entered. |
| Assignment group | The group who will work on the problem.<br><br>The business rule *`Populate Assignment Group based on CI/SO`* populates the **Assignment group** field based on the support group available for the configuration item (CI) or the Service offering consecutively.<br><br>**Note:**<br>The business rule is triggered when an incident is created or updated and when the **Assignment group** and the **Assigned to** field is empty. |

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**Problem form (continued)**

| Name | Definition |
|---|---|
| | If you want to override the default value, you need to create new properties and provide the field in the property value that must be used to populate the **Assignment group** field. Create the properties in the following order of preference:<br>• *com.snc.problem.ci_assignment_group.field_name*: identifies which CI field populates the **Assignment group** field.<br>• *com.snc.problem.service_offering_assignment_group*: identifies which service offering field populates the **Assignment group** field.<br><br>If the **Assignment group** field is blank, the incident is automatically assigned to a group. |
| Assigned to | Specific problem coordinator that the problem is assigned to. If an assignment rule applies, the problem is automatically assigned to the appropriate user or group. |
| Problem Statement | Description of the problem that the problem-solving team addressing. When you update the problem statement and move to another field, the **Related Search** field displays knowledge articles. If you configure the problem properties, then the **Related Search** field displays other related information related to the problem statement. |
| Description | Detailed description of the problem. |
| Related Search | Result of a search.<br><br>**Note:**<br>If you want to search and link a known error article or knowledge article to the Problem, click **Attach**. |
| Notes | |
| Work notes list | Users who receive notification when work notes are added to the problem. |
| Work notes | Inscription about the work that you perform on the Problem. |
| Analysis Information | |
| Workaround | Method that you have used to overcome the Problem. Providing a workaround if useful for fast Incident resolution. It can be a way of dealing with a problem or making something work despite the problem not being resolved.<br><br>If a workaround is available, the problem coordinator can click the Communicate Workaround action to notify the related Incidents. |
| Cause notes | Inscription on what had caused the problem. |

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**Problem form (continued)**

| Name | Definition |
|---|---|
| Resolution Information | |
| Resolved by | Read-only field. Name of the user who resolved the issue.<br>**Note:** This field appears only for new customers from Madrid or a later release as it is part of the state management process. |
| Resolved | Read-only field. The date and time when the Problem is resolved.<br>**Note:** This field appears only for new customers from Madrid or a later release as it is part of the state management process. |
| Fix notes | Inscription on how you have fixed the problem. If a fix is available, the problem coordinator can click the Communicate Fix action to notify the related Incidents. |
| Other Information | |
| Opened by | Read-only field. Name of the user who opened the problem. |
| Opened | Read-only field. The date and time when the user opened the Problem. |
| Confirmed by | Read-only field. Name of the user who confirms that the problem is valid and needs a resolution.<br>**Note:** This field appears only for new customers from Madrid or a later release as it is part of the state management process. |
| Confirmed | Read-only field. The date and time when the user confirms that the Problem is valid and needs a resolution.<br>**Note:** This field appears only for new customers from Madrid or a later release as it is part of the state management process. |
| Fix by | Read-only field. Name of the user who started the fix. |
| Fix | Read-only field. The date and time when the user started the fix. |

## Problem Task form

Description of the field values for the problem task form.

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### Problem task form

| Field | Description |
|---|---|
| Number | Read-only. Unique number to identify the task. |
| Type | Read-only state. Determines whether the problem task is created specifically to investigate the cause of the problem or is a general task.<br>**Note:** This field appears only for new customers from Madrid or a later release as it is part of the state management process. |
| Configuration item | Configuration item (CI) that the problem applies to. The CI class of the selected configuration item identifies the type of problem, for example, hardware, network, or database. |
| Due date | Date within which the problem task should be completed. |
| Source problem | Unique number of the problem for which the problem task is created. |
| State | For existing customers, the available states are: **Pending**, **Open**, **Work in Progress**, **Closed Complete**, **Closed Incomplete**, and **Closed Skipped**.<br>For new customers from Madrid, the state management process is applied. This state field is a read-only field. The states available are: **New**, **Assess**, **Work in Progress**, and **Closed**. |
| Close code | Read-only field indicating whether the problem task was completed or canceled.<br>**Note:** This field appears only for new customers from Madrid or a later release as it is part of the state management process. |
| Priority | How quickly the service desk should address the problem task (Critical, High, Moderate, Low, or Planning). |
| Assignment group | Specific group to whom the problem task is assigned to. |
| Assigned to | Specific problem analyst to whom the task is assigned to. |

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**Problem task form (continued)**

| Field | Description |
|---|---|
| Short description | Brief description of the problem task.<br>When you update the short description, and move to another field, the **Related Search** field displays knowledge articles. If you configure the problem properties, then the **Related Search** field displays other related information related to the short description. |
| Description | Detailed description of the problem task. |
| Related Search | Result of a search.<br>**Note:** If you want to search and link a knowledge article to the Problem task, click **Attach**. |
| Notes | |
| Work notes list | Users who receive notification when work notes are added to the problem task. |
| Work notes | Inscription about the work that you perform on the problem task. |
| Analysis Information | |
| Cause code | Cause of the Problem such as Environmental disaster, Hardware issue, People/Process/ Documentation. |
| Workaround (Root Cause Analysis only) | Method that you have used to overcome the Problem. It can be a way of dealing with a problem or making something work despite the problem not being resolved. |
| Closure Information | |
| Completed by | Read-only field. Name of the user who completed the task. |
| Completed | The reason why this problem task has been canceled. |
| Proposed fix notes (Root Cause Analysis only) | Inscription on how you have fixed the problem task. |
| Close notes (General task only) | Inscription on the work you have completed. |

## Legacy Problem form

Description of the field values for the legacy problem form.

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### Problem form fields

| Name | Definition |
|---|---|
| Business service | Business service that the problem applies to.<br><br>If you select a business service as the configuration item and that business service is also listed as the configuration item in any other active task, the active tasks icon (  ) appears. Click the icon to view the list of all the other active tasks that are affecting the business service.<br><br>You can view the BSM map (dependency view) of the selected business service by clicking the dependency icon  . |
| Configuration item | Configuration item (CI) that the problem applies to. The CI class of the selected configuration item identifies the type of problem, for example, hardware, network, or database. |
| Change request | Change request associated with the problem. |
| Major problem | Check box to prioritize a problem and highlight that it needs a review. |
| Knowledge | Check box to automatically submit a knowledge article when a problem is closed. |
| State | State of the problem:<br>• **Open**: Open and unassigned.<br>• **Pending Change**: Waiting for the corresponding change request to be closed.<br>• **Known Error**: This problem is not going to be fixed and there is a workaround. Users with the itil role have access to the **Known Errors** module.<br>• **Closed/Resolved**: The problem is fixed and closed. |
| Impact | Effect that the problem has on business. Select the appropriate impact level (**High**, **Medium**, or **Low**). |
| Urgency | Extent to which the problem resolution can bear delay. Select the appropriate urgency level (**High**, **Medium**, or**Low**). |
| Priority | How quickly the service desk should address the problem (**Critical**, **High**, **Moderate**, **Low**, or **Planning**). The **Priority** field is read-only and is set according to the **Impact** and **Urgency** values entered. |
| Assignment group | The group who will work on the incident.<br><br>The business rule *`Populate Assignment Group based on CI/SO`* populates the **Assignment group** field based on the support group available |

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**Problem form fields (continued)**

| Name | Definition |
|---|---|
| | for the configuration item (CI) or the Service offering consecutively.<br><br>**Note:** The business rule is triggered when an incident is created or updated and when the **Assignment group** and the **Assigned to** field is empty.<br><br>If you want to override the default value, you need to create new properties and provide the field in the property value that must be used to populate the **Assignment group** field. Create the properties in the following order of preference:<br>• *com.snc.problem.ci_assignment_group.field_name*: identifies which CI field populates the **Assignment group** field.<br>• *com.snc.problem.service_offering_assignment_group*: identifies which service offering field populates the **Assignment group** field.<br><br>**Note:** The sys_user_group *read* ACL calls the *SNCRoleUtil* function. The function verifies whether the group that is reviewed contains either the admin role or security_admin role. The function allows the user to view the group only if the user has the same role. As a result, a user with the itil role cannot assign an incident to a group that has the admin role or security_admin role nor to any group whose parent has those role. |
| Assigned to | Specific user that the problem is assigned to. If an assignment rule applies, the problem is automatically assigned to the appropriate user or group. |
| Parent | The parent task for this problem. |
| Short description | Summary of the problem. |
| Description | Detailed description of the problem. |
| Work notes list | Users who receive notification when work notes are added to the problem. Click the **Add me** icon to add yourself to the work notes list for problems you are interested in monitoring. |

## Known error article form

Description of the field values for the legacy problem form.

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### Known Error article form

| Field | Description |
|---|---|
| Number | Read-only field. Unique number to identify the known error article. |
| Knowledge base | Knowledge base (defaults to Known Error) in which the article is stored for future reference. The article is saved in the Known Error article [kb_template_known_error_article] table. |
| Category | Read-only field. The value of this field is reference from the Category field of the Problem. |
| Valid to | Date after which the known error article is deleted from the database. After this date, the article does not appear in the search result. |
| Version | Read-only field. Managed by the Knowledge Management process when changes are made to a published article. |
| Workflow | Read-only field. |
| Source Task | Read-only field. The Problem record on which you are creating the article. |
| Attachment link | Select the check box so that the article appears as an attachment in the Problem record. If you do not select the check box, the content of the article appears in the work note of the Problem. |
| Display attachments | Select the check box so that all attachments to the article appear when you view the article. The field is relevant only when the Attachment link field is not selected. |
| Short description | Brief description of the Known Error. |
| Description | Detailed explanation of the Known Error. |
| Workaround | Method that you have used to overcome the Problem. It can be a way of dealing with a problem or making something work despite the problem not being resolved. |
| Cause | Information on what had caused the problem. |

## Data lookup for prioritizing problems

To follow ITIL guidelines, problem records are prioritized by the impact and urgency of the problem.

Problem prioritization is available on new instances.

On the problem form, users select values from the **Impact** and **Urgency** fields that determine which priority value is generated for the problem.

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### ITIL problem order

| Field | Definition |
|---|---|
| Impact | Impact is a measure of the effect of an incident, problem, or change on business processes. |
| Urgency | Urgency is a measure of how long the resolution can be delayed until an incident, problem, or change has a significant business impact. |
| Priority | Priority is based on impact and urgency, and it identifies how quickly the service desk should address the task. |

Priority is calculated according to the following data lookup rules:

### Priority Data lookup rules

| Impact | Urgency | Priority |
|---|---|---|
| 1 - High | 1 - High | 1 - Critical |
| 1 - High | 2 - Medium | 2 - High |
| 1 - High | 3 - Low | 3 - Moderate |
| 2 - Medium | 1 - High | 2 - High |
| 2 - Medium | 2 - Medium | 3 - Moderate |
| 2 - Medium | 3 - Low | 4 - Low |
| 3 - Low | 1 - High | 3 - Moderate |
| 3 - Low | 2 - Medium | 4 - Low |
| 3 - Low | 3 - Low | 5 - Planning |

By default, the **Priority** field is read-only and must be set by selecting the **Impact** and **Urgency** values. To change how the priority is calculated, you can either alter the priority lookup rules or disable the **Priority is managed by Data Lookup - set as read-only** UI policy and create their own business logic.

In the Problem Priority Data Lookup [dl_problem_priority] table, you can modify the data lookup rules for the task priority.

## Work notes for problem priorities

When you initially create and save a problem, the **Work notes** field is not mandatory. If you change the priority of the problem by selecting different **Impact** or **Urgency** values on a problem form that was saved, the **Work notes** field becomes mandatory.

**Note:**
This feature is available only in new instances starting with Jakarta or a later release. The Problem Management Best Practice – Jakarta plugin (com.snc.best_practice.problem.jakarta) plugin must be activate.

## Problem management properties

Problem Management properties are used to control features such as creating problem task on a closed problem and reanalyzing a closed or a canceled problem.

These properties are available at **Problem** > **Administration** > **Problem Properties**.

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### Properties for Problem Management

| Property | Description |
|---|---|
| Problem State Transition Properties | |
| Accept Risk moves the Problem to Closed state instead of Resolved state<br><br>problem.acceptrisk.move_to_closed | • Type: true or false<br>• Default value: true |
| Can create a Problem Task on a Closed Problem?<br><br>problem.closed.can_create_tasks | • Type: true or false<br>• Value: true or false<br>• Default value: false |
| Who can Re-analyze a Canceled Problem?<br><br>problem.closed.role.reanalyze_from_canceled | • Type: choice list<br>• Default value: problem_manager |
| Who can Re-analyze a Risk Accepted (Closed state) Problem?<br><br>problem.closed.role.reanalyze_from_closed_riskaccepted | • Type: choice list<br>• Default value: problem_manager |
| Who can Re-analyze a Completed Problem?<br><br>problem.closed.role.reanalyze_from_completed | • Type: choice list<br>• Default value: problem_manager |
| Problem Task State Transition Properties | |
| Cancel open Problem Tasks when closing a Problem<br><br>problem.closed.cancel_open_tasks | • Type: true or false<br>• Value: true or false<br>• Default value: true |
| Who can Re-assess a Completed or Canceled Problem Task?<br><br>problem_task.closed.role.reaassess_from_closed | • Type: choice list<br>• Default value: problem_coordinator |
| Can Re-Assess a Problem Task on a Closed Problem?<br><br>problem_task.closed.can_reassess_on_closed_problem | • Type: true or false<br>• Default value<br>  ○ Upgrade: true<br>  ○ New instances: false |
| Problem Related List Properties | |

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**Properties for Problem Management (continued)**

| Property | Description |
|---|---|
| List of related task records (comma-separated) to track as fixes for this Problem. Used to notify the Coordinator when all the related fix records are Completed or Canceled. E.g. change_request.parent<br><br>problem.fix.records | • Type: string<br>• Default value: change_request.parent, rm_defect.parent, rm_release.parent, rm_enhancement.parent, sn_cim_register.source_id |
| List of related task records (comma-separated) to move over when a problem is marked as a duplicate of another. E.g. incident.problem_id<br><br>problem.duplicate.records_to_move | • Type: string<br>• Default value: incident.problem_id, sn_customerservice_case.problem, problem_task.problem |
| Who can relate closed Incidents to a Problem?<br><br>problem.role.relate_closed_incidents | • Type: choice<br>• Default value:<br>  ○ Upgrade: Nobody<br>  ○ New instances: Problem coordinators |
| Problem Created from Incident Properties | |
| List of attributes (comma-separated) that will be copied from the incident to create a new problem<br><br>com.snc.problem.create_from_incident.attributes | • Type: string<br>• Default value: number, description, short_description, cmdb_ci, impact, urgency, priority, company, sys_domain, business_service, category, subcategory |
| Problem Created from Interaction Properties | |
| Create saved problem<br><br>com.snc.problem.create_from_interaction.save | • Type: Boolean<br>• Default value:<br>  ○ Upgrade customers: No<br>  ○ New customers: Yes |
| Allow problem creation from interaction<br><br>glide.problem.interaction.allow_create | • Type: true or false<br>• Value: true or false<br>• Default value: false |

## Quick start tests for Problem Management

Validate that Problem Management still works after you make any configuration change such as apply an upgrade or develop an application. Copy and customize these quick start tests to pass when using your instance-specific data.

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Problem Management quick start tests require activating the Problem Management Best Practice — Madrid plugin (com.snc.best_practice.problem.madrid) and the Problem Management — ATF Tests plugin (com.snc.problem.atf). For all state related test, the Problem Management State Model (com.snc.best_practice.problem.madrid.state_model) plugin needs to be active.

### PRB MGMT: Problem Management test suite

| Test | Description | Release version |
|---|---|---|
| PRB MGMT: Cancel a Problem when the state of the Problem is Assess | Verify that when a Problem in the **Assess** state is canceled, the state of the Problem changes to **Closed** with **Resolution code** as **Canceled**. | Madrid |
| PRB MGMT: Cancel a Problem when the state of the Problem is Root Cause Analysis | Verify that when a Problem is in the **Root Cause Analysis** state and is canceled, the state of the Problem changes to **Closed** with **Resolution code** as **Canceled**. | Madrid |
| PRB MGMT: Mark a Problem as Duplicate when the state of the Problem is Assess | Verify that when a Problem is in the **Assess** state and is marked as duplicate, the state of the Problem changes to **Closed** with **Resolution code** as **Duplicate**. | Madrid |
| PRB MGMT: Mark a Problem as Duplicate when the state of the Problem is Root Cause analysis | Verify that when a Problem is in the **Root Cause Analysis** state and is marked as duplicate, the state of the Problem changes to **Closed** with **Resolution code** as **Duplicate**. | Madrid |
| PRB MGMT: Accept Risk of Problem (problem.acceptrisk.move_to_closed is false, Fix in Progress) | Verify that when a Problem state is **Fix in Progress** and the risk is accepted, then the Problem state changes to **Resolved** with **Resolution code** as **Risk Accepted**.<br>**Note:** The test is valid when Problem property **Accept Risk moves the Problem to Closed state instead of Resolved state** *(problem.acceptrisk.move_to_closed)* is false. | Madrid |
| PRB MGMT: Accept Risk of Problem (problem.acceptrisk.move_to_closed is true, Fix in Progress) | Verify that when a Problem state is **Fix in Progress** and the risk is accepted, then the Problem state changes to | Madrid |

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**PRB MGMT: Problem Management test suite (continued)**

| Test | Description | Release version |
|---|---|---|
| | **Closed** with **Resolution code** as **Risk Accepted**.<br><br>**Note:**<br>The test is valid when Problem property **Accept Risk moves the Problem to Closed state instead of Resolved state** *(problem.acceptrisk.move_to_closed)* is true. | |
| PRB MGMT: Accept Risk of Problem (problem.acceptrisk.move_to_closed=false, state Root Cause Analysis) | Verify that when a Problem state is **Root Cause Analysis** and the risk is accepted, then the Problem state changes to **Resolved** with **Resolution code** as **Risk Accepted**.<br><br>**Note:**<br>The test is valid when Problem property **Accept Risk moves the Problem to Closed state instead of Resolved state** *(problem.acceptrisk.move_to_closed)* is false. | Madrid |
| PRB MGMT: Accept Risk of Problem(problem.acceptrisk.move_to_closed=true, state Root Cause Analysis) | Verify that when a Problem state is **Root Cause Analysis** and the risk is accepted, then the Problem state changes to **Closed** with **Resolution code** as **Risk Accepted**.<br><br>**Note:**<br>The test is valid when Problem property **Accept Risk moves the Problem to Closed state instead of Resolved state** *(problem.acceptrisk.move_to_closed)* is true. | Madrid |
| PRB MGMT: Reanalyze Problem which is closed-Risk Accepted from state Root Cause Analysis | Verify that when a Problem is reanalyzed after it is **Closed** with the **Resolution code** as **Risk Accepted**, Problem state changes to **Root Cause Analysis**. | Madrid |

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### PRB MGMT: Problem Management test suite (continued)

| Test | Description | Release version |
|---|---|---|
| PRB MGMT: Create Emergency Change from Problem | Verify the creation of Emergency Change from a Problem. | Madrid |
| PRB MGMT: Create Normal Change from Problem | Verify the creation of Normal Change from a Problem. | Madrid |
| PRB MGMT: Problem State Management | Verify problem state management. | Madrid |
| PRB MGMT: Reanalyze a Problem from Complete | Verify that when a Problem is reanalyzed after it is **Closed** with the **Resolution code** as **Fix Applied**, Problem state changes to **Root Cause Analysis**. | Madrid |
| PRB MGMT: Reanalyze a Problem which is canceled from state Assess | Verify that when a Problem is reanalyzed after it is **Closed** with the **Resolution code** as **Canceled**, Problem state changes to **Root Cause Analysis**. | Madrid |
| PRB MGMT: Reanalyze a Problem which is canceled from state Root Cause Analysis | Verify that when a Problem is reanalyzed after it is **Closed** with the **Resolution code** as **Canceled**, Problem state changes to **Root Cause Analysis**. | Madrid |
| PRB MGMT: Reanalyze Problem which is closed-Risk Accepted from state Fix in progress | Verify that when a Problem is reanalyzed after it is **Closed** with the **Resolution code** as **Risk Accepted**, Problem state changes to **Root Cause Analysis**. | Madrid |
| PRB MGMT: Create a Known Error article from Problem | Verify creation of Known Error article from a Problem. | Madrid |
| PRB MGMT: Risk Accept reason on Incident | Verify the **Risk Accepted reason** is copied to the Incidents which are awaiting resolution of a Problem. | Madrid |
| PRB MGMT: Communicate Fix | Verify the communicate fix functionality. | Madrid |
| PRB MGMT: Communicate Workaround | Verify the communicate workaround functionality. | Madrid |
| PRB MGMT: Fix information on Incident | Verify that when a Problem is resolved, the state of the Incidents that are awaiting resolution of the Problem changes to **Resolved**. The | Madrid |

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**PRB MGMT: Problem Management test suite (continued)**

| Test | Description | Release version |
|---|---|---|
| | fix notes of the Problem are copied to the Incidents. | |
| PRB MGMT: Problem task (Type:General) state management | Verify Problem task state management of a general type Problem. | Madrid |

**Related topics**

Quick start tests

## Domain separation and problem management

Domain separation is supported in Problem Management. Domain separation enables you to separate data, processes, and administrative tasks into logical groupings called domains. You can control several aspects of this separation, including which users can see and access data.

## Support level: Standard

- Includes all aspects of **Basic** level support.
- Application properties are domain-aware as needed.
- Business logic: The service provider (SP) creates or modifies processes per customer. The use cases reflect proper use of the application by multiple SP customers in a single instance.
- The instance owner must configure the minimum viable product (MVP) business logic and data parameters per tenant as expected for the specific application.

Sample use case: An admin must be able to make comments required when a record closes for one tenant, but not for another.

For more information on support levels, see Application support for domain separation.

## Domain separation in Problem Management - Overview

- Problem Management is about eliminating the root cause of a service interruption.
- The problem and problem task tables support domain separation. Therefore a Problem user sees only problems or problem tasks that have been created within the (tenant) domain that they belong to.
- Only Problem users can create and access Problems and problem tasks.
- Problem and problem task tables both support domain separation. Therefore, a Problem user sees only problems and problem tasks that have been created within the (tenant) domain that they belong to.

## How domain separation works in Problem Management

Problem users see only problems and problem tasks that have been created within the (tenant) domain that they belong to.

Problem users can use Problems and problem tasks within the tenant domains. Problem users can create and update problems and problem tasks of their domain, any child domains, and the global domain.

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## Known Issues

Task-Outage Relationship `[cmdb_ci_outage]` is not domain separated.

If installed, the Task-Outage Relationship table is not domain separated. Therefore Fulfillers or Problem users can view any Task-Outage Relationship records regardless of the domain that the records belong to.

The Task-Outage Relationship table is installed when administrator activates the optional Task-Outage Relationship plugin.

**Related topics**

Domain separation for service providers

## Data for problem resolution

The quick resolution of problems requires gathering as much information as possible about the problem.

In addition to the information within the problem ticket, useful information is often found in other tables.

## Pertinent related records

Common related records include changes (through the **Change request** related list) and incidents in the **Incidents** related list. All the directly related records are accessible through related lists. If the appropriate related list does not appear on the form, the administrator can configure the form to add it.

## Known errors and knowledge articles

Information about already-known issues can be found in two places: the **Known Errors** module in the Problem Management application, or in the Knowledge application. The **Known Errors** module filters the problem table to present all the problems whose cause has been identified but cannot be fixed. The knowledge base can have information that was gathered from incidents, and may also have useful workarounds for problems.

## Dependency Views map

The Dependency Views map provides a visual representation of the configuration items and their relationships and displays information about related issues.

For example, the following image is a map for the CI **nyc rac na200**, which is a mass storage device.

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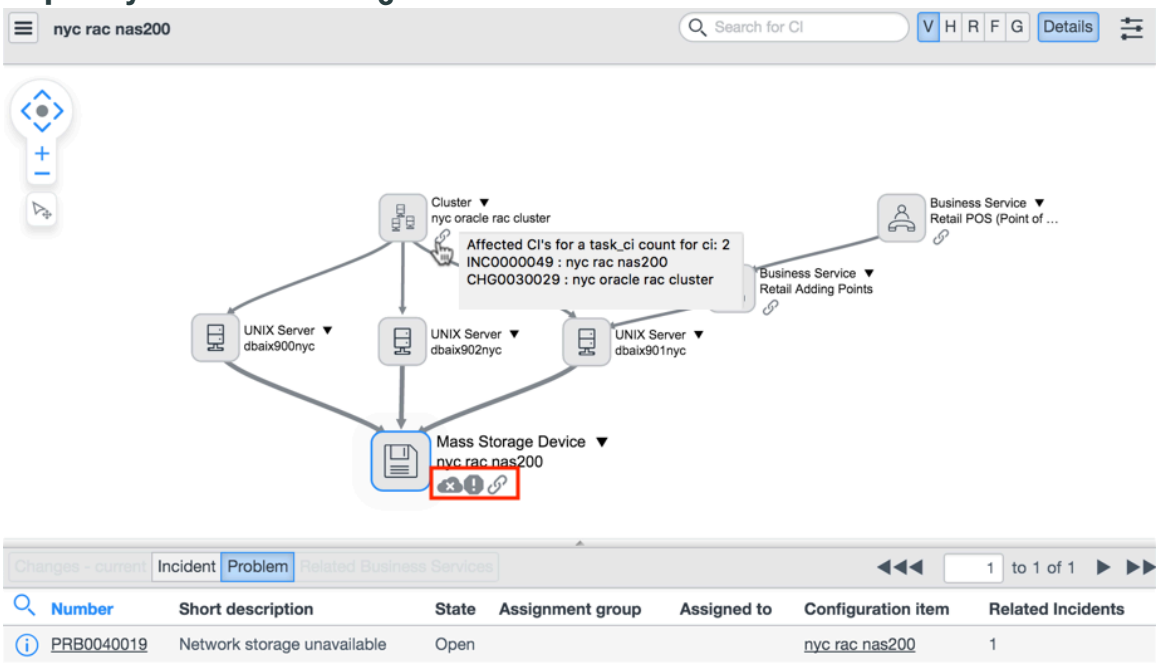
**Map for nyc rac nas200 storage device**




The icons beside CIs indicate the following information. You can view information for the selected CI by clicking **Details** in the form header, or by pointing to the icon and viewing a pop-up box.

- The cloud **x** icon indicates that the CI has an associated problem, which is listed in the **Problem** details pane.
- The **(!)** icon indicates that there is a related incident.
- The link icon indicates that there are associated tasks, which can be incidents, problems, or changes. If you select the CI, the Details pane displays the associated records.

To open the incident or problem record, click the number in the Details pane.

The map shows the upstream and downstream relationships of the CI. The storage device problem might be an improper change to one of the UNIX servers.

## CMDB baseline history

If a baseline is generated, planned or unplanned changes are tracked within the system. A common cause of problems is improperly executed changes, and reviewing the history of changes to a CI helps track problems caused by improper changes.

To check the CMDB Baseline, view the CI record and check **Baseline Differences** and **Scheduled Changes**. The administrator can use the form designer to add these formatters.

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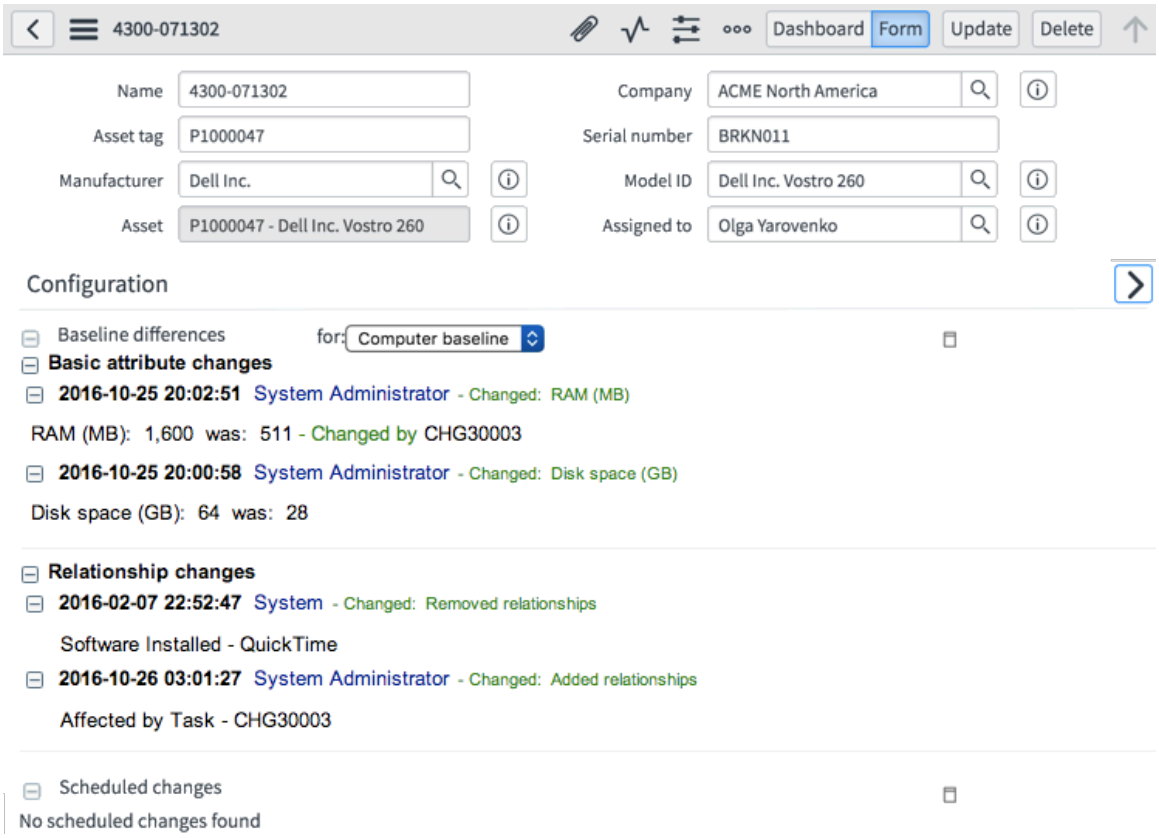
**Problem baseline**




In the example above, the change in RAM is associated with a change request. You can review the change and see what was planned and what was implemented. The removal of QuickTime software was recorded as an unplanned change.

## Synchronization between incident and problem records

Change in a Problem record impacts related Incident records. Notification is sent to the user for each such update.

When you activate the Problem Management Best Practice — Madrid (com.snc.best_practice.problem.madrid) and the Problem Management Best Practice — Madrid — State Model (com.snc.best_practice.problem.madrid.state_model) plugin, the changes in a Problem record impact incidents that are associated to that Problem.

### Impact on incident records

| Plugin | Incident state | Problem state | Action on Problem | Action on Incident |
|---|---|---|---|---|
| Problem Management Best Practice — Madrid plugin `com.snc.best_practice.problem.madrid` | Any incident state other than resolved, closed, or canceled. | Any | Click the **Communicate workaround** related link | • The workaround is copied to the **Work notes** field. A notification is sent to the users listed in the **Assigned to** and **Work notes list** fields. The |

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### Impact on incident records (continued)

| Plugin | Incident state | Problem state | Action on Problem | Action on Incident |
|---|---|---|---|---|
| | | | | notification is sent only when the incident state is New, On Hold, or In Progress.<br>• The workaround is copied to the **Additional Comments** field. If **Known error** is selected from the **Resolution code** field of the incident, then a notification is sent to the caller and to the users listed in the **Assigned to** and **Watch list** fields. |
| Problem Management Best Practice — Madrid plugin<br>`com.snc.best_practice.problem.madrid` | Any incident state other than resolved, closed, or canceled. | Any | Click the **Communicate Fix** related link | • The fix is copied to the **Work Notes** field of the incident record.<br>• A notification is sent to the users listed in the **Assigned to** and **Work notes** list fields of the incident record. |
| Problem Management Best Practice — Madrid — State Model plugin<br>`com.snc.best_practice.problem.` | **On Hold** and **On hold reason** is **Awaiting Problem** | Problem state is **Closed** or **Resolved** and the problem **Resolution code** is **Fix Applied** | NA | • The **Resolution notes** on the incident form displays the message `Related problem INCxxxx` |

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### Impact on incident records (continued)

| Plugin | Incident state | Problem state | Action on Problem | Action on Incident |
|---|---|---|---|---|
| `madrid.state_model` | | | | `closed. Please see additional comments for fix notes`, where INCxxxx is the incident number from which the problem was created.<br>• The incident state is changed to **Resolved**.<br>• The **Resolution code** is changed to **Resolved by problem**.<br>• An email notification is sent to the caller and the user who is assigned to the Incident. |
| Problem Management Best Practice — Madrid — State Model plugin<br>`com.snc.best_practice.problem.madrid.state_model` | **On Hold** and **On hold reason** is **Awaiting Problem** | Problem state is **Closed** or **Resolved** and the problem **Resolution code** is **Risk Accepted** | NA | • The information from the **Risk accepted reason** field on the Problem form is copied to the **Work notes** field on the Incident form.<br>• An email notification is sent to the user who is assigned to the Incident. |

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### Working with contextual search

Contextual search display results on forms and record producers based on the text that you provide in a field.

**Note:**
Contextual Search is available for problems in instances starting with the Madrid release. Existing users can request to activate the Problem Management Best Practice — Madrid plugin (com.snc.best_practice.problem.madrid).

You can:

- Find articles using the **Related Search** field. The articles can be based on any category that you select from the choice list.
- Use the choice list next to the **Related Search** field to select the category such as **Knowledge (All)**, **Pinned Articles**, **Incidents**, **Open Problems**, and **Resolved Problems**.
- Attach the article in the **Notes** > **Work notes** if your search result displays knowledge articles.

#### Related topics

Contextual search overview

# Release Management

The ServiceNow® Release Management v2 application encompasses the planning, design, build, configuration, and testing of hardware and software releases to create a defined set of release components.

The Release Management v2 application handles releases using the task record system. Each planned feature is generated through various means as a task record, populated with the pertinent information in individual fields. These tasks can be assigned to appropriate release management team members, who deal with the tasks as appropriate until the release has been properly deployed.

Release Management can be effectively used to coordinate releases as a vehicle for planning releases, composed of individual work items such as, projects, epics, stories, and problems. After the release scope (projects, stories, and so on) is finalized, you can generate Change Items and associate them to the release, allowing the implementation and deployment of a release to be handled within the change management process.

## Activate Release Management

Activate the Release Management plugin (com.snc.release_management_v2) with the admin role.

### Before you begin

Role required: admin

### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.

3. Select **Install** to start the installation process.

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**Note:**
When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

## Components installed with Release Management

Several types of components are installed with activation of the Release Management v2 plugin, including tables and user roles.

Demo data is available for this feature.

## Roles installed

| Role title [name] | Description | Contains roles |
|---|---|---|
| Release admin<br>[release_v2_admin] | Can access the entire application | release_v2_user |
| Release user<br>[release_v2_user] | Can access the all the various feature and task-related modules but cannot update any content. | None |

## Tables installed

The Release Management v2 application contains with a flexible product, release, phase, release work items, and task hierarchical table layout to allow for releases of varying complexity.

| Table | Description |
|---|---|
| Product<br>[rm_product] | Represent whole products whose releases are being managed.<br>It is optional to use the Product construct. A generic release can also be defined without any specific product. |
| Release<br>[rm_release] | Represent individual releases of the product. |
| Release Phase<br>[rm_release_phase] | Represent the different stages of work required to complete a release. |
| Release Tasks<br>[rm_task] | Represent tasks under a phase for phase activities. |
| Release Items | Represents work items and change records associated to the release. |

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| Table | Description |
| --- | --- |
| [rm_m2m_release_task] | |

## Business stakeholder role for Release Management

Use the business stakeholder role to read and retrieve data from any table of the Release Management application to generate reports.

When you activate the Business Stakeholder plugin (com.snc.business_stakeholder) in your ServiceNow instance, the Read only roles for Release Management plugin (com.snc.release_management_read_roles) is also activated. This plugin provides a business stakeholder role (sn_release_read) with which you can access all the tables of the Release Management application. You can assign this role to any user in your organization who is a business stakeholder.

### Plugin availability

If you are a new customer, the Read only roles for Release Management plugin (com.snc.release_management_read_roles) is activated on zBoot. However, the business stakeholder role (sn_release_read) is available only when you activate the Release Management plugin (com.snc.release_management_read_roles).

If you are an upgrade customer, you must manually activate the read-only roles for Release Management plugin and the Release Management plugin (com.snc.release_management_v2).

### Release Management tables accessible by users with the business stakeholder role

When the Read only roles for Release Management plugin (com.snc.release_management_v2) is active in your ServiceNow instance, the user with the business stakeholder role (sn_release_read) has read access to the following tables.

**Release Management tables**

| Table | Description |
| --- | --- |
| Product<br><br>[rm_product] | Represent whole products whose releases are being managed.<br><br>It is optional to use the Product construct. A generic release can also be defined without any specific product. |
| Release<br><br>[rm_release] | Represent individual releases of the product. |
| Release Phase<br><br>[rm_release_phase] | Represent the different stages of work required to complete a release. |
| Release Tasks<br><br>[rm_task] | Represent tasks under a phase for phase activities. |
| Release Items | Represents work items and change records associated to the release. |

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**Release Management tables (continued)**

| Table | Description |
|---|---|
| [rm_m2m_release_task] | |

## Domain separation in Release Management

This is an overview of domain separation and Release Management. Domain separation enables you to separate data, processes, and administrative tasks into logical groupings called domains. You can control several aspects of this separation, including which users can see and access data.

### Support level: Basic

- Business logic: Ensure that data goes into the proper domain for the application's service provider use cases.
- The application supports domain separation at run time. The domain separation includes separation from the user interface, cache keys, reporting, rollups, and aggregations.
- The owner of the instance must set up the application to function across multiple tenants.

Sample use case: When a service provider (SP) uses chat to respond to a tenant-customer's message, the customer must be able to see the SP's response.

For more information on support levels, see Application support for domain separation.

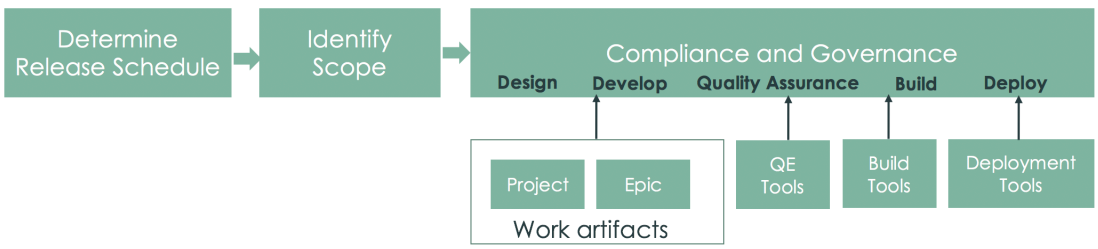
**Related topics**

Domain separation for service providers

## Release Management concepts

The Release Management application encompasses the planning, design, build, configuration, and testing of hardware and software releases to create a defined set of release components.

Release management comprises of a series of activities performed to ensure that the changes are applied successfully to both pre-production and product environments.




**Release Management concepts**

| Concept | Description |
|---|---|
| Products | Represents the hardware or software for which releases are built. A product can be linked with a Business Service in the CMDB to link it with other ITIL processes. |

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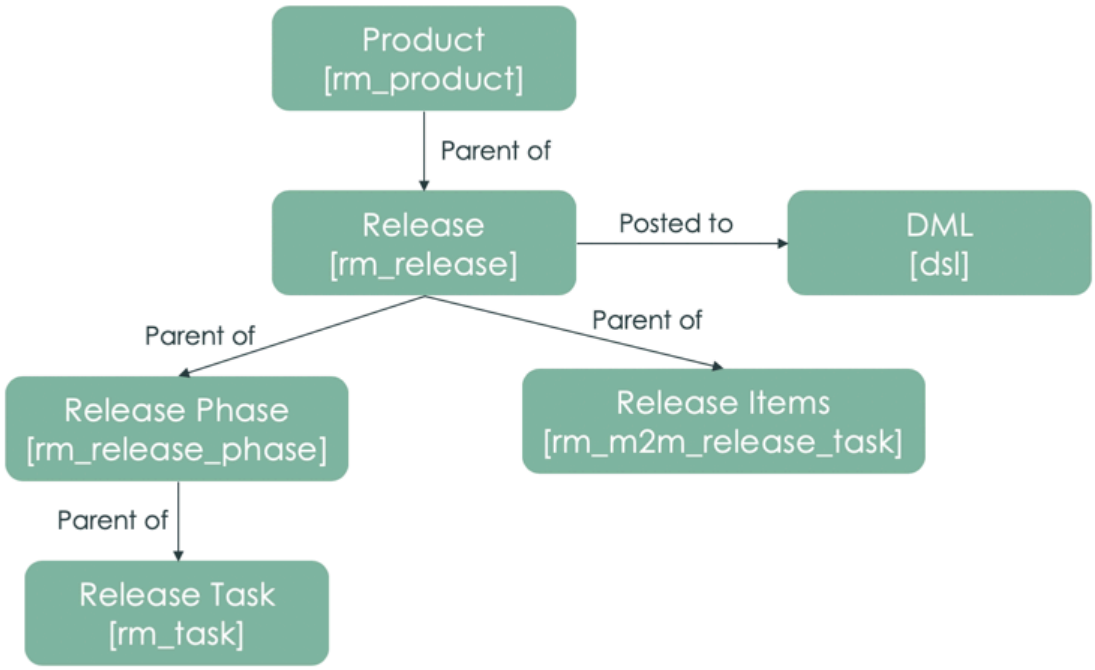
**Release Management concepts (continued)**

| Concept | Description |
|---|---|
| Releases | Bundles all the work done (projects, epics, stories, enhancements, defects, problems, incidents, and so on) for products or services together and ensures that these work items are built, tested, and deployed on non-production and/or production environments. |
| Release Phases | Represents the planned phases within a release, which are used to group the tasks required to carry out the release. For example, gathering requirements, planning, design, development, testing, and deployment. |
| Release Tasks | Represents any of the tasks required to implement a feature of a product. |

**Table relationships in Release Management**




**Note:**
The tables for Feature and Feature Task under a release are not removed. If you already use Feature and Feature Task under a release, you can continue doing so.

## Default state categories for Release and Release task tables

Understand how the different states of the Release [rm_release] and Release Task [rm_task] tables are configured by default. Use this information to customize the states according to your organizational release processes.

**State categories for Release table**

| Category | State number |
|---|---|
| completed_states | 3 |
| close_states | 3, 7 |
| default_close_state | 3 |

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**State categories for Release table (continued)**

| Category | State number |
|---|---|
| default_work_state | 2 |
| default_open_state | 1 |
| default_skipped_state | 7 |
| default_pending_state | -5 |
| pending_states | -5 |
| open_states | 1 |
| work_in_progress_states | 2, 4, 10 |
| skipped_states | 4, 7 |

**State categories for Release task table**

| Category | State number |
|---|---|
| completed_states | 3 |
| close_states | 3, 4, 7 |
| default_close_state | 3 |
| default_work_state | 2 |
| default_open_state | 1 |
| default_skipped_state | 7 |
| default_pending_state | -5 |
| pending_states | -5 |
| open_states | 1 |
| work_in_progress_states | 2 |
| skipped_states | 4, 7 |

## Using Release Management v2

The Release Management v2 plugin (com.snc.release_management_v2) provides release tables which store information about the planned release and tasks that are required to execute the release.

### Product

Use a Product record in Release Management to store information about a product for reference purposes and groups all the releases and work artifacts for the product.

You can use the **Configuration Items** reference field to link the product with a corresponding CI in the CMDB. Each CI keeps information about how it relates to other CIs, and can track any incidents, problems, or changes related to it. Specifying a CI for the Product connects information from the release process to other processes in the instance.

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Defining a product is not mandatory to manage the release process. A release can be an enterprise release in which it is associated with all products or services, or it can be associated to more than one product as well. In either of these cases, defining a product is not mandatory.

Once releases are defined for a product, the Product Hierarchy related link displays the hierarchy of releases, release phases, and release tasks associated with the product.

### Release

Once a product is defined, you can plan and execute a release. Start by defining a release for the product and add child releases or release phases for the release. Then, scope the release by defining work artifacts for the release.

### Release Phase

Define multiple release phases for a release for release governance and smooth execution.

For example, if the release is managed more like a waterfall process, the release phases could be requirement gathering, design, development, testing, build, acceptance, and deployment. For each phase, there can be release tasks associated to it. The phase gets completed as and when all tasks are completed for a phase. Release managers must keep the release phases updated.

If the release is divided into multiple merges, the phases could be merge 1, merge 2, merge 3, and so on. The type and number of phases would depend upon the release management process of your organization.

### Scoping a release

Before starting the release execution, you must define scope of the release. Scope of a release includes the work artifacts such as projects, epics, stories, enhancements, and defects that are a part of the release.

For example, a minor release might only have a few problems and enhancements whereas a major release might have multiple projects or epics associated to it.

**Important:**
Starting with the New York release, scoping a release using SDLC or Scrum (Agile Development 1.0 (com.snc.sdlc.scrum.pp)) is not available.

While scoping the release, you can use the Release Hierarchy related list on the Release Form to view the release as a hierarchy.

## Product hierarchy in Release Management

A release can be an enterprise release, in which it is associated to all products or services or to more than one product. In either case, defining a product is not required.

If a product has releases defined, the **Product Hierarchy** related link displays the hierarchy of releases, phases, and phase tasks associated with the product.

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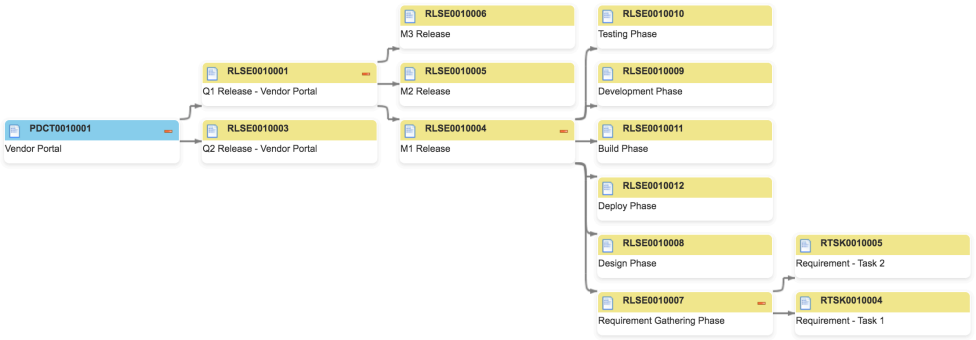


## Define a product in Release Management

Define a product in the Release Management application to facilitate managing a release process.

### Before you begin

Role required: release_v2_admin

### Procedure

1. Navigate to **All** > **Release** > **Products**.
2. Click **New**.
3. On the form, fill in the fields.

| Field | Input value |
|---|---|
| Number | Auto-generated unique identifier for the Product. |
| Configuration Item | CI that corresponds to the product. |
| Assignment Group | Group responsible for the product. |
| Assigned To | user responsible for the product. |
| Short Description | Brief description of the product. |
| Description | Detailed description of the product. |
| Work Notes | A journal field for logging notes about the product. |

4. Click **Submit**.

## Define a release in Release Management

During the release planning process, release managers define the type of the release (major, minor, and so on.), schedule of the release (planned start and end dates), required phase, phase tasks, and the scope.

### Before you begin

Role required: release_v2_admin

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## Procedure

1. Navigate to **All** > **Release** > **Products**.
2. Open the product to which you want to add a release.

   If a release belongs to no product or more than one product, you can directly navigate to **Release** > **Releases** to define the release. You need not define a release in the context of a product.
3. In the **Releases** related list, click **New**.
4. On the form, fill in the fields.

**Release form**

| Field | Description |
|---|---|
| Number | Auto-generated unique identifier for the release. |
| Release Type | Type of the release such as Major, Minor, Upgrade, Patch, or others. |
| Priority | Priority of the release such as Critical, High, Moderate, or others. |
| State | State of the release such as Draft, Work in progress, testing, or others.<br><br>If you want to customize the options in this list, reach out to your admin. Custom states can be added according to the default state categories of the release table. Learn more about the default states of the release table. |
| Percent complete | Progress of the release as a percentage of the whole. |
| Short description | Brief description of the release. This description helps in identifying this release from a list of releases. |
| Description | Details of the release. |
| Planned start date | Tentative start date of the release. |
| Planned end date | Tentative end date of the release. |
| Planned duration | Duration of the release in days.<br><br>When you submit the form, this field auto-populates based on the values of Planned start date and Planned end date. |

5. Click **Submit**.

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### What to do next

- Attach documents such as release and deployment plans, installation manuals, and training documentation to a release.

  For more information, see Add and manage attachments.

- Releases can have child releases. So, you can group minor releases under major releases.

  Add a child release by clicking **New** in the Releases related list in the Release form.

- Define a release phase in Release Management.
- Define scope of a release in Release Management.

## Define a release phase in Release Management

Define a release phase to represent the different stages of work required to complete your release.

### Before you begin

Role required: release_v2_admin

### Procedure

1. Navigate to **All** > **Release** > **Releases**.
2. Click the release number to which you want to add a release phase.
3. In the **Release Phases** related list, click **New**.
4. On the form, fill in the fields.

**Release form**

| Field | Description |
|---|---|
| Priority | Priority of the phase such as Critical, High, Moderate, or others. |
| State | State of the phase such as Draft, Work in progress, testing, or others. |
| Percent complete | Progress of the phase as a percentage of the whole. |
| Short description | Brief description of the phase. This description helps in identifying this phase from a list of release phases. |
| Description | Details of the phase. |
| Planned start date | Tentative start date of the phase. |
| Planned end date | Tentative end date of the phase. |
| Planned duration | Duration of the phase in days.<br><br>When you submit the form, this field auto-populates based on the values of Planned start date and Planned end date. |

5. Click **Submit**.

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## Define scope of a release in Release Management

Add projects, epics, stories, enhancements, and defects to define the scope of a release.

### Before you begin

Role required: release_v2_admin

### Procedure

1. Navigate to **All** > **Release** > **Releases**.
2. Click the release number for which you want to define the scope.
3. On the Release form, navigate to one of the following related lists.
   - Projects
   - Scrum Epics
   - Scrum Stories
   - SAFe Epics
   - SAFe Features
   - SAFe Stories
   - Defects
   - Enhancements
   - Incidents
   - Problems
   - Changes

   **Note:**
   To view the respective work items, ensure that the plugins Agile Development 2.0, Project Portfolio Management, Essential SAFe, and Portfolio SAFe are active.

4. Add a task to the related list.
   a. Click **Attach task**.
   b. Find and locate the required task by clicking the search icon ( ).
   c. Add the task as a release task by clicking the task number.
5. Click **Submit**.

# Software control distribution

The application enables the Release Management team to control the distribution of software by creating a Definitive Media Library (DML) stored in the CMDB.

The DML table [dsl] consists of a physical store and a logical store.

- The physical store holds the original copies of all software media. This tends to be software that has been provided from an external source.
- The logical store is the index of all software and releases, versions, and so on, highlighting where the physical media can be located. The logical store may also be used to store software that is developed within the organization.

Both physically and logically stored software are represented as records on the DML table [dsl].

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# Recommendation Framework

ServiceNow® Recommendation Framework provides a framework with relevant, contextual, and actionable recommendations for a user in a configurable workspace.

Recommendation Framework is now deprecated and no longer supported or available for new activation. Recommended Actions for ITSM feature provides the latest experience for this functionality. To get the advanced version, you must install the Advanced Recommended actions for ITSM (com.snc.uib.sow_itsm_ra_advanced) plugin and you must procure ITSM Pro package subscription.

**Note:**
The best practice to get the advanced version is to install the Task Intelligence for ITSM (com.snc.itsm_ml_task) plugin and procure the ITSM Pro package subscription. For more information, see Exploring Recommended Actions for ITSM in Service Operations Workspace.

## Get started

| Explore | Configure | Integrate |
| --- | --- | --- |
| Learn about Recommendation Framework concepts and features. | Configure environment and properties. | Integrate Recommendation Framework with other applications. |

## Request apps on the Store

Visit the ServiceNow Store website to view all the available apps and for information about submitting requests to the store. For cumulative release notes information for all released apps, see the ServiceNow Store version history release notes.

## Troubleshoot and get help

Contact Customer Service and Support

# Exploring Recommendation Framework

A reusable framework to deliver outcome-based recommendations for a user in a configurable workspace.

Recommendations are available in multiple areas of a configurable workspace.

## Recommendations in a contextual panel

You can configure recommendations in a contextual panel, for example, the **Recommendations** panel that can be accessed from the sidebar of an incident in Service Operations Workspace. Recommendations can be configured and grouped in any of the following formats.

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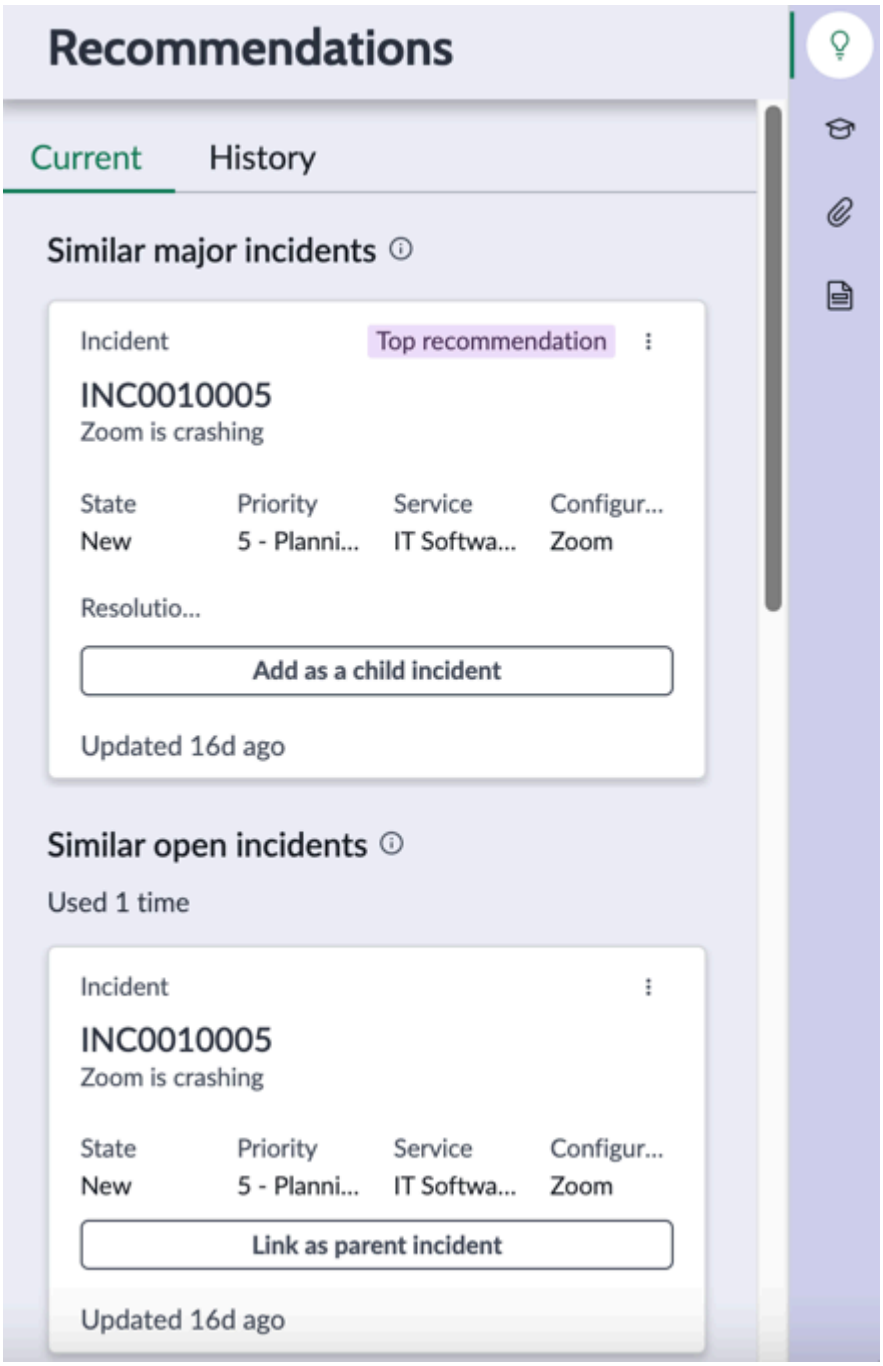
- Record card: Relevant record details of a table and corresponding actions are available.
- Message card: A message derived from the recommendation and corresponding actions are available. For example, **Propose major incident** card for an incident in Service Operations Workspace.

**Note:**
All cards of the same recommendation rule are grouped. For example, for the Similar open incidents rule for an incident in Service Operations Workspace, all relevant incidents are grouped as cards under **Similar open incidents**.

**Recommendations from the sidebar**




For information on available card groups and their dependencies on recommendation rules, see Recommendation rules for an incident in Service Operations Workspace.

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When you click a card or its record number, detailed information about that card and its actions are displayed in a new tab.

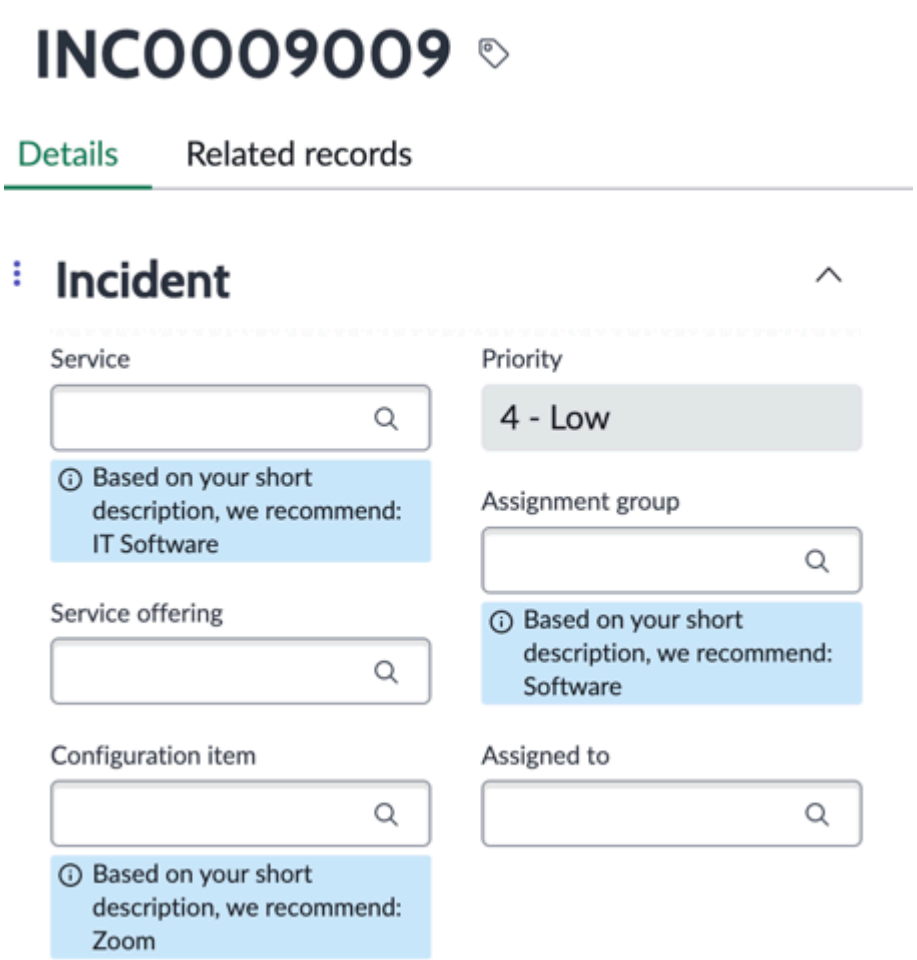
Every card has a primary action and multiple other actions. For every action you perform on the card, the recommendations are recomputed. You can discard a recommendation if not relevant. Also, when you perform a primary action on a card, it moves from the **Current** tab to the **History** tab.

**Note:**
Based on the priority, the first card of the top card group is displayed as the top recommendation at the top of the **Recommendations** panel.

### Recommendations at the field level

A predicted value is displayed at the field level based on the corresponding recommendation rule. For information about these rules for an incident, see Recommendation rules for an incident in Service Operations Workspace. When a threshold value is configured, the recommended value can be stamped or auto-populated as the field value. For information about these configurations for an incident, see Configure Recommendation Framework for an incident in Service Operations Workspace.

**Recommendations at field level**




## Configuring Recommendation Framework

Set up Recommendation Framework so that users can review recommendations and perform an action in a configurable workspace.

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For information about how Recommendation Framework can be set up in Service Operations Workspace, see Configuring Recommendation Framework in Service Operations Workspace.

## Integrating Recommendation Framework with other applications

Recommendation Framework integrates with Service Operations Workspace to provide dynamic and contextual recommendations for an agent while working on an incident.

Recommendations are available in multiple areas for an incident in Service Operations Workspace. For more information about Recommendation Framework in Service Operations Workspace, see Recommendation Framework in Service Operations Workspace.

# Request Management

Request Management allows catalog items to be requested and fulfilled based on defined flows.

**Related topics**

- Exploring Service Catalog
- Catalog Builder

## Request Management architecture

Request Management allows catalog items to be requested and fulfilled based on defined flows.

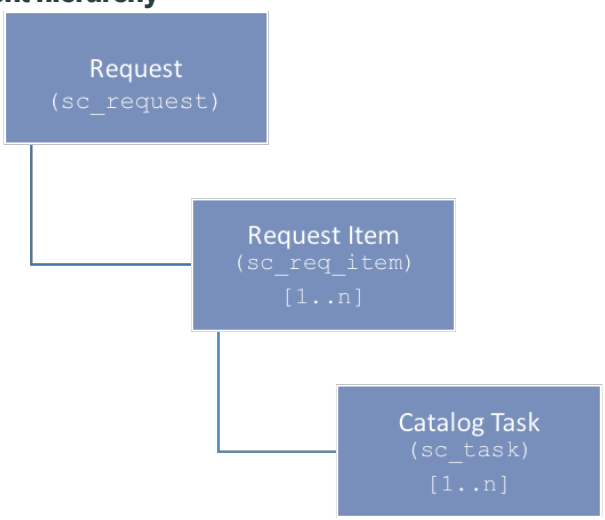
### Request Management hierarchy

Service Catalog is the starting point of the request management process. The request management process is triggered only when a catalog item from the Catalog Item [sc_cat_item] table is requested.

When a user submits a request for a catalog item, records are generated in the following hierarchy.

**Note:**
Variables are associated only with the Requested Item [sc_req_item] table. Variables are not supported for extended tables.

**Request Management hierarchy**

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**Note:**
When you configure Request Management:

- The data model does not support a record producer generating request management objects such as request, request item, and catalog task. Hence, do not use a record producer to insert records in the following request management tables or their extensions:
  - Request [sc_request]
  - Request Item [sc_req_item]
  - Catalog Task [sc_task]
- Do not write business rules with the `before` trigger for the following tables:
  - Request [sc_request]
  - Request Item [sc_req_item]
  - Cart [sc_cart]
  - Cart Item [sc_cart_item]

## Request management process

### Catalog item is ordered directly without adding it to the cart

When a catalog item is ordered or requested directly without adding it to the cart, the following steps are performed:

1. A temporary cart, sc_cart, is created.
2. The catalog item along with the variables (values entered by the user) is added to the temporary cart as a record in the Cart Item [sc_cart_item] table.
3. The variables are saved in the Options [sc_item_option] and Variable Ownership [sc_item_option_mtom] tables.
4. The temporary cart is checked out by performing these steps.
   a. A record in the Request [sc_request] table is initialized but not committed in the database.
   b. A record in Request Item [sc_req_item] table is initialized but not committed in the database.
   c. The request reference for the Request Item [sc_req_item] table record is updated with the Request [sc_request] table record.
   d. The variables record in the Options [sc_item_option] and Variable Ownership [sc_item_option_mtom] tables are updated based on the Request Item [sc_req_item] table record.
   e. The Request Item [sc_req_item] table record is committed in the database.
   f. The Request [sc_request] table record is committed in the database.

### Request is submitted after adding the item to the cart

If a catalog item is added to the cart and the request is submitted using the checkout process, the default cart is checked out.

All steps mentioned in the preceding scenario, Catalog item is ordered directly without adding it to the cart, are applicable. However, if multiple catalog items are added to the cart, step b to step e are repeated for each item.

### Request is submitted using an order guide

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For a two-step order guide checkout, the temporary cart is used for all items. For a three-step order guide checkout, the default cart is used for the items.

All steps mentioned in the preceding scenario, Catalog item is ordered directly without adding it to the cart, are applicable.

**Note:**
The base system workflow attached to the request is demo data.

**Related topics**

Create a catalog request in Agent Workspace

Create a request from Universal Request

## Domain separation in Request Management

This is an overview of domain separation in Request Management. Domain separation enables you to separate data, processes, and administrative tasks into logical groupings called domains. You can control several aspects of this separation, including which users can see and access data.

### Support level: Standard

- Includes all aspects of **Basic** level support.
- Application properties are domain-aware as needed.
- Business logic: The service provider (SP) creates or modifies processes per customer. The use cases reflect proper use of the application by multiple SP customers in a single instance.
- The instance owner must configure the minimum viable product (MVP) business logic and data parameters per tenant as expected for the specific application.

Sample use case: An admin must be able to make comments required when a record closes for one tenant, but not for another.

For more information on support levels, see Application support for domain separation.

### Activation information

The Domain Support - Domain Extensions Installer plugin (com.glide.domain.msp_extensions.installer) should be activated to enable domain separation for Request Management. For information on how you can request for this plugin activation, see Request domain separation.

### How domain separation works in Request Management

Fulfillers see only requests, requested items, and catalog tasks that have been created within the (tenant) domain for which the fulfiller has the visibility. For information on visibility in domain hierarchies, see Visibility domains and Contains domains.

### Domain separated tables

- Request [sc_request]
- Requested Item [sc_req_item]
- Catalog Task [sc_task]

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### Use cases

- A user belonging to “Initech” domain, submits a request. Only those fulfillers belonging to “Initech” domain or global domain can see this request.
- A fulfiller belonging to a parent domain can see requests, requested items, and catalog tasks of all its child domains as well.
- A fulfiller belonging to a specific domain can create requests only on behalf of the domains that they have access to.
- If a user has access to multiple domains, the domain specified on the current record drives the functionality of that record and reference fields.

**Related topics**

Domain separation for service providers

## Agent Workspace for Request Management

Agent Workspace for Request Management integrates the platform functionality specific to tier 1 agents into an easy-to-navigate interface. This multi-tab interface helps the agents to efficiently manage multiple incidents, catalog requests, and catalog tasks. The ITSM Workspace plugin (com.snc.agent_workspace.itsm) that automatically activates the Service Catalog - Workspace (com.glideapp.servicecatalog.workspace) plugin should be activated for the Request Management flows in workspace.

### Request Management categories in workspace

- **Request**: Displays the active requests and requested items.
- **Catalog Task**: Displays the active tasks assigned to the current user, and to at least one of the assignment groups of the user.

### Request Management forms in workspace

The form layouts, UI actions, UI policies, and client scripts that are available on the following Request Management forms in Platform are also available on the corresponding Workspace forms.

- Request
- Request Item
- Catalog Task

**Note:**
A variable editor is displayed as a pop-up window for request items and catalog tasks only if it is included in the Platform forms.

If you want to change the view of any workspace form, customize the workspace view from the corresponding request management form in the platform UI.

### Create a catalog request in Agent Workspace

You can create a catalog request in Agent Workspace to join the Service Catalog flow from a different flow. For example, from an incident flow, you can create a request, and associate the request with the incident. It helps you in tracking the requests associated with an incident and vice versa.

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### Before you begin

Role required: itil

You can create a catalog request in Agent Workspace to join the Service Catalog flow from a different flow. For example, from an incident flow, you can create a request, and associate the request with the incident. It helps you in tracking the requests associated with an incident and vice versa.

- To associate a request with any parent table record, the corresponding mapping configuration should be available in the **Catalog Administration** > **Request Parent Mapping** submodule.
- To associate a record producer request with the parent table record, retrieve the *sysparm_parent_sys_id* and *sysparm_parent_table* parameters from the URL using the RP.getParameterValue() method in the **Script** field of the record producer.
- For the **Create Request** UI actions in workspace on the Interaction [interaction] table, the field values should be as follows:
  - **Workspace Client Script**:

```
function onClick() {
    var result = g_form.submit('sysverb_ws_save');
    if (!result) {
        // failed form submission
        return;
    }
    result.then(function () {
        var params = {};
        params.sysparm_parent_table = "interaction";
        params.sysparm_parent_sys_id =
 g_form.getUniqueValue();
        g_service_catalog.openCatalogItem('sc_cat_item',
 '-1', params);
    });
}
```

- For the **Create Request** UI actions in workspace on the Incident [incident] table, the field values should be as follows:
  - **Condition**: `current.incident_state != global.IncidentState.CLOSED && gs.hasRole("itil")`
  - **Workspace Client Script**:

```
function onClick() {
    g_form.submit('sysverb_ws_update').then(function () {
        var params = {};
        params.sysparm_parent_table = "incident";
        params.sysparm_parent_sys_id =
 g_form.getUniqueValue();
        g_service_catalog.openCatalogItem('sc_cat_item',
 '-1', params);
    });
}
```

### Procedure

1. Initiate a catalog request using any of the following options.

2. Click **Order Now**.

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The Order Confirmation window is displayed.

**Note:**
The value in the **Request for** field is set by default depending on where the request is created:

- If the request is created from an incident, the value is set to the person who called in the incident.
- If the request was started from an interaction, the value is set to the person with whom the interaction is happening.

3. **Optional:** Specify the **Delivery Information** and **Special instructions**.
4. Click **Checkout**.
   The request is created and associated with the parent incident.
5. Click **Close**.
6. **Optional:** To view the created request, click **View Details**.

## Request Management integration with Universal Request

Integration of Request Management with the Universal Request application extends the capabilities of Universal Request and enables your employees and agents to create a universal request by submitting a request from a catalog item or record producer. This integration provides a consistent ticketing experience and facilitate inter-department request transfers.

**Note:**
To use this capability, enable the *sn_uni_req.com.snc.ur.request_integration* property under Universal Request properties in the Universal Request application. For more information, see Universal Request properties.

Configure the catalog item or record producer to create a universal request. The associated requested item (for catalog item) or task-based record (for record producer) becomes the primary ticket for that universal request. For more information on Universal Request, see Exploring Universal Request

### Benefits of integrating with Universal Request

The integration enables you to perform the following actions:

- Create a request directly from the Universal Request application using the **Create Request** option.
- Transfer a request to another department or back to the Universal Request queue by using the **Transfer** option.
- Configure a catalog item as Universal Request and automatically associate the request as a primary ticked for the universal request. For more information, see Configure a catalog item or record producer to create a universal request.
- View all the associated requests and request items as a related list for a universal request.
- Employees can view the details related to their Universal Request from Employee Center.

### System requirements to integrate Request Management with Universal Request

Ensure that you have installed the Universal Request plugin (com.snc.universal_request) to create a universal request from a request item.

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After the plugins are installed, in the Universal Request application properties, set the *sn_uni_req.com.snc.ur.request_integration* to true. For more information, see Universal Request properties.

## Create a request from Universal Request

As a routing agent, create a request from a universal request and then assign it to the appropriate assignment group. The request manager handles the requested items and takes further actions to fulfill the request.

### Before you begin

Ensure that you have the following plugins installed.

- Universal Request plugin (com.snc.universal_request)
- Request Management plugin (com.sn_cs_sm_request)

**Note:**
A request is associated with the parent Universal Request record only when you have the following conditions set:

- The *glide.sc.use_cart_layouts* system property is set to true.
- The **Use Cart Layout**" check box for an individual catalog item is selected.

Role required: routing agent

### Procedure

1. Navigate to **Universal Request** > **All**.
2. Open the universal request record from which you want to create a request.
3. Select **Create Request**.

### Result

A request is created and is automatically assigned to the appropriate assignment group. If required, you can also add more details on the Requested item form.

On the Requested item form, the universal request number that was used for creating the request is displayed. The request item number (RITM#) appears in the **Primary ticket** field on the Universal Request form and also under the Associated Requests related list.

## Requested item state mapping

Map your requested items states to the universal request (UR) states to provide a better user experience during the requested item state transition and to track the progress of the request.

### Before you begin

Role required: admin

### About this task

Mapping the states of the requested item to the universal request state ensures that the status of request is also reflected on the state of universal request. As the request moves through different stages of the life cycle, the state of the universal request also gets updated to reflect the change.

For example, consider a universal request has a requested item as a primary ticket. When the state of the request changes from **Open** to **Work in Progress**, the universal request state changes from **New** to **In Progress**.

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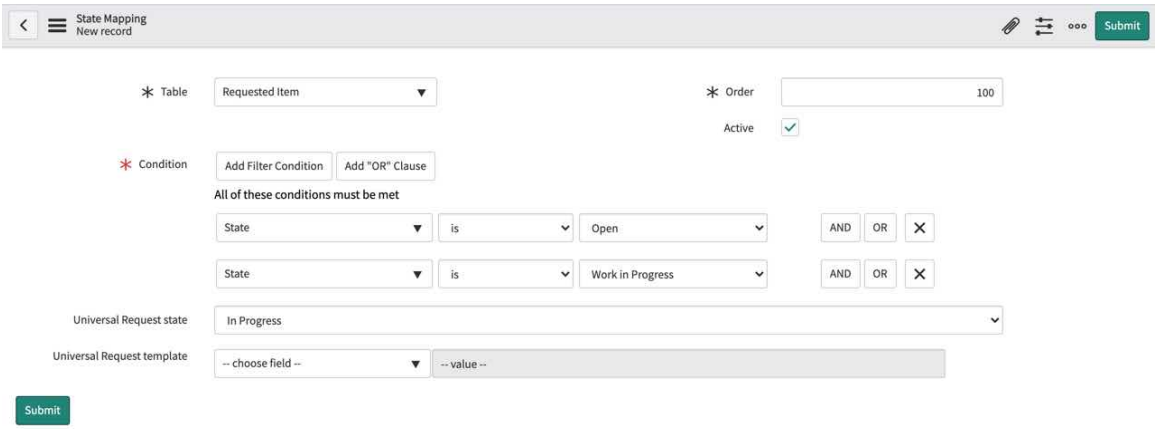


The following table lists the default state mapping of requested item state with UR states.

**Default state mapping of requested item state with UR states**

| Request item state | UR state |
|---|---|
| Open | In Progress |
| Work in Progress | In Progress |
| Pending | In Progress |
| Closed Complete | Closed |
| Closed Skipped | Closed |
| Closed Incomplete | Closed |

If you change the state of the request to Close Incomplete, Closed Skipped, or Closed Complete without transferring the request back to the Universal Request queue or to another department, then one of the following action is performed:

- If the **Needs resolution review** option is selected on the Universal Request, then the state of the request changes to Close Incomplete, Closed Skipped, or Closed Complete and the UR state reason is changed to Confirm response.
- If the **Needs resolution review** option is not selected on the Universal Request, then the request is closed based on the state mapping.

**Note:**
By default, the **Needs resolution review** on the Universal Request is set to false.

### Procedure

1. Navigate to **All** > **Universal Request** > **Administration** > **State Mapping**.
2. Click **New**.
3. On the form, fill in the fields.
   For more information, see State mapping form.

## Transfer a request to another department

Transfer a request to another department with or without resolution to fulfill the request.

### Before you begin

Role required: itil, routing agent, sn_request_write, or sn_hr_core_case_writer

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Configure the sn_uni_req.transfer_type property in the Universal Request properties page to determine how to handle the request transfers. For more information, see Universal Request properties.

The agent can transfer a request with one of the following reasons:

**Transfer with resolution**

The request is resolved and transferred back to UR, a specific department, or a service. Agents can select this option when another departments help is required to fulfill the request.

**Transfer without resolution**

The request isn't resolved or doesn't belong to the specific department and transferred back to UR, a specific department, or a service.

### Procedure

1. Navigate to **All** > **Service Catalog** > **Open Records** > **Items**.
2. Select the request item that you want to transfer.
3. Click **Transfer**.

> **Note:**
> To transfer a request, either you must be part of the assignment group or the request must have been assigned to you.

4. In the **Transfer Ticket** dialog box, fill in the details.

**Transfer ticket dialog**

| Field | Description |
|---|---|
| Department | Department that you want to transfer the request to. |
| Transfer reason | Reason why you are transferring the request to the department. |
| Transfer notes | Brief description on the reason for transferring the primary ticket. These notes are read by the UR Routing agent who handles universal requests. |
| Copy additional comments and attachments | Option to copy the comments and attachments of the request while transferring. The option is automatically selected.<br>**Note:** Work notes are not copied while transfer. |

5. Click **Transfer**.

### Result

The request item is transferred to the selected department. The request is transferred based on the direct transfer mappings in mapping configuration and transfer type configurations. For more information on configuring routing, see Transfer configuration.

## Request ITSM Roles - Request Management

Request the ITSM Roles plugin (com.snc.itsm.roles) to activate the ITSM Roles — Request Management plugin (com.snc.itsm.roles.request_management) to gain more control over the

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access that different service desk agents, technicians, and managers have within your Request Management process.

### Before you begin
Role required: admin

### About this task
The ITSM Roles plugin (com.snc.itsm.roles) includes an additional security model. The security model provides more granular roles across ITSM applications as well as within them, allowing you flexibility in setting up access controls. The ITSM Roles plugin is available by default in new instances. Users upgrading from Madrid or earlier versions must request the plugin.

**Plugins for ITSM Roles**

| Plugin | Adds roles |
|---|---|
| Business Stakeholder<br><br>[com.snc_business_stakeholder] | business_stakeholder<br><br>**Note:** The business_stakeholder role contains the sn_incident_read, sn_problem_read, sn_change_read, sn_request_read, and approver_user roles. |
| ITSM Roles — Incident Management<br>[com.snc.itsm.roles.incident_management] | • sn_incident_read<br>• sn_incident_write |
| ITSM Roles — Problem Management<br>[com.snc.itsm.roles.problem_management] | • sn_problem_read<br>• sn_problem_write |
| ITSM Roles — Change Management<br>[com.snc.itsm.roles.change_management] | • sn_change_read<br>• sn_change_write |
| ITSM Roles — Request Management<br>[com.snc.service_management.roles.request_management] | • sn_request_read<br>• sn_request_write<br>• sn_request_comment_write<br><br>**Note:** The sn_request_comment_write role alone doesn't give access to comments write, you need write access for the table. |

To purchase a subscription, contact your ServiceNow account manager. The account manager can arrange to have the plugin activated on your organization's production and subproduction instances, generally within a few days.

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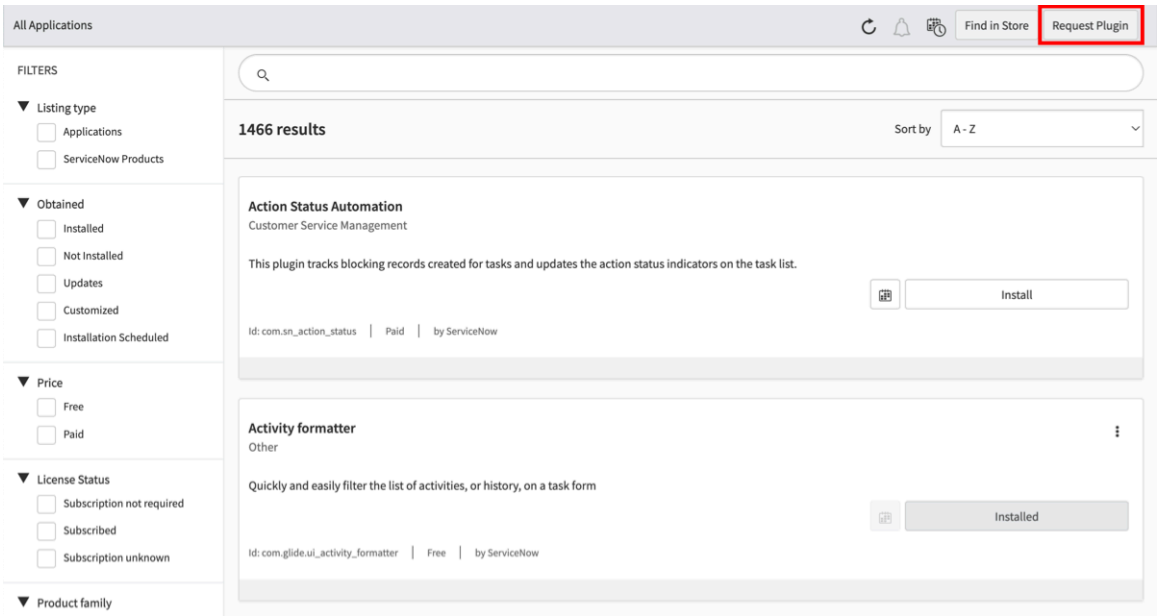
If you don't have an account manager, decide to delay activation after purchase, or want to evaluate the product on a subproduction instance without charge, follow these steps.

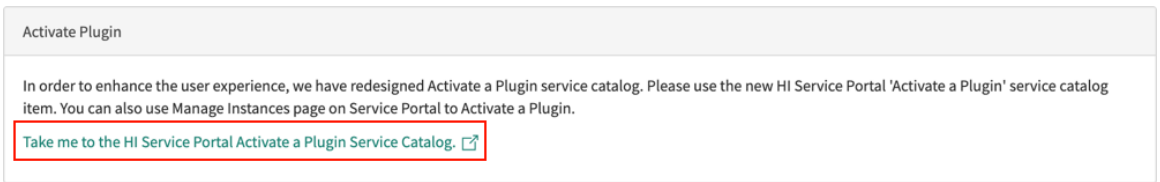
**Note:**
Activate the ITSM Roles plugin on a subproduction environment and test the functionality before requesting activation in the production environment. For assistance, contact the ServiceNow Professional Services team.

### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. On the All Applications page, select **Request Plugin** to open the **Activate Plugin** form on Now Support.




3. On Now Support, select the link to access the Now Support Service Portal Service Catalog.




4. Select your instance.
5. Select **Actions > Activate Plugin**.
6. On the **Activate Plugin** form, provide the following information.

#### Activate Plugin form

| Field | Description |
|---|---|
| What is your target instance | Instance on which to activate the plugin. |
| Which plugin would you like to activate | Name of the plugin to activate. |

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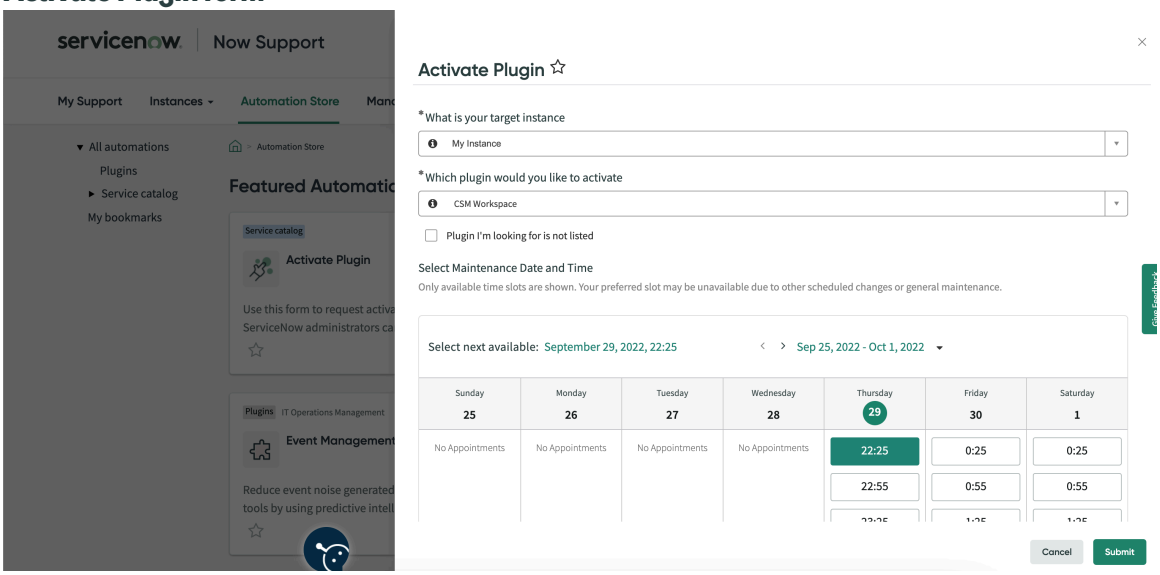
| Field | Description |
| --- | --- |
| | **Note:** If the system does not list the plugin you want or if you are activating the plugin on an OEM or on-premise instance, select the **Plugin I'm looking for is not listed** check box and then enter the name of the plugin. |
| Select Maintenance Date and Time | The date and time to activate the plugin.<br>**Note:** Plugins are activated in two batches, once in the morning and once in the evening, on every business day in the US Pacific time zone. If the plugin must be activated at a specific time, enter the request in the **Reason/Comments** field. |

### Example

For example, see the following form to activate the CSM Workspace plugin on an instance named My Instance.

**Activate Plugin form**




7. Select **Submit**.
   For additional details about requesting a plugin, see Requesting a Plugin from the Service Catalog [KB0751715] article in the Now Support Knowledge Base.

## Components installed with ITSM Roles — Request Management

Several user roles are installed with the activation of the ITSM Roles - Request Management plugin (com.snc.itsm.roles.request_management).

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**Note:**
The Application Files table lists the components that are installed with this application. For instructions on how to access this table, see Find components installed with an application.

### Roles installed

| Role title [name] | Description | Contains roles |
|---|---|---|
| sn_request_read | Read access to the Request (sc_request) or Requested Item (sc_req_item) only for a user who is also an approver of the request or requested item.<br>**Note:** As there are future updates expected for the sn_request_read role, do not assign it to users without the business_stakeholder role. | NA |
| sn_request_write | Write access to the Request (sc_request) or Requested Item (sc_req_item). | • task_editor<br>• dependency_views<br>• agent_workspace_user<br>• view_changer<br>• cmdb_read<br>• cmdb_query_builder_read<br>• sn_request_read |
| sn_request_comment_write | Write access to the comments for the Requested Item (sc_req_item).<br>**Note:** The sn_request_comment_write role alone does not give access to comments write, you will need write access for the table. | NA |

## Activate Business Stakeholder

Activate the Business Stakeholder plugin (com.snc.business_stakeholder) if you have an admin role. This plugin installs the Business Stakeholder role. Users with this role can view and approve records at all ITSM product levels.

**Before you begin**
Role required: admin

**Note:**
Ensure that ITSM Roles plugin (com.snc.itsm.roles) is activated before you activate the Business Stakeholder plugin. For more information to activate ITSM Roles plugin, refer Request ITSM Roles- Change Management.

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### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.

3. Select **Install** to start the installation process.

   **Note:**
   When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

   You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

### Related topics

List of plugins (Washington DC)

## Installed with Business Stakeholder

The Business Stakeholder plugin (com.snc.business_stakeholder) installs the Business Stakeholder role when activated.

**Note:**
The Application Files table lists the components that are installed with this application. For instructions on how to access this table, see Find components installed with an application.

## Roles installed

| Role title [name] | Description | Contains roles |
|---|---|---|
| Business Stakeholder<br><br>[business_stakeholde | Users with this role can view and approve records within all products of ITSM.<br><br>**Note:**<br>The business_stakeholder role contains the following ITSM roles sn_incident_read, sn_problem_read, sn_change_read, sn_request_read, and approver_user roles. | • pa_viewer.business_stakeholder<br>• approver_user.business_stakeholder<br>• cmdb_read.business_stakeholder |

# Service Builder

Create and edit services and service offerings using the ServiceNow® Service Builder application. Service Builder is an interactive, guided experience as you create and edit services and service offering details. Even though Service Builder is a feature of Service Portfolio Management, its plugin is part of the Digital Portfolio Management list of products in the ServiceNow Store.

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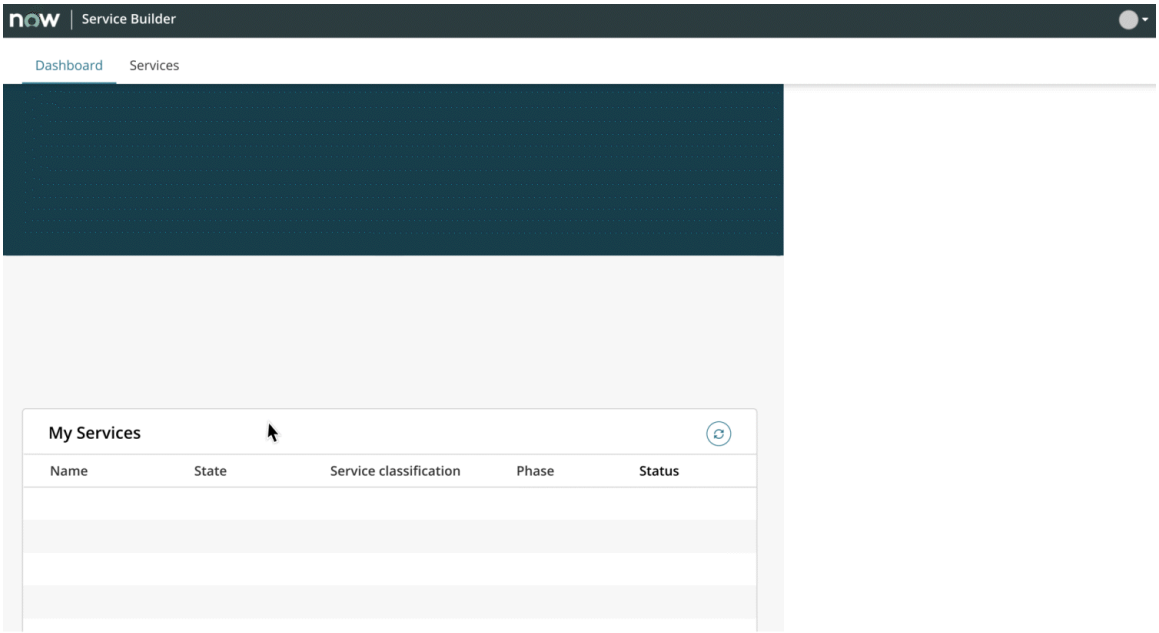



**Tip:**
Refresh the browser to replay the demo video.

## Service Builder overview

Create and maintain definitions of your business and technical services and offerings through a guided experience in Service Builder. You can edit service definitions anytime before you publish as well as update already-published services using version control.

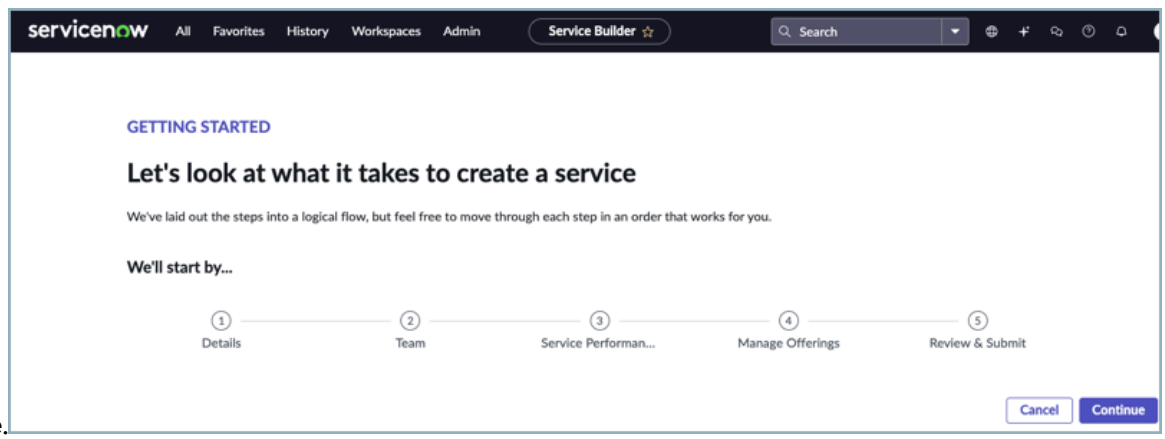
After your services and offerings are published, you can view and edit them in the **Services** tab of Service Builder or in its parent application Service Portfolio Management.

## Walk-through experience with contextual guidance

Service Builder provides contextual guidance for each step tab as you create your services and service offerings. From the Service Builder **Dashboard** tab, create a service by selecting one of the two options:

- **Create a business service**
- **Create a technical service**

After you select an option, Service Builder provides an organizer for you to see the steps to create a service.

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Selecting **Continue** takes you through each step, starting with the **Details** tab as described in the following Service Builder tabs table.

**Service Builder tabs**

| Tab | Definition |
|---|---|
| Details | General information about the service such as name, type, and classification. |
| Team | Service team information including the owner, delegate, and business contacts. |
| Service Performance | Measurement criteria for the service performance. |
| Manage Offerings | General information about the service offering. This tab has its own set of tabs to enter or edit the offering's details, team, operations, financials, and performance criteria. |
| Review and Submit | Comprehensive view of the services and offerings you created. You can make changes, if necessary. After review, submit for publishing. |

You can edit your services and offerings at any time. You can also duplicate them (create a copy) to edit services, as needed so that you can create other services and offerings quickly. The contextual guidance in the experience walks you through how to do these tasks.

After you edit a service or an offering, the published version stays active until the draft that you're working on becomes the new published version. For more information, see Service Builder approval flow.

**Service Builder home page tabs**

| Home page tab | Description |
|---|---|
| Dashboard | The default landing page where you can create a business service or a technical service. You can also view services that you interacted with in the last few days from the dashboard view. |
| Services | List of all services along with their state, classification, phase, status, and owner. If you have editing access to the services and service offerings, you can edit them from this tab. |

**Related topics**

- Service Builder approval flow
- Create a service in Service Builder
- Create a service offering in Service Builder

## Install Service Builder

You can install the Service Builder application (sn_service_builder) using the admin role. The application installs related plugins that aren't already installed. It also installs the Service Builder components plugin to enable UI components for the product.

### Before you begin

Confirm that the application and all of its associated ServiceNow Store applications have valid ServiceNow entitlements. For more information, see Get entitlement for a ServiceNow product or application.

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Role required: admin

### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Search for Service Builder.
3. Select **Install** and follow the onscreen instructions.

   If the application doesn't display in your search, then request it from the ServiceNow Store.

   - Visit the ServiceNow Store website.
   - Search for Service Builder.
   - Follow the online screen instructions to install the application.
     - If the **Compatibility** release differs from what you want, then select **Other App Versions**.
     - Open the version that you want, and then select **View Details**.
     - Select **Install** and follow the onscreen instructions.

## Roles installed with Service Builder

Roles are added to Service Builder with the activation of ServiceNow® Service Portfolio Management.

### Roles

**Service Builder roles**

| Role | Description |
|---|---|
| Service admin | The service admin role can create services and edit any services, even services that they didn't create. |
| Service author | The service author role can create services and edit the services that they create. |
| Service editor | The service editor role can edit services that they own. They can't create services. |

Service Builder is a feature of Service Portfolio Management. Its plugin (sn_service_builder) is activated from the base system and activates related plugins that aren’t already active.

**Note:**
Even though Service Builder is a feature of Service Portfolio Management, its plugin is part of the Digital Portfolio Management list of products in the ServiceNow Store.

**Related topics**

Installed with Service Portfolio Management

## Service Builder approval flow

As you create and edit services and service offerings in Service Builder, various states get assigned and change on the services' way to being published (approved). Administrators enable the standard approval flow and can even customize it using the subflow option in Workflow Studio.

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## Standard approval flow

By default, the approval flow in Service Builder is set to approve services automatically.

When editing a service or offering in Service Builder, the standard approval flow is as follows:

- As you edit a service or offering, it's in a **Draft** state.
- After you submit your service or offering, it moves into the **Awaiting approval** state.
- After your service or offering is approved, it moves into the **Published** state.

You can edit (checkout) a service or a single offering, one at a time. You can also edit a service without checking out its child offerings — The offerings remain in the **Published** state until they're separately checked out.

When you check out an offering to edit it, the offering and its parent service both get checked out. The rest of the child offerings of that parent service remain in the **Published** state. After you finish editing the offering, submit it to the parent service so the offering can be republished (offerings are published via the parent service).

## Service states

See the following table for each state in the standard service and service offering approval flow.

| State | Description |
|---|---|
| Published | When a new service or offering is created and submitted in Service Builder, the item goes through an approval process before it's assigned to the **Published** state. The **Published** state indicates that the item is the version being used by the application and available for others.<br><br>When you edit a published item, Service Builder automatically checks out the item for you and creates a copy for you to work on. The copy is set to the **Draft** state. |
| Draft | A service item is in the **Draft** state in one of these scenarios:<br>• A new service or offering is being created in Service Builder and hasn't yet been submitted.<br>• An existing published service or offering has been checked out for editing in Service Builder.<br>  ○ When the item is being edited, Service Builder checks out the item and creates a copy of it and its related records (offerings and subscribers).<br>  ○ The copy is in a **Draft** state.<br><br>**Note:**<br>In the **Draft** state (checked out), the item displays in both Service Builder and in Service Portfolio Management in one or more of the following ways:<br>▪ The word [DRAFT] is in front of the checked out item name.<br>▪ A red dot ( ) is next to the item, signifying that it's read only.<br>▪ A clear triangle warning symbol ( ) is next to the item name, signifying it's the new copy (DRAFT) that's being worked on. |

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| State | Description |
| --- | --- |
| | ○ The published item remains in the **Published** state and the **Checked out** field is set to **True**.<br>○ After editing and submitting the item, the edits to the draft are merged with the related published item, and then the draft version is deleted. |
| Awaiting approval | After submitting your service or service offering, your submission goes through an approval process. Your organization's approval flow confirms that the service is created according to standards such as naming conventions, descriptions, proper use of commitments, and key performance indicators (KPIs). It also enables a quality check to confirm services aren't duplicative.<br>The following lists the tasks for each persona in the approval flow:<br>• Service owners create or edit services and offerings in the **Draft** state and then submit them for approval.<br>• Process owners and portfolio owners review and approve services and offerings before they approve them for publishing.<br>• Process owners and admins can access the 'Service Builder publish' subflow in Workflow Studio to set up and modify the approval flow based on the organizations needs. |

**Important:**

- You can only edit an item when it's in a **Draft** state. You can't edit a published item that has been checked out.
- An item in the **Draft** state is always inactive and doesn't show up in a search or when you're browsing.
- You can't change the **Active** flag of an item in the **Draft** state.
- The approval process is available starting with the Utah release and after. Depending on your organization, the approval process could take some time. Contact your administrator if you have questions about the approval process time.

### Enable and customize an approval flow

Administrators enable the approval flow that comes with the base system by updating the 'Service Builder publish' subflow in Workflow Studio.

Administrators can also create a customized approval flow that best meets the organization's needs. See the following for more information about these tasks in Workflow Studio:

- Edit a flow
- Ask for Approval action
- Create a flow

## Create a service in Service Builder

Create a service in Service Builder to model, map, and document your own business and technical services and offerings that relate to your data in Service Portfolio Management.

### Before you begin

Role required: service_admin, service_author, portfolio_admin, or portfolio_editor

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### About this task

The Service Builder framework offers you the option to create a business service or a technical service. Once you select the type of service that you want to create, the workflow guides you through the process of adding information in a logical order:

1. **Details**
2. **Team**
3. **Manage Offerings**
4. **Review and Publish**

> **Tip:**
> You can cancel out of creating a service anytime by selecting the **Cancel** button (next to the **Save** button). Also, to return to the home page at any time while creating or editing a service, select  .

### Procedure

1. Navigate to **All** > **Service Portfolio Management** > **Service Builder**.
2. From the landing page, select the type of service that you want to create - **Business** or **Technical**.
3. Review the Getting Started screen, and then select **Continue**.
4. On the form, fill in the fields.

> **Tip:**
> When you check out a service that's already been created (to review or edit it), the word [DRAFT] displays in front of the service name. Once checked back in as saved, the service name doesn't have [DRAFT] in front of it.

#### Details form

| Field | Description |
|---|---|
| Service name | Unique name that reflects the nature of the service. The name should be technology agnostic. |
| Consumer type | Definition of who the service is to be provided for. |
| Portfolio | A hierarchical categorization of services that enables you to organize your services and report on them at each level of the portfolio taxonomy. |
| Node | Taxonomy nodes enable you to organize and categorize services in your portfolio. Services can only be added to the lowest level taxonomy node of the portfolio. |
| Lifecycle status | The stage and status for the service that you're creating.<br><br>If you have the CSDM Activation plugin installed [com.snc.cmdb.csdm.activation], then the CSDM compliant lifecycle fields display.<br><br>If you don't have the plugin installed, then the legacy Service Portfolio Management phase and status fields display.<br><br>For information on the different types of fields, see Apply the CSDM guidelines to Digital Portfolio Management. |

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| Field | Description |
|---|---|
| Description | A concise description of your service to verify that it makes sense to the end user or consumer of the service. |
| Business criticality | Business criticality for the service:<br>• **1 — most critical**<br>• **2 — somewhat critical**<br>• **3 — less critical**<br>• **4 —not critical** |
| Business need | The business justification for the service. Some examples are how it reduces costs and how it increases employee productivity. |

5. Select the **Team** tab or **Continue to Team**.
6. On the form, fill in the fields.

**Team from**

| Field | Description |
|---|---|
| Owned by | Person accountable for the service and can edit this service at any time. This person is the service owner. Service owners must have the service_author role. |
| Delegate | Person that can edit this service and who can act on behalf of the service owner. Delegates must have the service_editor role. |
| Delivery manager | Person that has responsibility for the day-to-day management and delivery of this service. |
| Business relationship manager | Person that provides business requirements to the service owner. This person helps to define the vision, strategy, and desired outcomes for the service and works closely with the service owner. |
| Business contact | Person that contributes business requirements to the service, or who has a vested interest in the service performance. |
| Vendor | Vendor that may help deliver and support this service or may provide the required tooling or technology to deliver this service. |
| Stakeholders | Individuals that have a vested interest in this service. |

7. Select the **Manage Offerings** tab or **Continue to Manage Offerings**.
   The **Manage Offerings tab** displays those offerings that this service is provided for and how it's provided to them. Here you can edit an offering or create a new offering. It contains tabs for the offering's details, team, operations, financials, and performance. A service must have at least one offering to be published. Select a tooltip ( ) to see a description for each tab's field entry.
8. Select **Continue to Review and Submit**.
9. Scroll down the page to review all your entries and if needed, make edits to any of your entries.
10. Select **Submit**.

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# Create a service offering in Service Builder

Create a service offering to define and view the products or applications that make up your service in Service Builder.

## Before you begin

Role required: service_author or service_editor

## About this task

A service offering represents how a service is provided and who it is for. A service must have at least one offering to be published. The workflow guides you to create a service offering in a logical order:

1. **Details**
2. **Team**
3. **Operations**
4. **Financials**

> **Tip:**
> You can cancel out of creating a service anytime by selecting the **Cancel** button (next to the **Save** button). Also, to return to the home page at any time while creating or editing a service, select  .

To create a service and service offering, you must be assigned the service_author role. To edit (not create) a service or service offering, you must be assigned the service_editor role.

## Procedure

1. Navigate to **All** > **Service Portfolio Management** > **Service Builder**.
2. To add or edit a service offering, select the service and then select the **Manage offerings** tab.
3. To add a new service offering, select **New**.
4. On the form, fill in the fields.

### Details form

| Field | Description |
|---|---|
| Offering name | Unique name for the offering that associates with the parent service. |
| Consumer type | The consumer type determines if the service is provided internally to the business or to the employees, or externally to customers, or to both. The options are:<br>• Internal<br>• External<br>• Internal and External |
| Business criticality | Signifies the importance of this offering to business operations. The value of this field could be used to trigger business logic. For example, your most critical offerings may warrant special treatment for disaster recovery. |
| Phase | The phase for the offering: |

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| Field | Description |
|---|---|
| | • **Pipeline**: The offering is being designed and a business case is being created.<br>• **Catalog**: The offering has been approved and it is now being designed or is operational.<br>• **Retired**: The offering is no longer in operation. |
| Status | Status enables a unique status workflow that enables you to track each step of the service offering life cycle. |
| Description | A concise description of the service offering to ensure that it makes sense to the end user or consumer of the service. |

5. Select the **Team** tab or click **Continue to Team**.
6. On the form, fill in the fields.

**Team form**

| Field | Description |
|---|---|
| Owned by | Person accountable for the service offering and can edit the service at any time. This person is the service owner. Service owners must have the service_author role. |
| Delegate | Person that can edit the service offering and who can act on behalf of the service owner. Delegates must be assigned the service_editor role. |
| Delivery manager | Person responsible for the daily management and delivery of the service offering. |
| Support group | Group that provides expert support to the service offering. This group is usually a level 2 support team. |
| Change group | Team responsible for providing change management for the service offering. |
| Vendor | Vendor that may help deliver and support the service offering. This field helps show and track accountability for service offering delivery. |
| Stakeholders | Individuals that have a vested interest in the service offering. |

7. Select the **Operations** tab or select **Continue to Operations**.
8. On the form, fill in the fields.

**Operations from**

| Field | Description |
|---|---|
| Selected groups | Subscriber groups that have an interest in the service offering. |
| Selected departments | Departments that have an interest in the service offering. |

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| Field | Description |
|---|---|
| Selected locations | Users by location. |
| Selected users | Individuals impacted by the service offering. |
| Selected companies | Individuals impacted by the service offering that are defined by the core company table. These individuals represent all users related to a given company.<br>**Note:**<br>You may need to scroll down to see the remaining fields on this form. |
| Selected commitments | Select commitments, for example, service level agreements and availability commitments. Commitments may be defined in a contract for the service offering or based on standards defined by your company. |
| Service level requirements | Service level requirements for the service offering. |
| Active contract | Active contract to maintain awareness of the service commitments. |
| Additional contracts | Supporting, secondary, or past contracts related to the service offering. |
| Selected catalog items | Catalog item to track the request activity for all catalog items associated with this offering. A single offering can have multiple catalog items. |
| Offerings I depend on | Other service offerings that your service offering depends on. For example, if another offering experiences an outage, your offering availability may be impacted or degraded as a result. |
| Application services I depend on | Applies to business services. Application services that the service offering depends on. |
| Application services I contain | Applies to technical services. Application services that the offering supports. |

9. Select the **Financials** tab or select **Continue to Financials**.
10. On the form, fill in the fields.

### Financials form

| Field | Description |
|---|---|
| Price model | How the service offering is to be priced. Your selection determines the next field to display. |
| Price unit | If the price model is set to **Per Unit**, then enter the price unit in this field. For example, license or subscription. |

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| Field | Description |
|---|---|
| Price | If the price model is set to **Fixed**, then enter the price in this field. Be sure to enter the currency symbol as well (for example, $ for United States dollar). |
| Unit description | If the price model is set to **Per Unit**, then use this field to describe what is included in the unit. |
| The following fields appear conditionally according to the cost source selected in Service Portfolio Management. These fields are enabled as part of the financial optional plugin for Service Portfolio Management. For financial information, the required plugin is com.snc.financial_management_for_spm. For estimate spend information, the required plugin is com.snc.spm.spend. Both plugins require ITSM Pro SKU. | |
| Cost model | The cost model that determines how the estimated spend will be calculated. |
| Offering cost | If the cost model is set to **Fixed**, then the cost should represent the estimated cost of the offering per time period. |
| Time period | Interval that you want to track the estimated spend (**day**, **month**, **quarter**, **year**). |
| Cost Unit | If the cost model is set to **Per unit**, the cost should represent the cost per unit. |
| Units per period | The number of units per period. |
| Estimated spend | The estimated spend for this item. |

11. Select **Save & Close**.

# Service Operations Workspace for ITSM

ServiceNow® Service Operations Workspace is a configurable workspace that provides a unified experience for multiple IT Service Management and IT Operations Management workflows. Configure your agent experience using the easy-to-navigate interface of Service Operations Workspace for ITSM.

## Request apps on the Store

Visit the ServiceNow Store website to view all the available apps and for information about submitting requests to the store. For cumulative release notes information for all released apps, see the ServiceNow Store version history release notes.

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## Get started

| | |
|---|---|
| Explore<br>  <br>Learn about Service Operations Workspace for ITSM concepts and features. | Configure<br>  <br>Configure environment, tools, and user access. |
| Use<br>  <br>Learn how agents can use Service Operations Workspace for ITSM. | Reference<br>  <br>Get details about Service Operations Workspace for ITSM components such as roles and dependent applications. |

For information about Service Operations Workspace for ITOM, see Service Operations Workspace for ITOM.

### Troubleshoot and get help

Contact Customer Service and Support

# Exploring Service Operations Workspace for ITSM

You can manage the life cycle of task records such as incidents, requests, and walk-ups in IT Service Management workflows.

## Key features

**Landing page**

Tailored landing page for your tier 1 and tier 2 agents. It provides an overview of outages, service announcements, and assignments to efficiently prioritize the work. Tier 1 agents can view and manage their performance and learning tasks assigned by their manager.

**Incident management**

Agents can manage incidents effectively with contextual information and targeted actions. Streamline investigations and accelerate incident resolution with the metrics data collected from Agent Client Collector (ACC).

**Tailored recommendations**

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Agents can use information from similar incidents and knowledge articles to accelerate incident resolution.

**Experts on-call**

Agents can reach out to experts on-call for high-priority tasks.

**Collaboration on incidents**

Agents can collaborate with the requester and peers from the task using Microsoft Teams chat.

**Request management**

#Agents can create requests from incidents and interactions. Agents can also manage the entire life cycle of requests.

**Walk-up experience**

Agents and administrators can review and manage walk-up interactions, appointments, stockrooms, and kiosks at the walk-up service location.

**Onboarding experience for logged-in users**

All logged-in users can view key features to get started with Service Operations Workspace for ITSM.

**Guided setup**

Administrators can have a guided experience for initial configuration of Service Operations Workspace for ITSM.

For information about key features in Service Operations Workspace for ITSM, see Exploring Service Operations Workspace for ITOM.

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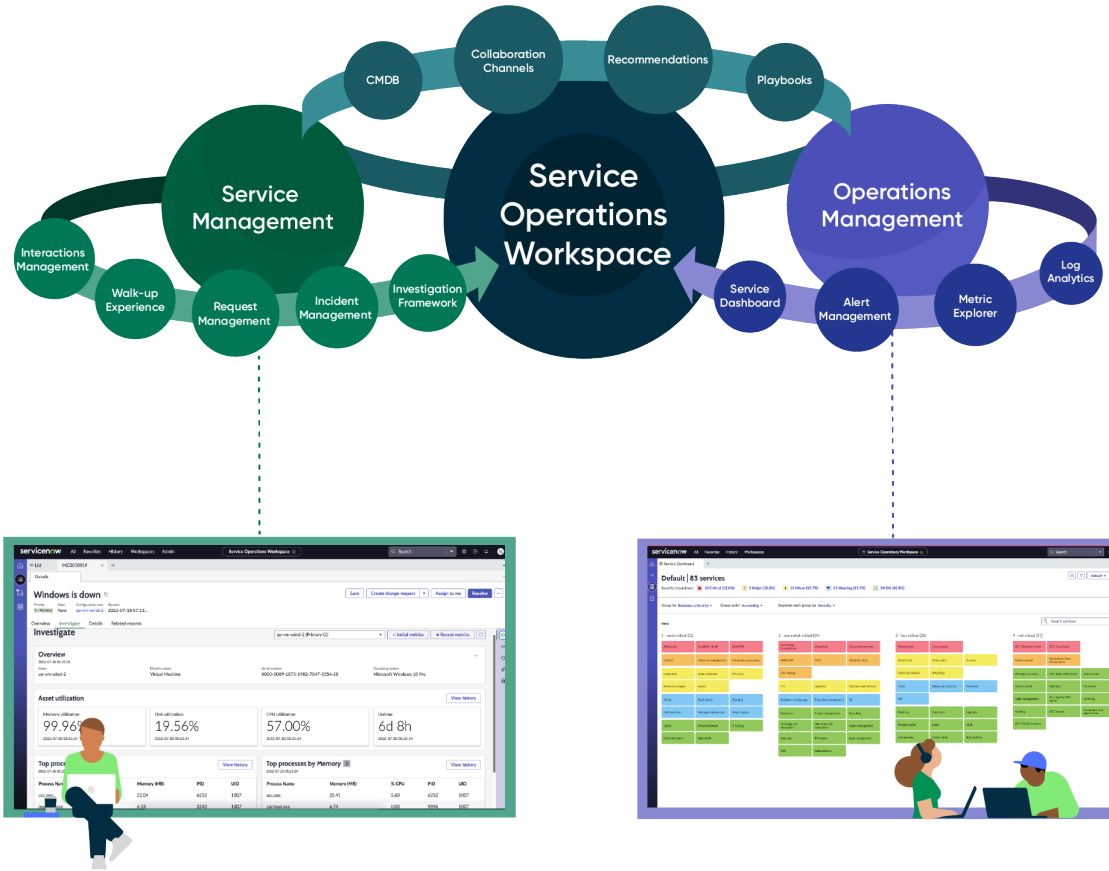
## SOW overview

# Diagram of SOW Workflow

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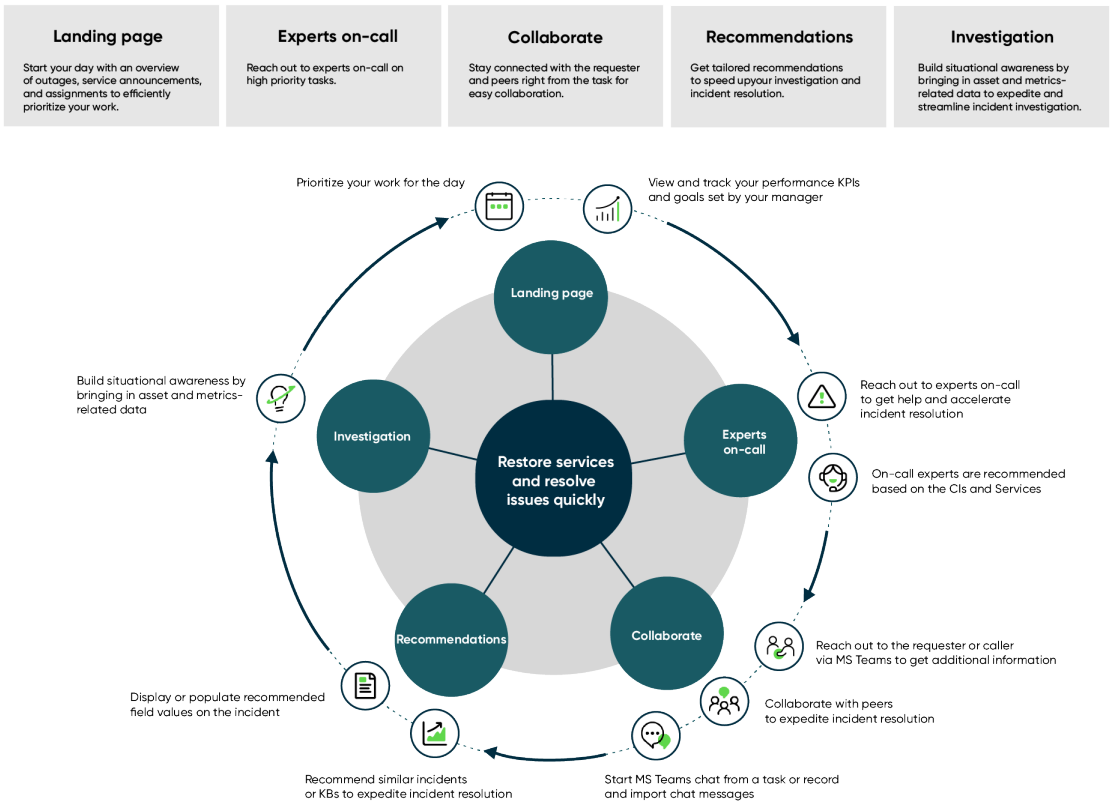
### SOW workflow




## Agent experience in Service Operations Workspace for ITSM

- An agent can start the day by looking at an overview of assignments, outages, service announcements, and assignments in Service Operations Workspace to prioritize work based on service level agreements (SLAs), priority level, and urgency.
- The agent can create an incident based on the issue reported. Since the agent has access to related incidents and recent interactions, better and faster support can be provided. Agent also has access to all related information from the incident record page.
- The agent can resolve the incident faster by using tailored recommendations.
- The agent can reach out to experts on-call for high-priority tasks.
- The agent can collaborate easily with the requester and peers right from the task.
- The agent can create a change request to fix the issue.

## Using guided setup to implement Service Operations Workspace for ITSM

Service Operations Workspace for ITSM guided setup provides a sequence of tasks that help you configure Service Operations Workspace for ITSM on your ServiceNow instance. To open Service Operations Workspace for ITSM guided setup, navigate to **All** > **Adoption Services** >

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**Guided Setup**. For more information about using the guided setup interface, see Using guided setup.

**Related topics**

List of workspaces

## Service Operations Workspace for ITSM user interface

You can navigate through the Service Operations Workspace to get an overview of how an agent can prioritize tasks and provide resolution.

## Accessing Service Operations Workspace

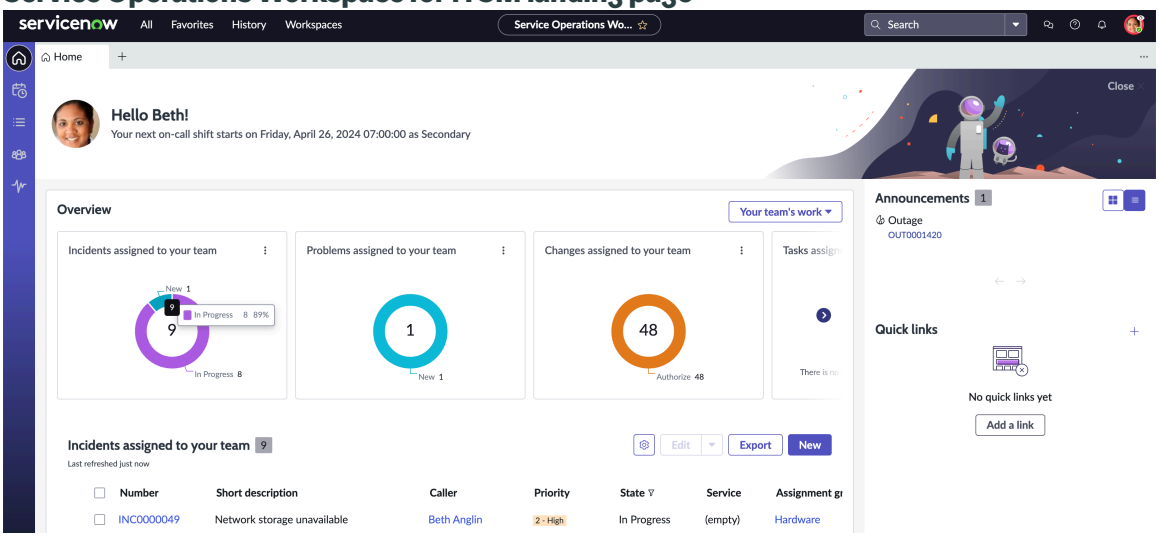
From the **Workspaces** menu, select **Service Operations Workspace**.

## Landing page

From the **Workspaces** menu, select **Service Operations Workspace** and click the home icon ( ).

An agent can analyze assignments and view announcements and upcoming tasks. Tier 1 agents can also analyze the performance and view the assigned courses. For information about the landing page, see Service Operations Workspace for ITSM landing page.

### Service Operations Workspace for ITSM landing page




## Lists

From the **Workspaces** menu, select **Service Operations Workspace** and click the list icon ( ).

An agent can analyze the individual lists of incidents, catalog tasks, requests, problem, and so on, and take appropriate action.

From the **My Lists** tab, an agent can create a separate list or a different version of the existing list. For information about creating a list, see Create a list in Service Operations Workspace.

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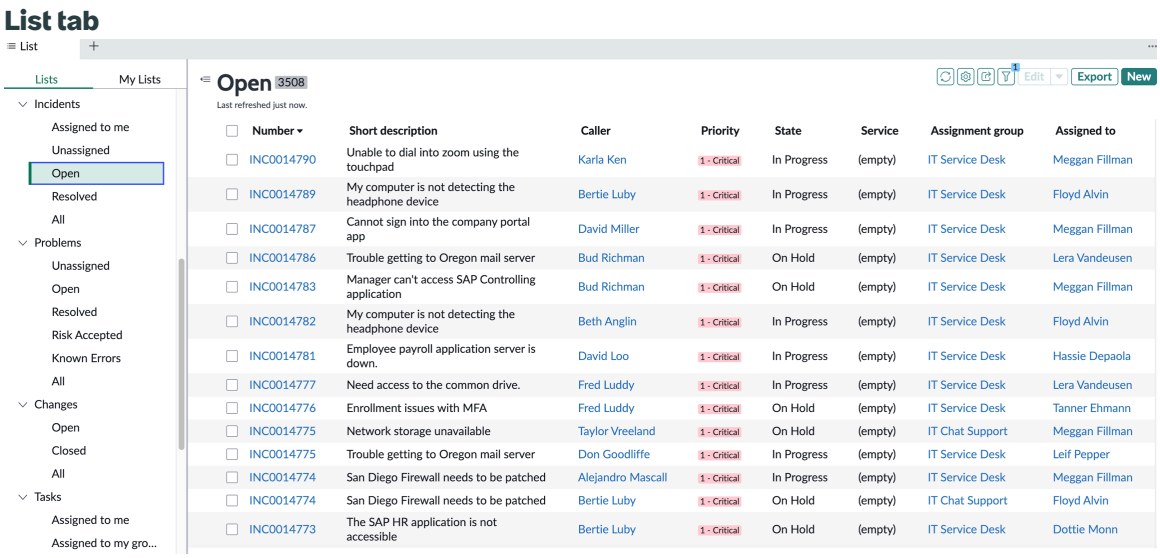
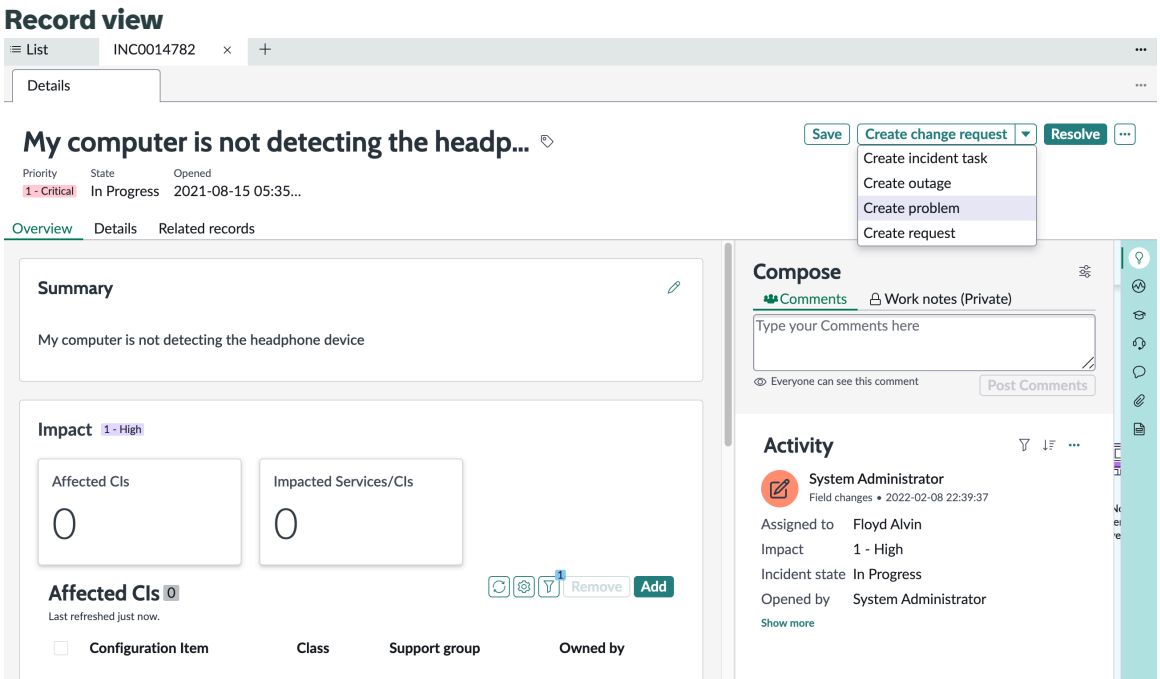



## Record view

Open any task record to navigate to its record view.




## Inbox

Agents can set the status to Available or Away to open or close the inbox for chat requests. When a requester initiates a chat conversation from any Service Portal page, the chat interaction appears in the inbox of all agents who are configured as group members for Agent Chat Queue. For information about inbox configuration, see Configure the inbox in Service Operations Workspace.

The following scenarios are possible for assignment of chat conversation to an agent.

- When the automatic assignment of chat conversations is enabled, the chat conversation is automatically assigned to the agent, an interaction record is created in Service Operations Workspace, and the agent can continue the chat conversation. Based on options selected in the Chat - Most Capacity assignment rule, the interactions can open as non-active tabs in

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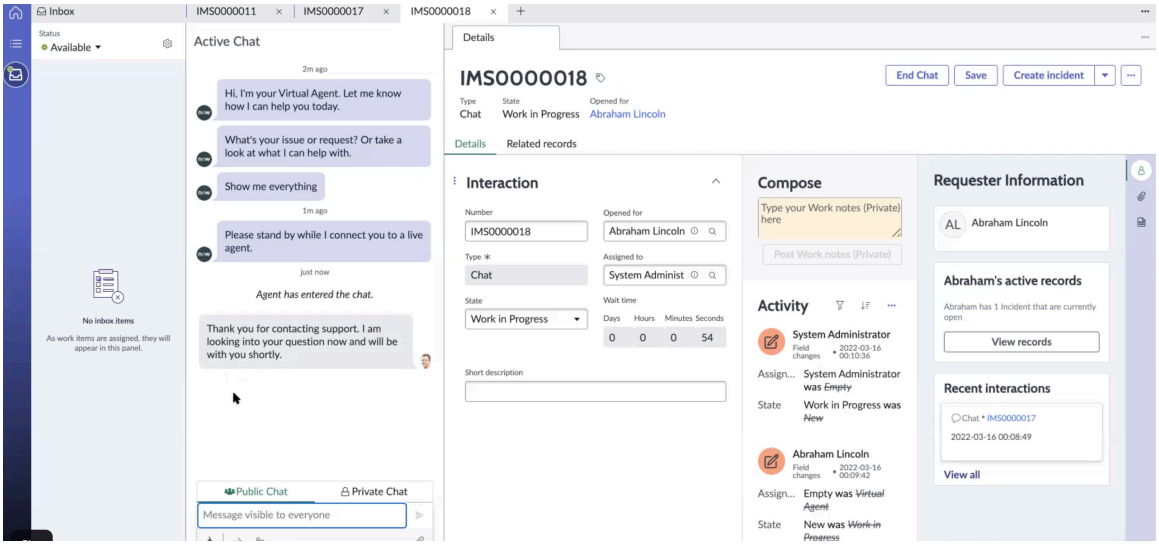
the inbox. For information on enabling automatic assignment of chat conversations using this assignment rule, see Enable automatic assignment of interactions to an agent.

- When the automatic assignment of chat conversations is not enabled, the agent can then approve or reject the chat conversation. When the agent accepts the chat conversation, an interaction record is created in Service Operations Workspace and the agent can continue the chat conversation.

When the requester in Service Portal or the agent in Service Operations Workspace ends the chat conversation, the interaction is closed.

**Inbox**




### Service Operations Workspace for ITSM landing page

An agent can get quick visibility into the work assigned, view announcements, and view upcoming tasks.

## Required roles

A user should have the itil role to access the landing page. A tier-1 agent is an itil user who belongs to a service desk group. A tier-2 agent is an itil user who doesn't belong to a service desk group. For more information about redirection of tier-1 and tier-2 agents to the respective landing page, see Redirect an agent to the Service Operations Workspace landing page.

## Use cases

For examples of how people in your organization can use this landing page, see these use cases. Unless specified otherwise, various sections of the landing page are available for both tier-1 and tier-2 agents.

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**Service Operations Workspace use cases**

| User | Use case |
| --- | --- |
| Tier-1 agent | • Get quick visibility into the work assigned to the agent or the agent's team before starting the day.<br>• Analyze incidents and catalog tasks that need attention and navigate to the records on which action should be taken.<br>• Monitor incidents with service level agreements (SLAs) that have been breached or at risk, open P1 incidents, or the ones not updated in 24 hours.<br><br>To use the features in Workforce Optimization for ITSM, see the **Explore key features in *Workforce Optimization for ITSM*** section. |
| Tier-2 agent | • Get quick visibility into the work assigned to the agent and the agent's team before starting the day.<br>• Analyze incidents, problems, change requests, and tasks that need attention and navigate to the records on which action should be taken.<br>• View the upcoming tasks and announcements.<br>• Access the recently viewed items. |

## Header section

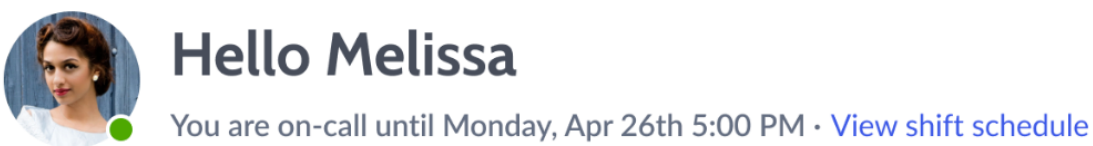
This section displays the greeting text and shift details of the agent. For information about how you can customize this section, see Modify the greeting text on the landing page.

**Header section**




**Note:**
A tier-1 agent with the sn_shift_planning.agent role can navigate to the shift schedule when the Shift Planning for Configurable Workspace application (sn_uib_agent_sp) is enabled.

**Shift schedule of an agent**




## Overview section

From this section, an agent can get an overview of various assignments from the donut cards.

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**Important:**

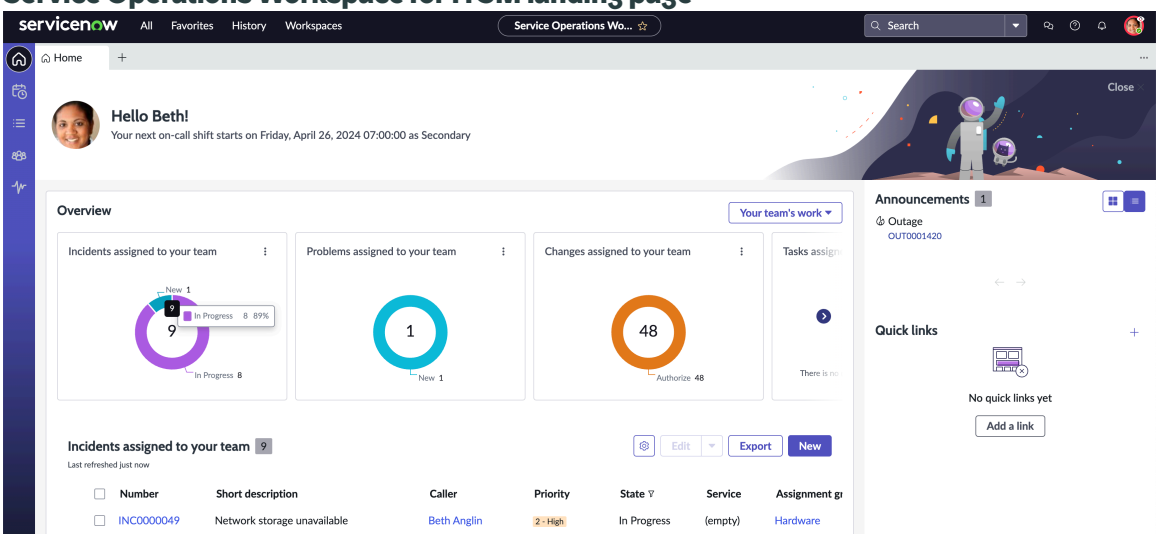
- A tier-1 agent can get an overview of catalog tasks and unresolved incidents assigned to the agent or the agent's group.
- A tier-2 agent can get an overview of problems, change requests, catalog tasks, and unresolved incidents assigned to the agent or the agent's group.
- A tier-1 or tier-2 agent can view tasks delegated to the agent by other users.

When an agent selects any part of the donut area, the associated records are displayed in the list view. When an agent selects the center of the donut area, all records associated with that card are displayed in a list view. From these list views, you can preview and update the record information in the workspace view for the following records by pointing to a record and selecting the preview icon ( ⓘ ):

- Incident
- Problem
- Interaction
- Change
- Request

For information about customizing the **Overview** section, see Modify the donut cards in the Overview section.

**Service Operations Workspace for ITSM landing page**




## Announcements section

This section notifies an agent of any announcements. The agent can view them in a list view or grid view.

For information about how you can customize this section, see Modify the Announcements section on the landing page.

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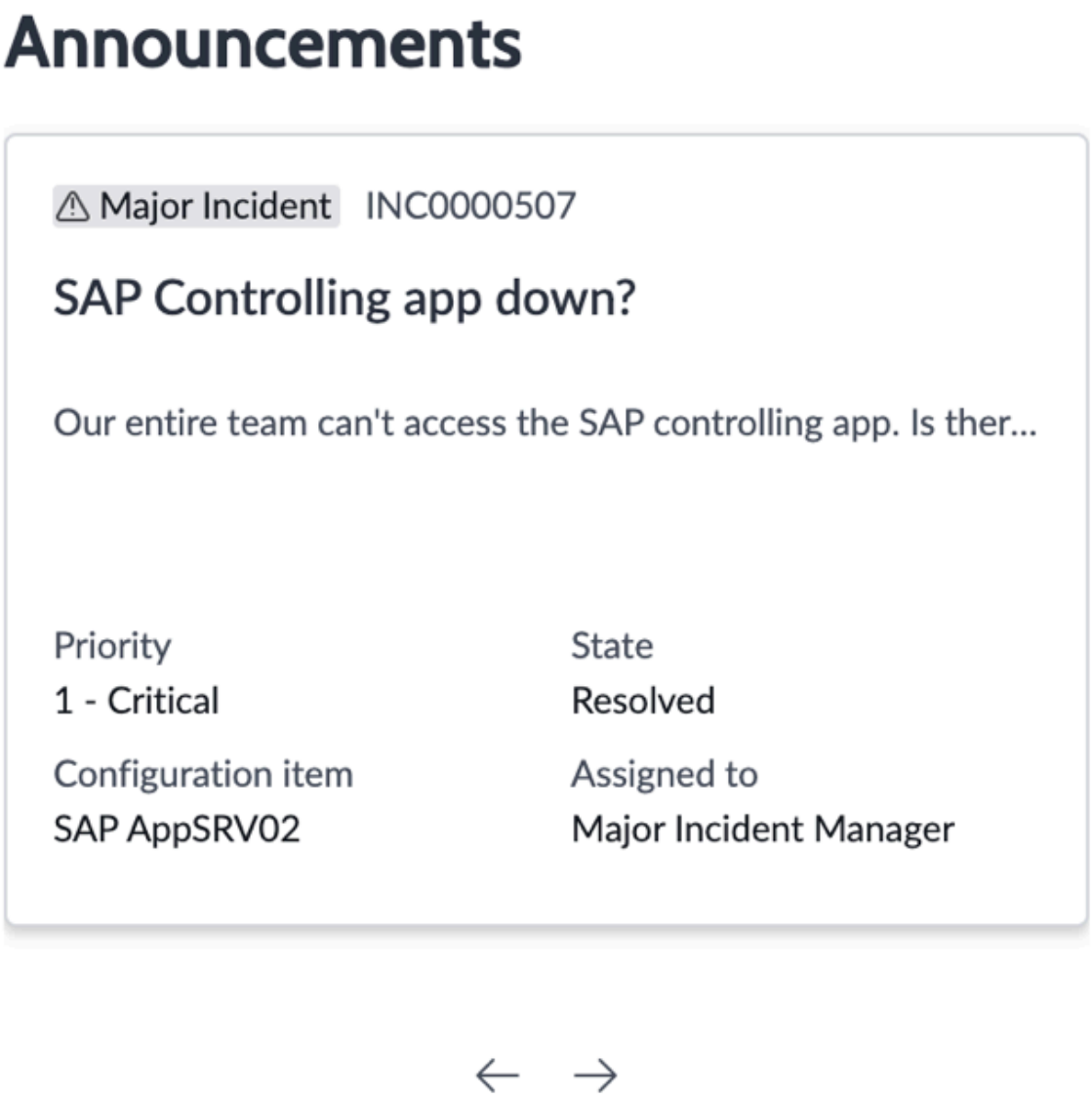
**Announcements section**




## Upcoming section

This section reminds agents of the upcoming tasks for the same day and next day. If there's a single record for the task type, the record opens. If there are multiple records for the task type, it opens a list of all records in a new tab.

**Note:**
An agent can also view tasks delegated to the agent by other users.

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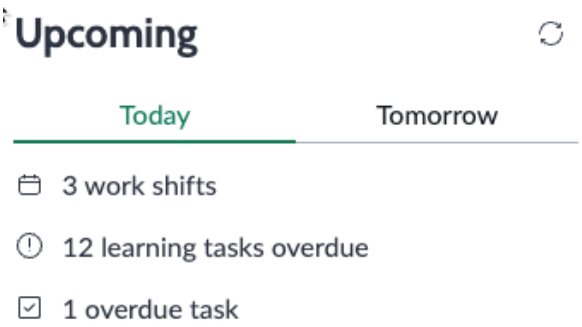
**Workforce Optimization for ITSM Service Operations Workspace**

If you're an agent using the Workforce Optimization for ITSM Service Operations Workspace, you can see links to your upcoming tasks at a glance in the **Upcoming**section.

- The **Today** tab shows tasks that you may want to attend to on the current day.
- The **Tomorrow** tab shows tasks coming up the day after the current day.

You can select the link to access the task.




The following table describes the tasks displayed in this section.

| Tasks | Description |
|---|---|
| Events | Number of events such as training and time off that's related to your shifts.<br>**Note:**<br>If you have an upcoming PTO on the day after the current day, in the **Upcoming** section, the **Today** list will display that you have an upcoming PTO the next day. If you are on PTO the current day, this list does not display that you have a PTO. |
| Shifts | Number of work shifts. |
| Skill review requests | Number of requests from your manager to review your skills. |
| Shift sign-ups | Shifts that you can sign up for that are due on the current day and the day after the current day. |

For more information on Workforce Optimization for ITSM in Service Operations Workspace, see Service Operations Workspace - Scheduling.

For information about how you can customize this section, see Modify the Upcoming section on the landing page.

## Quick links section

This section displays the configured quick links. For information about how you can customize this section, see Add a user-specific quick link on the ITSM landing page.

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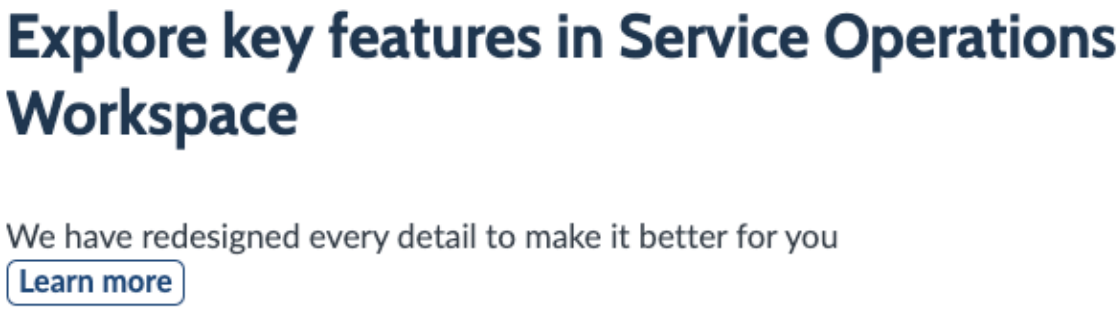
**Quick links section**




## Explore key features in Service Operations Workspace section

It provides an onboarding experience by specifying all key features to get started with Service Operations Workspace for ITSM.

**Onboarding section**




## Explore key features in Workforce Optimization for ITSM

In Service Operations Workspace, when the Workforce Optimization for ITSM plugin (sn_wfo_cfg_itsm) is enabled, you can do the tasks listed for each section in the following table.

| Section in Service Operations Workspace | Task description |
|---|---|
| **Upcoming** | View tasks for the current day and the next day. |
| **My performance** | Analyze performance targets set by your manager. |
| **My active learning section** | Monitor learning tasks that you must complete. |

### Upcoming section

This section reminds agents of the upcoming tasks for the same day and next day. If there's a single record for the task type, the record opens. If there are multiple records for the task type, it opens a list of all records in a new tab.

**Note:**
An agent can also view tasks delegated to the agent by other users.

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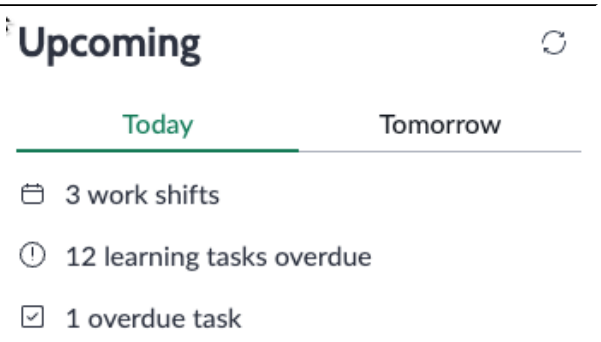
If you're an agent using the Workforce Optimization for ITSM Service Operations Workspace, you can see links to your upcoming tasks at a glance in the **Upcoming**section.

- The **Today** tab shows tasks that you may want to attend to on the current day.
- The **Tomorrow** tab shows tasks coming up the day after the current day.

You can select the link to access the task.



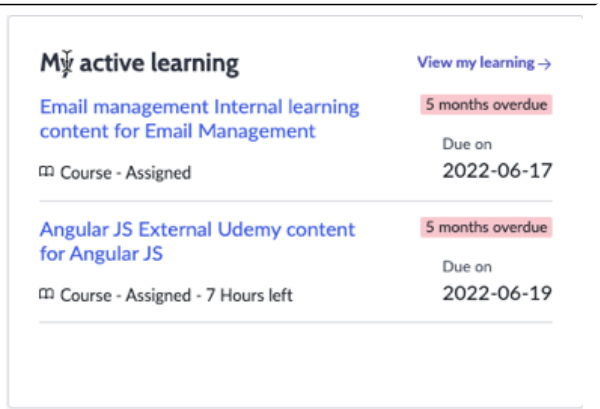

| Tasks | Description |
|---|---|
| Events | Number of events such as training and time off that's related to your shifts.<br>**Note:** If you have an upcoming PTO on the day after the current day, in the **Upcoming** section, the **Today** list will display that you have an upcoming PTO the next day. If you are on PTO the current day, this list does not display that you have a PTO. |
| Shifts | Number of work shifts. |
| Skill review requests | Number of requests from your manager to review your skills. |
| Shift sign-ups | Shifts that you can sign up for that are due on the current day and the day after the current day. |

For information about how you can customize this section, see Modify the Upcoming section on the landing page.

For more information on scheduling in Workforce Optimization for ITSM in Service Operations Workspace, see Service Operations Workspace - Scheduling.

**My active learning section**

The **My active learning** section displays up to three learning tasks, which could include learning paths and courses that are new, due soon, or overdue. These tasks are either the ones that have been assigned to you or the ones you chose to self-enroll. The tasks are sorted by the due date and they're highlighted in red when they're overdue. You can also see the remaining duration to complete a task that you can select and complete.

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For more information, see Service Operations Workspace - Learning.

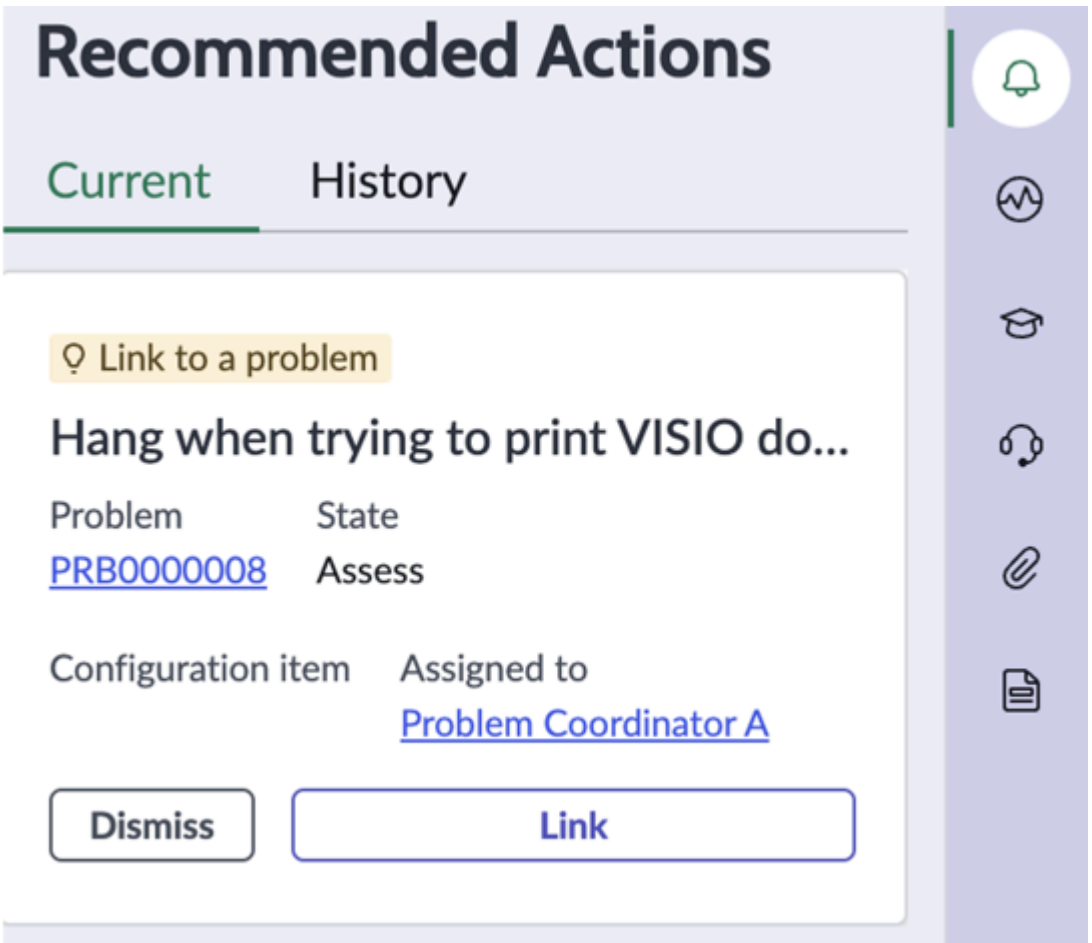
## Exploring Recommended Actions for ITSM in Service Operations Workspace

Recommended Actions for ITSM enables you to configure and use actionable real-time recommendations for incidents in Service Operations Workspace. Agents can quickly and easily use these recommendations to help customers and resolve issues.

## Recommended Actions for ITSM in Service Operations Workspace overview

There are two ways in which recommendations appear- as actionable real-time recommendations in the side panel and as field level recommendations while updating or creating the incidents in Service Operations Workspace.

Agents can access recommended actions in Service Operations Workspace by selecting the recommended actions icon ( ) in the side panel. For more information, see Get Guidance based recommendations.




Agents can view field-level recommendations in the fields of an incident form in Service Operations Workspace. If you're on version prior to 4.2, the recommendations appeared as shown in the following diagram.

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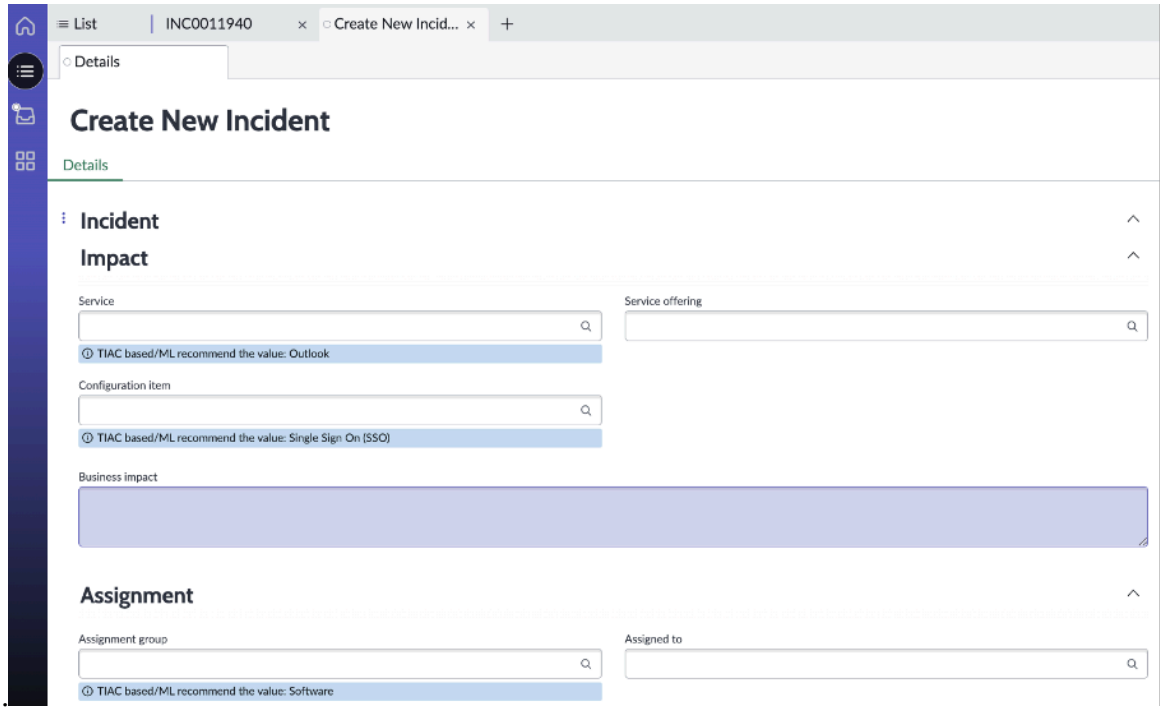
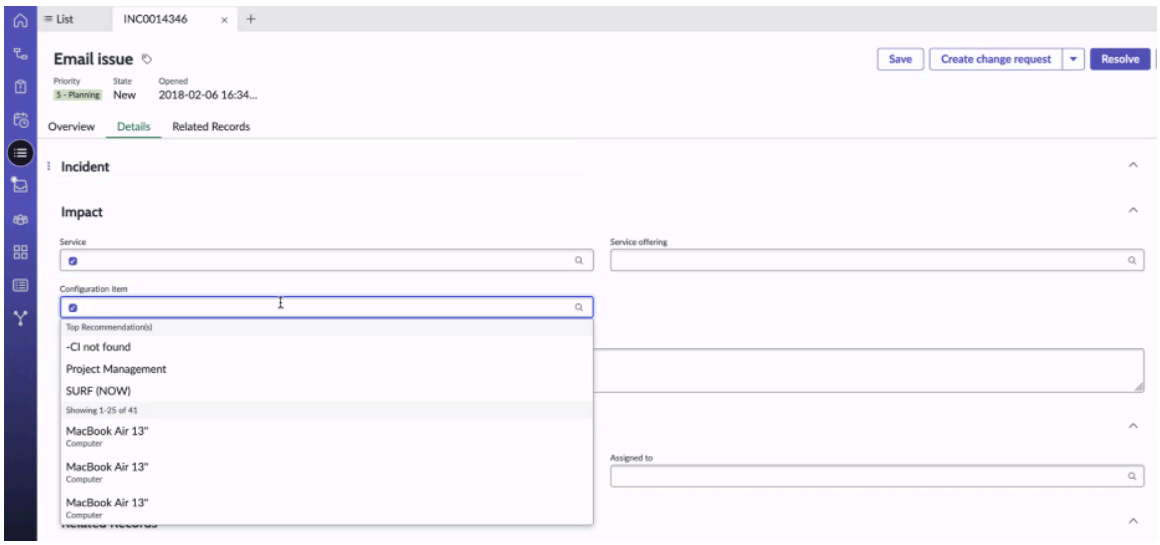



Starting from the version 4.2, field recommendations appear in a drop-down when you click in the field. For more information, see Get field recommendations.




**Note:**
The Recommended Actions for ITSM application only supports ITSM customers using Service Operations Workspace. For more information about Recommended Actions, see Configuring Recommended Actions.

## Request apps on the Store

Visit the#ServiceNow Store #website to view all the available apps and for information about submitting requests to the store. For cumulative release notes information for all released apps, see the#ServiceNow Store#version history release notes.

## Application Details

There are two versions of Recommended Actions - Standard and Advanced.

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The standard version of Recommended Actions for ITSM is provided as a new feature in Incident Management for the Service Operations Workspace application, which is a part of Service Operations Workspace 3.0.

Existing users that have upgraded to Service Operations Workspace 3.0 get the standard version of Recommended Actions for ITSM by default as a new feature. New users get the standard version of Recommended Actions after installing the Service Operations Workspace ITSM (sn_sow_itsm_cont) application from the ServiceNow Store.

To get the advanced version, users must install the Advanced Recommended actions for ITSM (com.snc.uib.sow_itsm_ra_advanced) plugin and must procure the ITSM Pro package subscription.

**Note:**
To get the advanced version, you can install the Task Intelligence for ITSM (com.snc.itsm_ml_task) plugin and procure the ITSM Pro package subscription. For more information, see Configuring Recommended Actions for ITSM in Service Operations Workspace.

## Workflow

The workflow for Recommended Actions for ITSM includes the following:

1. Use Context - **Incident**: Use incident context to generate the field predictions on the incident form.
2. Set Rule: Configure the recommendations for required roles and conditions.
3. Create Recommendations: Create recommendations where you select a resource generator and action types.
   - Create Resource Generator: Resource generators provide information that you can use as inputs to actions such as recommendation guidance and field recommendations. The trained machine learning solution models configured in Predictive Intelligence or Task Intelligence for ITSM are used as solutions in the generator type to get the required recommendations for the incident forms in Service Operations Workspace.

     **Note:**

     - The **Incident Fields value prediction (TI)** recommendation is the only recommendation where the trained model comes from Task Intelligence for ITSM. For more information, see Task Intelligence for ITSM.
     - All remaining recommendations use the trained model from Predictive Intelligence. For more information, see Predictive Intelligence for Incident Management.

   - Create Action type: Configure the actions that an agent can perform for Recommended Actions guidance. Update the following:
     - Input: Select the input fields.
     - Output: Select the options to decide how the recommendations should look in the input fields.
     - Action: Select the actions that are presented to the agent to perform the guidance.

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**Note:**
For more information, see Setting up Recommended Actions for ITSM.

4. Get guidance-based or field-level recommendations for incident forms in Service Operations Workspace. For more information, see Recommended Actions for ITSM in Service Operations Workspace.

### Recommended Actions for ITSM overview

IT Service Management (ITSM) includes the following base system components used to configure Recommended Actions for incidents in Service Operations Workspace.

## Contexts in Recommended Actions for ITSM

#A context enables agents to see recommendations for a specific type of record when certain rules are met. These recommendations can help agents by suggesting actions to take based on the record context.#For more information, see Contexts in Recommended Actions.

The ITSM base system ships with Incident-context. For more information about the field description of this context, see Contexts in Recommended Actions for ITSM.

**Note:**
To create a context, see Create a context in Recommended Actions.

## Rules in Recommended Actions for ITSM

A rule is a set of conditions that applies to a context. A rule shows recommendations to agents with certain roles for records that meet certain conditions. For more information, see Rules in Recommended Actions.

The ITSM base system includes the following rules:

- Active incident
- Active non-child non-MI Incident

For more information about the field descriptions of these rules, see Rules in Recommended Actions for ITSM.

**Note:**
To create a rule, see Create a rule in Recommended Actions.

## Recommendations in Recommended Actions for ITSM

A recommendation is a way to suggest a helpful action to an agent. A recommendation includes the action and any relevant resources and inputs. For more information, see Recommendations in Recommended Actions.

For more information about recommendation types, see Recommendations in Recommended Actions.

**Note:**
To create a recommendation, see Create a recommendation in Recommended Actions.

The ITSM base system includes Guidance-based recommendations and Field-level recommendation types.

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### Guidance-based recommendations

The ITSM base system includes these guidance-based recommendations:

- Propose Major Incident (Trend)
- Similar KB Articles (Similarity)
- Similar Major Incident (Trend)
- Similar Open Incidents (Similarity)
- Similar Open PRBs (Similarity)
- Similar Resolved Incidents (Similarity)
- Open PRBs (CI & service)
- Open incidents (CI & Service)
- Similar Resolved incidents (CI & Service)
- Similar Resolved incidents (CI & Service)

For more information about the field descriptions of the guidance-based recommendations, see Guidance based recommendations in Recommended Actions for ITSM.

### Field-level recommendations

The ITSM base system includes the following field-level recommendations:

- Predictive Intelligence -based recommendations:
  - Assignment Group (Classification)
  - Configuration Item (Classification)
  - Service (Classification)
- Task Intelligence for ITSM -based recommendation: Incident Fields value prediction (TI)

**Note:**
All Predictive Intelligence -based recommendations included in the ITSM base system are inactive by default. To activate them, navigate to the Recommendations screen, edit the corresponding Active column to the required recommendation of **true**, and select **Update**.

For more information about the field-level recommendations field descriptions, see Field level recommendations in Recommended Actions for ITSM.

**Note:**
To create a guidance and field recommendations, see Creating guidance and field recommendation in Recommended Actions.

### Resource generators in Recommended Actions for ITSM

The ITSM base system includes the following resource generators:

- Assignment group using Classification.
- Configuration item using Classification
- Incident Fields predictions TI
- Similar Open Incidents with same CI & Service

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- Open PRBs using CI & Service
- Propose major incident using trend
- Service using Classification
- Similar KBs using similarity
- Similar major incident using trend
- Similar open incidents using Similarity
- Similar PRBs using similarity
- Resolved Incidents with same CI & Service
- Similar resolved incidents using similarity.

For more information about the field descriptions of resource generators, see Resource generators in Recommended Actions for ITSM.

For more information about the types of resource generator, see Resource generators in Recommended Actions.

**Note:**
To create a resource generator, see Create a resource generator in Recommended Actions.

### Guidances

The ITSM base system includes the following guidance:

- Link open incident
- Link open problem
- Link to major incident
- Attach KB
- Copy resolution
- Propose Major Incident
- [Non-ML] Copy Resolution
- [Non-ML] Link open incident
- [Non-ML] Link open problem

For more information about the field descriptions of the guidance, see Guidances in Recommended Actions for ITSM.

**Note:**
To create guidance, see Create a guidance in Recommended Actions.

## Configuring Service Operations Workspace for ITSM

Configure Service Operations Workspace so that agents can manage IT fulfillment volume efficiently.

For information about configuring Service Operations Workspace for ITOM, see Configuring Service Operations Workspace for ITOM.

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## Setting up Service Operations Workspace for ITSM

Setting up Service Operations Workspace helps an agent get started with using its features and capabilities.

1. Procure ITSM Standard license or above for ServiceNow IT Service Management applications.
2. Install Service Operations Workspace ITSM Applications from ServiceNow® Store. For information about this installation, see Install Service Operations Workspace ITSM Applications.
3. To redirect an agent to the Service Operations Workspace landing page, see Redirect an agent to the Service Operations Workspace landing page.
4. To ensure that the right users have access to the Service Operations Workspace landing page, see Configure service desk groups to access the Service Operations Workspace landing page.
5. To display SLA information on an incident record page, you should configure SLA timer configuration mappings for incident timer configurations. For information about this configuration, see Customize the display of service level agreements for an incident.

### Install Service Operations Workspace ITSM Applications

You can install the Service Operations Workspace ITSM Applications application (sn_sow_itsm_cont) if you have the admin role. The application includes demo data and installs related ServiceNow® Store applications if they are not already installed.

#### Before you begin

- Ensure that the application and all of its associated ServiceNow Store applications have valid ServiceNow entitlements. For more information, see Get entitlement for a ServiceNow product or application.
- Review the Service Operations Workspace ITSM Applications application listing in the ServiceNow Store for information on dependencies, licensing or subscription requirements, and release compatibility.

Role required: admin

#### About this task

The Service Operations Workspace ITSM Applications application enables you to streamline IT Service Management workflows and processes. You can effectively manage the life cycle of incidents, requests, and walk-up appointments in Service Operations Workspace.

The following items are installed with Service Operations Workspace ITSM Applications:

- Store applications
- Plugins
- Role

For more information, see Components installed with Service Operations Workspace ITSM Applications.

#### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the Service Operations Workspace ITSM Applications application (sn_sow_itsm_cont) using the filter criteria and search bar.

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You can search for the application by its name or ID. If you cannot find the application, you might have to request it from the ServiceNow Store.

In the list next to the **Install** button, the versions that are available to you are displayed.

3. Select a version from the list and select **Install**.

   In the Install dialog box that is displayed, any dependencies that are installed along with your application are listed.

4. If you're prompted, follow the links to the ServiceNow Store to get any additional entitlements for dependencies.
5. **Optional:** If demo data is available and you want to install it, select the **Load demo data** check box.
   Demo data comprises the sample records that describe application features for the common use cases. Load the demo data when you first install the application on a development or test instance.

   **Important:**
   If you don't load the demo data during installation, it's unavailable to load later.

6. Select **Install**.

### Redirect an agent to the Service Operations Workspace landing page

Enable an agent to start prioritizing tasks quickly by redirecting the agent to the Service Operations Workspace landing page after logging in to the ServiceNow instance.

#### Before you begin

Role required: admin

Ensure that Next Experience is enabled on your instance. For information about its activation, see Considerations for activating Next Experience.

Ensure that the value of the *glide.login.home* property is set to `/now/nav/ui/home`. This property specifies the default homepage displayed on login.

#### About this task

A tier-1 agent is an itil user who belongs to a service desk group.

A tier-2 agent is an itil user who doesn't belong to a service desk group.

#### Procedure

1. To redirect the agent to Service Operations Workspace, ensure that the itil role is assigned to the user record of the agent.

   a. Navigate to **All** > **User Administration** > **Users** and then open the user record for the agent.

   b. In the Roles related list, ensure that the itil role is added and active.

   c. If the itil role isn't already added to the user record, add the itil role by following these steps.

      i. In the Roles related list, select **Edit**.

      ii. On the Edit Members form, add the itil role from the **Collection** list to the **Roles List** list.

      iii. Select **Save**.

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2. To redirect a tier-1 agent to the Service Operations Workspace tier-1 landing page, ensure that the user record belongs to a service desk group.

   a. Navigate to **All** > **User Administration** > **Groups** and open a service desk group. For example, Service Desk.

   b. In the Group Members related list, ensure that the agent(user) is added.

   c. If the user isn't already added to the service desk group, add the user by following these steps.

      i. In the Group Members related list, select **Edit**.

      ii. On the Edit Members form, add the user from the **Collection** list to the **Group Members List** list.

      iii. Select **Save**.

   d. If you aren't using the service desk group available in the base system, update the *sn_sow.service_desk_groups* property with the group id of the agent by following these steps.

      i. From the#**All**#menu, navigate to **sys_properties.list**.

      ii. Select **New**.

      iii. Add the#*sn_sow.service_desk_groups* property.

      iv. In the#**Value**#field, specify the sys_id of the user group that the agent is part of.

      > **Note:**
      > If you want to specify multiple service desk groups, add a comma-separated list of sys_ids of the user groups.

      v. Select#**Submit**.

3. To redirect a tier-2 agent to the Service Operations Workspace tier-2 landing page, enable the use of user criteria records instead of the **Roles** field for UX Framework variants.

   a. From the#**All**#menu, navigate to#**sys_properties.list**.

   b. Select the *glide.ux.user_criteria_enabled* property.

   c. In the#**Value** field, specify **true**.

   d. Select#**Update**.

### Configure service desk groups to access the Service Operations Workspace landing page

Ensure that the right users have access to the Service Operations Workspace landing page.

#### Before you begin

Role required: admin

#### About this task

It is applicable only for an instance that has Service Operations Workspace 1.1 installed and has upgraded to Washington DC.

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### Procedure

1. Configure the system property for landing page access by performing the following steps.
   a. From the **All** menu, navigate to **sys_properties.list**.
   b. To ensure that the user criteria records are used instead of roles to access the landing page, set the *glide.ux.user_criteria_enabled* property to `true`.
   c. Select **Update**.
2. Add the required service desk groups to the user criteria of the SOW Service Desk Audience by performing the following steps.
   a. Navigate to **All** > **Now Experience Framework** > **Building Blocks** > **Audiences**.
   b. Perform the following steps for **SOW Service Desk Audience**.
      i. From the **User Criteria Inclusions** related list, open the **Service Desk Group Inclusion**.
      ii. For the **Groups** field, add the required service desk group that the agent is part of.
      iii. Select **Update**.

## Redirect agents of a specific group to Service Operations Workspace

Enable only agents of specific user groups to be automatically redirected to Service Operations Workspace after logging in to the ServiceNow instance.

### Before you begin
Role required: admin

### About this task
Only the agents who are part of specified user groups are redirected to Service Operations Workspace. All other agents are redirected either to the agent-configured landing page or ServiceNow AI Platform landing page.

### Procedure

1. From the **All** menu, navigate to **user_criteria.list**.
2. Select the **ITIL non-admin** user criteria record.
3. For the **Groups** field, select the required user groups whose agents must access Service Operations Workspace.
4. Select **Update**.
5. Ensure that the itil role is assigned to each agent.
   a. Navigate to **All** > **User Administration** > **Users** and then open the user record for the agent.
   b. In the **Roles** list, ensure that the **itil** role is added and active.
   c. If the itil role isn't already added to the user record, add the itil role by following these steps.
      i. In the **Roles** list, select **Edit**.
      ii. On the **Edit Members** form, add the itil role from the **Collection** list to the **Roles List** list.
      iii. Select **Save**.

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### Disable auto-redirection for all agents to Service Operations Workspace

Verify that no agent is automatically redirected to Service Operations Workspace after logging in to the ServiceNow instance.

#### Before you begin

Role required: admin

#### Procedure

1. From the **All** menu, navigate to sys_homepage_destination_rule.list.
2. Select the **SOW Landing Page** record.
3. Clear the **Active** check box.
4. Select **Update**.
5. Clear the browser cache by using the following steps:
   a. Enter `<instance-name>.service-now.com/cache.do` in the web browser.
   b. Select **Clear Cache**.
      The browser page is refreshed.
   c. Select **Clear All Browser Caches**.
      The browser page shows the `Unified Cache Cleared` message.

**Note:**

If the Homepage Destination Rules [sys_homepage_destination_rule] table contains other records that redirect to SOW, use these steps to clear the **Active** check box for each record.

## Setting up Investigation Framework in Service Operations Workspace

Set up the Investigation Framework in Service Operations Workspace to enable the display of the CI metrics information on the **Investigation** tab of the Incident records.

### Setting up investigation framework using Agent Client Collector for Investigation

Set up the Investigation Framework in Service Operations Workspace using the Agent Client Collector for Investigation adapter to enable the display of the CI metrics information on the **Investigation** tab of the Incident records.

You must ensure that the following requirements are met:

- Install the Service Operations Workspace ITSM Applications (sn_sow_itsm_cont) application from the ServiceNow Store. For information about this installation, see Install Service Operations Workspace ITSM Applications.
- Install the Agent Client Collector for Investigation Application. For more information, see Install Agent Client Collector for Investigation.

**Note:**
Installing the Agent Client Collector for Investigation application requires the ITSM Pro package subscription.

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### Install Agent Client Collector for Investigation

Install the Agent Client Collector for Investigation application (sn_acc_adapter) if you have the admin role.The application includes demo data and installs related ServiceNow® Store applications and plugins if they are not already installed.

## Before you begin

- Ensure that the application and all of its associated ServiceNow Store applications have valid ServiceNow entitlements. For more information, see Get entitlement for a ServiceNow product or application.
- Review the Service Operations Workspace ITSM Applications application listing in the ServiceNow Store for information on dependencies, licensing or subscription requirements, and release compatibility.
- Installing the Agent Client Collector for Investigation application requires ITSM Pro package subscription.

Role required: admin

## About this task

The Agent Client Collector for Investigation application enables you to retrieve and display the CI metrics information for the affected CIs with ci_computer or ci_server class. You can customize and configure the display of the CI metrics data using the Investigate Framework module, which is installed along with this application. The CI metrics information of the affected CIs helps you to analyze and resolve the issue.

The following items are installed with the Agent Client Collector for Investigation application:

- Store applications
- Roles

For more information, see Components installed with Agent Client Collector for Investigation.

## Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the Agent Client Collector for Investigation application (sn_acc_adapter) using the filter criteria and search bar.

   You can search for the application by its name or ID. If you cannot find the application, you might have to request it from the ServiceNow Store.

   In the list next to the **Install** button, the versions that are available to you are displayed.
3. Select a version from the list and select **Install**.

   In the Install dialog box that is displayed, any dependencies that are installed along with your application are listed.
4. If you're prompted, follow the links to the ServiceNow Store to get any additional entitlements for dependencies.
5. **Optional:** If demo data is available and you want to install it, select the **Load demo data** check box.
   Demo data comprises the sample records that describe application features for the common use cases. Load the demo data when you first install the application on a development or test instance.

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**Important:**
If you don't load the demo data during installation, it's unavailable to load later.

6. Select **Install**.

### Setting up investigation framework using Microsoft Endpoint Configuration Manager for Investigation

Set up the Investigation Framework in Service Operations Workspace using Microsoft Endpoint Configuration Manager for Investigation to enable the display of the CI metrics information on the **Investigation** tab of the Incident records.

You must ensure that the following requirements are met:

- Install the Service Operations Workspace ITSM Applications (sn_sow_itsm_cont) application from the ServiceNow Store.

  For information about this installation, see Install Service Operations Workspace ITSM Applications.

- Install and configure Microsoft Endpoint Configuration Manager Spoke (sn_ms_epcfgmgr_spk) application. For more information, see Microsoft Endpoint Configuration Manager spoke and Microsoft SCCM integration.
- Install the Microsoft Endpoint Configuration Manager for Investigation application.

  For more information, see Install Microsoft Endpoint Configuration Manager for Investigation.

### Install Microsoft Endpoint Configuration Manager for Investigation

You can install the Microsoft Endpoint Configuration Manager for Investigation (sn_mecm_adapter) application if you have the admin role. The application includes demo data and installs related ServiceNow® Store applications and plugins if they aren't already installed.

#### Before you begin

- Ensure that the application and all of its associated ServiceNow Store applications have valid ServiceNow entitlements. For more information, see Get entitlement for a ServiceNow product or application.
- Review the Service Operations Workspace ITSM Applications application listing in the ServiceNow Store for information on dependencies, licensing or subscription requirements, and release compatibility.

Role required: admin

#### About this task

The Microsoft Endpoint Configuration Manager for Investigation (sn_mecm_adapter) application enables you to retrieve and display the CI metrics information for the affected CIs with the ci_computer or ci_server class on the **Investigation** tab of the Incident record. You can configure the display of the CI metrics data using the Investigate Framework module, which is installed along with this application. The CI metrics information of the affected CIs helps you to analyze and resolve the issue.

The following items are installed with Microsoft Endpoint Configuration Manager for Investigation (sn_mecm_adapter) application:

- Store applications
- Roles

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For more information, see Components installed with Microsoft Endpoint Configuration Manager for Investigation.

### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the Microsoft Endpoint Configuration Manager for Investigation (sn_mecm_adapter) application using the filter criteria and search bar.

   You can search for the application by its name or ID. If you can't find the application, you might have to request it from the ServiceNow Store.

   In the list next to the **Install** button, the versions that are available to you are displayed.
3. Select a version from the list and select **Install**.

   In the Install dialog box that is displayed, any dependencies that are installed along with your application are listed.
4. If you're prompted, follow the links to the ServiceNow Store to get any additional entitlements for dependencies.
5. **Optional:** If demo data is available and you want to install it, select the **Load demo data** check box.
   Demo data comprises the sample records that describe application features for the common use cases. Load the demo data when you first install the application on a development or test instance.

   **Important:**
   If you don't load the demo data during installation, it's unavailable to load later.
6. Select **Install**.

### Configuring CI metrics for Microsoft Endpoint Configuration Manager for Investigation

Configure the display of the metrics for Microsoft Endpoint Configuration Manager for Investigation.

You must ensure the following requirements:

- Microsoft Endpoint Configuration Manager for Investigation (sn_mecm_adapter) application must be installed along with the investigation framework applications. For more information, see Install Microsoft Endpoint Configuration Manager for Investigation and Components installed with Microsoft Endpoint Configuration Manager for Investigation.
- Microsoft Endpoint Configuration Manager Spoke [sn_ms_epcfgmgr_spk] must be installed and configured. For more information, see Microsoft Endpoint Configuration Manager spoke and Microsoft SCCM integration.
- Microsoft Endpoint Configuration Manager server must be logged in using the Microsoft remote desktop.

**Note:**
You can configure the delay time in milliseconds between two consecutive Microsoft Endpoint Configuration Manager queries that are submitted to the Microsoft Endpoint Configuration Manager server to fetch and display the metrics, using the property **Specify the delay in milliseconds between two MECM query submissions.** (*sn_mecm_adapter.request_query_delay*). The default value is 10000.

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### Configure system overview - msinfo32 metrics

Configure the system overview - msinfo32 metrics for Microsoft Endpoint Configuration Manager for Investigation (MECM).

## Before you begin

Role required: sn_cimaf.sn_cimaf_admin

## Procedure

1. Open the Microsoft Endpoint Configuration Manager.
2. Create a MECM script with the name `createMSInfo32File`.
   For more information, see Create a script in Microsoft Endpoint Configuration Manager.
3. Provide the following code in the script block.

```
Param(
[Parameter(Mandatory=$True)]
[string]$scriptName
)

$filePath = ".\" + $scriptName + ".txt";

#invoke msinfo32 and save data into file
msinfo32 /report $filePath;
```

4. Create a MECM script with the name `checkMsInfo32FileExist`.
   For more information, see Create a script in Microsoft Endpoint Configuration Manager.
5. Provide the following code in the script block.

```
Param(
[Parameter(Mandatory=$True)]
[string]$scriptName
)

$filePath = ".\" + $scriptName + ".txt";

#check if file exist
$fileExist = Test-Path -Path $filePath;

#read msinfo32 data
if($fileExist) {
    Write-Host "True"
}else {
    Write-Host "False";
}
```

6. Create a MECM script with the name `fetchMsInfo32File`.
   For more information, see Create a script in Microsoft Endpoint Configuration Manager.
7. Provide the following code in the script block.

```
Param(
[Parameter(Mandatory=$True)]
[string]$scriptName
)

$filePath = ".\" + $scriptName + ".txt";
```

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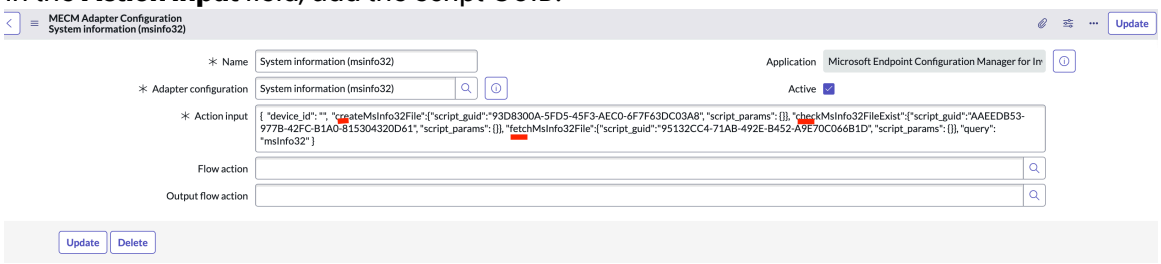
```
#check if file exist
$fileExist = Test-Path -Path $filePath;

#read msinfo32 data
if($fileExist) {
    Get-Content $filePath;
    Remove-Item $filePath
}else {
    Write-Host "File doesn't exist";
}
```

8. Retrieve and copy the script GUID.
9. Open the MECM Adapter Configuration [sn_mecm_adapter_config] table.
   The MECM Adapter Configuration table displays the list of adapter configurations.
10. From the list of configurations, select and edit **System information (msinfo32)**.
11. In the **Action input** field, add the script GUID.




12. Click **Update**.

### Configure system overview - dsregcmd metrics

Configure the system overview - dsregcmd metrics for Microsoft Endpoint Configuration Manager for Investigation (MECM).

#### Before you begin

Role required: sn_cimaf.sn_cimaf_admin

#### Procedure

1. Open the Microsoft Endpoint Configuration Manager.
2. Create a MECM script with the name `dsregcmd`.
   For more information, see Create a script in Microsoft Endpoint Configuration Manager.
3. Provide the following code in the script block.

```
dsregcmd /status
```

4. Retrieve and copy the script GUID.
5. Open the MECM Adapter Configuration [sn_mecm_adapter_config] table.
   The MECM Adapter Configuration table displays the list of adapter configurations.
6. From the list of configurations, select and edit **System information**.
7. In the **Action input** field, add the script GUID.

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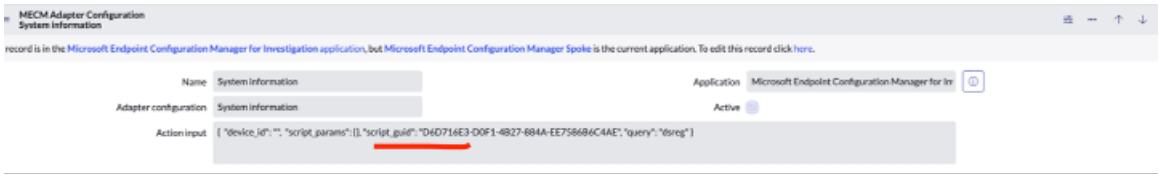


8. Click **Update**.

### Configure asset utilization metrics

Configure the display of the asset utilization metrics for Microsoft Endpoint Configuration Manager for Investigation.

#### Before you begin

Role required: sn_cimaf.sn_cimaf_admin

#### Procedure

1. Open the Microsoft Endpoint Configuration Manager.
2. Select the required CI device, and verify the CMPivot entities and attributes.
   For more information, see Verify a CMPivot entity.
3. Configure the Disk Utilization metrics by verifying that the **Disk** CMPivot entity exists and has the attributes **Size** and **Free Space**.
4. Configure the Memory Utilization metrics.
   a. Verify that the **Memory** CMPivot entity exists and has the attribute **TotalPhysicalMemory**.
   b. Verify that the **OS** CMPivot entity exists and has the attribute **FreePhysicalMemory**.
5. Configure the CPU Utilization metrics by verifying that the **Processor** CMPivot entity exists and has the attribute **LoadPercentage**.
   If the **Processor** CMPivot entity doesn't exist, you must add the entity to the hardware inventory. For more information, see Extend hardware inventory.
6. Configure the Uptime metrics by verifying that the **OperatingSystem** CMPivot entity exists and has the attribute **LastBootUpTime**.

#### Result

The asset utilization metrics is displayed on the **Investigation** tab of the incident record in Service Operations Workspace.

### Configure processes metrics

Configure the top processes by CPU and top processes by memory metrics for Microsoft Endpoint Configuration Manager for Investigation.

#### Before you begin

Role required: sn_cimaf.sn_cimaf_admin

#### Procedure

1. Open the Microsoft Endpoint Configuration Manager.
2. Create a MECM script with the name `GetProcess`.
   For more information, see Create a script in Microsoft Endpoint Configuration Manager.
3. Provide the following code in the script block.

```
Param(
[Parameter(Mandatory=$True)]
[string]$orderBy,
```

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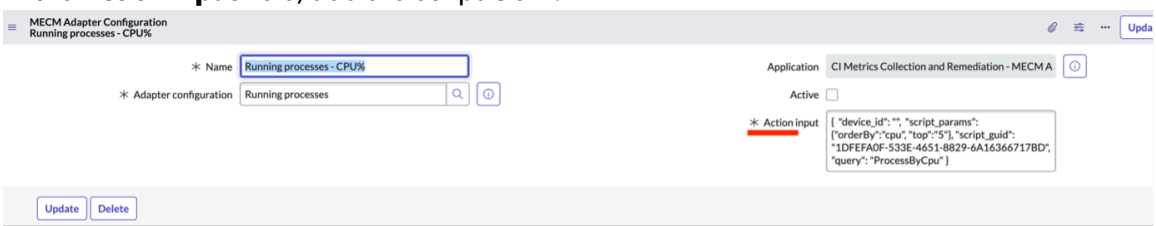
```
[Parameter(Mandatory=$True)]
[string]$top
)

$processes = get-process

$Total = 0;
ForEach ($process in $processes) {
    $Total += $process.cpu;
}

$processes | Sort-Object $orderBy -Descending | select
 processname,id,ws,cpu -First $top | select processname,id,
 @{l="mem"; e={$_.ws}}, @{l="cpu"; e={($_.cpu / $Total) *
 100}};
```

4. Retrieve and copy the script GUID.
5. Open the MECM Adapter Configuration [sn_mecm_adapter_config] table.
   The MECM Adapter Configuration table displays the list of adapter configurations.
6. From the list of configurations, select and edit **Running processes - CPU%**.
7. In the **Action input** field, add the script GUID.




8. Click **Save**.
9. From the list of configurations, select and edit **Running processes - MEM**.
10. In the **Action input** field, add the script GUID.
11. Click **Save**.

### Result

The top processes by CPU and top processes by memory metrics are displayed on the **Investigation** tab of the incident record in Service Operations Workspace.

## Configure services metrics

Configure the services metrics for Microsoft Endpoint Configuration Manager for Investigation (MECM).

### Before you begin

Role required: sn_cimaf.sn_cimaf_admin

### Procedure

1. Open the Microsoft Endpoint Configuration Manager.
2. Select the required CI device, and verify the CMPivot entities and attributes.
   For more information, see Verify a CMPivot entity.
3. Configure the services metrics by verifying that the **Services** CMPivot entity exists and has the attributes **Name**, **DisplayName**, **State**, and **ProcessId**.

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### Result
The services metrics are displayed on the **Investigation** tab of the incident record in Service Operations Workspace.

#### Configure logged in users metrics

Configure the display of the logged in users metrics for Microsoft Endpoint Configuration Manager for Investigation.

### Before you begin
Role required: sn_cimaf.sn_cimaf_admin

### Procedure

1. Open the Microsoft Endpoint Configuration Manager.
2. Select the required CI device, and verify the CMPivot entities and attributes.
   For more information, see Verify a CMPivot entity.
3. Verify that the **LogonSession** CMPivot entity exists and has the attributes **LogonId**, **LogonType**, and **StartTime**.
4. Verify that the **LoggedOnUser** CMPivot entity exists and has the attributes **Antecedent** and **Dependent**.

> **Note:**
> If either the **LogonSession** or **LoggedOnUser** CMPivot entities aren't available, you must add them to the hardware inventory. For more information, see Extend hardware inventory.

### Result
The logged in users metrics is displayed on the **Investigation** tab of the incident record in Service Operations Workspace.

#### Configure Installed application metrics

Configure the display of the installed application metrics for Microsoft Endpoint Configuration Manager for Investigation.

### Before you begin
Role required: sn_cimaf.sn_cimaf_admin

### Procedure

1. Open the Microsoft Endpoint Configuration Manager.
2. Select the required CI device, and verify the CMPivot entities and attributes.
   For more information, see Verify a CMPivot entity.
3. Verify that the **InstalledSoftware** CMPivot entity exists and has the attributes **ProductName**, **ProductVersion**, and **Publisher**.

> **Note:**
> If the **InstalledSoftware** CMPivot entity isn't available, you must add the entity to the hardware inventory. For more information, see Extend hardware inventory.

### Result
The installed application metrics is displayed on the **Investigation** tab of the incident record in Service Operations Workspace.

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### Configure remedial action - Restart Service

Configure the Restart Service remedial action for Microsoft Endpoint Configuration Manager for Investigation (MECM).

#### Before you begin

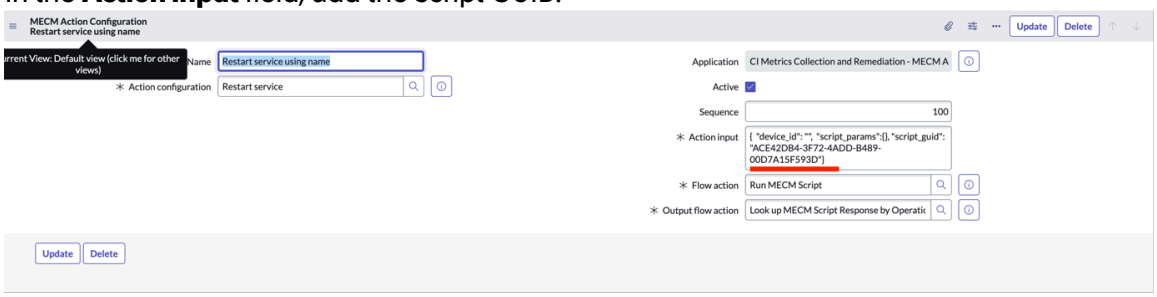
Role required: sn_cimaf.sn_cimaf_admin

#### Procedure

1. Open the Microsoft Endpoint Configuration Manager.
2. Create a MECM script with the name `RestartService`.
   For more information, see Create a script in Microsoft Endpoint Configuration Manager.
3. Provide the following code in the script block.

```
Param(
[Parameter(Mandatory=$True)]
[string]$service_name
)
Restart-Service -Force -Name $service_name -PassThru
```

4. Retrieve and copy the script GUID.
5. Open the MECM Action Configuration [sn_mecm_action_config] table.
   The MECM Action Configuration table displays the list of action configurations.
6. From the list of configurations, select and edit **Restart service using name**.
7. In the **Action input** field, add the script GUID.




8. Click **Save**.

### Configure remedial actions - End Process

Configure the End Process remedial action for Microsoft Endpoint Configuration Manager for Investigation (MECM).

#### Before you begin

Role required: sn_cimaf.sn_cimaf_admin

#### Procedure

1. Open the Microsoft Endpoint Configuration Manager.
2. Create a MECM script with the name `EndProcess`.
   For more information, see Create a script in Microsoft Endpoint Configuration Manager.
3. Provide the following code in the script block.

```
Param(
[Parameter(Mandatory=$True)]
[string]$process_id
)
```

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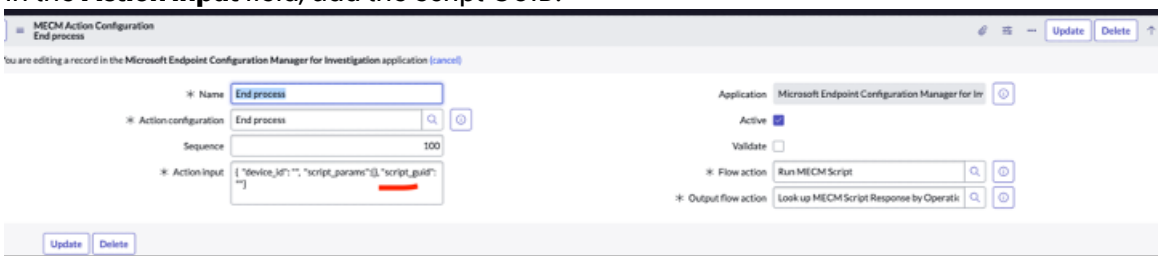
```
Get-Process -Id $process_id | Stop-Process -Force -PassThru
```

4. Retrieve and copy the script GUID.
5. Open the MECM Action Configuration [sn_mecm_action_config] table.
   The MECM Action Configuration table displays the list of action configurations.
6. From the list of configurations, select and edit **End Process**.
7. In the **Action input** field, add the script GUID.




8. Click **Save**.

## Create a script in Microsoft Endpoint Configuration Manager

Create a script in the Microsoft Endpoint Configuration Manager to configure the display of the processes metrics on the **Investigation** tab of the Incident record.

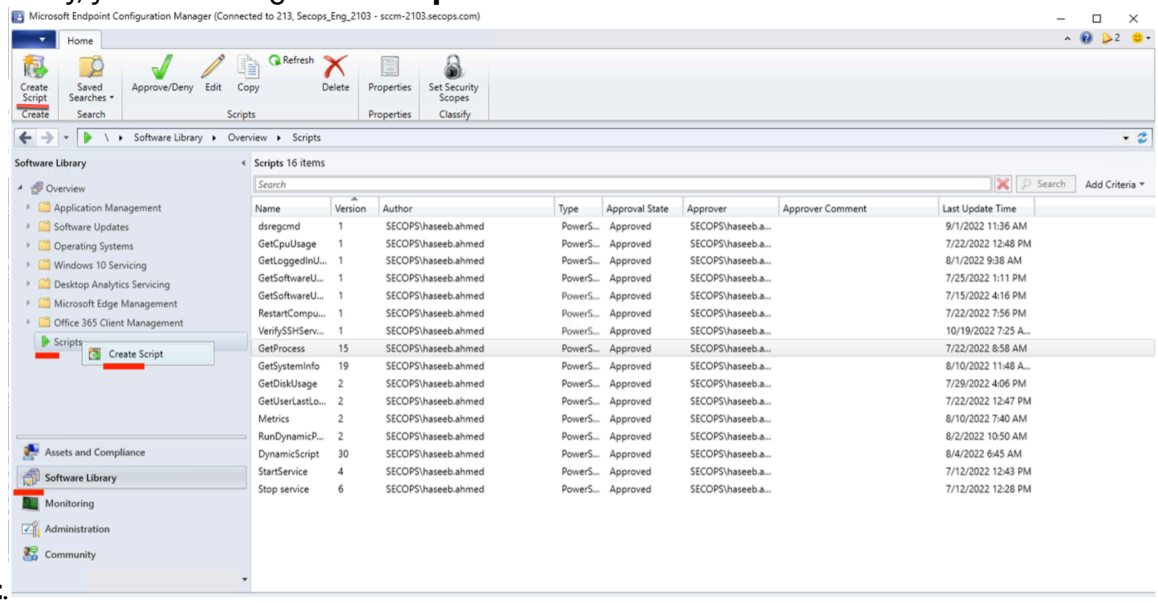
### Before you begin

The Microsoft Endpoint Configuration Manager server must be logged in using the Microsoft Remote Desktop.

Role required: admin

### Procedure

1. Open the Microsoft Endpoint Configuration Manager.
2. On the Microsoft Endpoint Configuration Manager, select **Software Library**.
3. On the Software Library section, select **Scripts** and click **Create Script**.
   Alternatively, you can also right-click **Scripts** and select **Create Script**.




4. Specify **Script name**.
5. Add the script on the script field (block).

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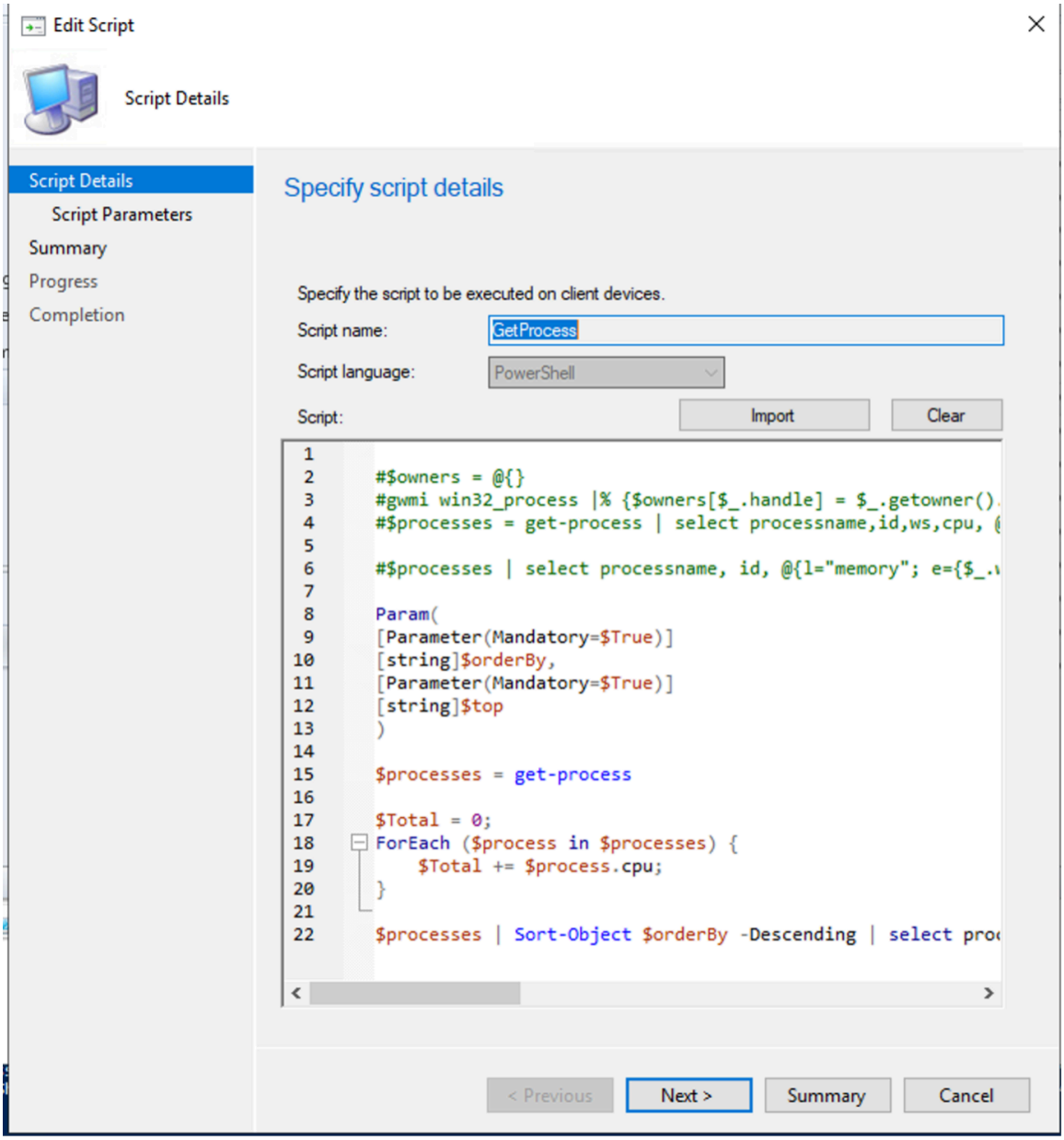


6. Click **Next**.
7. Click **Next & Close**.
   A script record is created with **Approval State** as **Waiting for Approval**.
8. Select the script record.
9. Select the **Approve/Deny** option and then click **Approve** to approve the script.

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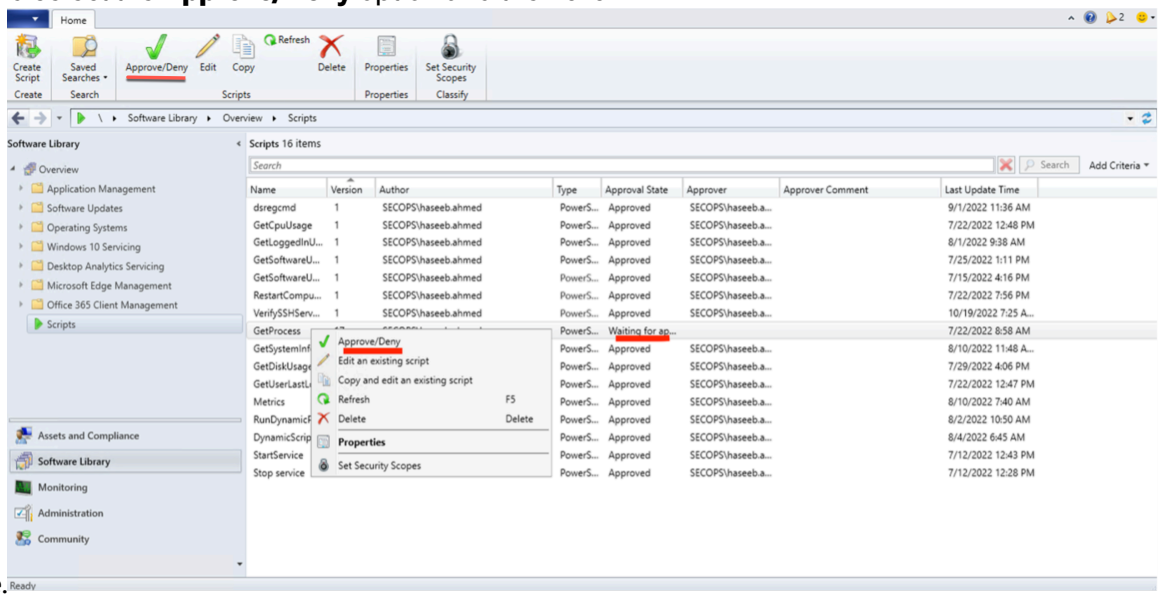
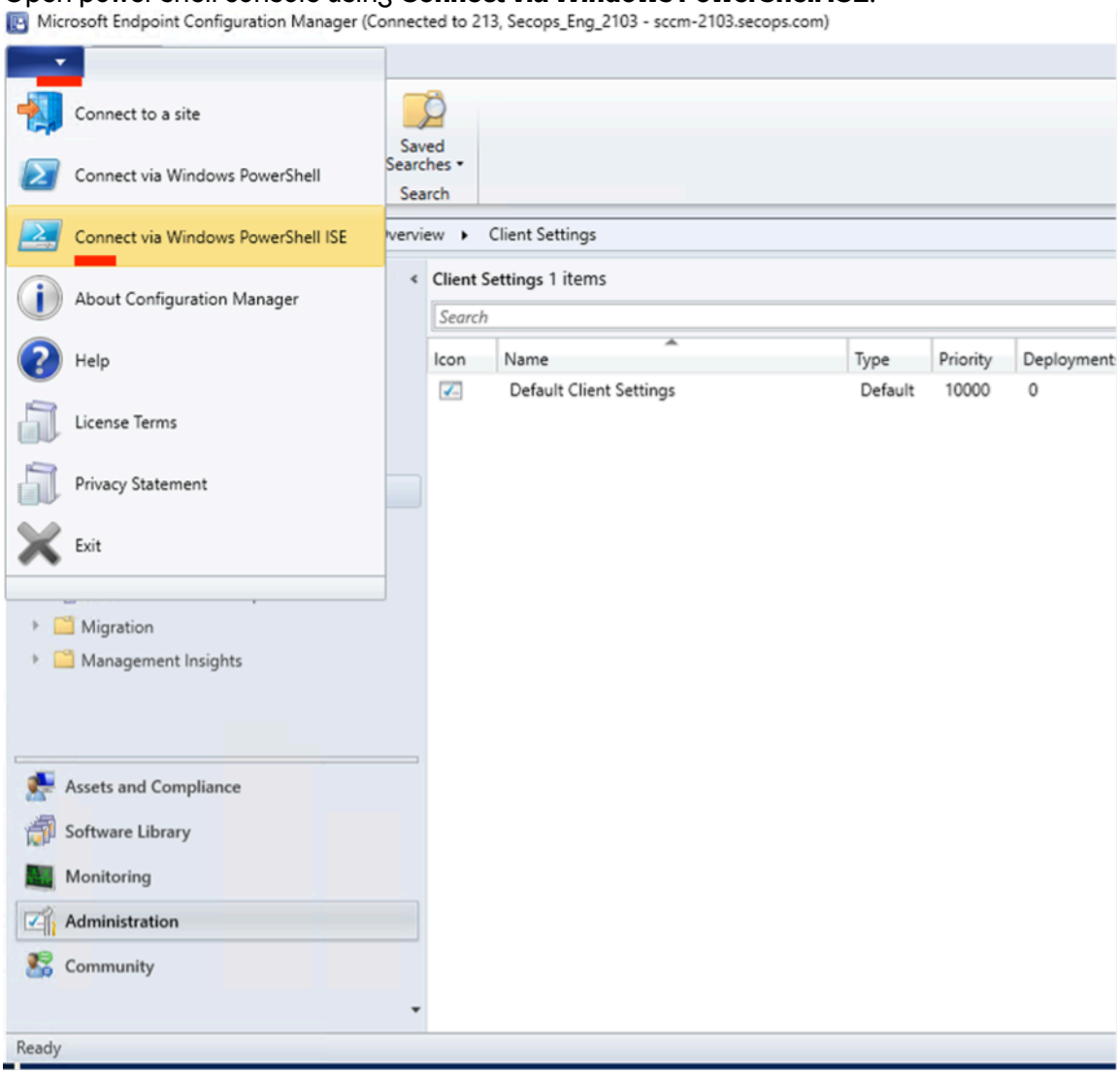
Alternatively, you can also right-click on the created script record and select the **Approve/Deny** option and then click **Approve**.




10. Get the script GUID.

a. Open power shell console using **Connect via Windows PowerShell ISE**.

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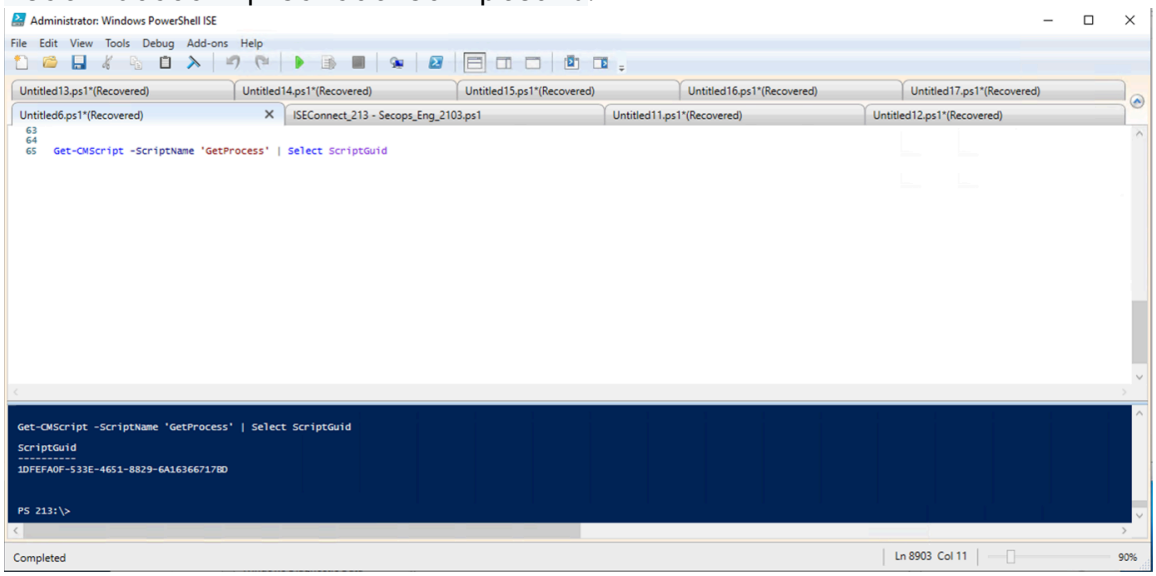
**b.** Get the script GUID by running the command `Get-CMScript -ScriptName 'GetProcess' | Select ScriptGuid`.




### Extend hardware inventory

Extend the hardware inventory to add the CMPivot entity on the CMPivot entity list in the Microsoft Endpoint Configuration Manager.

## Before you begin

The Microsoft Endpoint Configuration Manager server must be logged in using the Microsoft Remote Desktop.

Role required: admin

## Procedure

1. Open the Microsoft Endpoint Configuration Manager.
2. On the Microsoft Endpoint Configuration Manager, select **Administration**.
3. On the Administration section, click **Client Settings**.
4. Double-click the **Default Client Settings** that is displayed on the right pane of the window.
   The Default Settings pop-up window is displayed.
5. On the Default Settings window, select **Hardware Inventory**.
6. Click **Set Classes**.
   A Hardware Inventory Classes pop-up window containing the list of Hardware Inventory Classes is displayed.
7. On the Hardware Inventory Classes window, select the entity and required attributes from the list.

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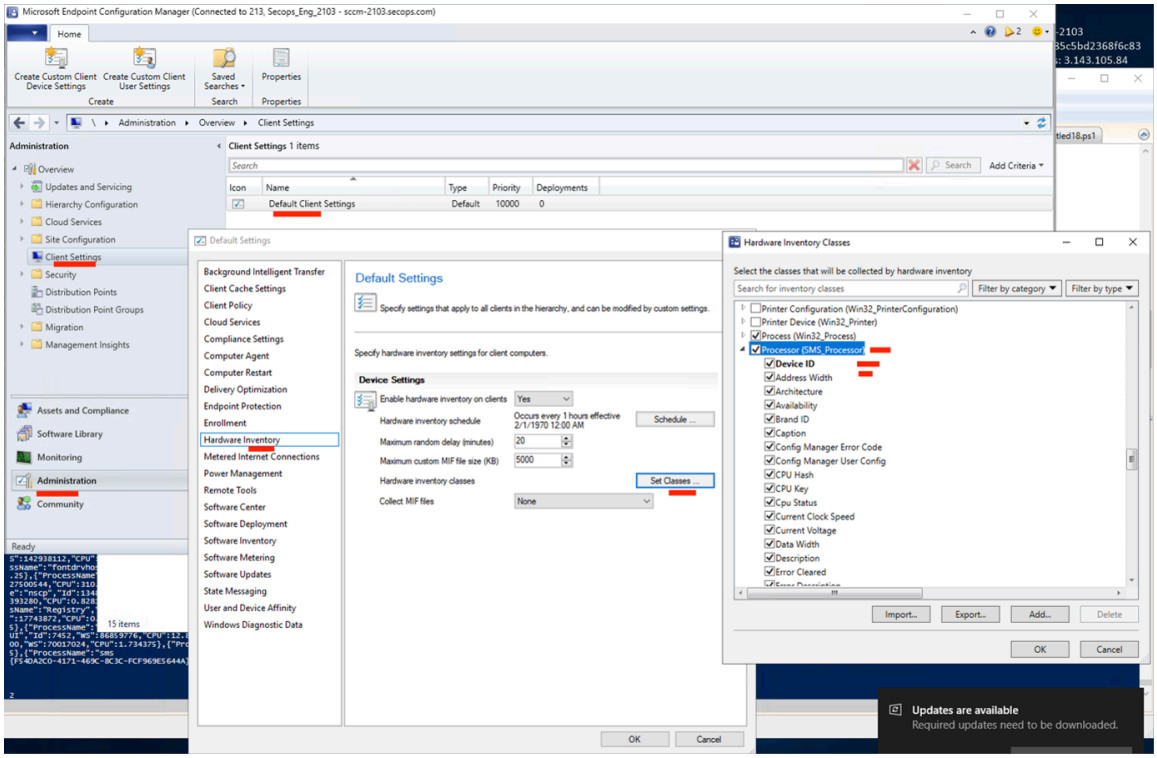


8. Click **OK**.

## Result

The added hardware inventory is displayed in the CMPivot entity list to verify the required attributes. For more information on verifying the CMPivot entity and the required attributes, see Verify a CMPivot entity.

### Verify a CMPivot entity

Verify a CMPivot entity and its attributes to configure the display of the CI metrics information on the Investigation tab of the Incident record.

## Before you begin

The Microsoft Endpoint Configuration Manager server must be logged in using the Microsoft Remote Desktop.

Role required: admin

## Procedure

1. Open the Microsoft Endpoint Configuration Manager.
2. On the Microsoft Endpoint Configuration Manager, select **Assets and Compliance**.
3. On the Assets and Compliance section, select **Devices**.
   The list of devices are displayed on the right pane of the window.
4. Select the required CI device from the list.

**Note:**
The selected CI device must be Active.

In case the required CMPivot entity isn't displayed on the list, extend the hardware inventory to add the CMPivot entity to the list. For more information, see Extend hardware inventory.

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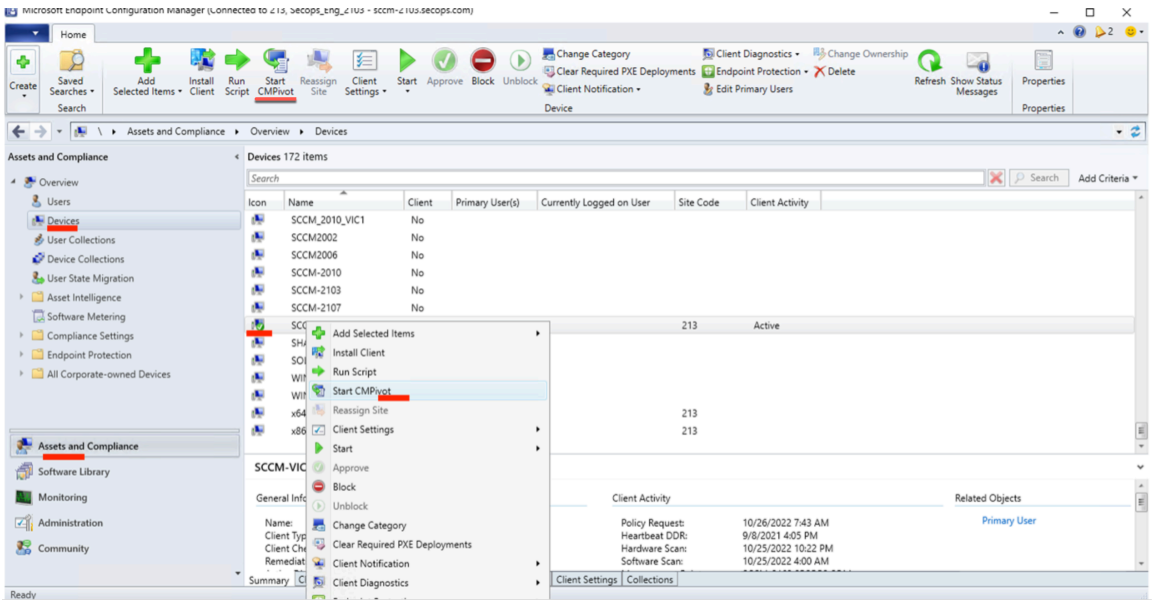
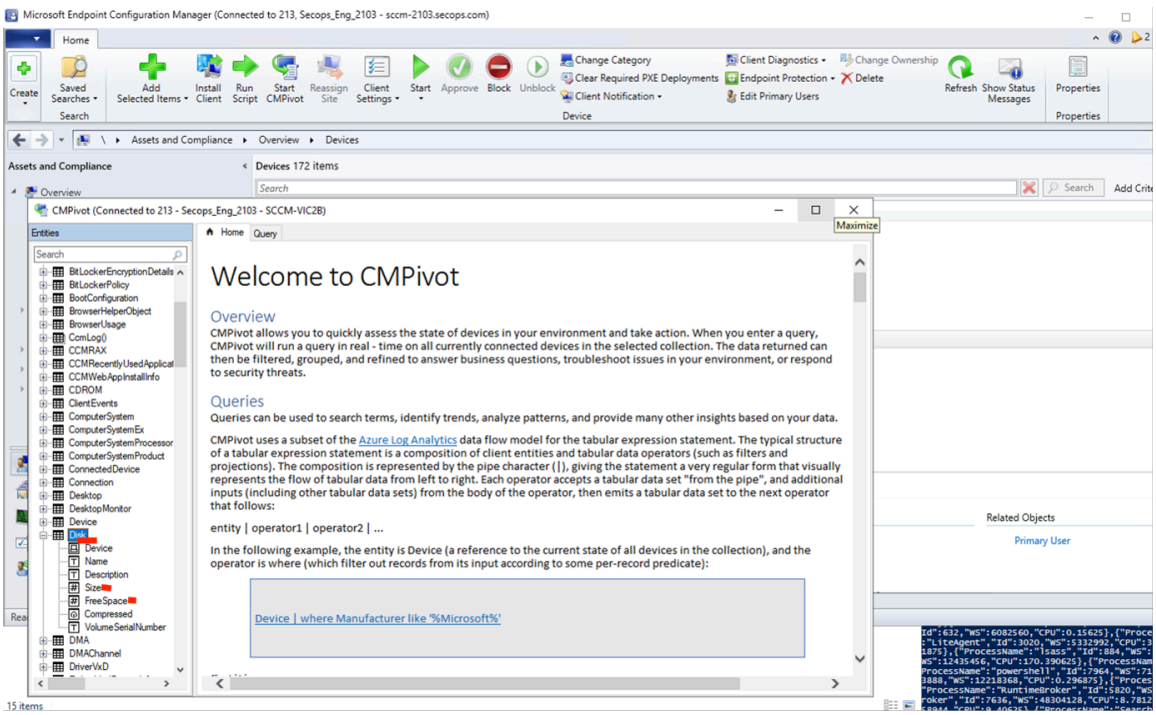
5. Click **Start CMPivot**.
   Alternatively, you can also right-click on the device and select **Start CMPivot**.




6. Verify the CMPivot entity and attributes.




## Configure a metric definition

Configure a metric definition to create or modify the existing base system CI metrics displayed on the Investigation tab.

### Before you begin

Role required: sn_cimaf.sn_cimaf_admin

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## Procedure

1. Navigate to **All** > **Metrics and CI Actions Framework** > **Administration** > **Metric Definitions**.
   These following existing metric definition tables are displayed:
   - Asset usage
   - Installed Applications
   - Logged-in users
   - Running processes
   - Services
   - System Information (dsregcmd)
   - System Information (msinfo32)
   - System overview
2. Create a metric definition record.
   You can also select an existing metric definition record to modify the record.

   **a.** Select **New**.

   **b.** On the Metric definition form, fill in the fields.

   **Metric definition form**

| Field | Description |
|---|---|
| Name | Name of the metric. |
| Active | Option to activate the metric definition. |
| CI Class | Particular CI class for which the metric is applicable. |
| Description | Description of the metric definition. |
| Schema | High-level structure in which the metrics retrieved from the provider are stored in the metric table. |

   **c.** Select **Submit**.

3. On the Adapter Configuration related list, create a record.
   Adapter configuration for the metric definition enables you to define the provider and the query, as well as transform flows or scripts.

   **a.** Select **New**.
   You can also select an existing adapter configuration record to modify the record.

   **b.** On the Adapter Configuration form, fill in the fields.

   **Adapter Configuration form**

| Field | Description |
|---|---|
| Name | Name of the adapter configuration. |

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| Field | Description |
| --- | --- |
| Metric Definition | Metric definition for which the adapter configuration is created. |
| Provider | Provider for metrics, such as Agent Client Collector or Microsoft Endpoint Configuration Manager for Investigation. |
| Order | Sequence order in which the adapter configuration record applies to the metric definition when there are multiple configurations available.<br>**Note:** The first applicable adapter configuration that is based on the **Order** value is only considered for fetching the metrics. |
| Duplicate request time limit (seconds) | Sets the number of seconds to prevent duplicate metric requests when one is already in progress. |
| Query | |
| Query Action | Type of action that is used to retrieve the metric data from the provider. The value can be a flow or script. |
| Query Flow/script | Flow or script that is used to retrieve the metric from the provider.<br>**Note:** In case no flow or script is defined, the default query flow of the provider is considered. |
| Transform | |
| Transform Action | Type of action that is used to transform the metric data, which is retrieved by the provider, to output. The value can be a flow or script. |
| Transform Flow/script | Flow or script that is used to transform the metric data, which is retrieved by the provider, to output.<br>**Note:** In case no flow or script is defined, the default transform flow of the provider is considered. |

**c.** Select **Submit**.

**4.** On the Provider Specific Adapter Configuration related list, create a record.

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Provider Specific Adapter Configuration table enables you to define and configure adapter configuration, such as query or command, for a specific provider, such as Agent Client Collector (ACC) or Microsoft Endpoint Configuration Manager (MECM) for Investigation.

**a.** Select **New**.
You can also select an existing provider specific adapter configuration record to modify the record.
A list of specific provider action configuration table is displayed, such as ACC Action Configuration and MECM Action Configuration.

**b.** Select the provider for which you want to create an adapter configuration.

**c.** On the Provider Specific Adapter Configuration form, fill in the fields.

**Provider Specific Adapter Configuration**

| Field | Option |
|---|---|
| Name | Name of the provider specific adapter configuration. |
| Adapter Configuration | Adapter configuration for which the provider specific adapter configuration is created. |
| Active | Option to activate the configuration. |
| Check Definition | Check definition that is used for the execution and handling the output of the command or query. For example, app-ci-metrics-acc-adapter.osquery.<br>**Note:**<br>This is applicable only if the provider is Agent Client Collector for Investigation. |
| Query/Command | Query or command that the provider runs on the end machine.<br>**Note:**<br>This is applicable only if the provider is Agent Client Collector for Investigation. |
| Action Input | Input parameters required by flow action.<br>**Note:**<br>This field is applicable only if the provider is Microsoft Endpoint Configuration Manager for Investigation. |
| Flow Action | MECM spoke flow action to perform the read operation on the MECM device. |

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| Field | Option |
| --- | --- |
| | **Note:** This field is applicable only if the provider is Microsoft Endpoint Configuration Manager for Investigation. |
| Output Flow Action | MECM spoke flow action to look up the read operation response from the MECM server.<br>**Note:** This field is applicable only if the provider is Microsoft Endpoint Configuration Manager for Investigation. |

**d.** Select **Submit**.

**5.** On the Adapter Applicability Rule related list, create a rule.
Adapter Applicability Rule table enables you to configure which CIs apply to the selected adapter configuration.

**a.** Select **New**.
You can also select an existing adapter applicability rule record to modify the record.

**b.** On the Adapter Applicability Rule form, fill in the fields.

**Adapter Applicability Rule form**

| Field | Description |
| --- | --- |
| Adapter Configuration | Adapter configuration that applies to the adapter applicability rule. |
| CI Conditions | |
| CI Class | CI class that applies the adapter configuration. |
| Allow matching CI class extension | Option to apply the configurations to the child of a CI class. |
| CI conditions | Condition builder to configure which CIs apply to the adapter configuration. |

**c.** Select **Submit**.

## What to do next

After the new metric definition is created, perform the UI configuration for displaying the metric definition on the Investigate tab of the incident record page. You must get the sys_id of the metric definition and add it to the `sn_sow.SOWInvestigateConfig` script. You can also customize the display of the metric definition, such as the labels, units, and threshold values. For more information, see Customize the Investigate tab.

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### Configure CI Actions

Configure the CI Action Framework to add a new CI action or modify an existing one.

## Before you begin

Role required: sn_cimaf.sn_cimaf_admin

## Procedure

1. Navigate to **All** > **Metrics and CI Actions Framework** > **Administration** > **Actions**.
   This table contains the list of all CI actions.
2. Create a CI Action.
   a. Select **New** to create a record.
   You can also select an existing action record to modify the record.
   b. On the Action form, fill in the fields.

#### Action form

| Field | Description |
|---|---|
| Name | Name of the CI action. |
| CI Class | CI class for which the CI action is applicable, such as computer [cmdb_ci_computer]. |
| Active | Option to activate the CI action. |
| Description | Brief description of the CI action. |

   c. Select **Submit**.
3. On the Action Role related list, add a role.
   The Action Role related list contains the list of roles required to access and execute the CI actions.
   a. Select **New**.
   b. Choose a **Role**.
   c. Select **Submit**.
4. On the User Criteria Action Inclusion related list, add a user criteria.

   The User Criteria Action Inclusion related list contains the list of user criteria that are allowed to execute the CI action.
   a. Select **New**.
   b. Choose a **User Criteria**.
   c. Select **Submit**.
5. On the User Criteria Action Exclusion related list, add a user criteria.

   The User Criteria Action Exclusion related list contains the list of user criteria that aren't permitted to execute the CI action.

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a. Select **New**.

b. Choose a **User Criteria**.

c. Select **Submit**.

6. On the Action Configuration related list, create a record.
   The Action Configuration related list contains a list of action configurations applicable to CI. You can create multiple configurations for a CI action based on different providers or CI class.

   a. Select **New** to create a record.
      You can also select an existing action record to modify the action configuration record.

   b. On the Action Configuration form, fill in the fields.

**Action Configuration form**

| Field | Description |
|---|---|
| Name | Name of the action configuration for the CI action. |
| Provider | Provider for which you want to create the action configuration. |
| CI Class | CI class applicable to the action configuration. |
| Allow matching CI Class extension | Option to apply the configuration to the child of CI class, such as device or server. |
| CI Condition | Condition builder to configure the CIs where the action configuration is applicable. |
| Action Type | Action type that is used to execute the CI action. It can be a flow or a script. |
| Action execution flow | A flow that is used to execute the CI action. |
| Order | Sequence in which the configuration is applicable in case there are multiple configurations available for a CI action.<br>**Note:** The first applicable adapter configuration that is based on the **Order** value is only considered for executing the CI action. |
| Duplicate request time limit (seconds) | Sets the number of seconds to prevent the execution of duplicate action requests when one with the same parameters is already in progress. |

   c. Select **Submit**.

7. On the Action Configuration Step related list, create or modify a record.
   The Action Configuration Step related list contains the list of steps applicable for the action configuration.

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**a.** Select **New** to create a record.
You can also select an existing record to modify the steps record.
A list of provider-specific action configuration table is displayed, such as Agent Client Collector (ACC) Action Configuration and Microsoft Endpoint Configuration Manager (MECM) Action Configuration.

**b.** Select the provider for which you want to create an adapter configuration.
For example, ACC Action Configuration for Agent Client Collector for Investigation.

**c.** On the Action configuration step form, fill in the fields.

**Action configuration step form**

| Field | Description |
|---|---|
| Name | Name of the step that you want to create for the action configuration. |
| Active | Option to activate the action configuration step. |
| Sequence | Step sequence that is executed if multiple steps exist for an action configuration record. |
| Check definition | Check definition that is used for the execution and handling the output of the command. For example, remedial-action.<br>**Note:** This is applicable only if the provider is Agent Client Collector for Investigation. |
| Command | Command that is executed.<br>**Note:** This field is applicable only if the provider is Agent Client Collector for Investigation. |
| Action Input | Input parameters required by flow action.<br>**Note:** This field is applicable only if the provider is Microsoft Endpoint Configuration Manager for Investigation. |
| Flow Action | MECM spoke flow action to perform the write operation on the MECM device. |

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| Field | Description |
| --- | --- |
| | **Note:** This field is applicable only if the provider is Microsoft Endpoint Configuration Manager for Investigation. |
| Output Flow Action | MECM spoke flow action to look up the write operation response from the MECM server.<br>**Note:** This field is applicable only if the provider is Microsoft Endpoint Configuration Manager for Investigation. |
| Validate | Option to validate the command. |
| Validation script | Script that is run to check if the command has a valid execution and output.<br>**Note:** This field is visible only if the **Validate** option is selected. |
| Run | Values for how and when the command must be validated. You can select the following values:<br>▪ Once: Validation must be run once.<br>▪ Poll: Validation must be run more than once.<br>**Note:** This field is visible only if the **Validate** option is selected. |
| Polling count | Maximum number of times the validation is run for the command.<br>**Note:** This field is visible only if **Run** field is set to **Poll**. |
| Polling interval | Time interval in which the validation must be rerun for the command execution.<br>**Note:** This field is visible only if **Run** field is set to **Poll**. |

**8.** On the Action Parameter related list, create a record.

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The Action Parameter related list contains the list of parameters required to execute the CI action.

**a.** Select **New** to create a record.
You can also select an existing record to modify the parameter record.

**b.** On the Action Parameter form, fill in the fields.

**Action Parameter form**

| Field | Description |
|---|---|
| Type | Type of the parameter, such as integer or reference.<br>**Note:** If you select reference, you must also specify the reference table. |
| Label | Name of the parameter. |
| Mandatory | Option to mark the applicability of the parameter as required. |
| Active | Option to activate the action parameter. |
| Default value | |
| Default value | Default value of the parameter. |
| Choice list specification | |
| Choices | Type of choice list that must be applicable for the parameter.<br>**Note:** This field is enabled only if the **Type** field is set to **Choice list**. |

**c.** Select **Submit**.

### What to do next
You must configure the Remedial Actions Framework. For more information, see Configure the Remedial Actions Framework.

## Configure the Remedial Actions Framework

Configure the Remedial Actions Framework to add a new remedial action or modify an existing one.

### Before you begin
Role required: sn_reacf.sn_remedial_action_admin

### Procedure

1. Navigate to **All** > **Remedial Actions Framework** > **Administration** > **Remedial Actions**.
   This table contains the list of the remedial actions available at the base system.
2. Create a remedial action.

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a. Select **New** to create a record.
You can also select an existing action record to modify the action record.

b. On the Remedial Action form, fill in the fields.

**Remedial Action form**

| Field | Description |
|---|---|
| Name | Name of the remedial action. |
| Action | Action that is performed. You must select a table name and a record in that table.<br>**Note:** You must select the action table that is defined for the **Applicability** field of the Remedial Action Type record. |
| Type | Type of the remedial action or flow, such as CI action and standard change. |
| Description | Brief description of the remedial action. |
| Active | Option to activate the remedial action. |
| Target Table | Table for which the remedial action is applicable. |
| Match Target Extensions | Option to apply the remedial action to the child of the target table. |
| Target Conditions | Condition builder to configure the applicable remedial action for the target records. |

c. Select **Submit**.

3. On the Remedial Action Parameters related list, add a parameter to the remedial action.
The Remedial Action Parameters related list contains the list of parameters, such as *Process ID* and *Assigned to*, required to execute the remedial actions.

a. Select **New**.

b. On the Remedial Action Parameters form, fill in the fields.

**Remedial Action Parameter form**

| Field | Description |
|---|---|
| Type | Type of parameter, such as integer, boolean, or reference.<br>**Note:** If you select reference, you must also specify the reference table. |

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| Field | Description |
|---|---|
| Label | Name of the parameter. |
| Mandatory | Option to mark the parameter as required. |
| Active | Option to activate the parameter. |
| Consider for concurrency check | Option to determine whether the parameter should be considered for the duplicate check of the remedial action. |
| Default Value | |
| Default value | Default value of the parameter.<br>**Note:** If this value isn't defined, the default value that is specified in the CI Actions Framework tables is considered. |
| List specification | |
| Choices | Type of list that must be applicable for the parameter.<br>**Note:** This field is enabled only if the **Type** field is set to **Choice list**. |

   c. Select **Submit**.

4. On the Remedial Action Roles related list, add a role.
   Remedial Action Roles contains the list of roles required to access and execute the remedial actions.
   a. Select **New**.
   b. Choose a **Role**.
   c. Select **Submit**.
5. On the User Criteria Action Inclusions related list, add a user criteria.
   The User Criteria Action Inclusion related list contains the list of user criteria that are permitted to execute the remedial action.
   a. Select **New**.
   b. Choose a **User Criteria**.
   c. Select **Submit**.
6. On the User Criteria Action Exclusions related list, add a user criteria.
   The User Criteria Action Exclusion related list contains the list of user criteria that aren't permitted to execute the remedial action.
   a. Select **New**.
   b. Choose a **User Criteria**.
   c. Select **Submit**.
7. Navigate to **All** > **Remedial Actions Framework** > **Administration** > **Remedial Action Types**.
   This table contains the list of remedial action types, such as CI action and standard change.

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8. Create a remedial action type.
   a. Select **New**.
   b. On the Remedial Action Type form, fill in the fields.

**Remedial Action Type**

| Field | Description |
|---|---|
| Name | Name of the remedial action type. |
| Applicability | List of Action tables where the remedial action type is applicable. |
| Processor | Script include that is used for the implementation of the extension point *`RemedialActionProvider`* to execute the remedial action. |
| Allow concurrent execution | Option to allow duplicate concurrent execution of remedial actions.<br>**Note:** If the **Consider for concurrency check** option is set to false for all the parameters, then the duplicate actions are allowed by default. |

   c. Select **Submit**.

9. Navigate to **All** > **Remedial Actions Framework** > **Administration** > **Remedial Action Origin**. This table contains the list of applications where you can use the Remedial Actions Framework.
10. Add an application.
    a. Select **New**.
    b. Add the name of an application that you want to use for the Remedial Actions Framework.
    c. Select **Submit**.

### What to do next

When a Remedial Action Type is created, you must create an implementation or do the necessary changes in the existing implementation of the **RemedialActionProvider** scripted extension point. To view and use the new or modified remedial actions, you must configure the Investigate UI to display the remedial actions. For more information, see Customize the Investigate tab.

## Setting up Major Incident Management in Service Operations Workspace

Set up Major Incident Management (MIM) to manage major incidents from the incident record page in Service Operations Workspace. A major incident (MI) is an incident that results in significant disruption to the business and has a high business impact.

A major incident demands a response beyond the routine incident management process. Major incidents have a separate procedure with shorter timescales and higher priority so there's a faster resolution process for incidents with high business impact.

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## Configuration overview

Setting up Major Incident Management in Service Operations Workspace involves installing Major Incident Management using Admin Center in Service Operations Workspace.

Admin Center in Service Operations Workspace gives admins centralized control of the instance. It provides quick access to manage all customizations in Service Operations Workspace for IT Service Management (ITSM) and additional plugins that extend the Service Operations Workspace for ITSM capabilities. For more information on Admin Center, see Admin Center in Service Operations Workspace for ITSM.

### Activate Major Incident Management in Service Operations Workspace

Activate the Major Incident Management (app-sow-mim) plugin in Service Operations Workspace using Admin Center.

#### Before you begin
Role required: admin

#### Procedure

1. Navigate to **All** > **Service Operations Workspace** > **Configurations**.
2. On the Admin Center **Overview** tab, in the Configure ITSM Core section, select the **Install** button under Major Incident Management.
3. In the pop-up window that lists plugins to be installed, select **Start Install**.

#### What to do next
After Major Incident Management has been activated, you can configure the available features by selecting the Configure option, which redirects you to the **Configuration** tab of the Admin Center. For more information, see Configuring Major Incident Management in Service Operations Workspace.

### Configuring Major Incident Management in Service Operations Workspace

Configure the features in Major Incident Management to use and manage major incidents in Service Operations Workspace.

## Configuration overview

Admin Center enables you to configure the following features in Major Incident Management:

- Major incident manager roles
- Major incident trigger rules
- Communication templates and plans
- Playbooks
- Email notifications
- Timeline configurations for a post incident report

### Assign the Major incident manager role

Assign the Major incident manager (major_incident_manager) role to existing users to manage, analyze, and resolve major incidents.

#### About this task
As a Major incident manager (major_incident_manager), you can do the following actions:

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- Promote a major incident candidate to a major incident.
- Create a major incident candidate.
- Manage the major incident process and resolve major incidents.

### Before you begin

You must activate the Major Incident Management plugin in Service Operations Workspace. For more information, see Activate Major Incident Management in Service Operations Workspace.

Role required: admin

### Procedure

1. Navigate to **All** > **Service Operations Workspace** > **Configurations**.
2. On the Admin Center page, navigate to the configuration page for Major Incident Management through either the **Overview** tab or the **Configurations** tab.
   - In the **Overview** tab, select the **Configure** button in the Major Incident Management section.
   - In the **Configurations** tab, select **Major Incident Management**.

   The configuration page displays all configurable features in Major Incident Management. In the Major Incident Management section, you can view the number of users who currently have the major_incident_manager role assigned.
3. On the Major Incident Managers section, select **Configure**.
   The Major Incident Manager page contains the following tabs:
   - **MI Managers**: List of users that have the major_incident_manager role.
   - **Available users**: List of users to whom you can assign the major_incident_manager role.
4. Select the **Available users** tab.
5. Select a user and assign the role by selecting **Assign MI Manager**.
   The user is also added to the list of users on the **MI Managers** tab.

## Configure major incident trigger rules

Create and configure the trigger rules for a major incident to define the conditions for when a trigger action is executed. You can create major incident trigger rules to define the conditions under which an incident is automatically considered as a major incident candidate.

### About this task

Major incident trigger rules are evaluated asynchronously each time a major incident is created or promoted from an incident, provided the following conditions are met:

- The incident record doesn't have the Parent Incident populated, which means that the current incident isn't a child incident.
- The major incident isn't proposed or accepted.
- The incident is active.

You can also configure major incident trigger rules to directly create a major incident, bypassing the candidate step.

**Note:**
Base system trigger rules are available.

### Before you begin

The Major Incident Management plugin must be activated in Service Operations Workspace. For more information, see Activate Major Incident Management in Service Operations Workspace.

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Role required: admin

### Procedure

1. Navigate to **All** > **Service Operations Workspace** > **Configurations**.
2. On the Admin Center page, navigate to the configuration page for Major Incident Management through either the **Overview** tab or the **Configurations** tab.
   - In the **Overview** tab, select the **Configure** button in the Major Incident Management section.
   - In the **Configurations** tab, select **Major Incident Management**.

   The configuration page displays all configurable features in Major Incident Management. In the Trigger rules section, you can view the number of trigger rules that are configured and are currently active.
3. On the Trigger rule section, select **Configure**.
   The Trigger rules page displays a list of available trigger rules. You can select any available trigger rule and select the following actions:
   - Activate: Activates the selected trigger rule. The base system major incident trigger rules are inactive by default.
   - Delete: Deletes the selected trigger rule.
   - Deactivate: Deactivates the selected active trigger rule.
   - Copy: Copies the trigger rule along with the information. This option helps in creating a trigger rule using the data of an existing trigger rule.
4. Select **New**.
5. On the form, fill in the fields.

**Trigger rules form**

| Field | Description |
|---|---|
| Name | Name of the trigger rule. |
| Table name | Table where the trigger rule is executed. |
| Action to take | Action taken on the incident when the trigger rule is executed. Possible values:<br>○ **Propose Major Incident**: Incident is proposed as a major incident candidate when the trigger rule is executed. After it's approved, the incident is promoted to a major incident.<br>○ **Promote Major Incident**: Incident is promoted directly to a major incident when the trigger rule is executed.<br>**Note:** The **Create major incident from candidate** (*sn_major_inc_mgmt.com.snc.incident .min* system property creates different behaviors depending on which options are selected. |

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| Field | Description |
| --- | --- |
| | When the system property is set to **Create new**, the following behaviors occur in relation to the **Action to take values**:<br>○ **Propose Major Incident**: The incident is proposed as a major incident candidate. After it's approved, a new major incident is created and the existing incident is marked as its child.<br>○ **Promote Major Incident**: A new incident is created and promoted to a major incident. The existing incident is marked as its child.<br>When the system property is set to **Promote**, the following behaviors occur in relation to the **Action to take** values:<br>○ **Propose Major Incident**: The incident is proposed as a major incident candidate. After it's approved, it's promoted to a major incident.<br>○ **Promote Major Incident**: The existing incident is promoted to a major incident. |
| Application | Application scope of the trigger rule. The trigger rule is available for all applications or for scoped applications. |
| Execution order | The sequence that the rules are triggered. The rule with lowest execution order is triggered first. For example, a rule with order = 100 is executed first then a rule with order = 200.<br>**Note:** If any of the existing trigger rule conditions are met, the incident is considered to be a major incident candidate. Verification of the remaining rules isn't required. Otherwise, all the rules are verified based on the execution order. |
| Active | Option to activate the trigger rule. |
| Conditions | Condition builder to set conditions that must be met to execute the trigger rule. |

6. Select **Save**.
   The trigger rule is created and added to the list of available trigger rules.

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### Setting up communication templates and plans in Major Incident Management

Set up the communication templates and plans in Major Incident Management to help reduce the efforts and time spent in creating and composing communication at the various stages of a major incident. Effective communications with stakeholders help resolve major incidents.

### Configure a communication template for email in Major Incident Management

Configure a communication templates for email in Major Incident Management to help reduce the efforts and time spent in creating and composing communication emails.

## Before you begin

The Major Incident Management plugin must be activated in Service Operations Workspace. For more information, see Activate Major Incident Management in Service Operations Workspace.

Role required: admin

## Procedure

1. Navigate to **All** > **Service Operations Workspace** > **Configurations**.
2. On the Admin Center page, navigate to the configuration page for Major Incident Management through either the **Overview** tab or the **Configurations** tab.
   - In the **Overview** tab, select **Configure** for Major Incident Management.
   - In the **Configurations** tab, select **Major Incident Management**.

   The configuration page displays all configurable features in Major Incident Management.
3. In the **Communication Template** section, select **Configure email** to display a list of available communication email templates.
4. Select **New**.
5. On the form, fill in the details.

#### Configure Email form

| Field | Description |
|---|---|
| Name | Name of the email template. |
| Table | Table where the email template is applicable.<br>**Note:** By default, the value is the Incident Communication Task [incident_alert_task] table. |
| Application | Application scope of the email template. The email template is available for all applications or for scoped applications. |
| Execution order | The sequence that the templates are applied. The template with lowest execution order is applied first. For example, a template with execution order = 100 is applied first then a template with execution order = 200. |
| Condition | Condition builder that sets the conditions that must be met to apply the email template when composing email communications. |

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| Field | Description |
| --- | --- |
| Content | |
| Subject | Subject line of the email. |
| Content Type | Content type of the email. Possible values:<br>○ **HTML**: Enables you to add links, multimedia, and other HTML content to the email.<br>○ **Plain Text**: Enables you to add only text and other text-related features, such as bold and italics. |
| Body | Content for the body of the email.<br>**Note:**<br>Based on the option chosen in the **Content Type** field, the **Body** field enables you to add text or HTML-related content. |
| Select Variables | Add field variables to the **Body**. |
| Recipients | |
| To | Users or recipient list to be added in the **To** section of the email. |
| Cc | Users or recipient list to be added in the **Cc** section of the email. |
| Bcc | Users or recipient list to be added in the **Bcc** section of the email. |
| Sender configuration | |
| From Generation Type | Generation type of the email sent. This value provides information about the email sender displayed on the **From** section of the email. Possible values:<br>○ **SMTP Email Account**: Email is generated and sent using the SMTP email account of the sender.The **From** section of the email sent displays the SMTP email account of the sender.<br>○ **Select from List**: The **From** section of the email sent displays the list of email addresses specified in the **Email Client from Address** field.<br>○ **Script**: Email is generated and sent using the script specified in the **Script For From** field. The From section of the email sent displays the sender name based on the script. |

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| Field | Description |
| --- | --- |
| | ○ **Text**: The From section of the email displays the value specified in the **From** field.<br>○ **None**: The **From** section of the email sent displays no value. |
| Email Client from Address | Email address that is displayed on the **From** section of the email. You can add multiple email addresses.<br>**Note:** This field is visible only if **From Generation Type** is set to **Select from List**. |
| Script For From | Script that is responsible for creating and sending the email.<br>**Note:** This field is visible only if **From Generation Type** is set to **Select from List**. |
| From | Name or user that is displayed on the **From** section of the email.<br>**Note:** This field is visible only if **From Generation Type** is set to **Select from List**. |

6. Select **Submit**.

### Configure a communications template for SMS in Major Incident Management

Configure a communication template for SMS in Major Incident Management to help reduce the efforts and time spent in creating and composing communication SMS.

#### Before you begin

Major Incident Management must be installed and activated in Service Operations Workspace. For more information, see Activate Major Incident Management in Service Operations Workspace.

Role required: admin

#### Procedure

1. Navigate to **All** > **Service Operations Workspace** > **Configurations**.
2. On the Admin Center page, navigate to the configuration page for Major Incident Management through either the **Overview** tab or the **Configurations** tab.

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- In the **Overview** tab, select **Configure** for Major Incident Management.
- In the **Configurations** tab, select **Major Incident Management**.
  The configuration page displays all configurable features in Major Incident Management.

3. In the **Communications Template** section, select **Configure SMS**.

   The Notify SMS template page displays a list of available communication SMS templates. For more information on Notify, see Legacy Notify.

4. Select **New**.
5. On the form, fill in the details.

**SMS configuration form**

| Field | Description |
|---|---|
| Name | Name of the SMS template. |
| Table | Table on which the SMS template is used.<br>**Note:** By default, the value is the Incident Communication Task [incident_alert_task] table. |
| Template | Content added in the body of the SMS. |
| Select Variables | Field variables added to the **Template**. |

6. Select **Submit**.
   The SMS template record is added to the list of available communication SMS templates.

### Configure a communication plan in Major Incident Management

Configure a communication plan and tasks for effective communication with various stakeholders about the progress, milestones, and issues related to the different stages of a major incident record.

#### Before you begin

The Major Incident Management plugin must be activated in Service Operations Workspace. For more information, see Activate Major Incident Management in Service Operations Workspace.

Role required: admin

#### Procedure

1. Navigate to **All** > **Service Operations Workspace** > **Configurations**.
2. On the Admin Center page, navigate to the configuration page for Major Incident Management through either the **Overview** tab or the **Configurations** tab.
   - In the **Overview** tab, select **Configure** for Major Incident Management.
   - In the **Configurations** tab, select **Major Incident Management**.
     The configuration page displays all configurable features in Major Incident Management. In the Communication Plan subsection of the Communications section, you can view the number of configured communication plans and active communication plans.
3. In the Communication Plan section, select **Configure**.

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The Communications plan page displays a list of available communications plan definitions. You can select any available communications plan and then select any of the following actions:

- **Activate**: Activates the selected communications plans.
- **Delete**: Deletes the selected communications plan.
- **Deactivate**: Deactivates the selected active communications plan.
- **Copy**: Copies the communications plans along with the task information. This option helps when creating a communications plan using the data of an existing communication plan.

In case if no communication plans exist, the **Create a communication plan** option is displayed.

4. Select **New** to create a communication plan definition.

   For more information on creating a communication plan, see Define a communication plan.

   After a communication plan definition is created, the following related lists appear in the communication plan definition record:

   - Communication Task Definitions
   - Communication Contact Definitions

5. Select the Communication Task Definitions related list and then select **New** to create a communication task.

   For more information on creating a communication task, see Define a communication task.

6. On the Communication task record, select the required communication channel related link and define the communication channel.

   For more information on creating a communication channel, see Define a communication channel.

7. On the Communication plan definition record, select the Communication contact definition related list.
8. Select **New** to create a communication contact definition.

   For more information on creating a communication contact definition, see Define a communication contact.

### Assign a playbook to Major Incident Management

Configure and assign playbooks to manage the major incidents process.

#### Before you begin

The Major Incident Management (MIM) plugin must be activated in Service Operations Workspace. For more information, see Activate Major Incident Management in Service Operations Workspace.

Role required: admin

#### Procedure

1. Navigate to **All** > **Service Operations Workspace** > **Configurations**.
2. On the Admin Center page, navigate to the configuration page for Major Incident Management through either the **Overview** tab or the **Configurations** tab.
   - In the **Overview** tab, select **Configure** for Major Incident Management.
   - In the **Configurations** tab, select **Major Incident Management**.

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The configuration page displays all configurable features in Major Incident Management. In the Playbook section, you can view the number of assigned playbooks.

3. Select **Configure**.
   The Playbook page displays the following tabs:
   - **Assigned playbooks**: List of playbooks that are assigned to Major Incident Management.

     In the case that no playbook is assigned, the **Assign playbook** option is available so you can assign a playbook to Major Incident Management.
   - **Available Playbooks**: List of playbooks that are available to be assigned to Major Incident Management.
4. On the configuration page, you can use the following options to assign a playbook to Major Incident Management.

| Option | Description |
| --- | --- |
| **Recommended playbooks** | The recommended playbooks section dis plays the following two base system play books that are shipped with Major Incident Management:<br>○ **MI playbook**: Provides a simple and con cise interface for communication and col laboration, as well as for unplanned commu nication or collaboration features in sepa rate sections in a task-oriented view. This playbook is suggested for and can be used by upgrade customers.<br>○ **Advanced MI playbook**: Provides a simi lar interface to the MI Playbook but has ad vanced, configurable capabilities for com munication and collaboration, as well as un planned communication or collaboration placed under a single section. You can con figure the unplanned communication or col laboration section of the playbook to cre ate, add, and configure the communication plans, tasks, collaboration channels, and channel types as required using the Play books.<br><br>For more information, see Designing a major incident playbook. Playbooks enables you to make the Advanced MI Playbook more flexi ble to use. This playbook is suggested for and can be used by new or zBoot customers. For more information, see Managing major inci dents using playbooks.<br><br>You can assign and use any or both play books with Major Incident Management based on your requirements and usage. Use the *sn_sow.mim_playbook_ids* proper ty to add the sys_id of the playbook that you want to display under the playbook section and use for Major Incident Management. |

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| Option | Description |
| --- | --- |
| | Select **View details** to view the playbook information and then select **Assign to MIM** to assign the playbook to Major Incident Management. |
| **Available playbooks** | Select the **Available playbooks** tab, then select **Playbook** and then select **Assign**. The selected playbook is assigned to Major Incident Management and is added to the list of assigned playbooks. |
| **Create new playbook** | Select the **Process Automation Designer** link in the Create new playbook section on the side panel to create a playbook or configure an existing playbook. For more information, see Designing a major incident playbook. |

### Designing a major incident playbook

Use Playbooks to design your own playbook by creating custom flows, and then configure trigger rules to activate the playbook for Major Incident Management.

Select the **Process Automation Designer** link in the Create new playbook section of the Assign Playbook page in Admin Center to open the Playbooks page. For more information on how to assign a playbook, see Assign a playbook to Major Incident Management.

The Playbooks home page displays a list of available processes including the following playbooks that are available in the base system:

- **MI Playbook** – This playbook is available in the **Published** state.
- **Advanced MI playbook** – This playbook is available in the **Draft** state. You can select the playbook and then select **Activate** to change the status of the playbook.

You can select **New** to create a playbook or select an existing playbook, such as the Advanced MI playbook, to add and configure the flows, activity, and trigger rules. You can do the following actions using Playbooks:

- Trigger rules - Select **Trigger** to set the trigger conditions in the condition builder under which a playbook gets attached to a major incident.
- Flows and UI layout – Use the options on the side panel to set the properties, create automation tasks and activities, add details and flows, and configure the playbook UI layout.
- Activity – Add activities to the playbook, such as unplanned communication or collaboration steps. Use the custom activity that is shipped as part of the base system to add and configure activities.
- Activate – Activate the playbook on the instance.
- Test – Test the playbook on the instance.

For more information on working with Playbooks, see Playbooks.

### Configure email notifications in Major Incident Management

Configure the automated email notification alerts that are sent to major incident managers in the various stages of the major incident process. These stages include a change of state, assignment, or user group for a major incident.

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## Before you begin

The Major Incident Management plugin must be activated in Service Operations Workspace. For more information, see Activate Major Incident Management in Service Operations Workspace.

Consider the following items when you create or update a notification:

- Your notification recipients must be active users and have a valid email address defined.

  ServiceNow® users or members of groups must be defined as active users in the User [sys_user] table. They must also have a valid email address defined for their primary device in the Notification Device [cmn_notif_device] table. If users don't have an active profile and a valid email address, they don't receive notifications.

- Your notification recipients must have the appropriate notification preferences enabled.

  Each user or group member must have the option to subscribe to the notification. They should have that option enabled in their notification preferences, along with the devices through which they want to receive the notification. Admins can impersonate users to review and configure their notification preferences. For more information, see Setting notification preferences in Core UI.

- To have your email notification also send as an SMS notification, recipients must subscribe to the notification on an SMS channel. For more information on creating an SMS channel, see Create notification channels.
- After you create or update the notification, use the **Preview Notification** option to examine it. For example, you can test links that you have added and verify the notification recipients. For details, see Preview email notifications.

Role required: admin

## About this task

Use the following tabs in the Notification form to configure an email notification:

- When to send — Conditions required to send the notification.
- Who will receive — Recipients of the notification.
- What it will contain — Contents of the notification.
- What a digest will contain — Contents of the email digests if the notification can be delivered in a digest. For more information, see Email digests.

**Note:**
If you don't see all the fields on the form, select the **Advanced** view option in the related link section.

## Procedure

1. Navigate to **All** > **Service Operations Workspace** > **Configurations**.
2. On the Admin Center page, navigate to the configuration page for Major Incident Management through either the **Overview** tab or the **Configurations** tab.
   - In the **Overview** tab, select **Configure** for Major Incident Management.
   - In the **Configurations** tab, select **Major Incident Management**.

   The configuration page displays all configurable features in Major Incident Management. In the Email notifications section, you can view the number of email notifications configured and in active status.

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3. On the Email notification section, select **Configure** to display the list of available email notifications.
4. Select **New**.
5. On the Notification form, fill in the fields.
   For a description of the field values, see Create an email notification.
6. Select **Submit**.

### What to do next

Use the **Preview Notification** option to preview what notifications look like before you actually enable the instance to send them. For example, you can see:

- How the **Subject** and **Message** fields are displayed.
- Which users do or don't receive the notification, including the reasons why the users don't receive it.

For more information, see Preview email notifications.

## Configure the timeline events for a Post Incident Report

Configure the incident information displayed as the event on the post incident report that is generated after a major incident is resolved. You can configure what information a post incident report must contain and how the information is arranged.

### Before you begin

The Major Incident Management plugin must be activated in Service Operations Workspace. For more information, see Activate Major Incident Management in Service Operations Workspace.

Role required: admin

### Procedure

1. Navigate to **All** > **Service Operations Workspace** > **Configurations**.
2. On the Admin Center page, navigate to the configuration page for Major Incident Management through either the **Overview** tab or the **Configurations** tab.
   - In the **Overview** tab, select **Configure** for Major Incident Management.
   - In the **Configurations** tab, select **Major Incident Management**.

   The configuration page displays all configurable features in Major Incident Management.
3. On the Timeline configuration section, select **Configure**.
4. On the Timeline configuration page, configure the options.

   Review the sample timeline events displayed on the Preview (sample timeline) section. Based on the data, you can use the following options to modify the default settings of the timeline.

#### Timeline configuration

| Option | Description |
| --- | --- |
| Incident Milestones | Option to include the following critical incident milestones in the timeline events of the post incident report:<br>○ Incident accepted as a Major Incident by an MI manager<br>○ Incident marked as Resolved |

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| Option | Description |
| --- | --- |
| Order of events | Option to arrange the order of the incident events in a post incident report. Available options:<br>○ Ascending – Order of events where the first event is placed at the top of the post incident report and the last event is displayed at the bottom of the post incident report.<br>○ Descending – Order of events where the last event is placed at the top of the post incident report and the first event is placed at the bottom of the post incident report.<br>**Note:** The first and last event displays the date along with the time. |
| Event grouping | Option to group the events, which are within a short time interval. This option enables you to have a more concise post incident report. |
| Group events within | Time duration within which events that exist must be grouped. |

## Configuring Recommendation Framework in Service Operations Workspace

You can enable an agent working on an incident to view predictions provided by Recommendation Framework.

Recommendation Framework is now deprecated and no longer supported or available for new activation. Recommended Actions for ITSM feature provides the latest experience for this functionality. To get the advanced version, you must install the Advanced Recommended actions for ITSM (com.snc.uib.sow_itsm_ra_advanced) plugin and you must procure ITSM Pro package subscription.

**Note:**
The best practice to get the advanced version is to install the Task Intelligence for ITSM (com.snc.itsm_ml_task) plugin and procure the ITSM Pro package subscription. For more information, see Exploring Recommended Actions for ITSM in Service Operations Workspace.

You must ensure that the following requirements are met:

- Install the Service Operations Workspace ITSM Applications (sn_sow_itsm_cont) application from ServiceNow Store. For information about this installation, see Install Service Operations Workspace ITSM Applications. With this installation, the following Recommendation Framework applications are also installed.

### Recommendation Framework store applications

| Application | Description |
| --- | --- |
| Recommendation Framework (sn_rf) | Provides the framework for dynamic and contextual recommendations in a configurable workspace. |

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| Application | Description |
|---|---|
| Recommendations for Incident Management (sn_sow_incident_rf) | Provides configurations, for example, recommendation rules, to predict recommendations for an incident in Service Operations Workspace. |

- Install the Predictive Intelligence for Incident plugin (com.snc.incident.ml) to install the Relevant problems solution definition. For information about this plugin installation, see Request Predictive Intelligence for Incident.
- Install the Predictive Intelligence for Major Incident Management plugin (com.snc.incident.mim.ml_solution) to install the following IT Service Management solution definitions. For information about this plugin installation, see Request Predictive Intelligence for Major Incident Management.
- Install the Predictive Intelligence for Incident Management plugin (com.snc.incident.ml_solution) to install the following IT Service Management solution definitions. For information about this plugin installation, see Request Predictive Intelligence for Incident Management.
  - Similar Knowledge Articles
  - Similar Open Incidents
  - Incident Service
  - Incident Configuration Item
  - Incident Assignment
  - Similar Resolved Incidents
- Train solution definitions to predict recommendations for an incident. For information about training solution definitions, see Predictive Intelligence.

### Configure Recommendation Framework for an incident in Service Operations Workspace

Enable recommendations at field level or from the contextual sidebar for an incident in Service Operations Workspace.

## Before you begin

Role required: admin

## Procedure

1. Navigate to **All** > **Recommendation Framework** > **Administration** > **Recommendation Properties**.
2. From the Recommendation Properties page, configure the recommendation framework settings.

#### Recommendation Framework properties

| Property | Description |
|---|---|
| Activate/Deactivate Recommendation Rule | |
| Assignment group recommendation for Incident | Enables the field-level recommendation for the **Assignment group** field of an incident. |
| Configuration item | Enables the field-level recommendation for the **Configuration item** field of an incident. |

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| Property | Description |
|---|---|
| recommendation for Incident | |
| Knowledge articles for Incident | Enables the **Knowledge articles** card when you access recommendations from the sidebar. |
| Propose major incident for Incident | Enables the **Propose major incident** card when you access recommendations from the sidebar. |
| Relevant problems for Incident | Enables the **Relevant problems** card when you access recommendations from the sidebar. |
| Service recommendation for Incident | Enables the field-level recommendation for the **Service** field of an incident. |
| Similar major incidents for Incident | Enables the **Similar major incidents** card when you access recommendations from the sidebar. |
| Similar open incidents for Incident | Enables the **Similar open incidents** card when you access recommendations from the sidebar. |
| Similar resolved incidents for Incident | Enables the **Similar resolved incidents** card when you access recommendations from the sidebar. |
| Set threshold value for field level stamping | |
| Assignment group recommendation for Assignment group | Threshold value for auto-populating a recommendation in the **Assignment group** field. When the prediction value is greater than or equal to the specified threshold value, the recommendation is auto-populated as the field value. |
| Configuration item recommendation for Configuration item | Threshold value for auto-populating a recommendation in the **Configuration item** field. When the prediction value is greater than or equal to the specified threshold value, the recommendation is auto-populated as the field value. |
| Service recommendation for Service | Threshold value for auto-populating a recommendation in the **Service** field. When the prediction value is greater than or equal to the specified threshold value, the recommendation is auto-populated as the field value. |

For information on recommendation rules, see Recommendation rules for an incident in Service Operations Workspace.

3. Click **Save**.

## Configuring Recommended Actions for ITSM in Service Operations Workspace

Enable an agent working on an incident to view the relevant recommendations provided by Recommended Actions for ITSM.

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The standard version of Recommended Actions for ITSM is provided as a new feature in Incident Management for the Service Operations Workspace application that is a part of Service Operations Workspace 3.0.

Existing users who upgrade to Service Operations Workspace 3.0 get the standard version of Recommended Actions for ITSM by default as a new feature. New users get the standard version of Recommended Actions for ITSM after installing the Service Operations Workspace ITSM Applications (sn_sow_itsm_cont) application from the ServiceNow Store. For more information, see Install Service Operations Workspace ITSM Applications. This plugin enables the standard recommended actions and offers the following recommendations:

- Open incidents (CI & Service)
- Similar Resolved incidents (CI & Service)
- Open PRBs (CI & Service)

To get the advanced version of Recommended Actions for ITSM, you must install the Advanced Recommended actions for ITSM (com.snc.uib.sow_itsm_ra_advanced) plugin, and you must procure the ITSM Pro package subscription.

**Note:**
The best practice to get the advanced version is to install the Task Intelligence for ITSM (com.snc.itsm_ml_task) plugin and procure the ITSM Pro package subscription.

This plugin offers the Task Intelligence-based recommendation for Incident fields: Incident Fields value prediction (TI).

**Note:**
The Advanced Recommended actions for ITSM (com.snc.uib.sow_itsm_ra_advanced) and Task Intelligence Admin Console (com.sn_ti_admin) plugins are installed as a dependency.

Additionally, to get Predictive Intelligence -based recommendations, install the following plugins:

- Install the Predictive Intelligence for Incident (com.snc.incident.ml) plugin to install the Relevant problems solution definition-Similar open PRBs (Similarity). For information about this plugin installation, see Request Predictive Intelligence for Incident.
- Install the Predictive Intelligence for Major Incident Management (com.snc.incident.mim.ml_solution) plugin to install the following IT Service Management solution definitions.
  - Propose major incident (Trend)
  - Similar major incident (Trend)

  For information about this plugin installation, see Request Predictive Intelligence for Major Incident Management.
- Install the Predictive Intelligence for Incident Management (com.snc.incident.ml_solution) plugin to install the following IT Service Management solution definitions.
  - Assignment group (Classification)
  - Configuration item (Classification)
  - Service (Classification)
  - Similar open incidents (Similarity)
  - Similar KB articles (Similarity)
  - Similar resolved incidents (Similarity)

  For more information, see Request Predictive Intelligence for Incident Management.

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Train solution definitions to predict recommendations for an incident. For information about training solution definitions, see Predictive Intelligence for Incident Management

For information about the training solution definition of Incident Fields value prediction (TI), see Task Intelligence for ITSM.

### Recommendation Framework Deprecation

Recommendation Framework is now deprecated and no longer supported or available for new activation. Recommended Actions for ITSM feature provides the latest experience for this functionality. To get the advanced version, you must install the Advanced Recommended actions for ITSM (com.snc.uib.sow_itsm_ra_advanced) plugin and you must procure ITSM Pro package subscription.

**Note:**
The best practice to get the advanced version is to install the Task Intelligence for ITSM (com.snc.itsm_ml_task) plugin and procure the ITSM Pro package subscription. For more information, see Exploring Recommended Actions for ITSM in Service Operations Workspace.

### Setting up Recommended Actions for ITSM

Set up recommended actions to display relevant recommendations based on the incident context in Service Operations Workspace.

**Before you begin**
Role required: admin

**Procedure**

1. Create a rule in Recommended Actions for ITSM.
   ITSM enables you to create new rules. For more information, see Create a rule in Recommended Actions.
2. Create a recommendation.

   ITSM enables you to create new recommendations. For more information, see Create a recommendation in Recommended Actions.
3. Create a resource generator.

   ITSM enables you to create new resource generators. For more information, see Create a resource generator in Recommended Actions.
4. Create Guidance and field recommendations.
   ITSM enables you to configure or create guidance and field recommendations. For more information, see Creating guidance and field recommendation in Recommended Actions.

## Admin Center in Service Operations Workspace for ITSM

The Admin Center provides centralized control of the instance to admins. It provides effortless, quick access to manage all customizations in Service Operations Workspace (SOW) for IT Service Management (ITSM), and additional plugins that extend the Service Operations Workspace for ITSM capabilities.

The Admin Center provides a single page where an admin can access all platform capabilities, applications, plugins, and help. It consists of the following tabs:

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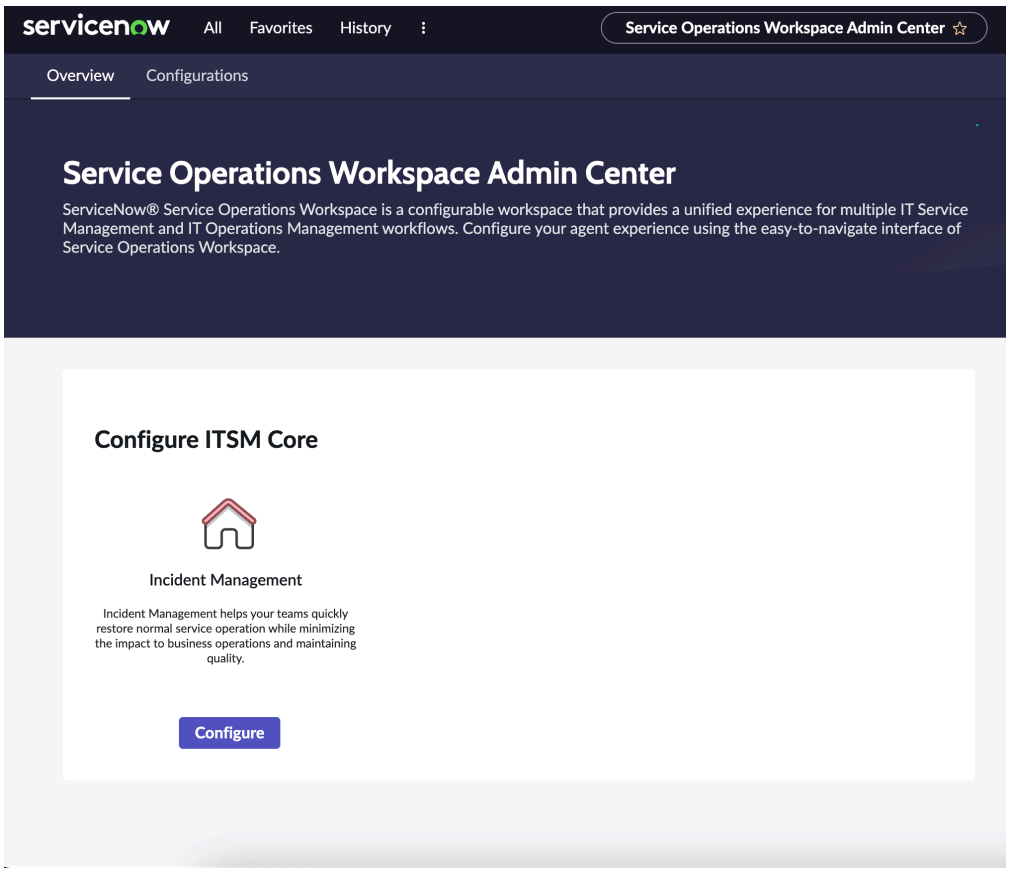
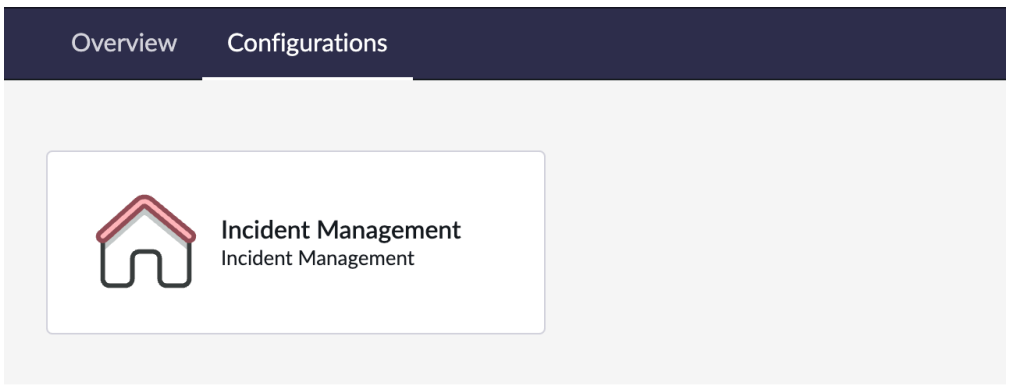
- **Overview**: Provides access to all customizations available in Service Operations Workspace for ITSM.
- **Configurations**: Provides access to page-related customizations available in Service Operations Workspace for ITSM. For example, the landing page and incident record page.

The following admin roles can access the Admin Center.

- sn_sow_itsm_admin.sow_admin_user: Granular level role used to access pages in the Admin Center for SOW configuration. This role is also referred to as an SOW admin role. An SOW admin can perform configurations related to ServiceNow® Incident Management only.

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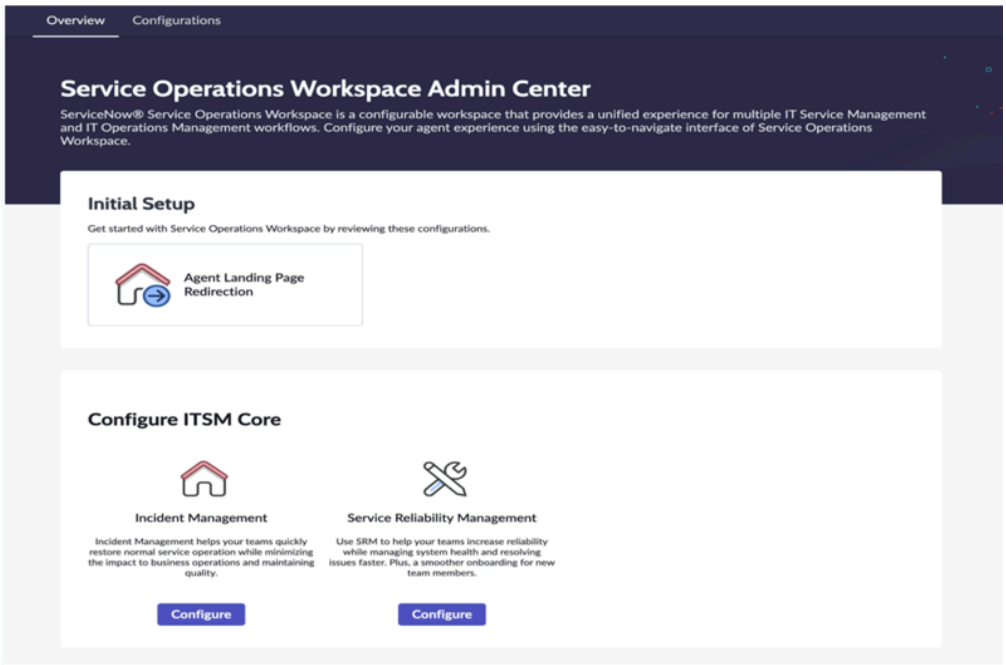
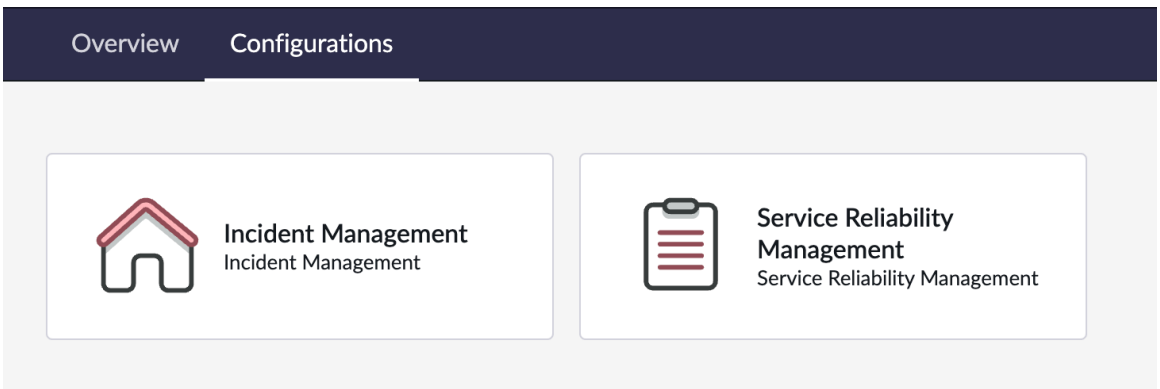
- admin: The admin or sys_admin role has access to all the pages in the Admin Center. An admin can perform configurations for all modules in the Admin Center.




For more information about performing the various customizations, see Manage customizations in Service Operations Workspace for ITSM.

### Manage customizations in Service Operations Workspace for ITSM

From a single page, quickly access and manage all customizations in Service Operations Workspace (SOW) for ITSM, access additional plugins that extend the Service Operations Workspace for ITSM capabilities, and access ServiceNow help.

#### Before you begin

Role required: sn_sow_itsm_admin.sow_admin_user, admin

#### About this task

The Admin Center consists of the following tabs:

- **Overview**: Provides access to all customizations available in Service Operations Workspace for ITSM.
- **Configurations**: Provides access to page-related customizations available in Service Operations Workspace for ITSM. For example, the landing page and incident record page.

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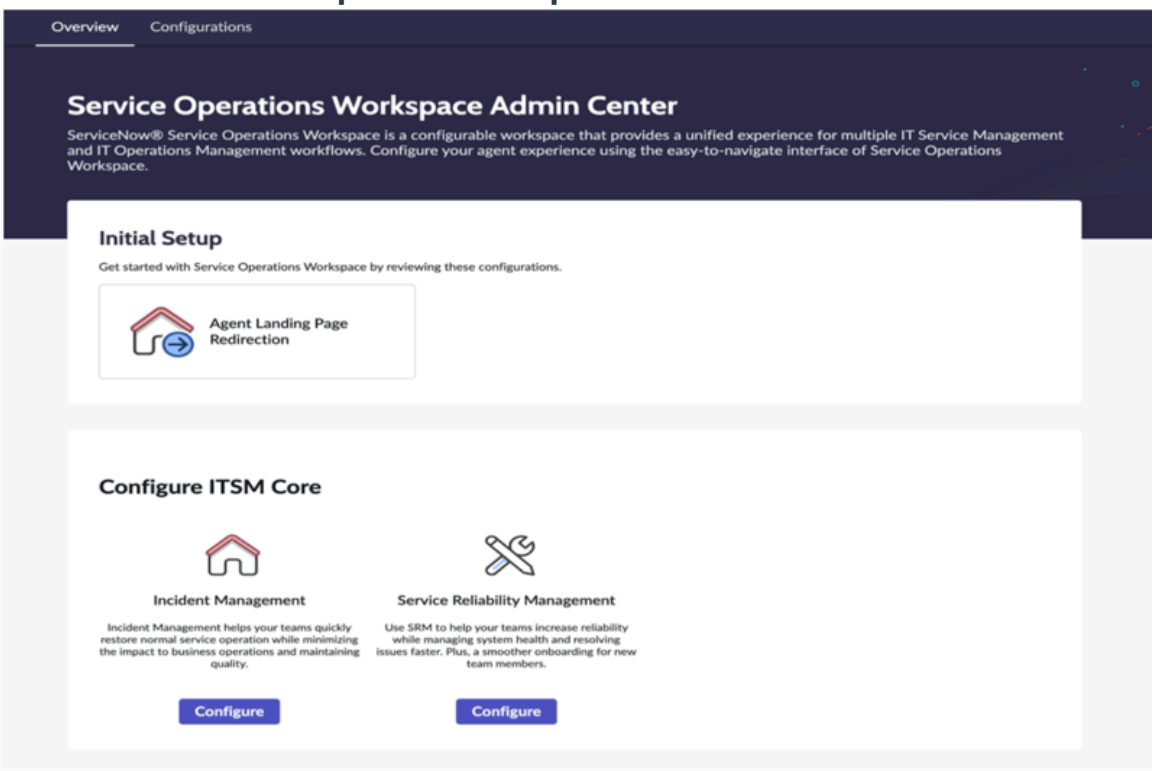
**Admin Center in Service Operations Workspace for ITSM for admin role**




### Procedure

1. Navigate to **All** > **Service Operations Workspace Admin Center** > **Overview**.
2. **Optional:** If not already installed, from the **Configure ITSM Core** section, install applications such as Incident Management and Service Reliability Management.
3. Select any of the following options.

## Customize the Service Operations Workspace for ITSM landing page

You can customize the data displayed in sub pages of the landing page that is available in the base system. For any visual styling changes, you need to create a copy of that landing page and edit it.

### Modify the greeting text on the landing page

Customize the greeting text on the landing page.

### Before you begin

Role required: admin

### About this task

The Get service desk agent shift data broker server script calls the `SOWServiceDeskAgentShift` script includes to display the shift information in the greeting text.

While the display text can be customized for the default landing page, the visual styling changes to the text can be done only by creating a copy of the landing page.

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**Header section**



Hello Grady!

You are on-call until Monday, Mar 21 12:00 AM

### Procedure

1. Navigate to **All** > **System Definition** > **Script Includes**.
2. From the Script Includes list, select SOW`ServiceDeskAgentShift`.
3. Edit the **Script** field.
   Refer to the existing functions in the script and how they are called using UI Builder.
4. Click **Update**.

## Modify the donut cards in the Overview section

Customize the data displayed in the first-level cards in the **Overview** section.

### Before you begin
Role required: admin

### About this task
You can customize header label, data source, metric, group by field, and viewAllQuery for all cards. For example, Catalog tasks assigned to me card.

### Procedure

1. Navigate to **sys_ux_client_script_include.list**.
2. Perform the following steps for the tier-1 landing page.

   a. From the UX Client Script Includes list, select `SowIncidentLandingPageUtils` client script include definition.

   b. On the UX Client Script Include form, inside the **Script** field add the code inside the class *`ServiceDeskLandingPageUtils`*.
   For example:

```
static async getVisualizationConfig(helpers, mode) {
            const evamDef = this.getEvamDef();
            const visualizationConfig = [{
                    "id": "incident_assigned",
                    "tableName": "incident",
                    "tableDisplayValue": "Incident",
                    "myWorkQuery":
 "active=true^assigned_toDYNAMIC90d1921e5f510100a9ad2572f2b47
7fe",
                    "myTeamQuery":
 "active=true^assigned_toISNOTEMPTY^assignment_groupDYNAMICd6
435e965f510100a9ad2572f2b47744",
                    "listView": mode == "your_work" ?
 "sow_landing_page_assigned" : "sow_landing_page",
```

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```
                    "header": mode == 'your_work' ? await
 helpers.translate("Incidents assigned to you") : await
 helpers.translate("Incidents assigned to your team"),
                    "groupByField": "state",
                    "evamId":
 evamDef['incidentEvamDefinitionId'],
                    "updated_on":
 "^ORDERBYDESCsys_updated_on",
                },
                {
                    "id": "incident_sla",
                    "tableName": "task_sla",
                    "tableDisplayValue": "Task SLA",
                    "myWorkQuery":
 "task.sys_class_name=incident^task.assigned_toDYNAMIC90d1921
e5f510100a9ad2572f2b477fe^task.active=true^sla.type=SLA^ORsla
.type=OLA^active=true^time_left<=1970-01-08 00:00:00",
                    "myTeamQuery":
 "task.sys_class_name=incident^task.assignment_groupDYNAMICd6
435e965f510100a9ad2572f2b47744^task.active=true^sla.type=SLA^
ORsla.type=OLA^active=true^time_left<=1970-01-08 00:00:00",
                    "listView": 'sow_landing_page',
                    "header": await
 helpers.translate("Incident SLAs"),
                    "groupByField": "time_left",
                    "evamId":
 evamDef['incidentSlaEvamDefinitionId'],
                    "updated_on": "^ORDERBYtime_left",
                },
                {
                    "id": "unassigned_incidents",
                    "tableName": "incident",
                    "tableDisplayValue": "Incident",
                    "myWorkQuery":
 "active=true^assigned_toISEMPTY^assignment_groupDYNAMICd6435
e965f510100a9ad2572f2b47744",
                    "myTeamQuery":
 "active=true^assigned_toISEMPTY^assignment_groupDYNAMICd6435
e965f510100a9ad2572f2b47744",
                    "listView": mode == "your_work" ?
 "sow_landing_page_assigned" : "sow_landing_page",
                    "header": await
 helpers.translate("Unassigned incidents"),
                    "groupByField": "priority",
                    "evamId":
 evamDef['incidentEvamDefinitionId'],
                    "updated_on":
 "^ORDERBYDESCsys_updated_on",
                },
                {
                    "id": "catalog_tasks",
                    "tableName": "sc_task",
                    "tableDisplayValue": "Catalog Task",
                    "myWorkQuery":
 "active=true^assigned_toDYNAMIC90d1921e5f510100a9ad2572f2b47
7fe",
```

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```
                    "myTeamQuery":
 "active=true^assignment_groupDYNAMICd6435e965f510100a9ad2572
f2b47744",
                    "listView": 'sow_landing_page',
                    "header": mode == 'your_work' ? await
 helpers.translate("Catalog tasks assigned to you") : await
 helpers.translate("Catalog tasks assigned to your team"),
                    "groupByField": "state",
                    "evamId":
 evamDef["catalogTaskEvamDefinitionId"],
                    "updated_on":
 "^ORDERBYDESCsys_updated_on",
                }
            ];
            return visualizationConfig;
        }
```

**c.** Select **Update**.

**3.** Perform the following steps for the tier-2 landing page.

**a.** From the UX Client Script Includes list, select SOWLandingPageTier2Utils client script include definition.

**b.** On the UX Client Script Include form, inside the **Script** field add the code inside the class *SOWLandingPageTier2Utils*.
For example:

```
static async getVisualizationConfig(helpers, mode) {
            const visualizationConfig = [{
                "id": "incidentAssigned",
                "tableName": "incident",
                "tableDisplayValue": "Incident",
                "myWorkQuery":
 "active=true^assigned_toDYNAMIC90d1921e5f510100a9ad2572f2b47
7fe",
                "myTeamQuery":
 "active=true^assignment_groupDYNAMICd6435e965f510100a9ad2572
f2b47744",
                "header": mode == 'your_work' ? await
 helpers.translate("Incidents assigned to you") : await
 helpers.translate("Incidents assigned to your team"),
                "groupByField": "state",
                "evamId": "01a404e8b7203010e69dbc16de11a93f",
                "updated_on": "^ORDERBYDESCsys_updated_on",
            },
            {
                "id": "problemsAssigned",
                "tableName": "problem",
                "tableDisplayValue": "Problem",
                "myWorkQuery":
 "active=true^assigned_toDYNAMIC90d1921e5f510100a9ad2572f2b47
7fe",
                "myTeamQuery":
 "active=true^assignment_groupDYNAMICd6435e965f510100a9ad2572
f2b47744",
```

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```
                "header": mode == 'your_work' ? await
 helpers.translate("Problems assigned to you") : await
 helpers.translate("Problems assigned to your team"),
                "groupByField": "state",
                "evamId": "5f0697b8f49bc510f8773ad5bd0ae292",
                "updated_on": "^ORDERBYDESCsys_updated_on",
            },
            {
                "id": "changesAssigned",
                "tableName": "change_request",
                "tableDisplayValue": "Change Request",
                "myWorkQuery":
 "active=true^assigned_toDYNAMIC90d1921e5f510100a9ad2572f2b47
7fe",
                "myTeamQuery":
 "active=true^assignment_groupDYNAMICd6435e965f510100a9ad2572
f2b47744",
                "header": mode == 'your_work' ? await
 helpers.translate("Changes assigned to you") : await
 helpers.translate("Changes assigned to your team"),
                "groupByField": "state",
                "evamId": "e1f06c4194130110f87765e94545da91",
                "updated_on": "^ORDERBYDESCsys_updated_on",
            },
            {
                "id": "taskAssigned",
                "tableName": "task",
                "tableDisplayValue": "Task",
                "myWorkQuery":
 "active=true^assigned_toDYNAMIC90d1921e5f510100a9ad2572f2b47
7fe^sys_class_name=incident_task^ORsys_class_name=problem_tas
k^ORsys_class_name=change_task^ORsys_class_name=sc_task",
                "myTeamQuery":
 "active=true^assignment_groupDYNAMICd6435e965f510100a9ad2572
f2b47744^sys_class_name=incident_task^ORsys_class_name=proble
m_task^ORsys_class_name=change_task^ORsys_class_name=sc_tas
k",
                "header": mode == 'your_work' ? await
 helpers.translate("Tasks assigned to you") : await
 helpers.translate("Tasks assigned to your team"),
                "groupByField": "sys_class_name",
                "evamId": "615d205d94df0110f87765e94545da03",
                "updated_on": "^ORDERBYDESCsys_updated_on",
            }];
            return visualizationConfig;
        }
```

**c.** Select **Update**.

### Customize the donut area color for first-level cards

Create a visual experience that works the best for donuts of a first-level card in the **Overview** section.

## Before you begin

Role required: admin

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### About this task

For a first-level card, donut area colors are based on the element that the donut is grouped by.

- Tier-1 landing page
  - In the **Incidents assigned to me** card, the donut is grouped by the state of incidents.
  - In the **Unassigned incidents** card, the donut is grouped by the priority of incidents.
  - In the **Catalog tasks assigned to me** card, the donut is grouped by the state of catalog tasks.
  - In the **Incident SLAs** card, the donut is grouped by the time left after which the incidents will breach SLA.
- Tier-2 landing page
  - In the **Incidents assigned to me** card, the donut is grouped by the state of incidents.
  - In the **Problems assigned to me** card, the donut is grouped by the state of problems.
  - In the **Changes assigned to me** card, the donut is grouped by the state of change requests.
  - In the **Tasks assigned to me** card, the donut is grouped by the state of catalog tasks.

### Procedure

1. To change the donut area colors for the following cards in the tier-1 landing page, perform these steps.
   - Incidents assigned to me
   - Unassigned incidents
   - Catalog tasks assigned to me

   a. Navigate to **Reports** > **Administration** > **Chart Colors**

   b. In the Chart Colors list, filter records based on the card that you want to customize and select a record.

      i. To customize the color of the **Incidents assigned to me** card, filter records with **Name** as **incident** and **Element** as **state**.

      ii. To customize the color of the **Unassigned incidents** card, filter records with **Name** as **incident** and **Element** as **priority**.

      iii. To customize the color of the **Catalog tasks assigned to me** card, filter records with **Name** as **sc_task** and **Element** as **state**.

   c. On the Chart Colors form, select the required color in the **Color name** field.

   d. Click **Update**.

2. To change the donut area color for the Incident SLAs card in the tier-1 landing page, perform the following steps.

   a. Navigate to **Reports** > **Administration** > **Report Ranges**.

   b. In the Ranges list, filter records with **Name** as **task_sla** and **Element** as **time_left**.

   c. Select the required record.

   d. On the Range form, select the required color in the **Color name** field.

   e. Click **Update**.

3. To change the donut area colors for the tier-2 landing page, perform the following steps.

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a. Navigate to **Reports** > **Administration** > **Chart Colors**

b. In the Chart Colors list, filter records based on the card that you want to customize and select a record.

   i. To customize the color of the **Incidents assigned to me** card, filter records with **Name** as **incident** and **Element** as **state**.

   ii. To customize the color of the **Problems assigned to me** card, filter records with **Name** as **problem** and **Element** as **state**.

   iii. To customize the color of the **Changes assigned to me** card, filter records with **Name** as **change_request** and **Element** as **state**.

   iv. To customize the color of the **Tasks assigned to me** card, filter records with **Name** as **sc_task** and **Element** as **state**.

c. On the Chart Colors form, select the required color in the **Color name** field.

d. Click **Update**.

### Configure the list view for donut cards in Service Operations Workspace for ITSM

Modify columns of the list view, which is displayed when you select a donut card on the landing page.

#### Before you begin
Role required: admin

#### About this task
Each donut card is associated with a system table. You can modify the columns in the donut's list view by adding or removing the associated table's fields.

#### Procedure

1. Navigate to **All** > **System UI** > **Views**.
2. From the UI Views list, select **sow_landing_page**.
3. From the Lists related list, select the table that you want to modify.
4. From the List Elements related list, modify the table fields.
5. Select **Update**.

### Modify the Announcements section on the landing page

Customize an existing announcement or add an announcement for additional tables.

#### Before you begin
Role required: admin

#### About this task
You can customize how the Entity View Action Mapper (EVAM) component is configured for the **Announcements** section. While the data can be customized for the default landing page, the visual styling changes can be done only by creating a copy of the landing page. In the base system, announcements and the corresponding data sources are defined for the following tables:

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- Outage [cmdb_ci_outage]
- Banner Announcement [sys_ux_banner_announcement]
- Incident [incident]

You can add announcements for additional tables by defining additional data sources in the EVAM definition.

### Procedure

1. Navigate to **All** > **Entity View Action Mapper (EVAM)** > **EVAM Definitions**.
2. From the EVAM Definitions list, select **SOW - Announcements**.
   For information on EVAM definition, see Create an EVAM definition.
3. To edit the data source of an announcement, navigate to the EVAM Datasource M2Ms related list and edit the required data source.
   For information on data source, see Define a datasource.
4. To create an announcement for an additional table, add a data source for that table.
   For information on data source, see Define a data source. For information on defining a data source, see Define a datasource.
5. **Optional:** To source custom announcements into the **Announcements** section, create an additional banner announcement configuration for the Banner Announcement [sys_ux_banner_announcement] table by performing the following steps.

   a. Create a banner announcement configuration and the corresponding banner announcements.
      For information on creating a banner announcement configuration, see Next Experience banner announcements.

   b. Associate the banner announcement configuration with the *sn_sow.banner_announcements_config_id* property.

      i. Navigate to sys_properties.list

      ii. Select the *sn_sow.banner_announcements_config_id* property.

      iii. On the System Property form, specify the sys_id of the banner configuration as the property value.

6. To configure how an announcement should be displayed for a data source, edit an EVAM view configuration and template by performing these steps.

   a. Navigate to the EVAM View Config Bundle M2Ms related list and select the required configuration bundle.

   b. On the EVAM View Config Bundle form, navigate to the EVAM View Configs related list and select a configuration for the required data source.

   c. On the EVAM View Config form, open the template from the **View Template** field.

   d. On the View Template form, edit the **Template** field.
      For information on editing a template, see Define an EVAM view template.

   e. Select **Update**.

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### Modify the Upcoming section on the landing page

Customize the data displayed in the **Upcoming** section.

#### Before you begin
Role required: admin

#### About this task
Using an extension point, you can call the custom scripts to extend the functionality of the **Upcoming** section and also easily integrate customizations without having to alter the base code. For information about extension points, see Creating and adding a scripted extension point.

**Scripted extension points for the Upcoming section in the base system**

| Extension point | Description |
|---|---|
| sn_sow.UpcomingLinkProvider | Gets a list of upcoming task records (changes, incident, requests, and overdue tasks) for the same day and the next day. |

#### Procedure
1. Navigate to **All** > **System Extension Points** > **Scripted Extension Points**.
2. From the Extension Points list, select **sn_sow.UpcomingLinkProvider**.
3. Create an implementation using the **Create Implementation** related link or edit an implementation from the Implementations related list.

### Create a copy of the Service Operations Workspace landing page

Make visual styling changes to the sub pages in the Service Operations Workspace landing page.

#### Before you begin
Role required: admin or ui_builder_admin

#### Procedure
1. Navigate to **All** > **Now Experience Framework** > **UI Builder**.
2. From the **Experiences** list, select **Service Operations Workspace**.
3. Under **Pages and Variants** section, under **Home**, point to **Service desk landing page SNC**, and select ⋮.
4. Select **Duplicate variant**.
   - A copy of the Service Operations Workspace landing page, along with its subpages, is created under the **Variants** section.
   - The copy of the landing page is created in the scope of the current logged-in user.
5. To edit the page or any of its subpages, customize its components.
   For information about components, see Work with components.

### Configure Service Operations Workspace landing page

Modify the landing page of the Service Operations Workspace to ensure that the customers can view the page that they use regularly.

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### Before you begin
Role required: admin

### Procedure

1. Navigate to **All** > **Now Experience Framework** > **Experiences**.
2. From the UX Applications list, select **Service Operations Workspace**.
3. For the Admin Panel field, select the ⓘ icon.
4. Select **Open Record**.
5. On the UX App Configuration Service Operations Workspace page, edit the **Landing Path** field to modify the landing page.
   To redirect the user to the Service Operations Workspace home page, enter the value *`home`*.
   To redirect the user to the Service Operations Workspace list page, enter the value *`list`*.

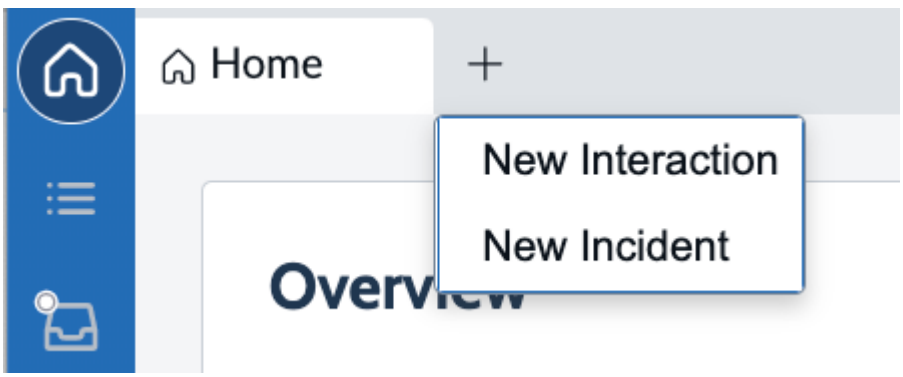
## Configure record creation from the new tab menu in Service Operations Workspace

Customize the records that can be created from the new tab menu in all pages of Service Operations Workspace.

### Before you begin
Role required: admin

### About this task
By default, an interaction or incident record can be created from the new tab menu in all pages of Service Operations Workspace.

**Record creation from tab**




You can customize the JSON value to provide a variety of options. For example, use this method to create a knowledge article directly from the new tab menu. For more information about knowledge article creation, go to Knowledge Management in Service Operations Workspace.

### Procedure

1. Navigate to **All** > **Now Experience Framework** > **Experiences**.
2. From the list of UX applications, select **Service Operations Workspace**.
3. On the UX Application form, from the UX Page Properties related list, select the *`chrome_tab`* property.
4. On the UX Page Property page, when the **Type** field is set to **json**, edit the **Value** field, for example, to add or delete routes or tables.

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To add a new option, for example, to create a knowledge article, add a new JSON object inside the *newTabMenu* object. Provide the name and the action performed when you select the option as a key-value pair inside the *newTabMenu* object.

5. Click **Update**.

## Configure the inbox in Service Operations Workspace

Enable an agent to receive and respond to chat conversations initiated from Service Portal.

### Before you begin

Role required: admin

### Procedure

1. Install the Advanced Work Assignment plugin (com.glide.awa).
2. Install the Agent Chat plugin (com.glide.interaction.awa).
3. Configure the Agent Chat Queue.
   For example, to add agent groups who can handle the incoming chat conversations. For information about configuring queues, see Work item queues and Set up Agent Chat.

#### Enable automatic assignment of interactions to an agent

Automatically accept chat conversations for an agent without having to accept or reject them in the inbox.

### Before you begin

Role required: admin

### Procedure

1. Navigate to **All** > **Advanced Work Assignment** > **Settings** > **Assignment Rules**.
2. Select the Chat - Most Capacity assignment rule.
   For information about AWA assignment rules, see Configure agent assignment rules.
3. In the Auto-assign handling related list, perform the following tasks.

   a. Select the **Enable auto-assign work items** check box.

   b. From the **Display options** list, select the required value.
      - Inbox card: Accepts the interactions and adds them to the agent inbox. Agent can open the accepted interaction from the inbox.
      - Inbox card and workspace tab: Accepts the interactions and opens a tab for each accepted interaction.

4. Click **Update**.

## Configure a task record form in Service Operations Workspace

Configure a task record form in Service Operations Workspace by modifying the form layout or related lists from the classic ServiceNow AI Platform user interface.

### Before you begin

Role required: admin

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### About this task

A task record, for example, problem or incident, has the following editable views in Service Operations Workspace.

- The view while creating the record.
- The **Details** tab view after the record is saved.

### Procedure

1. Open a task record, for example, in an incident or problem, in the classic ServiceNow AI Platform user interface.
2. Perform any of the following actions.
3. On the task record form, for example, in an incident form, select the additional actions icon ( ) and perform any of the following actions.
4. Move the required fields and related lists from the **Available** list to the **Selected** list.
5. Select **Save**.

## Customize the incident record page

You can customize the **Overview** tab and the contextual side panel for an incident.

### Customize the Overview tab for an incident

Modify the **Overview** tab of an incident record page to display the summary and other information of the incident for an agent.

### Before you begin

The demo data should be installed.

Role required: workspace_admin, ui_builder_admin, or admin

### About this task

You can customize which fields are displayed on the various sections, such as Summary, Impact, Cause, and Resolution, in the **Overview** tab. Customize the fields by configuring the **SOW-Incident-Overview** view on the Incident form using the form layout or form design feature in the ServiceNow AI Platform.

**Note:**
You must only configure the fields on the **SOW-Incident-Overview** view that are also available on the **Service Operation Workspace** view on the Incident form in the ServiceNow AI Platform.

For advanced customization of the **Overview** tab with SRP record, use the following procedure.

### Procedure

1. Navigate to **All** > **Now Experience Framework** > **UI Builder**.
2. From the Experiences list, select **Service Operations Workspace**.
3. In the Pages and Variants section under **Record**, select **SRP Record**.

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**Note:**
If you're on a version prior to 4.0, you must navigate from **Record SNC** in UI Builder to customize the **Overview** tab of an Incident record page.

4. Under **Contents** in the **Body** level, select **Main Tab**.

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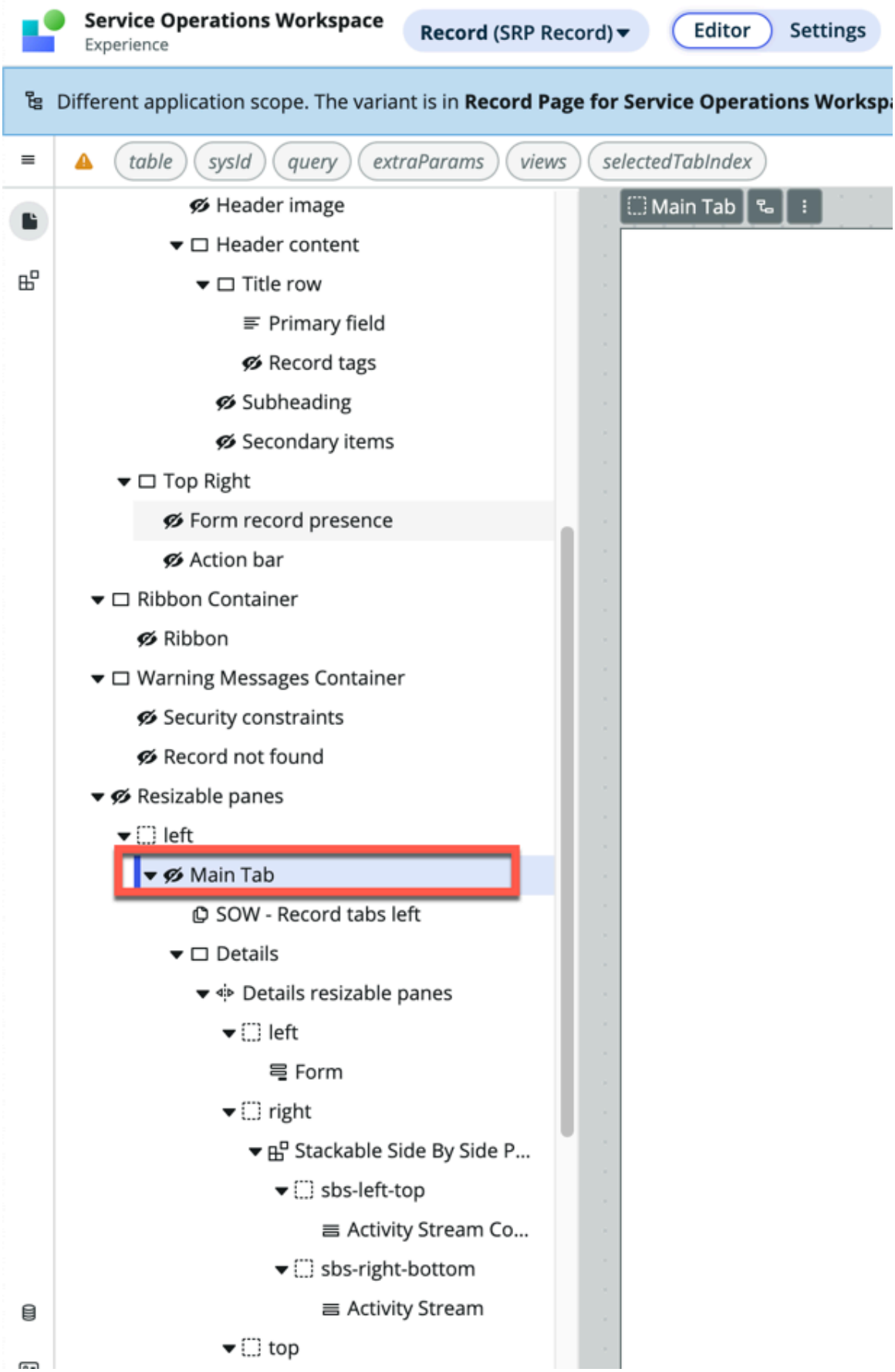
### Main Tab

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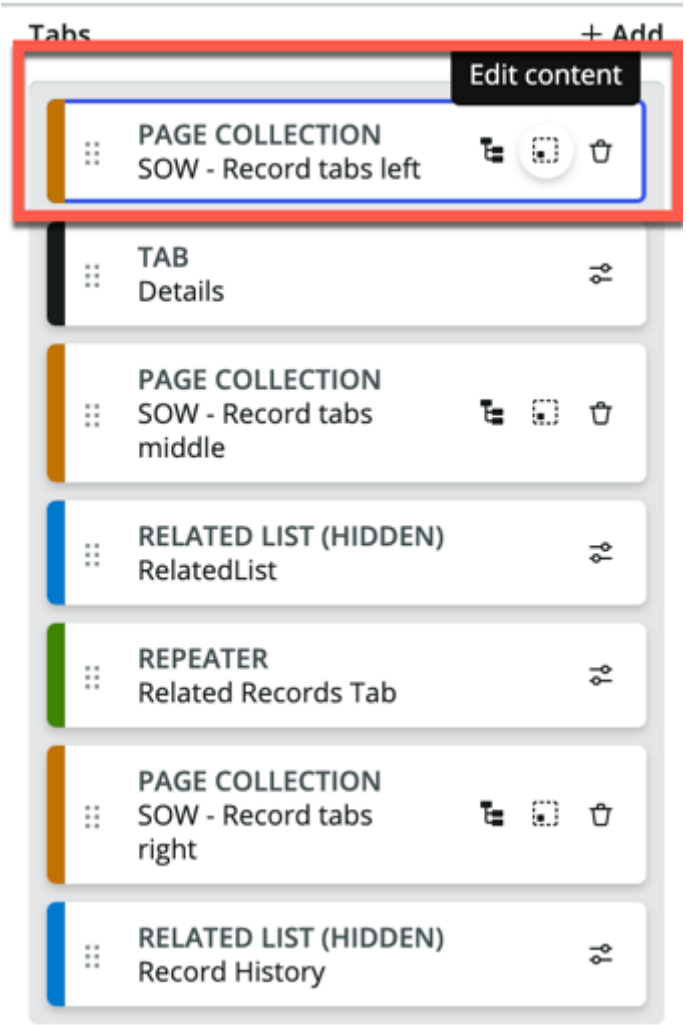
If the new copy is in a different application scope, select **Edit in original scope** before you start editing.

5. In the Config section under Tabs, point to the **Page Collection SOW - Record tabs left** tab and select the Edit content icon ( ).




6. Under **Overview**, point to the **Incident Overview SNC** variant and select the options icon ( ).
7. Select the duplicate variant icon ( ).
   The Variant creation page is displayed.
8. Enter the Name as `Incident Overview SNC Copy`.

   An error is displayed for the **Conditions** field.

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9. Resolve this error by performing the following steps:

   a. Close the Variant creation page.

   b. Under **Overview**, point to the **Incident Overview SNC** variant, select the options icon ( ⋮ ), then select **View settings**.

   c. Select **Open records**, then select **Variant record**.
   The Incident Overview SNC record is displayed.

   d. Edit the record, copy, and store the information from the **Screen Condition** field, then remove the information.
   You use the information from the **Screen Condition** field in the later steps.

   e. Select **Save** and close the record.

   f. Repeat steps 6 through 9.
   No error is displayed for the **Conditions** field.

   g. Open the Incident Overview SNC record again.

   h. Edit the record and paste the **Screen Condition** information copied previously.

   i. Select **Save** and close the record.

10. On the Variant creation page, select the **Settings** tab.
    If the new copy is in a different application scope, select **Edit in original scope** before you start editing.
11. Edit the **Order** value to modify the display order of the variants,
    The variant with the lowest number is the default configuration.
12. **Optional:** Add the criteria to display a page or tab in **Variant conditions**.
13. Select **Save**.
14. Select the **Editor** tab to start editing the page components for customizing the **Overview** tab.
    a. Select the **Body** level of the **Content** tree next to the main page area of UI Builder.
    b. Edit the page by configuring components as required.

    For more information on working with pages, see Work with pages.

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### Customize the Investigation tab for an incident

Modify the **Investigation** tab of an incident record page.

#### Before you begin

The demo data should be installed.

Role required: workspace_admin, ui_builder_admin, or admin

#### Procedure

1. Navigate to **All** > **Now Experience Framework** > **UI Builder**.
2. From the **Experiences** list, select **Service Operations Workspace**.
3. In the **Pages and Variants** section under **Record**, select **SRP Record**.

   **Note:**
   If you are on a version prior to 4.0, you must navigate from **Record SNC** in **UI Builder** to customize the **Investigation** tab of an Incident record page.

4. Under **Contents** in the **Body** level, select **Main Tab**.

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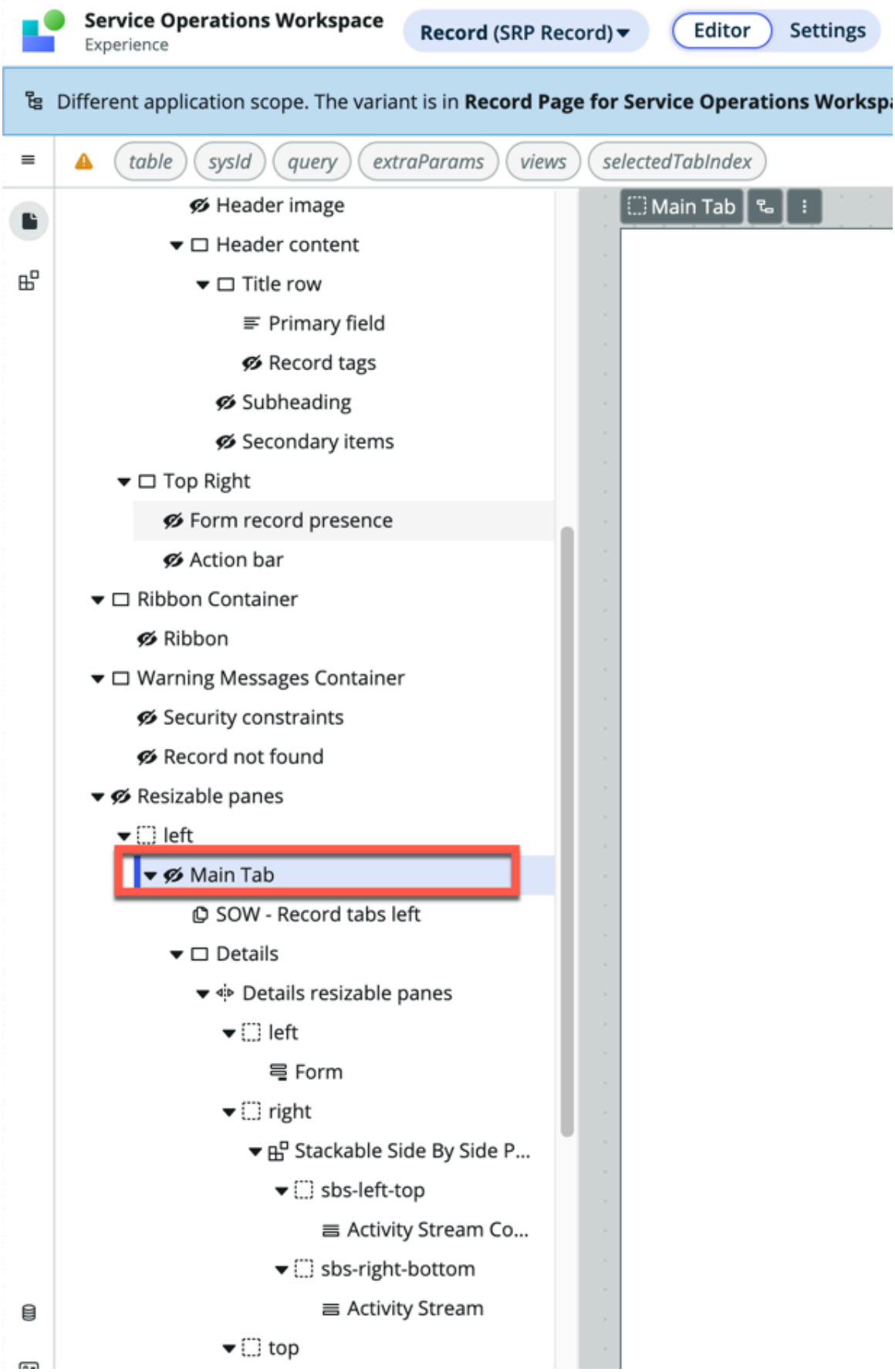
## Main Tab

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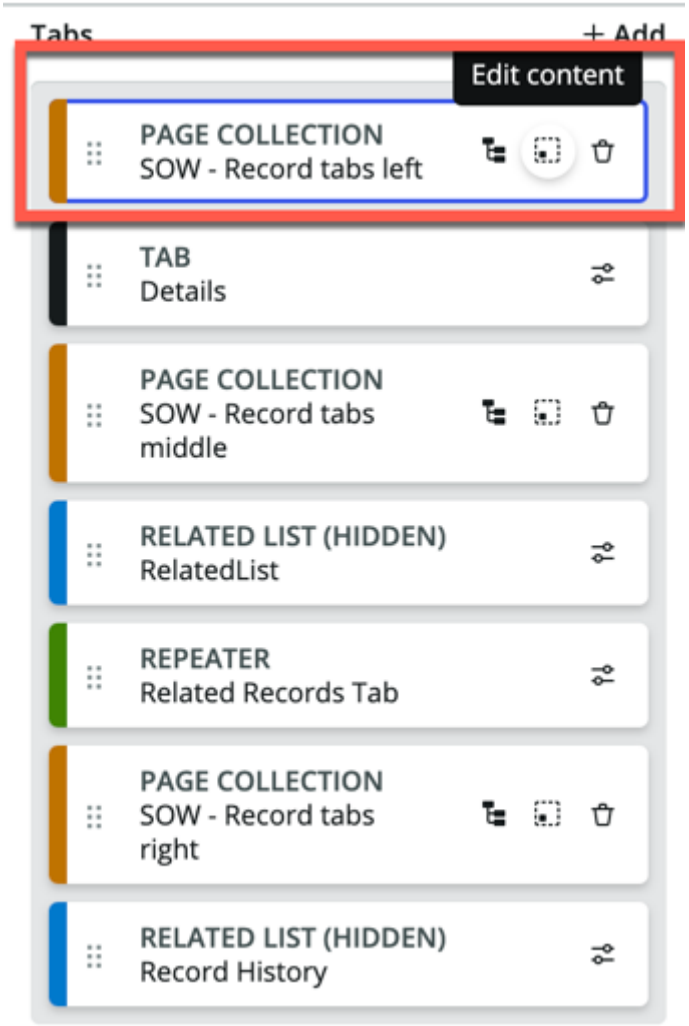
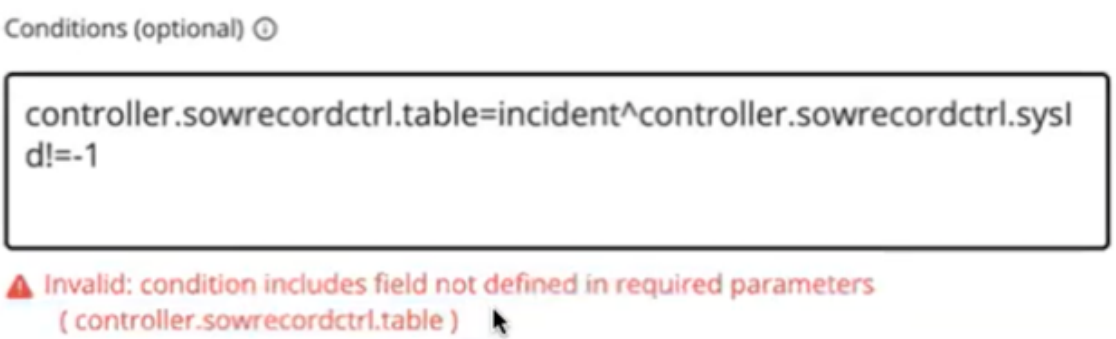
5. If the new copy is in a different application scope, select the **Edit in original scope** button before you start editing.
6. In the Config section under Tabs, point to the **Page Collection SOW - Record tabs left** tab and select the Edit content ( ) icon.




7. Under **Investigation**, point to **SOW Investigate SNC** variant and select the options ( ) icon.
8. Select the **Duplicate variant** icon ( ).
   The Variant creation page is displayed.
9. Enter the **Name** as `SOW Investigate SNC copy`.

   An error is displayed for the **Conditions** field.

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10. To resolve this error, perform the following steps:

    a. Close the Variant creation page.

    b. Under **Investigation**, point to **SOW Investigate SNC** variant, select the options icon ( ⋮ ), and then select **View settings**.

    c. Select **Open records** and then select **Variant record**.
    SOW Investigate SNC record is displayed.

    d. Edit the record, copy and store the information from the **Screen Condition** field, and then remove the information.
    You use the information from the **Screen Condition** field in the later steps.

    e. Select **Save**.

    f. Repeat the steps from Step 6 to Step 9.
    No error is displayed for the **Conditions** field.

    g. Open the SOW Investigate SNC record again.

    h. Edit the record and paste the **Screen Condition** information copied previously.

    i. Select **Save** and close the record.

11. On the Variant creation page, select the **Settings** tab.
12. If the new copy is in a different application scope, select **Edit in original scope** before you start editing.
13. To modify the display order of the variants, edit the **Order** value.
    The variant with the lowest number is the default configuration.
14. **Optional:** Add the criteria to display a page or tab in **Variant conditions**.
15. Select **Save**.
16. Select the **Editor** tab to start editing the page components for customizing the **Investigation** tab.
    a. Select the **Body** level of the **Content** tree to the left of the main page area of UI Builder.
    b. Edit the page by configuring components as required.

    For more information on working with pages, see Work with pages.

### Customize the Remedial action playbook for an incident

Customize the Remedial action playbook displayed on the contextual side panel of an incident record page.

#### Before you begin

The demo data should be installed.

Role required: workspace_admin, ui_builder_admin, or admin

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### Procedure

1. Navigate to **All** > **Now Experience Framework** > **UI Builder**.
2. From the **Experiences** list, select **Service Operations Workspace**.
3. In the **Pages and Variants** section under **Record**, select **SRP Record**.

   **Note:**
   If you are on a version prior to 4.0, you must navigate from **Record SNC** in **UI Builder** to customize the remedial action playbook.

4. Under **Contents** in the **Body** level, select **Tab sidebar**.

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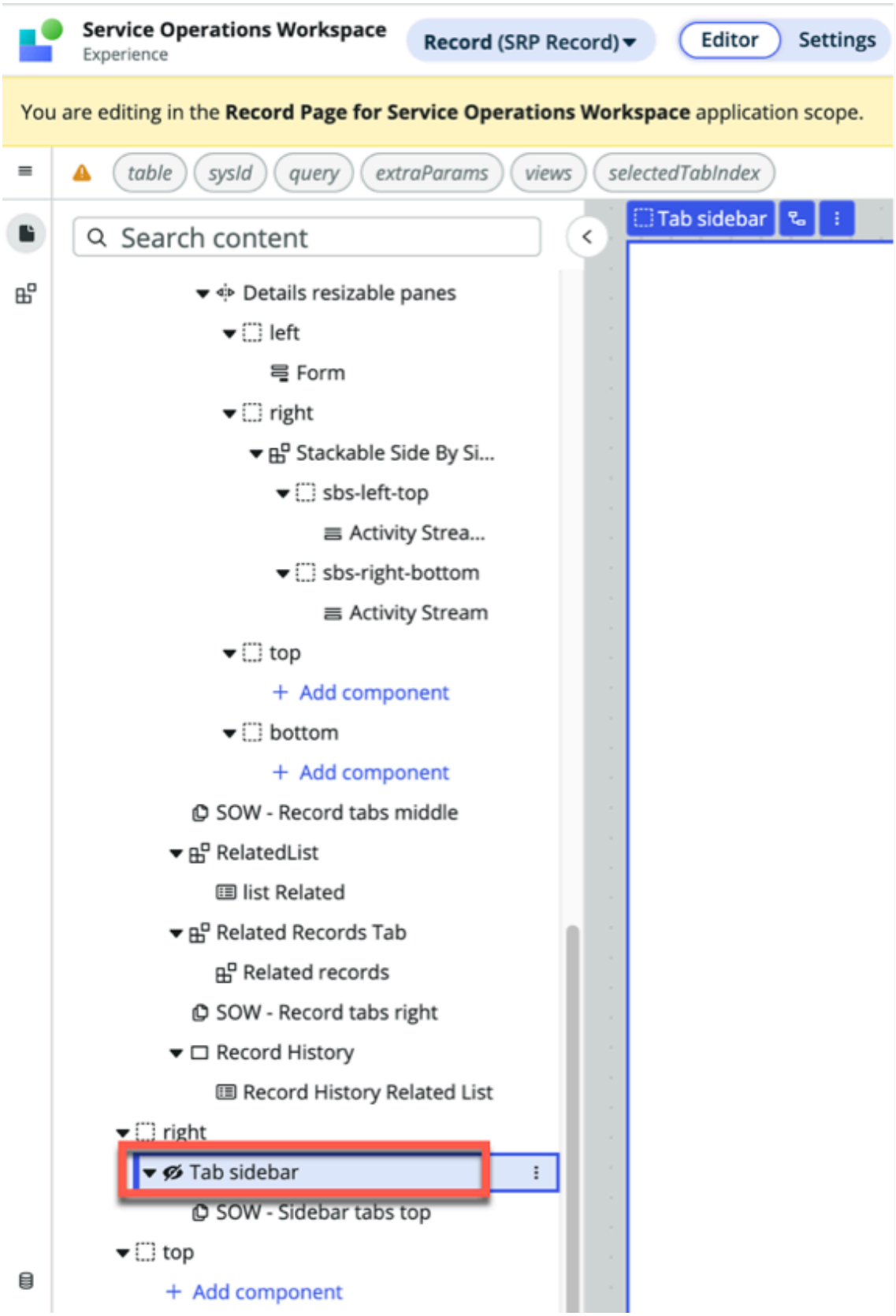
**Tab sidebar**




5. If the new copy is in a different application scope, select the **Edit in original scope** button before you start editing.

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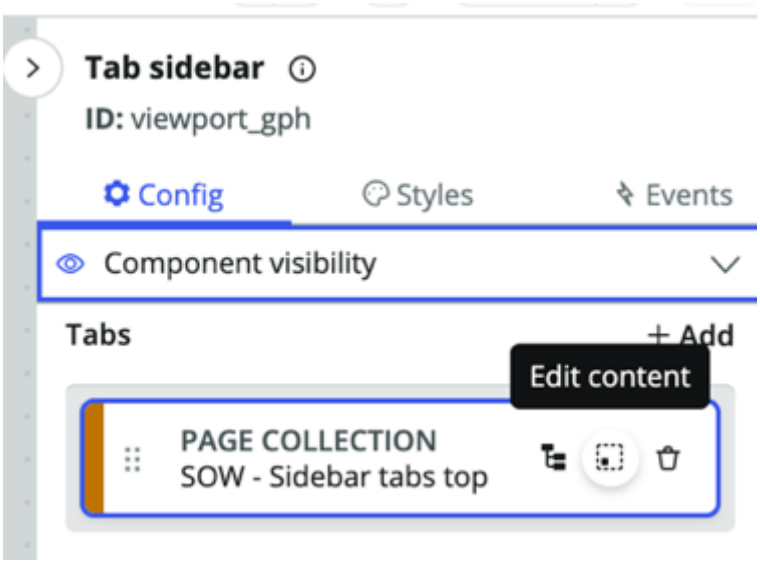
6. In the Config section under Tabs, point to the **Page Collection SOW - Sidebar tabs top** tab and select the Edit content ( ) icon.




7. Under **Playbook**, point to **Playbook SNC** variant and select the options icon ( ).
8. Select the **Duplicate variant** icon ( ).
   The Variant creation page is displayed.
9. Enter the **Name** as `Playbook SNC copy`.

   An error is displayed for the **Conditions** field.




10. To resolve this error, perform the following steps:

    a. Close the Variant creation page.

    b. Under **Playbook**, point to **Playbook SNC** variant, select the options icon ( ), and then select **View settings**.

    c. Select **Open records** and then select **Variant record**.
    Playbook SNC record is displayed.

    d. Edit the record, copy and store the information from the **Screen Condition** field, and then remove the information.
    You use the information from the **Screen Condition** field in the later steps.

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e. Select **Save**.

f. Repeat the steps from Step 6 to Step 9.
No error is displayed for the **Conditions** field.

g. Open the Playbook SNC record again.

h. Edit the record and paste the **Screen Condition** information copied previously.

i. Select **Save** and close the record.

11. On the Variant creation page, select the **Settings** tab.
12. If the new copy is in a different application scope, select the **Edit in original scope** button before you start editing.
13. To modify the display order of the variants, edit the **Order** value.
The variant with the lowest number is the default configuration.
14. **Optional:** Add the criteria to display a page or tab in **Variant conditions**.
15. Select **Save**.
16. Select the **Editor** tab to start editing the page components for customizing the remedial action playbook .
    a. Select the **Body** level of the **Content** tree to the left of the main page area of UI Builder.
    b. Edit the page by configuring components as required.

    For information on working with pages, see Work with pages.

### Customize the incident record information in the contextual side panel

Modify the incident record information displayed on the contextual side panel of an incident record page.

#### Before you begin

The demo data should be installed.

Role required: workspace_admin, ui_builder_admin, or admin

#### Procedure

1. Navigate to **All** > **Now Experience Framework** > **UI Builder**.
2. From the Experiences list, select **Service Operations Workspace**.
3. In the Pages and Variants section under **Record**, select **SRP Record**.

> **Note:**
> If you're on a version prior to 4.0, you must navigate from **Record SNC** in UI Builder to customize the incident record information.

4. Under **Contents**, in the **Body** level, select **Tab sidebar**.

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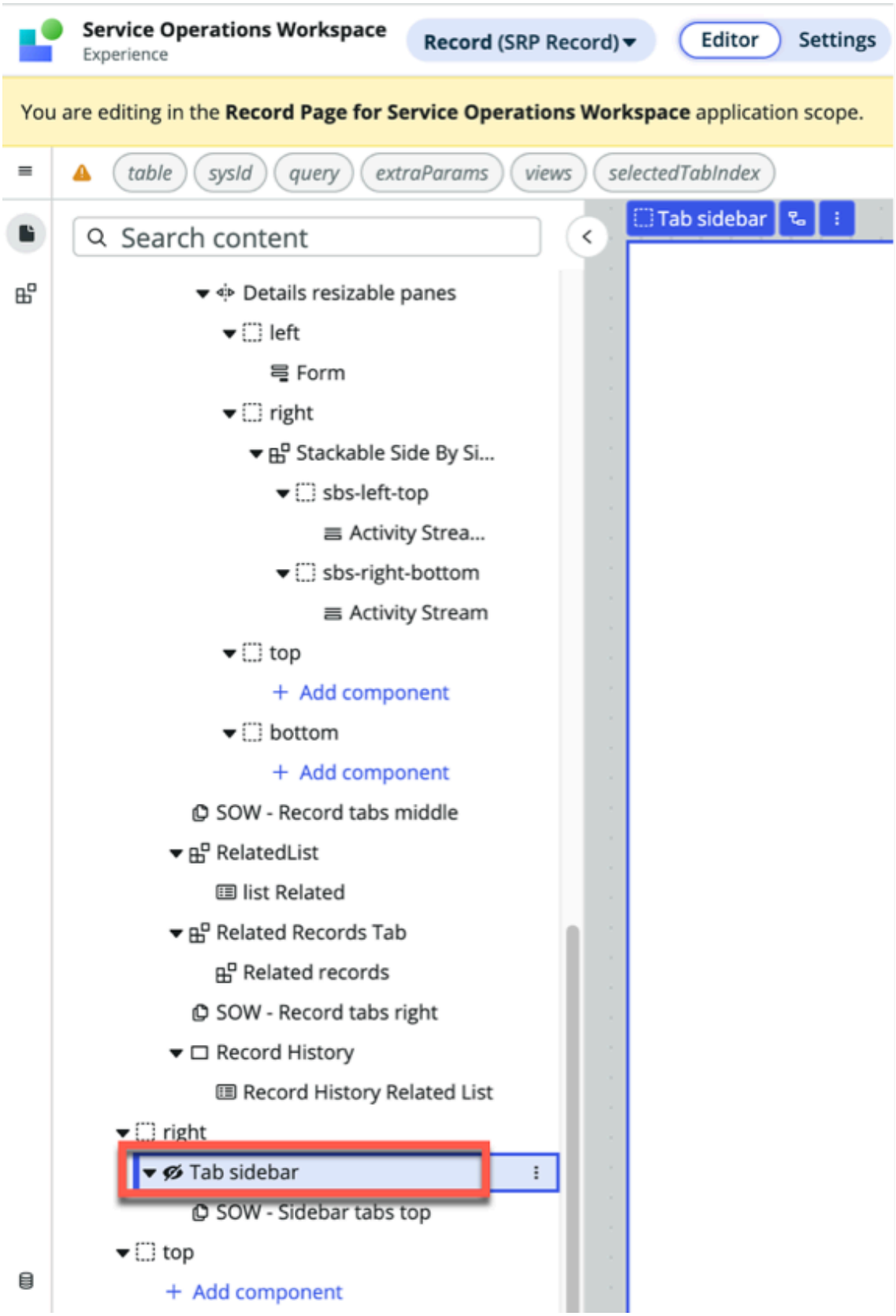
**Tab sidebar**




If the new copy is in a different application scope, select **Edit in original scope** before you start editing.

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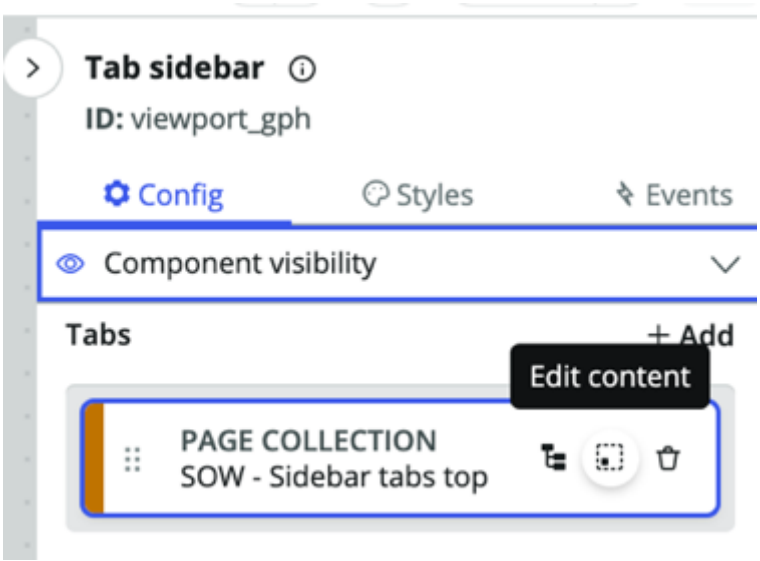
5. In the Config section under Tabs, point to the **Page Collection SOW - Sidebar tabs top** tab and select the edit content icon ( ).




6. Under **Record Information**, point to the **Record Information SNC** variant and select the options icon ( ).
7. Select the duplicate variant icon ( ).
   The Variant creation page is displayed.
8. Enter the Name as `Record Information SNC copy`.

   An error is displayed for the **Conditions** field.




9. To resolve this error, perform the following steps:

   a. Close the Variant creation page.

   b. Under **Record Information**, point to the **Record Information SNC** variant, select the options icon ( ), and then select **View settings**.

   c. Select **Open records** then select **Variant record**.
   The Record Information SNC record is displayed.

   d. Edit the record, copy and store the information in the **Screen Condition** field, and then remove the information.
   You use the information from the **Screen Condition** field in the later steps.

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e. Select **Save**.

f. Repeat steps 6 to 9.
No error is displayed for the **Conditions** field.

g. Open the Record Information SNC record again.

h. Edit the record and paste the **Screen Condition** information copied previously.

i. Select **Save** and close the record.

10. On the Variant creation page, select the **Settings** tab.
If the new copy is in a different application scope, select **Edit in original scope** before you start editing.
11. Edit the **Order** value to modify the display order of the variants.
The variant with the lowest number is considered as the default configuration.
12. **Optional:** Add the criteria to display a page or tab in **Variant conditions**.
13. Select **Save**.
14. Select the **Editor** tab to start editing the page components for customizing the incident information in the contextual side panel.
    a. Select the **Body** level of the **Content** tree next to the main page area of UI Builder.
    b. Edit the page by configuring components as required.

    For information on working with pages, see Work with pages.

### Customize the display of service level agreements for an incident

Configure the display of service level agreement (SLA) information in the incident record page.

#### Before you begin

Role required: admin

The following SLA timer configurations display the response and resolution SLA for an incident.

- Incident Response
- Incident Resolution

You should configure SLA timer configuration mappings for these timer configurations. For information on how you can configure these mappings, see Configure the SLA timer.

#### Procedure

1. Navigate to **System Definition** > **Script Includes**.
2. From the Script Includes list, select **SOWIncidentInfo**.
3. In the **Script** field, modify the display information for SLAs.

```
getSLAConfig: function() {
        var config = [{
                "configId": "af871ab3532730102d05ddeeff7b124f",
                "slaTimerLabel": gs.getMessage("Response SLA"),
                "timeLabel": gs.getMessage("Time to respond")
            },
```

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```
            {
                "configId": "aca7d6b3532730102d05ddeeff7b12ec",
                "slaTimerLabel": gs.getMessage("Resolution
SLA"),
                "timeLabel": gs.getMessage("Time to resolve")
            }
        ];
        return config;
    },
```

For information about how the SLA information is displayed for an incident, see View service level agreement information for an incident.

### Enable inline editing for lists in Service Operations Workspace

Enable quick updates for field values in a list in Service Operations Workspace.

#### Before you begin

Role required: admin

#### About this task

If the Hardware Asset Management Professional plugin (com.sn_hamp) is installed, you should enable inline list editing to specify asset actions for a configuration item (CI) from the Affected CI related list of an incident.

#### Procedure

1. From the **All** menu, navigate to **sys_properties.list**.
2. For the *glide.lists.inline_editing_enabled* property, set the **Value** field to `true`.
3. Click **Update**.

### Customize the Investigate tab

Customize on how the CI related metrics information is displayed on the **Investigate** tab of the Incident record.

#### Before you begin

Role required: script_include_admin

#### About this task

Use this task to customize and configure the **Investigate** tab of the Incident record to do the following:

- Add, remove or customize the view of the CI metrics information on the Investigate tab. For example, remove Asset Utilization metrics or add a new metric to the Investigation tab.
- Modify the threshold (warning or critical) values of the metrics.
- Modify the label names of the metrics.
- Change the units in which the metric values are displayed.
- Add or remove rows and columns from the metric information cards.
- Add, remove or rename the remedial action labels.

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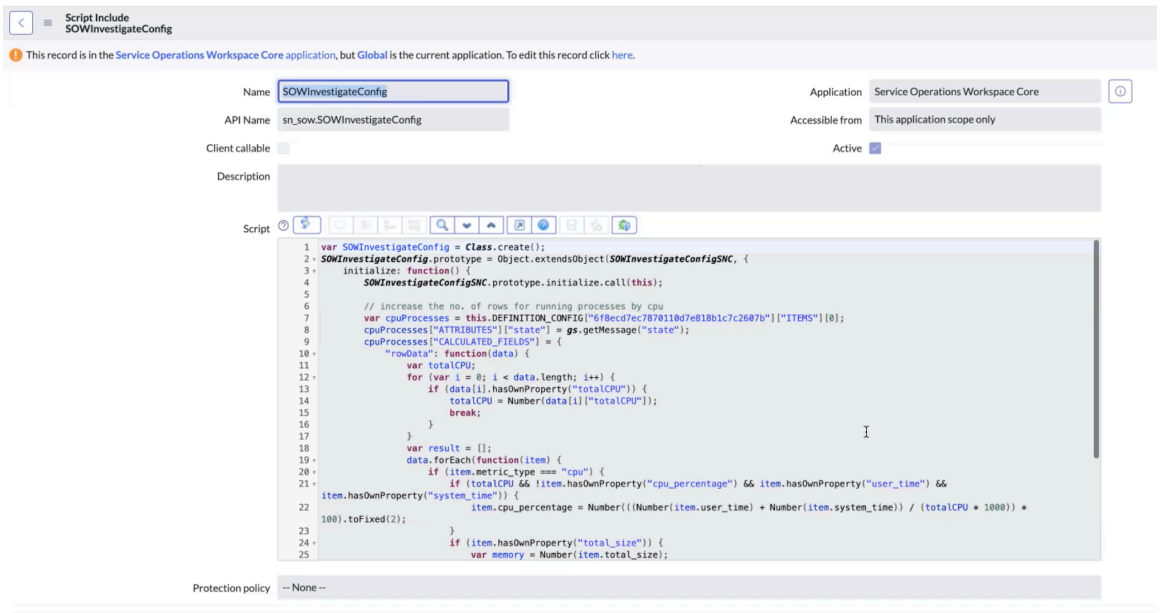
## Procedure

1. Navigate to **All** > **System Definition** > **Script Includes**.
2. From the script Include list, select **sn_sow.SOWInvestigateConfigSNC**.
3. Copy the required function from the **Script** field.
4. From the Script Includes list, select **sn_sow.SOWInvestigateConfig**.
   For example, refer the screen shot for sn_sow.SOWInvestigateConfig script include record.




5. In the **Script** field, paste the required function and edit to customize the UI elements that are displayed on the different sections of the **Investigate** tab.
   The `sn_sow.SOWInvestigateConfigSNC` script include record contains the configuration that is required to render the Investigate tab UI. Use this script include record as a reference to override the configuration as required, using the `sn_sow.SOWInvestigateConfig` script include record.
6. Click **Save**.
7. From the Script Includes list, select the provider specific script include SNC record.
   - **sn_acc_adapter.AccTransformUtilsSNC** for Agent Client Collector for Investigation (ACC).
   - **sn_mecm_adapter.MecmTransformUtilsSNC** for Microsoft Endpoint Configuration Manager for Investigation (MECM).
8. Copy the required function from the **Script** field.
9. From the Script Includes list, select the provider specific script include record.
   - **sn_acc_adapter.AccTransformUtils** for Agent Client Collector for Investigation (ACC).
   - **sn_mecm_adapter.MecmTransformUtils** for Microsoft Endpoint Configuration Manager for Investigation (MECM).

   For example, refer the screen shot for sn_acc_adapter.AccTransformUtils script include record.

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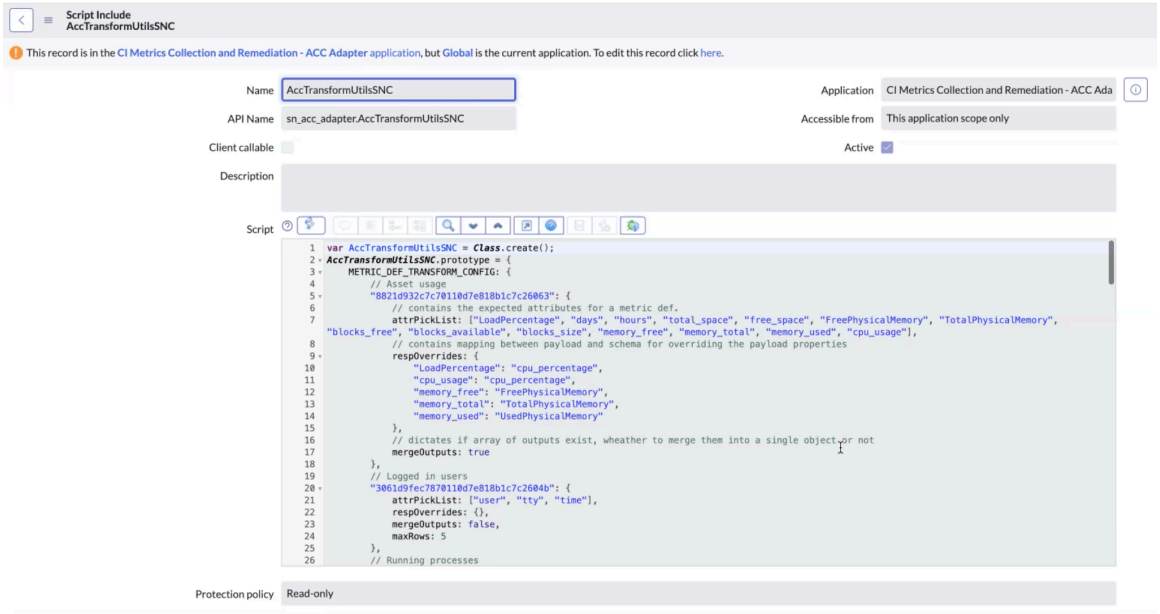


10. In the **Script** field, paste and edit the script to configure the display of the metrics information on the customized UI of the **Investigate** tab.
    The `sn_acc_adapter.AccTransformUtilsSNC` script include record contains the configuration such as which data to store and how much data must be displayed on the Investigate tab UI. Use this script include record as a reference to override the configuration as required, using the `sn_acc_adapter.AccTransformUtils` script include record.
11. Click **Save**.

### What to do next

On the **Investigate** tab of the Incident record in the Service Operations Workspace, click the get latest metrics icon ( ) to refresh and view the customizations. For more information, see Incident Management in Service Operations Workspace.

## Configure the collection rules for the Investigate tab

Configure the collection rules and map the rules to the metric definitions in the Investigate Framework module. This configuration enables you to define when the CI related metrics information is automatically retrieved on the **Investigate** tab of the Incident record.

### Before you begin

Agent Client Collector for Investigation (sn_acc_adapter) and Investigation Framework (sn_invest_fwk) must be installed on the instance to view the Investigate Framework module. For more information, see Install Agent Client Collector for Investigation.

The Agent Client Collector framework (sn_agent) plugin must be installed on the instance, and Agent Client Collector must be installed to the affected CI. These installations are required to view the **Investigate** tab on the Incident record and the CI related metrics information displayed on the **Investigate** tab of the Incident record. For more information on the Agent Client Collector framework plugin and the installation, see Agent Client Collector Framework and Agent Client Collector installation.

Role required: sn_cimaf.sn_cimaf_admin or sn_invest_fwk.sn_investigate_admin

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## Procedure

1. Navigate to **All** > **Metrics and CI Actions Framework** > **Administration** > **Collection Rules**.
2. Click **New**.
3. On the form, fill in the fields.
   Trigger conditions are conditions under which the collection rule is activated. These conditions trigger the automatic retrieval of the CI related metrics information on the **Investigate** tab of the Incident record.

**Collection Rule form**

| Field | Description |
|---|---|
| Name | Name of the collection rule. |
| Active | Option to activate the collection rule. This option is selected by default. |
| Trigger Conditions | |
| Source table | Table where the collection rule is applicable. For this task, select **Incident**. |
| CI field | Type of CI applicable to the source table. For this task, select **Configuration item**. |
| Table conditions | Condition builder to define the criteria for the fields related to the incidents under which the collection rule is triggered. |
| CI class | Class of the affected CI associated with the incident. |
| CI conditions | Condition builder to define the criteria for the fields related to the CI under which the collection rule is triggered. |
| Allow matching CI extensions | Option to enable the selection of the child CI classes associated with the selected CI class. For example, if the **CI class** is set as **cmbi_ci_computer**, and if the **Allow matching CI extensions** option is selected, then you can select CI classes such as the cmbi_ci_computer server that is a child CI of cmbi_ci_computer. |

4. Click **Submit**.
   The collection rule is created.
5. Click the collection rule record.
6. On the Collection Rule Metric Associations related list, click **New**.
   Use the Collection Rule Metric Associations related list to associate and map the collection rule with the metric definition (information).
7. On the form, fill in the fields.

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**Collection Rule Metric Associations form**

| Field | Description |
|---|---|
| Collection rule | Collection rule that you want to map with the metric definition. |
| Metric definition | Metric definition that you want to map with the collection rule. Metric definition is the CI related metrics information for which you want to implement the collection rule. |

**Note:**
You can configure multiple collection rules with multiple metric definitions.

8. Click **Submit**.

### Result

The collection rule is created and mapped to the metric definition. When the collection rule is triggered, the mapped metric definition is retrieved and displayed on the **Investigate** tab of the Incident record. The configured collection rule is triggered only when the **Configuration Item** field is modified on the Incident record.

## Configuring Problem Management in Service Operations Workspace

Configure aspects of Problem Management to accommodate your organization's workflow.

It is recommended that you activate the Problem Management Best Practice — Madrid — State Model plugin (com.snc.best_practice.problem.madrid.state_model). For information about the plugin activation, see Activate Problem Management Best Practice — Madrid — State Model.

**Note:**

- The best practice states introduced in this plugin are not compatible with previous versions of Problem Management and require verification before this plugin can be activated.
- This plugin is activated by default for the new instances. If the plugin is not active on your instance, use the Problem Management migration utility to verify and migrate to this plugin. For information about the migration utility, see Migration Utility.

### Configure the problem form layout in Service Operations Workspace

Configure the problem form so that the information it collects is relevant to your organization's processes. You can easily modify the form to show only the fields, related lists, and other elements that you need.

### Before you begin

Role required: admin or personalize_form

### Procedure

1. Navigate to **All** > > **Problem** > **Create New**.
2. On the form context menu, select **Configure**, and then select **Form Builder**.
3. From the Default view list, select one of the following.

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- To customize the layouts of existing problem forms, select **Service Operations Workspace**.
- To customize the layouts of new problem forms, select **Service Operations Workspace New Record**.

4. If the form is in a different application scope, select **Edit in original scope** before you start editing.

### Configure the problem task form layout in Service Operations Workspace

Configure the problem task form so that the information it collects is relevant to your organization's processes. You can easily modify the form to show only the fields, related lists, and other elements that you need.

#### Before you begin
Role required: admin or personalize_form

#### Procedure

1. Navigate to **All** >  > **Problem** > **Create New**.
2. On the form context menu, select **Configure**, and then select **Form Builder**.
3. From the Problem list, select **Problem Task**.
4. From the Default view list, select one of the following.
   - To customize the layouts of existing problem task forms, select **Service Operations Workspace**.
   - To customize the layouts of new problem task forms, select **Service Operations Workspace New Record**.
5. If the form is in a different application scope, select **Edit in original scope** before you start editing.

### Configure problem modals shown during state transitions

Add the optional and mandatory fields necessary to move a problem record through its life cycle using the Form Builder.

#### Before you begin
Role required: admin

#### Procedure

1. Navigate to **All** >  > **Problem** > **Create New**.
2. On the form context menu, select **Configure**, and then select **Form Builder**.
3. From the Default view list, select any of the following.

4. If the form is in a different application scope, select **Edit in original scope** before you start editing.

### Configure problem task modals shown during state transitions

Add the optional and mandatory fields necessary to move a problem task record through its life cycle using the Form Builder.

#### Before you begin
Role required: admin

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### Procedure

1. Navigate to **All** > > **Problem** > **Create New**.
2. On the form context menu, select **Configure**, and then select **Form Builder**.
3. From the Problem list, select **Problem Task**.
4. From the Default view list, select any of the following.

5. If the form is in a different application scope, select **Edit in original scope** before you start editing.

## Configure properties for Problem Management in Service Operations Workspace

Configure the properties used to control process-related features, such as creating a problem task on a closed problem and re-analyzing a closed or a canceled problem.

### Before you begin
Role required: admin or problem_manager

### Procedure

1. Navigate to **All** > **Problem** > **Administration** > **Problem Properties**.
2. Adjust the properties as needed.
   For more information about the available options, see Problem management properties.

## Create a task type for problem or change in Service Operations Workspace

Configure a task type that can be used during problem or change creation.

### Before you begin
Role required: admin

### About this task
If you extend problem task or change task to add your own task type, you can set the child of problem or change task as the target table. Depending on the default values you set in the child of problem task or change task, you need not pass any values.

For information about creating a change task, see Create a change task in Service Operations Workspace.

For information about creating a problem task, see Create a problem task in Service Operations Workspace.

### Procedure

1. In the navigation filter, enter `sn_sow_interceptor_record_type_selector.list`.
2. From the Record Type Selectors list, select **New**.
3. On the Record Type Selector form, fill in the fields.

#### Record Type Selector form

| Field | Description |
|---|---|
| Applies to | Table that the task type applies to. Select Problem task [problem_task] or Change Task [change_task]. |

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| Field | Description |
|---|---|
| Order | Order of the task type in the Create problem task or Create change task dialog box. |
| Application | Scope of the application. |
| Active | Option for enabling the task type. |
| Title | Card title that is displayed in the Create problem task or Create change task dialog box. |
| Description | Card description. |
| Target table | Table where the record should be created when using this task type.<br>**Note:**<br>This field is not displayed if the table selected in the **Applies to** field does not have any child tables. |
| Values | Default values that are populated when creating a record using this task type. |

### Define priority lookup rules for Problem Management in Service Operations Workspace

Define the impact and urgency of the problem to calculate its priority. Use the priority calculation to prioritize your work and to drive service level agreements.

#### Before you begin
Role required: admin

#### Procedure

1. Navigate to **All** > **System Policy** > **Rules** > **Priority Lookup Rules**.
2. Select **New**.
3. On the form, fill in the fields.
   For more information about the available fields, see Data lookup for prioritizing problems.

## Configure a record page tab in Service Operations Workspace

Configure the display order of a record page tab in Service Operations Workspace.

#### Before you begin
Role required: workspace_admin, ui_builder_admin, or admin

#### About this task
The record pages (incident, problem, change, and so on) in Service Operations Workspace have multiple tabs. Few tabs such as the **Overview** tab of the incident record page are specific to a record page. Few other tabs are common across multiple record pages in multiple workspaces, for example, the **Details** tab. The Details tab is associated with incident, change, problem, and other record pages in multiple workspaces.

When you modify the order of a common tab in multiple record pages and workspaces, the changes are applicable in all those records and workspaces.

#### Procedure

1. From the **All** menu, navigate to **sys_ux_app_route.list**.
2. From the UX App Routes list, select the tab record that you want to modify.

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- To modify the order of a common tab. For example, the **Details** tab, select **Record Details Tab**. Any changes that you make are applicable to the **Details** tab in all associated record pages in multiple workspaces.
- To modify the order of a record page-specific tab. For example, the **Overview** tab of the incident record page in Service Operations Workspace, select **Overview** whose **App Configuration** is **Service Operations Workspace** and **Parent macroponent** is **Record Page Tabs**. Any changes made are applicable only to the **Overview** tab of the incident record page in Service Operations Workspace.

3. On the UX App Route form, modify the **Order** field.
   If the UX App Route form doesn't contain the Order field, add the Order field to the form. For more information about adding a field to the form, see Show or hide fields on a form.
4. Select **Update**.

## Configure contextual side panel tabs in Service Operations Workspace

Add or delete tabs from the contextual side panel that is available in all record pages in Service Operations Workspace.

### Before you begin

Role required: admin, workspace_admin, or ui_builder_admin

### About this task

By default, all record pages such as an incident and interaction record page have a contextual side panel with multiple tabs in Service Operations Workspace. From these tabs, you can perform multiple tasks such as viewing the record information, collaborating through Microsoft Teams, viewing recommendations and so on.

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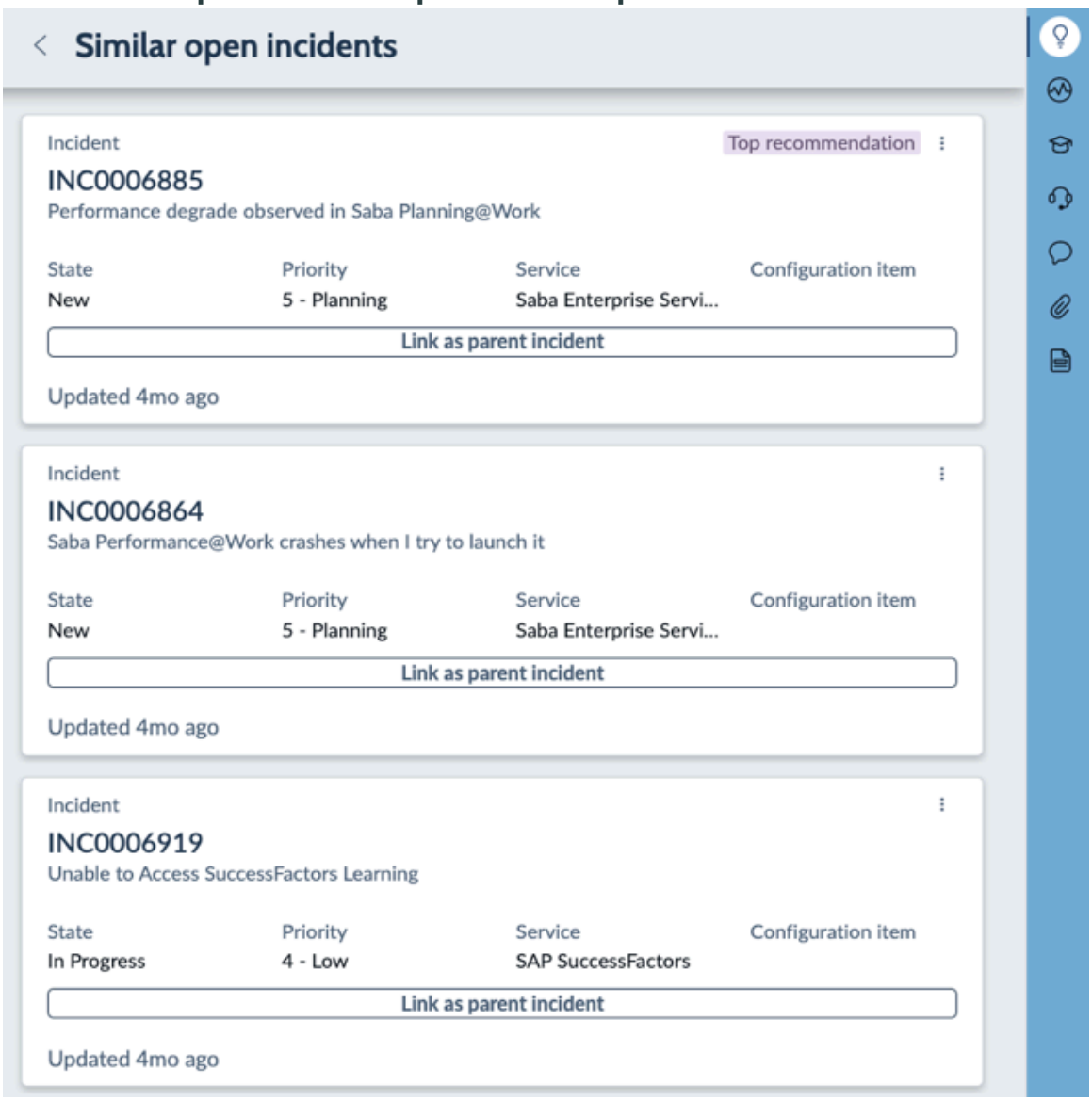
**Contextual side panel in Service Operations Workspace**




## Procedure

1. Navigate to **All** > **Now Experience Framework** > **UI Builder**.
2. From the Experiences list, select **Service Operations Workspace**.
3. Under the Pages and variants list, select **SRP Record**.
4. From the left of the UI Builder area, navigate to **Body** > **Resizable panes** > **right**, and select **Tab sidebar**.
5. From the right of the UI builder, navigate to the **Config** > **Tabs**, and select the **SOW - sidebar tabs top**.
6. Select the icon to open the tab configuration.
   The pages and variants associated with contextual sidebar appears. For example, select the Agent assist SNC to add the Agent assist option in the sidebar.
7. Edit the screen condition for the UX screen.

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a. From the left of the page, select ☰ and navigate to **Developer** > **Open variant record**.

b. On the UX screen form, edit the **Screen Condition** field to add or delete records to get the tab to the required position.

c. Select **Update**.
You're redirected to the Dashboards page.

8. Edit the screen condition script for the UX screen by performing the following steps.
   a. Select the previously opened tab of the UI Builder page, for example, the Agent assist SNC tab page.
   b. From the left of the page, select ☰ and navigate to **Developer** > **Open variant record**.
   c. From the UX Screen Conditions related list on the UX screen form, open the associated record.
   d. Edit the **Script** field to add or delete conditions for records where you want the tab to be available.
   e. Select **Update**.

## Configure the Agent Assist tab in Service Operations Workspace

Enable or disable the Agent Assist tab in the contextual side panel for the required record type.

### Before you begin

Role required: admin

**Note:**
Admin should be in Global Domain to edit the table configurations of Agent Assist in Service Operations Workspace.

### About this task

Add or remove a record table from the screen condition and update the sys_id for the record to enable or disable the Agent Assist tab for that table.

**Important:**
Use this process if you're using a SOW version prior to 4.0. If you're using the version after 4.0, you can use **SOW Sidebar tabs top** Page collection to enable or disable the Agent Assist tab. For more information, see Configure the Agent Assist tab in Service Operations Workspace using the Standard Record Page.

### Procedure

1. Navigate to **All**.
2. In the search box, enter `sys_ux_screen_type.list` and press Enter.
3. Select the filter icon ( ▽ ), enter **[Name] [contains] [Agent Assist]** and **[Application] [is] [Service Operations Workspace]**, and select **Run**.
4. Select the **Agent Assist** link.
5. From the **UX Screens** tab, select **Agent assist SNC**.
6. To update the Screen Condition and sys_id, do the following:

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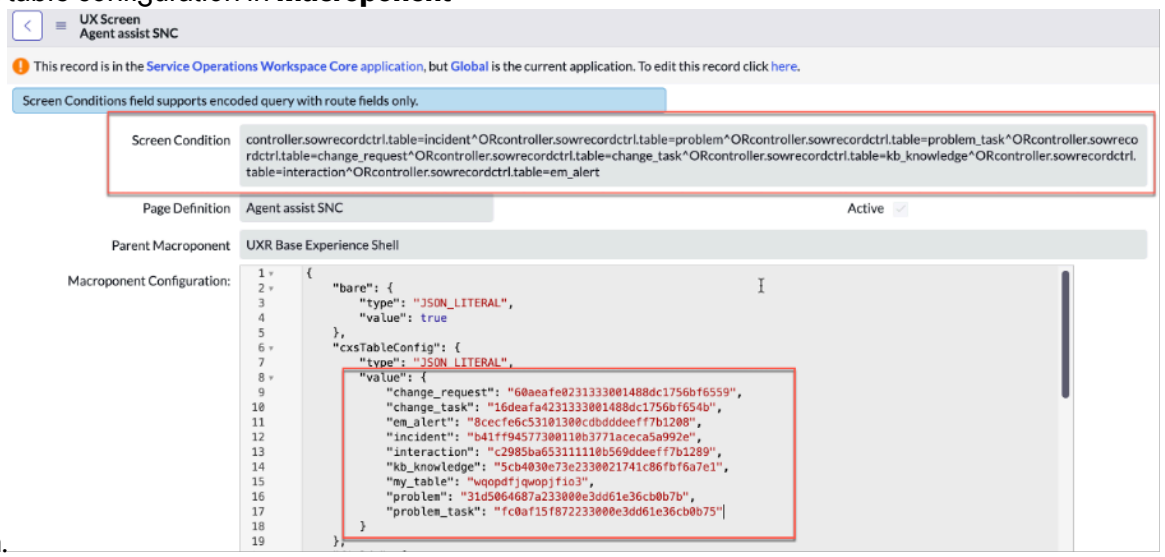
a. On the UX Screen form, edit the **Screen Condition** field and add the record tables where you want the tab to appear.
For example, you could add the following code for the interaction record.

```
controller.sowrecordctrl.table=incident^ORcontroller.sowrecordctrl.table=problem^ORcontroller.sowrecordctrl.table=problem_task^ORcontroller.sowrecordctrl.table=change_request^ORcontroller.sowrecordctrl.table=change_task^ORcontroller.sowrecordctrl.table=kb_knowledge^ORcontroller.sowrecordctrl.table=interaction
```

b. If you want to enable the Agent Assist tab, add the sys_id of the relevant table configuration in **Macroponent Configuration**.




For more information, see Edit the table configuration for Agent Assist in Service Operations Workspace.

c. Select **Update**.

7. To disable the Agent Assist tab for a record table, remove the record table from the **Screen Condition** field and sys_id of the relevant table configuration from the **Macroponent Configuration** field, and then select **Update**.

## Edit the table configuration for Agent Assist in Service Operations Workspace

Edit the table configuration for Agent Assist to see the required search results in the Agent Assist tab.

### Before you begin

Role required: admin

**Note:**
Admin should always be in Global Domain to edit the table configurations of Agent Assist in Service Operations Workspace.

### About this task

Update the table configuration to get the required search results.

To create a table configuration, see Configure table for a contextual search.

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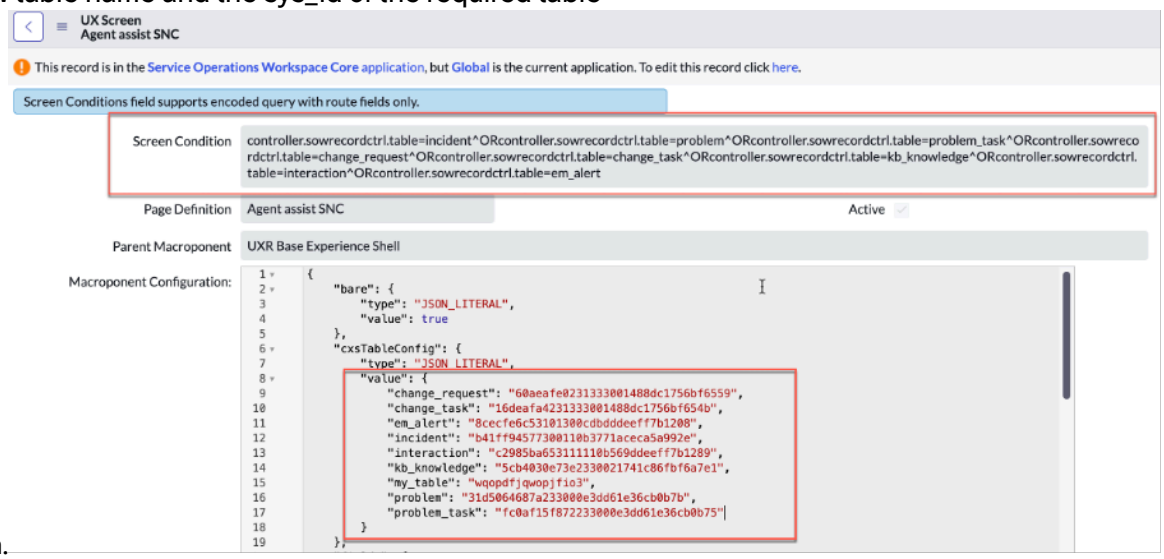
**Important:**
Use this process if you're using a SOW version prior to 4.0. If you're using the version after 4.0, you can use **SOW Sidebar tabs top** Page collection to enable or disable the Agent Assist tab. For more information, see Edit the table configuration for Agent Assist in Service Operations Workspace using the Standard Record Page.

### Procedure

1. Navigate to **All**.
2. In the search box, enter `sys_ux_screen_type.list` and press Enter.
3. Select the filter icon ( ), enter **[Name] [contains] [Agent Assist]** and **[Application] [is] [Service Operations Workspace]**, and select **Run**.
4. Search for name containing: **Agent Assist** and Application is the workspace name: **Service Operations Workspace**.
5. Select the **Agent Assist** link.
6. From the **UX Screens** tab, select **Agent assist SNC**.
7. To add the property and relevant sys ID of the table configuration in the **Macroponent Configuration**, do the following:

   a. Enter the new table name and the sys_id of the required table configuration.




   **Note:**
   To copy the sys_id, navigate to **Table Configuration** > **Copy_sysid**.

   b. Select **Update**.
   To enable or disable Agent Assist tab, see Configure the Agent Assist tab in Service Operations Workspace.

## Configure the Assign or Resolve dialog box for an incident or change request in Service Operations Workspace

Customize the fields displayed in the Assign and Resolve dialog box for an incident in Service Operations Workspace. Customize the fields displayed in the Assign dialog box for a change request in Service Operations Workspace.

### Before you begin

Role required: admin

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### About this task

**Important:**

- For an incident, you can customize the fields in the Assign and Resolve dialog boxes.
- For a change request, you can customize the fields in the Assign box.
- Only the fields that are configured in the Service Operations Workspace view can be added to the Resolve or Assign dialog boxes.
- Any pre-configured client scripts and UI policies configured for the customized fields are also applicable on the Resolve or Assign dialog boxes.
- The fields in the Assign, Reassign and Resolve dialog boxes do not support field decorators.

### Procedure

1. Configure the Assign dialog box.
   a. Open an incident or change request in Core UI.
   b. On the incident form or the change request form, select the additional actions icon ( ) on the header.
   c. Navigate to **View** > **SOW Assign Modal**.
   The record is opened in the SOW Assign Modal view.
   d. Select the additional actions icon ( ) on the header.
   e. Navigate to **Configure** > **Form Layout**.
   f. Move the required fields from the **Available** list to the **Selected** list.
   g. Select **Save**.
2. Configure the Resolve dialog box.
   a. Open an incident in Core UI.
   b. On the incident form, select the additional actions icon ( ) on the header.
   c. Navigate to **View** > **SOW Incident Resolve Modal**.
   The record is opened in the SOW Incident Resolve Modal view.
   d. Select the additional actions icon ( ) on the header.
   e. Navigate to **Configure** > **Form Layout**.
   f. Move the required fields from the **Available** list to the **Selected** list.
   g. Select **Save**.

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## Configure search resources for an interaction

You can configure additional search resources for an interaction to assist agents with quick resolution of the interaction.

### Before you begin

Role required: itil or interaction_agent

### Procedure

1. Navigate to **All** > **Contextual Search** > **Search Contexts** > **Interaction (SOW)**.
2. Edit the Search Context Interaction (SOW) record.
   a. Search for a resource or combination of resources in the **Searcher** field and select the search resource that you want to add.
   b. Update the Searcher text field with the name that you want to give to the search resource.
   c. Save or update the record.
   The newly added search resource is available to be selected from the search resource filter in the Agent Assist window.

## Customize the on-call support group recommendations

Configure the support group recommendations that should be displayed in the **Experts on-call** panel for an incident.

### Before you begin

Role required: admin

### Procedure

1. Navigate to **All** > **System Definition** > **Script Includes**.
2. From the Script Includes list, select **OnCallUtilsSow**.
3. To configure the support group recommendations, modify the **Script** field.
   For information about how these groups are available for an incident, see Experts on-call in Service Operations Workspace.

```
getRecommendedGroups: function(table, sysId, fieldWatchList) {
  if(!table || !sysId) {
   return {};
  }

  var recommendedGroups = {};
  var gr = new GlideRecord(table);
  if (gr.get(sysId)) {
   var self = this;

   if (table == this.TABLES.INCIDENT) {
    fieldWatchList.forEach(function(watchField) {
     if (watchField.field == "assignment_group"
 && !recommendedGroups[watchField.value + ""] &&
 self._isOnCallDefinedForTheGroup(watchField.value)) {
      recommendedGroups[watchField.value + ""] =
 gs.getMessage("Recommended based on assignment group");
     } else if (watchField.field == "cmdb_ci") {
      var cmdbCiGr = new GlideRecord(self.TABLES.CMDB_CI);
      if (cmdbCiGr.get(watchField.value + "")) {
```

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```
      if (cmdbCiGr.support_group
 && !recommendedGroups[cmdbCiGr.support_group + ""] &&
 self._isOnCallDefinedForTheGroup(cmdbCiGr.support_group + ""))
 {
       recommendedGroups[cmdbCiGr.support_group + ""] =
 gs.getMessage("Recommended based on affected CI");
      }
     }
    } else if (watchField.field == "business_service") {
     var businessServiceGr = new
 GlideRecord(self.TABLES.CMDB_CI_SERVICE);
     if (businessServiceGr.get(watchField.value + "")) {
      if (businessServiceGr.support_group
 && !recommendedGroups[businessServiceGr.support_group + ""] &&
 self._isOnCallDefinedForTheGroup(businessServiceGr.support_gr
oup + "")) {
       recommendedGroups[businessServiceGr.support_group + ""]
 = gs.getMessage("Recommended based on impacted service");
      }
     }
    }
   });
  }
 }

 return recommendedGroups;
}
```

4. Click **Update**.

## Create a task type for problem or change in Service Operations Workspace

Configure a task type that can be used during problem or change creation.

### Before you begin

Role required: admin

### About this task

If you extend problem task or change task to add your own task type, you can set the child of problem or change task as the target table. Depending on the default values you set in the child of problem task or change task, you need not pass any values.

For information about creating a change task, see Create a change task in Service Operations Workspace.

For information about creating a problem task, see Create a problem task in Service Operations Workspace.

### Procedure

1. In the navigation filter, enter `sn_sow_interceptor_record_type_selector.list`.
2. From the Record Type Selectors list, select **New**.
3. On the Record Type Selector form, fill in the fields.

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**Record Type Selector form**

| Field | Description |
|---|---|
| Applies to | Table that the task type applies to. Select Problem task [problem_task] or Change Task [change_task]. |
| Order | Order of the task type in the Create problem task or Create change task dialog box. |
| Application | Scope of the application. |
| Active | Option for enabling the task type. |
| Title | Card title that is displayed in the Create problem task or Create change task dialog box. |
| Description | Card description. |
| Target table | Table where the record should be created when using this task type.<br>**Note:**<br>This field is not displayed if the table selected in the **Applies to** field does not have any child tables. |
| Values | Default values that are populated when creating a record using this task type. |

## Configure the display of requester related records in an interaction

For an interaction, ensure that related records of a requester are displayed as intended for Service Operations Workspace.

### Before you begin

Role required: admin

View the order of the My Requests - Requested item predicate EVAM view config.

### About this task

The records related to a requester are displayed when an agent views the requester information in an interaction. For information about agent actions on an interaction, see Work on an interaction in Service Operations Workspace.

### Procedure

1. Navigate to **All** > **Entity View Action Mapper (EVAM)** > **View Definitions** > **View Configurations**.
2. From the list of EVAM View Configs, select **SOW Related Tasks**.
3. Edit the order such that it is less than that of the My Requests - Requested item predicate EVAM view config.
4. Click **Update**.

## Configure the task record information in the MS Teams Import tab

Customize the task record fields displayed when you view or import a Microsoft Teams chat conversation.

### Before you begin

Role required: admin

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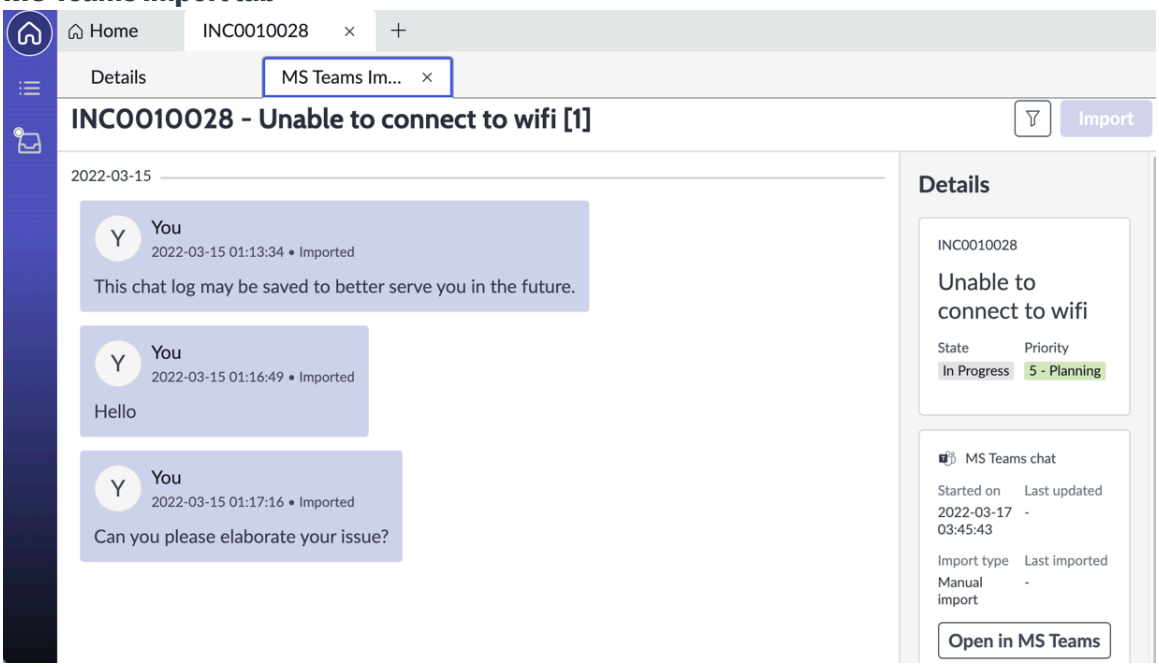
### About this task

When you view or import a Microsoft Teams chat conversation for a task record, the record details are displayed in the **Details** section of the **MS Teams Import** tab. These details are configured in the **Script** field of an implementation corresponding to the task record in the sn_tcm_collab_hook.MSTeamsTaskInfoCardHandler extension point.

For information about collaborating on a task record using Microsoft Teams chat, see Collaborate on a task record using Microsoft Teams in Service Operations Workspace.

**MS Teams Import tab**




### Procedure

1. Navigate to **All** > **System Extension Points** > **Scripted Extension Points**.
2. From the Extension Points list, select **sn_tcm_collab_hook.MSTeamsTaskInfoCardHandler**.
3. From the Implementations related list, select an implementation associated with the task record and modify the **Script** field.
4. Edit the **Script** field.
5. Click **Update**.

## Specify the refresh duration for user presence in Service Operations Workspace

Define the duration after which the user presence should be refreshed for all collaboration channels in Service Operations Workspace.

### Before you begin

Role required: admin

### About this task

The *sn_sow_collab.user_presence_refresh_duration* property specifies the refresh duration of user presence for all collaboration channels in Service Operations Workspace. However, if the user presence refresh duration is also defined for an individual collaboration channel, then the maximum of these two values is considered for that channel.

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For example, consider the following scenario where the user presence refresh duration is defined individually for Microsoft Teams and also for all collaboration channels in Service Operations Workspace.

- The *sn_tcm_collab_hook.teams.presence_status_cache_invalidate_duration* property value is set to 240 secs. For information about defining the user presence refresh duration for Microsoft Teams, see Configure cache duration for the user presence status.
- The *sn_sow_collab.user_presence_refresh_duration* property value is set to 180 secs.

In this case, the value specified for the *sn_tcm_collab_hook.teams.presence_status_cache_invalidate_duration* property is considered to refresh the user presence in Microsoft Teams.

### Procedure

1. From the **All** menu, navigate to **sys_properties.list**.
2. Select the *sn_sow_collab.user_presence_refresh_duration* property.
3. In the **Value** field, specify the duration after which you want the user presence to refresh.
4. Click **Update**.

## AI Search in Service Operations Workspace for ITSM

Intelligent query features enable you to quickly find the answers that you require. The Next Experience Unified Navigation search field enables you to search multiple record types and switch between global search results and results from the workspace applications that you can access.

For information about AI Search, see AI Search.

For information about installing and configuring AI Search in Next Experience, see Install AI Search for Next Experience.

The following configurations are added for the AI Search experience in Service Operations Workspace.

- A search application configuration, [AIS]. For information about search application configurations, see Search application configurations. To modify the card layout of the AI Search results, you can modify its EVAM definition, AI Search for Next Experience. Search for and add an EVAM configuration bundle. For information about the EVAM definition, see Configuring EVAM definition.
- A search profile. For information about search profiles, see AI search profiles.

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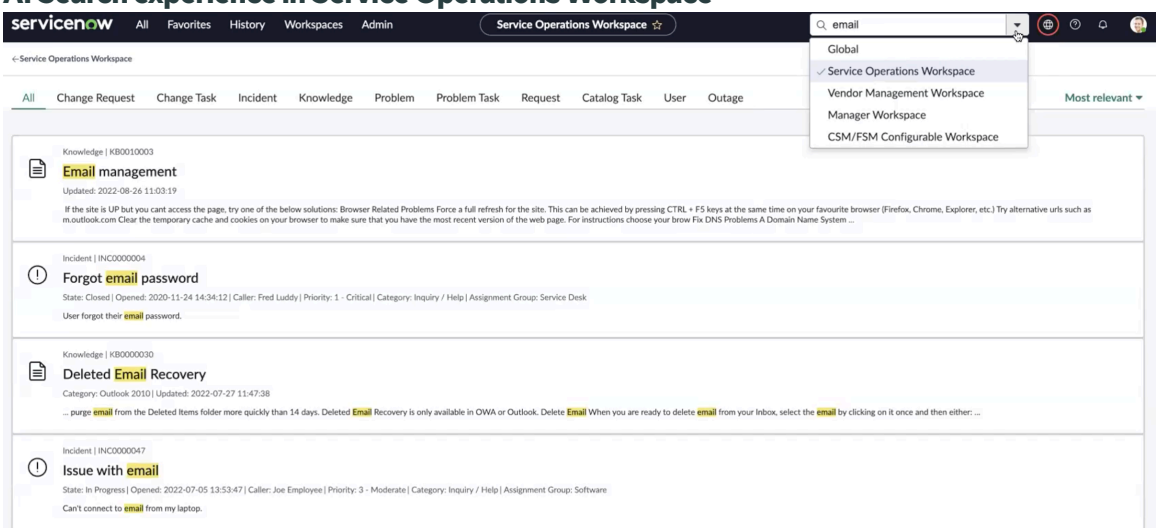
**Note:**

- AI Search experience is available in Service Operations Workspace starting in version 1.3.
- AI Search for Service Operations Workspace version 1.3 is compatible with the SR - PlatformX - Search - AI Search for Next Experience Bundle - v2.0. For all upgrade scenarios, use the Guided Setup for Zing to AI Search Migration module and ensure that the following conditions are met:
  - New search sources should be indexed.
  - The search profile should be published.
  - AI Search should be enabled.

  For information about using Guided Setup for Zing to AI Search Migration, see Configuring AI Search for Next Experience.
- Ensure that the search engine is set to AI Search. To set the AI Search, ensure that the *globalSearchDataConfigId* UX page property value is set to the sys_id of the AI Search, `6fcaa8d770a45110f877edb72a2fbd2f`.

- Genius results display the most relevant information and actions for a search query using Genius Result cards. The genius result cards appear alongside the regular search results. For more information about genius results, see Genius Results. By default, Service Operations Workspace supports the Q&A genius result configuration. If it isn't active, ensure the following:
  - Ensure that the version of AI Search for Next Experience is 3.0 or later.
  - Ensure that the Q&A genius result configuration is in an Active state. For more information about the Q&A genius result configurations, see Q&A Genius Results.

**AI Search experience in Service Operations Workspace**




You can customize the AI Search experience by adding a data source, editing a search profile, and so on, by using the AI Search Guided Setup. For information on using this guided setup, see Configuring AI Search.

## Configure notifications in Service Operations Workspace

Customize notifications that are sent to an agent to update about various changes.

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### Before you begin

Role required: workspace_admin, notification_provider_admin, or admin

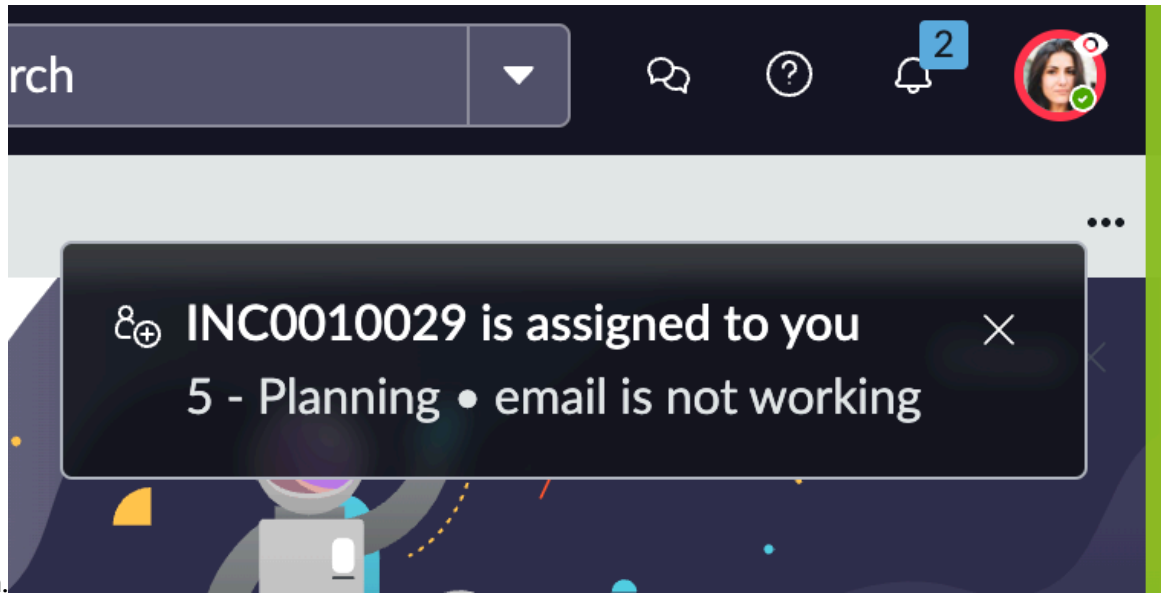
For delegation notifications, the Notification Provider for Next Experience plugin (com.glide.notification.provider.next.experience) must be installed.

### About this task

An agent is notified in the following scenarios:

- A change request, incident, or problem assigned to an agent has any updates.
- A task is delegated to the agent.

The notification icon shows notification alerts. The icon shows a badge with notification count and new notifications for a short duration.

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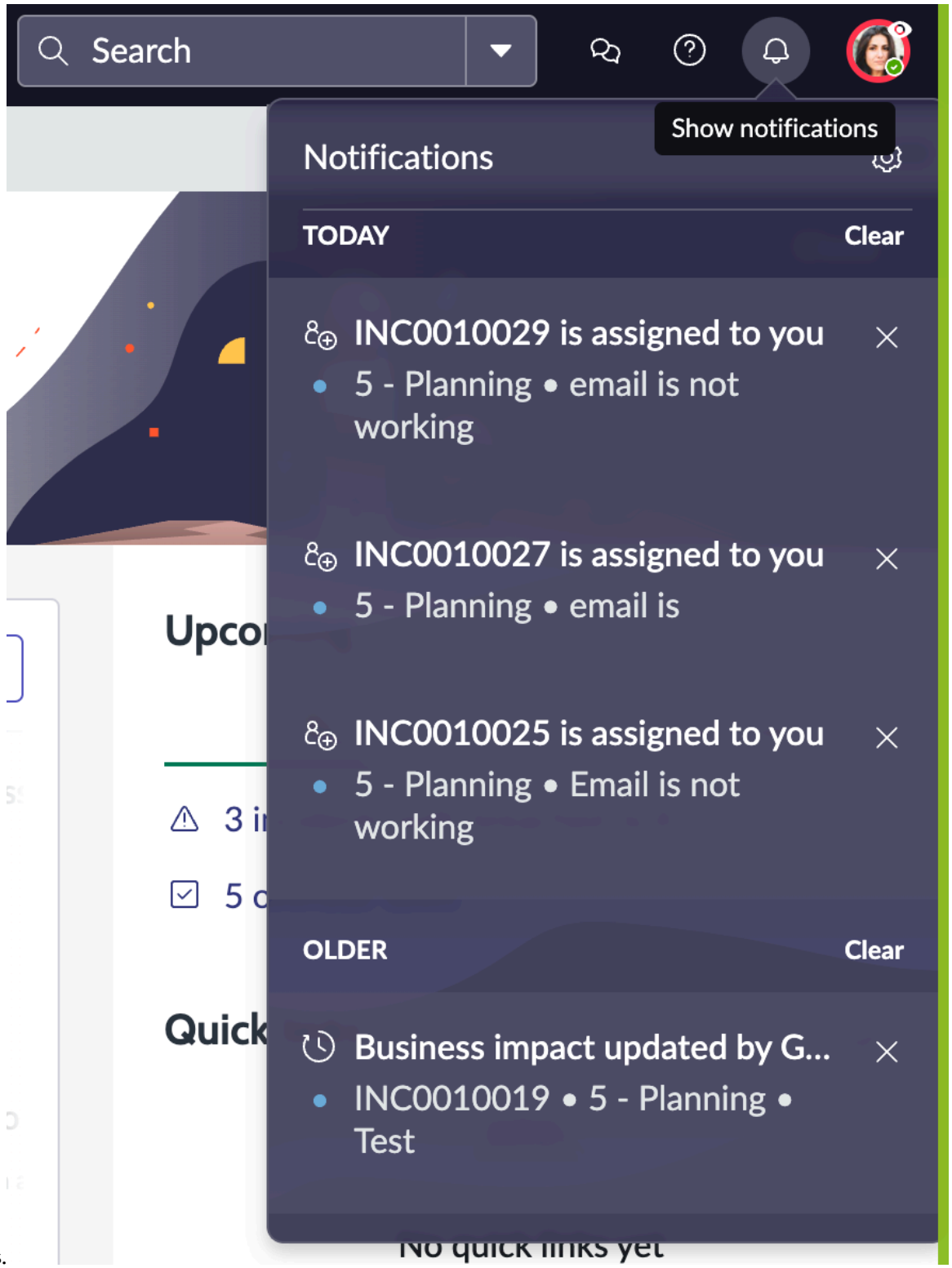
Use the notification icon to view the




notifications.

### Procedure

1. Navigate to **All** > **Workspace Experience** > **Administration** > **Notification triggers**.
2. To modify the notifications for incident, problem, and change updates, perform the following steps:

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a. From the list of notification triggers, select one of the following:
   - Incident notification
   - Problem notification
   - Change notification

   For information about default notification formats, see Default notification formats.

b. Edit the required information, such as the notification category, who to send it to and when to send it.

   **Who to send** and **When will receive** tabs contain the notification settings.

   **Note:**
   Keep in mind the following information when editing these notifications:
   - You can't edit the notification header.
   - The **Category** field of each type of notification must match that notification type so the notifications are categorized correctly for agents. For example, the **Category** field must be **Incident** for incident notifications. This step confirms that the notification is categorized in the notification preferences and agents can easily turn on and off all the notifications categorized under a category.

c. Select **Update**.

3. To modify the delegation notification, perform the following steps:

a. From the list of notification triggers, select **Delegation notification**.

b. Edit the required notification information, such as who to send it to, when to send it, its header and content.
   **Who to send** and **When will receive** tabs contain the notification settings.

c. Select **Update**.

## Enable Computer Telephony Integration providers to interact with the Service Operations Workspace

Enable an agent (with the sn_openframe_user role) to receive inbound calls and place outbound calls using the Computer Telephony Integration (CTI) interface.

### Before you begin

Enable the following plugins.

- com.snc.notify
- com.snc.cti
- com.sn_openframe

For more information about installing and enabling a plugin, see Activate a plugin.

Role required: admin

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### About this task

The CTI integration helps an agent call a user using the phone number in the user profile and contact cards. The ServiceNow application uses the OpenFrame API when an agent initiates a call. The OpenFrame API helps the ServiceNow AI Platform® communicate with the connectors, such as an Amazon connector, already configured in the application.

For more information about CTI integration, see Integrating with Computer Telephony Integration (CTI).

For more information on the various OpenFrame APIs, see openFrameAPI - Client.

### Procedure

1. From the **All** > **sys_properties.list**.
2. Open the *sn_sow.default_call_from_contact_page* property.
3. In the **Value** field, specify `CTI`.
4. Select **Update**.

## Configure Standard Record Page in Service Operations Workspace

Configure individual record pages to display information and help them to update the customization easily.

A Standard Record Page (SRP) is the basic format in which records appear in the Service Operations Workspace. These record pages have containers, components, modals, and other layouts that display the record information.

Service Operations Workspace contains incidents, cases, and tasks that an agent requires for daily work. SRP provides a basic structure that displays record information, such as a communication interface and suggestions for resolution. It provides the following constructs that help in customization:

- Presets: Presets are the pre-configured mappings inside the record pages. When you add a new component to the record page, the presets associated with the component are also added to the record page. You can configure presets to components by selecting the lock icon of a configuration. A copy or duplicate of the component contains these preset values.
- Controllers: Controllers are the base scripts that help implement a record page's functionality. When you create a copy or duplicate of the record page, SRP establishes a reference to the original controller. You can't modify the base functionality of the record page. However, you can modify the record page using the scripts and states according to your requirements.

**Note:**

- If you are on a version prior to 4.0, you can change the Incident record page using **Record SNC** in the UI Builder.
- ServiceNow doesn't recommend customizing the Incident record page using methods such as **Record SNC** or **SRP Record**. So, no support is provided for record page customizations.

### Adding Declarative Actions on the Standard Record Page

Adding declarative actions on the Incident page and the tabs inside the incident record page using the Standard Record Page (SRP) in the Service Operations Workspace.

### Before you begin

Role required: admin

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### About this task

Declarative actions help you to modify the list actions, related list actions, and field decorators available in the Service Operations Workspace. For more information about creating declarative actions and how to use them, see Declarative actions.

Along with the declarative actions customizations, the SRP or Standard Record Page also modifies the add-on events in the Incident records and the tabs inside the records.

### Procedure

1. Navigate to **All** > **sys_ux_addon_event_mapping.list**.
2. From the UX Add-on Event Mappings list, go to the required event mapping.
   You can add two types of declarative actions mappings.
   - Declarative action mappings without using the parent macroponent. This option uses the controllers for the mappings.
   - Declarative action mapping using the source element ID and the parent macroponent. This option doesn't use the controllers.

   For example, to modify the form declarative action to create a change, go to the **Form Create Change task** for which the **Parent Macroponent** is empty. Similarly, you can add the declarative action for inline tabs inside an incident. For example, to add a declarative action to add a change request to the Related Records list, go to **SOW Related list Add Change Request** for which the **Parent Macroponent** is empty.

   **Note:**
   To add declarative action to page collection tabs such as Overview, add Handled events in the UI Builder. Map this event to the event in the UX Add-on Event Mappings list using the Source element ID.

3. Add the following information to modify the action.

| Field | Description |
|---|---|
| Source Component | The component emits the source event. For example, the Action bar. |
| Source Declarative Action | Declarative actions used as the source event |
| Controller | A controller that handles the target event. For example, Form. |
| Target Event | Handled event that the mapping in *`Target Payload mapping`* targets |
| Target Payload Mapping | The binding of the container and the type of the event |

## Custom Modal Migration in Standard Record Page

Modify the modal containers inside a record page in the Service Operations Workspace.

### Before you begin

Role required: admin

### About this task

Standard Record Page (SRP) provides options to modify the different modals used inside Service Operations Workspace. You can duplicate the modals in the page collection and modify them according to your requirement.

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### Procedure

1. Navigate to **All** > **Now Experience Framework** > **UI Builder**.
2. Under the Experiences list, select **Service Operations Workspace**.
3. Under the **Pages and Variants** section, under **Record**, select **SRP Record**.

   **Note:**
   If you are on a version prior to 4.0, you can navigate from **Record SNC** in **UI Builder** to modify the **Overview** tab of an Incident record page.

4. From the left of the UI Builder, navigate to **Modals and popovers** > **Modals**, and select **Modal Container (Viewport)**.
5. From the right of the UI Builder, navigate to **Configs** > **Page collection**.
   There are two options available under Page collections.
   - Record Page Modals: Select this option to modify modals across all experiences.
   - SOW Record Page Modals: Select this option to modify the modals used in Service Operations Workspace.
6. Select the icon to open the variants provided.
7. Select the  icon to create a page or to add a new variant to a page.
   For more information about creating a page and variant, see Learn UI Builder by example

## Modify the Record Page in the Service Operations Workspace using the Standard Record Page

Configure the order number and screen conditions of a record page using the Standard Record Page (SRP) in the Service Operations Workspace.

### Before you begin
Role required: admin

### About this task
Every record page contains an order number, which can be active or inactive. A default record page must be active and have the lowest order number. Service Operations Workspace displays the record with the lowest active order number as the default record page.

SRP also provides ways to add screen condition mappings when a page appears.

### Procedure

1. Navigate to **All** > **Now Experience Framework** > **UI Builder**.
2. Under the Experiences list, select **Service Operations Workspace**.
3. Under the **Pages and Variants** section, under **Record**, select **SRP Record**.

   **Note:**
   If you are on a version prior to 4.0, you can navigate from **Record SNC** in **UI Builder** to modify a record page.

4. Under **Contents**, in the **Body** level, select **Main Tab**.

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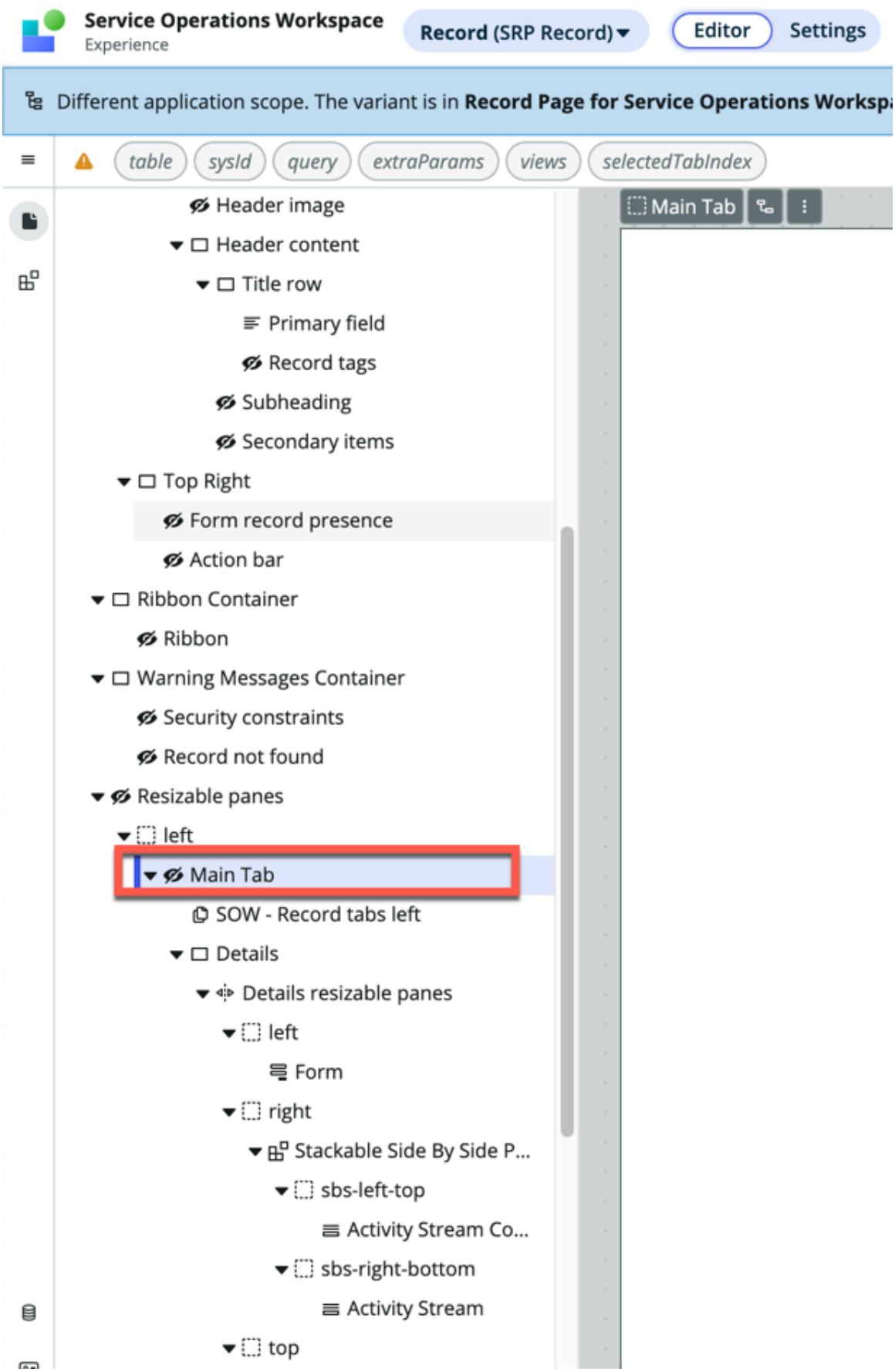
**Main tab**

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5. If the new copy is in a different application scope, select **Edit in original scope** before editing.




6. From the right of the page, navigate to **Config** > **Tabs**.
   SRP record has four types of tabs for customization.
   - Page Collection: Contains the pages and variants associated with the record page.
   - Inline tabs: Inline tabs and the Page collection tab contain the code related to a page.
   - Related List: Contains the details of the records associated with the record. The related list is a static tab, and you can't modify the order of this tab.
   - Repeater tabs: Contains the details of the tabs that recur throughout the page. The repeater tab is a static tab, and you can't modify the order of this tab.

   These tabs help in changing of the page layout. For example, if you want to add a tab that appears before the **Details** tab, you can change the **SOW - Record tabs left**. Similarly, to add a tab after the **Details** tab, you can modify the **SOW - Record tabs middle**.

7. To modify and view the pages and variants inside each tab, select the ⊡.
8. Under the Pages and Variants list, select the required page.
   For example, inside the Page collection tab, select Incident Overview SNC.

   **Note:**
   The data, events, and mappings in the **Config** and **Events** tabs can't be modified.

9. From the top of the page, select the **Open menu** (☰) icon.
10. To modify the order of the record, perform the following steps.

    a. Select the **Settings** tab 
    
    .

    b. To modify the display order of the record, edit the **Order** value.
    The variant with the lowest order is considered ßthe default configuration.

11. To modify the variant ordering, perform the following steps.

    a. Navigate to **Developer** > **Open variant collection record**.

    b. Under the UX Screens list, modify the *`Order`* field.
    The default variant has the lowest order value.

    c. Select **Update**.

12. To modify the **Screen Conditions** of the record page, perform the following steps.

    a. Navigate to **Developer** > **Open variant record**.
    The conditions of the screen appear in the *`Screen Condition`* field.

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**b.** To modify or add a new UX Screen condition, navigate to the UX Screens conditions list.

**c.** Select the screen condition.

**d.** Enable the *Scripted Condition* field.

**e.** Modify the *Script* and *Parameter Mapping* fields to set the screen conditions according to your requirements.

**f.** Select **Update**.

### Configure the Agent Assist tab in Service Operations Workspace using the Standard Record Page

Enable or disable the Agent Assist tab in the contextual side panel for the required record type using the Standard Record Page (SRP) in Service Operations Workspace.

#### Before you begin

Role required: admin

**Note:**
Admin should be in Global Domain to edit the table configurations of Agent Assist in Service Operations Workspace.

#### About this task

Add or remove a record table from the screen condition, update the sys_id for the record, and update the script conditions to enable or disable the Agent Assist tab for that table.

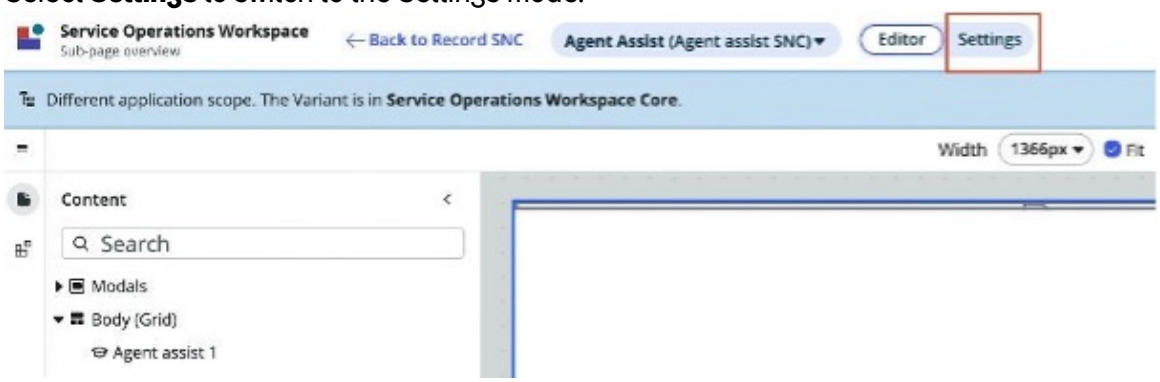
**Important:**
If you are on a version prior to 4.0, see Configure the Agent Assist tab in Service Operations Workspace.

#### Procedure

1. Navigate to **All** > **Now Experience Framework** > **UI Builder**.
2. From the Page Collections list, select **SOW Sidebar tabs top**.

   **Note:**
   The **SOW Sidebar tabs top** Page collection is used in the Service Operations Workspace SRP record page.

3. From the Pages and variants list in the Record section, select **Agent Assist SNC**.
4. Select **Settings** to switch to the Settings mode.

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5. To update the Script Conditions, do the following:

   a. Select the **Scripted Screen Conditions** icon ( ) to open the script conditions.

   b. Under **Active** column, select **True**.

   c. If you want to enable the Agent Assist tab for a record table, add the required script to the **Script** field and select **Update**.

   d. If you want to disable the Agent Assist tab for a record table, remove the script from the **Script** field and select **Update**.

6. To update the Screen Conditions and sys_id, do the following:

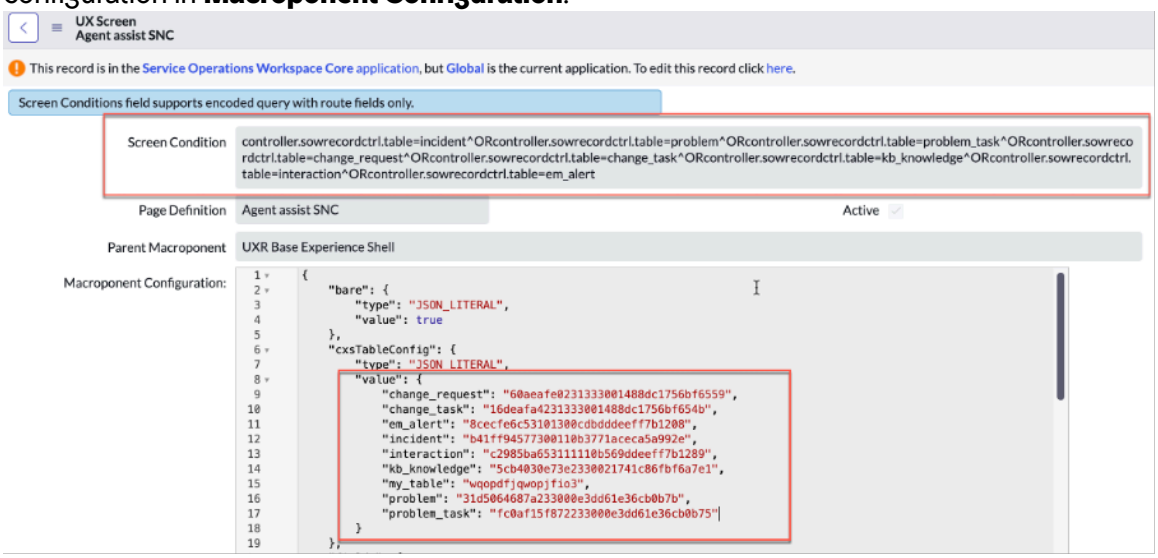
   a. From the **Open records** drop-down list, select **Variant record**.

   b. On the UX Screen form, edit the **Screen Condition** field and add the record tables where you want the tab to appear.
   For example, you could add the following code for the interaction record.

```
controller.sowrecordctrl.table=incident^ORcontroller.sowrecordctrl.table=problem^ORcontroller.sowrecordctrl.table=problem_task^ORcontroller.sowrecordctrl.table=change_request^ORcontroller.sowrecordctrl.table=change_task^ORcontroller.sowrecordctrl.table=kb_knowledge^ORcontroller.sowrecordctrl.table=interaction
```

   c. If you want to enable the Agent Assist tab, add the relevant sys_id of the table configuration in **Macroponent Configuration**.
   For more information, see Edit the table configuration for Agent Assist in Service Operations Workspace using the Standard Record Page.

   d. If you want to disable the Agent Assist tab, remove the sys_id of the relevant table configuration in **Macroponent Configuration**.




   e. Select **Update**.

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### Edit the table configuration for Agent Assist in Service Operations Workspace using the Standard Record Page

Edit the table configuration for Agent Assist to see the required search results in the Agent Assist tab using Standard Record Page (SRP) in Service Operations Workspace.

## Before you begin

Role required: admin

## About this task

Update the table configuration using to get the required search results.

To create a table configuration, see Configure table for a contextual search.

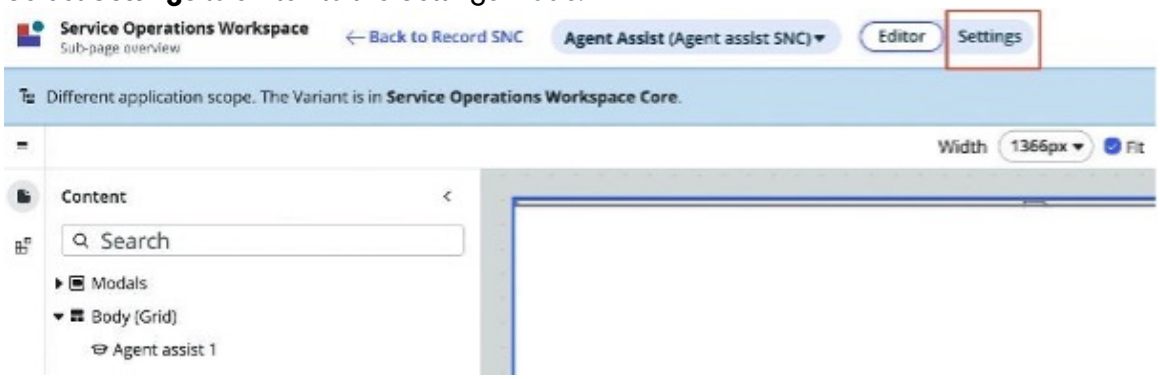
**Important:**
If you are on version which is prior to 4.0, Edit the table configuration for Agent Assist in Service Operations Workspace.

## Procedure

1. Navigate to **All** > **Now Experience Framework** > **UI Builder**.
2. From the Page Collections list, select **SOW Sidebar tabs top**.

   **Note:**
   The **SOW Sidebar tabs top** Page collection is used in Service Operations Workspace SRP record page.

3. From the Pages and variants list in the Record section, select **Agent Assist SNC**.
4. Select **Settings** to switch to the Settings mode.




5. From the Open records drop-down list, select **Variant record**.
6. In the UX screen form, add the property and sys ID in the **Macroponent Configuration** tab.

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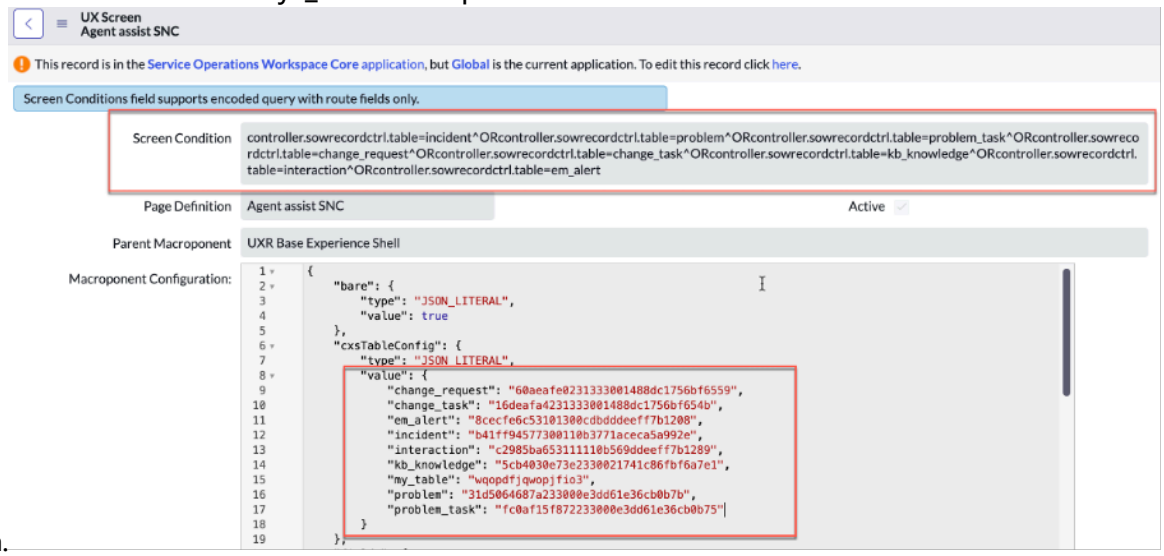
**a.** Enter the new table name and the sys_id of the required table configuration.




**Note:**
To copy the sys_id, navigate to **Table Configuration** > **Copy_sysid**.

**b.** Select **Update**.

**Note:**
To enable or disable Agent Assist tab, see Configure the Agent Assist tab in Service Operations Workspace using the Standard Record Page.

## Install Universal Request for Service Operations Workspace

You can install the Universal Request for Service Operations Workspace application (com.snc.universal_request) if you have the admin role.The application includes demo data and installs related ServiceNow® Store applications and plugins if they aren't already installed.

### Before you begin

- Ensure that the application and all of its associated ServiceNow Store applications have valid ServiceNow entitlements. For more information, see Get entitlement for a ServiceNow product or application.
- Review the application listing in the ServiceNow Store for information on dependencies, licensing or subscription requirements, and release compatibility.

Role required: admin

### About this task

The following items are installed with Universal Request:

- Plugins
- Store applications
- Roles

For more information, see Components installed with Universal Request for Service Operations Workspace.

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### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the Universal Request application (com.snc.universal_request) using the filter criteria and search bar.

   You can search for the application by its name or ID. If you can't find the application, you might have to request it from the ServiceNow Store.

   In the list next to the **Install** button, the versions that are available to you're displayed.
3. Select a version from the list and select **Install**.

   In the Install dialog box that is displayed, any dependencies that are installed along with your application are listed.
4. If you're prompted, follow the links to the ServiceNow Store to get any additional entitlements for dependencies.
5. **Optional:** If demo data is available and you want to install it, select the **Load demo data** check box.
   Demo data comprises the sample records that describe application features for the common use cases. Load the demo data when you first install the application on a development or test instance.

   **Important:**
   If you don't load the demo data during installation, it's unavailable to load later.
6. Select **Install**.

## Install Universal Task for Service Operations Workspace

You can install the Universal Task application (sn_uni_task) if you have the admin role.The application includes demo data and installs related ServiceNow® Store applications and plugins if they are not already installed.

### Before you begin

- Ensure that the application and all of its associated ServiceNow Store applications have valid ServiceNow entitlements. For more information, see Get entitlement for a ServiceNow product or application.
- Review the application listing in the ServiceNow Store for information on dependencies, licensing or subscription requirements, and release compatibility.

Role required: admin

### About this task

The following items are installed with Universal Task:

- Plugins
- Store applications
- Roles

For more information, see Components installed with Universal Task for Service Operations Workspace.

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### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the Universal Task application (sn_uni_task) using the filter criteria and search bar.

   You can search for the application by its name or ID. If you cannot find the application, you might have to request it from the ServiceNow Store.

   In the list next to the **Install** button, the versions that are available to you are displayed.
3. Select a version from the list and select **Install**.

   In the Install dialog box that is displayed, any dependencies that are installed along with your application are listed.
4. If you're prompted, follow the links to the ServiceNow Store to get any additional entitlements for dependencies.
5. **Optional:** If demo data is available and you want to install it, select the **Load demo data** check box.
   Demo data comprises the sample records that describe application features for the common use cases. Load the demo data when you first install the application on a development or test instance.

   **Important:**
   If you don't load the demo data during installation, it's unavailable to load later.
6. Select **Install**.

## Using Service Operations Workspace for ITSM

Service Operations Workspace provides a unified experience for multiple IT Service Management workflows by integrating with various applications.

For information about using Service Operations Workspace for ITOM, see Using Service Operations Workspace for ITOM.

### Add a user-specific quick link on the ITSM landing page

Refer to a URL quickly from the Service Operations Workspace landing page.

#### Before you begin
Role required: itil

#### Procedure

1. Navigate to the Service Operations Workspace landing page.
2. Under the **Quick links** section, select add quick link ( + ).
3. In the **URL** field, specify the URL that you want to refer to.
4. In the **Display text** field, specify the text that you want to display for the URL.
5. Select **Add**.

### Create a list in Service Operations Workspace

Create a list or use an existing list to create a list.

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### Before you begin
Role required: itil

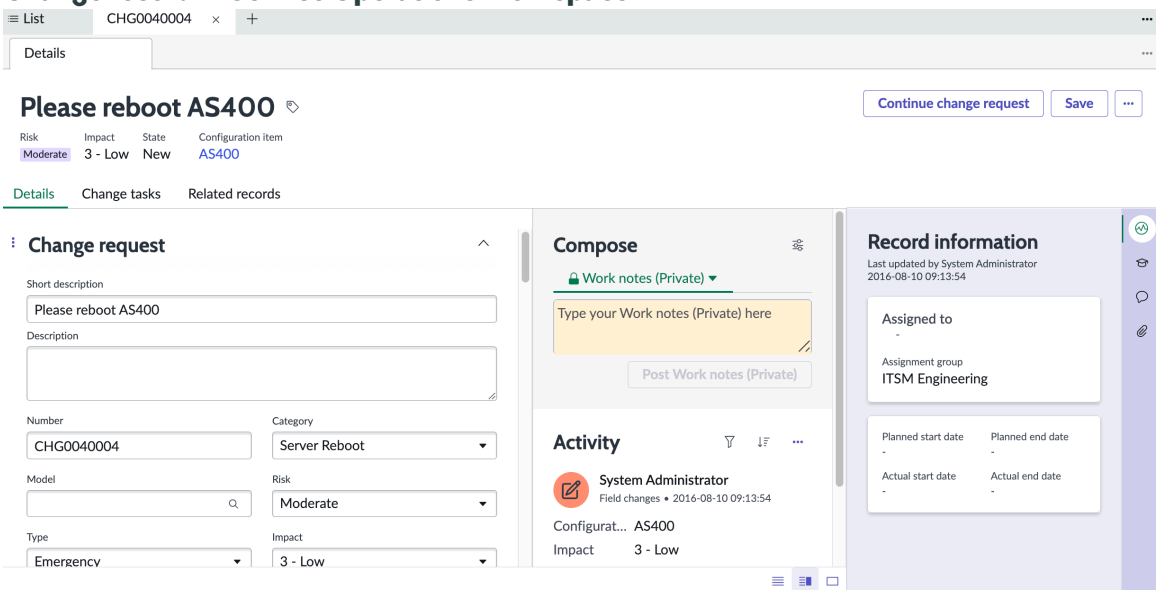
### Procedure

1. From the primary navigation in Service Operations Workspace, select the **List** menu and select the **My Lists** tab.
2. Select **Add new list**.
3. To create a different version of the existing list, perform the following steps.
   a. In the New List dialog box, select the **Start from existing** tab.
   b. Specify the required details.
4. To create your own list, perform the following steps.
   a. In the New List dialog box, select the **Create your own** tab.
   b. Specify the required details.
5. Select **Create**.

## Change Management in Service Operations Workspace

When a change to your infrastructure or a business service is required, you can create a change request and track it in Service Operations Workspace.

**Change record in Service Operations Workspace**




## Details tab

This section displays the detailed information of a change request. For information about fields in this section, see Create a change request in Service Operations Workspace.

For information about how you can configure fields in this tab, see Configure a task record form in Service Operations Workspace.

From the **Compose** section, you can add work notes for the change request.

## Change tasks tab

This section displays change tasks associated with the change request. For information about creating a change task, see Create a change task in Service Operations Workspace.

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## Related records tab

This section provides a list view of the records associated with the change request, for example, affected CIs and outages. You can add a record, create a record, or remove it from the change request.

## Contextual side panel

From this section, you can access the following information:

- Record information for the change request.
- Agent Assist and search for relevant records and perform the required actions.

For information about Change Management, see Change Management.

### Create a change request in Service Operations Workspace

Track modifications to a supported configuration item (CI). Use a change request form to record information such as the reason for the change, type, priority, and risk.

#### Before you begin

Role required: itil or admin

#### Procedure

1. Perform one of the following actions to start creating a change request.

2. Select the change model that you want to create, and click **Next**.

   For information about change models, see Change models.

| Option | Description |
|---|---|
| **Normal** | Any service change that is not a pre-ap proved change or an emergency change. |
| **Pre-approved** | A pre-authorized change that is low risk, rela tively common, and follows a specified proce dure or work instruction. |
| **Emergency** | An emergency change that bypasses group and peer review and approval, and goes straight to the authorization state for approval by the CAB approval group. |

**Note:**

- You can filter and search for the change type.
- When you create a change request from an interaction, only pre-approved change types are available.

3. In the Overview tab, fill in the fields.

   You must provide the initial details of the change in the Overview tab.

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| Field | Description |
|---|---|
| Short description | Brief description of the change. |
| Description | Detailed description of the change. |
| Justification | Reason for the planned change request, which helps approvers determine their decision. |

4. Click **Save**.

   The change request is created along with **Scope and impact**, **Assignment**, **Schedule**, **Risk evaluation**, and **Change task** sections.

5. Select **Add scope** in **Scope and impact** section.

   a. On the form, fill in the fields.

   **Add scope form**

| Field | Description |
|---|---|
| Configuration item | Configuration item (CI) that the change applies to. You can associate any type of CI with a change request, including service offerings. It also provides detailed access to SLA and availability requirements. |
| Service offering | Consists of one or more service commitments that uniquely define the level of service in terms of availability, scope, pricing, and packaging options. Service offering enables you to receive different features and their levels of performance for a given service. |
| Service | The business service that you want to make available for the change request. |
| Category | The category of the change, for example,**Hardware**,#**Network**, or#**Software**. |
| Refresh impact services | When you refresh impacted services, the Impacted Services/CIs, Business Applications, and Service Offerings related lists get updated based on the affected CIs. The records in each of the related list are unique even though the impact can be from a single affected CI. |

   b. Click **Save**.

6. Select **Assign** in the **Assignment** section.

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**a.** On the form, fill the fields.

| Field | Description |
|---|---|
| Assignment group | Group assigned to the change.<br><br>You can populate the **Assignment group** field automatically based on the support group available for the respective configuration item (CI). If the CI does not have any change group, then the field gets populated with the change group available for service offerings. The business rule **Populate Assignment Group based on CI/SO** triggers the functionality when an incident, problem, or change request is created or updated and when the **Assignment group** and the **Assigned to** field is empty. The following properties identify the field whose value populates the **Assignment group** field:<br><br>▪ *com.snc.change_request.ci_assignment_gro* This change property identifies which CI field populates the **Assignment group** field.<br><br>▪ *com.snc.change_request.service_offering_* This change property identifies which service offering field populates the **Assignment group** field.<br><br>**Note:** The default value for the properties is support group for incident or problem and change group for change request respectively. The business rule **Populate Assignment Group based on CI/SO** is shipped as part of the development plugin ITSM CSDM Best Practice – Quebec plugin (com.snc.best_practice.itsm_csdm.quebec) and is available only for the new customers. |
| Assigned to | User assigned to the change request. If an assignment rule applies, the change is automatically assigned to the appropriate user or group. |
| Work notes | Information about how to resolve the change or steps taken to resolve it, if applicable. This note is for internal use. The work notes information is not visible to your customer. |

**b.** Click **Save**.

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7. Select **Schedule** to schedule the implementation for the change.

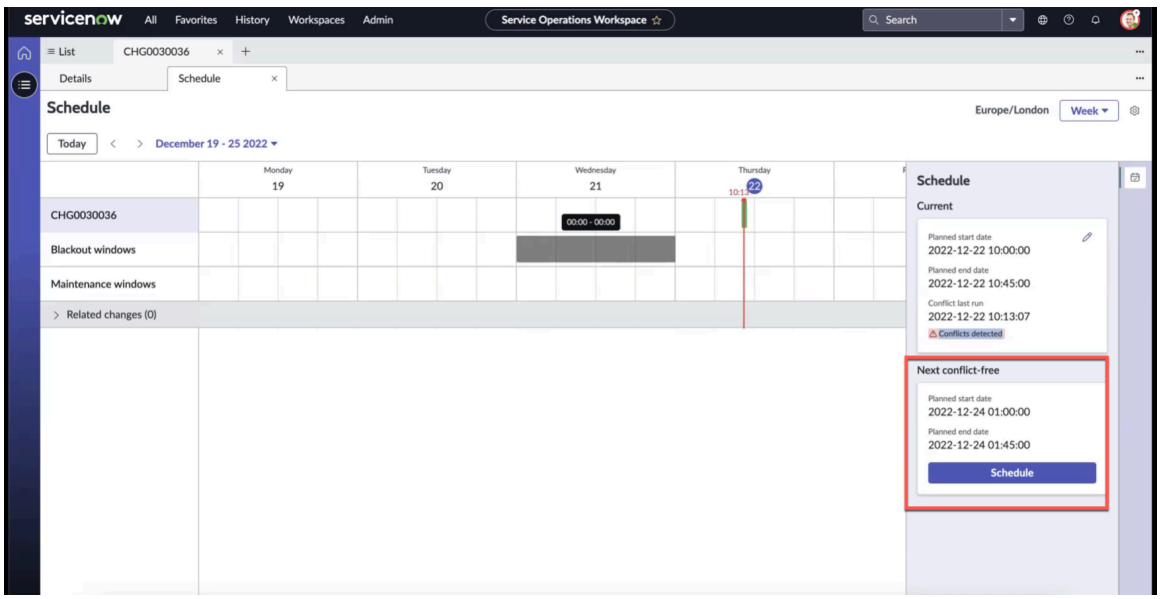
   a. On the form, fill in the fields.

   **Schedule**

| Field | Description |
|---|---|
| Planned start date | Date to begin working on the change. |
| Planned end date | Date the change is planned to be completed.<br><br>If the task type is#**Implementation**, the**Planned start date** #and **Planned end date**#values must fall within the planned start and end dates specified in the change request. |
| Actual start date | Start date of the implementation. |
| Conflict status | Status of the conflict. |
| Actual end date | Date when the change was implemented. |
| Conflict last run | Date when the conflict was last run. |

   b. Select **Schedule**.

   Select **Schedule** under **Next conflict-free card** to re-schedule the implementation of the change if there is any conflict.




   c. Select **Details** tab to view the Change details.

8. Select **Risk evaluation** to evaluate the risk for the change.

   The risk is calculated and is shown in Record information.

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The last evaluated risk value is displayed along with the timestamp.

9. Select **New** in **Change task** section.
   For more information to create a change task, refer Create a change task in Service Operations Workspace.
10. Select#**Request Approval** when the change request is ready to move to the next state.

    The state is moved forward based on the type of change request:

    - Assess state: Group level approval for a normal change request. Approval records are automatically generated based on the#Change approval policies. You can conduct peer and technical reviews of the proposed change.
    - Authorize state: Approval required by the business stakeholders, or by the Change Advisory Board.
    - Scheduled state: Pre-approved standard changes.

    **Note:**

    To mail the change record, click the more options icon ( ) in the content frame and select **Email**. Both the user who requested the change and the user who is assigned to the change are automatically populated in the list of recipients.

    To view the calendar, click **View Calendar** in the title bar of the Change Request form.

11. Click **Save**.

### Work on a change request in Service Operations Workspace

Modify a supported configuration item (CI) if required and close the change request.

#### Before you begin
Role required: itil

#### Procedure

1. Open a change request.

   For information about creating a change request in Service Operations Workspace, see Create a change request in Service Operations Workspace.

2. Perform any of the following actions on the change record page.

### Create a change task in Service Operations Workspace

When you need to engage another team or agent for help, create and assign change task. For example, there can be tasks to plan the change, implement the change, and test, and review the work.

#### Before you begin
Role required: itil or admin

#### Procedure

1. Open a change request.
2. On the change record page, Click the more actions icon ( ) and select **Create Change Task**.
3. In the Create Change task dialog box, select the task type.

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By default, the following task types are available. To create additional task types, see Create a task type for problem or change in Service Operations Workspace.

- Planning
- Implementation
- Testing
- Review

4. Click **Create**.
5. On the form, fill in the fields.

**Create New Change Task form**

| Name | Definition |
|---|---|
| Short description | A summary of the task. |
| Description | Detailed description of the task. |
| Number | Auto-generated identification number for the task. |
| Change request | Associated change request. |
| State | State of the change task:<br>○ **Pending**: Open and unassigned<br>○ **Open**: Open and unassigned<br>○ **In progress**: Open and actively being worked on<br>○ **Closed**: Inactive and closed. Requires close code and close notes to be provided.<br>○ **Canceled** |
| Configuration item | Configuration item (CI) or service that the change task applies to. |
| Type | Type of change task, **Planning**, **Implementation**, **Testing**, or **Review**. The default workflow generates tasks in type **Review**. |
| On hold | Option to indicate whether the change task is on hold. Provide an **On hold reason** if a change task is placed on hold. |
| Assignment | |
| Assignment group | Group that the change task is assigned to. |
| Assigned to | User that the change task is assigned to. If an assignment rule applies, the change task is automatically assigned to the appropriate user or group. |
| Schedule | |
| Planned start date | Date you plan to begin working on the task. |
| Planned end date | Date the change task is planned to be completed. |

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| Name | Definition |
| --- | --- |
| | If the task type is **Implementation**, the **Planned start date** and **Planned end date** values must fall within the planned start and end dates specified in the change request. |

6. Click **Save**.

### Work on a change task in Service Operations Workspace

Complete the change task that in turn helps in resolving the associated change.

#### Before you begin

Role required: itil or admin

#### Procedure

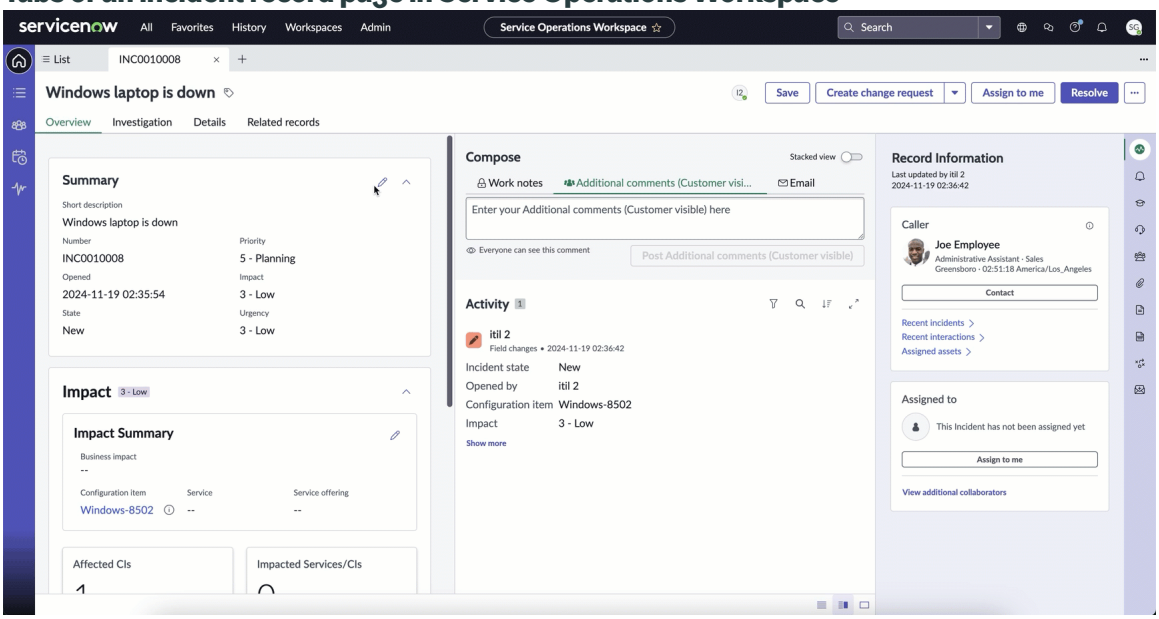
1. Open a change.
2. From the **Change tasks** tab, open the required change task.
3. To find and work on records that help in quick resolution of the change task, perform the following actions.
   a. From the contextual side panel, click the agent assist icon ( ).
   b. Search for a resource and perform the required action.
4. To delete the change task, Click the more actions icon ( ) and select **Delete**.

## Incident Management in Service Operations Workspace

You can create and manage your incidents in Service Operations Workspace.

Introduction to incident management in Service Operations Workspace

### Tabs of an incident record page in Service Operations Workspace

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### Overview tab

This tab displays the following information about an incident:

- Summary
- Impact
- Cause
- Resolution

From the Compose section, you can add comments and work notes for the incident.

The Overview tab displays the field information along with the field labels, including when you're in read mode.

For more information on the fields displayed on the **Overview** tab, see View and update incident information on the Overview tab.

You can customize the display of the information on the **Overview** tab. For more information, see Customize the Overview tab for an incident.

### Investigation tab

This tab enables you to investigate any affected CIs with the `ci_computer` or `ci_server` class associated with the incidents. The tab displays the metrics information of the associated primary CI or any affected CI that is selected, which helps you to analyze and resolve the issue. You can use the various remedial actions on this tab to resolve the CI-related issues.

By default, the tab displays metrics information of the primary affected CI associated with the incident. But you can also select and view the information for any affected CI with the `ci_computer` or `ci_server` class that is associated with the incident. For information about how you can set up Investigation Framework, see Setting up Investigation Framework in Service Operations Workspace.

**Note:**

- The tab is visible only if the Agent Client Collector (ACC) or Microsoft Endpoint Configuration Manager (MECM) adapters are installed and configured.
- The tab displays the metrics information for the CI only in the following conditions:
  - Agent Client Collector or Microsoft Endpoint Configuration Manager (MECM) is installed for the associated CI. This helps to retrieve the metrics data for the CI.
  - The associated CI class is a CMDB CI computer.
- This feature supports only the macOS, Windows, and Linux operating systems.

You can also customize the display of the metrics information on this tab. For more information, see Customize the Investigate tab.

For more information on the metrics displayed on this tab, see Features of the Investigation tab.

### Communicate tab

This tab displays all the communication tasks and options that enable you to communicate with the stakeholders in the various phases of an incident. This tab is available only if any of the following conditions are met:

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- For a major incident - The Major Incident Management (sn-sow-mim) plugin is active and configured in Admin Center, for Service Operations Workspace. For more information, see Setting up Major Incident Management in Service Operations Workspace.
- For Incident – The Task Communications Management and Incident Communications Management applications are installed, active, and configured in the instance and you select the **New Communication** option from the **More Actions** (  ) icon of the Incident record page. For more information, see Task Communications Management and Incident Communications Management.

For more information on the features of the **Communicate** tab, see Communicating with stakeholders about incidents and major incidents.

### Post incident report tab

This tab enables you to generate, configure, publish, and export a post incident report for a major incident after it's resolved. The post incident report enables you to review the cause and resolution of the major incident and also identify potential process gaps. Based on this information, you can take preventive measures to avoid the issue in the future or to handle the major incident in a better way. This tab is available only if the following conditions are met:

- Major Incident Management is active and configured in Admin Center for Service Operations Workspace. For more information, see Setting up Major Incident Management in Service Operations Workspace.
- The major incident is in the **Resolved** state.

For more information on the features of the **Post incident report** tab, see Review and update a post incident report.

### Details tab

This tab displays detailed information about the incident. For example, the short description, assignment details, and related records. For more information on how you can configure fields in this tab, see Configure a task record form in Service Operations Workspace.

### Related records tab

This tab provides a list view of the records associated with the incident. For example, task SLAs and affected CIs.

### Contextual side panel

From this section, you can view record information and recommendations, collaborate using Microsoft Teams, and reach out to experts on-call to resolve incidents quickly.

For more information about Incident Management, see Incident Management.

#### Create an incident in Service Operations Workspace

Track the investigation, possible solutions, and resolution of a problem for a customer.

**Before you begin**
Role required: itil or admin

**Procedure**

1. Perform one of the following actions to start creating an incident.

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2. On the form, fill the fields in the **Details** tab.

**Create New Incident form**

| Field | Description |
|---|---|
| Incident | |
| Short description | Brief description of the incident. |
| Description | Detailed explanation of the incident. |
| Number | Auto-generated unique number to identify the incident record. |
| Caller | User who contacted you with an issue. Begin typing the first name of the caller to select from a list of matching names, or look up and select the user. |
| Location | Location of the caller. |
| Channel | Mode of communication taken by the user to create the incident. |
| State | Different states through which the incident proceeds during its life cycle. |
| Impact | The effect of an incident, problem, or change on the business processes. |
| Urgency | How long the resolution can be delayed until an incident, problem, or change has a significant business impact. |
| Priority | How quickly the service desk should address the task. Priority is based on impact and urgency. |
| Impact | |
| Service | Business service that is affected. |
| Configuration item | Configuration item that is affected. |

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| Field | Description |
| --- | --- |
| Service Offering | Consists of one or more service commitments that uniquely define the level of service in terms of availability, scope, pricing, and packaging options. Service offering enables you to receive different features and their levels of performance for a given service. |
| Business impact | Impact of the incident. |
| Assignment | |
| Assignment group | Group to work on this incident. If you do not provide a value, the incident is automatically assigned based on assignment rules. |
| Assigned to | The user to work on this incident.<br>**Note:**<br>If the **Assignment group** changes, the **Assigned to** field is cleared. |
| Notes | |
| Additional comments (Customer visible) | More information about the issue as needed. All users who can view incidents can also see additional comments. |
| Work notes | Information about how to resolve the incident or steps taken to resolve it, if applicable. |
| Related Records | |
| Parent Incident | Associated parent incident that makes the current incident a child incident.<br>**Note:**<br>When the parent incident is resolved, the child incident is also marked as resolved. |
| Problem | Any related problem record. |
| Change Request | Any related change request. |
| Caused by Change | Associated change request that prompted the creation of the incident. |

3. Click **Save**.

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### View and update incident information on the Overview tab

View and update the incident information, such as summary, impact, cause, and resolution, from the **Overview** tab. This incident information helps you analyze the issue and resolve the incident quickly.

## Before you begin

An incident must be created. For more information, see Create an incident in Service Operations Workspace.

Role required: itil

## About this task

Review the incident information on the **Overview** tab. If necessary, you can edit or add information.

You can select the **Preview record** icon ( ⓘ ) for any reference field to display a preview of that record information on the same page. If necessary, you can also select **Open record** to open the record on a separate tab.

## Procedure

1. On an incident record, select the **Overview** tab.
2. On the Summary section, add or edit the information as needed.

   a. Select the **Edit summary** ( ✎ ) icon to edit the fields.

   b. On the form, fill in the details.

#### Incident summary

| Field | Description |
|---|---|
| Short description | Brief description of the incident. |
| Description | Detailed explanation on the incident. |
| Number | The unique system-generated incident number. This is a read-only field. |
| Priority | How quickly the service desk should address the task. The **Priority** field is calculated based on the **Impact** and **Urgency** fields. |
| Opened | The date and time when the incident was created. This is a read-only field. |
| Impact | Level of impact that the incident has on the business. Possible values:<br>▪ 1-High<br>▪ 2-Medium<br>▪ 3-Low |

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| Field | Description |
| --- | --- |
| | **Note:**<br>When you modify the value in the **Impact** and **Urgency** fields and save the record, a Record update pop-up window is displayed where you must enter the **Work notes** information to proceed further. |
| Urgency | Level of urgency the incident requires to be resolved. Possible values:<br>▪ 1-High<br>▪ 2-Medium<br>▪ 3-Low<br>**Note:**<br>When you modify the value in the **Impact** and **Urgency** fields and save the record, a Record update pop-up window is displayed where you must enter the **Work notes** information to proceed further. |
| State | Different states through which the incident proceeds during its life cycle. Possible values:<br>▪ New<br>▪ In progress<br>▪ On Hold<br>▪ Resolved<br>▪ Canceled<br>**Note:**<br>▪ When you select the **On Hold** state and save the record, a Record update pop-up window appears where you must select the **On hold reason** field and enter the **Additional comments**.<br>▪ When you select the **Resolved** state and save the record, a Record update pop-up window appears where you must select the **Resolution code** field and enter the **Resolution notes** to proceed further. |
| Major Incident state | State of the Major incident. |

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| Field | Description |
|---|---|
| | **Note:** This field is available only if the Major Incident Management for Service Operations Workspace (sn_sow_mim) plugin is installed and active. For more information, see Setting up Major Incident Management in Service Operations Workspace. |
| Caller | User who reported the incident. |

c. Select the **Save Summary** ( ) icon.

3. On the Impact Summary section, edit the information as needed.

a. Select the **Edit impact summary** ( ) icon.

b. On the form, fill in the details.

**Impact summary**

| Field | Description |
|---|---|
| Business impact | Impact of the incident on the business. |
| Configuration item | Primary configuration item that is impacted. |
| Service | Primary business service that is impacted. |
| Service offering | Consists of one or more service commitments that uniquely define the level of service in terms of availability, scope, pricing, and packaging options. Service offering enables you to receive different features and their levels of performance for a given service. |

c. Select the **Save Impact Summary** ( ) icon.

4. On the **Location** field of the Impact section, select **View impacted locations** to view the impacted locations and users on a world map in a separate tab.
The **Impacted location** tab displays the following information:

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- Number of impacted users – Number of users impacted by the incident.

  **Note:**
  The number of impacted users is calculated based on the following data sources:

  - Caller of the incident.
  - Callers of the child incidents.
  - Service offerings associated with the Incident. This source is only used if Service Portfolio Management Foundation is activated and being used. For more information, see Activate Service Portfolio Management.

- Number of impacted locations – Number of unique locations calculated based on the number of users.
- Impact world map – Map of impacted locations marked on the world map along with the impacted users. You can view the impacted users counts and details at these locations. You can further narrow down to the continent, country, state, or city level.

**Note:**
The Location section is available only if the Major Incident Management for Service Operations Workspace (sn_sow_mim) plugin is installed and active, and if the incident is a major incident. For more information, see Major Incident Management in Service Operations Workspace.

5. Select the following cards to add or update the configuration items associated with the Incident.
   a. Select the **Affected CIs** card to add or remove the configuration items (CI) that are affected by the incident.
   b. Select the **Impacted Services/CIs** card to add or remove the Configurations items or Services impacted by the incident.
   c. Select the **Assets** card to add or remove the configuration items that users use as assets.
6. On the Cause section, add or update the cause of the incident.
   a. Select **Add cause**.
   b. Enter **Probable cause** of the incident.
   c. Select **Save cause** ( ) icon.
7. On the Resolution section, add the resolution information to resolve the incident.

   **Note:**
   Populate the values in this section only when the incident is ready to be resolved.

   a. Select **Add resolution**.

   b. On the form, fill in the details.

**Resolution section**

| Field | Description |
|---|---|
| Resolution code | Category in which the incident is resolved. |

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| Field | Description |
|---|---|
| Resolution notes | Details on how the incident is resolved. |

c. Select the **Save resolution** ( ) icon.

8. On the Compose section, post messages to the activity stream and send emails to stakeholders.
   a. Enter and post the **Comments** message to the activity stream.
   b. Enter and post the **Work notes (Private)** message to the activity stream.
   c. Enter and post the **Action taken** on the major incident to the activity stream.
   d. **Compose** and then **send Email** to the stakeholders.

### Viewing incident record information using the Contextual side panel

View the incident record information, such as caller details and assets, from the Contextual side panel. Use this information to help manage an incident more efficiently.

Select the **Record information** ( ) icon on the Contextual side panel to view the incident information. The record information side panel includes this following information.

## Active calls

The Active calls card displays active conference calls that are currently in progress for major incidents. This card is displayed only for major incident records and if the Major Incident Management for Service Operations Workspace (sn_sow_mim) plugin is installed and active. For more information, see Setting up Major Incident Management in Service Operations Workspace.

A maximum of five collaboration records are displayed on this card. You can select the call record links displayed on this card to join the calls. You can use the **Collaborate** side panel tab to view and manage additional call record information.

**Note:**

For Twilio calls, plain text is displayed instead of a link. In such case, you can join the call using the **Collaborate** side panel tab.

The collaboration information is retrieved from the Collaboration services integration with Service Operations Workspace.

## SLAs and timings

The SLAs and timings card includes the following information:

- Major incident duration – Time duration since the incident has been promoted, created, or accepted as a major incident. This field is visible only if Major Incident Management for Service Operations Workspace is installed and active.
- Response SLA – The Task service level agreement (SLA) stage according to the configured Incident Response SLA timer configuration. Displays the time left to respond to an incident before the task SLA is breached.
- Resolution SLA – The Task SLA stage according to the configured Incident Resolution SLA timer configuration. Displays the time left to resolve an incident before the task SLA is breached.

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- View all SLAs – All SLAs associated with the incident record.

**Note:**
This option is visible only if there is at least one SLA associated with the current incident task.

## Caller

The Caller card displays quick information about the caller, such as name, local time, department, and location. You can also select the **Preview caller** ( ⓘ ) icon to preview the caller record. Select **Open record** to open the caller record on a separate tab. You can also select **Contact** to view all details about the caller.

You can select the following links to get additional record information specific to the caller, if necessary:

- Caller assets – List of the caller's assets (CIs).
- Recent interaction – List of recent interactions with the caller that have been created in the last seven days.#You can view up to ten interaction records on the card. Select **View all** to view the list of all interactions on a separate tab.

**Note:**
For interaction records, the **Assigned to** user is considered as the caller.

- Recent incidents - List of recent incidents associated with the caller that have been created in the last seven days. You can view up to ten incident records on the card. Select **View all** to view the list of all incidents on a separate tab.

## Assigned to

The Assigned to card displays the assignment status of the incident record. Select **Assign to** to assign the incident record to you. You can select the **View additional collaborators** link to view the list of collaborators associated with the incident record in a modal experience. The list of collaborators is retrieved from the following data sources:

- Historical **Assigned to** users for the incident or incident tasks except the current **Assigned to** user.
- Users who have added comments and work notes to the major incident record. This data source is applicable only for major incidents.
- Collaborators from the collaboration channels that are initiated from the **Collaborate** side panel. This information is retrieved using the collaboration APIs.

You can view a list of five collaborators on a page at a time.

### Work on an incident in Service Operations Workspace

If resolving the incident involves creating a problem, change, service request, and so on, you can create them directly from the incident record.

**Before you begin**
Role required: itil

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## Procedure

1. Open an incident.

   For information about creating an incident in Service Operations Workspace, see Create an incident in Service Operations Workspace.

2. Perform any of the following actions on the incident record page.

### Remedial actions using Playbook

Resolve the CI-related issues using the remedial actions using Playbook in the Investigate tab.

The Investigate tab includes the following types of remedial action to resolve CI-related issues:

- End process
- Restart service

These remedial actions are available on the Investigate tab only if the following conditions are met:

- The Investigation Framework [sn_invest_fwk] application is installed and configured. For more information, see Setting up Investigation Framework in Service Operations Workspace and Configure the Remedial Actions Framework.
- The remedial actions are configured to display on the UI. For more information, see Customize the Investigate tab.

Remedial actions use playbooks to resolve CI issues. Playbook provides you with an interactive UI to guide and execute the remedial actions step by step. With a playbook, you can control every execution step of the remediation process. Playbook is available on the contextual side panel of the Incident record page. When any remedial action is performed, that remediation process is added to a playbook. You can then select the playbook ( ) icon on the contextual side panel to open the playbook on a separate panel and execute the process. The playbook panel displays the following tabs:

- Current: Displays the current list of playbooks that trigger the remedial action, including both processes and services that have the status New and In Progress.
- History: Displays the historical list of playbooks, including both processes and services that have the status **Completed**, **Canceled**, or **Failed**.

You can cancel an ongoing End process or Restart service remedial action playbook. To cancel a remedial action playbook, select the remedial action playbook and select the menu ( ) icon and then select **Cancel action** option. After the remedial action playbook is canceled, the corresponding action is also canceled. Then, the status of the remedial action is displayed as **Canceled** in the History tab of the playbook panel. To view the reason for cancellation, select the **View reason** option on the playbook. This option isn't available if any of the following are true:

- The remedial action is already in **Canceled** status.
- The corresponding CI action record of the remedial action is already in progress.
- The change request has already moved to implement state for actions associated to CIs of type server.

The Remedial actions section on the Investigate tab also contains the **Current** and **History** tab to display the list of remedial actions performed. By default, this section displays the list of remedial actions for the primary CI or current CI. You can switch the **Show actions performed on all CIs**

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**in this incident** toggle to display the list of remedial actions for all the CIs associated with the Incident.

Playbook is available only if both the Remedial Action Framework [com.snc.sn_reacf] application and the Investigation Framework [sn_invest_fwk] application are installed and configured, as well as if the remedial actions are triggered. For more information on Playbook, see .

**Note:**
You can't execute concurrent or duplicate remedial actions when a remedial action is in progress on a process or service for a CI type device or server. You also can't execute concurrent or duplicate remedial actions on the same CI until the previous remedial action execution is completed. You can change this behavior and allow concurrent execution of the remedial action by selecting the **Allow concurrent execution** option for Remedial Action Type. For more information, see Configure the Remedial Actions Framework.

## End process

The **End process** remedial action is available with the following metric information cards:

- Top processes By Memory
- Top processes By CPU

Select the CI and then select **End process** to stop the process running on the CI. The remediation process then is added to the playbook. Select the Playbook ( ) icon from the contextual side panel to open the playbook on a separate panel and execute the process. You can execute the End process remedial action for the following CI classes:

- Device: For this CI class, a two-step process is executed where you must get the user approval before the End process remediation process can be executed. After it's approved, you can directly stop the process on the device, which is also known as the endpoint.
- Server: For this CI class, you must create a change request before the End process remedial action can be executed using a standard change request. You must also provide additional information to create a change request.

## Restart service

The **Restart service** remedial action is available with the Services metric information card.

Select the CI and then select **Restart service** to restart the services running on the CI. The remediation process then is added to the playbook. Select the Playbook ( ) icon on the contextual side panel to open the playbook on a separate panel and execute the process. You can execute the Restart service remedial action for the following CI classes:

- Device: For this CI class, a two-step process is executed where you must get the user approval before the Restart service remediation process is executed. After it's approved, you can directly restart the services on the device, which is also known as the endpoint.
- Server: For this CI class, you must create a change request before you can execute the remedial action using a standard change request. You must also provide additional information to create a change request.

### Major Incident Management in Service Operations Workspace

Create and manage major incidents in Service Operations Workspace.

## Major Incident Management overview

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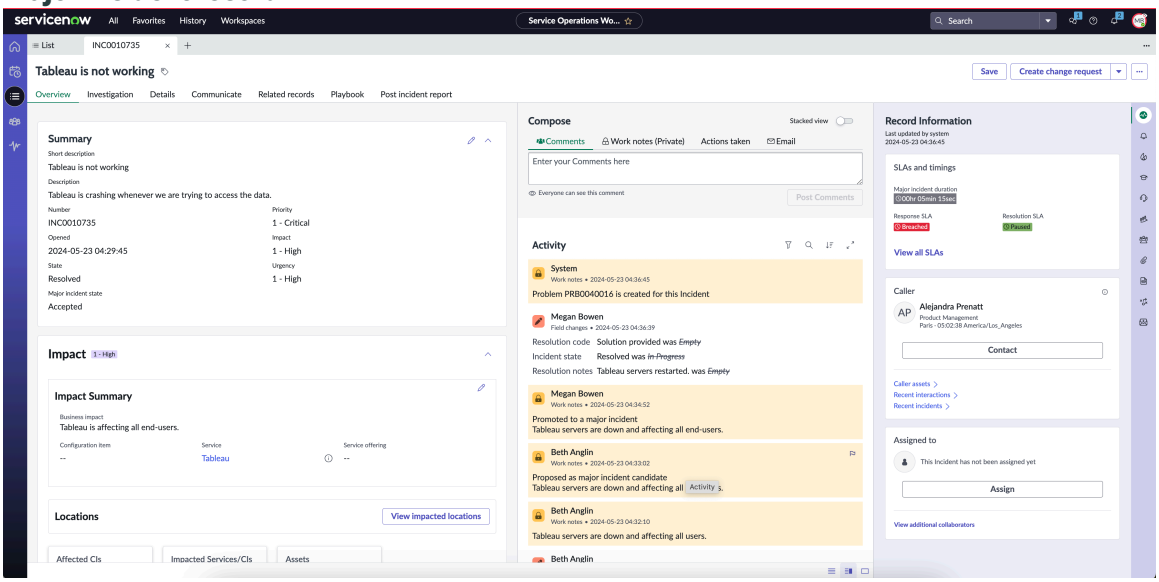
https://player.vimeo.com/video/990305784?h=fa145c9c15&badge=0&autopause=0&player_id=0&app_id=58479

## Major incident record




A major incident (MI) is created when an issue occurs that results in significant disruption to the business and demands a response beyond the normal incident management process.

Major incidents have a separate procedure with shorter timescales and higher priorities to encourage a faster resolution process for the incidents with a high business impact.

The definition of what constitutes a major incident must be determined based on your requirements. For example, a major incident can be created if a critical business service is impacted or if there's a service outage that affects many users.

## Major incident user roles

The major incident manager (major_incident_manager) user role is available in the base system and enables you to manage and resolve major incidents. As a major incident manager, you can do the following:

- Promote a major incident candidate to a major incident.
- Create a major incident.
- Directly promote an incident to a major incident without going through the proposal process.

## Major incident creation

A major incident is created or promoted from a major incident candidate. A major incident candidate can be created from the incident record page in Service Operations Workspace in the following ways:

- Propose an incident as a major incident candidate.
- Create a major incident candidate.
- Use major incident trigger rules to propose an incident as a major incident candidate or promote directly to a major incident automatically.

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## Major incident response and handling

When responding to a major incident, some crucial actions include the following:

- Finding the correct resources
- Communicating updates to users and stakeholders
- Setting up conference calls to investigate and resolve the incident
- Escalating the incident when required

You must define the communication plans that are associated with a major incident based on pre-defined conditions. Incident communication plans and related communication tasks are created for a major incident based on the communication plan definitions. Afterwards, tasks get executed as defined in the associated incident communication.

### Major Incident Management process in Service Operations Workspace

A major incident has a high impact and urgency that affects a large number of users and deprives the business of one or more crucial services. Given the urgency of the situation, a well-coordinated response process is required to accelerate the resolution and minimize the business impact.

When responding to major incidents, an effective and efficient system is needed to minimize the high impact of service interruption. An efficient system involves the following actions:

- Minimize the impact of service interruptions.
- Ensure that an appropriate incident manager, major incident team, or management group is in place to manage a major incident.
- Communicate to the stakeholders about the service interruptions, degradations, resolutions, and other major incident updates.
- Collaborate with stakeholders to resolve the major incident and restore service.
- Create a problem record to analyze the root cause.
- Generate a post incident report (PIR) to review each major incident once the service is restored.

The Major Incident Management process can be classified in the following phases.

#### Major Incident identification and detection

The first phase in the process is to identify a potential major incident candidate. You can detect and identify major incidents in the following ways:

- An incident is detected based on the configured major incident trigger rules and is either proposed as a major incident candidate or promoted directly to a major incident automatically.
- An agent reviews the incident information to identify if the incident should be proposed to a major incident candidate. If proposed, a major incident manager reviews the information of the major incident candidate and promotes it to a major incident.
- A major incident manager creates a major incident directly without the proposal process.

#### Communication and collaboration

The second phase is communication. Proper communication during a major incident is crucial to ensure that the IT teams, business stakeholders, and end users are informed about the impact and progress of the major incident.

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Communicating throughout a major incident requires a comprehensive communication plan, including whom to contact, the methods and frequency of communication, and messaging channels used to support, such as email and SMS. A communication plan enables the incident response team to focus their efforts on the resolution process and to set expectations for any future communications.

You can define one or more communication plans based on the communication type, the priority of the incident, and the target audience of the major incident. Throughout the life cycle of the major incident, notifications and status updates are sent to the stakeholders to keep them informed and involved.

Along with communications, effective collaboration with IT teams and other business stakeholders is also important when resolving a major incident. You can use communication channels, such as Microsoft Teams conference calls, to collaborate and work toward issue resolution. The Incident record page in Service Operations Workspace provides various controls for collaboration. For more information, see Collaborate with stakeholders during a major incident.

**Resolution**

The next phase in the major incident life cycle is resolving the major incident. Resolving a major incident also involves resolving all associated child incidents, and the individual callers receive a notification about incident resolution.

**Problem record creation**

A problem record must be created to analyze the root cause of the major incident. You can configure the **Create problem from major incident** flow to create a problem record automatically after a major incident is resolved or manually create a problem record, as required. You can also configure if the major incident information is automatically copied to a problem record when a problem record is created.

**Post incident report review**

The final phase of a major incident life cycle is generating a post incident report (PIR). After the major incident is resolved, a PIR is generated. You can use a PIR to analyze the incident and understand how to help prevent a similar incident in the future. This review also provides an opportunity to evaluate the incident response process and identify areas for improvement. The report contains the timeline of events that occurred after an incident is created. You can review and update the PIR during the review process before it's shared with stakeholders.

### Managing a major incident record

Manage a major incident record with a playbook or the various tabs on the major incident record page.

Based on the information displayed on different tabs, an agent can propose a major incident using the **Propose Major Incident** option. A major incident manager reviews the information on the **Overview** tab, such as the location information, and then accepts or rejects the major incident proposal. After a proposal is accepted, the major incident manager uses the **Promote Major Incident** option to promote the candidate to a major incident.

After an incident is promoted to a major incident, each tab on a Major Incident record page contains information about the major incident. You can use the various options and the action menu to manage the major incident process and view incident information on the following:

- Overview tab
- Details tab
- Communicate tab
- Related tab

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- Playbook tab
- Contextual side panel

**Overview tab**

The **Overview** tab displays the incident information in the following sections:

- Summary – Basic incident information, such as short description, description, impact, urgency, and state.
- Impact:
  - Impact summary - Impact summary information, such as business impact, configuration item, service, and service offering.
  - Location – The location of the caller on the world map, the number of locations, and the number of users. This information is only displayed for a major incident and if you have the major_incident_manager role.
  - Affected CIs – The number of CIs affected by the incident.
  - Impacted Services/CIs – The number of CIs and services impacted by the incident.
  - Assets – The number of assets associated with the incident.
- Cause – The probable cause of the incident.
- Resolution – Incident resolution-related information, such as resolution code and resolution notes, once the incident is resolved.

On the Activity section, you can view all comments, work notes, actions taken, and composed emails. This section also includes user activities, such as a change in the state and the assignment group. In the Compose section, you can add comments, work notes, and actions taken, as well as compose emails.

For more information on the **Overview** tab, see View and update incident information on the Overview tab.

**Details tab**

The **Details** tab displays detailed information about the incident, such as category, subcategory, impact, related record, assignment group, watch list, cause, and resolution. For more information on the **Details** tab, see Incident Management in Service Operations Workspace.

**Communicate tab**

The **Communicate** tab displays the list of communication tasks with various options that are used to maintain communications with the stakeholders for major incidents. For more information on the options available on the **Communicate** tab, see Communicating with stakeholders about incidents and major incidents.

**Related records tab**

The **Related records** tab provides a list view of the records associated with the major incident. For example, task SLAs and affected CIs.

**Playbook tab**

The **Playbook** tab displays the information of the playbooks available for Major Incident Management. For each playbook, you can select to work with the playbook to manage major incidents. For more information, see Managing major incidents using playbooks.

**Contextual side panel options**

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On the Contextual side panel, you can use the following options:

- Major Incident Playbook – Select the **Major Incident Playbook** (  ) icon to launch the playbook side panel. The playbook provides a guided approach to the entire major incident process. It provides a way to visualize business process workflows for major incidents in a simple, task-oriented view. The playbook contains the following two tabs:
  - Current – List of major incident playbooks running currently.
  - History – Historical list of major incident playbooks.
- Recommended actions – Select the **Recommended Actions** (  ) icon to launch the **View recommendation** side panel. The side panel lists all the recommended actions for major incidents. When an incident is promoted to a major incident and doesn't have a problem record associated with it, this tab displays a card with the **Create a problem** option to create a problem record.

  You can also configure whether the incident field information is copied automatically when a problem record is created by using the **List of attributes (comma-separated) that will be copied from the incident to create a new problem** (*com.snc.problem.create_from_incident.attributes*) system property. For more information, see Create a problem.
- Record Information – Select the **Record information** (  ) icon to view the incident record information on the side panel. The record information side panel includes the following information:
  - Active calls – Details of the active conference calls for major incidents. You can select the call record to start a conference call.
  - Caller details – Name, local time, address, email id, and other caller information. Select the **Contact** option to view the caller details and caller assets. You can also see recent interactions and incidents with the caller.
  - SLAs and timing – Duration of time since a major incident has occurred, as well as the state of the response and the resolution SLAs for the major incident. You can select **View all SLA** to see all the task SLAs associated with the incident.
  - Assign to – The assignment status of the incident. You can select the **Assign to** option to assign the incident to yourself. You can select the **View additional collaborators** option to view the list of collaborators associated with the incident.

  For more information on the record information in the Contextual side panel, see Viewing incident record information using the Contextual side panel.
- Collaborate – Select the **Collaborate** (  ) icon to open the **Collaborate** side panel tab. This tab displays the following tabs:
  - Call – Call-related information for the upcoming, pending, overdue, or active calls with the collaborators such as status and due date with time duration. You can select **Start** to initiate that call. You can also select the **Initiate collaboration** (  ) icon to create a call using various communication channels such as Zoom and Webex.
  - Chat - Chat-related information, such as name, number of participants, and due date, for upcoming, pending, overdue, or active chats with collaborators.

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You can select **Open discussion** to start that chat. You can select the **Initiate collaboration** ( ) icon to create a chat using various communication channels, such as Microsoft Teams and Slack.

- On call – Select the **Experts on-call** ( ) icon to identify and contact available on-call members of a support group to resolve an issue.

### Propose a major incident

Propose an incident to a major incident candidate based on the incident information.

#### Before you begin

Role required: itil

#### Procedure

1. Open an incident record.
   For information about creating an incident in Service Operations Workspace, see Create an incident in Service Operations Workspace.
2. On the incident record, use the following information to decide if you want to propose this incident:
   - Incident information on the **Overview** tab
   - Incident information on the **Details** tab
   - Incident information on the **Related records** tab
   - Record information on the Contextual side panel

   For more information on the tabs, see Managing a major incident record.
3. On the incident record for the incident that you want to propose, select **Propose Major incident.**
4. On the Propose Major incident window, fill in the details.

**Propose Major incident**

| Field | Description |
|---|---|
| Work notes | Reason for proposing the incident as major incident candidate. |
| Business Impact | Details of the impact created by the incident on the business. |

5. Select **Propose Major incident**.

### Managing major incidents using playbooks

Manage the major incident life cycle and process using Major Incident Playbooks from the contextual side panel of an incident record page.

A Major Incident Playbook in Service Operations Workspace provides a guided approach to the entire major incident process. It provides a way to visualize business process workflows for major incidents in a simple, concise, and task-oriented view. You can access the Major Incident Playbook using the **Major Incident Playbooks** ( ) icon on the contextual side panel of an incident record page.

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The following playbooks are available in the base system for Major Incident Management:

- **MI playbook** - Provides a simple and concise interface in separate sections for planned and unplanned communication or collaboration features in a task-oriented view. This playbook is suggested for upgrade customers.
- **Advanced MI playbook** - Provides a similar interface to the MI playbook but has more advanced, configurable capabilities for planned and unplanned communication or collaboration, as well as collaboration placed under a single section. You can configure the unplanned communication or collaboration section to create, add, and configure the communication plans and tasks, and the collaboration channels or channel types using Playbooks. For more information, see Designing a major incident playbook. This playbook is suggested for new or zBoot customers.

You can select and assign one or more of the playbooks to Major Incident Management as needed. The **Playbook** tab displays all the playbooks that are assigned to Major Incident Management. For more information on assigning playbooks to major incidents, see Assign a playbook to Major Incident Management.

### Manage major incidents using the MI playbook

Manage major incidents using the MI playbook from the contextual side panel or the **Playbook** tab of an incident record page. This playbook provides a simple, concise, and task-oriented interface for managing the major incident process.

## Before you begin

The incident must be proposed as a major incident candidate. For more information, see Propose a major incident.

The MI playbook must be assigned to Major Incident Management. For more information, see Assign a playbook to Major Incident Management.

Role required: major_incident_manager or admin

## About this task

The MI playbook in Service Operations Workspace provides a guided approach to the entire major incident process. It provides a way to visualize business process workflows for major incidents in a simple, concise, and task-oriented view.

## Procedure

1. Open an incident record that has been proposed as a major incident candidate.
2. Select the **Major Incident Playbooks** ( ) icon on a contextual side panel to launch the major incident playbook.

   The Major Incident Playbook panel opens on the side panel. The panel includes the following tabs:

   - Current
   - History
3. On the **Current** tab, select **MI playbook**.
   You can view the major incident process steps and your progress along the following steps:
   - Review Situation
   - Communicate
   - Collaborate

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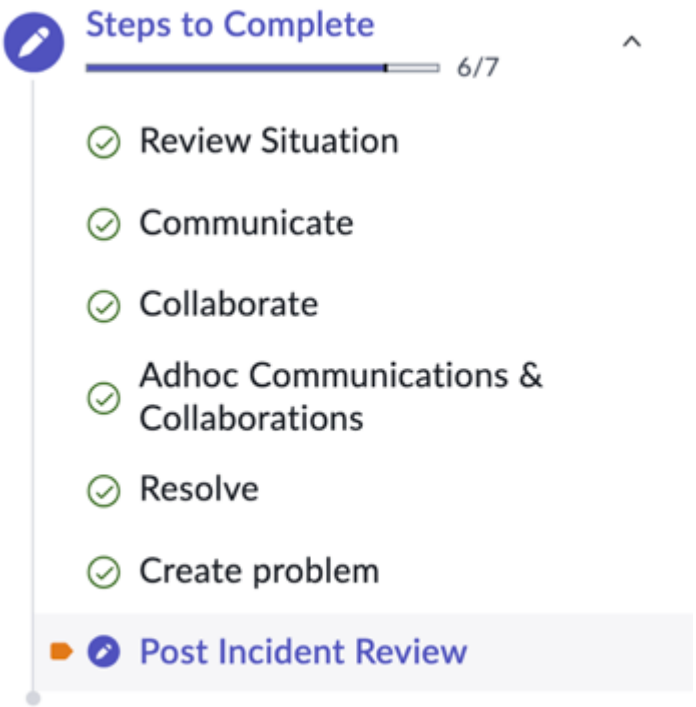
- Adhoc Communications & Collaborations
- Resolve
- Create problem
- Post Incident Review




**4.** Review the incident information and then promote the major incident.

**a.** Select **Review Situation**.

**b.** Review the incident information.

**c.** Select **Promote** to promote the incident to a major incident based on the incident information.
For more information, see Promote a major incident.

**5.** Communicate with stakeholders by composing a communication message, such as email or SMS.

**a.** Select **Communicate**.

**b.** On a communication task that you want to complete, select **Compose** to compose a communication message, such as email or SMS.
For more information, see Compose communications for incidents and major incidents.

**c. Optional:** Select the **More actions** ( ⋮ ) icon for a communication task and then select **Manage Recipients** to add or manage the recipients for communications.
For more information, see Manage recipients in a communication task.

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For more information, see Compose communications for incidents and major incidents. You can also add or manage recipients for the communications. For more information, see Manage recipients in a communication task.

6. Collaborate with stakeholders.

   a. Select **Collaborate**.

   b. Select a collaboration record, and then select one of the following options based on the selected type of collaboration channel:

      - Start - To start a call.
      - Open discussion - To start a chat.

      For more information on how to use these collaboration channels, see Collaborate with stakeholders during a major incident.

7. Perform unplanned communications and collaborations.

   a. Select **Adhoc collaboration and communication**.
   This section contains the following collaboration and communication records that are created separately than pre-defined and configured communications and collaboration plans:

      - Communications – All the communications that you create using the **New communication** option from the **Communicate** tab or using the Incident communication plan related list on the **Related records** tab are displayed in this section. For more information on creating unplanned communications, see Create an adhoc communication task and Create adhoc communication and collaboration using the Related record tab.
      - Collaboration – All the collaboration records that you create using the Incident Communications plan related list on the **Related records** tab are displayed in this section. For more information on creating unplanned communications and collaboration, see Create adhoc communication and collaboration using the Related record tab.

   b. Select the one of the following options for unplanned communications and collaboration.

      - For unplanned communications, you can do one of the following actions:
        - Select **Compose** to compose a communication message such as email or SMS. For more information, see Compose communications for incidents and major incidents.
        - Select the **More actions** ( ⋮ ) icon for a communication task and then select **Manage Recipients** to add or manage the recipients list for the communication task. For more information, see Manage recipients in a communication task.
      - For unplanned collaboration, you can do one of the following actions:
        - Start a call - Select **Start** on a collaboration record to start a call with the stakeholders. For more information, see Collaborate with stakeholders during a major incident.
        - Start a chat – Select **Open discussion** to start a chat with the stakeholders. For more information, see Collaborate with stakeholders during a major incident.

8. Select **Resolve**.
   For information on how to resolve a major incident, see, Resolve and close a major incident.
9. Select **Create Problem**.

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**Note:**
This section is visible in the playbook only if:

- The incident doesn't have a problem record associated with it.
- The Problem Management Best Practice - Madrid - State Model (com.snc.best_practice.problem.madrid.state_model) plugin is activated on the instance.
- The **Create problem from major incident** flow is inactive on the instance. This flow is shipped as part of the base system in the **Inactive** status. Once activated, it creates a problem record automatically when an incident is promoted to a major incident.

You can also configure if the incident field information is copied automatically to the respective fields in a problem record using the **List of attributes (comma-separated) that will be copied from the incident to create a new problem** (*com.snc.problem.create_from_incident.attributes*) system property when a problem record is created. For more information, see Create a problem.

A problem record is created automatically. You can select **View Problem** to view the problem record on a separate tab.

10. Mark the post incident review as complete.

    a. Select **Post Incident Review**.

    b. Select **Mark Complete** to end the major incident process in the **Playbook** side panel. You can continue to work on the post incident report review from the **Post Incident Report** tab on the Incident record page. For more information, see Review and update a post incident report.

### Manage major incidents using the Advanced MI playbook

Manage a major incident using the Advanced MI playbook that's available on the contextual side panel or the **Playbook** tab of an incident record page. This playbook provides a similar interface to the MI playbook but has advanced, configurable capabilities for communication and collaboration steps.

#### Before you begin

The incident must be proposed as a major incident candidate. For more information, see Propose a major incident.

The Advanced MI playbook must be assigned to Major Incident Management. For more information, see Assign a playbook to Major Incident Management.

Role required: major_incident_manager or admin

#### About this task

The Advanced MI playbook in Service Operations Workspace provides a guided approach to the entire major incident process. It provides a way to visualize business process workflows for major incidents in a simple, concise, and task-oriented view interface.

#### Procedure

1. Open an incident record that has been proposed as a major incident candidate.
2. Select the **Major Incident Playbooks** ( ) icon on a contextual side panel to launch the major incident playbook.

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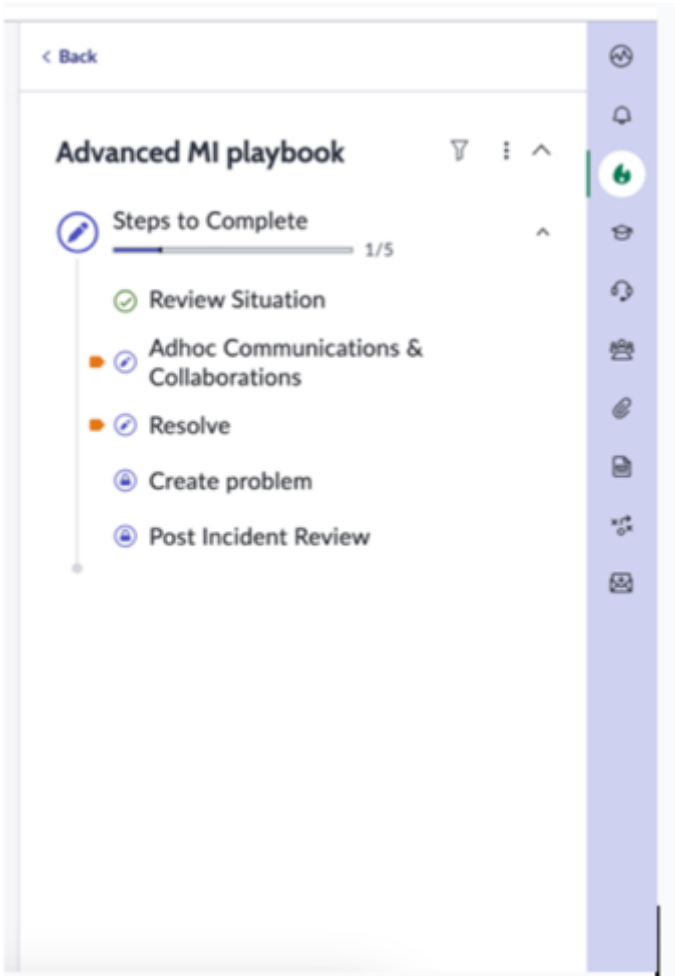
The Major Incident Playbook panel opens on the side panel. The panel includes the following tabs:

- Current
- History

3. On the **Current** tab, select **Advanced MI playbook**.
   You can view the major incident process steps and your progress along the following steps:
   - Review Situation
   - Adhoc Communications & Collaborations
   - Resolve
   - Create problem
   - Post Incident Review




4. Review the incident information and then promote the major incident.

   a. Select **Review Situation**.

   b. Review the incident information.

   c. Select **Promote** to promote the incident to a major incident based on the incident information.
   For more information, see Promote a major incident.

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5. Perform unplanned communication and collaboration.

   a. Select **Adhoc collaboration and communication**.
   This section contains the following communication and collaboration plans and records:

   - The pre-defined and configured communication and collaboration include all the communications and collaborations plans configured as part of Major Incident Management communications in the Admin Center. For more information, see Setting up communication templates and plans in Major Incident Management.
   - The separately created communication and collaborations include the following:
     - Communications – All the communications tasks that you create using the **New communication** option from the **Communicate** tab are displayed in this section. All the communication plans and tasks that you create using the Incident communication plan related list from the **Related record** tab are displayed also. For more information, see Create an adhoc communication task and Create adhoc communication and collaboration using the Related record tab.
     - Collaboration – All the collaboration records that you create using the Incident Communications plan related list from the **Related record**s tab are displayed in this section. For more information, see Create adhoc communication and collaboration using the Related record tab.

   b. Select the one of the following options for unplanned communications and collaboration.

   - For adhoc communications, you can do the following actions:
     - Select **Compose** to compose a communication message, such as email or SMS. For more information, see Compose communications for incidents and major incidents.
     - Select the **More actions** ( ⋮ ) icon for a communication task and then select **Manage Recipients** to add or manage the recipient lists for the communication task. For more information, see Manage recipients in a communication task.
   - For adhoc collaboration, you can do the following actions:
     - Start a call - Select **Start** on a collaboration record to start a call with the stakeholders. For more information, see Collaborate with stakeholders during a major incident.
     - Start a chat – Select **Open discussion** to start a chat. For more information, see Collaborate with stakeholders during a major incident.

6. Select **Resolve**.
   For information on how to resolve a major incident, see, Resolve and close a major incident.
7. Select **Create Problem**.

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**Note:**
This section is visible in the playbook only if:

- The incident doesn't have a problem record associated with it.
- The Problem Management Best Practice - Madrid - State Model (com.snc.best_practice.problem.madrid.state_model) plugin is activated on the instance.
- The **Create problem from major incident** flow is inactive on the instance. This flow is shipped as part of the base system in the **Inactive** status. Once activated, it creates a problem record automatically when an incident is promoted to a major incident.

You can also configure if the incident field information is copied automatically to the respective fields in a problem record using the **List of attributes (comma-separated) that will be copied from the incident to create a new problem** (*com.snc.problem.create_from_incident.attributes*) system property when a problem record is created. For more information, see Create a problem.

A problem record is created automatically. You can select **View Problem** to view the problem record on a separate tab.

8. Mark the post incident review as complete.

   a. Select **Post Incident Review**.

   b. Select **Mark Complete** to end the major incident process in the **Playbook** side panel. You can then continue work on the post incident report review from the **Post Incident Report** tab on the Incident record page. For more information, see Review and update a post incident report.

### Promote a major incident

Review the information of the proposed major incident candidate and promote it to major incident using the Major Incident Playbook.

#### Before you begin

You must propose the incident as a major incident candidate. For more information, see Propose a major incident.

Role required: major_incident_manager or admin

#### Procedure

1. Open an incident record.
2. Select the **Major Incident Playbooks** ( ) icon on a contextual side panel to launch the major incident playbook.

   The Major Incident Playbook panel appears on the side panel. It includes the following tabs:

   - Current
   - History
3. On the **Current** tab, select the current Major Incident Process playbook.
4. Select **Review situation**.
5. On the **Overview** tab, review the business impact, work notes, and other incident information.
6. Select **Promote** to promote the major incident candidate to a major incident.

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If you want to reject the major incident proposal, you can select **Reject**. This action would convert the major incident candidate back into an incident.

7. On the Promote to Major Incident pop-up window, fill in the details.

**Promote to Major Incident**

| Field | Description |
|---|---|
| Reason | Reason for promoting the incident as major incident candidate. |
| Business Impact | Impact the incident creates on the business. By default, the business impact stated by the agent to propose major incident is displayed. You can modify the value. |

8. Select **Promote to Major Incident**.

**Note:**

You can also promote a major incident by selecting the **More actions** (...) icon and then selecting **Promote to Major Incident**.

### Communicating with stakeholders about incidents and major incidents

Use the **Communicate** tab to create and manage all communications with stakeholders during the various phases of an incident or a major incident.

The **Communicate** tab contains the following options to create and manage communications:

**Group By**

Group communication tasks the following ways:

- Communication plan – The communication tasks that are associated with a particular communication plan are grouped.
- Completion status - The communication tasks are grouped based on the completion status and due dates. You can choose to list the tasks from the following group sections:
  - Overdue – Communication tasks with past due dates.
  - Upcoming – Communications tasks with an upcoming due date.
  - Completed – Communication tasks that are completed.
  - Skipped – Communication tasks that are skipped.

**Filter by communication plan**

Filter the communication task by a communication plan.

**Compose**

Compose a communication message, such as an email, SMS, Microsoft Teams, or Slack message.

**New Communication**

Create a communication task. This option is available only to the following users:

- User with the major_incident_manager role
- User with both the ia_admin and itil roles

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**Manage recipients**

Add and manage recipients for a communications task. You can add a user role and a user in the recipient list. You can also access this option by selecting the **More actions** ( ⋮ ) icon on the communication task and then selecting **Manage recipients**.

**View Record**

View detailed information about the communication task. Select the **More actions** ( ⋮ ) icon on the communication task and then select **View record**.

**Close**

Close the communication task. Select the **More actions** ( ⋮ ) icon on the communication task and then select **Close**. The communication task is then moved to either the Completed or Skipped section of the **Communicate** tab based on the following scenarios:

- If a communication task has the **Frequency** field set to **Recurring** and at least one communication has been composed and sent, selecting **Close** moves the communication task to the Completed section.
- If a communication task has the **Frequency** field set to **One time** or **Recurring** and no communication has been composed and sent, selecting **Close** moves the communication task to the Skipped section.

**Start**

Start the communication task with the **Pending** status. Select the **More actions** ( ⋮ ) icon on the communication task and then select **Start**.

**Snooze**

Increase the **Due in** time for a communication task. Select the **More actions** ( ⋮ ) icon on the communication task and then select **Snooze**.

### Compose communications for incidents and major incidents

Compose communication messages for incidents and major incidents using communication channels such as email and SMS.

## About this task

The **Communicate** tab displays the list of communication tasks with various options that are used to maintain communications with the stakeholders for an incident. For each communication task, you can view the following information:

- Communication plan - Name of the communication plan.
- Communication task – Name of the communication task.
- Status – Status of the communication task.
- Channels – Communication channel of the task, such as email or SMS.
- Past due – Time duration since the due date has passed. This information is applicable for communication tasks that have a past due date in the overdue section.
- Due in – Duration of time left until the due date.

## Before you begin

You must configure the communication plans and tasks in one of the following ways:

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- For major incidents, you must configure communication plans and tasks for Major Incident Management in Admin Center. For more information, see Configure a communication plan in Major Incident Management.
- For incidents, you must activate and then configure communication plans and tasks in Task Communications Management. For more information, see Task Communications Management.

Role required: major_incident_manager, ia_admin, itil, or admin

### Procedure

1. On the incident record, select the **Communicate** tab.
   The **Communicate** tab displays the list of communication tasks based on the communications configured for major incidents or incidents.
2. Select the communication task where you want to compose the communication message.

   **Note:**
   Select the communication task based on the due dates to avoid breaching of any due date for communications. For example, communication tasks from the Overdue section.

3. On the communication task, select **Compose**.
   The communication task record opens on a new tab within the incident view with the configured communication channels, such as email and SMS.

   **Note:**
   Based on the channel selected on the communication task, any or all of the following sections are displayed:
   - Email
   - SMS
   - SMS notification
   - Microsoft Teams notification
   - Slack
   - Slack notifications

4. On the form, fill in the fields.

**Email form**

| Field | Description |
|---|---|
| Email template | Email template used for composing the email. |
| To | List of users to whom the email is sent. |
| Cc | List of users to whom the email is sent as Cc. |
| Bcc | List of users to whom the email is sent as Bcc. |
| Subject | Subject of the email. |
| Body | Content of the email. |
| Attach file | Attachments for the email. |

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#### SMS notifications/SMS/Microsoft Teams notification/Slack/Slack notifications form

| Field | Description |
|---|---|
| From | Number from which the message is sent. |
| To | User to whom the message is sent. |
| Message | Content of the message. |

**Note:**

- Depending on the channel selected on the communication task, options such as email or SMS are displayed.
- SMS communication is sent to the recipient only if the recipient has a phone number linked to the recipient record.

5. Select **Send**.

### Manage recipients in a communication task

Manage the recipients list for a communication task to create flexible and effective communication with the required stakeholders.

### Before you begin

Role required: major_incident_manager, ia_admin, itil, or admin

### Procedure

1. On an incident record, select the **Communicate** tab.
2. Select **Manage recipients**.

   You can also select the **More actions** ( ⋮ ) icon for a communication task and then select **Manage recipients**.
3. On the Manage recipients pop-up window, fill in the details.

#### Manage recipients

| Field | Description |
|---|---|
| Communication | Communication plan that is associated with the communication task for which you want to manage recipients.<br><br>**Note:** When you select the **More actions** icon ( ⋮ ) for a communication task and then select **Manage recipients**, the communication plan associated the selected communication task is selected by default. When you select the **Manage recipients** option directly from the **Communicate** tab, you must select the communication plan. |
| Add recipients | User, user group, or list of recipients to whom the communication is sent. |

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| Field | Description |
|---|---|
| Designate role | User role of the recipients. |
| Add | Button to add the recipients and the user role to the **Recipients** field. |
| Recipients | User, user group, or list of recipients with the user role. You must use the **Add** button to add the recipients and the user role to this field. |

4. Select **Save**.

### Create an adhoc communication task

Create an adhoc communication task as required during the various phases of an incident in Major Incident Management.

## Before you begin

Role required: major_incident_manager, itil, ia_admin, or admin

## Procedure

1. On the incident record page, select the **Communicate** tab.
2. Select **New communication**.
3. On the New communication pop-up window, fill in the details.

#### New communication

| Field | Description |
|---|---|
| Compose and sent communication | Indicates when the communication message must be composed and sent. Possible values are:<br>○ Now – The communication message is composed and sent immediately.<br>○ Later – The communication message is composed and sent later after a definite time interval. |
| Frequency | Frequency at which the communication must be composed and sent. Possible values are:<br>○ One time – The communication message is composed and sent only once.<br>○ Recurring - The communication message is composed and sent after a repeated time interval. |
| Due in (minutes) | Duration of time in minutes after which the communication message must be composed and sent.<br>**Note:** This field is displayed only if the **Frequency** field is set to **Recurring**. |

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| Field | Description |
|---|---|
| Short description | Brief description of the communication task. |
| Channels | Channel that must be used to compose and sent communication messages. Possible options are:<br>○ Email – Compose and send the communication message as an email.<br>○ SMS – Compose and send the communication message as SMS.<br>○ Microsoft Teams notification - Compose and send communication messages as Microsoft Teams notifications.<br>○ Slack - Compose and send communication message to a Slack channel.<br>○ SMS notifications- Compose and send communication message as SMS notifications.<br>○ Slack notifications – Option to compose and send communication messages as Slack notifications. |
| Recipients | User, user groups, or list of recipients to whom the communication message must be sent. |

4. Either save your communication or compose your communication, depending on whether the **Compose and sent communication** field has been set to **Later** or **Now**.
   - If the **Compose and sent communication** field is set to **Later**, select **Save**. The communication task is saved and displayed in the list of communication tasks on the **Communicate** tab.
   - If the **Compose and sent communication** field is set to **Now**, select **Compose communication** to compose your messages within your selected communication channels. The communication task record opens on a new tab within the incident view. For more information, see Compose communications for incidents and major incidents.

### Collaborate with stakeholders during a major incident

Collaborate with the required stakeholders during the various phases of a major incident to discuss and resolve the incident quickly. You can initiate a chat or make conference calls using a service provider to communicate with stakeholders.

## About this task

Collaboration services provide a way to communicate and collaborate in real time to resolve incidents. For more information on the integration and features of Collaboration services available in Service Operations Workspace, see Collaboration in Service Operations Workspace.

## Before you begin

Role required: major_incident_manager, itil, ia_admin, or admin

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### Procedure

1. On the incident record, select the **Collaborate** ( ) icon on the contextual side panel to open the collaborate tab on the side panel.
   The collaborate tab displays the following tabs:
   - Call – Includes a list of call records and call-related information, such as status and due date with time duration, for the upcoming, pending, overdue, and active calls with the collaborators.
   - Chat - Includes a list of chat records and chat-related information, such as name and number of participants and due date with time duration, for upcoming, pending, overdue, and active chats with collaborators.
2. Select the **Initiate collaboration** ( ) icon.
3. Collaborate using chat.

   a. Select any one of the following chat options:
   - Select **Start Sidebar discussion** to open the conversation on a sidebar chat.
   - Select **MS Teams chat** to open the conversation on Microsoft Teams.

   **Note:**
   - The chat application must be configured with Service Operations Workspace.
   - Slack channels aren't supported.

   b. On the pop-up window, fill in the details.

**Collaborate using chat**

| Field | Description |
|---|---|
| Record number | Incident record number associated with the collaboration chat. The incident record is selected by default. |
| Subject | Subject or title for the collaboration chat. |
| Add participants | User, user group, or list of recipients who must attend the collaboration chat. |
| Include a brief message for participants | Brief description about the issue to be discussed in the chat. |

   c. Select **Start Discussion**.

   The chat application opens with the selected participants.
4. Collaborate using call.

   a. Select one of the following call options.
   - Start Webex meeting
   - Start MS teams meeting
   - Start Twilio meeting
   - Start Zoom meeting

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**Note:**
The selected call channel applications must be configured for Service Operations Workspace.

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**b.** On the pop-up window, fill in the details.

**Collaborate using call**

| Field | Description |
|---|---|
| Conference bridge | Call channel used for collaboration. |
| Title | Subject or title for the collaboration call. |
| Add participants | User, user group, or list of recipients who must attend the collaboration call. |
| Provide a brief description, this note will be stored in the conference record | Brief description about the issue to be discussed in the call. |

**c.** Select **Start**.
The call starts with the selected participants.

### Create adhoc communication and collaboration using the Related record tab

Create adhoc communication and collaboration using the incident communication plan related list on the **Related records** tab of an incident record page.

#### Before you begin
Role required: major_incident_manager, itil, ia_admin, or admin

#### Procedure

1. On an incident record, select the **Related records** tab.
2. In the related list, select the **Incident communications Plans** button to open a list of the existing communication plans associated with the incident record.
3. Select **New** to create an incident communication plan.
   For more information on the form fields of an incident communication plan, see Create adhoc incident communication plan from incident.
   The Incident communication plan record opens on a separate tab.
4. On the Incident communication plan record, select the **Related records** tab.
5. In the related links section, select **Incident Communication task**.
6. Select **New** to create an incident communication task.
   For more information on the form fields of an incident communication task, see Create adhoc incident communication task from Incident Communications Management.
7. On the Incident communication task record, add a communication channel.

   **a.** Select the **More actions** ( ⋮ ) icon and then select **Add communication channel**.

   **b.** On the pop-up window, select **Channel type**.
   The possible values are:

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- Communication
- Collaboration

**c.** Select **Channel**.
The possible values change depending on the selected **Channel type**:

- If **Channel type** is set to **Communication**, you can set one of the following values:
  - Email
  - SMS
  - Microsoft Teams
  - Slack
  - Slack notification
- If **Channel type** is set to **Collaboration**, you can set one of the following values:
  - Sidebar discussion
  - Conference

**d.** Select **Save**.
The communication channel record opens on a separate tab.

**e.** On the communication channel record, fill in the required details based on the selected **Channel**.
For more information on the form fields, see Define a communication channel.

**f.** Select **Save**.

### Resolve and close a major incident

Resolve a major incident to reinstate service after the interruption.

## Before you begin

Role required: major_incident_manager or admin

## Procedure

1. Open a major incident record.
2. Review the major incident record to ensure that the issue associated with the major incident is resolved.
3. Select **Resolve**.
4. On the Resolve major incident pop-up window, fill in the details.

**Resolve major incident**

| Field | Description |
|---|---|
| Resolution code | Category of how the major incident was resolved. Possible values are:<br>○ Duplicate<br>○ Known error<br>○ No resolution provided<br>○ Resolved by caller |

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| Field | Description |
| --- | --- |
| | ○ Resolved by change<br>○ Resolved by problem<br>○ Resolved by request<br>○ Solution provided<br>○ Workaround provided |
| Resolution note | Brief description on how the major incident was resolved. |

5. Select **Resolve**.
   The state of the major incident is set to **Resolved**.
6. Select **Close**.

### Result
The state of the major incident is set to **Closed**.

## Review and update a post incident report

Review a post incident report (PIR) using the **Post Incident Report** tab. A PIR helps you review and understand the cause of the major incident and the actions taken by the teams to resolve the incident. This helps prevent the issue in the future.

### Before you begin
The major incident must be in the **Resolved** state. For more information, see Resolve and close a major incident.

Role required: major_incident_manager or admin

### About this task
Reviewing the post incident report (PIR) also provides an opportunity to evaluate the incident response process and identify areas for improvement. The PIR can be reviewed and updated during the review process before it's shared with stakeholders.

After you resolve a major incident, you must publish the PIR for the major incident and share it with the stakeholders within a specified time duration as defined in the SLA. You can configure the SLA by specifying the value in hours in the **PIR publish hours** (*sn_sow_inc.pir.publish.hours*) system property.

The following events are captured in the timeline of the PIR:

- Incident created
- Incident proposed as major incident
- Incident accepted as major incident
- Incident resolved
- Incident closed
- Custom events
- Incident task created
- Incident task closed

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## Procedure

1. Open a major incident record that is in the **Resolved** state.
2. Select the **Post incident report** tab.
3. On the Incident Response Timing section, review the time duration for the following fields.

**Incident Response Timing**

| Field | Description |
|---|---|
| Time to identify | Duration of time taken to identify an incident as major incident.<br><br>The **Time to identify** field is displayed based on this calculation:<br>`Time to identify = (incident created time) - (incident proposed time)`<br>or<br>`Time to identify = (incident created time) - (incident promoted time)` |
| Time to response | Duration of time taken to respond to the proposed major incident.<br><br>The **Time to response** field is displayed based on this calculation:<br>`Time to response = (incident proposed time) - (incident promoted time)` |
| Time to resolve | Duration of time taken to resolve the major incident.<br><br>The **Time to resolve** field is displayed based on this calculation:<br>`Time to resolve = (incident promoted time) - (incident resolved time)` |

4. On the Contributors section, add users to help with creating and publishing the PIR.
   a. Select the **Edit Co-contributors** ( ) icon to add users as contributors.
   b. In the **Co-contributors** field, enter users or user groups.
   c. Select the **Save Co-contributors** ( ) icon to save the changes.
5. On the Incident summary section, review the incident summary information and edit as needed.

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**Note:**

By default, this section retrieves the incident summary information from the **Overview** tab. You can modify the values.

**a.** Select the **Edit report** ( ) icon to edit the incident summary field of this section.

**b.** Edit the following information.

- Summary
- Impact
- Resolution

**c.** Select the **Save report** ( ) icon to save the changes.

**6.** On the Timeline section, review the incident events timeline and edit as needed.

**a.** Select the **Edit Timeline** ( ) icon to edit the event timeline.

**b.** Select the **Add event** option, enter the following information, and then select **Add** to add a new event to the timeline.

**Add event**

| Field | Description |
|---|---|
| Select date and time of the event | Date and time of the event. |
| Enter short description of the event | Brief description of the event. |

**c.** Edit the event timeline with the following setting options.

**Event timeline setting options**

| Options | Description |
|---|---|
| Hide | Select the **Hide** ( ) icon to hide an event from the timeline. |
| Show | Select the **Show** ( ) icon to show a hidden event on the timeline. |
| Edit | Select the **Edit** ( ) icon to edit the description or the date and time of an event. This option is available only for the events added using the **Add event** option. |
| Delete | Select the **Delete** ( ) icon to delete an event from the event timeline. This option is available only for the events added using the **Add event** option. |

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| Options | Description |
|---|---|
| Order of events | Option to set the chronological order of events. Possible options:<br>▪ Ascending – The event that occurred first is placed at the top, and the event that occurred last is placed at the bottom.<br>▪ Descending – The event that occurred last is placed at the top, and the event that occurred first is placed at the bottom. |
| Event Grouping | Option to enable the grouping of the events that occur within a specified time duration. |
| Group events with--of each other | Time duration that groups events if the events occur within this value. |
| Visibility settings | |
| Show hidden events in edit view | Option to show the events that are hidden when the **Edit Timeline** ( ) icon is selected. |
| Show manually events in edit view | Option to show the events that are added manually when the **Edit Timeline** ( ) icon is selected. |
| Show time line events in edit view | Option to show the timeline events when the **Edit Timeline** ( ) icon is selected. |
| Reset settings | Select the **Reset settings** ( ) icon to reset the settings back to the default settings. |

**d.** Select the **Save settings** ( ) icon to save the changes.

**7.** On the Related records section, review the information of the records associated with the incident and update as needed.

**a.** Select **Edit**.
You're redirected to the Related records section of the **Details** tab in the major incident record.

**b.** On the Related records section, edit the following fields.

**Related records**

| Fields | Description |
|---|---|
| Parent incident | Incident record that is associated as the parent to the incident record. |
| Problem | Problem record associated with the incident record. |

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| Fields | Description |
|---|---|
| Change request | Change request associated with the incident record. |
| Caused by change | Change request for which the incident is created. |

c. Select **Save**.
The information is updated in the fields of the Related records section of the Post incident report tab.

8. Select **Preview**.

**Note:**
This option is available only if the **PIR SOW preview page** (*sn_sow_inc.pir_pdf_preview_sow_page*) system property is set to **true**.

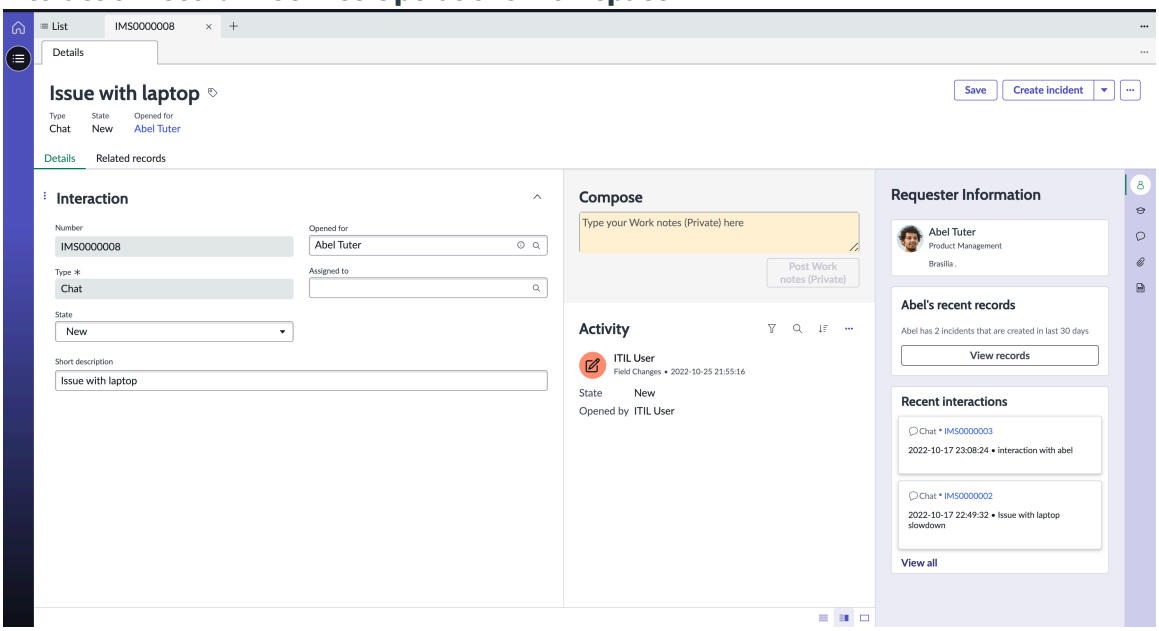
9. Select **Download**.
A pop window displays the post incident report export in progress. Once the export process is completed, a **Download** option appears on the pop-up window.
10. Select **Download**.

**Result**
The post incident report is downloaded to your system in PDF format. You can send the PDF file to the required stakeholders.

## Interaction Management in Service Operations Workspace

Interactions are a centralized location for all communication channels in Service Operations Workspace. You can respond to an incoming chat, phone, walk-up, or messaging interactions faster.

### Interaction record in Service Operations Workspace

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## Details tab

This tab displays the detailed information of an interaction. For information about fields in this section, see Create an interaction in Service Operations Workspace.

From the **Compose** section, you can add work notes for the interaction.

For information about how you can configure fields in this tab, see Configure a task record form in Service Operations Workspace.

## Related records tab

This tab provides a list view of the records associated with the interaction, for example, tasks related to this interaction, incidents related to the requester, and tasks related to the requester. You can add a record, create a record, or remove it from the interaction.

## Contextual side panel

From this section, you can view record information, requester information, add attachments, and create templates for reuse.

For information about Interaction Management, see Interaction Management.

### Create an interaction in Service Operations Workspace

Track an interaction that is a centralized location for all communication channels. Each interaction represents a request for assistance through a communication channel, for example, a phone call or a chat.

**Before you begin**
Role required: itil or admin

**Procedure**

1. Perform one of the following actions to start creating an interaction.

2. On the form, fill the fields in the **Details** tab.

**Create New Interaction form**

| Field | Description |
|---|---|
| Number | Auto-generated identification number for the interaction. |
| Type | Mode through which the interaction started. For example, chat, phone, or walk-up. |
| State | State of the interaction. |
| Opened for | Name of the user starting the interaction. |
| Assigned to | User to whom the interaction is assigned to. |
| Short description | Detailed description of the interaction |
| Work notes | Work notes related to the interaction. |

3. Click **Save**.

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### Work on an interaction in Service Operations Workspace

Work on customer conversations to resolve issues.

#### Before you begin

Role required: itil or admin

#### Procedure

1. Open an interaction.
2. Perform any of the following actions on the interaction record page.

### Collaborate using Microsoft Teams from an interaction record in Service Operations Workspace

You can initiate a chat or make conference calls using Microsoft Teams to communicate with stakeholders to resolve the issue.

#### Before you begin

Role required: itil or admin

#### Procedure

1. Navigate to **Workspaces** > **Service Operations Workspace**.
2. Select the **List** ( ) icon.
3. Select **Interactions** > **Open**.
4. Select the interaction record.
5. Select the **Collaborate** icon ( ) from the contextual side panel.
6. Select **Start Microsoft Teams chat**.
7. In the **Start Microsoft Teams chat** dialog box, specify the participants.
8. To start a chat conversation, perform the following actions.

   a. In the **Collaborate** panel, click the plus sign (+), and select **Start Microsoft Teams chat**.

   b. In the **Start Microsoft Teams chat** dialog box, specify the participants.

   c. **Optional:** To specify more chat options, click **Show more chat options** and specify a client.

   (Optional) You can choose Microsoft Teams application or the Microsoft Teams web application.

   d. Click **Start Chat**.

   - A chat conversation is initiated in Microsoft Teams.
   - All automatic chats are automatically imported to the **Collaborate** panel.

9. To view a chat conversation, click the more options icon ( ) on the chat and select **View chat**.
10. To import a chat conversation, perform one of the following actions.

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## Knowledge Management in Service Operations Workspace

Knowledge articles provide agents with information such as self-help, troubleshooting, and task resolution.

An agent can work on the agent's published and unpublished articles, feedback tasks, flagged tasks, and translation tasks. For information about knowledge articles, see Using Knowledge Management.

**Note:**
The list of agent's translation tasks is available only when the I18N: Knowledge Management Internationalization Plugin v2 plugin (com.glideapp.knowledge.i18n2) is activated.

Agents can also use knowledge blocks to reuse content within knowledge articles. For information about knowledge blocks, see Knowledge blocks.

**Note:**
The list of knowledge blocks is available only when the Knowledge Blocks plugin (com.snc.knowledge_blocks) is activated.

### Work on a knowledge article in Service Operations Workspace

Share information across your organization using a knowledge article.

#### Before you begin
Role required: itil

#### Procedure

1. Open a knowledge article in Service Operations Workspace.
2. Perform any of the following actions on the record page.

## On-Call Scheduling in Service Operations Workspace

Use On-Call Scheduling in Service Operations Workspace to view and manage your shifts and schedules.

## On-Call Scheduling overview

As an agent, view your schedule, the schedules of your peers, request an absence, propose shift coverage, and set your notification preferences.

As a shift manager, view and manage shifts, approve or reject absence requests, and resolve gaps and conflicts. You can also manage notification preferences, delivery channels, escalation trigger rules, and policies for your group.

As an on-call admin, view and manage shifts, approve or reject absence requests, and resolve gaps and conflicts. You can also manage notification preferences, delivery channels, escalation trigger rules, and policies for any group.

## Schedules in Service Operations Workspace

Use the Schedules menu on the home page to access On-Call Scheduling in Service Operations Workspace.

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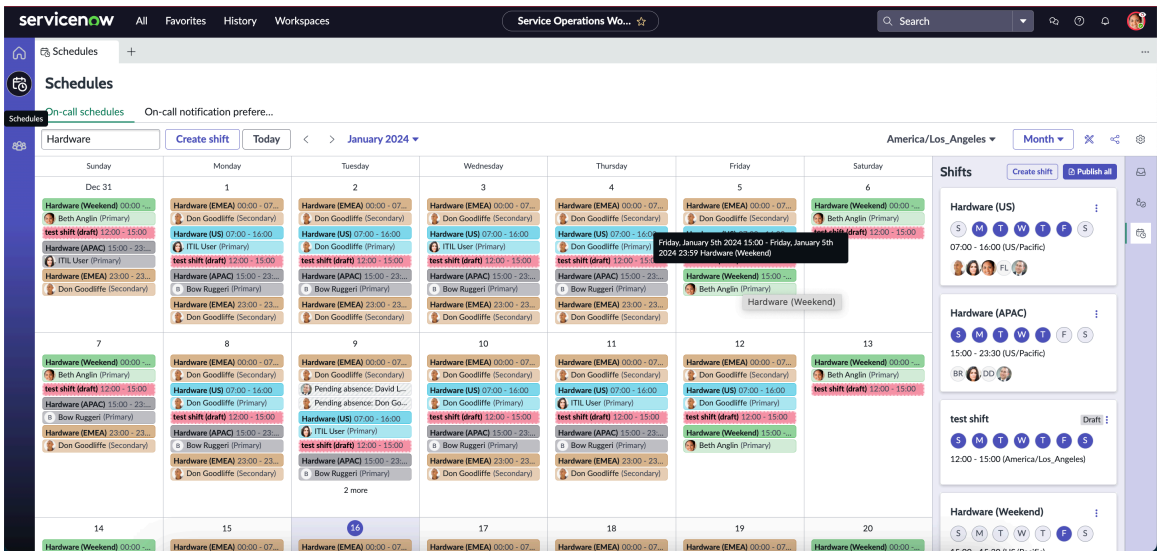
### Schedules menu




## On-call Schedules tab

This tab displays all the user's schedules and shifts in a calendar or time-line view. You can customize the view as a day, week, or month view, and filter the calendar based on your groups or time zones.

You can manage your work, shifts, and time-off requests on this tab.

## On-call notification preferences

On this tab, you can define your preferred notification methods to receive alerts when a ticket is escalated to you.

You can define the escalation notification rules and the delivery channels that are used to receive these notifications.

## Teams in Service Operations Workspace

Use the teams menu icon ( ) in Service Operations Workspace to view all teams. Select a team card to view and manage a team's schedule, define escalation policies, and team preferences for the selected shift. This feature verifies that your team knows who is on call, is accountable, and is confident that critical alerts or incidents are acknowledged.

Use the **Schedule** tab to create and manage shifts for your team. This feature verifies that the right person is available to respond to incidents and critical alerts. You can also add or edit team members, a description, and the contact information of your team.

Use the **Escalation triggers and policies** tab to set an escalation policy and the trigger rules to be followed if there's an incident. You assign these policies and trigger rules, along with notification preferences, to a team.

Use the **On-call Team preferences** tab to edit shift preferences for a group. You can add a shift manager and the start day of the week, set preferences for absence requests and shift overlap, and escalation rules for shift overlap.

## Contextual side panel

Use On-Call Scheduling from the Contextual side panel when you open an incident. You can also configure experts on call and escalation tracking for any other record, if necessary.

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Select the experts on-call icon (  ) from the Contextual side panel to view and contact the recommended subject matter experts for help.

To view the escalation details and dynamic tracking of an on-call escalation, select the on-call escalations icon (  ) from the Contextual side panel.

### Scheduling in Service Operations Workspace

View and manage schedules, shifts, and time-off requests.

The Schedules menu helps agents view and manage day-to-day work, request time off, and propose coverage for an absence.

A shift manager can create and manage schedules, shifts, team members, escalation trigger rules, and policies for their group. Shift managers can also approve or reject time-off requests, and resolve conflicts and gaps for their group. An on-call admin can perform these tasks for any group.

#### Schedules page field description

| Field | Description |
|---|---|
| Teams search field | Select and view all the shifts of a particular group. You can also enter the name of a team to execute the search operation. |
| Create shift | Create a shift. You can customize the name, start date, end date, occurrences, and repetition, or use a predefined template. |
| Today | View all the activities for the current day. |
| Month | Select and jump to a particular month. |
| Timezone | Select a time zone for the shift. |
| View | Drop-down list for selecting either the time-line view or calendar view. You must also decide whether you prefer the day, week, or month view. |
| General settings | Filters to view:<br>• Gaps<br>• Conflicts<br>• Shift members<br>• Pending absences<br>• Approved absences<br>• Draft shifts |
| Share calendar | Share the iCal URL or .ics file with other members to download and subscribe to a calendar. Agents and Shift managers can also select a preferred shift from the drop-down list, go to the subscription page and subscribe to the shift calendar. The drop-down |

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**Schedules page field description (continued)**

| Field | Description |
|---|---|
| | list displays all the shifts of the group, user is part of.<br><br>**Note:**<br>This option is available for Washington DC and later releases only. For previous releases, you have the option to send an email with a subscription link. |
| Shift card | Select a shift or right-click it to view the shift details and access the following:<br>• Edit shift icon ( ) to edit the shift details.<br>• More options icon ( ) to resolve gaps and conflicts. |
| Edit shift icon ( ) | Select a shift and select the edit shift icon ( ) to do the following:<br>• View and edit shift details like the start time, date, time zone.<br>• Add, delete, and edit the members in a shift. You can also add or delete responder levels and rotation details.<br>• Open and edit the escalation policies in the team record. |
| More options icon ( ) | Use the more options icon to do the following:<br>• Provide coverage<br>• Schedule extra time<br>• Schedule an absence |
| Required actions | Displays a list of upcoming tasks that are assigned to you.<br>• For an agent, the task might be an upcoming shift or absence that they've scheduled.<br>• For a manager, the task might be a list of gaps and conflicts or a time-off request for an upcoming shift. |

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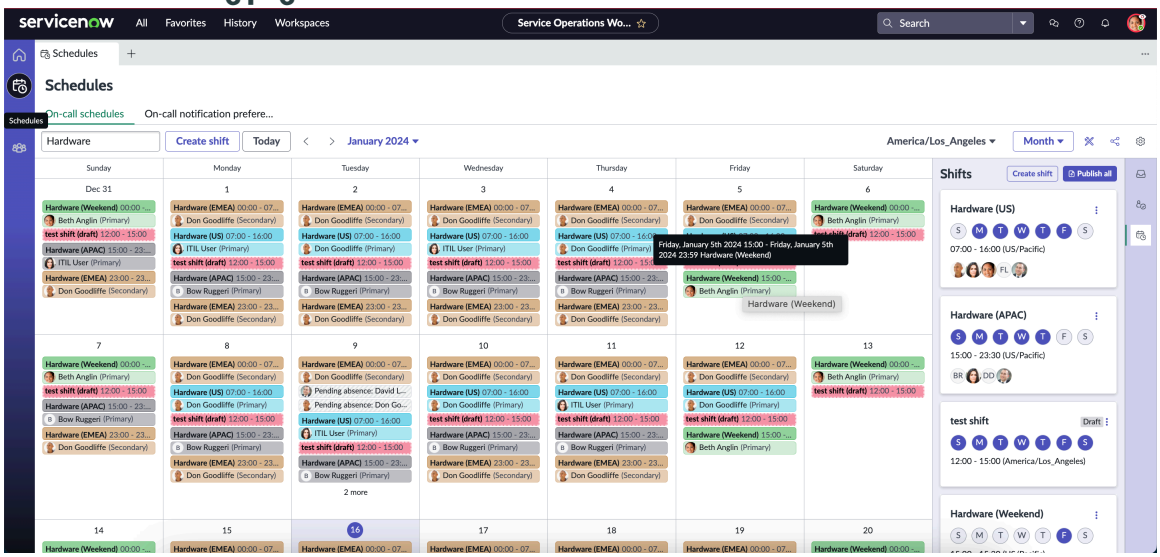
## Schedules landing page




### Manage your work and schedule an absence

Request an absence, provide coverage for a shift, and request overtime for a shift. Managing your work helps shift managers and on-call admins plan shifts and confirm that members are available to respond to incidents and escalations at all times.

## Before you begin

Role required: itil

## About this task

You can schedule your own time off and suggest suitable coverage from among the fellow roster members.

Get an overview of how to schedule an absence with this video. Schedule absence

## Procedure

1. Navigate to **Workspaces** > **Service Operations Workspace**.
2. View your calendar by selecting the Schedule menu.
   You can also do the following to view your calendar:
   - Navigate to **Workspaces** > **Service Operations Workspace**.
   - Select the Teams menu from the home page and select a team.
   - View all the schedules for the team by selecting the **Schedule** tab.
3. Select a shift card and select the more options icon ( ⋮ ) or right-click a shift card.

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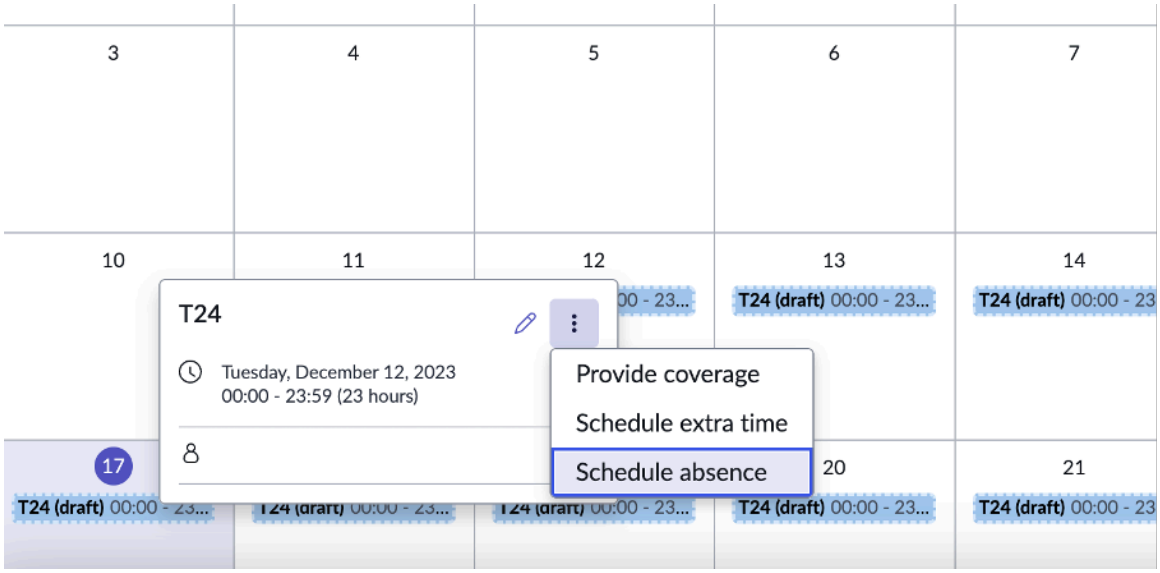
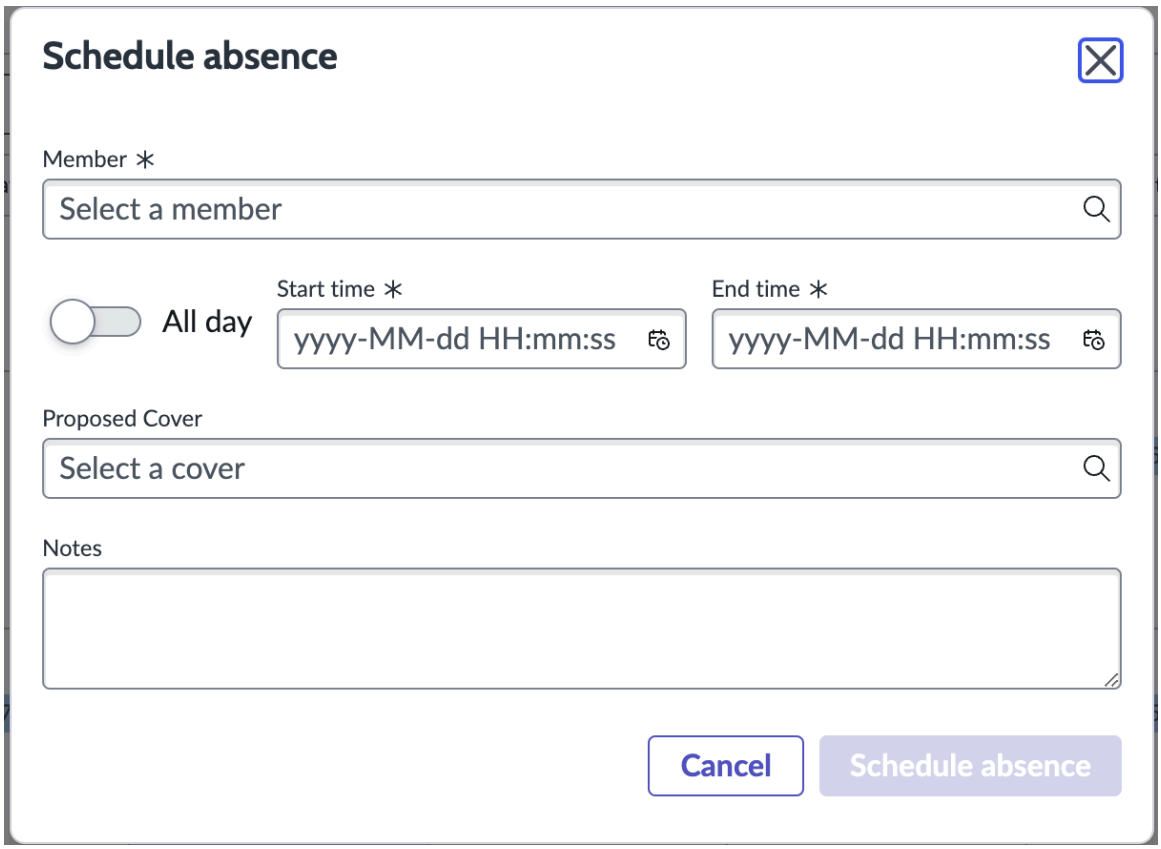



4. Request an absence for the shift by selecting **Schedule absence** and providing the following details:
   - Member
   - All day toggle button
   - Start time and End time
   - Proposed cover
   - Notes




5. Select **Schedule absence**.

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## Create and edit on-call shifts in Service Operations Workspace

Create and edit an on-call shift using the Schedules menu or the Teams menu in Service Operations Workspace.

### Before you begin

Role required: rota_manager, rota_admin

### About this task

There are two ways to create and edit a shift:

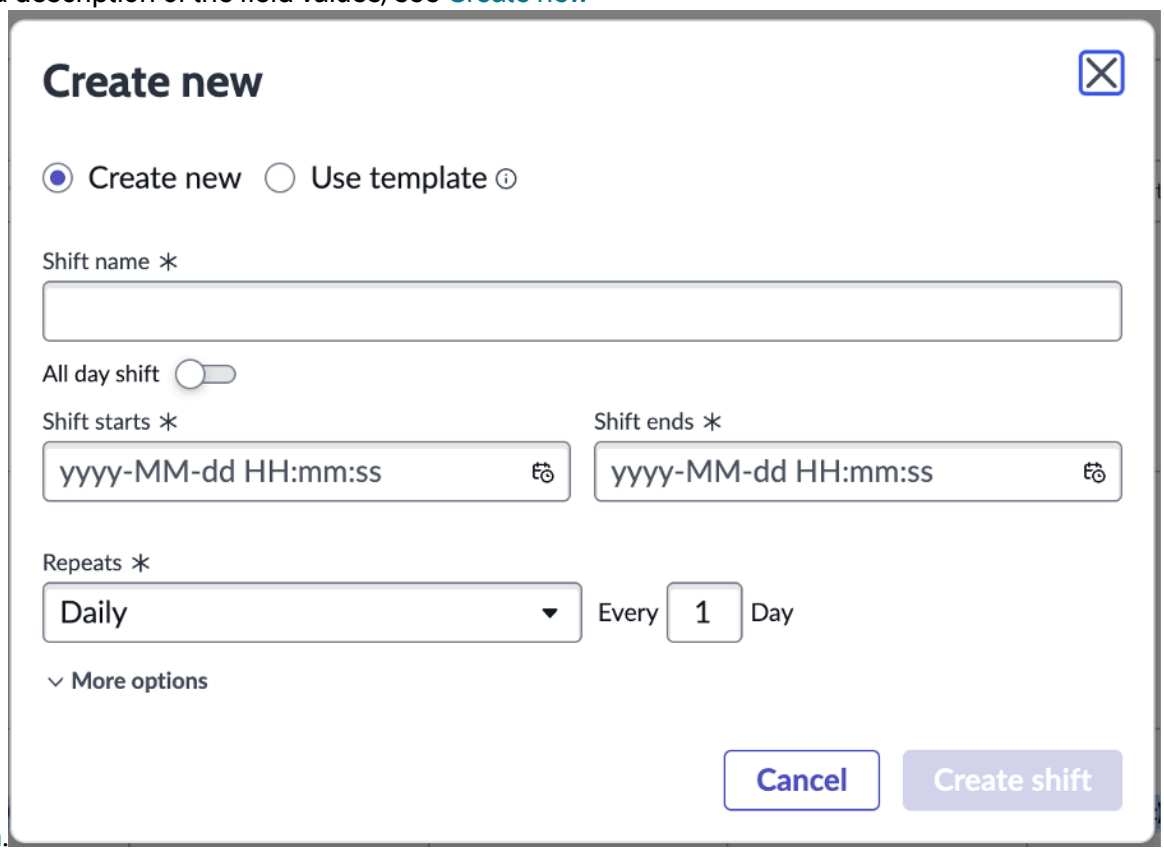
- Navigate to **Workspaces** > **Service Operation Workspace** and select the teams menu icon ( ). Select a team to view details and select the **Schedules** tab.
- Navigate to **Workspaces** > **Service Operation Workspace** and select the Schedules menu icon ( ).

Get an overview of how to create and edit a shift in this video. Create and edit a shift

### Procedure

1. On the Schedules page, select **Create shift**.
2. Select **Create New**.
3. On the Create new form, fill in the required field values.

   For a description of the field values, see Create new form.




   On the Create new form, if you select the **Use template** option, provide the following details.

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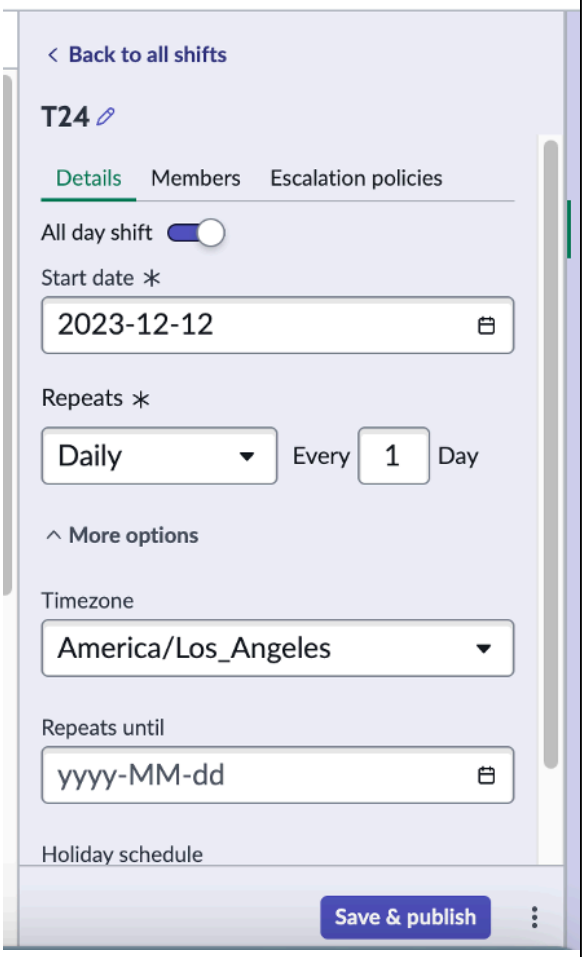
**Create New shift using a template form**

| Field | Description |
|---|---|
| Shift name | Name for the shift. |
| Template/Schedule | Existing templates for shifts.<br>Available options:<br>○ 24 x 7<br>○ Off hours (workday 8:00 - 5:00)<br>○ Off hours (workday 9:00 - 5:00)<br>○ Workday 8:00 - 5:00<br>○ Workday 9:00 - 5:00 |

4. If desired, edit a shift by right-clicking the shift card and selecting the edit shift icon ( ) The shift details appear in the side panel.
5. Edit the following shift details from the side panel:

**Edit shift form**

| Field | Description |
|---|---|
| Details tab | Shift details:<br>  |

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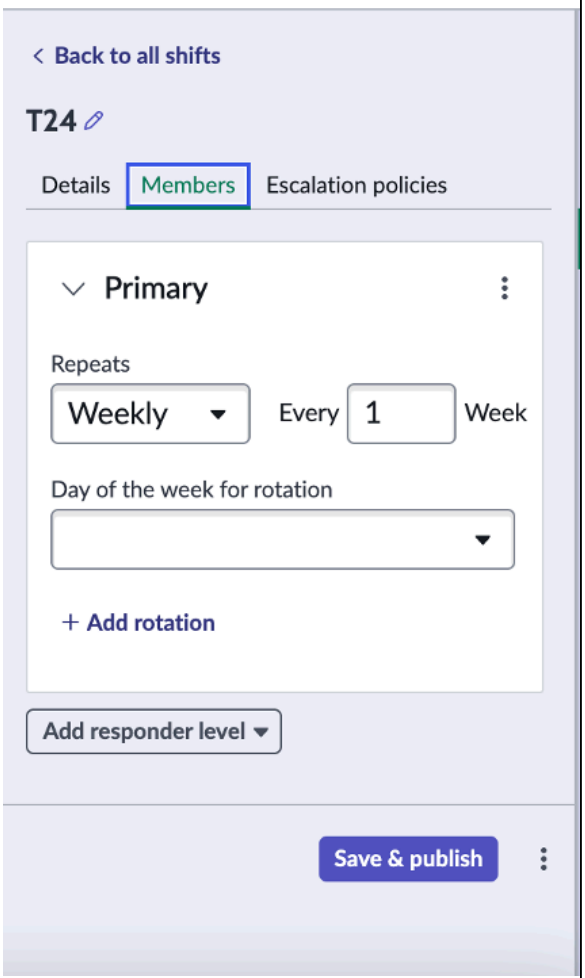
| Field | Description |
| --- | --- |
| | ○ All day shift<br>○ Shift starts<br>○ Shift ends<br>○ Repeats<br>○ Timezone<br>○ Holiday schedule<br>○ Repeats until |
| Members tab | Shift details:<br>  <br><br>○ Repeats every week<br>○ Day of the week for rotation<br>○ Add rotation<br>○ Add/delete/rename responder level |
| Escalation policies tab | Escalation policy. View the escalation policy and select **Open Team** |

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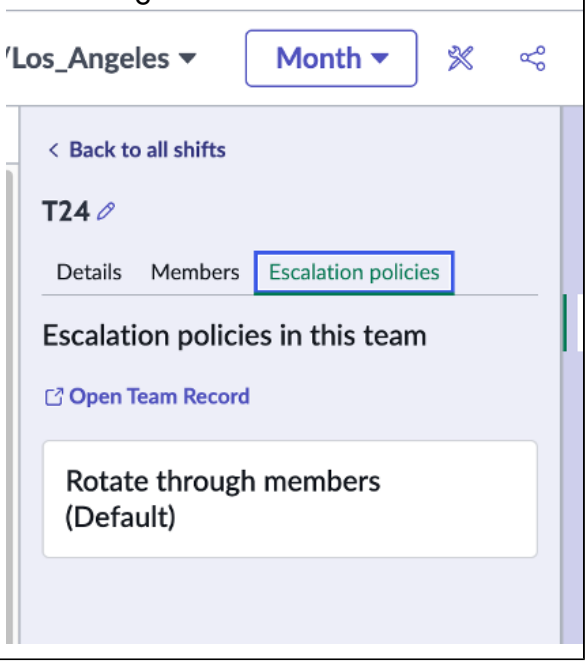
| Field | Description |
| --- | --- |
| | **Record** to go to the team record.<br>  |

6. Select **Save & publish** to save the changes after updating the shift details.
7. Select the more icon ( ⋮ ) to change the shift to draft mode, delete, or deactivate/activate the selected shift.
8. Select **Back to all shifts** to view all the shifts scheduled for a team.

   You can also select the more icon ( ⋮ to change the color of a shift card.

### Create new form

Use the Create new form to create an on-call shift in Service Operations Workspace. If you select the **Create new** option on the Schedules page, provide the following field details.

#### Create new form

| Field | Description |
| --- | --- |
| Shift name | Name for the shift. |
| All day shift | Toggle for all-day commitment. |
| Shift starts | Date and time the shift begins. |
| Shift ends | Date and time the shift ends. |
| Repeats | Shift repetition.<br>Available options:<br>• Never<br>• Daily<br>• Weekly |
| Every | Repetition of the shift. The display depends on the time frame selected in the **Repeats** field. |

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### Create new form (continued)

| Field | Description |
|---|---|
| **More options** | |
| Timezone | User timezone. |
| Holiday schedule | Schedule to use for the holiday. |
| Repeats until | Date and time to end repetition. |

### Manage on-call shifts in Service Operations Workspace

Accept or reject absence requests, resolve gaps, and conflicts by providing coverage and scheduling extra time for an on-call shift in Service Operations Workspace.

## Before you begin

Get an overview of how to manage shifts in this video.

https://player.vimeo.com/video/989602605?badge=0&autopause=0&player_id=0&app_id=58479

Role required: rota_manager, rota_admin

## Procedure

1. Navigate to **Workspaces** > **Service Operation Workspace**.
2. View all absence requests, gaps, and conflicts in a shift by selecting the schedules menu icon ( ).
   All absence requests are displayed in the Required actions section.
3. Select **Approve** or **Reject** and confirm the same when prompted.
4. If there are gaps or conflicts, select the shift card and select the more options icon ( ) or right-click a shift card.
5. Select **Provide coverage** to replace a shift member and enter the following details.
   - Member: Name of the member
   - Start: Coverage start date
   - End: Coverage end date

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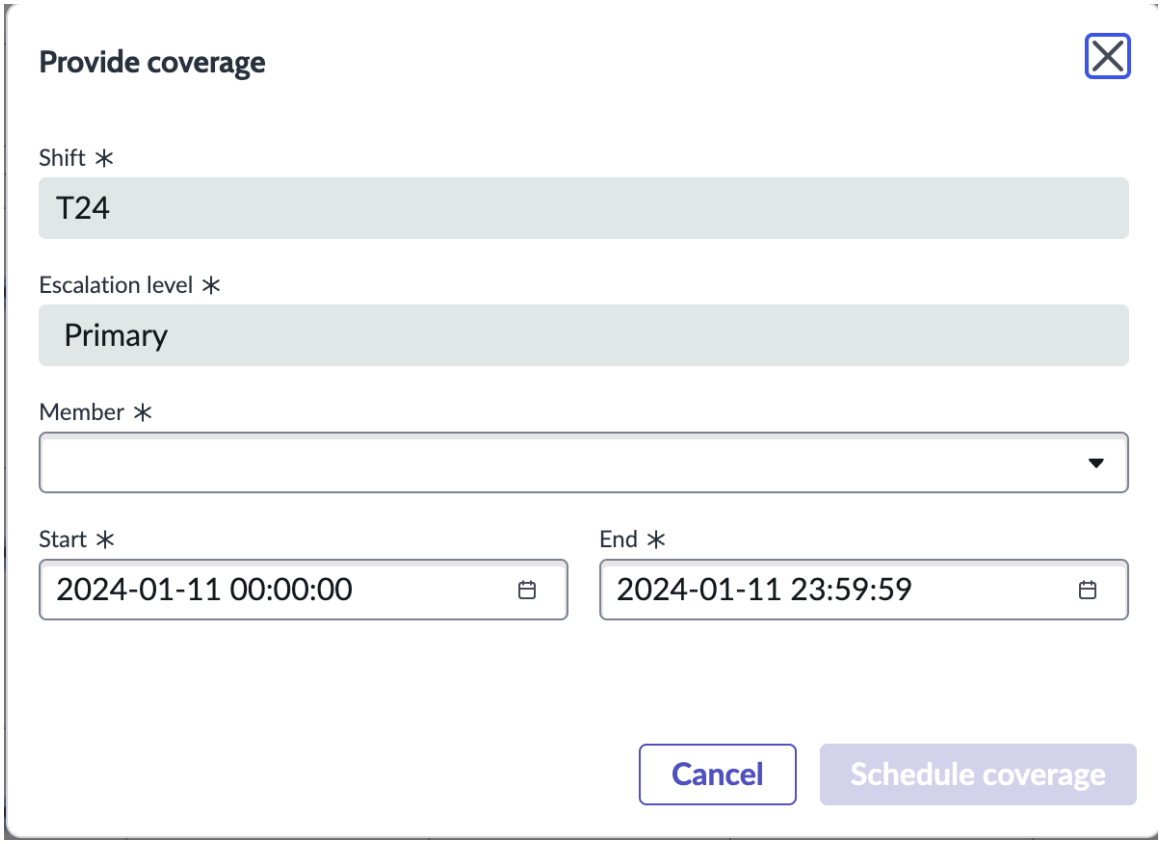
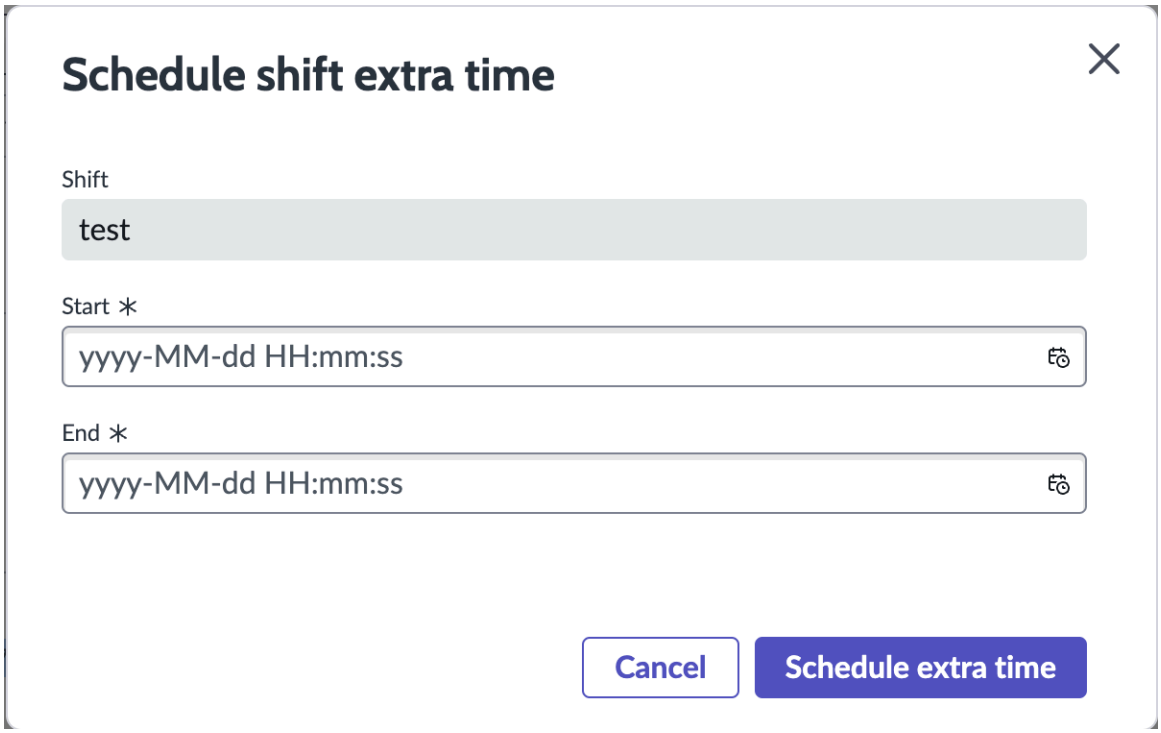



6. Schedule extra time by selecting the shift card and selecting the more options icon ( ⋮ ) or right-click a shift card.
7. Work for extended hours by selecting **Schedule extra time** and providing the following details:
   - Start
   - End




8. Remove the approved absence request from the calendar by right-clicking a shift card and selecting **Delete absence**.

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### Create notification preference rule

Define your preferred notification methods and delivery channels for receiving alerts whenever an escalation ticket is raised.

## About this task

Get an overview of how to add delivery channels and notification preferences in this video.

Create notification preference rule and delivery channels

## Before you begin

Role required: itil, rota_manager, rota_admin

## Procedure

1. Navigate to **Workspaces** > **Service Operation Workspace**.
2. Click the **Schedule** icon.
3. On **Schedules** page, click **On-call notification preferences** tab.
4. To define your preferred notification, click **Create new** and provide the following details:
    - Rule name
    - Select **Define active days and hours** to customise the rule with the following details:
        - All-day selection box
        - From and Until
        - Active days detail
        - Active days
        - Notification attempt

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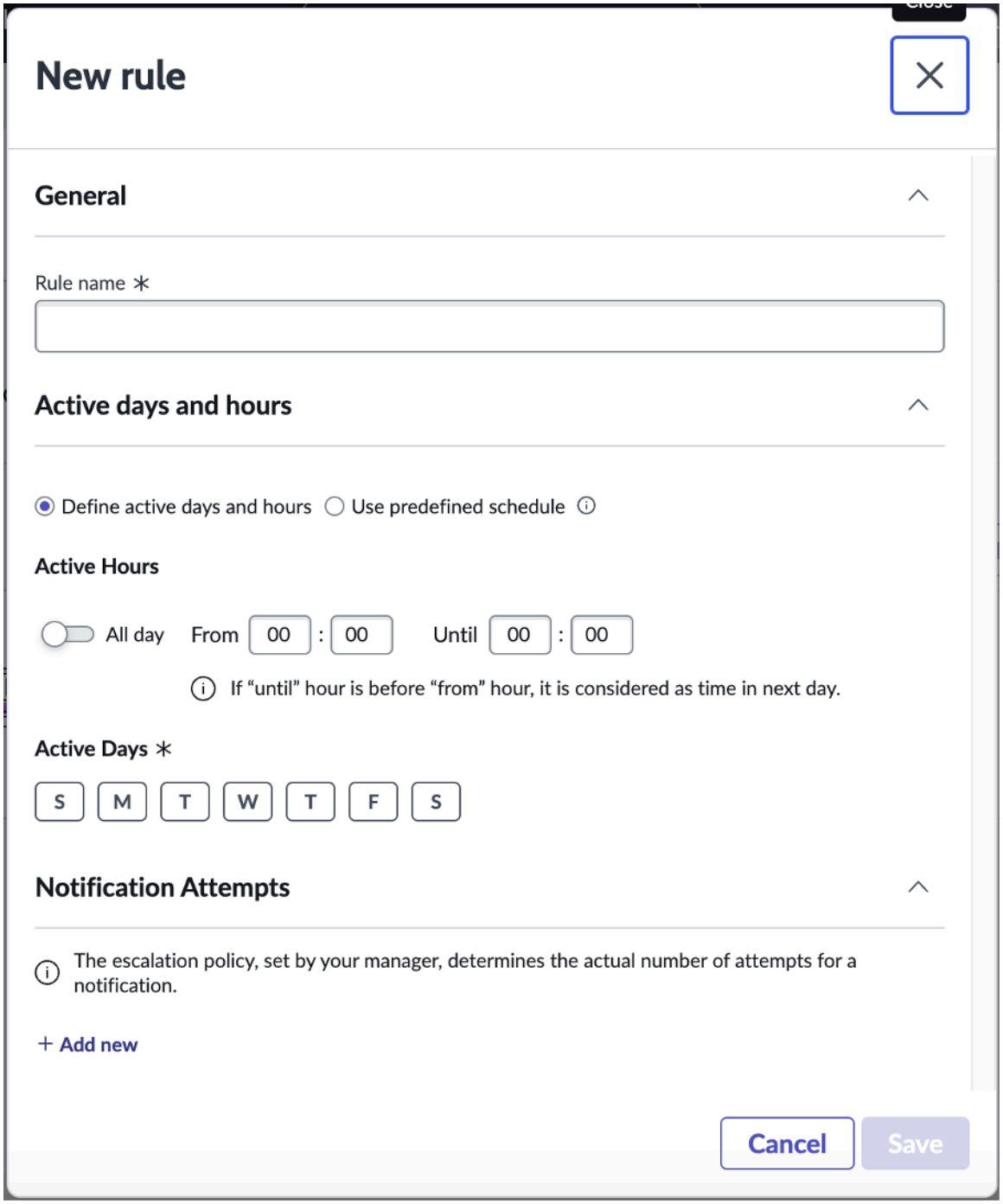


- Select **Use preferred schedule** to reuse an existing schedule and provide required details.
- In **Notification Attempts**, click **Add new** and select your preferred methods from the following:
  - Slack
  - MS Teams
  - Email IDs

5. Click **Save**.

### Edit On-call team preference using Teams menu

Use the **Teams** menu to edit the on-call preferences for a selected team.

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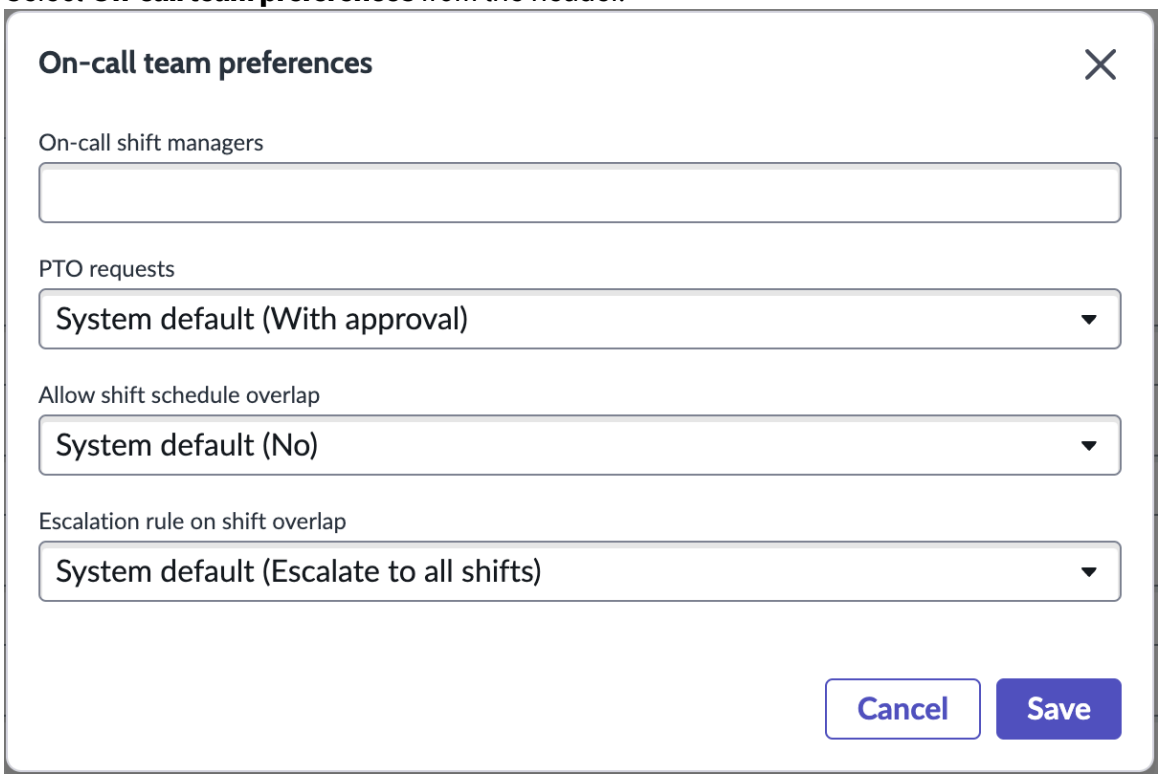
### Before you begin
Role required: rota_manager, rota_admin

### Procedure
1. Navigate to **Workspaces** > **Service Operation Workspace**.
2. Select **Teams** from the left navigation pane.
3. Select a team card to open.
4. Select **On-call team preferences** from the header.




5. Select an **On-call shift managers** from the list menu.
6. Select an option for **PTO requests** from the list menu.
7. Select an option for **Preferred start day of the week** from the list menu.

   **Note:**
   This option is available for Washington DC and later release only.

8. Select an option for **Allow shift schedule overlap** from the list menu.
9. Select an option for **Escalation rule on shift overlap** for the list menu.
10. Select **Save**.

## Edit delivery channel

Edit rules and delivery channels.

### Before you begin
Role required: rota_manager, rota_admin

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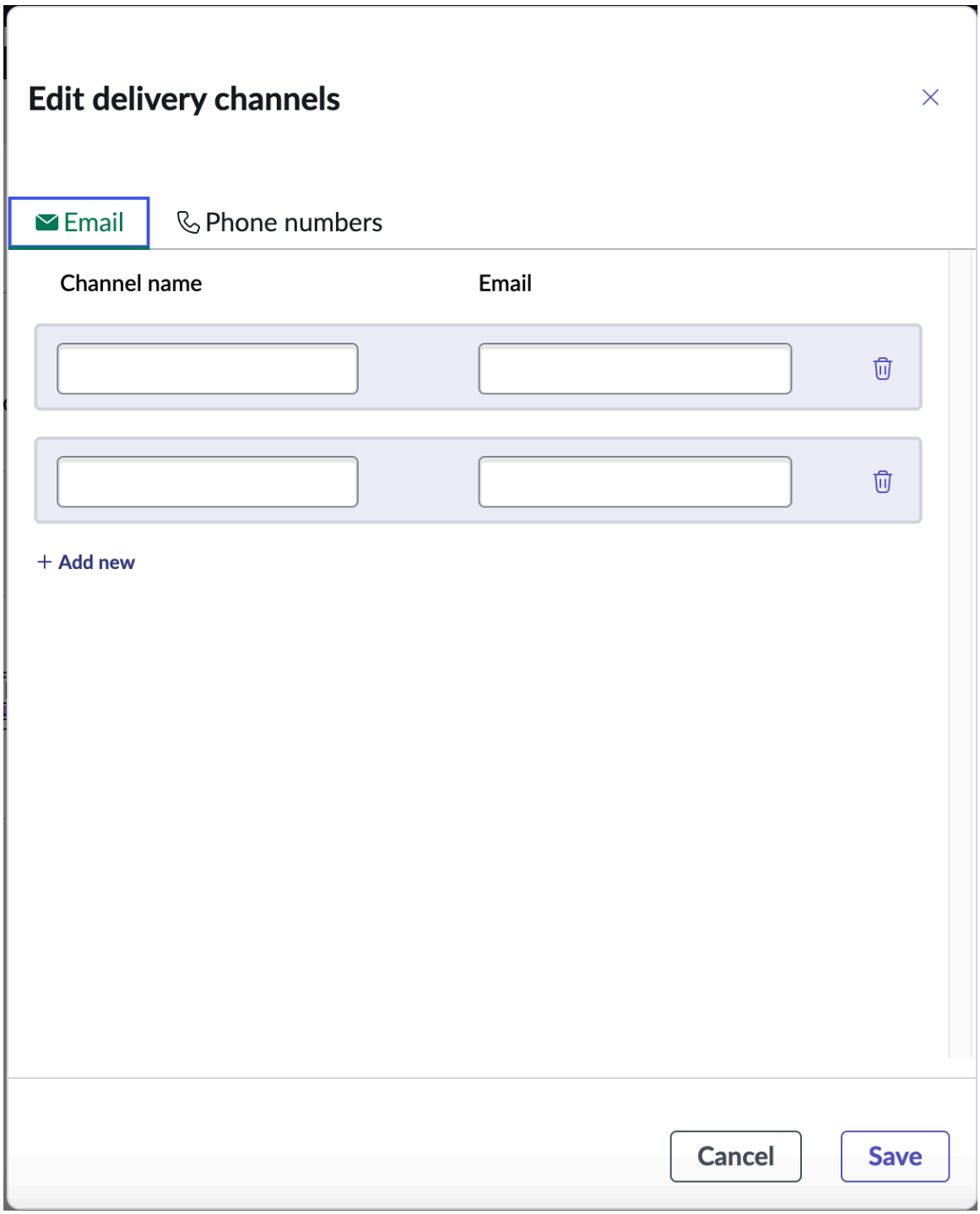
### Procedure

1. Navigate to **Workspaces** > **Service Operation Workspace**.
2. Click the **Schedule** icon.
3. On **Schedules** page, click **Notification preferences** and select **Edit** to add or edit Delivery channels.




4. Click **Add New** to add a new channel and provide name and email ID.
5. Select **Phone numbers** tab to add and edit phone numbers.
6. Click **Save** to apply your changes.

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## Escalation triggers and policies

Create and edit trigger rules.

### About this task

There are two ways to create and edit escalation triggers and policies. Navigate to **Workspaces** > **Service Operation Workspace** and:

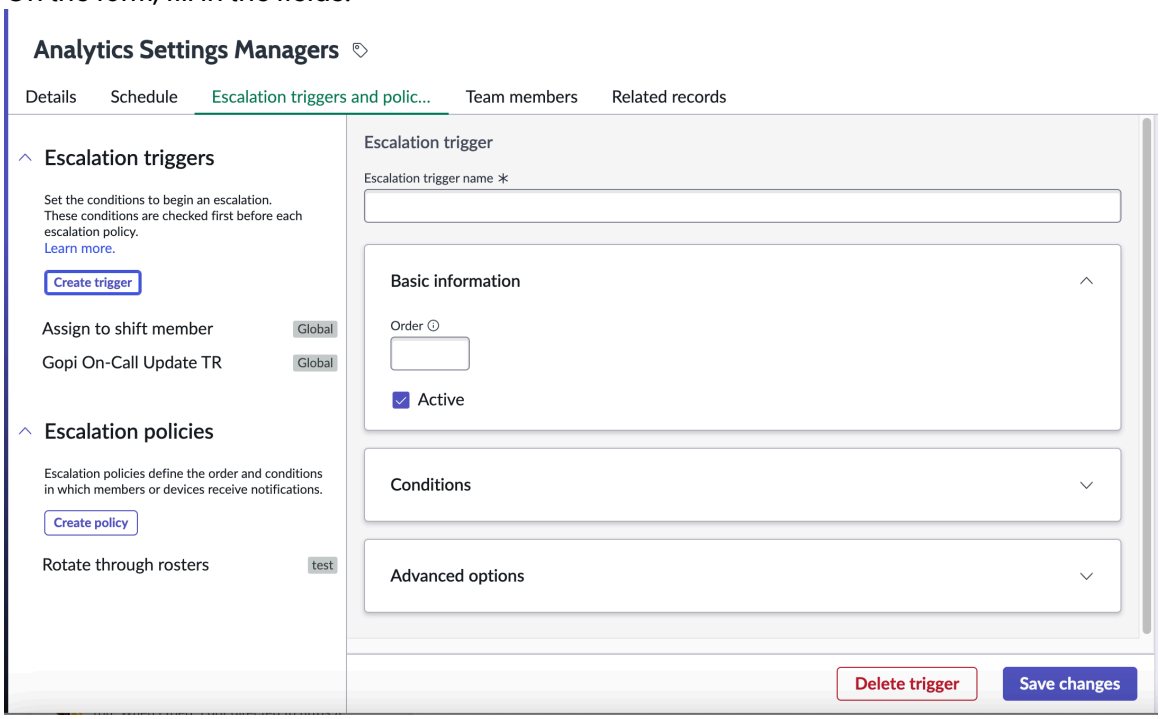
- Schedules menu:
  - Click the **Schedule** menu, select a shift card and click icon.
  - Select **Escalation policies** tab and click **Open Team Record**.
- Teams menu:
  - Click the **Teams** menu, select **All Shifts** from the drop-down and select a shift card.
  - Click **Escalation triggers and policies** tab.

### Before you begin

Role required: rota_manager, rota_admin

### Procedure

1. To create trigger rules, click **Escalation triggers** in the left panel, select **Create trigger**.
2. On the form, fill in the fields.




### Escalation trigger form

| Field | Description |
|---|---|
| Escalation trigger name | Enter the name of the trigger. |
| Active | Check the box to activate or deactivate the trigger. |
| Order | Select an order of execution. When there are multiple escalation triggers in a team, The |

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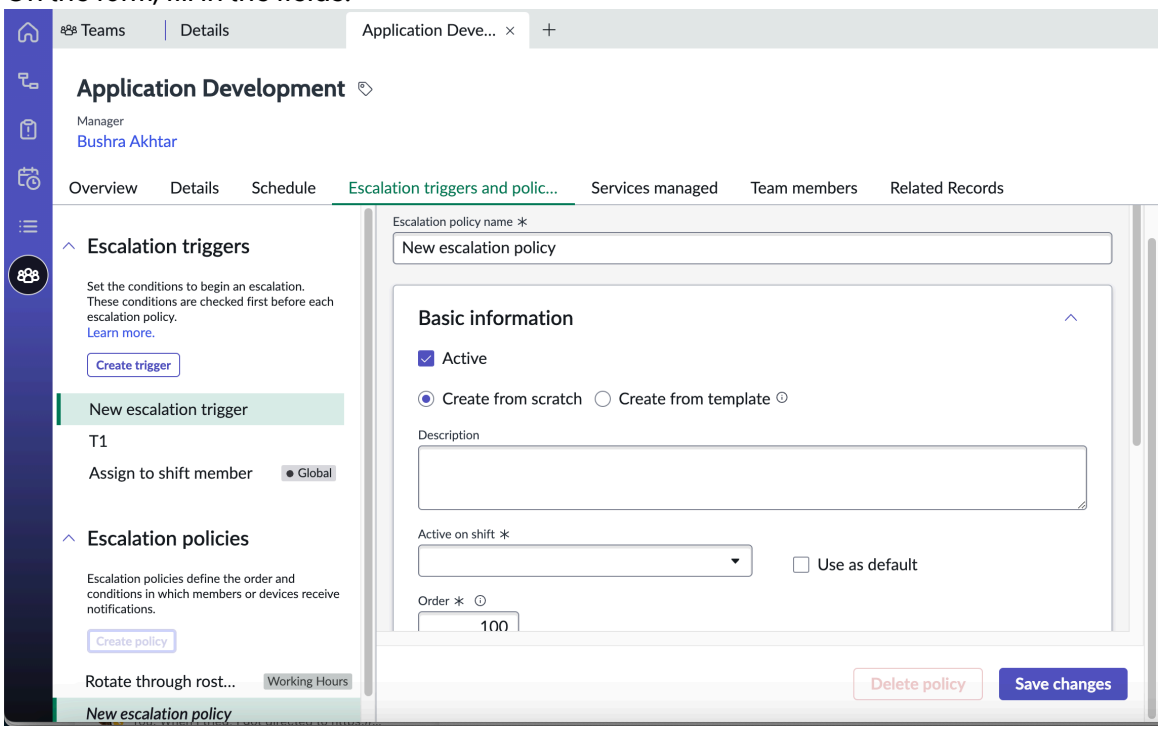
| Field | Description |
|---|---|
| | one with smaller order number is checked first. |
| Conditions | Set the conditions for the trigger by selecting a table and condition set. When conditions are met, Escalation triggers are triggered for shifts in SRM team. |

3. Select **Save changes**.
   You can delete the trigger at this point.
4. Under **Escalation policies** in the left panel, select **Create policy**.
5. To create your own escalation policy, click **Create from scratch**.
6. On the form, fill in the fields.




| Field | Description |
|---|---|
| Active | Check the box to activate or deactivate the policy. |
| Create from scratch or Create from template | Create your own policy or use a template created by your admin. |
| Description | Enter text describing the policy. |
| Active on shift | Select from the list menu. Set this as the default using the check box. |
| Order | Select an order of execution. When there are multiple escalation triggers in a team, The one with smaller order number is checked first. |
| Conditions | Set the conditions for the policy by selecting a table and condition set. These conditions |

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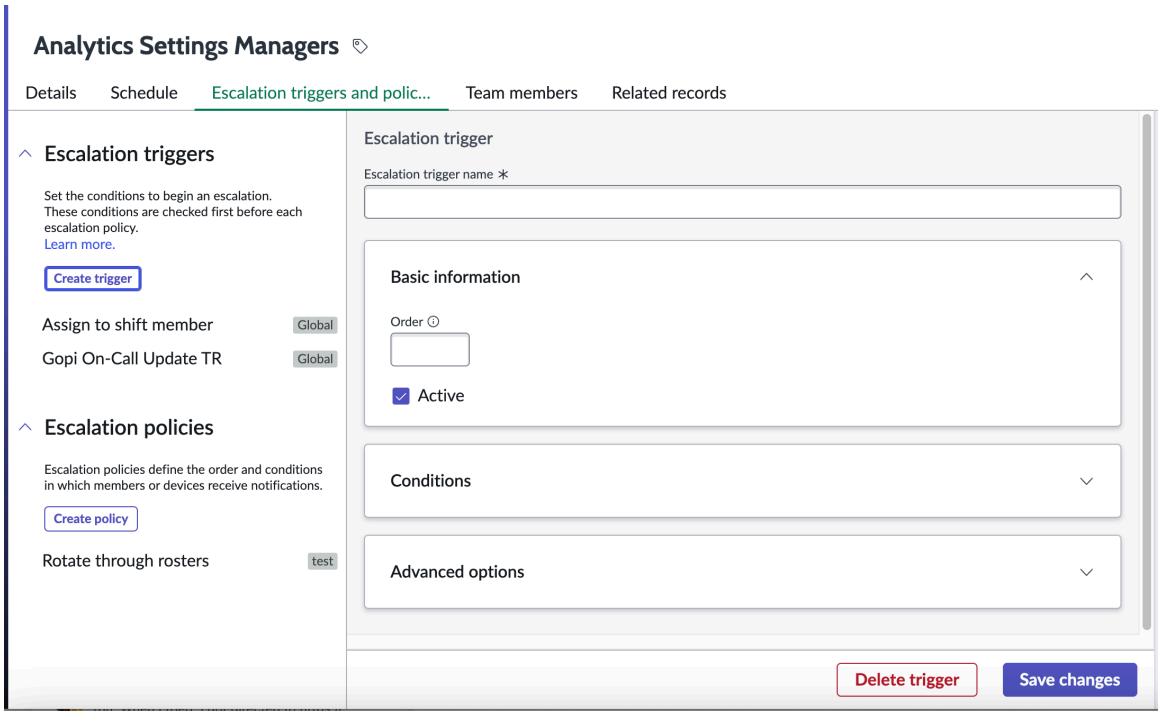
| Field | Description |
|---|---|
| | are checked after the escalation is started by an escalation trigger. If the conditions are met, the policy is run. |
| Escalation steps | Using the modal, add escalation steps. Select **Done** when you are finished. |
| Escalation notifications | Set the notification conditions for the policy. Toggle user preference override, manual set or use a template. |
| Add notification step | Select email, call, or SMS. You can add as many attempts as you like. Select **Done** when you are finished. |

7. To add more escalation levels to the policy, click **Add an escalation level**.
8. Click **Save changes**.
9. **Optional:** To add another escalation policy to the team for another category of alert or incident, click **Add a policy**.
10. To create trigger rules, click **Escalation triggers** in the left panel, select **Create trigger**.
11. On the form, fill in the fields.




### Escalation trigger form

| Field | Description |
|---|---|
| Escalation trigger name | Enter the name of the trigger. |
| Active | Check the box to activate or deactivate the trigger. |
| Order | Select an order of execution. When there are multiple escalation triggers in a team, The |

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| Field | Description |
|---|---|
| | one with smaller order number is checked first. |
| Conditions | Set the conditions for the trigger by selecting a table and condition set. When conditions are met, Escalation triggers are triggered for shifts in SRM team. |

12. Select **Save changes**.
    You can delete the trigger at this point.

### Create escalation trigger rules and policy from team record

Navigate to team record to create new policy and trigger rules

#### About this task

Get an overview of how to create escalation trigger rules and policy from a team record in this video. Create escalation trigger rules and policies

#### Before you begin

Role required: rota_manager, rota_admin

#### Procedure

1. Navigate to **Workspaces** > **Service Operation Workspace**.
2. Click the **Schedule** icon.
3. On the **Schedules** page, right-click the shift span and click icon.

### On-call support for an incident in Service Operations Workspace

You can identify available on-call members of a support group and contact them to resolve an issue.

## On-call support for an incident

Based on support groups associated with all services and CIs of the incident, the **Experts on-call** panel displays three on-call recommendations in the following order:

- Support group associated with the primary service, that is, the **Service** field
- Support group associated with the primary configuration item, that is, the **Configuration item** field
- Top support group of impacted services from the Impacted Services/CIs related list
- Top support group of affected CIs from the Affected CIs related list
- Assignment group of an agent, that is, the **Assignment group** field

For each of these fields, on-call information such as shift names and on-call members is displayed. For each on-call member, you can view the contact information.

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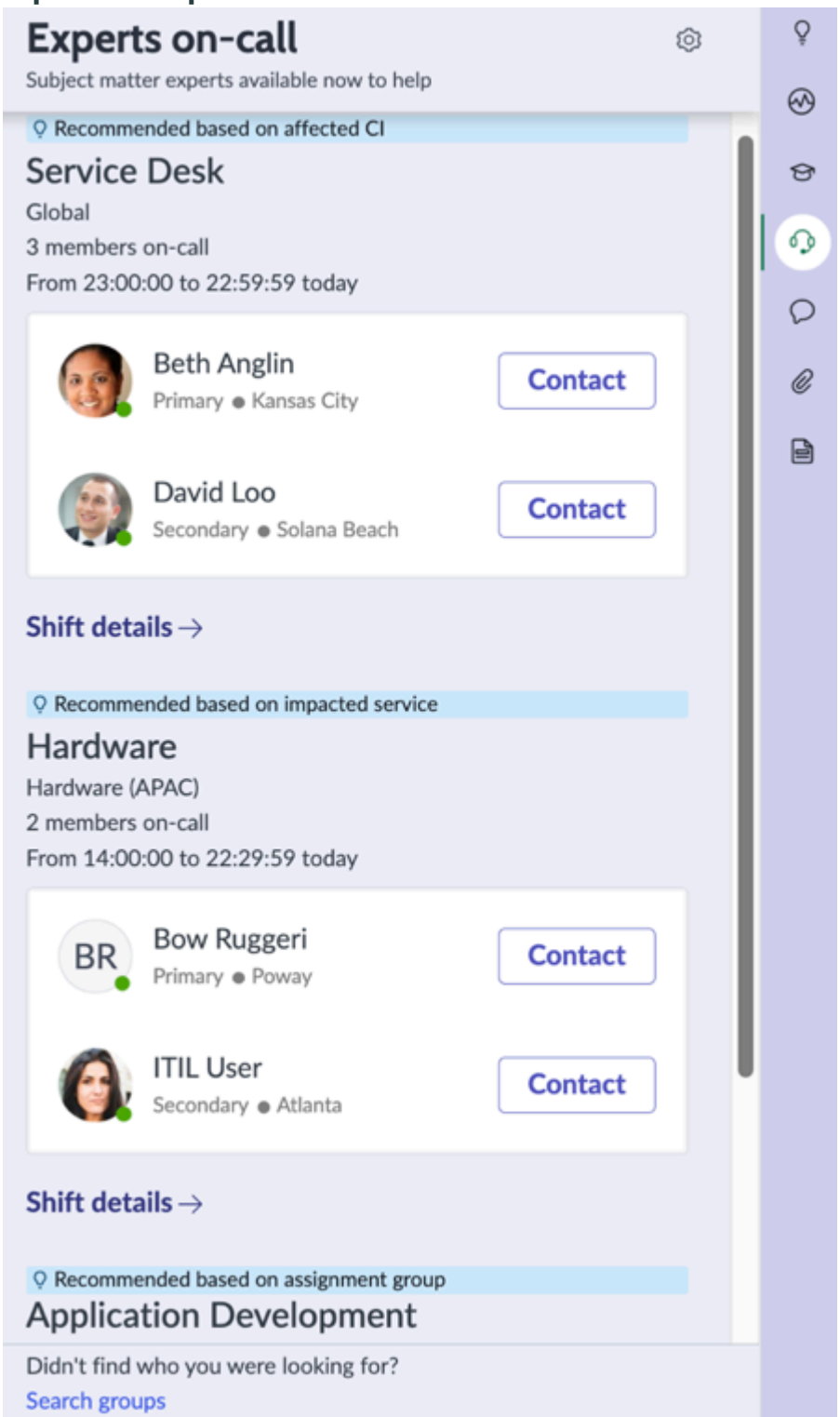
**Experts on-call panel**




For information about On-Call Scheduling, see On-Call Scheduling.

### Experts on-call in Service Operations Workspace

View the relevant shift details and contact on-call members for issue resolution and dynamically track the on-call escalation.

### Before you begin

Role required: itil or admin

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Ensure that the escalation logging, that is, the *com.snc.on_call_rotation.log_escalations* property is enabled to view the on-call escalation tracking page. For information about this property, see System properties for On-Call Scheduling.

### Procedure

1. Open an incident.
2. To view the relevant shift details, contact on-call members, and do other relevant tasks, perform the following steps.

   a. From the contextual side panel, click the experts on-call icon (  ).
   For information about how on-call recommendations can be configured, see Customize the on-call support group recommendations.
   Three on-call recommendations are displayed based on support groups associated with all services and CIs of the incident in the following order:
   - Support group associated with the primary service, that is, the **Service** field
   - Support group associated with the primary configuration item, that is, the **Configuration item** field
   - Top support group of impacted services from the Impacted Services/CIs related list
   - Top support group of affected CIs from the Affected CIs related list
   - Assignment group of the agent, that is, the **Assignment group** field

   b. To view detailed shift information such as all on-call members and start time and end time and, click **Shift details**.
   When no on-call member is available for a support group in that shift, you can view the next shift with on-call members.

   c. To start a Microsoft Teams chat conversation with an on-call member, click **Contact** next to the member details and click **Start Teams chat**.

   **Note:**
   You can view the user presence before contacting the on-call member.

   For information about Microsoft Teams chat, see Collaborate on a task record using Microsoft Teams in Service Operations Workspace.

   d. To configure display preferences in the **Experts on-call** panel, click the preferences icon (  ) and perform any of the following actions.
   - To hide shifts with no on-call members, use the **Hide shifts with no on-call** toggle switch.
   If no on-call members are available for all support groups, you can search for other groups and view its on-call members.
   - To use the default date and time format configured for the current user, use the **Use default date and time formats** toggle switch.

3. To view dynamic tracking of an on-call escalation, click the on-call escalations icon (  )

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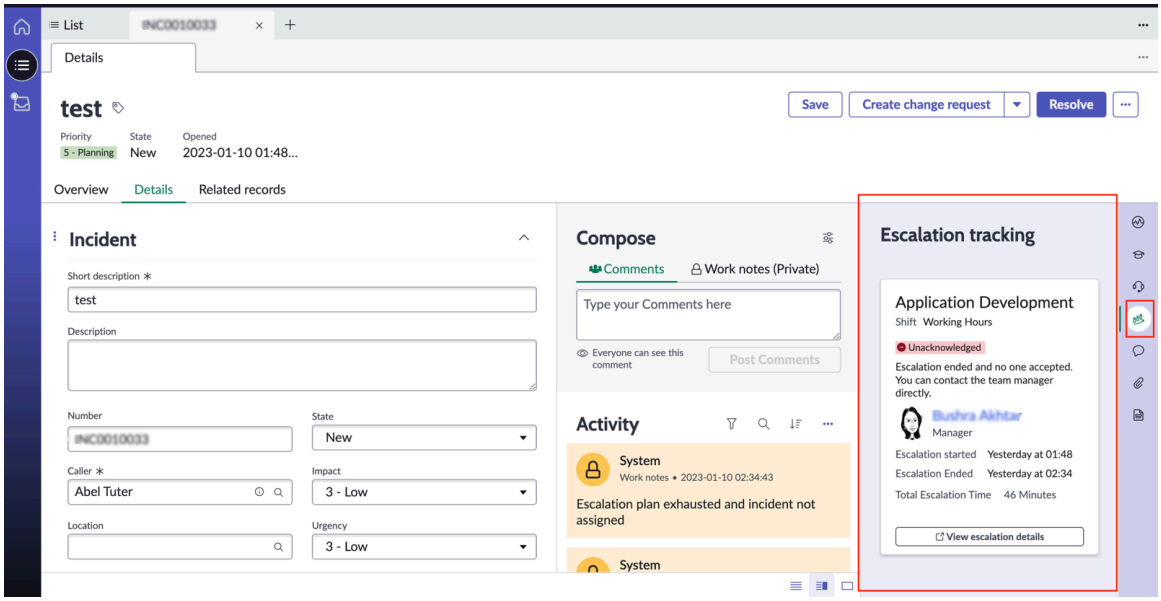
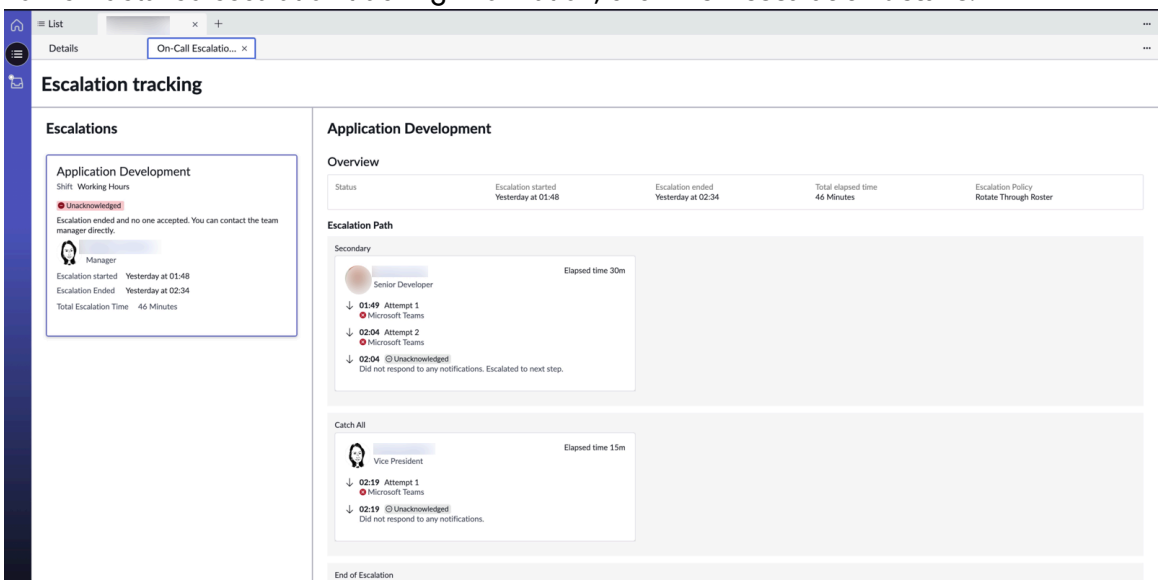



4. To view detailed escalation tracking information, click **View escalation details**.




## Problem Management in Service Operations Workspace

When you have recurring incidents or a major incident, you can create a problem to identify the root cause of the incidents and help prevent them from happening again.

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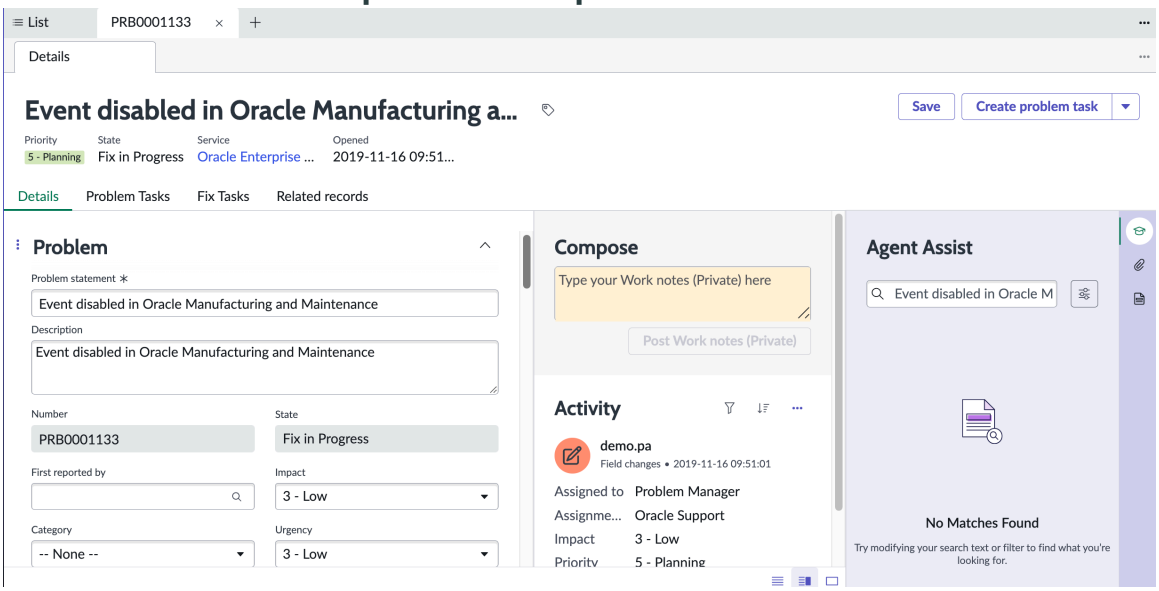
### Problem record in Service Operations Workspace




## Details tab

This section displays the detailed information of a problem. For information about fields in this section, see Create a problem in Service Operations Workspace.

From the **Compose** section, you can add work notes for the problem.

All fields that are available on the Problem form in ServiceNow AI Platform are available in Service Operations Workspace. However, on the problem form in Service Operations Workspace, the **State** field is read-only. For information about state transitions of a problem, see Life cycle of a problem.

For information on how you can configure fields in this tab, see Configure a task record form in Service Operations Workspace.

## Problem Tasks tab

This section displays problems tasks associated with this problem. Problem tasks are created when you need help from other teams to identify a fix for the problem. For information about creating a problem task, see Create a problem task in Service Operations Workspace.

## Fix Tasks tab

This section displays fix tasks associated with the problem. In Service Operations Workspace, only change requests are configured as fix tasks. For information about the **List of related task records (comma-separated) to track as fixes for this Problem** property where the fix tasks are configured, see Problem management properties.

**Note:**
This section only displays the change requests created from the Fix Tasks tab.

## Related records tab

This section displays the following records related to the problem. You can add a record, create a record, or remove it from the problem.

- Incidents
- Affected CIs

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- Outages
- Knowledge attached from Agent Assist

## Contextual side panel

From this section, you can access Agent assist and search for relevant records and perform the required actions.

For information about Problem Management, see Problem Management.

### Create a problem in Service Operations Workspace

Investigate the root cause of recurring incidents or a major incident. Provide a permanent fix to help prevent them from happening again.

#### Before you begin

Role required: itil or problem_coordinator

#### Procedure

1. Create a problem from any of the following sources.

2. On the problem form, fill the fields in the **Details** tab.
   For a description of the field values, see Problem form.
3. Select **Save**.

### Work on a problem in Service Operations Workspace

Manage problems and problem tasks through their life cycle, share workarounds or fixes with related incidents, and create known error articles to help deflect incidents.

#### Before you begin

If you aren't using the base problem life cycle, you will continue to use the classic experience to manage problems or problem tasks through their life cycle. From the problem record page, select **Continue problem** to be redirected to the ServiceNow AI Platform user interface where you can make state transitions. For information about state transitions of a problem, see Life cycle of a problem.

The base problem life cycle is included with the Problem Management#Best Practice - Madrid - State Model (com.snc.best_practice.problem.madrid.state_model) plugin. Use the Problem Management Migration Utility store application to enable this plugin and migrate your records to the base problem life cycle.

Role required: itil, problem_coordinator or higher (for managing the life cycle of the problem), problem_admin (for deleting the problem)

#### Procedure

1. Open a problem.
   For information about creating a problem in Service Operations Workspace, see Create a problem in Service Operations Workspace.
2. Perform any of the following actions on the problem record page.

### Create a problem task in Service Operations Workspace

When you need to engage another team or agent for help, create and assign a problem task.

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### Before you begin
Role required: itil or problem_coordinator

### Procedure

1. Open a problem.
2. From the problem record page, create a problem task in the one of the following ways.
   - Select **Create problem task**.
   - From the **Problem Tasks** tab, select **New**.
3. In the Create problem task dialog box, select the problem task type.
   - **Root cause analysis**: Tasks to investigate the root cause of a problem and to find a resolution for the problem.
   - **General**: Tasks other than root cause analysis tasks.

   For information about creating additional task types, see Create a task type for problem or change in Service Operations Workspace.
4. Select **Create**.
5. On the problem task form, fill in the fields.
   For a description of the field values, see Problem task form.
6. Select **Save**.

#### Work on a problem task in Service Operations Workspace

Manage problems and problem tasks through their life cycle, share workarounds or fixes with related incidents, and create known error articles to help deflect incidents.

### Before you begin
If you aren't using the base problem life cycle, you will continue to use the classic experience to manage problems or problem tasks through their life cycle. From the problem task record page, select **Continue problem task** to be redirected to the ServiceNow AI Platform user interface where you can make state transitions. For information about state transitions of a problem, see Life cycle of a problem.

The base problem life cycle is included with the Problem Management#Best Practice - Madrid - State Model (com.snc.best_practice.problem.madrid.state_model) plugin. Use the Problem Management Migration Utility store application to enable this plugin and migrate your records to the base problem life cycle.

Role required: itil or problem_task_analyst (for changing the state of the problem task or deleting it)

### Procedure

1. Open a problem.
   For information about creating a problem in Service Operations Workspace, see Create a problem in Service Operations Workspace.
2. From the **Problem Tasks** tab, open the required problem task.
3. Perform any of the following actions on the problem task record page.

## Recommendation Framework in Service Operations Workspace

An agent can view dynamic and contextual recommendations and perform a relevant action.

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Recommendation Framework is now deprecated and no longer supported or available for new activation. Recommended Actions for ITSM feature provides the latest experience for this functionality. To get the advanced version, you must install the Advanced Recommended actions for ITSM (com.snc.uib.sow_itsm_ra_advanced) plugin and you must procure ITSM Pro package subscription.

**Note:**
The best practice to get the advanced version is to install the Task Intelligence for ITSM (com.snc.itsm_ml_task) plugin and procure the ITSM Pro package subscription. For more information, see Exploring Recommended Actions for ITSM in Service Operations Workspace.

Recommendations are available in multiple areas for an incident in Service Operations Workspace.

## Recommendations from the sidebar for an incident

From the sidebar of an incident, you can access the **Recommendations** panel where you can configure and group recommendations in any of the following formats.

- Record card: Relevant record details of a table and corresponding actions are available.
- Message card: A message derived from the recommendation and corresponding actions is available. For example, **Propose major incident** card.

**Note:**
All cards of the same recommendation rule are grouped. For example, for the Similar open incidents rule for an incident in Service Operations Workspace, all relevant incidents are grouped as cards under **Similar open incidents**.

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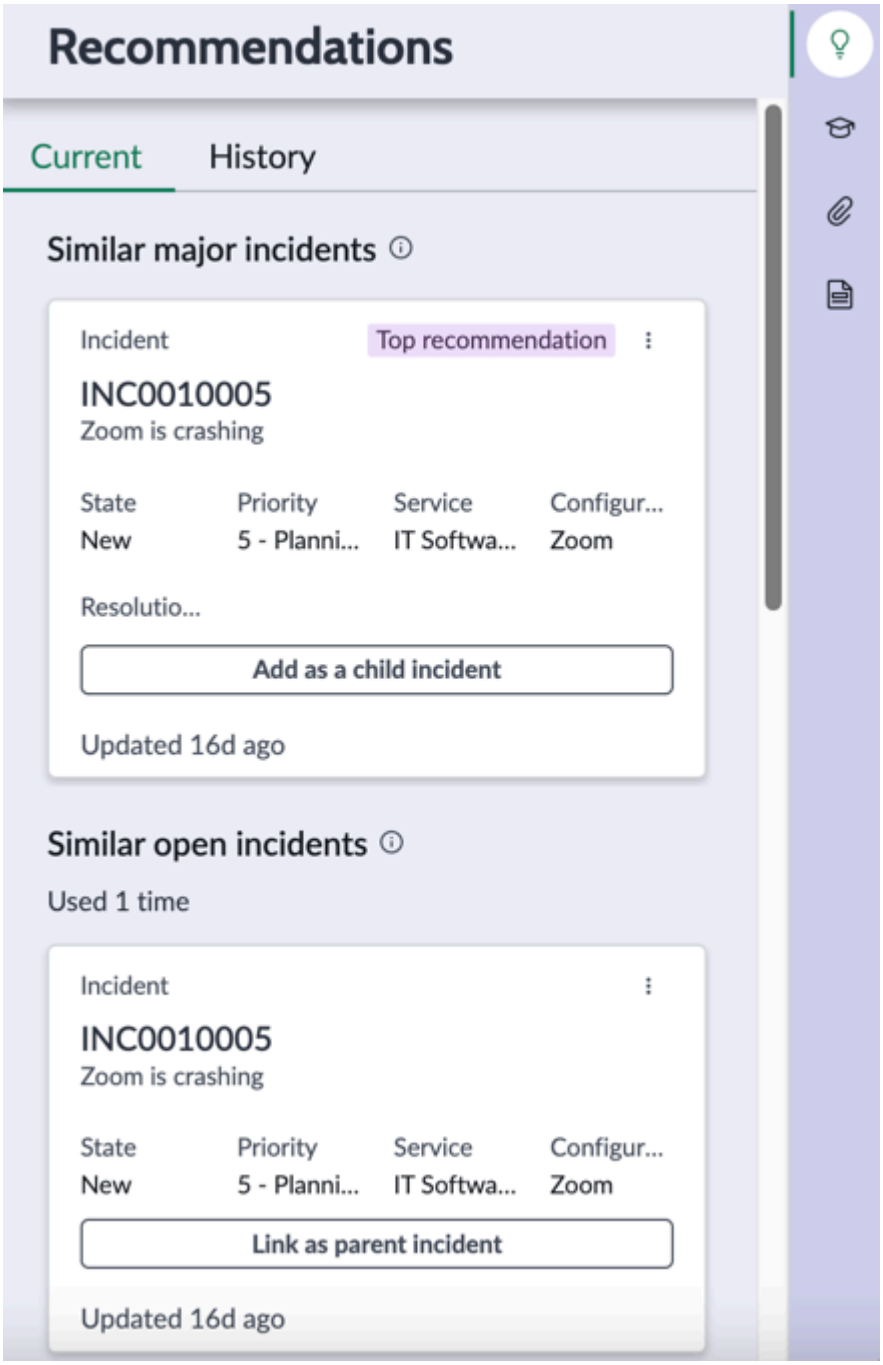
**Recommendations from the sidebar**




For information on available card groups for an incident and their dependencies on recommendation rules, see Recommendation rules for an incident in Service Operations Workspace.

When you click a card or its record number, detailed information about that card and its actions is displayed in a new tab.

Every card has a primary action and multiple other actions. For every action you perform on the card, the recommendations are recomputed. You can discard a recommendation if not relevant. Also, when you perform a primary action on a card, it moves from the **Current** tab to the **History** tab.

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**Note:**
Based on the priority, the first card of the top card group is displayed as the top recommendation at the top of the **Recommendations** panel.

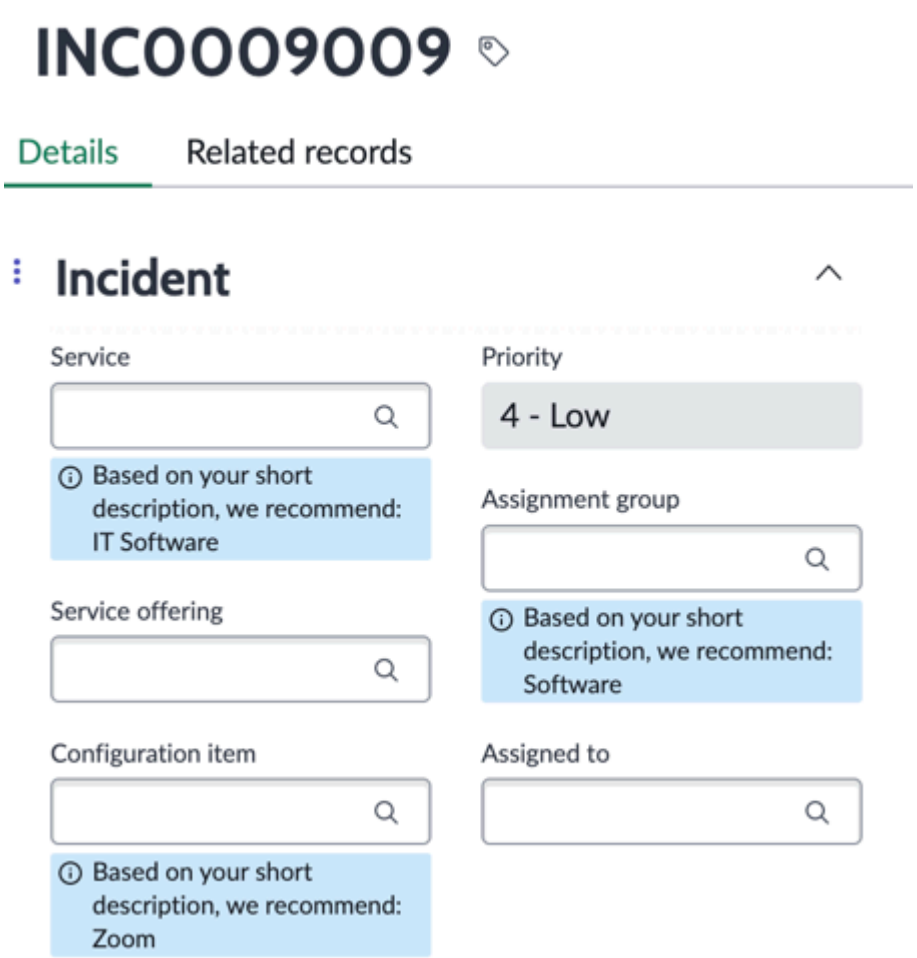
## Recommendations at the field level for an incident

A predicted value is displayed for these fields in the **Details** tab of an incident.

- Assignment group
- Configuration item
- Service

These values are predicted based on a recommendation rule for each field. For information about these rules, see Recommendation rules for an incident in Service Operations Workspace. When a threshold value is configured, the recommended value can be stamped or auto-populated as the field value. For information about this configuration, see Configure Recommendation Framework for an incident in Service Operations Workspace.

**Recommendations at field level**




## Recommended Actions for ITSM in Service Operations Workspace

Get guidance-based or field-level recommendations for incident forms in Service Operations Workspace.

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### Get Guidance based recommendations

Get actionable real-time recommendations in the side panel to help address customer issues and resolve incidents quickly.

## Before you begin

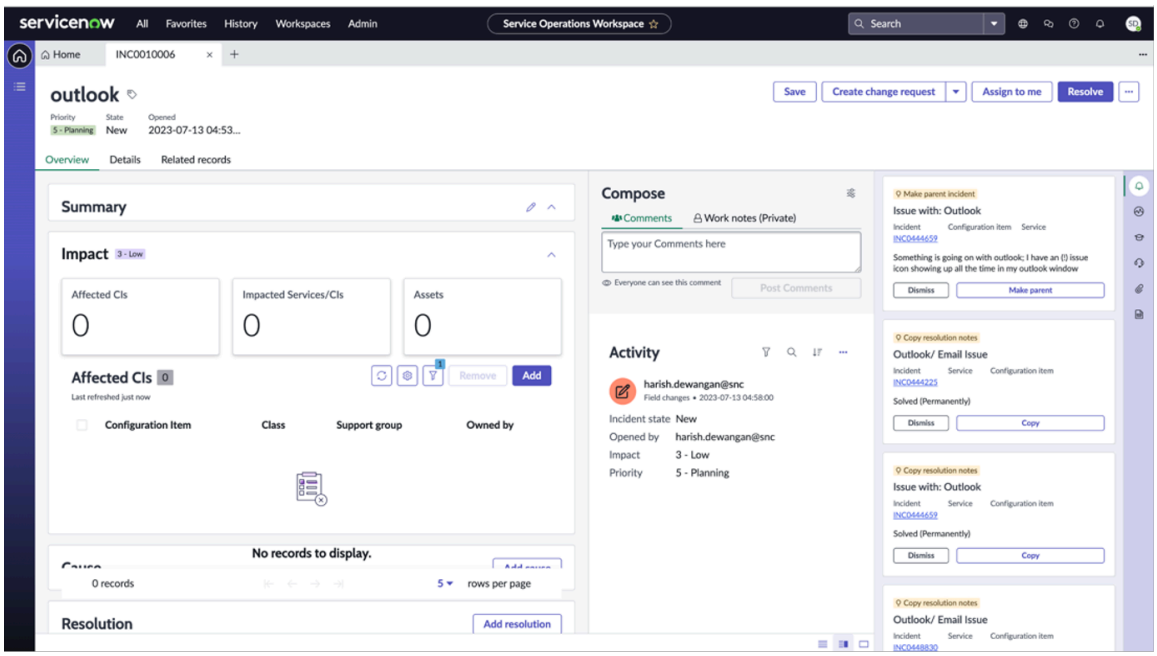
**Important:**
Users who have itil or sn_incident_write in the ITSM base system, can see and use the recommendations. These roles (itil and sn_incident_write) also include the following two roles:

- sn_nb_action.next_best_action_user: To view the recommendation.
- sn_gd_guidance.guidance_user: To use the recommendation

Role required: itil, admin, sn_incident_write

## Procedure

1. Navigate to **All** > **Workspace Experience** > **Workspaces** > **Service Operations Workspace.**.
2. Open an incident record that you want to work on.
3. Select the Recommended Actions icon( ) in the contextual side panel.
   Depending on the entered short description or description, recommendations appear.




4. Review the Recommended Actions cards and do one of the following:
   - To accept a recommendation, select the action button on the card.
   - To remove a recommendation from the contextual side panel, select **Dismiss** on the card.

### Get field recommendations

Get incident field recommendations in Service Operations Workspace while creating or updating incidents.

## Before you begin

Role required: admin

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### About this task

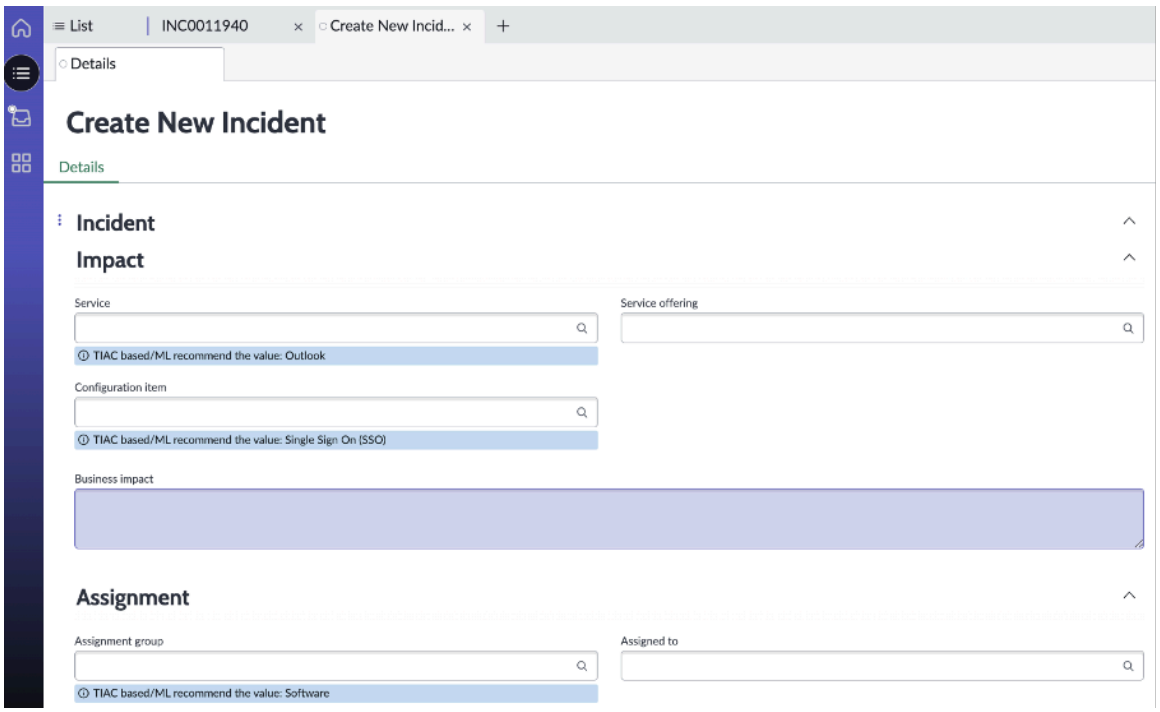
- Field recommendations are only available in the Advanced Recommended actions for ITSM application, which requires the ITSM Pro package subscription.
- The recommendations associated with field recommendations must be active.
- The field recommendations must be configured in the Recommended Actions. For more information, see Create a field recommendation in Recommended Actions.

### Procedure

1. Navigate to **All** > **Workspace Experience** > **Workspaces** > **Service Operations Workspace**.
2. Perform one of the following actions to start creating an incident.

3. In the **Description** field and the **Short description** field, enter a description and a short description for the incident.
4. Perform one of the following actions to get the field recommendations:
   - If you're on a version prior to 4.2, then press the tab key to get the field recommendations.

     The fields are auto-filled or recommended based on the output defined in the recommendation.

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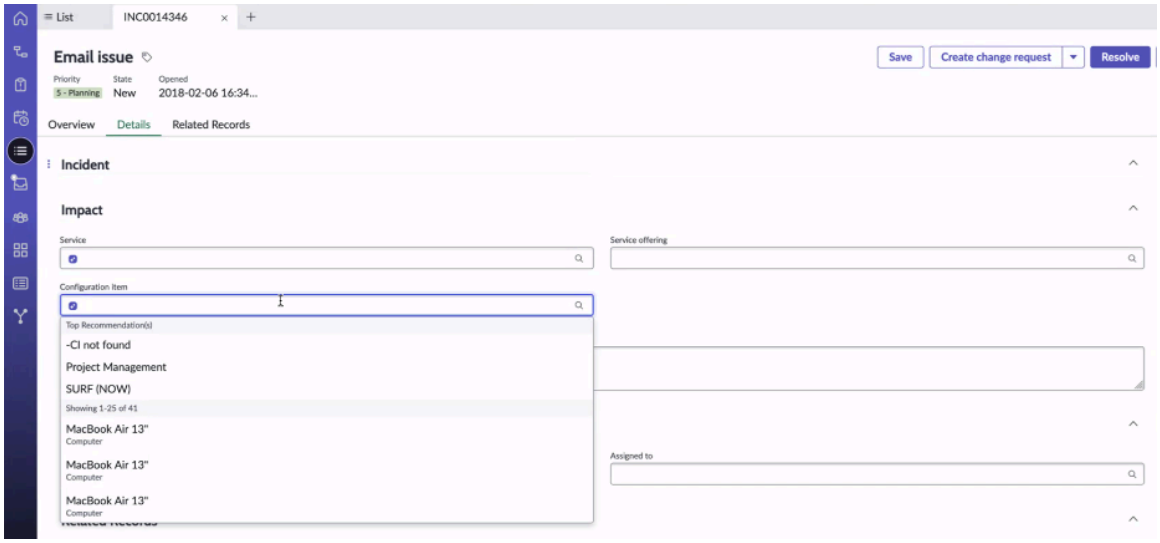
- If you're using a version after 4.2, select the required fields to see the field recommendations in the drop-down list.




## Request Management in Service Operations Workspace

Service Operations Workspace for Request Management integrates the platform functionality for tier 1 agents into a multi-tab interface that helps agents efficiently manage multiple incidents, catalog requests, and catalog tasks.

As an agent, you can create a catalog request in Service Operations Workspace to initiate a catalog request flow from a different IT Service Management flow. For example, from an incident flow, you can create a request, and associate the request with the incident to help track requests associated with an incident and vice versa. You can also work on catalog tasks and update the state of the tasks, and manage approvals of requests and requested items.

The Service Operations Workspace ITSM Applications application (sn-sow-itsm-cont) that automatically installs the Request Management for Service Operations Workspace (sn_sow_req) application should be installed for the Request Management flows in Service Operations Workspace. For more information, see Install Service Operations Workspace ITSM Applications.

## Request Management categories in Service Operations Workspace

The following Request Management categories are available in Service Operations Workspace:

- **Request**: Enables you to view active requests and requested items.
- **Catalog Task**: Enables you to view the active tasks assigned to the current user and active tasks assigned to the current user's assignment groups.

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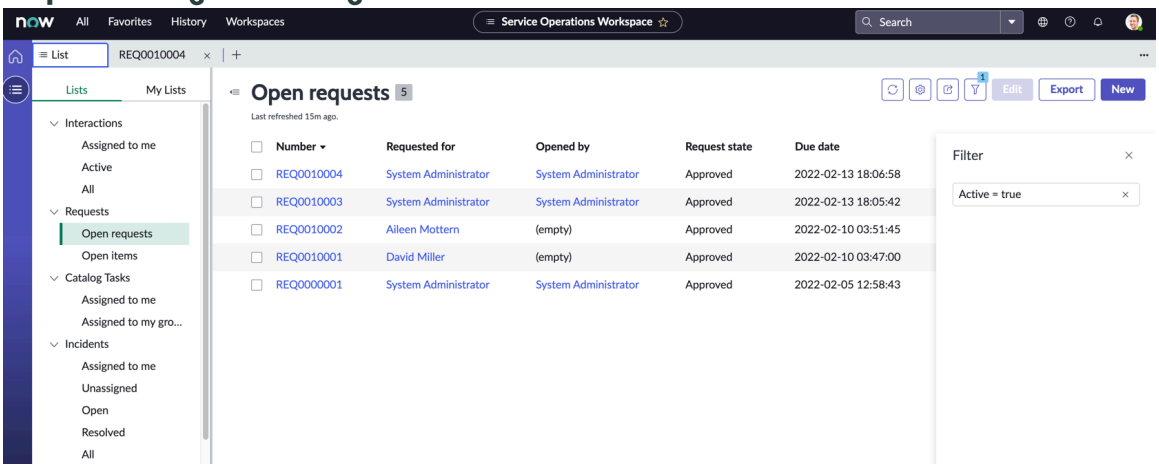
### Request Management categories



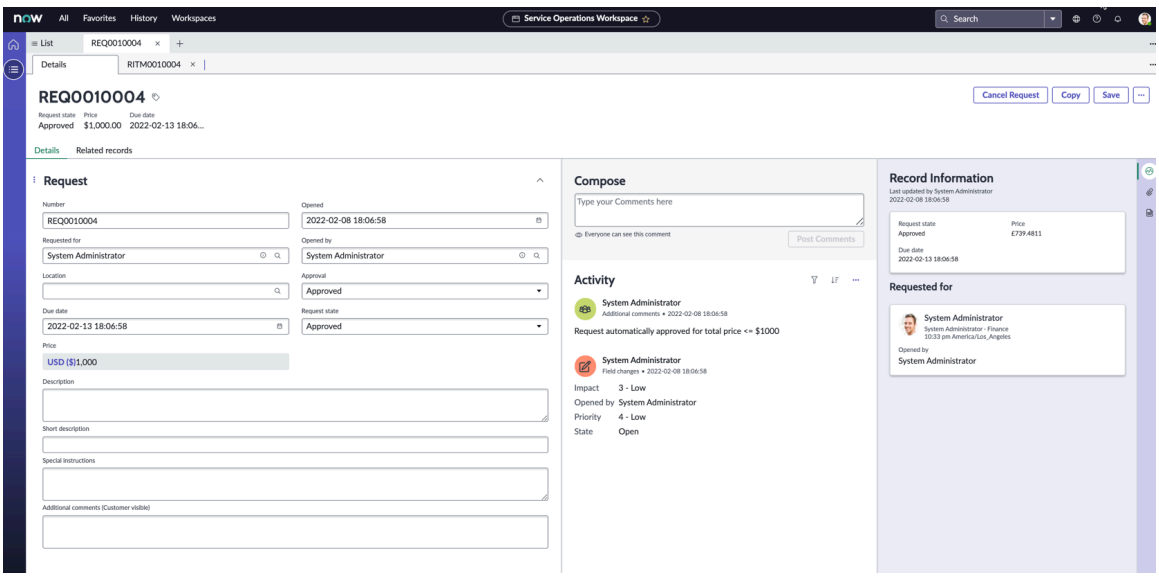

## Request Management forms in Service Operations Workspace

The form layouts, UI actions, UI policies, and client scripts available on the following Request Management forms in the ServiceNow AI Platform UI are also available on the corresponding Service Operations Workspace forms.

- Request
- Request Item
- Catalog Task

### Request form

You can view the request form in Service Operations Workspace and track the record information like the request state, price, due date for a request, requested item, or task in the Record Information section.




**Note:**
A variable editor is displayed as a pop-up window for request items and catalog tasks only if it is included in the platform forms.

You can change the view of any Service Operations Workspace form by customizing the Service Operations Workspace view from the corresponding Request Management form in the ServiceNow AI Platform UI.

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### Create a catalog request in Service Operations Workspace

Create a catalog request in Service Operations Workspace to initiate a catalog request flow from a different IT Service Management flow. For example, from an incident flow, you can create a request and associate the request with the incident to help track requests associated with an incident and vice versa.

#### Before you begin

Role required: itil

#### Procedure

1. Navigate to **Workspaces** > *Service Operations Workspace*.
2. Initiate a catalog request from an incident or from an interaction record.
3. Select **Order Now**.
   The value in the **Request for** field is set by default depending on where the request is created:
   - If the request is created from an incident, the value is set to the person who called in the incident.
   - If the request was started from an interaction, the value is set to the person with whom the interaction is happening.
4. **Optional:** On the Order Confirmation page, specify the shipping address in the **Delivery Information** field.
5. **Optional:** On the Order Confirmation page, provide any additional information in the **Special Instructions** field.
6. Select **Checkout**.
   The request is created and associated with the parent incident.
7. Select **Close**.
8. **Optional:** View the created request by selecting **View Details**.

## ServiceNow integrations with Microsoft Teams in Service Operations Workspace

You can create a connected experience for users in Service Operations Workspace through ServiceNow integrations with Microsoft Teams.

Collaboration using Microsoft Teams is available for the following task records in Service Operations Workspace.

- Incident
- Problem
- Change
- Request
- Interaction

From the **Collaborate** panel of the task record, you can perform any of the following actions:

- View the history of chat conversations related to the record.
- Initiate a chat conversation from the record.
- Import messages from an existing chat conversation to the record.

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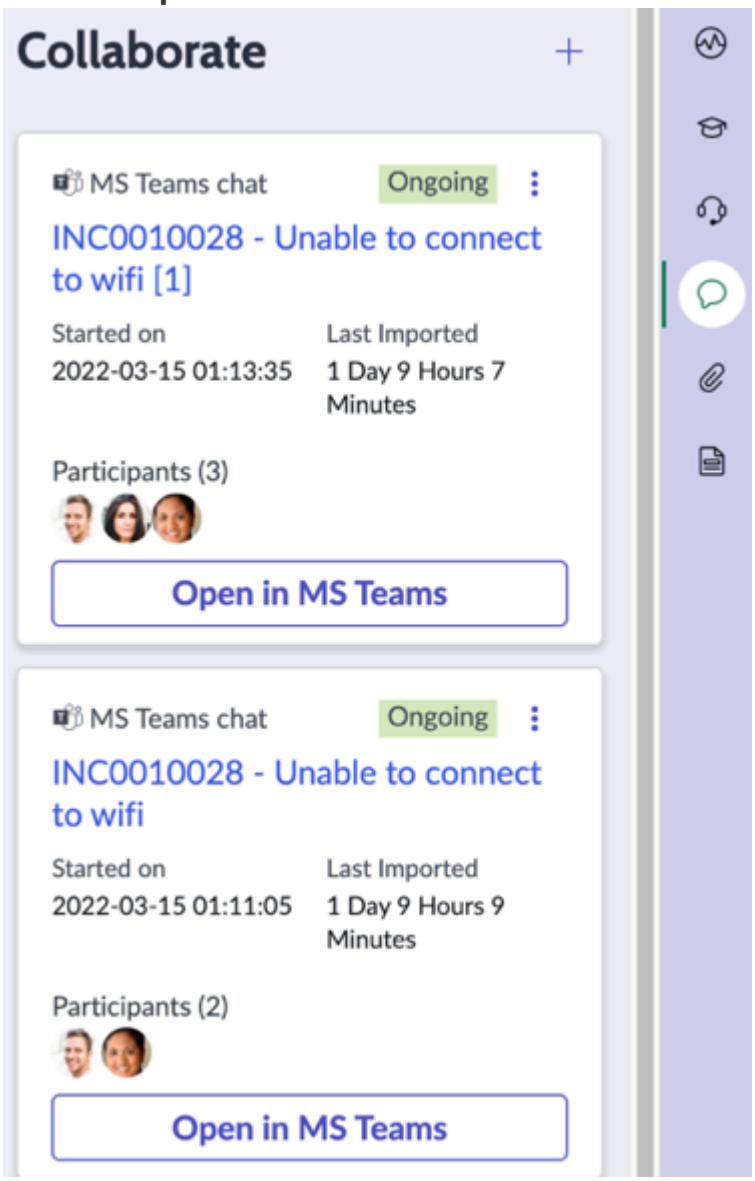
An agent can view the user presence before contacting the user. For information about the refresh duration for user presence in Service Operations Workspace, see Specify the refresh duration for user presence in Service Operations Workspace.

**Collaborate panel from the sidebar**




For more information about Service Operations Workspace through ServiceNow integrations with Microsoft Teams, see ServiceNow for Microsoft Teams.

### Collaborate on a task record using Microsoft Teams in Service Operations Workspace

Provide a connected experience for users by starting a Microsoft Teams chat conversation from a task record or importing the chat to the task record.

#### Before you begin

Role required: itil or admin

#### About this task

When you view or import a Microsoft Teams chat conversation for a task record, the record details are displayed in the **Details** section of the **MS Teams Import** tab. For information about configuring these details, see Configure the task record information in the MS Teams Import tab.

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### Procedure

1. Open a task record, for example, incident.
2. From the Sidebar, click the collaborate icon (  ).
3. To view a chat conversation, click the more options icon ( ⋮ ) on the chat and select **View chat**.
4. To start a chat conversation, perform the following actions.
   a. In the **Collaborate** panel, click the plus sign (+), and select **Start Microsoft Teams chat**.
   b. In the **Start Microsoft Teams chat** dialog box, specify the participants.
   c. **Optional:** To specify more chat options, click **Show more chat options** and specify a client.

      (Optional) You can choose Microsoft Teams application or the Microsoft Teams web application.
   d. Click **Start Chat**.
      - A chat conversation is initiated in Microsoft Teams.
      - All automatic chats are automatically imported to the **Collaborate** panel.
5. To view a chat conversation, click the more options icon ( ⋮ ) on the chat and select **View chat**.
6. To import a chat conversation, perform one of the following actions.

   Imported chats are reflected in the activity stream of the task record.

## Service Level Management in Service Operations Workspace

You can access the service level agreement (SLA) information for an incident on the Service Operations Workspace landing page and incident record page.

## SLA information on the Service Operations Workspace landing page

On the Service Operations Workspace landing page, you can click the **Incident SLAs** card to view incidents grouped by their SLAs. This card displays SLA details only for incidents assigned to the agent. For information on possible customizations for this card, see Customize the donut area color for first-level cards.

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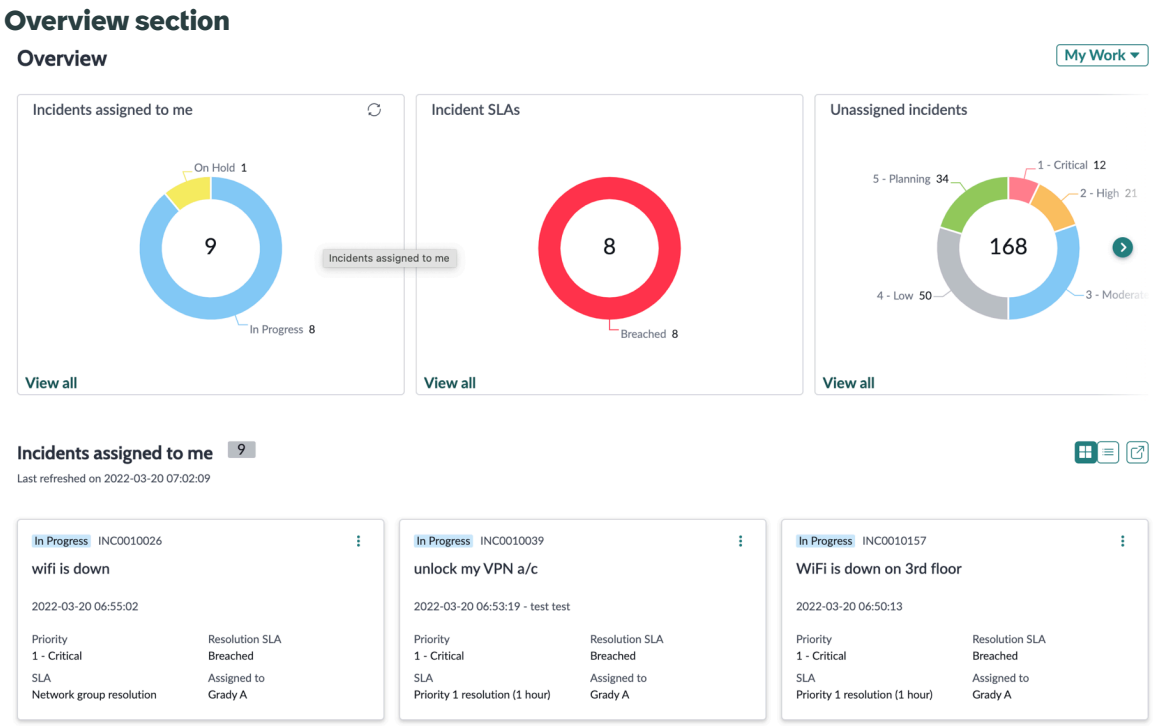


For information about monitoring SLAs, see Monitoring Service Level Agreement (SLA).

## View service level agreement information for an incident

Monitor task service level agreements (SLAs) displayed on an incident record page.

### Before you begin

Role required: itil or admin

The following SLA timer configurations display the response and resolution SLA for an incident.

- Incident Response
- Incident Resolution

You should configure SLA timer configuration mappings for these timer configurations. For information on how you can configure these mappings, see Configure the SLA timer.

### Procedure

1. Open an incident record page.
2. From the contextual side panel, select the record Information icon ( ).
   - The response and resolution SLAs are displayed.
   - In case of multiple SLA timer configuration mappings for Incident Response and Incident Resolution timer configurations, only one response and resolution SLA record associated with the mapping with the least order is displayed.
   - After the SLA is complete, the time taken to respond and resolve the incident are displayed.

   For information about configuring the display of SLA information, see Customize the display of service level agreements for an incident.

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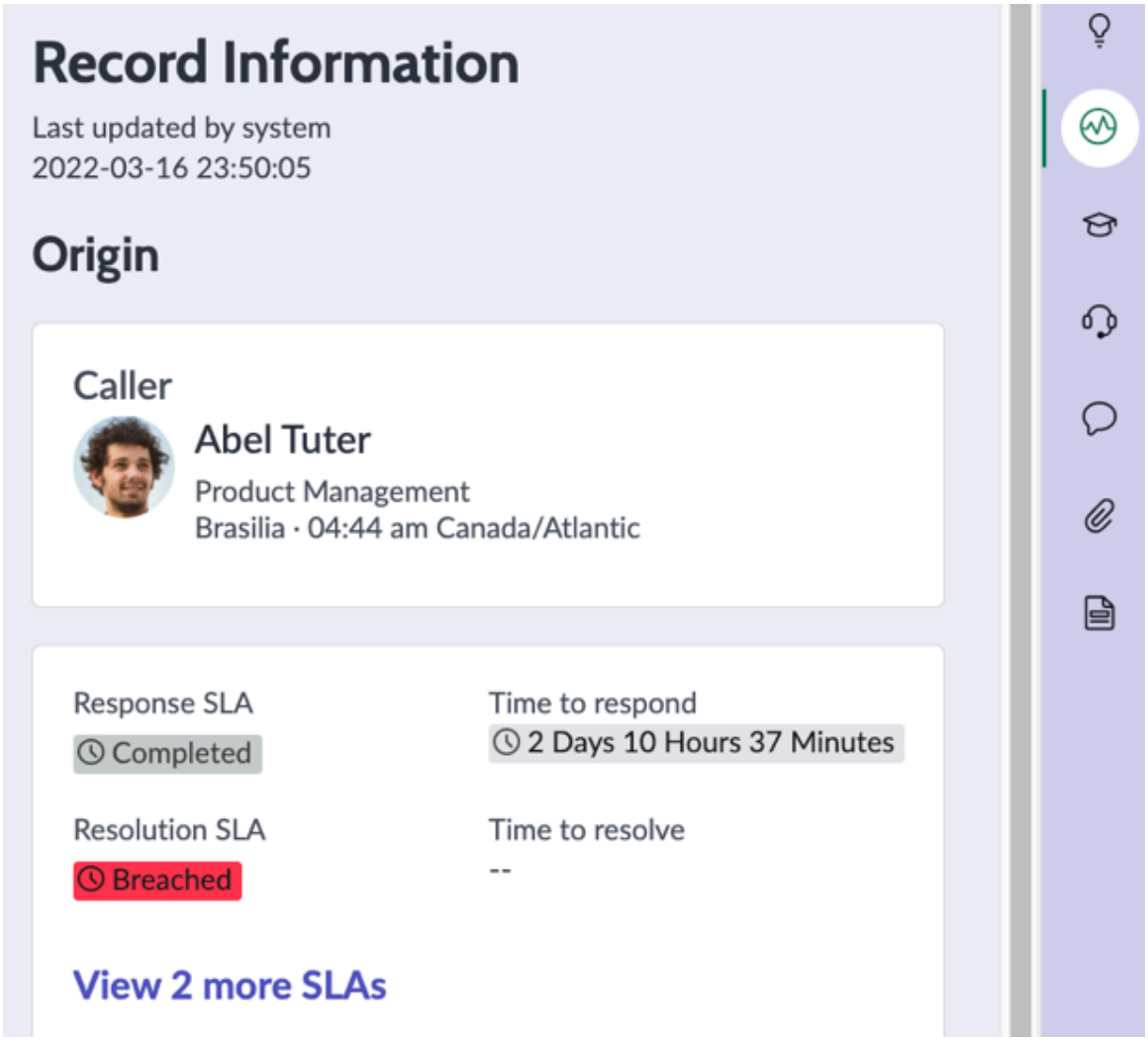
**SLA information for an incident**




3. **Optional:** To view all SLAs related to the incident, click **View more SLAs**.
   A list of all task SLAs is displayed.

## Walk-up Experience management in Service Operations Workspace

Manage your Walk-up interactions and queues in Service Operations Workspace.

As a Walk-up agent, you can use Service Operations Workspace to manage your assigned walk-up interactions. You can open incidents when an issue is not resolved at the walk-up location. You can also directly create a request for hardware or software through the Service Catalog when an asset is not available at the walk-up location stockroom.

As a Walk-up agent, you can do the following activities.

- Access personal inbox to view Walk-up channel assignments.
- Work on concurrent or multiple interactions at the same time.
- Promote interactions to incidents or requests.
- Randomly pull and work on a Walk-up interaction from the queue.
- Use Agent Assist to expedite fulfillment.
- View your assigned walk-up interactions, scheduled and upcoming appointments, walk-up locations and kiosks assigned to you.

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- View available assets and fulfill requests from a local stockroom.
- Create incidents and requests when necessary.
- Reassign, transfer, and modify walk-up interactions when necessary.

**Walk-up Experience lists**

| List item | Description |
|---|---|
| My Stockrooms | Stockrooms and assets associated with the walk-up locations assigned to you. |
| Walk-up Locations | Walk-up locations assigned to you. |
| Location Kiosks | Available kiosks at a Walk-up location. Select a kiosk to check in. |
| My Assigned Walk-ups | Walk-up interactions you are assigned to resolve or fulfill requests. These interactions are in a Work in Progress state. |
| Open - Unassigned | List of all open and unassigned walk-up interactions for all locations. These interactions are in New, Queued, or Work in Progress state. |
| Closed Walk-ups | All closed walk-up interactions. Closed interactions have either Closed Complete or Closed Abandoned state. |
| Appointments | All upcoming Walk-up appointments. |

## Exploring Walk-up interaction in Service Operations Workspace

Explore the various sections of a walk-up assignment.

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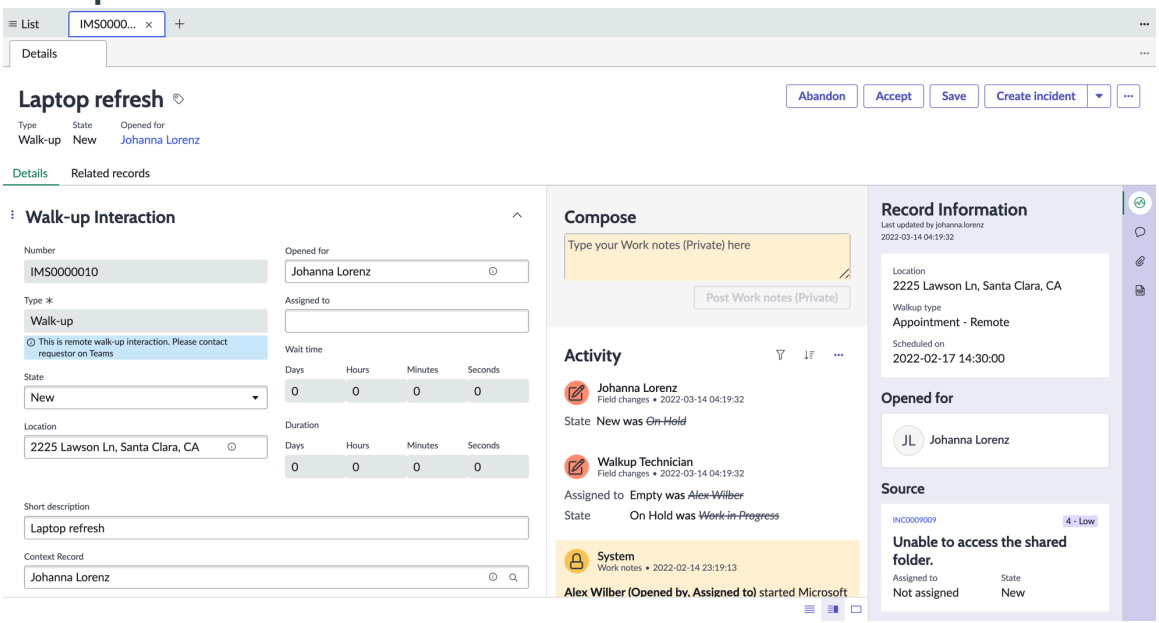
## Walk-up interaction record




## Details tab

View details of a Walk-up interaction.

- Walk-up Interaction: View details of the Walk-up interaction such as the number, state, Walk-up location, and the reason for the Walk-up visit.
- Compose: Write work notes for yourself.
- Activity: View the activities performed on that record.
- Record Information: View the information about the appointment.
- Opened for: View the requester's information.
- Source: View the source of the Walk-up interaction record.

> **Note:**
> The Source section appears only if a Walk-up appointment is created through an incident. For more details, view Create an appointment through incident

## Related records tab

View details of the related records.

- Related Tasks
- User's Tasks

### Work on Walk-up interaction in Service Operations Workspace

Manage your Walk-up appointments in Service Operations Workspace.

**Before you begin**
Role required: itil or admin

**Procedure**

1. Navigate to **Workspaces** > **Service Operations Workspace**.
2. Select **Inbox** from the side bar.

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3. Set your status as **Available**.
   A Walk-up interaction task is automatically pushed in your inbox, if you do not already have any walk-up interactions assigned to you.
4. Select **Accept**.
5. On the details page, select one of the following options.

6. If you already have interactions assigned to you, navigate to **Lists** > **Walk-up** > **My Assigned Walk-ups**.
7. From the Walk-up list, select **Location Kiosk**.
8. Select a kiosk assigned to the location from the list.
9. On the **Walk-up Location Kiosk** page, select **Check-in**.

   **Note:**
   Walk-up location kiosks are displayed only when the Show kiosk option is enabled.

10. On the **My Assigned Walk-ups** page, select the Walk-up interaction assigned to you.
11. After you have fulfilled or resolved the request, set the state of the Walk-up interaction to **Closed Complete**.

### Create an appointment through incident

Schedule an appointment on behalf of a requester through an incident record.

#### Before you begin
Role required: itil or admin

#### Procedure

1. From the navigation list, select **List**.
2. Under **Incidents**, select **Open** or **Assigned to me**.
3. Select the incident for which you want to schedule an appointment.
4. Select the More actions icon.
5. From the drop-down list, select the option **Book Walk-up Appointment**.
6. In the Walk-up Appointment Booking window, enter the required details to book an appointment on behalf of the requester.
7. Select **Submit**.

#### Result

- A walk-up appointment record is created.
- The **Walk-up Appointment** option appears under the **Related records** tab for that incident. You can see all the Walk-up appointments related to the incident.
- The requester is notified of the appointment. The requester can also see the appointment created on the home page under the My active items widget.

## Workforce Optimization for ITSM in the Service Operations Workspace

Manage your schedule using Workforce Optimization for ITSM Scheduling in Service Operations Workspace. Use Coaching to review and complete assigned training.

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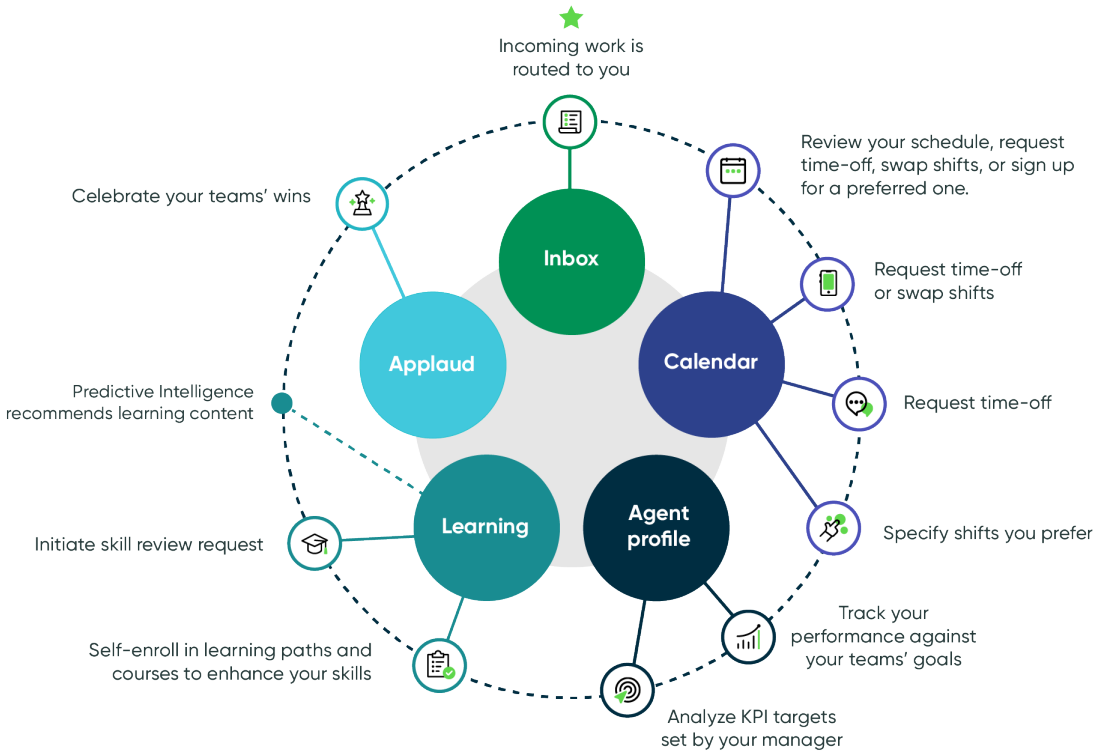
**Important:**
You must activate the Workforce Optimization for ITSM Configurable Workspace (sn_wfo_cfg_itsm) plugin to use Workforce Optimization for ITSM for Service Operations Workspace. For more information, see Activate Workforce Optimization for ITSM.

The image below displays the agent work flow between the different modules in Workforce Optimization for ITSM.




Monitor targets set by your manager, view learning tasks that you need to complete, and keep track of upcoming items in the Service Operations Workspace landing page. For more information, see Service Operations Workspace landing page.

### Access your profile in Service Operations Workspace

Track and monitor the real-time status of your work by accessing your profile in Service Operations Workspace. You can track how many incidents and interactions you have closed and how many you are actively working on. You can also view the roles and groups to which you belong and see information about your manager and teammates.

## Before you begin

Role required: sn_wfo_cfg_itsm.employee

## About this task

Access your profile to analyze information such as:

- Key performance indicators that matter most to you and Performance Analytics targets set for you by your manager. For information on Performance Analytics, see Performance Analytics targets.
- Pending training that has been assigned to you and when they're due.
- Service channels that you are assigned to and their current utilization.

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- Skills and skill levels that you currently use and skill gaps that you may want to address.
- Upcoming PTO.

### Procedure

1. Navigate to **Workspaces** > **Service Operations Workspace**.

   When you click the home icon (), you can view the status of your work, organizational performance, current status of incidents, and unassigned incidents in the Service Operations Workspace landing page.

2. Click the lists icon ().

## Service Operations Workspace - Scheduling

Use Service Operations Workspace to manage your schedule.

As an agent, you can use the Service Operations Workspace dashboard to see events such as training and time-off that's related to the agent's shifts, or how many work shifts you have on the current day and the day after the current day.

**Note:**
If you have an upcoming PTO on the day after the current day, in the **Upcoming** section, the **Today** list will display that you have an upcoming PTO the next day. If you are on PTO the current day, this list will not display that you have a PTO.

## Manage your schedule using the Service Operations Workspace

Look up your schedule, create an event of custom event type, request time off for an on-call or work shift, or swap your shift with your peers using the calendar in Service Operations Workspace.

### Before you begin

- If your system administrator has enabled the *sn_uib_agent_sp.allow_agent_edit_break* system property, you can edit the start and end time of your break time in a shift span.
- If your system administrator has enabled the *sn_uib_agent_sp.allow_agent_add_remove_break* system property, you can add or remove your break time in a shift span.

Role required: sn_shift_planning.agent

### About this task

If you can work during the requested shift, you can also approve your peer's request for shift swap. When you request time off for an on-call shift, you can also propose an agent to cover the shift. You can also filter agents in the team calendar based on team member, location, skills, shift plan or events.

You can:

- Swap shifts with agents that are within your assignment group.
- Add attendees to the meeting or training event types.
- Edit or delete meeting or training event types that you have created.
- Edit or delete work event types if you're the logged-in user and if the event has been assigned to you.

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**Note:**
When you create an event of types meeting or training, the logged-in user will always be part of the attendees list and cannot be removed.

### Procedure

1. Navigate to **Workspaces** > *Service Operations Workspace*.
2. Click the Schedule icon.
   Access the schedule:
   - View your schedule by clicking the **My Calendar** tab. Then, use the list to select the schedule that you want to view by day, week, or month.
   - View another agent's schedule by clicking the **Team Calendar** tab. Then, click an agent's schedule to see that agent's work and break times.

   **Note:**
   You can view the schedule for the primary assignment group and the on-call group you're part of.

3. Create an event of custom event type.
   You can create, edit, or delete events of custom event types that your system administrator has enabled for agent access.
   a. Click **New** and select the name of the custom event type.
   b. In the custom event type form, fill in the fields as required.
   c. Click **Save**.

   To edit the event, select the event, and then the edit icon ( ) to make the necessary changes and save the event. To delete it, select the delete icon.
4. Make a request.
   - You can use the **Compose** field in the time-off request to communicate with your manager.
   - You can use the **Compose** field in the shift swap request to communicate with your peers.

| To | Do this |
|---|---|
| Request a shift swap | Create a shift swap or swap by selecting a shift.<br>To create a shift swap:<br>a. Click **New** and select **Shift Swap**.<br>b. Fill in the requestor details.<br>Your name is automatically populated in the **Requestor** field.<br>i. In the **Date**field, select the date for which you want to swap the shift.<br>ii. In the **Shift** field, select the shift to swap. If you have only one shift for the selected date, this field is auto-populated.<br>c. Fill in the details for the agent with whom you want to swap the shift. |

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| To | Do this |
| --- | --- |
| | i. In the **Agent** field, select the name of the agent.<br>ii. In the **Date**field, select the date for which you want to swap the shift.<br>iii. In the **Shift** field, select the shift to swap. If you have only one shift for the selected date, this field is auto-populated.<br>**d.** Click **Submit**.<br><br>To swap by selecting a shift:<br>**a.** Select a shift on the calendar and click the swap shift icon.<br>**b.** From the Shift menu for your shift, select the shift that you want to swap with another agent. This information is auto-populated when you open the request using the swap shift icon.<br>**c.** In the **Agent** field for the requested shift, select the agent that you want to swap with.<br>**d.** From the Shift menu for the requested shift, select the agent's shift that you want to swap with.<br>**e.** Click **Submit**. |
| Request time off for a work shift | Create a new time-off request or select a work shift for which you want to take time off.<br><br>To create a new time-off request:<br>**a.** Click **New** and select **Time Off**.<br>**b.** In the **Start date** field, click the calendar icon and select the date to start taking time off.<br>**c.** In the **End date** field, click the calendar icon and select the date you want to the end time off.<br>**d.** Click **Save**.<br><br>To create a request from a work shift:<br>**a.** Select the work shift in the calendar for which you want to take time off and click the Request Time-off icon ( ).<br><br>The start date and time and the end date and time are automatically populated.<br>**b.** In the **Title** field, enter a name for the work shift.<br>**c.** In the Description field, enter a reason for the time-off.<br>**d.** Click **Save**.<br><br>**Note:**<br>○ To edit a work shift, select the shift span for which you want to edit the break time, select the edit icon ( ) in the work shift, edit the desired break times and click **Save**.<br>○ If you edit your time-off request after you submit it, the request changes to **Requested** state. |

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| To | Do this |
| --- | --- |
| Request time off for an on-call shift | Create a new on-call time-off request or select an on-call shift for which you want to take time off.<br><br>**Note:** The PTO approval preferences for each on-call group are set by your administrator. For more information, see Configure preferences for a user group.The *com.snc.on_call_rotation.pto.approval.required* property must be set `true`. For more information, see System properties for On-Call Scheduling.<br><br>To create a new request:<br>**a.** Click **New** and select **On Call Time Off**.<br>**b.** In the **Start date** field, click the calendar icon and select the date to start taking time off.<br>**c.** In the **End date** field, click the calendar icon and select the date you want to the end time off.<br>**d.** In the **Group** field, select the group in which the agent that you propose for cover belongs.<br>**e.** In the **Proposed Cover** field, select the name of the agent.<br>**f.** Click **Save**.<br><br>To create a request from an on-call shift:<br>**a.** Select an on-call work shift in the calendar for which you want to take time off.<br>**b.** Click the Request Time-off icon ( ).<br>The start date and time, the end date and time, and the group are automatically populated.<br>**c.** In the **Proposed Cover** field, select the name of the agent.<br>**d.** Request time off.<br>**e.** Click **Save**. |

The shift-swap request moves to the approval queue of the agent that you've requested to swap with. For more information, see Approve or reject a shift swap

The time-off request moves to your manager's approval queue. For more information about approvals, go to Track and manage your teams' schedule

### Approve or reject a shift-swap in Service Operations Workspace

You can approve a shift swap requested by your peer if you are available to work for that time period. You can reject it if you are unable to work then.

#### Before you begin

Role required: sn_shift_planning.agent

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### Procedure

1. Navigate to **Workspaces** > **Service Operations Workspace**.
2. Click the Schedule icon.
3. Click the **Shift Approvals** tab.
4. Select the request you want to approve or reject.
5. Review the details of the shift swap request and do one of the following:
   - To approve the request, click **Approve**.
   - To reject the request, click **Reject**.

   If you approve a shift-swap, the application moves the request to your manager's approval queue. For more information, go to Track and manage your teams' schedule.

## Request time off using ITSM Virtual Agent

Automate your request for time off using the ITSM Virtual Agent. Type keywords into the chatbot to create and submit your request, which then gets automatically routed to your manager for approval. You can also use Natural Language Understanding to make your time-off request.

### Before you begin

The ITSM Virtual Agent Conversation Topics (com.snc.itsm.virtualagent) plugin must be enabled.

**Note:**
To search shifts and schedules, you must generate the text index for the Topic [sys_cs_topic] table before you start using the ITSM Virtual Agent for making time off requests.

Before you can use Natural Language Understanding to make time-off requests, the Time Off Request NLU model must be trained and published.

Role required: sn_shift_planning.agent

### Procedure

1. Navigate to **All** > **Service Portal** > **Service Portal Home**.
2. Click the chat icon.
3. In the chat window, do one of the following to create the request:
   - To use keywords, enter *`time off`*, *`vacation`*, or similar keywords.
   - To use Natural Language Understanding, enter an utterance.
4. Select the Time Off Request topic.
   The calendar appears with the message, "When do you want to start your time off?"
5. Select the start date and time for your time-off request and click **Select**.
   The calendar appears with the message, "When do you want to end your time off?"
6. Select the end date and time for your time-off request and click **Select**.
   The "Would you like to enter the reason for your time off?" message appears.
7. **Optional:** Click **Yes** and enter the reason for taking time off and click **Enter**.
   The message, "Your time-off request has been submitted and is in your manager's approval queue," appears.
8. To view the submitted request on your calendar, click **View submitted request (Request Number)**.

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### Clock-in and clock-out your work shift in Service Operations Workspace

Clock in and clock out your work shifts using Service Operations Workspace. You can track details, such as time attendance and time worked summary to know how close you are adhering to your schedules.

#### Before you begin
Role required: sn_shift_planning.agent

#### About this task
The clock-in event is generated when you either login or set your status as **Available** in Service Operations Workspace. The clock-out event is generated when you either logout from Service Operations Workspace or set your status as **Offline** or **Break**.

#### Procedure

1. Navigate to **Workspaces** > **Service Operations Workspace**.
2. Click the Inbox icon (  ).
   - To clock-in your shift, set your status to **Available**.
   - To clock-out from your shift, set your status to **Offline** or **Break**.

#### Result
You can view your time attendance and adherence in **Lists** > **Schedule Adherence** > **Time Attendance** > **Time Worked Summary** lists.

### Sign up for your preferred shifts

Specify one or more shifts in a schedule plan for which you would prefer to sign up.

#### Before you begin
Role required: sn_shift_planning.agent

#### About this task
You can receive notifications when your manager makes a schedule plan available for sign up. You can also receive notifications when the schedule plan that's open for sign up is due on the current day or when it's due soon.

#### Procedure

1. Navigate to **Workspaces** > **Service Operations Workspace**.
2. Select the Schedule icon (  ).
3. Select the **Sign up shifts** tab.

   You can use keywords to search the schedule plans, and view all schedules with active shifts for your assignment groups that you can sign up for. Use the pagination to scroll through all available schedule plans.

   The current state of each schedule plan displays as a highlight in each card. The table below describes the highlighted value.

| Highlighted value | Description |
|---|---|
| Available | Shifts for the schedule plan are available for sign up. |
| Draft | Shifts you've considered for sign-up but have not completed the sign-up process. |

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| Highlighted value | Description |
|---|---|
| Completed | Submitted one or more preferred shifts within the schedule plan. |
| Closed Incomplete | The schedule plan currently does not have shifts for which you could sign up. |
| Closed Complete | The schedule plan has at least one preferred shift for which you've signed up. |

4. Select the Overlapping time off icon (  ) to analyze if the time off you have requested or the ones that have been approved overlap with the schedule plan available to you for sign up.
5. To sign up for your preferred shifts, select **Add shifts**.
   You can only sign up for shifts in the schedule plan that have not been published yet.
   The Add shifts pop-up appears. You can search for shift using the search bar and select shifts to save as draft.

   You can sign up for a maximum number of shifts that your administrator has set up in the *sn_shift_planning.max_shifts_allowed_for_signup* system property.
6. To save the selected shifts for sign-up, select **Save Shifts** and then select **Save as draft**.
7. Select the plus (+) sign and sign up for additional shifts.
   When you have more than one shift, you can reorder them by using the up or down arrows in card for each shift.
8. Select **Submit**.
   All shifts you have added for sign up will be submitted.

### Service Operations Workspace - Learning

Use Service Operations Workspace Learning to review learning courses and paths and complete them.

As an agent, you can get recommendations on courses or paths that you may want to take, complete learning paths and courses, and add skills to your skills set when you complete them.

## Overview tab

Use the **Overview** tab to view your active or completed learning tasks, skills you've used recently, and recommendations based on your past activities.

| Section | Description |
|---|---|
| **My active learning** | View the learning tasks, which could include learning paths and courses.<br>• These include the ones that your manager has assigned to you and the ones you chose to self-enroll.<br>• They're sorted by the due date and display the duration to complete the task and the completion progress.<br>• You can select **View all active learning** to view all of your active tasks. |
| **Completed learning tasks in the last 90 days** | Monitor the status of enrolled learning paths and courses that you've completed in the last 90 days. |

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| Section | Description |
| --- | --- |
| **My skills** | Analyze how many skills that you have in your skills set at a given time including the skills you've recently used. |
| **You may like** | See recommendations that you may like based on your past activities or your teams' activities, what's trending, and courses that were added recently to your library. |

## Discover

Use the **Discover** tab to:

- Browse the course catalog or filter them based on set criteria narrow down the display of them to what's relevant to you.
- Analyze details for a course and path such as the time that it takes to complete them, or the skills you have gained recently.
- Get learning recommended to you based on your past activities or the activities of your teams to which you belong. The content is grouped into different categories. For more information, see Recommendation grouping.
- Select **Browse recommended learning**, and then select and enroll in the desired course item.

## My learning

Use the **My learning** tab to:

- Analyze courses or paths that are still pending completion and when they're due. You can also sort them by due date.
- See courses, which were assigned to you or the ones you've enrolled in that you've have completed.
- Use the **Assigned & enrolled** filter to narrow down the search.

Take a survey or review skills to add to your skill set. You can receive surveys available for any group to which you belong. You can make a copy of the survey and work on it to complete them.

### Learning path and course item discovery in Service Operations Workspace

Browse courses or learning paths and take the ones that are of interest to you. You can also discover them using Predictive Intelligence that provides recommendations based on past activities.

Service Operations Workspace uses Predictive Intelligence to discover and suggest all courses and learning paths that you might want to take based on the learning activities of the teams you belong to and your previous learning activities.

### Enroll in Learning to take a learning course or complete a learning path

When you enroll in a learning course or learning path, the application creates a learning task. You can track the progress of the course or path using the learning task.

#### Before you begin

Role required: sn_wfo_cfg_itsm.employee

#### Procedure

1. Navigate to **Workspaces** > **Service Operations Workspace**.
2. Select the Learning icon  .

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3. Select the **Discover** tab.

4. Select a course or a path in which you'd like to enroll.
5. Select **Enroll**.

### Complete learning tasks using the Service Operations Workspace

Enhance your skills set by completing learning tasks from internal or external learning content.

#### Before you begin
Role required: sn_wfo_cfg_itsm.employee

#### Procedure

1. Navigate to **Workspaces** > **Service Operations Workspace**.
2. Select the Learning icon  .
3. Select the **My learning** tab.
   You can view the details of the path and course items that you are working on.
   - Select the **Active** tab to view all tasks that you have not yet started or the ones that are in progress.
     - The tasks display a highlight to show which tasks are due on the current day, due soon, or are overdue. It also shows how long the course has been overdue. The most recently created tasks are highlighted as **New**.
     - You can also see which tasks you've self-enrolled and which tasks were assigned to you and also the progress of each course or path.
     - You can filter the tasks to display either all tasks that were assigned to you or all the ones you enrolled in or both.
     - You can sort the task by the date the task is due.
   - Select the **Completed** tab to view the list of tasks sorted by the date they were completed.
4. Complete a learning task.
   The skills associated with the tasks are added to your skill set.

### Review skills to add to your skill set

Evaluate the skill proficiency for an existing skill or add a new skill and request approval to update those skills in your skill set. Get notified when your manager requests a skill review.

#### Before you begin
Role required:sn_wfo_skillreview.user

#### About this task
You will receive a notification when your manager initiates or approves a skill review request.

#### Procedure

1. Navigate to **Workspaces** > **Service Operations Workspace**.
2. Select the List icon (  ).
3. Send a request to review an updated skill proficiency or to review a new skill to be added to your skill set.

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4. Select **Submit for review**.
   When your manager approves or rejects the skill review request and completes it, you will receive a notification.

### Take a survey in Service Operations Workspace

Get notified when a survey is assigned to you. Complete the survey to provide feedback.

#### Before you begin
Role required: sn_wfo_cfg_itsm.employee

#### About this task
You can respond to surveys or your assessments. You can access surveys available for any group to which you belong.

#### Procedure
1. Navigate to **Workspaces** > **Service Operations Workspace**.
2. Access your profile.
   For more information accessing your profile, see Access your profile in Service Operations Workspace.
3. Select the **Assessments** tab.
4. Go to **Surveys** > **Open**.
5. In the **Metric type** field, select the survey you would like to take.

   **Note:**
   You can also select the Notifications icon and select the survey.

   You will get notified 7 days before, the day before, and on the day when the survey will be available for you to complete.

6. Select **Take a survey**.
7. Complete the survey.

## Collaboration in Service Operations Workspace

Collaboration services provide a way to communicate and collaborate in real time to resolve the incidents. You can initiate a chat or make conference calls using a service provider to communicate with stakeholders.

To start a Microsoft Teams chat, refer Collaborate on a task record using Microsoft Teams in Service Operations Workspace.

### Notify in Service Operations Workspace

Notify in Service Operations Workspace provides support for SMS, telephone, and the service providers on the ServiceNow AI Platform for communicating internally with team members and externally with customers and contractors.

### Use Twilio to make conference calls in Service Operations Workspace

Use Twilio to schedule conference calls with stakeholders to resolve incidents in Service Operations Workspace.

Ensure that Twilio is configured to make conference calls from Service Operations Workspace. To configure Twilio, refer Configure Notify with Twilio.

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### Start and end a conference call from Twilio in Service Operations Workspace

Start a conference call using Twilio to collaborate with others to work toward the resolution of an incident. End the call when the discussion is over.

#### Before you begin

Role required: itil

#### Procedure

1. Navigate to **Workspaces** > **Service Operations Workspace**.
2. Select the **List** ( ) icon.
3. Select **Incidents** > **Open**.
4. Select the incident record.
5. Select the **Collaborate** ( ) icon from the contextual side panel.
6. Select the **Calls** tab, and then select the plus (+) icon.
7. Select **Start Telephony meeting**.
8. On the form, fill in the fields.

**Start Conference Call form**

| Field | Description |
|---|---|
| Title | Title for the conference call |
| Add participants | Provide the list of participants for the conference call. |
| Include a brief message for participants | Provide a brief summary about the issue to be discussed in the conference call. |

9. Select **Start**.

   If there are more than 50 participants, the conference call will be initiated in asynchronous mode and a few additional participants will be added to the conference call soon in background, this enables you to continue work without any interruption.

10. At the conclusion of the discussion, end the call.
    a. Select the active call card.
    b. From the **Leave call** drop-down menu, select **End call**.

### Join or leave a conference call from Twilio in Service Operations Workspace

Join an existing Twilio conference call to participate in a discussion to resolve an incident. You can leave the call without affecting other participants.

#### Before you begin

Role required: itil

#### Procedure

1. Navigate to **Workspaces** > **Service Operations Workspace**.
2. Select the **List** ( ) icon.

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3. Select **Incidents** > **Open**.
4. Select the incident record that has an active conference call.
5. Select the **Collaborate** ( ) icon from the contextual side panel.
6. Select the **Calls** tab.
7. Select the active call card.
8. Join or leave the call.
   - To join the call, select **Join call**.
   - To leave the call, select **Leave call**.

### Administer an existing Twilio call in Service Operations Workspace

Add or mute participants in a Twilio conference call.

#### Before you begin

Role required: itil

#### Procedure

1. Navigate to **Workspaces** > **Service Operations Workspace**.
2. Select the **List** ( ) icon.
3. Select **Incidents** > **Open**.
4. Select the incident record that has an active conference call.
5. Select the **Collaborate** ( ) icon from the contextual side panel.
6. Select the **Calls** tab.
7. **Optional:** Add participants to the call.
   a. Select **Meeting options**.
   b. Select **Add participants**.
   c. Enter the participants in the **Add participants** field.
   d. Provide a brief summary about the issue to be discussed in the conference call in the **Include a brief message for participants** field.
   e. Select **Add participants**.
8. Select the active call card.
9. **Optional:** Mute participants to avoid background noise by selecting the Mute icon ( ).

### Reinitiate a conference call from Twilio in Service Operations Workspace

Reinitiate a Twilio conference call that was ended to discuss about the resolution of an incident.

#### Before you begin

Role required: itil

#### Procedure

1. Navigate to **Workspaces** > **Service Operations Workspace**.
2. Select the **List** ( ) icon.

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3. Select **Incidents** > **Open**.
4. Select the incident record that has an active conference call.
5. Select the **Collaborate** ( ) icon from the contextual side panel.
6. Select the **Calls** tab.
7. In the **Completed** calls section, select the **Reinitiate** button.

### View a conference call recording from Twilio in Service Operations Workspace

View details for a recorded conference call in Service Operations Workspace by accessing the associated conference record as a reference.

#### Before you begin
Role required: itil

#### Procedure
1. Navigate to **Workspaces** > **Service Operations Workspace**.
2. Select the **List** ( ) icon.
3. Select **Incidents** > **Open**.
4. Select the incident record.
5. Select the **Collaborate** ( ) icon from the contextual side panel.
6. On the **Calls** tab in the **Completed calls** section, select the **View Recording** button.

#### Result
You can view the list of all the conference call recordings related to the incident record.

### Use Webex for conference calls in Service Operations Workspace

Use Webex to schedule the conference calls with the stake holders to resolve the incidents in Service Operations Workspace.

### Start a conference call using Webex in Service Operations Workspace

Start a conference call using Webex from to work towards the resolution of an incident.

#### Before you begin
Role required: itil

#### Procedure
1. Navigate to **Workspaces** > **Service Operations Workspace**.
2. Select the **List** ( ) icon.
3. Select **Incidents** > **Open**.
4. Select the incident record.
5. Select the **Collaborate** ( ) icon from the contextual side panel.
6. Select **Calls** tab, and then select plus (+) icon.
7. Select **Start Webex meeting**.
8. On the form, fill the fields.

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### Start Conference Call

| Field | Description |
|---|---|
| Conference bridge | Option to choose the conference bridge. |
| Title | Option to provide a title for the conference call |
| Add participants | Options to add participants for the conference call. |
| Include a brief message for participants | Provide a brief summary about the issue to be discussed in the conference call. |

9. Select **Start**.

## Add participants to an existing Webex call in Service Operations Workspace

Add a participant to a conference call to participate in the discussion to resolve the incident.

### Before you begin

Role required: itil

### Procedure

1. Navigate to **Workspaces** > **Service Operations Workspace**.
2. Select the **List** ( ) icon.
3. Select **Incidents** > **Open**.
4. Select the incident record that has an active conference call.
5. Select the **Collaborate** ( ) icon from the contextual side panel.
6. Select the **Calls** tab.
7. Select the active call card.
8. Select **Meeting options**.
9. Select **Add participants**.
10. On the form, fill the fields.

### Add participants

| Field | Description |
|---|---|
| Add participants | Options to add participants for the conference call. |
| Include a brief message for participants | Provide a brief summary about the issue to be discussed in the conference call. |

11. Select **Add participants**.

## Reinitiate a conference call from Webex in Service Operations Workspace

Reinitiate a conference call to discuss about the resolution of an incident.

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### Before you begin
Role required: itil

### Procedure
1. Navigate to **Workspaces** > **Service Operations Workspace**.
2. Select the **List** ( ) icon.
3. Select **Incidents** > **Open**.
4. Select the incident record that has an active conference call.
5. Select the **Collaborate** ( ) icon from the contextual side panel.
6. Select the **Calls** tab.
7. In the **Completed** calls, select **Reinitiate call**.

## Use Zoom to make conference calls in Service Operations Workspace

Use Zoom to schedule the conference calls with the stake holders to resolve the incidents in Service Operations Workspace.

## Start a conference call using Zoom in Service Operations Workspace

Start a conference call using Zoom to work towards the resolution of an incident.

### Before you begin
Role required: itil

### Procedure
1. Navigate to **Workspaces** > **Service Operations Workspace**.
2. Select the **List** ( ) icon.
3. Select **Incidents** > **Open**.
4. Select the incident record.
5. Select the **Collaborate** ( ) icon from the contextual side panel.
6. Select the **Calls** tab, and then select the plus (+) icon.
7. Select **Start Zoom meeting**.
8. On the form, fill the fields.

#### Start Conference Call

| Field | Description |
|---|---|
| Conference bridge | Option to choose the conference bridge. |
| Title | Option to provide a title for the conference call |
| Add participants | Options to add participants for the conference call. |
| Include a brief message for participants | Provide a brief summary about the issue to be discussed in the conference call. |

9. Select **Start**.

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### Manage Zoom conference calls in Service Operations Workspace

Add or mute participants in a Zoom conference call in Service Operations Workspace.

### Add participants to an existing Zoom call in Service Operations Workspace

Add a participant to a conference call to participate in the discussion to resolve the incident.

#### Before you begin

Role required: itil

#### Procedure

1. Navigate to **Workspaces** > **Service Operations Workspace**.
2. Select the **List** ( ) icon.
3. Select **Incidents** > **Open**.
4. Select the incident record that has an active conference call.
5. Select the **Collaborate** ( ) icon from the contextual side panel.
6. Select the **Calls** tab.
7. Select the active call card.
8. Select **Meeting options**.
9. Select **Add participants**.
10. On the form, fill the fields.

**Add participants**

| Field | Description |
|---|---|
| Add participants | Options to add participants for the conference call. |
| Include a brief message for participants | Provide a brief summary about the issue to be discussed in the conference call. |

11. Select **Add participants**.

### Join a conference call from Zoom in Service Operations Workspace

Join an existing conference call to participate in the discussion to resolve an incident.

#### Before you begin

Role required: itil

#### Procedure

1. Navigate to **Workspaces** > **Service Operations Workspace**.
2. Select the **List** ( ) icon.
3. Select **Incidents** > **Open**.
4. Select the incident record that has an active conference call.
5. Select the **Collaborate** ( ) icon from the contextual side panel.
6. Select the **Calls** tab.

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7. On the **Active** card, select **Join call**.

> **Note:**
> You can search the chat history by participant name, and the subject of the chat.

### Mute participants from a Zoom conference call in Service Operations Workspace

Join an existing conference call to participate in the discussion to resolve an incident.

#### Before you begin

Role required: itil

#### Procedure

1. Navigate to **Workspaces** > **Service Operations Workspace**.
2. Select the **List** ( ) icon.
3. Select **Incidents** > **Open**.
4. Select the incident record that has an active conference call.
5. Select the **Collaborate** ( ) icon from the contextual side panel.
6. Select the **Calls** tab.
7. Select the active call card.
8. Mute participants to avoid background noise by selecting the Mute icon ( ).

### Leave a Zoom conference call in Service Operations Workspace

Leave an active conference call. The call will still be active with other participants.

#### Before you begin

Role required: itil

#### Procedure

1. Navigate to **Workspaces** > **Service Operations Workspace**.
2. Select the **List** ( ) icon.
3. Select **Incidents** > **Open**.
4. Select the incident record that has an active conference call.
5. Select the **Collaborate** ( ) icon from the contextual side panel.
6. Select the **Calls** tab.
7. Select the active call card.
8. Select **Leave call**.

### End a Zoom conference call in Service Operations Workspace

As a host or a user with the incident manager role, you can end the conference call.

#### Before you begin

Role required: itil

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### Procedure

1. Navigate to **Workspaces** > **Service Operations Workspace**.
2. Select the **List** (  ) icon.
3. Select **Incidents** > **Open**.
4. Select the incident record that has an active conference call.
5. Select the **Collaborate** (  ) icon from the contextual side panel.
6. Select the **Calls** tab.
7. Select the active call card.
8. Select **Leave call** drop-down menu.
9. Select **End call**.

## Reinitiate a conference call from Webex in Service Operations Workspace

Reinitiate a conference call to discuss about the resolution of an incident.

### Before you begin

Role required: itil

### Procedure

1. Navigate to **Workspaces** > **Service Operations Workspace**.
2. Select the **List** (  ) icon.
3. Select **Incidents** > **Open**.
4. Select the incident record that has an active conference call.
5. Select the **Collaborate** (  ) icon from the contextual side panel.
6. Select the **Calls** tab.
7. In the **Completed** calls, select **Reinitiate call**.

## Use Microsoft Teams to make conference calls in Service Operations Workspace

Use Microsoft Teams to schedule the conference calls with the stake holders to resolve the incidents in Service Operations Workspace.

## Start a conference call using Microsoft Teams in Service Operations Workspace

Start a conference call from Microsoft Teams to work towards the resolution of an incident.

### Before you begin

Role required: itil

### Procedure

1. Navigate to **Workspaces** > **Service Operations Workspace**.
2. Select the **List** (  ) icon.
3. Select **Incidents** > **Open**.
4. Select the incident record.
5. Select the **Collaborate** (  ) icon from the contextual side panel.

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6. Select the **Calls** tab, and then select the plus (+) icon.
7. Select **Start MS Teams meeting**.
8. On the form, fill in the fields.

**Start Conference Call**

| Field | Description |
|---|---|
| Conference bridge | Option to choose the conference bridge. |
| Title | Option to provide a title for the conference call |
| Add participants | Options to add participants for the conference call. |
| Include a brief message for participants | Provide a brief summary about the issue to be discussed in the conference call. |

9. Select **Start**.

### Manage Microsoft Teams conference calls in Service Operations Workspace

Add or mute participants in a Microsoft Teams conference call in Service Operations Workspace.

### Add participants to an existing Microsoft Teams call in Service Operations Workspace

Add a participant to a conference call to participate in the discussion to resolve the incident.

#### Before you begin

Role required: itil

#### Procedure

1. Navigate to **Workspaces** > **Service Operations Workspace**.
2. Select the **List** (  ) icon.
3. Select **Incidents** > **Open**.
4. Select an incident that has an active conference call.
5. Select the **Collaborate** (  ) icon from the contextual side panel.
6. Select the **Calls** tab.
7. Select the active call card.
8. Select **Meeting options**.
9. Select **Add participants**.
10. On the form, fill in the fields.

**Add participants**

| Field | Description |
|---|---|
| Add participants | Options to add participants for the conference call. |

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| Field | Description |
| --- | --- |
| Include a brief message for participants | Provide a brief summary about the issue to be discussed in the conference call. |

11. Select **Add participants**.

### Join a conference call from Microsoft Teams in Service Operations Workspace

Join an existing conference call to participate in the discussion to resolve an incident.

#### Before you begin
Role required: itil

#### Procedure

1. Navigate to **Workspaces** > **Service Operations Workspace**.
2. Select the **List** ( ) icon.
3. Select **Incidents** > **Open**.
4. Select an incident that has an active conference call.
5. Select the **Collaborate** ( ) icon from the contextual side panel.
6. Select the **Calls** tab.
7. On the **Active** card, select **Join call**.

### Mute participants from a Microsoft Teams conference call in Service Operations Workspace

Mute a participant from the conference call to avoid unnecessary background disruption.

#### Before you begin
Role required: itil

#### Procedure

1. Navigate to **Workspaces** > **Service Operations Workspace**.
2. Select the **List** ( ) icon.
3. Select **Incidents** > **Open**.
4. Select an incident that has an active conference call.
5. Select the **Collaborate** ( ) icon from the contextual side panel.
6. Select the **Calls** tab.
7. Select the active call card.
8. Mute participants to avoid background noise by selecting the Mute icon ( ).

### Leave a Microsoft Teams conference call in Service Operations Workspace

Leave an active conference call. The call will still be active with other participants.

#### Before you begin
Role required: itil

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### Procedure

1. Navigate to **Workspaces** > **Service Operations Workspace**.
2. Select the **List** (  ) icon.
3. Select **Incidents** > **Open**.
4. Select an incident that has an active conference call.
5. Select the **Collaborate** (  ) icon from the contextual side panel.
6. Select the **Calls** tab.
7. Select the active call card.
8. Select **Leave call**.

## End a Microsoft Teams conference call in Service Operations Workspace

As a host or a user with the incident manager role, you can end the conference call.

### Before you begin

Role required: itil

### Procedure

1. Navigate to **Workspaces** > **Service Operations Workspace**.
2. Select the **List** (  ) icon.
3. Select **Incidents** > **Open**.
4. Select an incident that has an active conference call.
5. Select the **Collaborate** (  ) icon from the contextual side panel.
6. Select the **Calls** tab.
7. Select the active call card.
8. Select **Leave call** drop-down menu.
9. Select **End call**.

## Reinitiate a conference call from Microsoft Teams in Service Operations Workspace

Reinitiate a conference call to discuss about the resolution of an incident.

### Before you begin

Role required: itil

### Procedure

1. Navigate to **Workspaces** > **Service Operations Workspace**.
2. Select the **List** (  ) icon.
3. Select **Incidents** > **Open**.
4. Select an incident that has an active conference call.
5. Select the **Collaborate** (  ) icon from the contextual side panel.
6. Select the **Calls** tab.
7. In the **Completed** calls, select **Reinitiate call**.

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### View a conference call recording from Microsoft Teams in Service Operations Workspace

View details for a recorded conference call in Service Operations Workspace by accessing the associated conference record as a reference.

#### Before you begin

Role required: itil

#### Procedure

1. Navigate to **Workspaces** > **Service Operations Workspace**.
2. Select the **List** ( ) icon.
3. Select **Incidents** > **Open**.
4. Select the incident record.
5. Select the **Collaborate** ( ) icon from the contextual side panel.
6. On the **Calls** tab in the **Completed calls** section, select the **View Recording** button.

### Initiate a chat from Sidebar in Service Operations Workspace

Initiate a Sidebar chat to work towards the resolution of an incident.

#### Before you begin

To know more about configuring Sidebar, refer Sidebar .

Role required: itil

#### Procedure

1. Navigate to **Workspaces** > **Service Operations Workspace**.
2. From the navigation list, select **List**.
3. Navigate to **Incidents** > **Open**.
4. Select an incident.
5. Select **Collaborate** from the contextual side panel.
6. Select **Chat** tab, and then select plus(+) icon.
7. Select **Start Sidebar discussion**.
8. On the form, fill in the fields.

#### Start Sidebar discussion

| Field | Description |
|---|---|
| Subject | Option to provide a title for the sidebar discussion.<br>**Note:** The chat count will be displayed at the beginning of the subject. |
| Add participants | Options to add participants for the sidebar discussion. |
| Include a brief message for participants | Provide a brief summary about the issue to be discussed in the sidebar discussion. |

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9. Select **Start discussion**.

> **Note:**
> If the caller doesn't read the messages within 24 hours, an email is sent as a reminder to view the messages and resume the discussion.

## Computer Telephony Integration in Service Operations Workspace

Service Operations Workspace provides an agent (with the sn_openframe_user role) to receive inbound calls and place outbound calls using the Computer Telephony Integration (CTI) interface.

The OpenFrame window is available to agents with the following roles.

- sn_openframe_user
- sn_customerservice_agent
- sn_customerservice.consumer_agent
- admin

After getting the required role, CTI must be enabled in the Service Operations Workspace by the admin. For more information about enabling CTI in the Service Operations Workspace, see Enable Computer Telephony Integration providers to interact with the Service Operations Workspace.

After the CTI integration, the agent can call a user using the phone number in the user profile and contact cards through any of these options:

> **Note:**
>
> The application's default CTI windows in the following images are provided for demo purposes only.
>
> Ensure that your instance contains the required connectors for communication.

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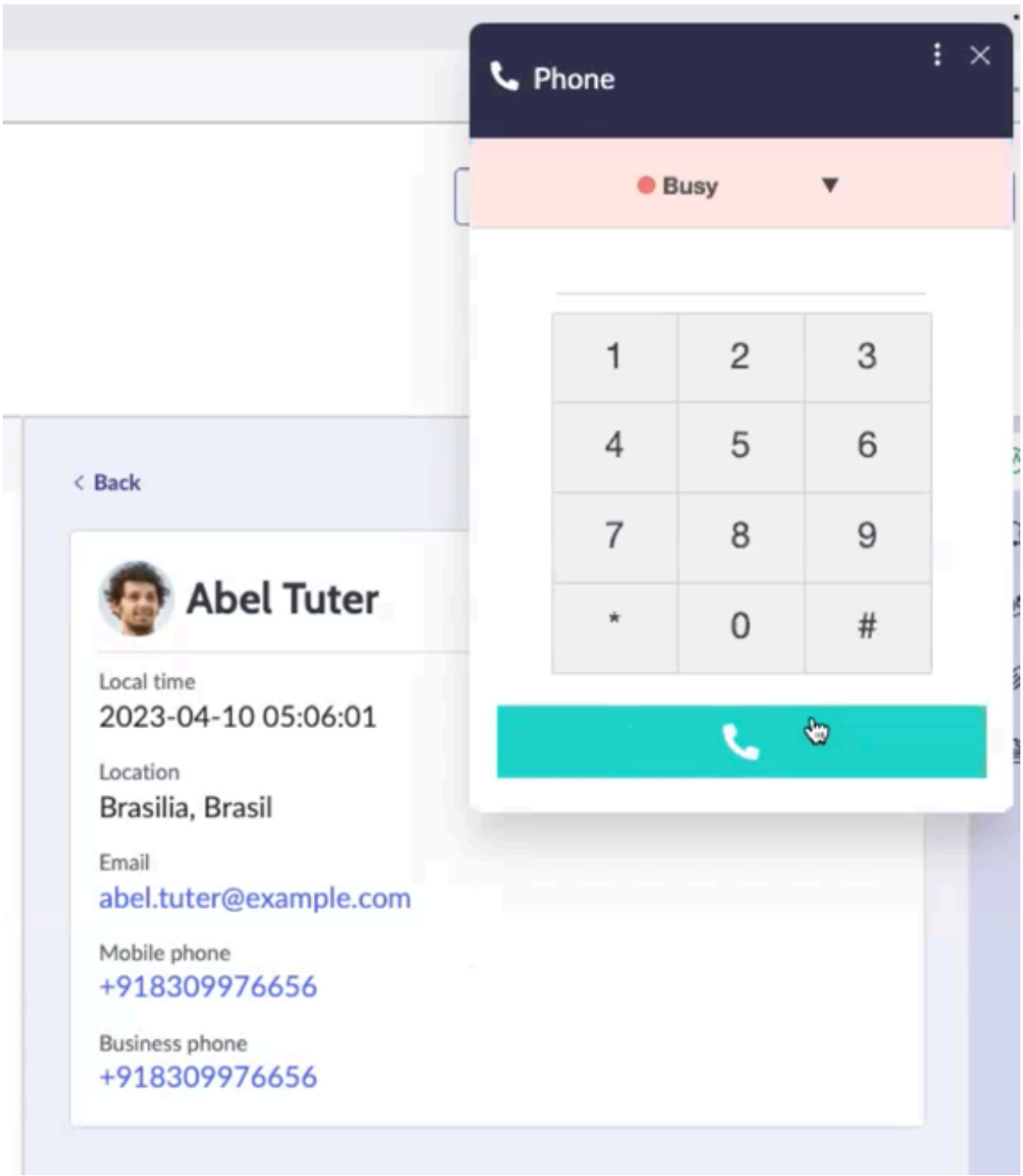
- Record information from the contextual side panel of a record.

**CTI call from record information**

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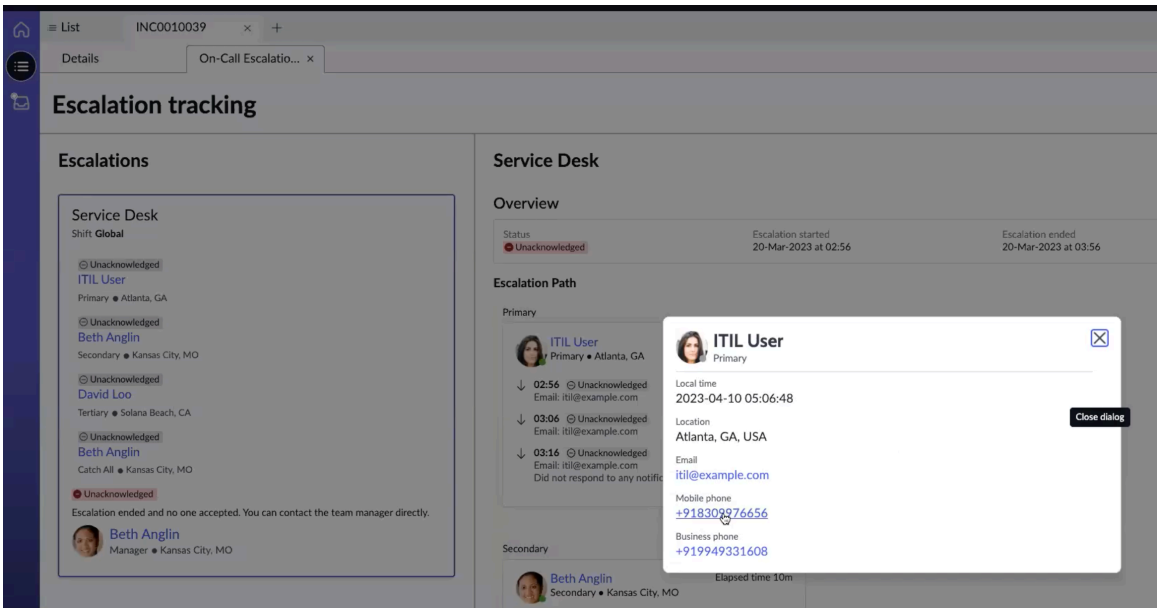
- On-call escalation.

**CTI call from an on-call escalation**




## Live Agent chat in Service Operations Workspace

Service Operations Workspace enables agents to work on any incident created using Live Agent chat.

An application admin can integrate the Live Agent into the ServiceNow application by installing the com.glide.interaction.awa plugin. For more information about installing and enabling a plugin, see Activate a plugin.

After the plugin installation, an inbox icon appears in the sidebar of the Service Operations Workspace window.

By default, the status of the agent is Offline. To start the communication, the agent must modify the status to Available.

When the customer reports an incident through Live Agent (for example, through the Service Portal), an incident is created automatically in the Inbox. The agent can then work on the incident and chat with the user simultaneously to resolve the issue.

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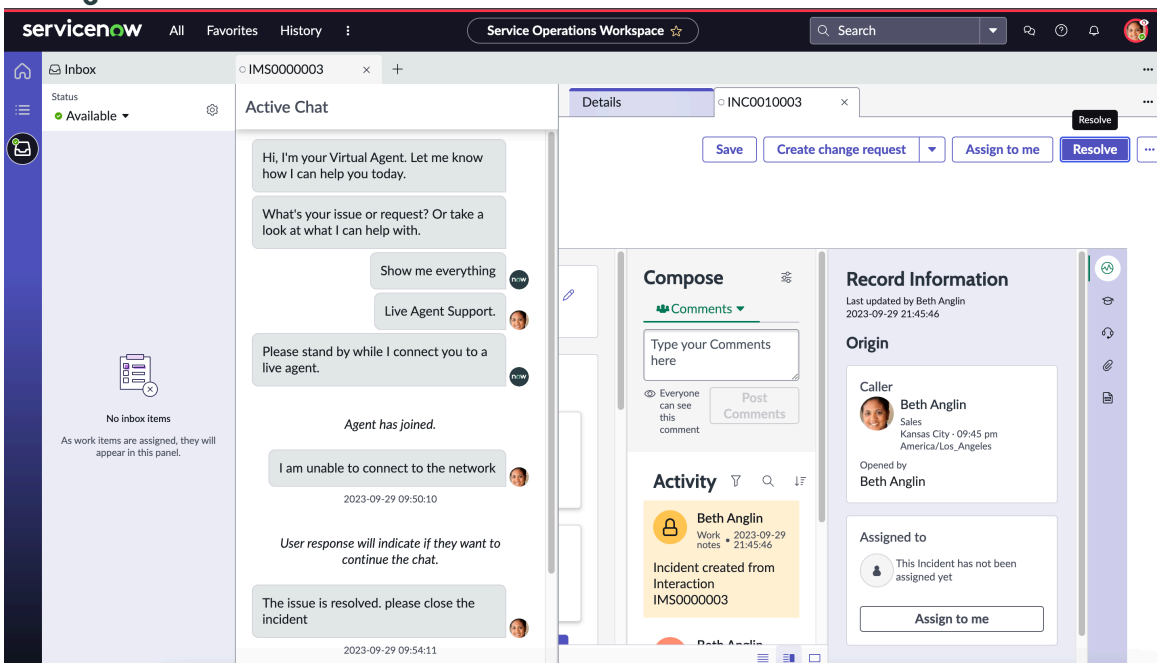
### Live Agent in SOW




For more information about Live Agent chat integration, see Move from Connect Support to Advanced Work Assignment and Agent Chat.

## Using Universal Request in Service Operations Workspace

The Universal Request is a task that a requester creates from any of the sources that include: Agent Workspace, Service Operations Workspace, or using a Virtual Agent chat.

Use the Universal Request in Service Operations Workspace to view, create, edit, and resolve universal requests.

### Create a Universal Request in Service Operations Workspace

As an agent, you can create universal requests from the Universal Request application on behalf of the requester to track and resolve issues.

#### Before you begin

Role required: itil, sn_uni_req.routing_agent, or admin

#### Procedure

1. Navigate to **All** > **Workspaces** > **Service Operations Workspace**.
2. From the navigation list, select **List**.
3. Navigate to **Universal Request** > **Open**.
4. Select **New**.
5. On the form, fill in the fields.

#### Universal Request form

| Field | Description |
|---|---|
| Number | The unique number generated for the universal request. |

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| Field | Description |
| --- | --- |
| Opened | The date and time when the universal request was created. |
| Opened by | The agent who created the universal request. |
| Opened for | The user who requested for this universal request. |
| Primary task | The task number, for example, an incident or HR case number that is associated with the universal request. |
| Contact type | The contact medium from which the universal request was created. |
| Priority | It identifies how quickly the service desk should address the request. |
| State | State of the universal request. |
| Impact | Impact value indicates a measure of the effect of an incident, problem, or change on business processes. |
| Assignment group | Group assigned to the universal request. |
| Assigned to | User assigned to the universal request. |
| Needs resolution review | When checked, and when the department agent closes the primary ticket, the Universal Request doesn't get closed. Universal Request state remains in **In Progress** and the state reason changes to **Confirm Response**. This notifies the tier 1 agent (Routing agent) to either Accept or Reject the resolution provided in the primary ticket before closing the Universal Request for the requester. |
| Short description | A brief description of the request. |
| Description | Detailed description of the request. |
| Notes section | |
| Watch list | Users to receive notifications when work notes are added. |
| Work notes list | Users to receive notifications when work notes are added.<br>**Note:**<br>The administrator must create an email notification for the work notes list. |
| Additional comments (Customer visible) | More information about the change. |
| Work notes | Information about how to resolve the universal request or steps taken to resolve it, if applicable. This note is for internal use. The work notes information isn't visible to your customer. |

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| Field | Description |
|---|---|
| Closure Information section | |
| Closed | The date and time when the universal request was closed. |
| Closed by | The agent that closed the request. |
| Close notes | How or why the universal request was closed. |

6. Select **Submit**.

### Cancel a Universal Request in Service Operations Workspace

Cancel the Universal Request if the issue is resolved already or you no longer require the request.

#### Before you begin
Role required: admin

#### About this task
You can cancel a universal request only if there are no active or closed primary tickets attached to it. You can cancel a universal request in **New** or **In Progress** state's only. When the universal request is canceled, email notifications are sent to the stakeholders associated with the request.

#### Procedure
1. Navigate to **All** > **Workspaces** > **Service Operations Workspace**.
2. From the navigation list, select **List**.
3. From the navigation list, select **Universal Request** > **Open**.
4. From the list of open universal requests, select the request you want to cancel.
5. Select **Canceled** from the **State** field.

> **Note:**
> If the person in **Opened for** tries to cancel the request, then they must enter the reason for canceling.

6. Select **Update**.

### Use Agent assist in Service Operations Workspace

Use the Agent assist in Service Operations Workspace to find similar Universal Requests that are open and closed, Knowledge articles, Catalog items, and Pinned articles.

#### Before you begin
Role required: itil, sn_uni_req.routing_agent, or admin

#### Procedure
1. Navigate to **All** > **Workspaces** > **Service Operations Workspace**.
2. From the navigation list, select **List**.
3. From the navigation list, select **Universal Request** > **Open**.
4. Select the universal request from the list.
5. In **Agent Assist**, select the settings icon ( ) and select your resource from the list.

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- Similar Closed Universal Request: To display all similar Universal Requests that are closed.
- Universal Request: To display all similar Universal Requests that are available.
- Knowledge and Catalog: To display all related knowledge articles and catalog items.
- Knowledge Articles: To display all related knowledge articles.
- Catalog Items: To display all related catalog items.
- Pinned articles: To display all related pinned articles.

### Transfer a primary ticket in Service Operations Workspace

You can transfer a primary ticket to Universal Request, service set (department), or service either with resolution or without resolution.

#### Before you begin

Role required: itil, the agents part of the assignment group or the agents on the primary ticket can perform this task.

#### Procedure

1. Navigate to **All** > **Workspaces** > **Service Operations Workspace**.
2. From the navigation list, select **List**.
3. From the navigation list, select **Universal Request** > **Open**.
4. Open the primary task that you want to route to a Universal Request.
5. Select **Transfer**.
6. In the **Transfer Ticket** dialog, provide the following details.
   - **Department**: Select the department from the list.
   - **Service**: Select the specific service of the chosen department.
   - **Transfer reason**: Select the reason from the list.
   - **Transfer notes**: A brief description for routing the primary ticket that you want to pass to the agent.
   - **Copy additional comments and attachments**: Deselect if you do not want to transfer the ticket with additional comments and attachments. By default, all attachments and comments are transferred.

     **Note:**
     Work notes aren't copied while transferring.

7. Select **Transfer**.

### Restrict or unrestrict universal request access in Service Operations Workspace

Mark a universal request as restricted or unrestricted when you identify that the request contains sensitive information.

#### Before you begin

Role required: routing agents, sn_uni_req.sensitiveinfo_agent or service-specific assignment group members

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### Procedure

1. Navigate to **All** > **Workspaces** > **Service Operations Workspace**.
2. From the navigation list, select **List**.
3. From the navigation list, select **Universal Request** > **Open**.
4. Navigate to the universal request that you want to mark as restricted.
5. On the form, select the **Restrict** button.

#### Mark the universal request as unrestricted in Service Operations Workspace

You can mark a restricted universal request as unrestricted if you identify that the request doesn't have any sensitive information.

### Before you begin

Role required: sn_uni_req.sensitiveinfo_agent or service specific assignment group members

### Procedure

1. Navigate to **All** > **Workspaces** > **Service Operations Workspace**.
2. From the navigation list, select **List**.
3. From the navigation list, select **Universal Request** > **Open**.
4. Navigate to the universal request that you want to mark as unrestricted.
5. On the form, select the **Unrestrict** button.

## Using Universal Task in Service Operations Workspace

Agents can use the Universal Task application to create tasks for employees and to manage the request resolution.

#### Create a universal task for a universal request in Service Operations Workspace

Create a universal task for a request and assign it to the employee or create multiple tasks for a request by using Universal Task.

### Before you begin

Role required: admin

### Procedure

1. Open the ticket that you want to create a universal task for.
2. Click the UI action for creating a universal task.
3. On the form, fill in the fields.

#### Universal Task form fields

| Field | Description |
|---|---|
| Number | Unique number that is generated for the Universal Task. |
| Parent | Number of the parent case or request. |
| Parent Assignment Group | Group assigned to the parent case or request. |
| Parent Assigned to | Agent primarily responsible for working on the parent case or request. |

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| Field | Description |
|---|---|
| Type | Type of task being assigned. |
| Employee form | Mandatory employee form.<br>**Note:**<br>This field appears only if the Collect Employee Input task is selected in the **Type** field. |
| Survey instance | Link to the completed employee form.<br>**Note:**<br>This field appears only if the Collect Employee Input task is selected in **Type** field, and the value of the **State** field is complete. |
| Template | Task template to auto-fill the task form. |
| State | State of the Universal Task. |
| Priority | Value that identifies how quickly the service desk should address the request. |
| Assignment group | Group assigned to the Universal Task. This field is available for the **Mark When Complete** and **Checklist** task types. Other tasks types require a mandatory update of the **Assigned to** field with the **Assignment group**.<br>**Note:**<br>Email notifications are sent only for the two task types. |
| Assigned to | Employee assigned to the Universal Task. |
| Due date | Expected date for the employee to complete the task. |
| Watch list | Users to receive notifications when there is any change in the task status. |
| Short description | Brief description of the request |
| Description | Detailed description of the request |
| Additional comments (Customer visible) | More information about the change. The information in this field is visible to the customer. |
| Work notes | Information about how to resolve the Universal Task or steps taken to resolve it, if applicable. This note is for internal use. The work notes information is not visible to customers. |

4. Select one of the following.

## Service Operations Workspace for ITSM reference

Reference topics provide additional information about ServiceNow Service Operations Workspace.

For information about components installed with Service Operations Workspace for ITOM, see Service Operations Workspace for ITOM reference.

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## Components installed with Service Operations Workspace ITSM Applications

Several types of components are installed with the Service Operations Workspace ITSM Applications application (sn-sow-itsm-cont) installation, including user role, plugins, and ServiceNow Store applications.

### Roles installed

| Role title [name] | Description | Contains roles |
|---|---|---|
| Service Operations Workspace user<br><br>[sn_sow.sow_user] | Enables users to access and perform basic operations in Service Operations Workspace. | None |

### Plugins installed

| Plugin | Description |
|---|---|
| UX Framework User Criteria<br><br>[com.glide.ux.user_criteria] | UX framework for user criteria. |
| Dynamic Related Records for Configurable Workspace<br><br>[com.snc.uib.sn_dyn_rel_rec] | Framework to display the contextual dynamic Related Records section in a configurable workspace. |

### Store applications installed

| Store application | Description |
|---|---|
| Record Page for Service Operations Workspace<br><br>[sn_sow_record] | Record view that is used across various applications in Service Operations Workspace. This view includes detailed record information such as actions and related records. |
| Quick links component for Service Operations Workspace<br><br>[sn_sow_quick_links] | Framework to create and maintain a list of customized hyperlinks in Service Operations Workspace. |
| Service Operations Workspace Core<br><br>[sn_sow] | Core capabilities and workspace configurations for Service Operations Workspace. |
| Change Management for Service Operations Workspace | Change creation process in Service Operations Workspace. |

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| Store application | Description |
| --- | --- |
| [sn_sow_chg] | |
| Collaboration services for Service Operations Workspace<br><br>[sn_sow_collab] | Collaboration between peers and requester using Microsoft Teams in Service Operations Workspace. |
| Incident Management for Service Operations Workspace<br><br>[sn_sow_inc] | Streamlined and automated incident response process to respond to an unplanned event or service interruption and to restore services in Service Operations Workspace. |
| Recommendations for Incident Management<br><br>[sn_sow_incident_rf] | Configurations to predict recommendations for an incident, for example, recommendation rules, in Service Operations Workspace. Use information from similar incidents and knowledge articles to resolve incidents faster. |
| Interaction Management for Service Operations Workspace<br><br>[sn_sow_interaction] | Streamlined interaction process to respond through a communication channel (chat, phone conversation, or walk-up) in Service Operations Workspace. |
| Interceptor UI for Service Operations Workspace<br><br>[sn_sow_interceptor] | Interceptor user interface to create a task type for change and problem in Service Operations Workspace. |
| Service Operations Workspace ITSM Common<br><br>[sn_sow_itsm_common] | Common configurations shared across IT Service Management applications in Service Operations Workspace. |
| On Call Scheduling for Service Operations Workspace<br><br>[sn_sow_on_call] | On-call support for incidents in Service Operations Workspace. |
| Problem Management for Service Operations Workspace<br><br>[sn_sow_problem] | Problem creation process to identify the cause of a service interruption reported by a significant or recurring incidents in Service Operations Workspace. |
| Request Management for Service Operations Workspace<br><br>[sn_sow_req] | Request creation process and support for the entire life cycle of requests in Service Operations Workspace. |

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| Store application | Description |
|---|---|
| Walk-up Experience for Service Operations Workspace<br><br>[sn_sow_walkup] | Setup for walk-up queues, stockroom, and appointments in Service Operations Workspace. |
| Recommendation Framework<br><br>[sn_rf] | Framework to generate contextual, actionable, and dynamic recommendations in a configurable workspace. |
| Service Level Management Experience for Workspace<br><br>[sn_sla] | Gathers service requirements and monitors and reports with reference to agreed service levels (SLAs) in a configurable workspace. |
| Service Operations Workspace Admin Center<br><br>[sn_sow_admin] | Provides quick access to configurations of customisable pages in Service Operations Workspace and recommends the additional setup needed to extend Service Operations Workspace capabilities. |
| Service Operations Workspace ITSM Admin Center<br><br>[sn_sow_itsm_admin] | Provides quick access to ITSM related configurations in Service Operations Workspace. |

## Components installed with Major Incident Management

Several types of components are installed with the Major Incident Management (sn-sow-mim) installation, including user roles, tables, plugins, and ServiceNow Store applications.

**Note:**
The Application Files table lists the components that are installed with this application. For instructions on how to access this table, see Find components installed with an application.

Demo data is available for this feature.

## Roles installed

| Role title [name] | Description | Contains roles |
|---|---|---|
| Major incident manager<br><br>[major_incident_manager] | A major incident manager can:<br>• Initiate the major incident process by assessing and approving major incident candidates or creating a major incident.<br>• Reject a major incident candidate.<br>• Demote a major incident after it's accepted so that the incident can be handled as a regular incident. | This role inherits the ia_admin role. |

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| Role title [name] | Description | Contains roles |
|---|---|---|
| | • Maintain the ownership and accountability for the life cycle of the incident.<br>• Identify the users and groups to be involved in the resolution activities.<br>• Create adhoc communication plans and tasks.<br>• Edit a communication plan that's attached to a major incident.<br>• Close a major incident. | |
| Communications manager<br>[communication_manager] | A communications manager can:<br>• Manage communications for major incidents and communicates with all stakeholders.<br>• Create adhoc communication plans and tasks.<br>• Edit a communication plan that is attached to a major incident. | This role inherits the ia_admin role. |
| Incident Manager<br>[incident_manager]<br>(Existing role with added responsibilities) | An incident manager can:<br>• Manage incident properties and major incident trigger rules.<br>• Create and edit Communication Plan Definitions. | None. |

## Tables installed

| Table | Description |
|---|---|
| Major Incident Trigger Rules<br>[major_incident_trigger_rule] | This table extends the Application File [sys_metadata] table and stores the major incident trigger rules. |

## Plugins installed

| Plugin | Description |
|---|---|
| Task Communications Management<br>[com.snc.task_communication_management] | Provides a framework for defining and managing a communication process for any entity that extends the task table. |
| Collaboration services for Task Communications Management<br>[com.snc.tcm_collab_hook] | Provides collaboration interface with Microsoft Teams, Slack, and Zoom. |
| Microsoft Teams<br>[com.snc.ms_teams] | Provides call and chat functionality for communications. |

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| Plugin | Description |
|---|---|
| Zoom<br><br>[com.sn.zoom.spoke] | Provides call and chat functionality for communications. |
| SOW UI Builder<br><br>[com.snc.uib.sow] | Enables building and configuring the UI as required. |

## Components installed with Agent Client Collector for Investigation

Several types of components are installed with activation of the Agent Client Collector for Investigation (sn_acc_adapter) application, including user roles and ServiceNow Store applications.

**Note:**
The Application Files table lists the components that are installed with this application. For instructions on how to access this table, see Find components installed with an application.

Demo data is available for this feature.

## Roles installed

| Role title [name] | Description | Contains roles |
|---|---|---|
| Metrics user<br><br>[sn_cimaf.sn_cimaf_read] | Enables users to access and perform basic operations in the Metrics Collector Framework such as view metric definition. | None |
| Metrics admin<br><br>[sn_cimaf.sn_cimaf_admin] | Enables users to install the application, add, configure the tables, and also view the metric definition. | [sn_cimaf.sn_cimaf_read] |
| Investigate Framework Admin<br><br>[sn_invest_fwk.sn_investigate_admin] | Enables users to install the Investigation Framework application and manage the Investigate Framework modules. | [sn_cimaf.sn_cimaf_admin] |

## Store applications installed

| Store application | Description |
|---|---|
| Metrics and CI Actions Framework<br><br>[sn_cimaf] | Core framework capabilities and configurations for Agent Client Collector for Investigation application, including API data and CI actions framework. For more information on the roles and tables installed, see Components installed with Metrics and CI Actions Framework |
| Investigation Framework | Framework to analyze the affected CIs using the metrics information. |

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| Store application | Description |
|---|---|
| [sn_invest_fwk] | |
| Remedial Actions Framework<br><br>[com.snc.sn_reacf] | Framework to remediate or resolve the CI related issues. For more information on the roles and tables installed, see Components installed with Remedial Actions Framework. |

## Components installed with Microsoft Endpoint Configuration Manager for Investigation

Several types of components are installed with activation of the Microsoft Endpoint Configuration Manager for Investigation (sn_mecm_adapter) application, including user roles and ServiceNow Store applications.

**Note:**
The Application Files table lists the components that are installed with this application. For instructions on how to access this table, see Find components installed with an application.

Demo data is available for this feature.

### Roles installed

| Role title [name] | Description | Contains roles |
|---|---|---|
| Metrics user<br><br>[sn_cimaf.sn_cimaf_read] | Enables users to access and perform basic operations in the Metrics Collector Framework such as view metric definition. | None |
| Metrics admin<br><br>[sn_cimaf.sn_cimaf_admin] | Enables users to install the application, add, configure the tables, and also view the metric definition. | [sn_cimaf.sn_cimaf_read] |
| Investigate Framework Admin<br><br>[sn_invest_fwk.sn_investigate_admin] | Enables users to install the Investigation Framework application and manage the Investigate Framework modules. | [sn_cimaf.sn_cimaf_admin] |

### Store applications installed

| Store application | Description |
|---|---|
| Metrics and CI Actions Framework<br><br>[sn_cimaf] | Core framework capabilities and configurations for Microsoft Endpoint Configuration Manager for Investigation application, including API data and CI actions framework. For more information on the roles and tables installed, see Components installed with Metrics and CI Actions Framework. |
| Investigation Framework | Framework to analyze the affected CIs using the metrics information. |

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| Store application | Description |
|---|---|
| [sn_invest_fwk] | |
| Remedial Actions Framework<br><br>[com.snc.sn_reacf] | Framework to remediate or resolve the CI related issues. For more information on the roles and tables installed, see Components installed with Remedial Actions Framework. |

## Components installed with Remedial Actions Framework

Several types of components are installed with activation of the Remedial Actions Framework (com.snc.sn_reacf) application, including user roles and tables.

**Note:**
The Application Files table lists the components that are installed with this application. For instructions on how to access this table, see Find components installed with an application.

### Roles installed

| Role title [name] | Description | Contains roles |
|---|---|---|
| Remedial action user<br><br>[sn_reacf.sn_remedial_action_read] | Enables users to access and read the Remedial Action Execution table and remediate CI related issues using remedial actions.<br><br>**Note:** itil role contains this role. | cmdb_read |
| Remedial action admin<br><br>[sn_reacf.sn_remedial_action_admin] | Enables users with read and write access to all Remedial Action configuration tables. | • sn_reacf.sn_remedial_action_read<br>• flow_operator |

### Tables installed

| Tables | Description |
|---|---|
| Remedial action<br><br>[sn_reacf_remedial_action] | List of remedial actions (definitions) such as End Process - Device, Restart Service - Server and so on. |

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| Tables | Description |
|---|---|
| Remedial action parameter<br><br>[sn_reacf_remedial_action_parameter] | List of parameters required to execute the remedial actions such as process ID, assigned to and so on. |
| Remedial action role<br><br>[sn_reacf_remedial_role] | List of roles required to access and execute the remedial actions. |
| User criteria action inclusion<br><br>[sn_reacf_remedial_user_criteria_mtom] | List of user criteria which are allowed to execute the Remedial Action. |
| User criteria action exclusion<br><br>[sn_reacf_remedial_user_criteria_no_mtom] | List of user criteria which aren't allowed to execute the Remedial Action. |
| Remedial action type<br><br>[sn_reacf_remedial_action_type] | List of remedial action types such as CI action and standard change. |
| Remedial action origin<br><br>[sn_reacf_remedial_action_origin] | List of applications where the Remedial Action Framework is used. |
| Remedial action execution<br><br>[sn_reacf_remedial_action_execution] | List of execution records that are created for each remedial action when executed. The record is used to track the progress and maintain the information. The record includes information such as executed remedial action, parameter values, action execution record, parent record, target record, current state, user who executed the remedial action and origin.<br><br>**Note:**<br>This table is read only. |

## Components installed with Metrics and CI Actions Framework

Several types of components are installed with activation of the Metrics and CI Actions Framework (sn_cimaf) application, including user roles and ServiceNow Store applications.

**Note:**
The Application Files table lists the components that are installed with this application. For instructions on how to access this table, see Find components installed with an application.

## Roles installed

| Role title [name] | Description | Contains roles |
|---|---|---|
| Metrics and CI Actions user<br><br>[sn_cimaf.sn_cimaf_read] | Enables users to access and read Metric, Action Request and Action Output tables. | cmdb_read |

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| Role title [name] | Description | Contains roles |
|---|---|---|
| | **Note:** itil role contains this role. | |
| Metrics and CI Actions admin<br><br>[sn_cimaf.sn_cimaf_admin] | Enables users with read and write access to all Metrics and CI Actions configuration tables. | • sn_cimaf.sn_cimaf_read<br>• flow_operator |

## Tables installed

| Tables | Description |
|---|---|
| Provider<br><br>[sn_cimaf_provider] | List of providers such as Agent Client Collector (ACC) or Microsoft Endpoint Configuration Manager (MECM). |
| Metric Definition<br><br>[sn_cimaf_metric_definition] | List of metric definitions such as Asset usage, Running processes and so on. |
| Adapter Configuration<br><br>[sn_cimaf_adapter_config] | List of configurations for the adapter. You can define the provider such as Agent Client Collector (ACC) or Microsoft Endpoint Configuration Manager (MECM), query and transform flows or scripts. |
| Adapter Applicability Rule<br><br>[sn_cimaf_adapter_applicability_rule] | List of adapter applicability rules that enables you to configure on which CIs, the selected adapter configuration is applicable. |
| Provider Specific Adapter Configuration<br><br>[sn_cimaf_provider_specific_adapter_config] | List of adapter configuration for a specific provider such as Agent Client Collector (ACC) or Microsoft Endpoint Configuration Manager (MECM). |
| Collection Rule<br><br>[sn_cimaf_collection_rule] | List of collection rules that enables you to configure when the metrics should be auto-collected. |
| Collection Rule Metric Association<br><br>[sn_cimaf_collection_rule_metric_asscn] | List of records that are created for the association of the collection rules with metric definitions. |
| Metric<br><br>[n_cimaf_metric] | List of metrics fetched. The metric record contains the information such as metric definition, CI, timestamp and the actual metric payload.<br><br>**Note:** This table is read only. |
| Action<br><br>[sn_cimaf_action] | List of CI actions such as End Process or Restart service and so on. |

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| Tables | Description |
| --- | --- |
| Action Role<br><br>[sn_cimaf_action_role] | List of roles required to access and execute the CI actions.<br><br>**Note:**<br>One CI action can be mapped to multiple roles. |
| User Criteria Action Inclusion<br><br>[sn_cimaf_action_user_criteria_mtom] | List of user criteria which are allowed to execute the CI Action. |
| User Criteria Action Exclusion<br><br>[sn_cimaf_action_user_criteria_no_mtom] | List of user criteria which aren't allowed to execute the action.<br><br>**Note:**<br>This table is prioritized over the Action Role and User Criteria Action Inclusion configuration tables. |
| Action Configuration<br><br>[sn_cimaf_action_config] | List of action configurations applicable to CI. You can create multiple configurations for a CI action based on different providers or CI class. |
| Action Parameter<br><br>[sn_cimaf_action_parameter] | List of parameters required to execute the CI action. |
| Action Configuration Step<br><br>[sn_cimaf_provider_specific_action_config] | List of sequential steps to be executed for any Action Configuration. |
| Action Request<br><br>[sn_cimaf_action_request] | List of the CI action execution records. The record includes information such as parameters, CI details, and CI action and current status.<br><br>**Note:**<br>This table is read only. |
| Action Output<br><br>[sn_cimaf_action_output] | List of the CI action output records. Each record is linked to the record in action request table. The record includes information such as action request record, action configuration step, payload, state, and request ID.<br><br>**Note:**<br>This table is read only. |

## Recommendation rules for an incident in Service Operations Workspace

Recommendations for an incident are based on rules defined in Recommendation Framework.

Recommendation Framework is now deprecated and no longer supported or available for new activation. Recommended Actions for ITSM feature provides the latest experience for this

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functionality. To get the advanced version, you must install the Advanced Recommended actions for ITSM (com.snc.uib.sow_itsm_ra_advanced) plugin and you must procure ITSM Pro package subscription.

**Note:**
The best practice to get the advanced version is to install the Task Intelligence for ITSM (com.snc.itsm_ml_task) plugin and procure the ITSM Pro package subscription. For more information, see Exploring Recommended Actions for ITSM in Service Operations Workspace.

For each recommendation rule to work, install the relevant plugin that installs the corresponding solution definition. Based on this solution definition, the recommendation rule predicts values or records for an incident.

For information about the plugins and the corresponding solution definitions, see Configuring Recommendation Framework in Service Operations Workspace.

**Recommendation rules for field-level recommendations on an incident form**

| Recommendation rule | Solution definition | Incident field where the recommendation is available |
|---|---|---|
| Assignment group recommendation | Incident Assignment<br><br>Predicts values for the **Assignment group** field based on the short description of the incident. | Assignment group |
| Configuration item | Incident Configuration Item<br><br>Predicts values for the **Configuration Item** field based on the short description of the incident. | Configuration item |
| Service recommendation rule | Incident Service<br><br>Predicts values for the **Incident Configuration Item** field based on the short description of the incident. | Service |

**Recommendation rules for card groups in the Recommendations panel**

| Recommendation rule | Solution definition | Associated card group in the Recommendations panel | Primary action for the card group | Other actions for the card group |
|---|---|---|---|---|
| Knowledge articles | Similar Knowledge Articles<br><br>Predicts knowledge articles that the | Knowledge articles | Attach: Attaches the recommended knowledge article to the current incident. On the incident record page, this article is displayed in | Discard: Discards the recommendation and moves it to the **History** tab in the **Recommendations** panel. |

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**Recommendation rules for card groups in the Recommendations panel (continued)**

| Recommendation rule | Solution definition | Associated card group in the Recommendations panel | Primary action for the card group | Other actions for the card group |
|---|---|---|---|---|
| | current incident can be linked to. | | the Attached Knowledge list of the **Related records** tab. | |
| Propose major incident | Major Incident Recommendation<br><br>Recommends the current incident to be proposed as a major incident. | Propose major incident | Propose major incident: Proposes the current incident as a major incident. The **Major incident state** field is set to **Proposed** for the incident. | View similar incidents: Displays a list of similar incidents related to the current incident. After viewing similar incidents, you can decide if the current incident can be proposed as a major incident. |
| Relevant problems | Similar Open Problems<br><br>Predicts relevant problems that the incident can be linked to. | Relevant problems | Link problem: Links the recommended problem to the current incident. On the incident record page, this problem is displayed in the **Related Records** section of the **Details** tab. | Discard: Discards the recommendation and moves it to the **History** tab in the **Recommendations** panel. |
| Similar major incidents | Major Incident Recommendation<br><br>Predicts similar active major incidents that the current incident can be linked to. | Similar major incidents | Add as a child incident: Adds the recommended incident as a parent to the current incident. On the current incident record page,the parent incident is then displayed in the **Related Records** section of the **Details** tab. | Discard: Discards the recommendation and moves it to the **History** tab in the **Recommendations** panel. |
| Similar open incidents | Similar Open Incidents | Similar open incidents | Link as a parent incident: Adds the recommended | Discard: Discards the recommendation and moves it to the |

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**Recommendation rules for card groups in the Recommendations panel (continued)**

| Recommendation rule | Solution definition | Associated card group in the Recommendations panel | Primary action for the card group | Other actions for the card group |
|---|---|---|---|---|
| | Predicts similar open incidents that the current incident can be linked to. | | incident as a parent to the current incident. On the current incident record page, the parent incident is then displayed in the **Related Records** section of the **Details** tab. | **History** tab in the **Recommendations** panel. |
| Similar resolved incidents | Similar Resolved Incidents<br><br>Predicts similar resolved incidents to help with incident investigation and resolution processes. | Similar resolved incidents | Link incident: Links the recommended incident to the current incident. On the current incident record page, the linked incident is then displayed as the parent incident in the **Related Records** section of the **Details** tab. | Discard: Discards the recommendation and moves it to the **History** tab in the **Recommendations** panel. |

## Recommended Actions for ITSM reference

Reference topics provide additional information about various form fields and components installed with Recommended Actions for ITSM.

### Contexts in Recommended Actions for ITSM

The ITSM base system includes the following context.

| Context | Description |
|---|---|
| Incident context | This will show all valid recommendations on incidents based on the active recommendations in the Service Operations Workspace. |

### Rules in Recommended Actions for ITSM

ITSM base system includes the following rules.

| Rule | Description |
|---|---|
| Active incident | This will show all valid recommendations if the incident is active. |
| Active non-child non-MI Incident | This will show all valid recommendations if the incident is active, with no child incident, and which is not a major incident. |

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### Guidance based recommendations in Recommended Actions for ITSM

ITSM base system includes the following guidance based recommendations.

| Recommendation | Description |
|---|---|
| Open PRBs (CI & service) | Returns guidance-based recommendations. The problems which have matching Configuration item or Service with the current incident record and which were created within last seven days appear. Atmost five recommendations for such type for an incident appear.<br><br>Select **Link to Problem** action- to associate the incident with the recommended problem. |
| Open incidents (CI & Service) | Returns guidance-based recommendations. The open incidents which have matching Configuration item or Service with the current incident record and which were created within the last six months appear. Atmost five recommendations for such type for an incident appear.<br><br>Select **Make parent** action to make the incident as the parent to the recommended incident. |
| Similar Resolved incidents (CI & Service) | Returns guidance-based recommendations. The resolved incidents which have matching Configuration item or Service with the current incident and which were created within the last six months appear. Atmost five recommendations for such type for an incident appear.<br><br>Select **Copy resolution** action- to copy the resolution and associate the incident with the recommended resolved incident. |
| Propose Major Incident (Trend) | Returns guidance-based recommendations. Based on the similarity with Trend, this returns incidents as recommendations.<br><br>Select **Propose as Major Incident** to propose the incident as major incident. |
| Similar KB Articles (Similarity) | Returns guidance-based recommendations. Based on the similarity , this returns KB articles as recommendations.<br><br>Select **Attach KB** to attach the KB article to the current incident. |
| Similar Major Incident (Trend) | Returns guidance-based recommendations. Based on the similarity with Trend, this returns major incidents as recommendations.<br><br>Select **Link Major incident as Parent** to link the recommended major incident to the current incident.<br><br>The current incident becomes child of the recommended major incident. |
| Similar Open Incidents (Similarity) | Returns guidance-based recommendations. Based on the similarity, this returns open incidents.<br><br>Select **Link as parent** incident to link the recommended incident to current incident. |

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| Recommendation | Description |
|---|---|
| | The current incident becomes child of the recommended open incident. |
| Similar Open PRBs (Similarity) | Returns guidance-based recommendations. Based on the similarity model, this returns open problems.<br><br>Select **Link Problem as Parent** to link the current incident to the recommended open problem.<br><br>The current incident has a problem field, which gets linked to the recommended problem. |
| Similar Resolved Incidents (Similarity) | Returns guidance-based recommendations. Based on the similarity, this returns resolved incidents.<br><br>Select **Copy resolution** to copy the resolution of the resolved recommended incidents to the current incident. |

### Field level recommendations in Recommended Actions for ITSM

ITSM ITSM base system includes the following field level recommendations.

| Recommendation | Description |
|---|---|
| Service (Classification) | Returns Predictive Intelligence based field recommendations. This will give field predictions in the Service field of the current incident. |
| Assignment group (Classification) | Returns Predictive Intelligence based field predictions in the Assignment Group field of the current incident. |
| Configuration item (Classification) | Returns Predictive Intelligence based field predictions in the Configuration item field of the current incident. |
| Incident Fields value prediction (TI) | Returns Task Intelligence for ITSM based field predictions in the Service Assignment Group, Configuration item fields of the current incident. |

### Guidances in Recommended Actions for ITSM

ITSM base system includes the following guidances.

| Guidance | Description |
|---|---|
| Link open incident | Enables agents to link the current incident to an existing open incident by clicking on Link to this incident link on recommended record, which sets the open incident as the parent of the current incident. |
| Link open problem | Enables agents to link the current case to an existing open problem by clicking on Link to this problem link on recommended record, which sets the open problem as the parent of the current incident. |
| Link to major incident | Enables agents to link the current case to an existing major incident by clicking on Link to this major incident link on a recommended record, which sets the major incident as the parent of the current incident. |
| Attach KB | Enables agents to attach the KB article to the current incident. |

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| Guidance | Description |
|---|---|
| Copy resolution | Copies the resolution of the resolved resolution to the current incident. |
| Propose Major Incident | Enables agents to propose a recommended incidents as major incidents. |
| [Non-ML] Copy Resolution | This guidance is used only for Non-ML recommendations. Enables agents to copy resolutions of the resolved incidents to the current incident. |
| [Non-ML] Link open incident | This guidance is specially used only for Non-ML recommendations. Enables agents to link the open incidents to the current incident. |
| [Non-ML] Link open problem | This guidance is specially used only for Non-ML recommendations. Enables agents to link the open problems to the current incident. |

### Resource generators in Recommended Actions for ITSM

ITSM base system includes the following resource generators.

| Resource Generator | Description |
|---|---|
| Assignment group using Classification | The recommendation- **Assignment group (Classification)**,uses this resource generator to return field predictions in the Assignment group field of the current incident. |
| Configuration item using Classification | The recommendation- **Configuration item (Classification)**, uses this resource generator to return field predictions in the configuration item field of the current incident. |
| Incident Fields predictions TI | The recommendation- **Incident Fields value prediction (TI)**, uses this resource generator to return field predictions in the Assignment group, configuration item, and service fields of the current incident. |
| Open PRBs using CI & Service | The recommendation- **Open PRBs (CI & service)**, uses this resource generator to return problems with same CI & Service, which can be linked to current incident. |
| Propose major incident using trend | The recommendation- **Propose Major Incident (Trend)**,uses this resource generator to return incidents which can be proposed as a major incident. |
| Resolved Incidents with same CI & Service | The recommendation- **Similar Resolved incidents (CI & Service)**, uses this resource generator to return resolved incidents with same CI & Service, whose resolution can be linked to current incident. |
| Service using Classification | The recommendation- **Service (Classification)**, uses this resource generator to return field predictions in the Service field of the current incident. |
| Similar KBs using similarity | The recommendation- **Similar KB Articles (Similarity)**, uses this resource generator to return KB articles as recommendations which can be attached to the current incident. |

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| Resource Generator | Description |
|---|---|
| Similar major incident using trends | The recommendation- **Similar Major Incident (Trend)**, uses this resource generator to return major incidents which can be linked to the current incident. |
| Similar open incidents using similarity | The recommendation- **Similar Open Incidents (Similarity)**, uses this resource generator to return open incidents which can be linked to the current incident. |
| Similar Open Incidents with same CI & Service | The recommendation- **Similar Resolved incidents (CI & Service)**, uses this resource generator to return open incidents with same CI & Service. |
| Similar PRBs using similarity | The recommendation- **Similar Open PRBs (Similarity)**, uses this resource generator to return problems which can be linked to the current incident. |
| Similar resolved incidents using similarity | The recommendation- **Similar Resolved Incidents (Similarity)**, uses this resource generator to return resolved incidents whose resolution can be copied to the current incident. |

## Reference section for Problem Management in Service Operations Workspace

Reference topics provide additional information about Problem Management in Service Operations Workspace.

### Problem form

Description of the field values for the problem form in Service Operations Workspace.

#### Create New Problem form

| Field | Description |
|---|---|
| Problem | |
| Problem statement | Brief description of the problem. |
| Description | Detailed description of the problem. |
| Number | Unique number that identifies the problem record. |
| First reported by | Task that first identified this problem. |
| Category and Subcategory | Group to which the problem belongs, such as software or hardware. After selecting the category, select the subcategory, if applicable. |
| State | Value that changes as the problem proceeds from one state to another state.<br><br>For information about state transitions of a problem, see Life cycle of a problem. |
| Impact | Effect that the problem has on business operations. |
| Urgency | Extent to which the problem resolution can bear delay. |

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**Create New Problem form (continued)**

| Field | Description |
|---|---|
| Priority | How quickly the service desk should address the problem. The **Priority** field is automatically set to the **Impact** and **Urgency** values. |
| Impact | |
| Service | Business service, such as email or IT Services, that the problem applies to. |
| Service Offering | Consists of one or more service commitments that uniquely define the level of service in terms of availability, scope, pricing, and packaging options. Service offering enables you to receive different features and their levels of performance for a given service. |
| Configuration item | Configuration item (CI) that the problem applies to. The CI class of the selected configuration item identifies the type of problem, for example, hardware, network, or database. |
| Assignment | |
| Assignment group | Group to which the problem is assigned.<br><br>You can populate the **Assignment group** field automatically based on the support group available for the respective configuration item (CI). If the CI does not have any support group, then the field gets populated with the support group available for service offerings. The business rule **Populate Assignment Group based on CI/SO** triggers the functionality when an incident, problem, or change request is created or updated and when the **Assignment group** and the **Assigned to** field is empty. The following properties identify the field whose value populates the **Assignment group** field:<br><br>• *com.snc.problem.ci_assignment_group.field*<br>This problem property identifies which CI field populates the **Assignment group** field.<br><br>• *com.snc.problem.service_offering_assignmen*<br>This problem property identifies which service offering field populates the **Assignment group** field. |
| Assigned to | Problem coordinator to whom the problem is assigned. If an assignment rule applies, the problem is automatically assigned to the appropriate user or group. |
| Notes | |

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### Create New Problem form (continued)

| Field | Description |
|---|---|
| Work notes | Informative notes about the work performed on the problem. |

## Problem task form

Description of the field values for the problem task form in Service Operations Workspace.

### Create New Problem Task form

| Field | Description |
|---|---|
| Problem Task | |
| Short description | Brief description of the problem task. |
| Description | Detailed description of the problem task. |
| Number | Number that identifies the problem task record. |
| Type | The problem task type. |
| Problem | ID number of the problem for which the problem task is created. |
| Order | Order in which the problem tasks must be associated with the problem. |
| State | Value that changes as the problem proceeds from one state to another state.<br><br>For information about state transitions of a problem task, see Life cycle of a problem task. |
| Priority | How quickly the service desk should address the problem. |
| Due date | Date by which the problem task must be completed. |
| Configuration Item | |
| Configuration item | Configuration item (CI) that the problem task applies to. The CI class of the selected configuration item identifies the type of problem, for example, hardware, network, or database. |
| Assignment | |
| Assignment group | Group to which the problem task is assigned. |
| Assigned to | Problem analyst to whom the task is assigned. |
| Notes | |
| Work notes (Private) | Information about the work performed on the problem task. |

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## Features of the Investigation tab

The **Investigation** tab displays CI metrics information along with various options. Use the options and the metrics information to view the data that helps to resolve the CI-related issues.

You can select the following drop-down options to view the metrics information for the CI:

- Initial metrics: Metrics information of the affected CI that is retrieved from 30 minutes before to 30 minutes after the incident is created. The metrics information of the CI is displayed only if the CI is populated in that one hour time period. You can configure the *sn_sow.initial_metric_fetch_window* property to change the one hour time period.

  **Note:**
  Initial Metrics is available only for the primary CI.

- Recent metrics: Latest metrics information that is available for the affected CI. By default, the **Recent Metric** option is selected.

**Note:**
The metrics information for the CI is retrieved in any one of the following conditions:

- When the primary CI is updated or added to the incident. You can also configure when and how the metric information is retrieved for a CI by configuring the collection rule. For more information, see Configure the collection rules for the Investigate tab.
- When you select the Get latest metrics icon (  ), it refreshes, retrieves, and displays the latest metrics on demand. This option is available only when you're viewing data in the Recent Metrics.

The metrics data includes the following information:

- Overview: Displays overview information of the CI, such as name, operating system, and model number, from the ServiceNow database records and CMDB CI computer using the glide record query. The **Name** field contains a hyperlinked value, which displays the CI record on a separate tab when selected.
- System information: Select to display the system information for the selected CI on a separate modal. The system information modal includes the following data:
  - Microsoft system (msinfo32): Displays information about the computer and a comprehensive view of the hardware resources, system summary, components, and software environments, which can be used to diagnose the computer issues. You can also search and view any specific system parameter, if necessary.
  - Azure (dsregcmd): Displays information on the state of the CI device that is managed by the Azure Active Directory (Azure AD). This information is used to diagnose and troubleshoot the device. The date and time when the information is last retrieved is also displayed. You can also search and view any device parameter, if necessary.

    **Note:**
    You can only use this option when the Agent Client Collector for Investigation (sn_acc_adapter) adapter is integrated with the Investigation Framework.

- Device health: Select the **Device health** link to launch the Digital End-User Experience application and device health page for the selected CI on a separate tab, within the incident view. This tab enables agents to view all the available metrics and the device health for the selected CI, which were collected by DEX. You can also access this feature using the **View device health** option on the CI record in Service Operations Workspace.

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**Note:**
DEX requires a separate entitlement.

This link is available to the agent only if the following conditions are met:

- The selected CI is of type Device, which is also known as Endpoint.
- The DEX plugin is installed on the instance. For more information on DEX, see Digital End-User Experience.
- The DEX agent is installed on the selected CI.

- Asset utilization: Utilization of the assets for the CI. The following information is displayed along with the date and time:
  - Memory utilization: Amount of the memory used on the CI. The value is displayed in percentage.
  - Disk utilization: Disk utilization of the logical drives for the affected CI. The value is displayed in percentage.
  - CPU utilization: CPU utilization for the CI. The value is displayed in percentage.
  - Uptime: Uptime (boot time) of the assets. The days and time since when the assets are up and running.

**Note:**
The following metrics are color-coded based on the threshold values to highlight the warning or critical level:

**Color coding metrics for Asset utilization metrics**

| Asset utilization metrics | Warning (Yellow color code) | Critical (Red color code) |
|---|---|---|
| Memory utilization | Greater or equal to 80 | Greater or equal to 95 |
| Disk utilization | Greater or equal to 80 | Greater or equal to 95 |
| CPU utilization | Greater or equal to 80 | Greater or equal to 95 |

However, you can also customize these threshold values, if necessary. For more information, see Customize the Investigate tab.

- Top processes by CPU: Top processes sorted based on the CPU utilization of the processes in the affected CI.

**Note:**
The Top processes by CPU metrics are color-coded based on the threshold values to highlight the critical level when the value is greater or equal to 90. However, you can also customize these values, if necessary.

- Top processes by memory: Top processes sorted based on the memory consumed by the processes in the affected CI.

**Note:**
The Top processes by memory metrics are color-coded based on the threshold values to highlight the critical level when the value is greater or equal to 90. However, you can also customize these values, if necessary.

- Services: List of services (device or server) running on the affected CI.

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- Logged in users: List of the logged-in users in the affected CI.
- Installed applications: List of the applications installed on the CI.

> **Note:**
> For devices with the Windows OS, the Installed applications don't include a list of pre-packed application.

Use the **View History** button to view the historical metrics data for the CI on a separate tab. You can select the time range from the drop-down options to view the historical data for that time range. For more information, see Viewing the historical data of CI metrics.

### Viewing the historical data of CI metrics

View the historical data of the CI metrics for the selected time range.

Use the **View History** option on the Investigate tab to view the historical data of the various CI metrics on a separate tab.

> **Note:**
>
> You can use the features of the history tab only if the following conditions are met:
>
> - The application version must be Tokyo patch 8 or later releases.
> - The Data Visualizations Core application must be upgraded to version 23.2.4 if you are on version Utah or later releases.

You can do the following on the history tab:

- Select the time range to view the historical data of the CI metrics.
- View the graphical representation of the following CI metrics (color-coded) in scatter plots for the selected time range along with the critical threshold values:
  - CPU utilization
  - Disk utilization
  - Memory utilization

  Point your mouse device device over a data point (represents specific date or time) on the scatter plot to view the values of the metrics along with the date when the metrics data is retrieved.
- Click a data point (represents specific date or time) on the scatter plot to display the data of all the CI metrics on the Metrics snapshot section along with the date and time.

## Components installed with Universal Request for Service Operations Workspace

Universal Request is activated in Service Operations Workspace when you enable the Universal Request plugin (com.snc.universal_request).

## Roles installed

| Role title [name] | Description |
| --- | --- |
| UR administrator<br><br>[sn_uni_req.ur_admin] | Set up and configure Universal Request roles for Universal Request for |

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| Role title [name] | Description |
|---|---|
| | Service Operations Workspace. |
| Routing agent<br><br>[sn_uni_req.routing_agent, sn_uni_req.universal_request_write, sn_uni_req.universal_request_read, itil] | Create, edit, view and resolve the universal requests. |
| Routing agent [sn_uni_req.routing_agent, sn_uni_req.universal_request_write,sn_uni_req.universal_request_read, interaction_agent] | Handle interactions and create universal request from interaction. |

## Components installed with Universal Task for Service Operations Workspace

Several types of components are installed with activation of the Universal Task application, including tables, and user roles.

### Roles installed

| Role title [name] | Description | Contains roles |
|---|---|---|
| Admin [sn_uni_task.admin] | View and configure the Universal Task application | None |
| Report view [sn_uni_task.report_view] | Access and view Universal Task reports | None |
| Employee form admin [sn_uni_task.emp_form_admin] | Create and manage Employee forms | survey_admin |
| Employee form creator [sn_uni_task.emp_form_creator] | Create and modify employee forms | survey_creator |
| sn_uni_task.template_admin | Create and manage Universal Task templates | None |

### Tables installed

| Table | Description |
|---|---|
| Universal Task [sn_uni_task_universal_task] | Store the Universal Task record details for a department-specific table. |
| Universal Task Configuration [sn_uni_task_config] | Store the list of task types for each department-specific table. |
| Catalog Task Configuration [sn_uni_task_catalog_task_config] | Stores the catalog items details of the department-specific table. |

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| Table | Description |
|---|---|
| Base Task Configuration [sn_uni_task_base_task_config] | Serves as the base table for the configuration tables for all task types. |
| Employee Form [sn_uni_task_employee_form] | Stores the employee form records that were created for the Collect employee input task type. |
| Employee Input Task Configuration [sn_uni_task_emp_input_task_config] | Stores the roles that can view the responses of completed employee forms for each department-specific table. |
| Universal Task Template [sn_uni_task_template] | Stores the universal task templates with predefined field values that can be applied on Universal Task forms. |
| Universal Task Dynamic Template Mapping [sn_uni_task_dynamic_template_mapping] | Stores the dynamic template mappings between Universal Task fields and parent table fields. |

## Extension points for batch processing in Service Operations Workspace

Use the implementation extension point to create implementations and execute batch processing to update multiple records, which improves the performance of the system.

The Multiple Record Associator (MRA) component enables you to create implementation extension points for batch processing of multiple records.

To view the extension points that are available by default, navigate to**All** > **System Extension Points** > **Scripted Extension Points**. You can select the **Create implementation** option to create an implementation extension point.

When you have multiple records to update, a business rule executes and updates once for each record, which can affect the performance of the system. Instead of executing the business rule for each record, you can use the `RelatedListIncidentItemUpdateHandler` script include to execute batch processing for updating multiple records.

You can use the `RelatedListIncidentItemUpdateHandler` script include to update multiple records with batch processing. For example, you could use this script include when associating and updating multiple child incidents with a parent incident.

The **RelatedListIncidentItemUpdateHandler** script include contains the `global.RelatedListItemUpdateHandler` implementation extension point and is used when batch processing multiple records on a related list.

The extension point used in the **related_list_edit_helper** script include uses API to facilitate invoking custom code. This extension point overrides the execution of the business rule to ensure that the implementation extension point is executed when updating multiple records instead of the business rule. You can also add a business rule that must be overridden. When multiple records are updated, this script include is triggered, and batch processing occurs that bypasses that business rule.

The `RelatedListIncidentItemUpdateHandler` script include contains the following functions:

- Initialize – Executes before multiple records are updated.
- Post update – Executes after multiple records are updated.

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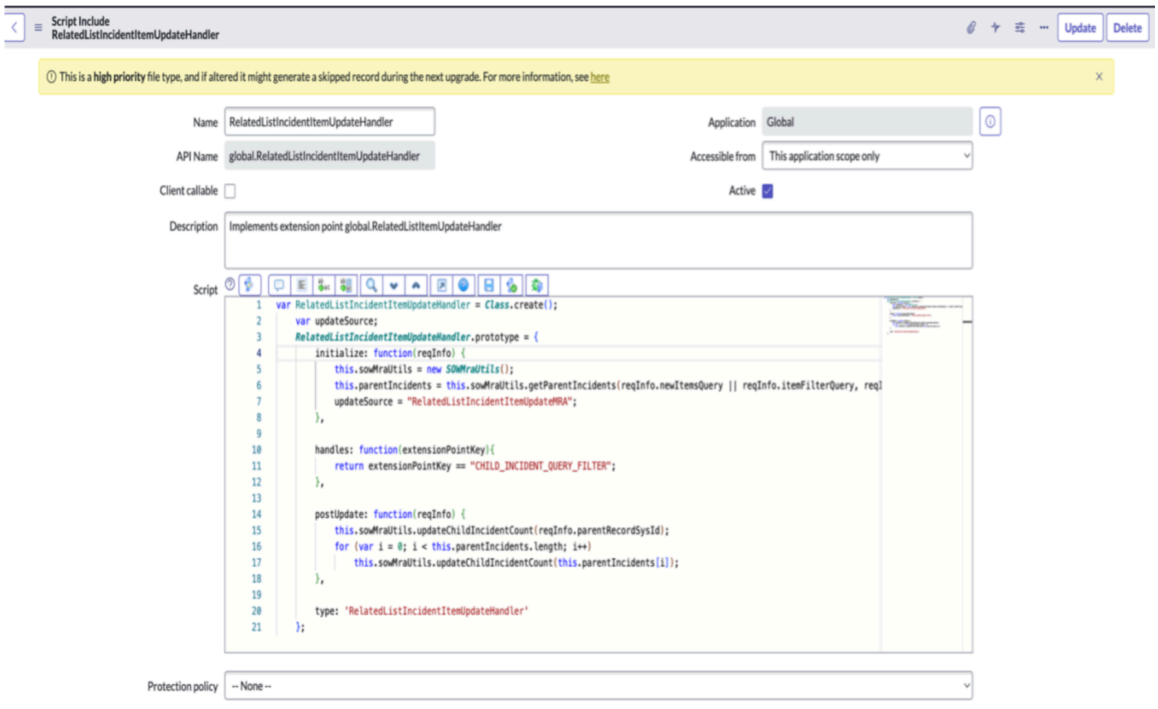


# Service Portfolio Management

ServiceNow® Service Portfolio Management enables you to improve your IT business operations and meet customer demands by documenting and managing your IT services using a standardized, structured format. Portfolio owners and service owners can create and manage services, service offerings, and portfolios.

## Get started

| Explore | Configure |
| --- | --- |
| Learn about Service Portfolio Management concepts and features. | Configure service offerings, commitments, subscriptions, and the service catalog. |

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Manage



Create and manage services, service offerings, portfolios, and service level agreements (SLAs).

Reference



Get information about Service Portfolio Management administration.

### Troubleshoot and get help

- Ask questions and explore other resources for Service Portfolio Management in the ServiceNow Community
- Search the Known Error Portal for known error articles
- Contact Customer Service and Support

## Exploring Service Portfolio Management

The Service Portfolio Management application enables you to document and manage your services, service offerings, and portfolios using a standardized, structured format.

### Service Portfolio Management overview

The Service Portfolio Management application enables you to create, organize, and manage portfolios of IT services. It optimizes the value of services and reduces their costs to help you to streamline your IT business operations and meet customer demands. A service portfolio includes information related to the organization of services and data about each service, including status and related items.

Service portfolios typically have three phases:

- Service pipeline: Services that aren't yet operational or available for use. These services are typically proposed or services in review for suitability. In this phase, you can analyze and manage the future growth and time line for each service.
- Service catalog: Services that are operational and available for use, as well as design and development. These services typically have representation in a request catalog.
- Retired services: Services that are no longer operational or available for use. These services can include essential historical information.

### Service Portfolio Management users

The following table presents the most common users for Service Portfolio Management. For more information about core roles and tables, see Installed with Service Portfolio Management.

**Users**

| User | Description |
| --- | --- |
| Portfolio admin | Set up, create, edit, and delete services and service portfolios. Manage portfolios including related commitments and |

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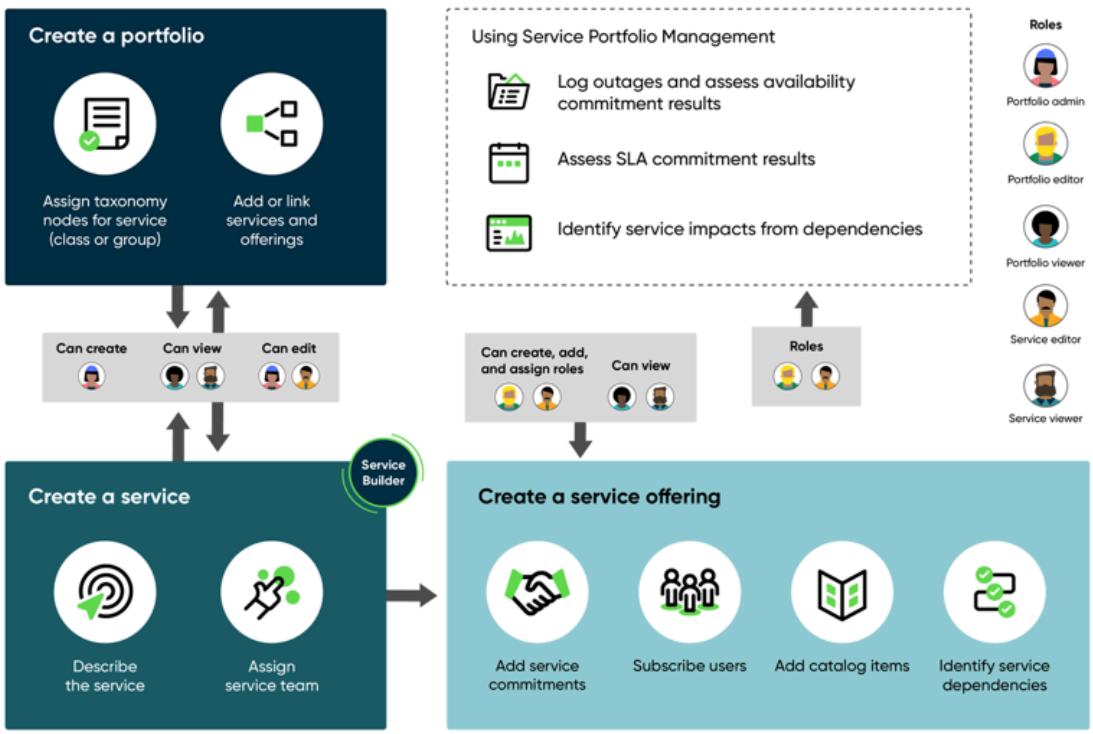
### Users (continued)

| User | Description |
|---|---|
| | availability. Update taxonomy nodes, services, service offerings, and reparent services. |
| Portfolio editor | Edit and delete services and service portfolios. Update portfolios, taxonomy nodes, services, service offerings, and reparent services. |
| Portfolio viewer | View portfolios, taxonomy nodes, services, and service offerings. |
| Service admin | Set up, create, edit, and delete services and service offerings. |
| Service editor | Edit services and service offerings that they own or are a delegate of. |
| Service viewer | View all service portfolios, services, and service offerings. |

## Service Portfolio Management workflow

Depending on your role, you can use Service Portfolio Management for a variety of use cases.

### Service Portfolio Management overview




- Portfolio admins create service portfolios, services, and service offerings. Portfolio admins can also use the ServiceNow® Service Builder application to create and edit services and service offerings.
- Portfolio editors and service editors create, add, and assign roles to service offerings. Portfolio editors and service editors can also log outages, assess availability commitment results,

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assess service level agreements (SLA) commitment results, and identify service impacts from dependencies.

- Portfolio viewers and service viewers can view service portfolios, services, and service offerings in both Service Portfolio Management and in Service Builder.

## Service Portfolio Management benefits

The Service Portfolio Management application provides several benefits to help you organize services and other solutions.

**Service Portfolio Management benefits**

| Benefit | Feature | Users |
|---|---|---|
| Create and manage service portfolios and add services and offerings to the portfolios. | Create portfolios in Service Portfolio Management | Portfolio admin |
| Create and manage the overall portfolio taxonomy, including service nodes. | Service Portfolio Management taxonomy | Portfolio admin |
| Create taxonomy nodes | Create taxonomy nodes in Service Portfolio Management | Portfolio admin |
| Create services | Create a service in Service Portfolio Management | Portfolio admin and service editor |
| Create service offerings, commitments, assign support teams to a service offering, and subscribe users. | Service offerings in Service Portfolio Management | Portfolio admin to create service offerings.<br><br>Service editor to add commitments to an offering, assign multiple support teams, and subscribe users. |
| Log outages | Log outages in Service Portfolio Management | Service editor |
| View availability results | View availability results in Service Portfolio Management | All Service Portfolio Management roles |
| Set the time zone for availability results | Set the time zone for availability results in Service Portfolio Management | Portfolio admin |
| Integrates with the Common Service Data Model (CSDM) | Applying the CSDM guidelines to Service Portfolio Management | Admin |

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## What to explore next

To learn more about configuring and using Service Portfolio Management, see:

- Configuring Service Portfolio Management
- Using Service Portfolio Management
- Service Portfolio Management reference

## Service Portfolio Management services

Configure IT services within your portfolios to add the most value to your organization. The IT services defined in your portfolios may, or may not be, specifically aligned to an application. IT services defined in your portfolios may, or may not be, represented in a request catalog.

The phase and status of a service indicates the life-cycle position of the service. You can view, track, and monitor the services by phase and status with platform lists and reports. The lists can also include retired services for viewing purposes.

Each service record has a unique number to identify the record.

To reflect the importance or impact of each service on the operations of your organization, you can select a criticality level for them. For example, you might select a high level for a service that supports sales functionality using the organization's website. You might then select a lower level for a service that provides internal printing for the organization's employees.

## Business services

Business services make up the structure of your service portfolio taxonomy. You can create dependencies to these types of services and view and manage associated service and offering details via the dependency tabs of the related list on the Service and Service Offering forms.

Create offerings as children of services. Offerings are created in the Service Offering [service_offering] table. Refer to Service offerings in Service Portfolio Management for more details.

You can designate services as **Services I depend On** or **Services Dependent On Me** via form related lists.

## Technical services

Although technical services are not added as part of your service portfolio taxonomy, you can still gain insight into these services by adding them as **Services I depend On** or **Services Dependent On Me** in the related list section of the Service form.

To create or modify services, see Create or modify Service Portfolio Management services.

To learn about service offerings, see Service Portfolio Management service offerings.

To subscribe users to a service offering, see Subscribe users to a service offering in Service Portfolio Management.

## Service Portfolio Management portfolios

A service portfolio presents an overall top-level view of your currently available services, possible future services, and services that existed in the past. Evaluate the impact that services have on your business and manage them in a single portfolio or multiple portfolios with unique taxonomy structures, owners, and market scope.

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## Portfolio overview

Gain valuable knowledge about your service portfolios, including an overall performance score and estimated spend. This knowledge helps you budget for your services and make informed decisions about adding new services and retiring services that no longer benefit your business.

Think of a service portfolio as a container that holds a hierarchical organization of definable nodes, services, and service offerings. Taxonomy in Service Portfolio Management refers to the classification of your portfolio layers and associated services (legacy portfolios use layers; see the **Note**). Typically, taxonomy is structured from a general, high-level perspective to a specific level, such as a service offering. With this dynamic taxonomy structure, you can organize your service portfolios in various ways.

## Standard and legacy portfolio structures

Prior to the Utah release, Service Portfolio Management provided one portfolio structure. With the Utah release and after, existing customers can move from the legacy structure to the improved standard structure by opting in via a system property.

As an existing customer, opting in to the standard portfolio structure upgrades all your service portfolios. Your existing portfolios remain intact, but performance metrics, scores, and weights are no longer available. With the improved standard service portfolios, you can use key performance indicator (KPI) groups in Digital Portfolio Management (DPM) to report on services, nodes, and portfolio performance.

The standard portfolio structure provides new features and capabilities for your service portfolios so that you can:

- Create portfolio structures that have multiple different depths in the same portfolio.
- Update your portfolio structure over time to add or remove depth in areas of the portfolio, as needed.
- Work in your existing portfolio in the new structure, even though "layers" are removed.

The portfolio_admin can navigate to **All** > **Service Portfolio Management** > **Administration** > **Upgrade to Standard Portfolio** to access the system property [standard_portfolio_construct.turn_on]. Only existing customers see this menu path. New customers get the standard portfolio structure by default so this menu path isn't available.

**Important:**
After you upgrade to the standard portfolio:

- You can't revert to the legacy portfolio structure.
- You don't have access to the performance score in Service Owner Workspace because weights and performance metrics are no longer available.

### Standard and legacy service portfolio structure considerations

| Opt in to the standard service portfolios | Don't opt in — keep legacy service portfolios |
|---|---|
| • Use node-to-node relationships to create service portfolios with different levels of depth in a single portfolio (no more layers).<br>• Report on services, nodes, and portfolio performance using KPI groups in DPM. | • Layered records are required, so you assign nodes to a layer and then reference the parent/child node.<br>• Report using portfolio performance metrics, scores, and weights from Service Owner Workspace (and not KPI groups from DPM). |

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When you opt in, a dialog box provides these important aspects and considerations. Select the check box if you want to opt in or not (Yes or No).

**Important:**
The Service Offering Metric Data [service_offering_metric_data] table along with the following four indicators have been deprecated in the Utah release:

- Average SLA Achievement [ServiceOffering.MetricData.SLA.Daily]
- Average Customer Satisfaction [ServiceOffering.MetricData.CSAT.Daily]
- Average Availability [ServiceOffering.MetricData.Availability.Daily]
- Average Request Activity [ServiceOffering.MetricData.Activity.Daily]

Therefore, if you have the Vendor Management Workspace application integrated with Service Portfolio Management, and if you are upgrading to the Service Portfolio Management standard portfolio, the metric data from the legacy indicators are no longer available. For information on vendor scores, see Vendor KPI Groups in Vendor Management Workspace reference.

### Portfolio administration

As a portfolio_admin user, you can create a single service portfolio or multiple portfolios. If your organization has multiple businesses, you can define multiple portfolios to segregate them by business location, by vendor, or by Chief Information Officer (CIO). You can also:

- Add and remove services from portfolios.
- Determine how the services in a portfolio are categorized.
- Update portfolio taxonomy.
- Update portfolio details.
- Update services and service offerings (the service_editor role also has access).
- Reparent services (the service_editor role also has access).

## Configuring Service Portfolio Management

Configuring topics provide information about how to set up and configure the Service Portfolio Management application.

### Configuration overview

To activate Service Portfolio Management, its plugins, and the sample content pack, you must have the admin role. To set up services and commitments, you must have the portfolio admin role or the service editor role.

### Activate Service Portfolio Management

The Service Portfolio Management Core plugin (com.snc.service_portfolio_core) is available by default for ITSM licensed customers. You can activate additional available related plugins for enhanced features and functionality.

#### Before you begin

Role required: admin

#### About this task

The Service Portfolio Management Foundation plugin [com.snc.service_portfolio] enables your organization to document portfolios, taxonomies, services, and service offerings using

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a standardized, structured format. It contains demo data and activates related plugins. The Foundation plugin is activated out of the box and activates related plugins, if they're not already active. For general information, see Service Portfolio Management.

**Related plugins for Service Portfolio Management Foundation**

| Plugin | Description |
|---|---|
| Service Portfolio Management Core<br><br>[com.snc.service_portfolio_core] | Adds the Service Offering table [service_offering] to the Configuration Management Database (CMDB).<br><br>Available by default for users with ITSM SKUs. |
| Service Catalog core applications<br><br>[com.glideapp.servicecatalog] | Enables integrations with the Service Catalog application and its capabilities. |
| Report Engine- use summary table for reports<br><br>[com.glideapp.summary_report_engine] | Adds the glide.report_summary_engine system property and enables the Summary Sets reporting engine for all reports within Service Portfolio Management. |

Several additional plugins offer increased functionality to Service Portfolio Management Foundation. Activate these plugins to enhance your experience.

**Additional plugins for Service Portfolio Management Foundation functionality**

| Plugin | Description |
|---|---|
| Service Portfolio Management SLA Commitments<br><br>[com.snc.service_portfolio.sla_commitment] | Adds SLA Commitment support to Service Portfolio Management. Includes demo data. |
| Service Portfolio Management Taxonomy Content Pack<br><br>[com.snc.spm.content] | Provides sample taxonomy metadata, complete with portfolio, layers, and nodes. Demo data includes services and service offerings, including related items, such as SLAs, incidents, changes, and more. Includes demo data. |

## Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.

3. Select **Install** to start the installation process.

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**Note:**
When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

**Related topics**

Installed with Service Portfolio Management

## Service Portfolio Management activation administration

Service Portfolio Management includes several plugins to enable the organization, documentation, and management of service portfolios within your IT business department.

Administrators can activate plugins and assign specific Service Portfolio Management roles to system users.

## Service Portfolio Management product applications

The following product application plugins are available:

| Name | Description |
|---|---|
| Service Portfolio Management Core<br><br>[com.snc.service_portfolio_core] | Adds the Service Offering table [service_offering] to the Configuration Management Database (CMDB).<br><br>Available by default for ITSM SKUs. |
| Service Portfolio Management Foundation<br><br>(com.snc.service_portfolio) | Enables your organization to document portfolios, taxonomies, services, and service offerings using a standard and structured format.<br><br>You can install this plugin from the ServiceNow AI Platform user interface. |
| Service Portfolio Management Foundation Demo Data<br><br>(com.snc.service_portfolio.demo_data) | Adds demo data for Service Portfolio Management and service level agreement commitments.<br><br>**Note:**<br>If you installed the Service Portfolio Management SLA Commitments plugin (com.snc.service_portfolio.sla_commitment) before the New York release, this plugin activates the newer version. |

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## Service Portfolio Management Taxonomy Content Pack

You can also activate the Service Portfolio Management Taxonomy Content Pack plugin [com.snc.spm.content]. This plugin contains demo data and provides sample taxonomy metadata, complete with portfolio, taxonomy layers, and nodes. Users can view services and service offerings, including related items, such as SLAs, incidents, changes, and more as a demonstration.

Portfolio managers benefit from the Service Portfolio Management Taxonomy Content Pack because it provides a useful example of how service portfolios and services are constructed within the application. This example results in faster modeling of an organization's service portfolio. Also, often portfolio managers must quickly provide the organization an example of a portfolio structure to accelerate decision making regarding business approach.

## Applying the CSDM guidelines to Service Portfolio Management

Service data relates to each other using different applications in different ways. Service Portfolio Management references the Common Service Data Model (CSDM) framework to bring service-related data together in a single view.

Since both ServiceNow® products of Service Portfolio Management and Digital Portfolio Management (DPM) closely align with the CSDM, it's helpful to know the common terms and life-cycle fields when working in these applications.

**Tip:**
For information about the CSDM, see Implementing the CSDM framework in stages.

## CSDM life-cycle fields for business and technical services

After the CSDM activation plugin is installed [*com.snc.cmdb.csdm.activation*], you can use the CSDM life-cycle fields in Service Portfolio Management. To see the field names, navigate to **All** > **Service Portfolio Management** > **Services**, and set the view to Service Portfolio.

Using the CSDM life-cycle fields helps you manage the end-to-end life cycle of services and service offerings. The shared field names provide you with consistency and alignment as you use other ServiceNow applications. For more information about the CSDM, see First activation step — Map existing life cycle data to CSDM standards.

The following comparison shows the differences from the traditional Service Portfolio Management phase and status fields to the CSDM life-cycle stage and status fields.

These fields also display when you use the Performance Analytics (PA) indicators.

**Service table [cmdb_ci_service] mapping of Service Portfolio Management and CSDM**

| Service Portfolio Management Phase and Status field names | CSDM life-cycle Stage and life-cycle Status field names |
|---|---|
| Pipeline \| Requirements | Ideation \| Under evaluation |
| Pipeline \| Definition | Ideation \| Under evaluation |
| Pipeline \| Analysis | Ideation \| Under evaluation |
| Pipeline \| Approved | Ideation \| Under evaluation |
| Pipeline\| Chartered | Design \| Chartered |
| Catalog\| Design | Design \| Design |

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### Service table [cmdb_ci_service] mapping of Service Portfolio Management and CSDM (continued)

| Service Portfolio Management Phase and Status field names | CSDM life-cycle Stage and life-cycle Status field names |
|---|---|
| Catalog \| Development | Design \| Design |
| Catalog \| Build/Test/Release | Deploy \| Test |
| Catalog \| Operational | Operational \| In-use |
| Catalog \| Retiring | Operational \| Pending Retirement |
| Retired \| Retired | End of life \| Retired |
| Retired \| Obsolete | End of life \| Obsolete |

## Common CSDM terms used in Service Portfolio Management and in DPM

### Common CSDM terms used in Service Portfolio Management and in DPM

| Term | Definition | Notes |
|---|---|---|
| Portfolio | Collection of services, products, projects, or applications. | Used to manage like items together for a business. Portfolios may be grouped by objective, capabilities, organization, like projects or services. |
| Business capability | High-level capability that an organization requires to execute its business model or fulfill its mission. | Typically described in the context of performing one or more specific tasks to achieve business outcomes. For example, demand management or financial planning. |
| Service | Means of delivering value to customers by facilitating outcomes customers want to achieve without the ownership of specific costs and risks. | Typically has three aspects:<br>• Interaction<br>• Offering<br>• Service system<br><br>ServiceNow provides three base service types:<br>• Business<br>• Technical<br>• Application<br><br>Customers can extend the base types to align with the service types in their organization. |
| Business service | A service type that is published to business users and it typically underpins one or more business capabilities. | Typically orderable by business users. Business users are able to select the desired offering and service commitment levels via the ServiceNow Service Catalog. For example, procurement, shipping, and finance. |
| Technical service | A service type that is published to service owners and typically | Typically orderable by service owners. Service owners are able to select the desired offering and service commitment levels via the Service Catalog. For example, computers, storage, and networks). |

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**Common CSDM terms used in Service Portfolio Management and in DPM (continued)**

| Term | Definition | Notes |
|---|---|---|
| | underpins a business or application service. | |
| Application service | A service type that is a logical representation of a deployed application stack. | Examples of application services are hosting, data backup, and recovery.<br>**Note:** There isn't a 1-to-1 relationship between application and application services. |
| Application | Any deployed program, module, or group of programs that is designed to provide specific functionality on a computer infrastructure. | Defines behavior and has specific functionality associated with it. Applications are typically discoverable functionality, like Apache Web Server. |
| Business Application | Represents all software and infrastructure environments (dev, test, prod) configured to provide functionality. | Used to increase productivity and perform other business functions accurately. For example, Dell Online. |
| Service catalog | Provides a consumable view of available products, services, service commitment options, and offerings. | Helps manage what services a user may have access to. Also, catalogs are the initiation point for access to available services. For example, the IT services catalog. |
| Service offering | A stratification of a service into capability, availability, pricing, and packaging options. | Different levels of performance and features for a given service can be made available. For example, ITSM Standard and ITSM Pro. |
| Service commitment | Defines service delivery obligations agreed to between the consumer and the provider. | Often manifested in the form of contracts such as service level agreements, operational level agreements, and underpinning contracts. Service commitments include specific performance characteristics that differentiate one offering from another. |
| Configuration item (CI) | Physical and logical components of an infrastructure that are currently or soon will be under configuration management. | A single module such as a server, database, or router or a more complex item, such as a complete system. For example, a web server, database, or infrastructure. |
| Asset | An item whose financial value is tracked. | Many assets are CIs and vice versa, but that's not always the case. Assets have a life cycle with financial considerations, for example Microsoft Office 365. |
| Operating model | An abstract and ideally visual representation (model) of how an | Typically represents the various elements of how an organization operates. It usually incorporates strategy positions such as the innovation model, |

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**Common CSDM terms used in Service Portfolio Management and in DPM (continued)**

| Term | Definition | Notes |
|---|---|---|
| | organization delivers value to its customers or beneficiaries. | degree of intelligent automation, industry alignment, provider delivery models, and the business expectations of IT. |

### Related topics

Implementing the CSDM framework in stages

## Set up services and commitments in Service Portfolio Management

Set up services and commitments in Service Portfolio Management to define services and track their performance against availability commitments. You can relay the performance information in real-time to your stakeholders.

### Before you begin

Role required: portfolio_admin or service_editor

### Procedure

1. Define the service offerings and commitments.
   Create service offering records that define different levels of service for an existing service. For example, you might offer two levels of desktop support in your organization. You offer a standard offering for upgrades and virus protection and an executive offering that also includes availability guarantee. Create a complete set of service offerings with service commitments that define the specifics of the offering.
2. Define the scope of the service offerings.
   Scope in Service Portfolio Management refers to the detailed service parameters that define the limits of a service. Define specific additional services related to the service as **In Scope** or **Out of Scope**. For instructions to apply scope definitions to services, refer to Apply scope to a service in Service Portfolio Management.
3. Configure the price of the service offering.
   Each service offering may have a pricing model and a price unit. Values are set on the parent service and inherited by the offerings. The actual price per unit that is charged for the service is established in the offering. For information about price modeling, refer to Set service offering price models and units in Service Portfolio Management and Service Portfolio Management service offering price.
4. Configure the service catalog for the end user.
   All the data created in the previous steps display on the service catalog page for a service. The layout is not configurable, but an administrator can control how the service is categorized and who can view the service in the catalog. For more information, see Service Catalog administration.
5. Subscribe to service offerings.
   With Service Portfolio Management, service owners can subscribe various business entities to Service offerings in Service Portfolio Management.
6. **Optional:** Opt in to the updated availability calculator system property [com.snc.availability.v2].
   This updated availability system property [com.snc.availability.v2] offers improved calculations and maintenance. For more information, see ..

## Activate Service Portfolio Management Sample Content Pack

Activate the Service Portfolio Management Taxonomy Content Pack plugin (com.snc.spm.content) to access a sample portfolio structure and service taxonomy. This sample

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data offers a demonstration users can adopt to accelerate the creation and management of a service portfolio.

### Before you begin
Role required: admin or portfolio_admin

### About this task

**Note:**
The Service Portfolio Management Taxonomy Content Pack data is best viewed in Service Owner Workspace. For details about accessing this workspace through a Service Owner Workspace subscription, refer to Service Owner Workspace.

The Service Portfolio Management Taxonomy Content Pack plugin (com.snc.spm.content), contains demo data and provides sample taxonomy structure metadata. Users can quickly and efficiently implement portfolios and associated taxonomies.

Gain access to a sample list of services that provides examples of service data, offerings, catalog items, and the relationships they share. Link to periphery example data, such as vendors and contracts, SLA definitions, cost models, and more.

After sample data loads, use it as a starting point to create and manage your service portfolios. You can view sample content in the **Service Portfolios** module of the Service Portfolio Management application as **Sample IT Services Portfolio**. Alternatively, if subscribed to and activated, users can view this data in Service Owner Workspace.

### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.
3. Select **Install** to start the installation process.

   **Note:**
   When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

   You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

## View Service Portfolio Management sample IT services portfolio content

Access, view, and analyze the Service Portfolio Management sample IT services portfolio content to plan and create your service portfolio. Consider the sample structure as a starting point. You can add to it or modify it to suit the specific needs of your organization.

### Before you begin
Role required: portfolio_admin, service_editor, or service_viewer

### About this task
The Sample IT service portfolio provides usable data in the form of portfolios, taxonomy layers, and taxonomy nodes. It also provides demo data in the form of services, service offerings, incidents, commitments, and more.

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You can view the Sample IT service portfolio content with any Service Portfolio Management role. To create portfolios or to manage the taxonomy nodes, you must have either the portfolio_admin role or the service_editor role.

You can view the sample content in both the Service Portfolio Management application and in the Digital Portfolio Management (DPM) Workspace.

### Procedure

1. Navigate to **All** > **Service Portfolio Management** > **Service Portfolios**.
2. Select **Sample IT Services Portfolio** to open the portfolio details.
3. Review the taxonomy nodes.
   A list of sample IT service-related nodes appear including but not limited to the following.
   - Software Management
   - Hardware Support
   - IT Management and Consulting
   - Network Support
   - Data Center Management
   - Software Support
4. Select a service type taxonomy node.
5. Review the sample IT service portfolio and its taxonomy nodes to understand the basic structure.
   Look at several service type taxonomy nodes to find the structure that best fits you your needs. You can use them as guidance as you build your own portfolio content structure.

### Related topics

Using Service Portfolio Management

Work with portfolios in Digital Portfolio Management

# Using Service Portfolio Management

Service Portfolio Management enables you to create services, service offerings, and assign them to service portfolios. You can also view service-related data including service availability results.

## Overview of Service Portfolio Management

The following topics provide guidance on how to use Service Portfolio Management.

## Create portfolios in Service Portfolio Management

You can create a single service portfolio or multiple service portfolios, each with its own taxonomy structure. The service portfolio enables you to see an overall view of your current IT services. You can also see services that may be available in the future and services that existed in the past.

### Before you begin

Role required: portfolio_admin

### About this task

Create a service portfolio before you define taxonomy nodes. After you create the service portfolio, you can edit it within the platform and monitor its performance in Digital Portfolio Management (DPM).

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**Important:**
Existing customers can opt in to the improved portfolio structure by navigating to **Service Portfolio Management** > **Administration** > **Configuration** > **New Portfolio Opt-In**. The improved structure uses nodes and doesn't use layers and weighted scores from the Service Owner Workspace. After customers opt in for the improved portfolio structure, there isn't an option to revert to the former structure. For more information, see Service Portfolio Management portfolios. New customers have the improved portfolio structure by default.

**Note:**
The following procedure reflects the **SPM Advanced** user view.

### Procedure

1. Navigate to **All** > **Service Portfolio Management** > **Service Portfolios** and select **New**.
2. On the form, fill in the fields.

**Service Portfolio form**

| Field | Description |
|---|---|
| Name | Unique name that reflects the nature of the service portfolio, for example, IT Service Portfolio. |
| Short description | Brief details about the service portfolio. |
| Description | Comprehensive details about the service portfolio, such as, Software and Network Support Tiers. |
| Market scope | Detailed service parameters that define the limits of a service. For example, who uses the portfolio services. |
| Service portfolio owner | Person who owns the portfolio, usually at the Chief Information Officer (CIO) level. This person has the portfolio_editor role and can view and update owned portfolios only. |
| Service portfolio manager | Person who has the portfolio_admin role and is authorized to manage the service portfolio. The portfolio_admin can create, read, update, and delete portfolio records of all types, including:<br>○ Portfolios<br>○ Taxonomy levels and nodes<br>○ Services and service offerings<br>○ Relationships<br>○ Performance criteria |
| Auto-create service offerings | When checked, the **Number of offerings per service** field displays, enabling you to select the number of service offerings to auto-create. |

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| Field | Description |
| --- | --- |
| | Every service must have a service offering. When you create a service offering using the auto-create check box, the following happens:<br>○ Service offerings are created with the naming convention of *<service name> Offering1*. The number represents the number of offerings that you created. If you created two, then the second offering name is *<service name> Offering2*.<br>○ The service offering inherits the following fields from the parent service:<br>▪ Owned by<br>▪ Delivery manager<br>▪ Delegate<br>▪ State<br>▪ Service classification<br>○ The auto-created service offerings are located in the Offerings related link of the service. |

**Important:**
The following performance fields only appear if you're using the deprecated Service Owner Workspace plugin. For more information on the deprecation of Service Owner Workspace, see Service Owner Workspace.

| | |
| --- | --- |
| Upper performance score threshold | Designated high threshold percentage point above which the indicators change from amber to green in Service Owner Workspace. In addition to the color change, the default percentage is **80**. |
| Lower performance score threshold | Designated low threshold percentage point below which the indicators change from amber to red in Service Owner Workspace. In addition to the color change, the default percentage is **60**. |
| Add default performance metrics | Option to add five metrics when you create a service portfolio. You can choose not to add the metrics by clearing the check box.<br>Default metrics added include:<br>○ Availability<br>○ Customer Satisfaction<br>○ Critical Incidents<br>○ Activity<br>○ Breached service level agreement (SLA) |

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| Field | Description |
| --- | --- |
| | **Note:** This field is hidden on Service Portfolio records. It only appears when you create a record. |
| Evenly weight performance metrics for new offerings | When active, each time an offering is created as part of this portfolio, the performance weight of each metric is evenly distributed. For example, each default metric is weighted at 20%. |

**Note:**
If your instance is integrated with Financial Management and the **Estimated Spend Cost model** fields are configured on the Service Offering form, then you 'd see the **Estimated Spend** details for the portfolio.

3. Select **Submit** to save your service portfolio or select **Update** after editing.
   The newly created service portfolio appears in the **Service Portfolios** module list.
4. Select the newly created service portfolio name in the list.
   The Taxonomy Nodes, Portfolio Metrics, and Taxonomy Node Weights related lists appear on the Service Portfolio form. See Service Portfolio Management taxonomy for detailed information regarding creating and adding taxonomy nodes within your service portfolio structure.

## Service Portfolio Management taxonomy

Service Portfolio Management uses a taxonomy framework to organize and manage services in a portfolio.

### Portfolio structures

Prior to the Utah release, Service Portfolio Management provided one portfolio structure with taxonomy layers and nodes. With the Utah release and beyond, existing customers can move from the legacy structure to the improved standard structure by opting in via a system property. The improved standard portfolio structure no longer uses layers in the taxonomy framework. Rather, it only uses nodes. For more information on the two types of portfolio structures, see Service Portfolio Management portfolios.

To upgrade to the standard portfolio structure, the portfolio_admin navigates to **Service Portfolio Management > Administration > Upgrade to Standard Portfolio** to access the system property [standard_portfolio_construct.turn_on]. Only existing customers see this menu path. New customers get the standard portfolio structure by default so this menu path isn't available.

### Legacy portfolio structure taxonomy

If you’re working in a legacy portfolio structure, then your taxonomy framework may look something like this example.

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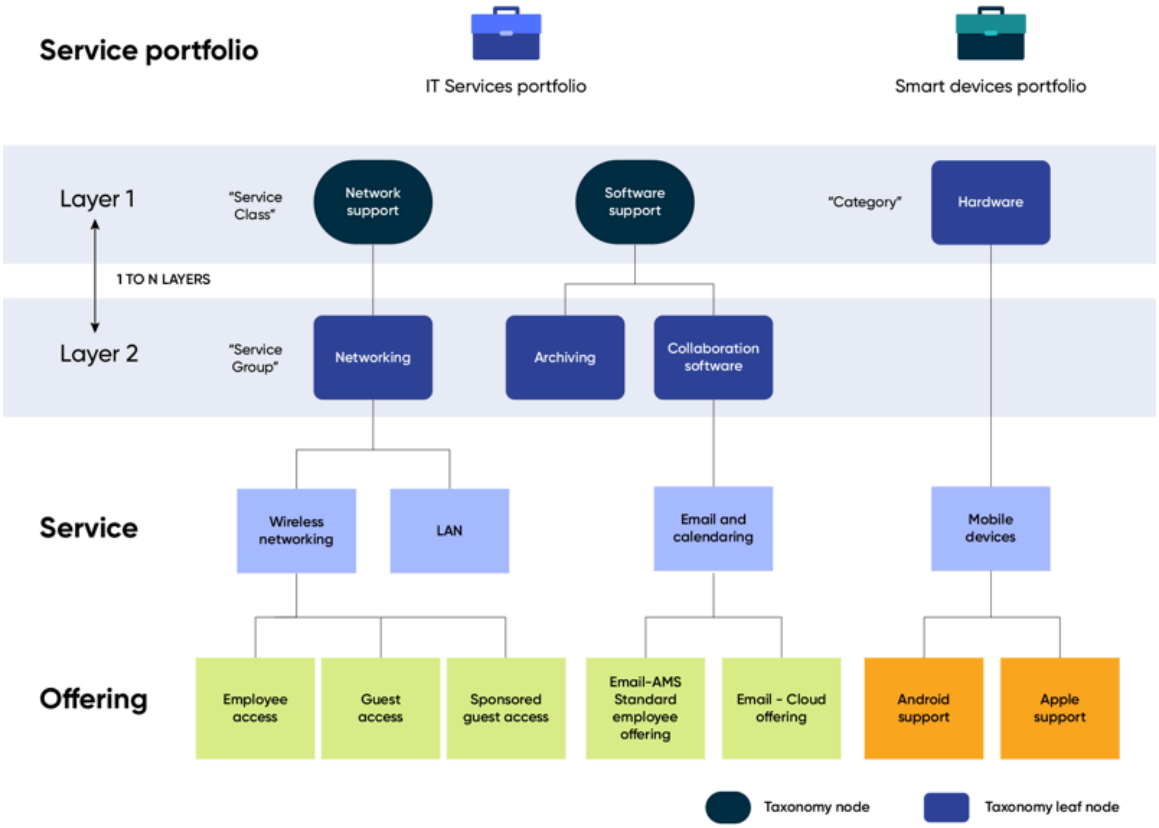
### Legacy portfolio structure taxonomy example




In this example, there are two service portfolios - IT Service portfolio and Smart devices portfolio.

- Below the service portfolios are the layers. You can have 1 to N layers and they can be a taxonomy node or a taxonomy leaf node, or both.
- Below the layers and leaf nodes are the services and service offerings.

## Standard portfolio structure taxonomy

If you're using the improved, standard portfolio structure, then your taxonomy framework may look something like this example.

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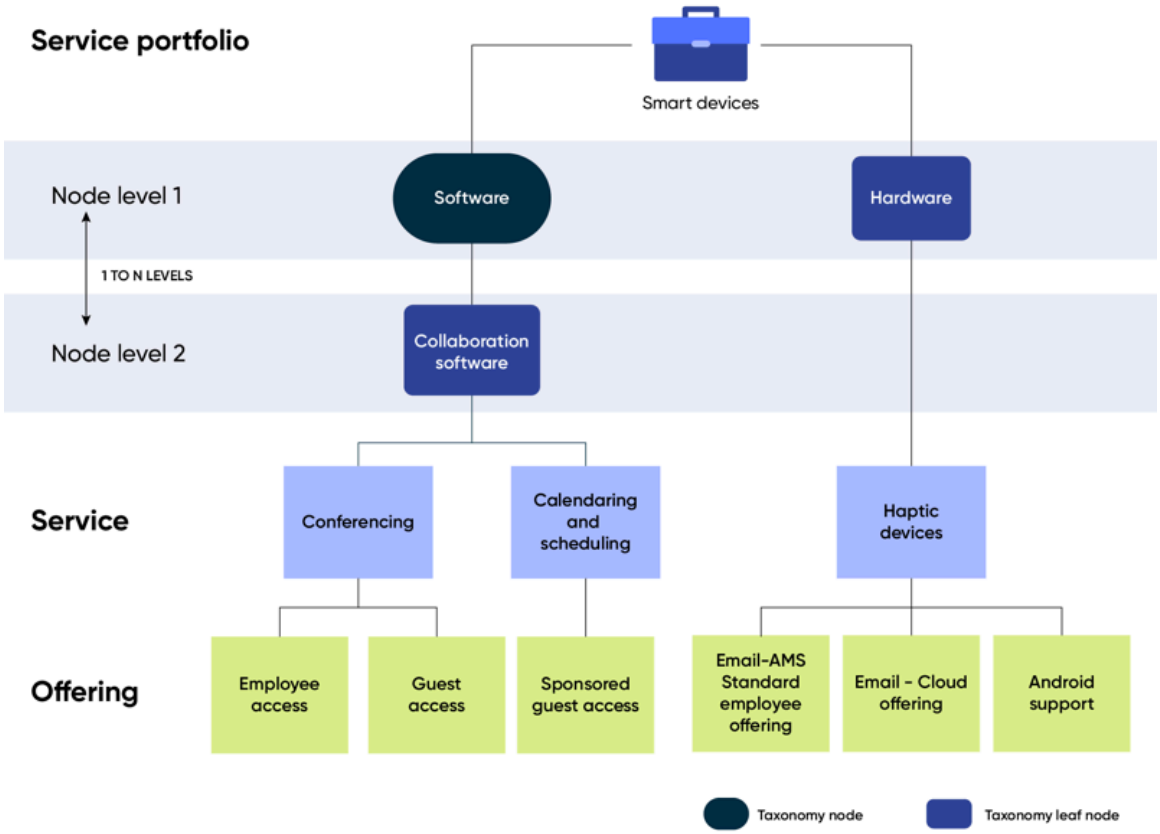
**Standard portfolio structure taxonomy example**




In this example, there's one service portfolio at the top — Smart devices.

- Below the service portfolio, is the node level.
  - You can have 1 to N node levels.
  - A node level can contain both a taxonomy node and a leaf node.
  - Assign multiple nodes (rather than layers) for more flexibility as you structure your service portfolios. For example, a single portfolio can have multiple levels of depth via node-to-node relationships.
- Below the taxonomy node levels are the services and service offerings.

**Note:**
You can see a visual relationship map of nodes, services, and service offerings in Digital Portfolio Management (DPM). For more information, see Getting started with Digital Portfolio Management.

**Related topics**

Create taxonomy nodes in Service Portfolio Management

Create taxonomy layer definitions in Service Portfolio Management

View relationship maps in Digital Portfolio Management

### Create taxonomy layer definitions in Service Portfolio Management

Create an unlimited number of taxonomy layers to organize, label, and manage your service portfolio. Taxonomy layers represent the highest containment levels of your service portfolio. Each level supports branches, or nodes, that contain child nodes or services in a hierarchical top-to-bottom structure.

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### Before you begin

**Important:**
This task applies if you are using the legacy portfolio structure. For information on the legacy and standard portfolio structures, see Service Portfolio Management taxonomy.

Role required: portfolio_admin

### About this task

Opening the **Taxonomy Layer Definitions** module displays a list of all existing layers defined for all service portfolios.

By default, the service portfolio name associated with the taxonomy layer is listed in the first **Service portfolio** column of the list. The service portfolio is the parent element to the taxonomy layer. Existing taxonomy layers appear in the **Name** column, and are chronologically sorted in the **Order** column. Your layer with order number 100 is always at the top, followed by order number 200, and so on.

Always associated taxonomy layers with a parent service portfolio. Example layers for an IT services portfolio might include the following taxonomy layers:

- Service Class
- Service Group

If the Service Portfolio Management Taxonomy Content Pack [com.snc.spm.content] plugin sample data is activated on your instance, review the provided taxonomy data to gain an understanding of how to best define your taxonomy layers. Refer to Activate Service Portfolio Management Sample Content Pack for more details.

### Procedure

1. Navigate to **Service Portfolio ManagementTaxonomy Layer Definitions**.
2. Select **New**.
   Alternatively, to edit an existing taxonomy layer definition, select the name of the taxonomy layer definition to open the form. Change any of the form field data as needed.
3. Fill in or edit the form fields.

**Taxonomy Layer Definitions**

| Field | Description |
|---|---|
| Name | Unique name that defines the purpose of the taxonomy layer, for example, Tier, as in software support tier or network support tier. |
| Order | Value that represents the hierarchical level where the taxonomy layer will exist. 1 is the highest level, with each chronological number following at a lower level.<br>**Note:** Layer ordering is locked and cannot be changed when a node is created for any layer in a service portfolio. Nodes cannot be added to layers if there is a gap in the layer order. |

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| Field | Description |
|---|---|
| Service Portfolio | Service portfolio for which the taxonomy layer is associated. |
| Short description | Brief detail about the taxonomy layer purpose. |

4. Click **Submit** to save your service portfolio or click **Update** after editing a taxonomy layer.
5. Click the newly created taxonomy layer definition in the list.
   The Taxonomy Nodes and Portfolio Metrics Related Lists appear on the Service Portfolio form. Refer to Service Portfolio Management taxonomy for detailed information regarding creating and adding taxonomy nodes within your service portfolio structure.

### Create taxonomy nodes in Service Portfolio Management

Create an unlimited number of nodes, or branches, and add them to your service portfolio taxonomy layers. By configuring taxonomy nodes, you can successfully achieve a highly detailed and organized service portfolio containing multiple elemental layers—from general to specific.

## Before you begin

Role required: portfolio_admin

## About this task

Add new nodes as needed and edit existing nodes, as well as reparent nodes or delete nodes. You can reparent a node to another node at the same taxonomy layer.
In Service Portfolio Management, taxonomy nodes typically represent service types within the configured taxonomy layers. These types act as containers for child nodes or services. Examples for an IT services portfolio could include the following taxonomy nodes:

- Data Center Management
- Hardware Support
- Software Management

If the Service Portfolio Management Taxonomy Content Pack [com.snc.spm.content] plugin sample data is activated on your instance, review the provided taxonomy data to gain an understanding of how to best define your taxonomy layers. Refer to Activate Service Portfolio Management Sample Content Pack for more details.

## Procedure

1. Navigate to **Service Portfolio Management** > **Taxonomy Nodes** and select **New**.
   To edit an existing taxonomy node, select the name of the taxonomy node to open the form. Change any of the form field data as needed. To delete an existing node, select **Delete**.
2. Fill in or edit the form fields.

### Taxonomy Node

| Field | Description |
|---|---|
| Name | Unique name that defines the purpose of the node. |
| Short description | Brief detail about the taxonomy node purpose. |
| Description | In-depth details about the node. |

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| Field | Description |
|---|---|
| Service portfolio | Service portfolio this taxonomy node is associated with. |
| Taxonomy layer | Taxonomy layer this node is associated with. |
| Parent | Taxonomy node to which the taxonomy node is associated. Use this form field to reparent a node at the same taxonomy level. |
| Owned by | Owner of the taxonomy node. |
| Valid from | The date the taxonomy code is valid. |
| Valid to | The date the taxonomy code is no longer valid. |
| Performance score<br>**Note:** Appears with a Service Owner Workspace subscription. | Most recent performance score for this node. The performance score is calculated by a nightly script.<br>**Note:** Only an admin can change the score, if necessary. |

3. **Submit** your taxonomy node.
   Alternatively, you can select **Update** after editing an existing taxonomy node.
4. Edit or define the taxonomy node weights.
   If available, select the **Edit Weights** related link to edit existing child service weights or child node weights. Alternatively, you can navigate to **Service Portfolio Management** > **Taxonomy Nodes** and find a node in the list. Select to open the form.

   **Note:**
   The **Edit Weights** related link appears with a Service Owner Workspace subscription. Weight values for associated child nodes are specified at the service offering level via the **Edit Metric Weights** related link on the Service Offering form.

5. Specify weight values for each associated child node.
   Total weight must equal 100 percent. For more information on weights and specifying weight values, refer to Service Owner Workspace performance metrics.
6. Review the related list records.
   Depending on the type of node, whether it is a leaf node or a non-leaf node, related lists display the following associated data.

| Option | Description |
|---|---|
| **Taxonomy Nodes** | List of all associated child nodes. You can ed it an existing child node by selecting a Taxon omy Node name. Create a new child node by clicking **New** and completing the **Taxonomy Node** form. |
| **Services** | List of all associated services shown for leaf nodes. Edit the list by selecting **Edit** and mak ing changes to the form. You can select a ser vice in the Related List to modify and update. Create a new associated service by clicking |

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| Option | Description |
| --- | --- |
| | **New** and completing the **Service** form. Refer to Create a service in Service Portfolio Management. |

## Create a service in Service Portfolio Management

Create services that benefit and add value to your internal organization and external customers and users.

### Before you begin

Role required: portfolio_admin or service_editor

### About this task

All occurrences of the table and reference field label **Business Service** throughout the product have changed to **Service**. For example, the Business Service form has changed to Service form. This change is for new instances only and doesn't affect existing upgraded instances.

**Note:**
You can also create and edit services and service offerings by using the Service Builder application. Service Builder provides a walk-through experience with contextual help along the way. For more information, see Service Builder.

### Procedure

1. Navigate to **All** > **Service Portfolio Management** > **Services** and select **New**.
   Alternatively, to edit an existing service, select the name of the service to open the form. Change any of the form field data as needed. To delete an existing service, select the **Delete** button in the form header.
2. On the form, fill in the fields.

#### Service form header

| Field | Description |
| --- | --- |
| Name | A unique name that reflects the nature of the service. |
| Service portfolio | Service portfolio this service is associated with. |
| Taxonomy node | Taxonomy leaf node within a portfolio this service is associated with. |
| Phase | Phase that the service is in. Available values are: **Pipeline**, **Catalog**, and **Retired**. |
| Status | That status of the service phase. |
| Short Description | Type of service. Available values are: **Business Service**, **Technical Service**, and **Application Service**. |
| Owned by | The service owner responsible for this service in the organization. |
| Delivery manager | The delivery manager for the service. |
| Business relation manager | Relationship manager for this service. |

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| Field | Description |
| --- | --- |
| **Important:** The following two fields only appear if you're using the deprecated Service Owner Workspace plugin. For more information on the deprecation of Service Owner Workspace, see Service Owner Workspace. | |
| Performance score | Most recent performance score. Populated after the service is active. The performance score is calculated by a nightly script and can't be changed. |
| CSAT score | Customer service feedback score. |

3. Select the **General** tab.
4. On the form, fill in the fields.

**Service form General tab**

| Field | Description |
| --- | --- |
| Number | Automatically generated unique identification for a new service record. Its value consists of a 'BSN' string and a unique number. Other forms and scripts can reference this identification.<br><br>The **Number** field is visible with the Service Portfolio form view.<br><br>**Note:** The **Number** field in service records that were created before the field was added, is null. |
| Version | Version of the service. |
| Aliases | Other names used for this service. |
| Service classification | Type of service. Available values are: **Business Service**, **Technical Service**, and **Application Service**. |
| Consumer type | Type of consumer. Available values are: **Internal**, **External**, and **Internal and External**. |
| Start date | Date the service is available. |
| End date | The date the service is retired. |
| Last review date | The date the service was last reviewed. |

5. Select the **Team** tab.
6. On the form, fill in the fields.

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**Service form Team tab**

| Field | Description |
|---|---|
| Delegate | A person authorized to manage the service on behalf of the service owner. |
| Business contact | Person to contact for issues related to this service. |
| Vendor | The vendor providing this service. |
| Stakeholders | People with an interest or concern regarding this service. |

7. Select the **Business Need** tab.
8. On the form, fill in the fields.

**Service form Business Need tab**

| Field | Description |
|---|---|
| Business need | Business need this service supports. |
| Business criticality | Criticality level that defines the importance of the service in your organization. |

9. After completing the form, select and hold (or right-click) the header bar and select **Save** from the pop-up menu.
   The related lists for the service appear. View associated or create the following:
   - Offerings
   - In Scope
   - Out of Scope
   - Services I depend On
   - Services Dependent On Me
   - Incidents
   - Problems
   - Change Requests
   - Other tasks
   - Knowledge Articles
   - Service Offering Node Weights
   - Improvement Initiatives
10. Select **Submit** to save your service or select **Update** after editing a service.

## Apply scope to a service in Service Portfolio Management

Define the limits of a service with scope details to grant or deny specific service views. Out of Scope items define what a service cannot provide and In Scope items define what a service provides. For example, nightly backups may be In Scope for the Desktop Support service, but Out of Scope for the Disaster Recovery service.

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### Before you begin
Role required: portfolio_admin or service_editor

### About this task
The In Scope and Out of Scope definitions appear in the service catalog page that users see when they access the service catalog.

To view the list of scope entries in your system, enter `service_scope.list` in the navigator and press the Enter key.

### Procedure
1. Navigate to **All** > **Service Portfolio Management** > **Services**.
2. Select the name of a service for which you want to define scope.
   Only a parent service can have scope.
3. In the In Scope or Out of Scope related list, select **New** to create a new definition or select **Edit** to add the scope to the In Scope or Out of Scope list for the service.
   Configure scope with anything that is pertinent to the service and helps define the limits of the service.
4. Give the scope item a descriptive name and provide details in the **Description** field.
5. Select **Submit**.

## Service offerings in Service Portfolio Management

A service offering derives from a service, refining the parent service to a specific business need and performance level.

## Service offerings and commitments

Offering records define different levels of performance for an existing service. For example, you might offer two levels of desktop support in your organization. You can offer a standard offering for upgrades and virus protection and an executive offering that also includes availability guarantee.

Service offering types include business service offerings and technical service offerings.

Create a complete set of service offerings defined by commitments that define the specifics of the offering. Each service must have at least one defined offering to move to the Catalog phase. This is because service offerings are where you define Service Level Agreements (SLAs) and where metrics are collated.

For detailed information about SLAs, including SLA definitions and results, refer to Service Level Management.

## Service offering pricing

Each service offering may have a pricing model and a price unit. Use this pricing data towards creating catalog items.

## Service offering subscriptions

You can subscribe different entities to a service offering. This data is then used to determine the total subscriber count on the offering form.

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## Technical service offerings

Technical service offerings can be shown as inherited relationships to business services and offerings. They are not included in metric models and do not use the weighting model.

## Re-parenting service offering types

You can change a service offering parent from one type of service to another. For example, changing an offering parent from a business service to a technical service or vice versa. Offerings cannot be re-parented to an application service. Some important information and guidelines concerning re-parenting service offering types, include:

- When you change the offering parent from a business service to a technical service you will receive a message alerting you that performance scoring is not available with technical service offerings.
- When you re-parent from one service type to another, existing weighting rules will apply.
- If you try to re-parent and the parent service is in Catalog phase with only one offering, you will receive a message that you cannot make this change.
- If the metric weight on the parent service is >0, you will receive a message alerting you to adjust the data before re-parenting the offering. You cannot re-parent the offering to a different service type until the weight for the offering on the former service type is set to zero.

## Service offering topics in this section

### View a service offering in Service Portfolio Management

View service offerings in Service Portfolio Management to find offerings that add value to your organization and external users. You can also view service offerings in the Service Builder application.

#### Before you begin

Role required: service_editor

#### Procedure

1. Navigate to **All** > **Service Portfolio Management** > **Service Offerings**.
2. Find the service offering by scrolling through the list or select the filter ( ) to adjust the filter conditions.
3. Select the service offering to open it.

   Before you open an offering, you may see one of the following symbols in front of its name.

   - The word [DRAFT] indicates that the offering is checked out and is in a draft state.
   - A clear triangle warning symbol ( ) indicates that it's the new copy [DRAFT] that's being worked on.
   - A red dot ( ) indicates that the offering is read only.

   As you view the offering, you can use the first set of tabs to see its general information, supporting teams, and information about price and operations. Use the second set of tabs (Related Links) for more details about the offering. Also, a button enables you to edit the offering in the Service Builder application.
4. **Optional:** View a service offering using the Service Builder application.

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a. Navigate to **All** > **Service Portfolio Management** > **Service Builder**.

b. Select the **Services** tab.

c. Find and open the service for the service offering that you seek.

> **Tip:**
> You can narrow your search by using the filter options on the column headings.

d. After the service opens, select **Manage Offerings** in the navigation panel to see the list of offerings.

You can also select **New** to create a service offering for that service.

> **Note:**
> The same symbols apply as previously described.

**Related topics**

Create a service offering in Service Portfolio Management

Create a service offering in Service Builder

### Create a service offering in Service Portfolio Management

Create service offerings to define services, document them, track performance against defined availability commitments, and relay the performance information in real time to your end users.

#### Before you begin

Role required: portfolio_admin

#### About this task

Often the data that's defined on a service and on its child offerings are identical. For example, the same person may own a service and its offerings, as defined in the **Owned by** field on the **Service** form. However, flexibility exists for defined data to be different between services and child offerings if the organization desires. For example, one person may own the service while another person owns the child offering.

Link service offerings to catalog items required to provision a service. Each service offering has commitments, which in turn, have service level agreements.

A service offering consists of a set of service commitments, which uniquely define the level of service in terms of availability, scope, and pricing. For example, an organization may offer two levels of Desktop Support in your organization. A Standard offering of upgrades and virus protection. And an Executive offering with the standard commitments plus some type of availability guarantee, such as 98% availability from 8-5 on weekdays.

When an offering is added to a service for the first time, some Offering form field values are inherited from the parent Service record. These form fields are: **Owned by**, **Business criticality**, **Delivery Manager**, and **Delegate**. When an offering is added and the parent Service record has empty field values, these fields are also empty on the Offering record. When you first insert an offering into a service, the parent Service record field values overwrite any existing values in the Offering record. You can update the fields after you've added the offering, if necessary.

You can also auto-create service offerings when creating a service portfolio. For more information, see Create portfolios in Service Portfolio Management.

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## Procedure

1. Navigate to **All** > **Service Portfolio Management** > **Service Offerings** and select **New**. Alternatively, to edit an existing service offering, select the name of the service offering to open the form. Change any of the form field data as needed. To delete an existing service, select the **Delete** button in the form header.
2. Fill in the form fields.

### Offering form

| Field | Description |
|---|---|
| Name | Unique name that reflects the nature of the service. |
| Parent | The parent service. |
| Phase | Phase that the service is in. Available values are: **Pipeline**, **Catalog**, and **Retired**. |
| Status | Status of the service per phase. |
| Short description | Brief details about the service portfolio. |
| Description | Comprehensive details about the service offering. |
| CSAT score | Customer satisfaction feedback score. |
| Total Subscribers | Number of subscriptions for this service offering. Total subscribers are calculated by a nightly script.<br>**Note:** Only an admin can change the score, if necessary. |
| Owned by | Service owner responsible for this service in the organization.<br>**Note:** This value is inherited from the parent Service record, but you can update. |
| Performance score<br>**Note:** This field displays if you're using the deprecated Service Owner Workspace plugin. For more information on the deprecation of Service Owner Workspace, see Service Owner Workspace. | Most recent performance score. Populated after the service is active. The performance score is calculated by a nightly script.<br>**Note:** Only an admin can change the score, if necessary. |

3. Select the **General** tab to complete the General section of the form.

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| Field | Description |
|---|---|
| Aliases | Other names used for this service. |
| Business criticality | Degree of how critical this service offering is to the business. You can base a demand response strategy off this value.<br>**Note:** This value is inherited from the parent Service record, but you can update. |
| Consumer type | Type of consumer. Available values are: **Internal** and **External**. |
| Service classification | Type of service. Available values are: **Business Service**, **Technical Service**, and **Application Service**. |
| Version | Version of the service offering. |
| Start date | Date the service is available. |
| End date | Date the service is retired. |
| Location | Physical location of the service. |
| CSAT Survey Frequency | How often a customer survey is sent. |
| CSAT Survey Last Sent | Last time a customer satisfaction survey was sent. |

4. Select the **Team** tab to complete the Team section of the form.
   The Teams related list enables you to assign different group types to support a service offering. For more information, see Teams related list and Assign multiple teams to support a service offering in Service Portfolio Management.

| Field | Description |
|---|---|
| Delivery Manager | The delivery manager for this service.<br>**Note:** This value is inherited from the parent Service record, but you can update. |
| Delegate | Person authorized to manage the service along with the service owner.<br>**Note:** This value is inherited from the parent Service record, but you can update. |
| Support group | Group managing the service. See Assign multiple teams to support a service offering in Service Portfolio Management. |
| Vendor | The vendor providing this service. |

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| Field | Description |
|---|---|
| Stakeholders | People with an interest or concern regarding this service. |

5. Select the **Price** tab to complete the Price section of the form.

| Field | Description |
|---|---|
| Price model | Pricing structure for a service offering as defined in the parent service.<br><br>The **Price model** field is read only. This value is set in the parent service. |
| Price unit | Short name of the unit for this service. Appears when **Per Unit** is chosen for the **Price Model** type in the parent service.<br><br>The **Price unit** field is read only. This value is set in the parent service. |
| Price | Price and currency. |
| Unit Description | Longer description of a unit of this offering. |

6. Select the **Operations** tab to complete the Operations section of the form.

| Field | Description |
|---|---|
| Contract | Associated contract number. |
| Maintenance schedule | Time during which maintenance is scheduled. |
| Service level requirement | Field captures the requirements, which include the service level agreements and service level targets, for the service. |
| Prerequisites | Prerequisites for this service offering. |
| Compatibility dependencies | Compatibility dependencies for this service offering. |
| Monitoring requirements | Requirements to monitor this service offering. |

7. **Optional:** Select the **Estimated Spend** tab to view the Estimated Spend section.

> **Important:**
> This step and the next one are optional because they only apply if you're using the deprecated Service Owner Workspace plugin. For more information on the deprecation of Service Owner Workspace, see Service Owner Workspace.

8. **Optional:** Choose a value for the **Cost model** field.
Choices include the default **None**, **Fixed**, and **Per unit**. View read-only data in the **Estimated spend** field.

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9. After completing the form, select and hold (or right-click) the header bar and select **Save** from the pop-up menu.
   The **Related Links** and related lists for the offering appear.
10. **Optional:** In **Related Links** you can create an offering improvement initiative, edit offering metric weights, and subscribe to the offering by selecting the associated link.

    **Important:**
    This step is optional because it only applies if you're using the deprecated Service Owner Workspace plugin. For more information on the deprecation of Service Owner Workspace, see Service Owner Workspace.

11. View associated related lists and items.
    View associated or create new:
    - Service Commitments
    - Service Offerings I Depend On
    - Service Offerings Dependent On Me
    - Outages
    - Incidents
    - Problems
    - Change Requests
    - Other Tasks
    - Knowledge Articles
    - Catalog Items
    - Subscribed by Group
    - Subscribed by Location
    - Subscribed by Department
    - Subscribed by User
    - Subscribed by Company
    - Performance Metrics
    - Improvement Initiatives
12. Select **Submit** to save your service offering or select **Update** after editing a service offering.

### Related topics

Teams related list

Assign multiple teams to support a service offering in Service Portfolio Management

## Add a commitment to a service offering in Service Portfolio Management

Service commitments are specific services that define the unique availability guarantees, scope, and pricing for a service offering.

### Before you begin

Role required: service_editor

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### About this task

Service commitments define the expected level of a service. A service offering derives from a service, tailoring the parent service to a specific business need. A service offering consists of a set of service commitments which uniquely define the service offerings.
To create service commitments, each service needs at least one associated service offering.

### Procedure

1. Navigate to **All** > **Service Portfolio Management** > **Service Offerings**.
   Alternatively, you can navigate to **Service Portfolio Management** > **Commitments**.
2. Open a service offering record.
3. In the Service Commitments related list, select **New**.
4. Give the commitment a descriptive name.
   You can specify any kind of service.
5. Select the **Type** of commitment from the list.

| Option | Description |
|---|---|
| **Availability or Maintenance Window** | Used in system processing. If you select **Main tenance Window**, the **Schedule** field is re quired.<br><br>Creates Availability records for the service of fering based on the outages for that offering. If an Availability commitment exists, when an Outage is created against a service offering with the Availability commitment, it will begin tracking down time and availability. |
| **Response Time, Delivery or Other** | Display additional information in the service catalog. This information details the type of service commitment the user may expect from a given service offering. These service commitment types do not provide additional functionality or a homepage gauge. |
| **Recovery time objective** | Guarantee of how long it takes to recover the system from the recovery point. Set the re covery time in the **Time Amount** field that ap pears when you select this commitment type. This field is available with vendor ticketing.<br><br>**Note:**<br>These service commitment types do not provide additional functionality or a homepage gauge. |
| **Recovery point objective** | Guarantee of how often backups are per formed. Set the backup interval in the **Time amount** field that appears when you select this commitment type. This field is available with vendor ticketing. |

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| Option | Description |
| --- | --- |
| | **Note:** These service commitment types do not provide additional functionality or a homepage gauge. |
| **SLA** | Allows commitments defined by a service lev el agreement (SLA) that tracks whether a ven dor provides a level of service for a defined percentage of the time. The SLA results are calculated automatically and can be viewed on the My Services - SLAs homepage or by navigating to **Services** > **Service Offering SLAs** > **SLA Results**. |

6. **Optional:** Select a **Contract** for this service commitment.
   This information is used when creating vendor credit records.

   **Tip:**
   If you don't see task (SLAs for incidents related to service commitments), then contact your Administrator. When **Contract** is entered in the Reference field of the incident, then the Use reference qualifier field should be set to **Advanced**, and the global business rule *`contractFilter`* must be entered in the **Reference qual** field.

7. Enter the information to calculate credit owed by the vendor for any contract breaches.
   These fields are available with vendor ticketing:
   - **Breach penalty amount**: Amount assessed per unit of time for a breach.
   - **Per**: Unit of time used to calculate the total credit owed for a breach.
   - **Breach penalty time**: Amount of free time provided by the vendor per breach.
8. Complete the form and select **Submit**.
   The Service Offering form opens, and the new commitment appears in the Service Commitment related list.
9. Select **New** to add another service commitment or select **Edit** to add an existing commitment to this offering.

### Assign multiple teams to support a service offering in Service Portfolio Management

You can assign multiple teams to support a single service offering when several teams are responsible for that offering.

#### Before you begin

Role required: service_editor

#### About this task

The service offering team table [cmdb_rel_team] enables multiple groups to be related to a single service offering. While in the offering record, use the **Team** tab to assign a support group to the offering. Use the Related Links **Teams** tab to add more support groups to the service offering. You can also edit the group type of the teams that you add in the Related Links **Teams** tab.

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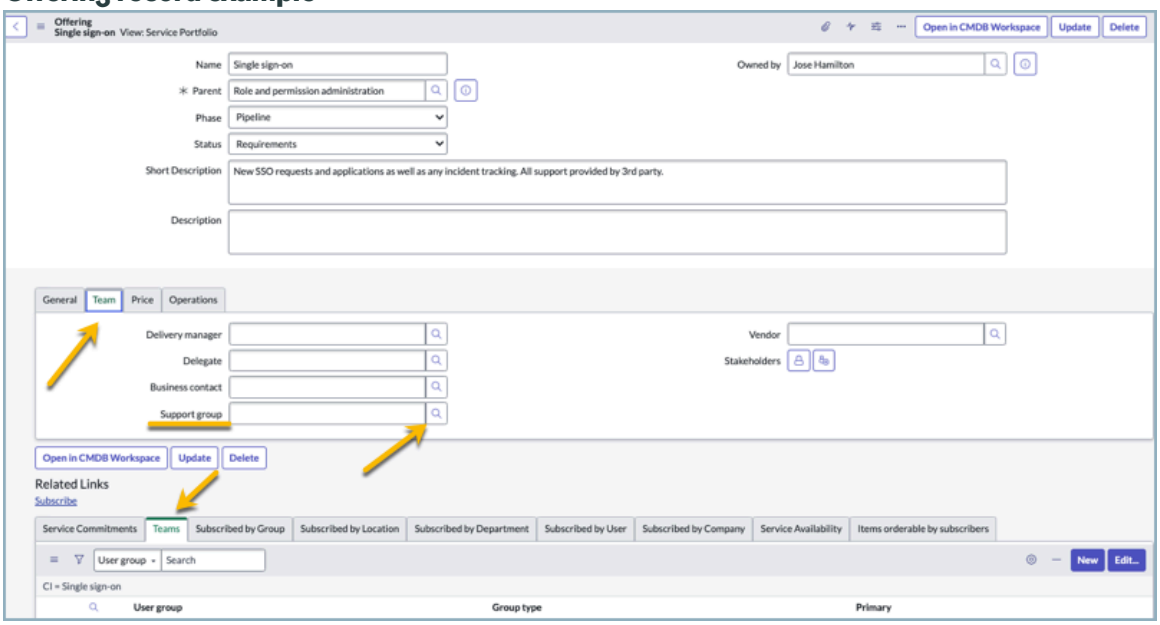
## Procedure

1. Navigate to **All** > **Service Portfolio Management** > **Service Offerings**.
2. Open the service offering that you want to assign support teams.

**Offering record example**




3. In the first **Team** tab on the offering record, use the Search icon ( ) to select the support group for this service offering, and then **Save** the page.
   After you save the page, the support group that you selected displays in the second **Teams** tab, in the Related Links area. The Related Links **Teams** tab has three columns: **User group** (the support group name that you selected in the first teams tab), **Group type**, and **Primary**. You can set the primary entry to true or false, indicating that the user group is the primary support group.
4. In the Related Links **Teams** tab, add more support groups to the **User group** list.
   a. Select **Edit**.
   b. Move one or more groups from the **Collection** to the **Teams List**, and then **Save**.
5. **Save** the offering record.
6. The Related Links **Teams** tab contains all the teams that you added.
   You can select any team in the **User group** column to change the team. You can also select any **Group type** to change it to one of the other options: Support Group, Approver Group, Change Group, or Managed By Group.

### Subscribe users to a service offering in Service Portfolio Management

Subscribe users to a service offering so they can order it from the catalog. You can also subscribe offerings for companies, locations, groups, and departments.

## Before you begin

Role required: com.snc.service_portfolio

Role required: service_editor

## About this task

Subscribers define who a service offering is for. Subscribe users to service offerings so they can view and request catalog items related to the service offering. For example, if a service is

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for video teleconferencing, it might have two offerings — one for a personal communications platform and one for a webinar. To select either option, users must order the option from the catalog. To order, they must be added as a subscriber to that service offering.

The base system counts the number of subscribers per offering and per service. It also enables you to send customer satisfaction (CSAT) surveys to subscribers to gain feedback about the service offering. You can choose the cadence for how often to send the surveys per interval.

### Procedure

1. Navigate to **All** > **Service Portfolio Management** > **Service Offerings**.
2. Select a service offering that you want to add subscribers.
3. Select the *Subscribed by User* related list (tab), and then select **Edit**.
   Alternatively, you can select one of the other related lists (tabs) to subscribe groups, locations, departments, or companies.
4. Select the subscriber name from the **Collection** and move it to the **Subscribed by User List**.
5. Select **Save**.

## Create catalog items for service offering subscribers in Service Portfolio Management

As a service owner or service offering subscriber, you can create one or more catalog items for your service regardless of the offering phase or status. You can also relate an existing catalog item to a service offering.

### Before you begin

Role required: com.snc.service_portfolio or service_editor

### About this task

Use the **Items orderable by subscribers** related list (tab) on a service offering to:

- Relate an existing catalog item to a service offering.
- Create catalog items for a service offering.

### Procedure

1. Navigate to **All** > **Service Portfolio Management** > **Service offerings**.
2. Open a service offering that you want to relate a catalog item to or add a catalog item to.
3. Select the **Items orderable by subscribers** tab.
4. **Optional:** Relate a catalog item to an existing service offering.
   a. Select **Edit** to see a list of catalog items that you can relate to the service offering. The list of catalog items includes record producers. To see a list of record producers, open a new tab and type `sc_cat_item_producer.list` in the Filter navigation field.
   b. Move the catalog item from the **Collection** list to the **Items orderable by subscribers List**.
   c. After you have moved all the catalog items that you want to relate to the service offering, select **Save**.
5. Create a catalog item for the service offering.
   a. Select **New**.
   b. On the form, fill in the fields.

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### Catalog Item form

| Field | Description |
|---|---|
| Name | Unique name for the catalog item. |
| Catalogs | The catalogs that this item is related with. |
| Category | Category for the item. Adding the catalog enables others to search for this item. |
| State | State of the catalog item. When creating a catalog item, you can't edit the **State** field. The state changes to **Draft** after you select **Submit**. |
| Checked out | Name of the person who has the catalog item checked out for editing. |
| Owner | Owner of the catalog item. |
| Fulfillment automation level | The fulfillment level of the catalog item. |
| Item Details | |
| Short Description | Short description that is viewed on the service catalog homepage, search results, and the title bar of the order form. |
| Description | Full description of the catalog item. You can embed videos, images, links to internal Knowledge Base (KB) articles, and links to external sources of information. |
| Meta | Comma-separated list of tags used to search for the catalog item. Use commas between keywords for better results when searching.<br><br>For more information, see Configure keyword search for catalog items. |
| Process Engine<br><br>**Note:**<br>You can specify a value for only one of these fields. | |
| Flow | Flow that defines the fulfillment of the catalog item. |
| Workflow | Workflow that defines the fulfillment of the catalog item. |
| Execution plan | Execution plan that defines the delivery of the catalog item. |
| Picture | |
| Icon | Image next to the catalog item in the catalog. The icon dimensions are 27x27 pixels. If no image is uploaded, the default icon is next to the catalog item. Your uploaded image overwrites the default image stored in `images/service_catalog/generic_small.gif`. |
| Picture | Image of the item. |
| Pricing | |
| Price | Price for the catalog item. Select the currency from the list. |

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| Field | Description |
|---|---|
| Recurring Price | Price for the catalog item that recurs. For example, a maintenance service could have a monthly recurring price. |
| Recurring Price Frequency | Time frame for recurrence, such as **Monthly** or **Annually**. |
| Portal Settings | |
| Use these settings to configure the catalog item behavior in the Service Portal. | |
| Request method | Setting that controls the label for the **Order Now** button and the order submission experience.<br>▪ **Order**:<br>▪ Button label: **Order Now**<br>▪ Confirmation dialog box: Displayed<br>▪ Delivery information: Editable<br>**Note:** This setting is the default setting.<br>▪ **Request**:<br>▪ Button label: **Request**<br>▪ Confirmation dialog box: Displayed<br>▪ Delivery information: Not displayed<br>This setting can be used in scenarios such as a code access request where the delivery information is pre-determined.<br>▪ **Submit**:<br>▪ Button label: **Submit**<br>▪ Confirmation dialog box: Not displayed<br>▪ Delivery information: Not displayed<br>This setting can be used in scenarios such as a reset password request where no further request information is required. |
| Hide 'Add to Cart' | If selected, the **Add to Cart** button isn't displayed for the item. If the **Show Add to Cart** instance option of the widget is set to **false**, then this setting is ignored.<br>This setting is selected by default if the **Request method** is **Request** or **Submit**.<br>For upgrade scenarios, if the **No cart** field is selected in Platform, then run the *CatalogPortalSettingsMigration* script include to update this setting to the **Hide 'Add to Cart'** field on the **Portal Settings** tab.<br>**Note:** This field is applicable for a catalog item and order guide. |
| Hide Quantity | If selected, the **Quantity** list isn't displayed for the catalog item. |

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| Field | Description |
|---|---|
| | **Hide Quantity** is selected by default if the **Request method** is **Request** or **Submit**.<br><br>For upgrade customers, if the **No quantity** field is selected in Platform, run the *CatalogPortalSettingsMigration* migration script to update this setting to the **Hide Quantity** field on the **Portal Settings** tab.<br><br>**Note:**<br>▪ Applicable for a catalog item.<br>▪ An order guide inherits this setting from the included catalog item. |
| Hide Delivery time | If selected, the **Delivery Time** field isn't displayed for the catalog item.<br><br>**Hide Delivery time** is selected by default if the **Request method** is **Submit**.<br><br>**Note:**<br>▪ Applicable for a catalog item.<br>▪ An order guide inherits this setting from the included catalog item. |
| Hide 'Add to Wish List' | If selected, the **Add to wish list** button isn't displayed for the catalog item. If the wish list is inactive for the catalog item or the portal widget instance option is set to **false**, then this setting is overridden for the item.<br><br>**Note:**<br>Applicable for a catalog item and record producer. |
| Hide Attachment | If selected, the **Add attachments** button isn't displayed for the catalog item.<br><br>**Note:**<br>▪ Applicable for a catalog item and record producer.<br>▪ An order guide inherits this setting from the included catalog item. |
| Mandatory Attachment | If selected, adding an attachment is required for the catalog item.<br><br>**Note:**<br>Applicable for a catalog item and record producer. |

6. **Submit**.
   Before you submit, select **Try It** to see the result.

### Reporting for services and service offerings

See what's impacting your services and service offerings and report on them by using related list information in Service Portfolio Management.

Service owners can track service level agreements (SLA) when an incident (or a problem or a change) references their service offering in one of these related lists: Impacted services or Affected configuration items (CIs). Portfolio admins can create indicators and reports for service offerings to get a comprehensive view of what is impacting each service offering.

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## Offering record related lists

On the service offering record, there are three related lists that impact your service offerings:

- All Incidents
- All Problems
- All Changes

As implied, each related list retrieves all the incidents, all the problems, and all the changes where the service offering has them added as part of these areas:

- Service offering field on the record
- Affected CIs related list on the record
- Impacted services related list of the record

You can also filter on each related list to find specific items.

## SLA commitment reporting

When a service offering is added to the impacted service or to the affected CI related list, the SLA breach reporting is triggered for that offering. The trigger happens even if the offering isn't listed in the service offering field on the record.

**Related topics**

View availability results in Service Portfolio Management

### Service Portfolio Management service offering price

Service offerings inherit the pricing structure of the associated parent service. If the price model for each service offering in Service Portfolio Management is defined in the parent service as per unit, then each service offering must also have an associated price unit. The actual price for that unit is established in the service offering record.

You can review service offering information regularly as a part of Data Certification and workflow. For example, you can set up a certification to validate pricing for your service offerings.

Forecast service usage and cost for a fiscal period to plan your future business using the Showback functionality of Financial Management.

To set a service offering price, navigate to **Service Portfolio Management** > **Service Offerings** and select an offering for which a defined pricing structure exists. Enter the **Price** for the service price unit and update the record. You can also type an optional description in the **Unit description** field of the service offering record.

### Set service offering price models and units in Service Portfolio Management

Define the pricing structure for a service offering to use either a per unit price model or a fixed price model.

#### Before you begin

Role required: portfolio_admin or service_editor

#### Procedure

1. Navigate to **All** > **Service Portfolio Management** > **Services Offerings**.
2. Select a service offering from the Service Offerings list.
3. Define the **Price model**.

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The choices are **Per Unit** and **Fixed**. If you select **Per Unit**, the **Price unit** field appears.

4. Type the name of a unit to use for pricing, for example, `service`, `server`, or `person`.
5. Select **Update**.

## Log outages in Service Portfolio Management

Log outages to adjust your business or technical service commitment availability.

### Before you begin

Role required: service_editor

### About this task

Service Portfolio Management tracks and reports on outages for all business or technical service offerings that include availability commitments.

The outage is used to evaluate the availability of the offering and appears in the reports generated for this offering. There are three types of outages:

- **Outage**: An unplanned outage that could be caused by hardware or network issues. The only type of outage that's considered when calculating the availability of a business or a technical service.
- **Planned Outage**: A necessary, expected outage caused by planned maintenance or an upgrade.
- **Degradation**: A problem that affects a business or technical service but doesn't result in a disruption of that service.

Outage records can relate to multiple configuration items (CIs). You can link a single outage to multiple CI records using the Affected CIs related list.

**Note:**
An outage must be created and saved before you can add a CI relation or link an outage to multiple CI records using the Affected CIs related list.

View a unique **Outage Number** identifier for your outage records. View the Outage Number column in the Outage table records list and on the Outage form.

**Note:**
The Outage Numbering plugin (com.snc.outage_numbering) must be activated to introduce number data. The plugin is automatically activated for all instances and upgrades except those instances that already have a number prefix column on the Outage table. If the plugin isn't active and you want to move to the base system field, see the Activate Outage Numbering plugin [KB0823685] article in the HI Knowledge Base or contact Customer Service and Support.

When an outage is opened against a business or technical service, all child offerings are added to the Affected CI related list on the outage form. A pop-up message notifies you that the outage affects all child offerings. If needed, the offerings can be removed from the Affected CIs related list.

### Procedure

1. Navigate to **Service Portfolio Management** > **Outages**.
2. Select **New** to create an outage or find the business or technical service offering in the Outages records list **Configuration item** field to edit.

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- If creating an outage, the Outage form opens.
- If editing an existing outage, select the outage in the **Type** field.

3. Edit the **Type** field as necessary or choose **None**.
4. **Optional:** Enter text in the **Message** field.
5. Enter the length of the outage.
   - Select the **Begin** and **End** dates and times with the calendar or
   - Enter the **Duration** as a function of days and hours.
6. Select and hold (or right-click) in the form header to save the record or select **Submit** or **Update** if editing an existing outage record.

**Note:**

If a single outage impacts multiple business or technical service offerings, you can add those offerings to the Affected CIs related list.

7. To add an associated affected CI, select **Add**.
   All affected CIs are listed in the **Service Offering** configuration class.
8. Select a single CI or group of CIs.
   Select the box next to the CI name and then select **Add Selected**. Alternatively, you can choose to add all the listed affected CIs to the outage record by selecting **Add All**.
9. Close the Add Affected Configuration Items list window.
   The CI or CIs are added to the Affected CIs related list.
10. Select **Update**.

## View availability results in Service Portfolio Management

View availability calculations for commitments on service offerings and application services. After the commitments are set up in Service Portfolio Management, you can view the results by an automated report that you set up.

After an availability commitment is added to a service offering or to an application service, Service Portfolio Management generates a year of availability records for that item and commitment, starting from the previous year. Service availability is based on the availability of the offerings, rolled up to the service. If an outage is updated, then the related availability records are updated as well so you can assess outage impacts and manage outage records.

Service Portfolio Management runs a daily job to generate the commitment availability reports and uses the system time zone.

For information on adding availability commitments, see Add a commitment to a service offering.

## Availability calculator

Starting with the Washington DC release, you can use an availability calculator *[com.snc.availability.v2]* for improved performance, calculations, and maintenance.

The availability calculator is redesigned from its predecessor to ensure that you see the most updated and accurate availability data in the period that you want.

Service Portfolio Management creates availability records on the first of the period so you can see the availability as the period progresses. This real-time data is especially valuable when you've committed to a specific level of availability for your customers.

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Also, the improved calculator updates the record as outages are created. For example, you can start off with 100% availability, and then when an outage happens, it updates to 99.95% based on the outage duration. You and your customers can rely on accurate availability data during outages, without repeated outage recalculations with no end date (as with the previous calculator).

Here are the availability period options that you can choose from when using the updated availability calculator:

- Daily
- Weekly
- Monthly
- Annually
- Last 7 Days
- Last 30 Days
- Last 12 Months

New customers automatically get the updated availability calculator, but existing customers must set the property to 'true' to opt in.

To set the updated system property to 'true,' admins must do the following:

- Type `sys_properties.list` in the Filter navigator, and then press **Enter**.
- Select the **for text** search option.
- Type **availability** in the **Search** field, and then press **Enter**.
- Find the *[com.snc.availability.v2]* option, and then set its value to true.

## Availability reporting for application services

To view availability reporting for application services, you must create and map availability commitments to an application service using the *[cmdb_ci_service_auto table]*.

In the *[cmdb_ci_service_auto table]*, use the *cmdb_ci* field in the *service_offering_commitment* field to associate an application service to an availability commitment.

## Generate availability results

To view availability results, navigate to **All** > **Service Portfolio Management** > **Availability**, and then select the related record from the list.

### Service availability fields and calculations

| Field | Description | Calculations |
|---|---|---|
| Display name | Name of the configuration item (CI) and the availability for the commitment. You can't edit this field. | Not applicable. |
| Service offering | The affected offering for this availability. | Not applicable. |
| Service commitment | The affected commitment for this availability. | Not applicable. |

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### Service availability fields and calculations (continued)

| Field | Description | Calculations |
|---|---|---|
| Start | Start of the availability interval. Mouse device pointing over this field displays the duration. | Not applicable. |
| End | End of the availability interval. Mouse device pointing over this field displays the duration. | Not applicable. |
| Committed uptime | Total expected service availability for this commitment, given in days, hours, minutes, and seconds. | Period end to period start. |
| Acceptable downtime | Acceptable amount of downtime against the commitment's schedule for this interval, given in days, hours, minutes, and seconds. | Scheduled period end to scheduled period start, multiplied by commitment percentage. |
| Total downtime | Wall clock downtime (independent of the schedule), given in days, hours minutes, and seconds. | Outage end to outage start. |
| Total availability % | Availability percentage for the entire interval (independent of the schedule). | (Available uptime minus the total downtime) divided by the available uptime. |
| Total outages | Total number of outage periods in this interval (independent of the schedule).<br>**Note:** If an unplanned outage (in full or in part) overlaps with a planned outage, then the unplanned outage time that overlaps doesn't count toward the total outage time. This logic applies to the CI and affected CIs on the outage record. | Number of outages. |
| Commitment availability % | Availability within this commitment's schedule. | (Committed uptime minus commitment downtime) divided by the committed uptime. |
| Commitment downtime | Downtime that counts against this commitment's schedule, given in days, hours, minutes, and seconds. | (Outage start minus outage end) in scheduled up time. |
| Commitment outages | Number of outage periods against this commitment's schedule in this interval. | Number of outages in scheduled uptime. |
| Met commitment | When checked, indicates that the availability commitment has been met. | True or false depending on if commitment availability percentage is higher than the service commitment. |
| Mean time between | Average time between commitment outages for a CI. | Basic formula: Total uptime in period divided by the number of outages in period (Commitment |

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**Service availability fields and calculations (continued)**

| Field | Description | Calculations |
|---|---|---|
| failures (MTBF) | | outage periods), where total uptime in period = (Committed uptime minus Committed downtime). |
| Mean time to restore service (MTRS) | Average duration of commitment outages for a CI. | Basic formula: Total duration (Commitment downtime) divided by the number of outages in period (Commitment outage periods). |

**Note:**
For more information about calculations for MTBF and MTRS, see KB1505841.

## Archival rules for better performance

Starting with the Vancouver release, archival rules are activated by default. Service Portfolio Management uses a scheduled job called table cleaner to archive older records from tables in the instance to keep table sizes and query performance manageable. To ensure you get quicker data results, Service Portfolio Management uses the table cleaner job to archive availability data that is older than three years.

## Set the time zone for availability results in Service Portfolio Management

By default, the time zone to calculate availability for services and commitments is set to the global (system) time zone. You can change the global time zone or you can set the time zone for service commitments. With either option, you can recalculate the availability results based on the time zone that you set.

### Before you begin

Role required: portfolio_admin or admin

### About this task

The following system properties work in the background for you to set the time zone for availability results:

- spm.availability.global.tz — The default time zone, also called the system time zone. This system property enables you to select a time zone from a list to calculate availability results for all commitments using this global time zone.
- spm.availability.commitment.tz — When set to true (or to Yes in the interface), this system property enables you to calculate availability results using the time zone that you select for a commitment record.

To set the time zone, the availability system property [com.snc.availability.v2] must be set to true.

1. In the Filter navigator, enter `sys_properties.list`.
2. Enter `*avail` in the **System Properties Name** search field, and then press **Enter**.
3. Verify that the availability system property [com.snc.availability.v2] is set to true.

**Note:**
If the availability system property isn't set to true, then select the system property name, set the Value field to true, and then select **Update**. A banner might display with a link to edit the record.

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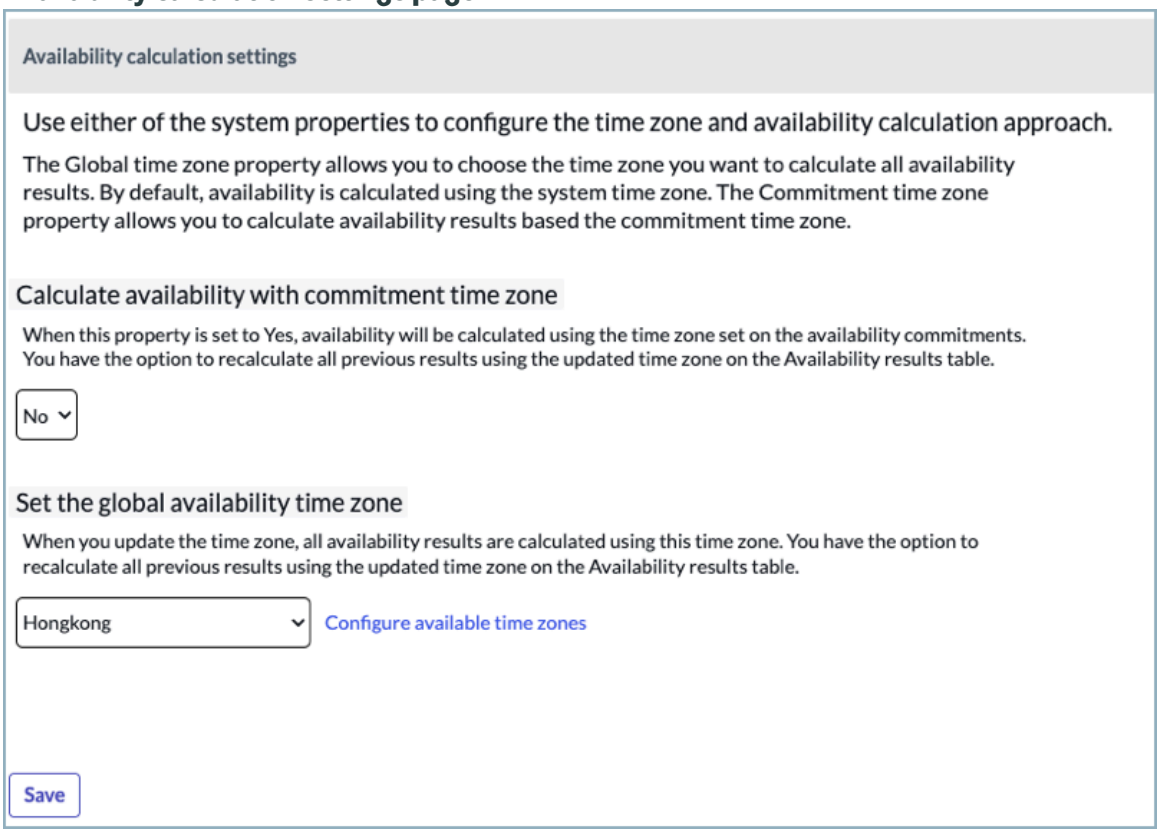
## Procedure

1. Navigate to **All** > **Service Portfolio Management** > **Administration** > **Availability calculation settings**.

**Availability calculation settings page**




2. Decide how you want to calculate availability.
   - **Calculate availability with commitment time zone** or
   - **Set the global availability time zone**.

   Refer to the **Availability calculations settings page** image for the next steps.
3. **Optional: Calculate availability with commitment time zone**.
   a. On the **Availability calculations settings** page, select **Yes** to **Calculate availability with commitment time zone**, and then **Save**.

   **Note:**
   Notice that the global availability time zone can't be set.

   b. In the Core UI tab, navigate to the list of service commitments.

   **Tip:**
   To see a list of service commitments, enter `service_commitment.list` in the Filter navigator, and then press **Enter**.

   c. Open a service commitment that you want to change the time zone. In the **Time zone** field, use the down arrow to select a different time zone, and then select **Update**.
   d. The **Time zone** column of the Service commitment table shows the time zone that you updated.
4. **Optional: Set the global availability time zone**.

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a. On the **Availability calculations settings** page, select **No** to **Calculate availability with commitment time zone**.

b. Use the down arrow to **Set the global availability time zone**, and then **Save**.

c. In the Core UI tab, navigate to the service availability list.

> **Tip:**
> To see the service availability list, enter `service_availability.list` in the Filter navigator, and then press **Enter**.

d. Select **Recalculate results**, and then select **Recalculate** on the **Confirmation** page.

e. Select **Refresh** ( ) on the service availability list to see the updated time zone in the **Time zone** column.

> **Note:**
> It takes a few minutes for all the records to recalculate and show the updated time zone field.

5. **Optional:** Configure the available time zones.

a. On the **Availability calculations settings** page, select **Configure available time zones** to open it in another tab.

b. In the opened tab, select the time zone from the **Available** field and move it to the **Selected** field.

> **Note:**
> You can also add a time zone to the **Available** field. Enter a time zone in the **Enter new item** field, and then select **Add**.

c. Select **Save**.

d. To return to the **Availability calculation settings** page, select its tab.

6. Select **Save**.

**Related topics**

View availability results in Service Portfolio Management

## Convert services in bulk in Service Portfolio Management

Convert multiple services from the Configuration Management Database (CMDB) service table to one of the dedicated child tables. You can convert to a business service or to a technical service.

### Before you begin

Role required: admin

### About this task

You can convert services individually but to reduce manual overhead, convert multiple services at once from the CMDB service table [cmdb_ci_service] to one of the dedicated child tables:

- Business service table [cmdb_ci_service_business]
- Technical service table [cmdb_ci_service_technical]

When you convert a service, the record and all its relationships remain intact.

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**Note:**
Service offerings can't be converted but they inherit the parent type (Service classification if your organization uses that field).

### Procedure

1. Navigate to **All** > **Service Portfolio Management** > **Services**.
2. Select the services that you want to convert.
   If your organization uses the Service classification field for business and technical services, then you can filter by Service classification.
3. Select **Actions on selected rows**, and then select **Convert to business service** or **Convert to technical service**.
4. At the prompt, select **OK** to continue to convert the services or select **Cancel**.

   **Note:**
   If a selected item can't be converted, a warning message is displayed.

5. **Optional:** Convert a service while in the service record.
   To convert a service wile in the service record, find the convert options under **Related Links**. If you don't see the convert options, then you might be in a record that isn't in the CMDB service table [cmdb_ci_service].

## View Service Level Agreement (SLA) results in Service Portfolio Management

Service Portfolio Management leverages the Service Level Management application and includes a module to manage your Service Level Agreement (SLA) definitions and results.

You can view, modify, or create SLA definitions from the Service Portfolio Management application. You can also view, modify, or create SLA results. Refer to Service Level Agreement (SLA) definition and Create an SLA definition for information about SLA definitions and configuration. For complete detailed information about SLAs, refer to Service Level Management.

After you define service commitments for your offerings, you can monitor the SLA results to manage performance by the running a daily job that generates the SLA results.

To enable Service Level Agreement (SLA) commitment support to Service Portfolio Management, activate the com.snc.service_portfolio.sla_commitment plugin. For more information, see Activate Service Portfolio Management.

To view the SLA results, navigate to **Service Portfolio Management** > **Service Level Management** > **SLA Results**. To edit an SLA result, select the name of the SLA result to open the SLA Result form. Change any of the form field data as needed.

#### SLA Result form

| Field | Description |
|---|---|
| Service offering | Select the service offering for which you want to create or modify an SLA Result record. |
| Service commitment | Select the service commitment to apply the SLA Result record. |
| Start | Specify the start date for this SLA Result interval. |

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**SLA Result form (continued)**

| Field | Description |
|---|---|
| End | Specify the end date for this SLA Result interval. |
| Company | Specify the company for which the SLA Result record is created. |
| Required SLA percentage | Enter the percentage of tasks that must meet this SLA. |

**Note:**
The following fields display SLA result data when available:

- **Total tasks** — Total number of incidents that are opened against the service offering.
- **Breached** — Number of tasks that breached this SLA for this interval.
- **Achieved** — Number of tasks that achieved this SLA for this interval.
- **Total achieved %** — SLA percentage achieved for the entire interval.

**Note:**
When an SLA definition is triggered against a particular task, a task SLA record generates and contains all the tracking data for the specific SLA on that record. To create an SLA task or modify an existing task, refer to Task SLA table.

## Service Portfolio Management reference

Reference topics provide additional information about the roles, lists, and forms to administer the Service Portfolio Management application.

### Installed with Service Portfolio Management

Service Portfolio Management Core is active by default for users with ITSM licenses. Service Portfolio Management Foundation is administrator activated and enables you to document portfolios, taxonomies, services, and service offerings using a standardized, structured format.

**Note:**
The Application Files table lists the components that are installed with this application. For instructions on how to access this table, see Find components installed with an application.

### Service Portfolio Management plugins

The following two plugins enable you to use the full functionality of Service Portfolio Management:

- Service Portfolio Management Core [com.snc.service_portfolio_core]
- Service Portfolio Management Foundation [com.snc.service_portfolio]

The Service Portfolio Management Foundation plugin automatically activates the Service Portfolio Management Core plugin. Each plugin independently installs a set of roles and tables.

If you install Service Builder from the ServiceNow Store, its plugin [com.snc.service_builder] automatically installs. Service Builder uses the same role set as Service Portfolio Management. See Service Builder for more information.

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## Service Portfolio Management Core roles and tables

### Roles installed with Service Portfolio Management Core

| Role | Role actions | Contains roles |
|---|---|---|
| [portfolio_admin] | • Set up, create, edit, and delete services and service portfolios.<br>• Manage portfolios including related commitments and availability.<br>• Update taxonomy nodes, services, service offerings, and reparent services. | • portfolio_editor<br>• service_admin<br>• sla_manager |
| [service_editor] | Edit services and service offerings that they own or are a delegate of. | service_viewer |
| [service_viewer] | View all services and service offerings. | cmdb_read |

### Table installed with Service Portfolio Management Core

| Table | Description |
|---|---|
| [service_offering] | Extends the [cmdb_ci_service] table. |

## Service Portfolio Management Foundation roles and tables

### Roles installed with Service Portfolio Management Foundation

| Role | Role actions | Contains roles |
|---|---|---|
| [portfolio_editor] | • Edit and delete services and service portfolios.<br>• Update portfolios, taxonomy nodes, services, service offerings, and reparent services. | • service_editor<br>• portfolio_viewer<br>• sla_manager |
| [portfolio_viewer] | View portfolios, taxonomy nodes, services, and service offerings. | service_viewer |
| [service_admin] | Set up, create, edit, and delete services and service offerings. | service_author |
| [service_author] | Create, edit, and delete services and service offerings | service_editor |

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### Roles installed with Service Portfolio Management Foundation (continued)

| Role | Role actions | Contains roles |
|---|---|---|
| | of which they're an owner or have created. | |

### Tables installed with Service Portfolio Management Foundation

| Table | Description |
|---|---|
| [spm_service_portfolio] | Used to create or modify a service portfolio. |
| [spm_taxonomy_layer_definition] | Used to define the order of a taxonomy layer associated with a service portfolio.<br>**Note:** Use this table with the legacy portfolio structure. The standard portfolio structure doesn't have taxonomy layers. For more information, see Service Portfolio Management portfolios. |
| [spm_taxonomy_node] | Used to create or modify a taxonomy node associated with a service portfolio. |
| [service_subscribe_company] | Used to associate service offering subscriptions to a specific company. |
| [service_scope] | Used to store user-defined limits to the service levels of a service. |
| [service_subscribe_department] | Used to associate service offering subscriptions to a specific department. |
| [service_availability] | Used to store the calculated availability records of a service. |
| [service_subscribe_sys_user] | Used to create a module enabling you to categorize subscribers by individual users. |
| sc_cat_item_subscribe_mtom | Used to create a catalog item and make it available for subscription. |
| sc_cat_item_subscribe_no_mtom | Used to create an item while not making it available for subscription. |
| service_subscribe_location | Used to specify where a service offering is located, by actual physical address. |
| sc_cat_item_service | Used to enter an item in the Service Catalog. |
| service_offering_commitment | Used to create and configure service commitments by specifying orders and associating service offerings. |

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**Tables installed with Service Portfolio Management Foundation (continued)**

| Table | Description |
|---|---|
| service_in_scope | Used to create and define services In Scope and specify the scope parameters. |
| service_subscribe_sys_user_grp | Used to create a module enabling you to categorize subscribers by group. |
| service_commitment | Used to store records from the **Service Commitments** related list in the Service Offerings form. |
| service_out_scope | Used to create and define services Out of Scope and specify the scope parameters. |

### Domain separation and Service Portfolio Management

Domain separation is supported in Service Portfolio Management. Domain separation enables you to separate data, processes, and administrative tasks into logical groupings called domains. You can control several aspects of this separation, including which users can see and access data.

### Support level: Basic*

The support level is Basic but has some exceptions or special conditions.

- Business logic: Ensure that data goes into the proper domain for the application's service provider (SP) use cases.
- The user interface, cache keys, reporting, rollups, and aggregations all use the domain at production run time.
- The owner of the instance must be able to set up the application to function across multiple tenants.

Sample use case: When an SP uses chat to respond to a tenant-customer's message, the client must be able to see the SP's response.

For more information on support levels, see Application support for domain separation.

*All components of Service Portfolio Management (SPM) and Service Owner Workspace (SOW) are domain-separated in releases of New York and forward. If using Financial Management for the SPM plugin for estimated spend, there can be only one fiscal calendar defined per instance. When this plugin is activated, there can be only one approach for service offering cost modeling per instance (using either the Financial Management engine or local data. Different domains cannot choose their own spend model.

**Related topics**

Domain separation for service providers

# Service Owner Workspace

ServiceNow® Service Owner Workspace provides an integrated Service Portfolio Management experience. If you're a portfolio manager or service owner, you can manage and monitor portfolios and services in an integrated user interface.

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**Important:**
As of the San Diego release, Service Owner Workspace is in a planned deprecation. New customers can't find or activate Service Owner Workspace. ServiceNow® continues to support existing customers with Service Owner Workspace but customers who opt in for the new standard portfolio structure must implement Digital Portfolio Management (DPM). See Digital Portfolio Management. For information on the deprecation process, see Deprecation Process [KB0867184].

Service Owner Workspace is available as a separate subscription and is part of the Service Portfolio Management Premium experience.

Track and analyze how your services are performing and which services need attention. You can also integrate data from the Vendor Management Workspace, Contract Management, SLA Contracts, Risk Management, and Continual Improvement Management (CIM) applications to quickly access data from one place.

### Key features

**Data all in one place**

Manage the performance of your services. Evaluate performance against value to ensure your services merit the investment.



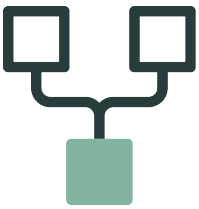
**Comprehensive service performance layout**

Analyze service performance metrics using a comprehensive layout of all information that is related to a service and its offerings.



**Integrated application data**

Use aggregated data from multiple applications and measure service performance using qualitative and quantitative metrics.



### Get started

Select a tile to get started.










## Exploring Service Owner Workspace

The Service Owner Workspace provides portfolio and service owners with an integrated and graphically intuitive user experience to manage and monitor portfolios and services.

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**Important:**
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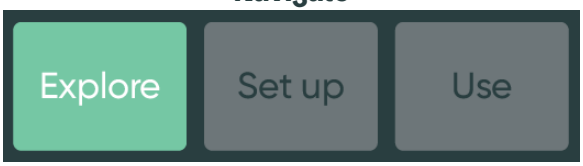
**Navigate**




## How Service Owner Workspace works

Service Owner Workspace is a read only user interface driven by Service Portfolio Management Premium plugin (com.snc.spm) functionality. Service Portfolio Management Premium collects service offering metrics and rolls these calculations up to parent services and taxonomy nodes for performance scores and other metrics viewed via Service Owner Workspace. Performance Analytics indicators capture this data and Service Portfolio Management Premium uses the Performance Analytics data as input metrics to calculate a service offering performance score. These indicators can also track data about a service offering without including it in the offering performance score.

Users can create new metric definitions or use the metric definitions provided in the base system application. Assign metrics to service portfolios and define weights for every metric at an offering level to provide more granularity into performance. Daily jobs then calculate the offering performance score and roll the scores up to the service and other associated taxonomy nodes to monitor in Service Owner Workspace.

## Service Owner Workspace browser requirements

ServiceNow workspaces do not support mobile devices, and, starting with the Orlando release, Internet Explorer, or Microsoft Edge. Instead, use Microsoft Edge-Chromium or one of the other supported browsers listed in Browser support. If you're using New York or an earlier release and you're using Internet Explorer 11 or Microsoft Edge with any workspace, such as ServiceNow® CSM Agent Workspace or ServiceNow® Vendor Manager Workspace, you must migrate to a newer browser before you upgrade to at least the Orlando release. See the Internet Explorer 11 Performance [KB0683275] article in the Now Support Knowledge Base for more information.

## Service Owner Workspace overview

Manage and monitor your services with premium features. View service offering details in the workspace:

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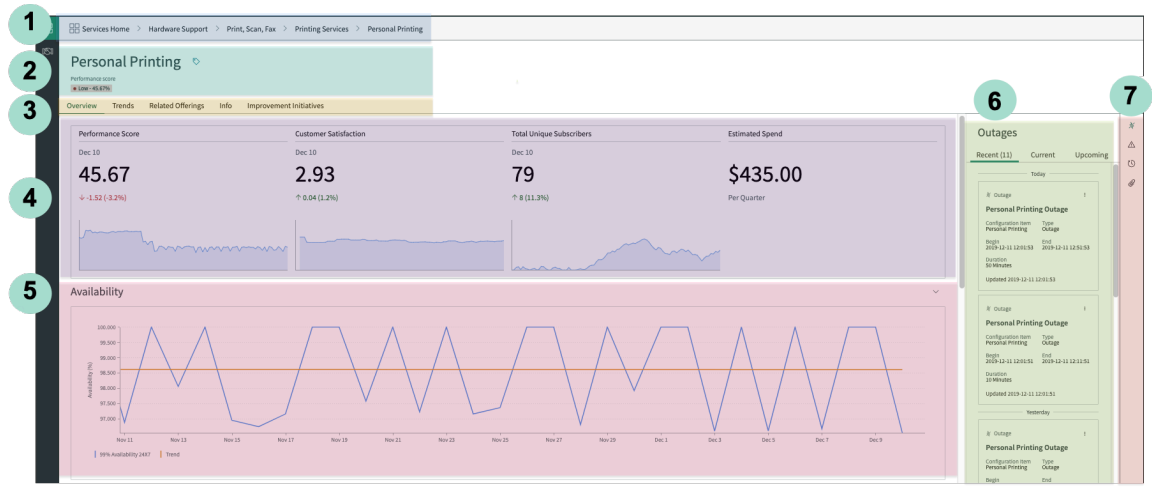
### Service offering details




| Number | Agent Workspace feature | Description |
|---|---|---|
| 1 | Tabs | The multi-tab interface enables you to easily navigate between service-related records.<br>• All services open in the **Services Home** tab.<br>• Associated service offering details open in subtabs. Drill down to the lowest hierarchical level to view details about all related service offerings. |
| 2 | Form header | The form header provides you with a quick summary of the service offering and an associated performance score. Estimated spend details appear in the form header when available. |
| 3 | Related items menu | Service-related information is available to view in the related items menu. Click an item to see the related information. |
| 4 | Ribbon | Ribbon components display service offering performance score, customer satisfaction, and total subscriber trends. Estimated spend data is also viewable when available. |
| 5 | Form pane | Additional service-related information is displayed as you scroll down the page and drill deeper into the data. Information includes, service-offering availability, breached SLAs, customer satisfaction, stability, and activity. |
| 6 | Contextual side panel details | Unique data details are displayed. Click icons to display **Outages**, **Critical Incidents**, **Change Requests**, or **Attachments** details. |
| 7 | Contextual side panel | The contextual side panel displays unique data depending on which icon you select. |

## Integration with Common Service Data Model

Improve your measurement and evaluation by using services and offering references on multiple IT Service Management task forms, including:

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- Problem
- Change
- Continual Improvement Management
- Incident

Directly reference a service offering as the target of a problem, change, or incident for consistency with the Common Service Data Model (CSDM). The system filters available offerings based on the service selected.

View and define the service model **Model ID** reference field on the Service and Offering forms to integrate with the CSDM.

## Service Owner Workspace performance metrics

Service Owner Workspace includes a metrics model in the platform Service Portfolio Management Premium application for measuring the performance of services offerings. These performance metrics are then aggregated to services and taxonomy nodes via a weighting mechanism.

**Important:**
As of the San Diego release, Service Owner Workspace is in a planned deprecation. New customers can't find or activate Service Owner Workspace. ServiceNow® continues to support existing customers with Service Owner Workspace. Customers who opt in for the new standard portfolio structure use metrics calculated from key performance indicators (KPIs) in Digital Portfolio Management (DPM). For more information, see Digital Portfolio Management.

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**Navigate**




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## Metric Definitions

When activated, Service Portfolio Management Premium collects service offering metrics which permit calculations to roll up to parent services and taxonomy nodes for performance scores and other metrics. All metric configurations are performed in the platform application. Service owners can view these performance scores and metrics via Service Owner Workspace. The following **Metric Definitions** are installed with the Service Portfolio Management Premium plugin (com.snc.spm):

**Activity**

The metric indicator is from service portfolio-related catalog activity. The metric is calculated from fulfilled request items derived from catalog items, which are connected to service offerings.

**Availability**

The metric indicator is Service Portfolio Management availability as calculated from outage records.

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**Note:**
If more than one Availability commitment exists for a service offering, at least one must be set as the Primary for trending purposes. Only one availability commitment is considered for performance score calculation, determined by the **Use in performance score** flag. Additional features include:

- Creation of Availability definitions specific to describe Availabilities for service offerings.
- Directly link a service offering commitment to an Availability definition.
- Maintain Availability statistics regarding outages.

**Breached SLA**

The metric indicator is from an SLA record, based on a breached SLA. Calculations depend on activation of the Service Portfolio Management SLA Commitments plugin (com.snc.service_portfolio.sla_commitment), which enables the following features:

- Creation of SLA definitions specific to describe the SLAs in place for service offerings.
- Directly link a service offering commitment to an SLA definition.
- Maintain SLA statistics regarding breaches.

**Note:**
If more than one SLA commitment exists for an offering, at least one must be set as the Primary for use in performance scoring. Only one SLA commitment is considered for performance score calculation, determined by the**Use in performance score** flag.

**Customer Satisfaction**

Calculations are tabulated from surveys sent to unique subscribers to an offering.

**Critical Incidents**

The metric indicator is calculated from a combination of daily P1 and major incident counts. You will need to update the lower and upper boundary for this metric. For details refer to Service offering performance weighting.

**Note:**
Prior to the Quebec release, the **Critical Incidents** metric was called **Stability** and was depicted as a single score widget on the **Trends** tab the workspace. The data currently appears as a time series chart. The default time frame for Service Owner Workspace metric performance is 30 days, except for the **Critical Incidents** metric, which shows all open major and P1 incidents per day.

## Service offering performance weighting

Service owners can vary the inclusion and weighting of service offering metrics to reflect the business needs and perspectives of their stakeholders. Metrics are normalized and weighted to determine the performance of an offering. Metrics are only maintained for service offerings with an operational status. Weights must equal 100 percent.

To disable a service offering metric with unavailable or unreliable data from performance calculations, you can set the metric weight to 0 in the platform Service Portfolio Management Premium application.

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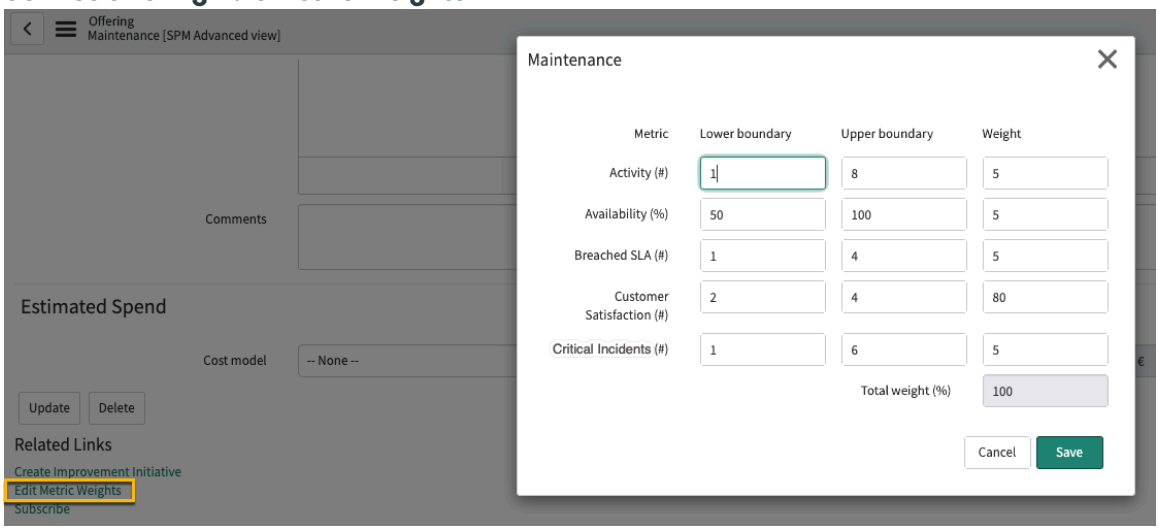
Click the **Edit Metric Weights** Related Link on the **Service Offering** form to edit the upper and lower boundaries for each metric. The **Maintenance** pop-up window appears for you to customize per service offering. The upper and lower boundaries define how a metric is measured against a 0 through 100 percent scale and normalized together. To obtain a 100% score for negative metrics, such as for Critical Incidents, the score must be below or equal to the lower boundary.

### Service offering Edit Metric Weights




## Service offering to service performance weighting

Service owners can vary the inclusion and weighting of the service offering in service performance to reflect the business needs and perspectives of their stakeholders. Service offering performance is weighted and combined to determine the performance of a service. Only offerings with an operational status are used to contribute to service performance.

Set a service offering weight to 0 to disable it from the performance calculations of its parent service.

Click the **Edit Weights** Related Link on the **Services** form to edit the weights for associated offerings. Weights are valued against a 0 through 100 percent scale and normalized together.

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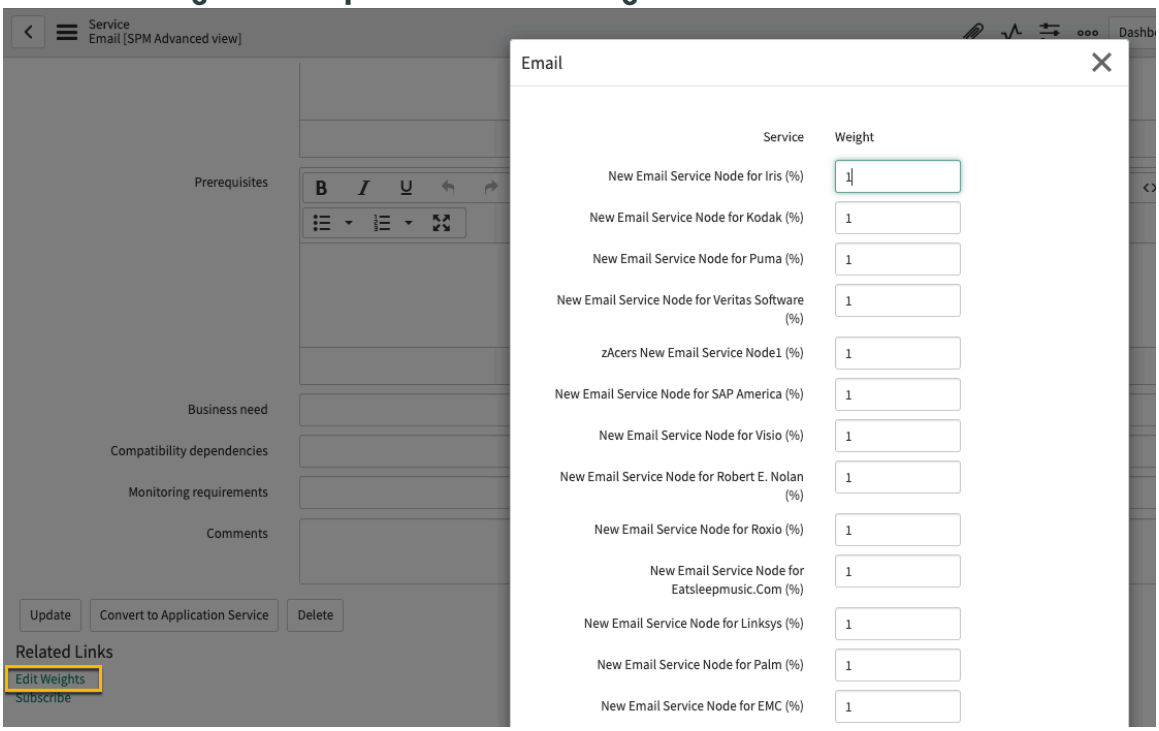
### Service offering to service performance Edit Weights




**Note:**

Upper and lower weight boundaries can be anything, from negative numbers to thousands of numbers. They do not have to be 0 to 100. But the outcome of the linear ranging math is to use those boundaries to make a normalized number between 0% and 100%.

For example, the normalization process dictates, that if you choose -20 and 150 as lower and upper boundaries, then anything at -20 or below will get normalized to 0% and anything at or above 150 will get normalized to 100%. Every number in between -20 and 150 is scaled to within the 0 through 100 range.

Another way to describe the normalization process is, for example, if you choose 5 and 150 as lower and upper boundaries and the metric is negative (minimize). With this metric anything below or equal to 5 gets a normalized score of 100%. Therefore, for a negative metric, the lower the raw score is, the higher the normalized score, which is capped at 100%. If you choose 5 and 150 as lower and upper boundaries and the metric is positive (maximize), then anything below or equal to 5 will get a normalized score of 0%.

## Service to nodes performance weighting

Portfolio owners and editors can vary the inclusion and weighting of services in node performance to reflect the business needs and perspectives of their stakeholders. Service performance is weighted and combined to determine the performance of sublevel taxonomy nodes, also called child nodes.

Use the **Edit Weights** Related Link on the **Taxonomy Nodes** form to edit the associated service weights. Service weights are valued against a 0 through 100 percent scale and normalized together.

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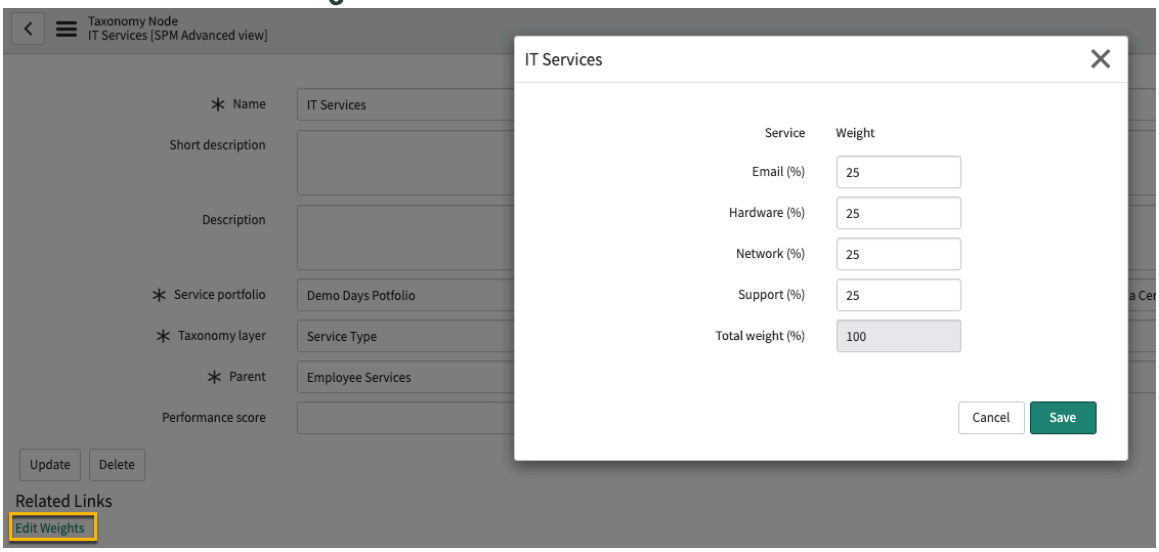
### Service to nodes Edit Weights




## Node to node performance weighting

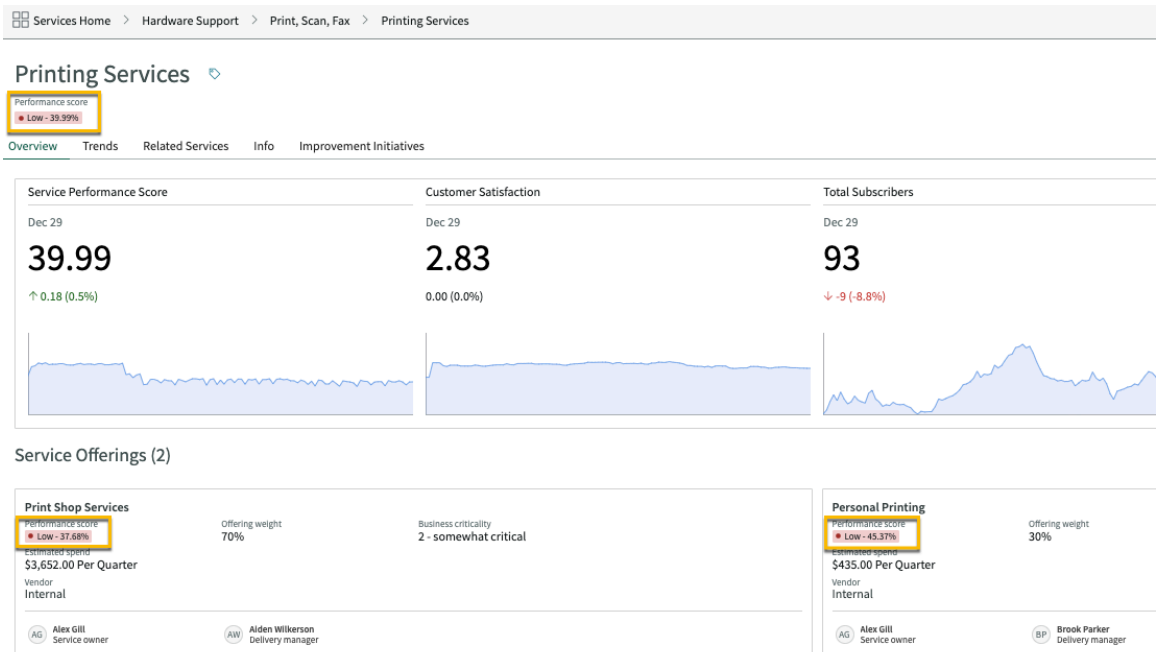
Portfolio owners and editors can vary the inclusion and weighting of node in node performance to reflect the business needs and perspectives of their stakeholders. Node performance is weighted and combined to determine the performance of taxonomy parent nodes.

## Performance scores

The performance score for services and offerings are highlighted with a different color in Service Owner Workspace based on the configured threshold limit defined on the portfolio record.

- Red: Indicates the score is lower than the set threshold limit.
- Amber: Indicates the score is within the set threshold.
- Green: Indicates the score is higher than the set threshold limit.

### Performance score indicators

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### Metrics configuration

To view or configure Service Owner Workspace metric definitions, refer to Configure Service Owner Workspace metric definitions.

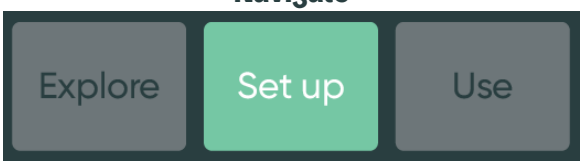
To view or configure Service Owner Workspace portfolio metrics, refer to Configure Service Owner Workspace portfolio metrics.

## Setting up Service Owner Workspace

Prepare for your Service Owner Workspace experience by activating necessary applications, accessing quick start tests to ensure proper functionality, and configuring metrics to monitor.

**Important:**
As of the San Diego release, Service Owner Workspace is in a planned deprecation. New customers can't find or activate Service Owner Workspace. ServiceNow® continues to support existing customers with Service Owner Workspace. For information on the product replacement and the deprecation process, see Service Owner Workspace.

**Navigate**




### Integrate with other applications

After activating the Service Owner Workspace plugin (com.spm_owner_workspace), align with other ServiceNow applications to expand your service portfolio monitoring experience.

Service Owner Workspace is meant to work seamlessly with Vendor Manager Workspace. Often service owners are also vendor managers. For this reason, activation of the Vendor Manager Workspace application is useful. Toggling between the two workspaces is easy because they share the same interface. Simply click the Vendor Manager Workspace icon in the workspace to view vendor-related data.

**Workspace icons**



Integrating with the Financial Management application provides estimated spend calculations based on fiscal periods and rolls spend data up from service offerings to associated services and taxonomy nodes within your portfolio. Estimated spend data is available to monitor and analyze in the workspace.

Refer to Service Owner Workspace integrations for complete details about applications that you can activate to add greater depth and value to your Service Owner Workspace monitoring experience.

### Metrics definition and configuration

Monitoring your services involves metrics and scores that keep you apprised of how well your services are performing, how satisfied your customers are with the services you provide, and how many people are subscribing to your services. Defining metrics and applying the metrics

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to your portfolios, services, and offerings ensures an accurate and goal-oriented monitoring experience. You determine the upper and lower thresholds of service performance.

### Portfolio setup automations

Choose from pre-built setup automations to apply to a portfolio to reduce your time creating services and offerings. Edit and update automations and scripts and define fields at the Service Portfolio record level which trigger when to run a script, or series of scripts.

- Automatically add five default metrics when you create a new service portfolio. You can choose not to add the metrics.
- Evenly weight all performance metrics for new offerings at the portfolio level.

  Each time an offering is created as part of a portfolio, the performance weight of each metric is evenly distributed. For example, each default metric is weighted at 20%.

  If re-parenting a service to a different portfolio, offerings will automatically assume the metrics of the new portfolio and the weights when the **Evenly weight performance metrics for new offerings** is active when creating a new portfolio. This same logic applies when an offering is created.

  **Note:**
  When you cannot evenly equal 100% across all metrics, use order to give the highest number the highest weight. For example, if you have seven metrics, you can weight the percentages as: 15, 15, 14, 14, 14, 14, 14. If you have three metrics, you can weight the percentages as: 34, 33, 33.

- Automatically create one-to-many offerings on a newly created service within a service portfolio or when adding a service to an existing service portfolio. The service must be associated with a service portfolio and it must not have any child offerings. When you activate this feature, a drop down field appears enabling you to choose how many offerings you want to create.

To activate these automations, refer to Create portfolios in Service Portfolio Management.

## Activate Service Owner Workspace

The Service Owner Workspace plugin (com.spm_owner_workspace) is available as a separate subscription. It activates related plugins, including the Service Portfolio Management Premium plugin (com.snc.spm). Subscribing to Service Owner Workspace adds the service-owner user interface and premium functionality to your Service Portfolio Management environment.

### Before you begin

Role required: admin

### About this task

**Important:**
As of the San Diego release, Service Owner Workspace is in a planned deprecation. New customers can't find or activate Service Owner Workspace. ServiceNow® continues to support existing customers with Service Owner Workspace. For information on the product replacement and the deprecation process, see Service Owner Workspace.

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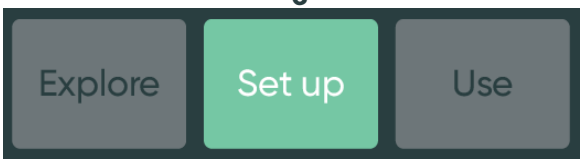
**Navigate**




A subscription to Service Owner Workspace includes full access to Performance Analytics.

The Performance Analytics - Premium plugin (com.snc.pa.premium) is necessary for Service Owner Workspace feature functionality. It must be activated before you can activate the Service Owner Workspace plugin.

The Service Owner Workspace plugin (com.spm_owner_workspace) activates related plugins if they are not already active.



**Related plugins for Service Owner Workspace**

| Plugin | Description |
| --- | --- |
| Performance Analytics — Premium<br><br>[com.snc.pa.premium]<br><br>**Note:**<br>This plugin must be activated before activating the Service Owner Workspace plugin (com.spm_owner_workspace). | Adds the following functionality to Service Portfolio Management:<br>• Create indicators, breakdowns, and other records.<br>• Create text analytics widgets.<br>• Use Performance Analytics with external data.<br>• Preserve performance scores beyond 180 days. |

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### Related plugins for Service Owner Workspace (continued)

| Plugin | Description |
| --- | --- |
| Service Portfolio Management Premium<br><br>[com.snc.spm] | Collects service offering metrics and rolls these calculations up to parent services and taxonomy nodes for performance scores and other metrics viewed via Service Owner Workspace. |
| Service Portfolio Management Estimated Spend<br><br>[com.snc.spm.spend] | Provides a simple cost model. |
| Agent Workspace - Form<br><br>[com.snc.agent_workspace.form] | Provides workspace form configurations. |
| Agent Workspace - List<br><br>[com.snc.agent_workspace.list] | Provides workspace list configurations. |
| Agent Workspace - Highlighted Values<br><br>[com.snc.agent_workspace.highlighted_values] | Provides support for highlighted values in workspace. |
| Agent Workspace - Declarative Actions<br><br>[com.snc.agent_workspace.declarative_actions] | Provides support for declarative actions in workspace. |
| Service Workspace<br><br>[com.snc.service_workspace] | Provides the Service Workspace application. |

Several additional plugins offer increased functionality to Service Owner Workspace. Activate these plugins to enhance your monitoring experience.

### Additional plugins for Service Owner Workspace monitoring functionality

| Plugin | Description |
| --- | --- |
| Vendor Manager Workspace<br><br>[com.snc.vlm.vmw] | Provides integration with the Vendor Manager Workspace as part of the Service Owner Workspace monitoring experience. |
| Continual Improvement Management CIM<br><br>[com.sn_cim] | Enables display of existing CIM records in Service Owner Workspace when a service relation is indicated on associated forms. Service owners can initiate a CIM record to address a performance issue with a service or offering. |
| Incident Management - Major Incident Management<br><br>[com.snc.incident.mim] | Provides a consolidated workbench to view major incidents via Service Owner Workspace. |
| Financial Management for SPM | Enables integration of Financial Management with Service Portfolio Management, providing |

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**Additional plugins for Service Owner Workspace monitoring functionality (continued)**

| Plugin | Description |
|---|---|
| [com.snc.financial_management_for_spm] | preconfigured service offering cost models to view in Service Owner Workspace.<br><br>Collects service offering cost and enables you to select between your local cost model and the Financial Management application model, when used.<br><br>**Note:**<br>Users can also choice not to use the local cost model or the Financial Management model, by selecting **None** in the |

### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.

3. Select **Install** to start the installation process.

   **Note:**
   When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

   You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

### Related topics

Installed with Service Owner Workspace

List of plugins (New York)

### Installed with Service Owner Workspace

Service Owner Workspace automatically activates the Service Portfolio Management Premium plugin (com.snc.spm). Service Portfolio Management Premium installs the following components.

**Important:**
As of the San Diego release, Service Owner Workspace is in a planned deprecation. New customers can't find or activate Service Owner Workspace. ServiceNow® continues to support existing customers with Service Owner Workspace. For information on the product replacement and the deprecation process, see Service Owner Workspace.

**Note:**
The Application Files table lists the components that are installed with this application. For instructions on how to access this table, see Find components installed with an application.

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## Service Portfolio Management Premium

### Tables installed with Service Portfolio Management Premium

| Table | Description |
|---|---|
| Metric Definition<br><br>[spm_metric_definition] | Used to define metrics for use in the Service Portfolio Management Premium application. |
| Service Offering Metric Data<br><br>[service_offering_metric_data] | Used to configure service offering metric data. With this record you can:<br>• Set boundaries within a service offering performance score range.<br>• Set a weight value. |
| Portfolio Metric<br><br>[spm_portfolio_metric] | Used to configure portfolio metric data. |
| | |
| SPM Node Weight<br><br>[spm_node_weight] | Used to assign a weight value to a node in relation to the value of its sibling nodes. |

## Quick start tests for Service Portfolio Management Premium

Validate that Service Portfolio Management Premium still works after you make any configuration change such as apply an upgrade or develop an application. Copy and customize these quick start tests to pass when using your instance-specific data.

Service Portfolio Management Premium quick start tests require activating the Service Portfolio Management Premium plugin (com.snc.spm).

### Service Portfolio Management Premium - ATF Tests test suite

| Test | Description | Release version |
|---|---|---|
| Portfolio Editor: Not Portfolio Owner, Read Only Taxonomy Access | Ensure a portfolio editor can only read associated non-owned portfolio taxonomies. | Orlando |
| Portfolio Editor: Cannot create new Portfolios | Ensure a portfolio editor cannot create new portfolios. | Orlando |
| Portfolio Editor: Valid Portfolio Owner Taxonomy Access | Ensure a portfolio owner has access to taxonomies within owned portfolios. | Orlando |
| Service Editor: Access | Ensure a service editor can only edit owned services and offerings. | Orlando |
| Portfolio Editor: Can Modify Owned Portfolios | Ensure a portfolio editor can modify and update owned portfolios. | Orlando |

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### Service Portfolio Management Premium - ATF Tests test suite (continued)

| Test | Description | Release version |
|---|---|---|
| Create a Portfolio | Ensure a portfolio admin can create a new portfolio. | Orlando |
| Portfolio Editor: Cannot Modify Non-Owned Portfolios | Ensure a portfolio editor cannot modify non-owned portfolios. | Orlando |
| Service Workflow | Verify that a service cannot move forward to Catalog phase without a service portfolio, taxonomy node, and service offering attached to it.<br><br>Verify a service cannot move backward from the Catalog phase to the Pipeline phase. | Orlando |
| Service Portfolio (Normal) | Create a service portfolio, taxonomy layer, and taxonomy nodes. | Orlando |
| Create a Portfolio + 3 Taxonomy Layers | Create a service portfolio with three taxonomy layers. | Orlando |
| Service Portfolio (Exception) - Taxonomy Layer Definition Set 01 | Create a service portfolio, taxonomy layer, and taxonomy nodes. | Orlando |
| SPM: Create a Portfolio | Create a service portfolio. | Paris |
| SPM: Create a Portfolio + 3 Taxonomy Layers | Create a service portfolio, with three taxonomy layers. | Paris |
| SPM: Service Portfolio (Normal) | Create a service portfolio, taxonomy layer, and taxonomy nodes. | Paris |
| SPM: Service Portfolio (Exception) - Taxonomy Layer Definition Set 01 | Create a service portfolio, taxonomy layer, and taxonomy nodes. | Paris |
| SPM: Portfolio Editor: Can Modify Owned Portfolios | Ensure a portfolio editor can modify portfolios that they own. | Paris |
| SPM: Portfolio Editor: Cannot Modify Non-Owned Portfolios | Ensure a portfolio editor cannot modify portfolios that they do not own. | Paris |
| SPM: Portfolio Editor: Cannot create new Portfolios | Ensure a portfolio editor cannot create new Portfolios. | Paris |
| SPM: Portfolio Editor: Valid Portfolio Owner Taxonomy Access | Ensure portfolio owners have access to taxonomies that they own. | Paris |

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**Service Portfolio Management Premium - ATF Tests test suite (continued)**

| Test | Description | Release version |
|---|---|---|
| SPM: Portfolio Editor: Not Portfolio Owner, Read Only Taxonomy Access | Ensure a portfolio editor can only read the taxonomies of portfolios they do not own. | Paris |
| SPM: Service Editor: Access | Ensure a service editor can only edit services and offerings that they own or are a delegate of. | Paris |
| SPM: Service Viewer: Access | Ensure a service viewer has access to view services. | Paris |
| SPM: Service Workflow | Verify a service cannot move forward to Catalog phase without a service portfolio, taxonomy node, and service offering attached to it.<br><br>Verify a service cannot move backward from Catalog to Pipeline phase. | Paris |

**Related topics**

Quick start tests

## Service Owner Workspace Migration Dashboard

Service Owner Workspace provides a migration dashboard to support your transition from the legacy Service Portfolio Management structure to the enhanced application structure.

**Important:**
As of the San Diego release, Service Owner Workspace is in a planned deprecation. New customers can't find or activate Service Owner Workspace. ServiceNow® continues to support existing customers with Service Owner Workspace. For information on the product replacement and the deprecation process, see Service Owner Workspace.

By viewing the **Migration Dashboard**, portfolio managers can quickly determine which existing services and offerings contain a deprecated structure or are considered orphaned in the enhanced Service Portfolio Management taxonomy structure.

Users with the following assigned roles can view the Service Portfolio Management dashboard:

- service_viewer
- portfolio_admin

Users with the portfolio_admin or service_editor role can modify services and service offerings to structurally comply with and migrate to the Service Portfolio Management Foundation application.

By default, the dashboard displays reports for all existing service portfolios. An interactive filter enables you to choose a single portfolio to view. The dashboard reports are visible even if there are no service portfolios defined.

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Dashboard report categories display the number of related identified migration issues. If there are no migration issues identified for a report category, a 0 is shown.

Access the dashboard by navigating to **Service Portfolio Management** > **Migration Dashboard**. To view detailed information, hover over any report graphic. All report graphs can be refreshed for the latest data.

Migration issues are indicated when a number graphic greater than zero is indicated on the report. For these reports, hover over and click the number graphic. A list opens displaying the services or offerings that require modification to migrate to the Service Portfolio Management Enterprise structure.

The following reports are available on the **Migration Dashboard**. If migration issues are indicated, refer to the report description and how to remedy the issue for migration.

| Migration Dashboard report | Description and migration task |
|---|---|
| Deprecated Operational Status Used for Offerings | Indicates the number of existing service offerings using the deprecated singular status of **Operational Status**.<br><br>Modify these offerings by filling in both the **Phase** and **Status** fields on the **Service Offering** form.<br><br>**Note:**<br>Status can be one of several choices, such as **Design**, **Development**, **Build/ Test/Release**, **Operational**, and **Retiring**.<br><br>Click **Update**. |
| Deprecated Operational Status Used for Service | Indicates the number of existing services using the deprecated singular status of **Operational Status**.<br><br>Modify these services by filling in both the **Phase** and **Status** fields on the **Service** form.<br><br>**Note:**<br>Status can be one of several choices, such as **Requirements**, **Definition**, **Analysis**, **Approved**, and **Chartered**.<br><br>Click **Update**. |
| Operational Services not in a Portfolio | Indicates the number of existing services not currently associated with a portfolio.<br><br>Modify the **Service** form by selecting a portfolio in the **Service portfolio** field. Click **Update**. |
| Orphaned Services in Catalog Phase | Indicates the number of services in Catalog phase that do not have a parent taxonomy node. |

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| Migration Dashboard report | Description and migration task |
|---|---|
| | Modify the **Service** form by selecting a taxonomy node in the **Taxonomy node** field. Click **Update**. |
| Deprecated Usage of Service Catalog Entry | Indicates the number of services or offerings linked to a catalog item via the deprecated **Service Catalog Entry**(sc_cat_item_service) table. |
| Orphaned Service Offerings | Indicates the number of service offerings where the **Parent** field on the **Service Offering** form is not pointing to a parent service. Offerings must be children of a service.<br><br>In the **Parent** field on the **Service Offering** form, search for and select the associated service. Click **Update**. |
| Cataloged Non-operational Offerings | Indicates the number of active catalog items connected to service offerings not in the catalog phase or with an operational status.<br><br>Modify the **Service Offering** form **Phase** field to **Catalog** and the **Status** field to **Operational**. Click **Update**. |
| Services in Catalog Phase without Offering | Indicates the number of services in the **Catalog** phase without at least one associated service offering. An offering must be defined for a service to move into Catalog phase.<br><br>To associate a service offering to a service, open a specific service offering associated with the cataloged service indicated in the **Migration Dashboard**. In the **Parent** field on the **Service Offering** form, search for and select the associated service. Click **Update**. |

## Service Owner Workspace integrations

Align with other product applications to add value to your Service Owner Workspace monitoring experience.

**Important:**
As of the San Diego release, Service Owner Workspace is in a planned deprecation. New customers can't find or activate Service Owner Workspace. ServiceNow® continues to support existing customers with Service Owner Workspace. For information on the product replacement and the deprecation process, see Service Owner Workspace.

## Service Owner Workspace and product alignment

Activate and integrate with these products to expand the functionality of Service Owner Workspace:

**Vendor Manager Workspace**

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Activate the Vendor Manager Workspace plugin (com.snc.vlm.vmw) to align this workspace data with Service Owner Workspace.

Manage your vendors from the same workspace interface to effectively gain knowledge of all vendor-related information.

Monitor and view vendor performance reports from the workspace view.

Decide what vendor metrics to monitor and manage in workspace view.

Calculate and view vendor CSAT weight and vendor service offering performance weight.

**Financial Management**

Activate the Service Portfolio Management Estimated Spend plugin (com.snc.spm.spend) to view service offering spend, enabling you to select between your local cost model and the cost model provided by the Financial Management application.

Activate the Financial Management for SPM plugin (com.snc.financial_management_for_spm) to provide preconfigured service offering cost models to view in Service Owner Workspace. Select between your local cost model and the Financial Management application model, when used.

**Continual Improvement Management (CIM)**

Display existing CIM records in Service Owner Workspace when a service relation is indicated on associated forms.

Service owners can initiate a CIM record when a performance issue with a service or offering is displayed.

**Incident Management — Major Incident Management**

Activate the Incident Management - Major Incident Management plugin (com.snc.incident.mim) to provide a consolidated workbench to view major incidents via the Service Owner Workspace activity stream.

## Integration with Common Service Data Model

Improve your measurement and evaluation by using services and offering references on multiple IT Service Management task forms, including:

- Problem
- Change
- Continual Improvement Management
- Incident

Directly reference a service offering as the target of a problem, change, or incident for consistency with the Common Service Data Model (CSDM). The system filters available offerings based on the service selected.

View and define the service model **Model ID** reference field on the Service and Offering forms to integrate with the CSDM.

When the Service Portfolio Management Premium plugin (com.snc.spm) is activated with CSDM is applied, the navigational pane includes the modules **Manage Technical Services** and **Sell and Consume**. Service offerings with associated catalog items are available to view and manage via **Technology Request Catalog** and **Business Request Catalog** within these modules. For

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complete information about CSDM and how it relates to Service Portfolio Management Premium, refer to Applying the CSDM guidelines to your product.

## Configure Service Owner Workspace metric definitions

Configure unique metric definitions to measure the performance of your service offerings in Service Owner Workspace.

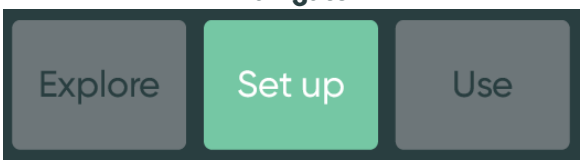
### Before you begin

Role required: admin or portfolio_admin

### About this task

**Important:**
As of the San Diego release, Service Owner Workspace is in a planned deprecation. New customers can't find or activate Service Owner Workspace. ServiceNow® continues to support existing customers with Service Owner Workspace. Customers who opt in for the new standard portfolio structure use metrics calculated from key performance indicators (KPIs) in Digital Portfolio Management (DPM). For more information, see Digital Portfolio Management.

**Navigate**




Service Owner Workspace includes several metric definitions which you can view and edit, if necessary. You can also create new metric definitions unique to your desired performance monitoring needs.

### Procedure

1. Navigate to **All** > **Service Portfolio Management** > **Configuration** > **Metric Definitions**.
2. View the available base system metric definitions and associated indicators.
3. To create a unique metric definition, click **New**.
4. Provide a unique name for the metric definition in the **Name** field.
5. Select a Performance Analytics indicator in the **Indicator** field.
6. Click **Submit**.
   For more information about Service Owner Workspace metrics and weight configuration, see Service Owner Workspace performance metrics.

## Configure Service Owner Workspace portfolio metrics

Decide which metrics to configure for your service portfolio to measure the performance of your service offerings in Service Owner Workspace.

### Before you begin

Role required: admin or portfolio_admin

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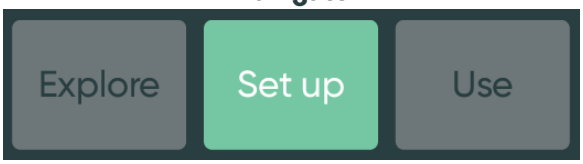
### About this task

**Important:**
As of the San Diego release, Service Owner Workspace is in a planned deprecation. New customers can't find or activate Service Owner Workspace. ServiceNow® continues to support existing customers with Service Owner Workspace. Customers who opt in for the new standard portfolio structure use metrics calculated from key performance indicators (KPIs) in Digital Portfolio Management (DPM). For more information, see Digital Portfolio Management.

**Navigate**




### Procedure

1. Navigate to **All** > **Service Portfolio Management** > **Configuration** > **Portfolio Metrics**.
2. Click an existing service portfolio to learn what metrics are associated.
   The Portfolio Metrics list opens displaying all the metrics applied to the service portfolio.
3. To add an additional metric to the service portfolio, click **New**.
4. Fill in the form fields.

**Portfolio Metric form**

| Field | Description |
|---|---|
| Service portfolio | Select the service portfolio for which you want to create a metric |
| Metric | Select the metric to apply. Choices include: **Activity**, **Availability**, **Breached SLA**, **Customer Satisfaction**, and **Critical Incidents**. |
| Order | Specify the display order of the trend chart on the **Trends** tab in Service Owner Workspace. |
| Trend chart | Check the box to display this metric on the **Trends** tab in Service Owner Workspace. |
| Performance calculation | Check the box to use this metric in the service offering performance calculation. |

5. Click **Submit**.
   For more information about Service Owner Workspace metrics and weight configuration, see Service Owner Workspace performance metrics.

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# Generate a service offering availability

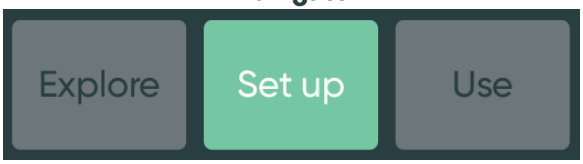
Generate on-demand availability reports displayed in Service Owner Workspace. When a service commitment contains an availability guarantee, the service offering displays an availability report.

## Before you begin

Role required: service_editor

## About this task

**Navigate**




Availability records are generated by a daily job when you select an Availability type service commitment for your service offering. By defining service offering availability, you generate reports that track the actual availability of the offering. For a 7-day chart, no reporting data is available until five days after the service offering is created. For 30-day charts, 23 days of data is required before a report is generated. For a 12-month chart, the database must contain at least 10 months of data.

## Procedure

1. To generate a new service availability, navigate to **Service Portfolio Management** > **Availability** and click **New**.

   **Note:**
   When an Availability commitment type is added to a service offering, it will generate a year's worth of availability records for that offering and commitment. For this reason, existing Availability forms should not be edited. Availability is calculated based on the outages in the system for that offering. If an outage is updated, then the related availability records are updated too.

2. Fill in the form fields.

**Service Availability form**

| Field | Description |
|---|---|
| Display name | Enter the name of the service availability as it appears in record lists. Automatically set at record creation based on service offering and commitment. |
| Service offering | Select the service offering for which you want to generate an availability record. |
| Service commitment | Select the service commitment to apply the availability record. |
| Start | Choose the start of this availability interval. |
| End | Choose the end of this availability interval. |

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| Field | Description |
| --- | --- |
| Committed uptime | Enter the total expected service availability for this commitment. |
| Acceptable downtime | Enter the acceptable amount of downtime against this commitment schedule for this interval. |
| Total downtime | Enter the wall-clock downtime, independent of schedule. |
| Met commitment | Availability commitment was met for this interval. Check to indicate the commitment was met. |

**Note:**
The following fields display SLA result data when available:

- **Total availability %** — Availability percentage for the entire interval, independent of schedule.
- **Total outages** — Total number of outages in this interval, independent of schedule.
- **Commitment availability %** — Availability percentage within this commitment schedule.
- **Commitment downtime** — Downtime that counts against this commitment schedule.
- **Commitment outages** — Number of outages against this commitment schedule in this interval.

3. Click **Submit**.
   View service offering **Availability** reports in Service Owner Workspace.

## Change scope to Service Portfolio Management Premium

Grant access to a dedicated user to enable switching the scope from Global to Service Portfolio Management Premium to create a custom automated indicator.

### Before you begin

Role required: admin

### About this task

**Important:**
As of the San Diego release, Service Owner Workspace is in a planned deprecation. New customers can't find or activate Service Owner Workspace. ServiceNow® continues to support existing customers with Service Owner Workspace. For information on the product replacement and the deprecation process, see Service Owner Workspace.

**Navigate**




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Both the indicator and the job must be in the same scope. Provide a user with delegated developer access and the pa_admin role to change the scope from Global to Service Portfolio Management Premium when creating custom indicators for Service Portfolio Management Premium jobs.



### Procedure

1. In the Navigator, type `sys_scope.list` and press Enter.
   The Applications list appears.
2. Search by name for Service Portfolio Management Premium and click the application name to open the associated Store Application form.
3. In Related Links, click **Manage Developers**.
4. Search for the user or group you want to grant delegated developer access to.
   The **Permissions** configuration screen appears.
5. Configure delegated developer access for the user or group.
   a. In the **File Type Access** section, toggle the **Reporting** category radio button to grant this type of access.
   b. Click **Save**.
   Grant access to any other section category by toggling the associated radio button.
6. Assign the pa_admin role to the user or group with delegated developer access.

## Create indicators in Service Portfolio Management Premium

Create custom indicators for your Service Portfolio Management Premium jobs in the correct scope.

### Before you begin

Role required: pa_admin

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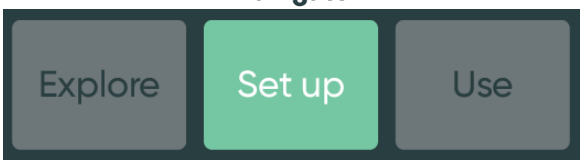
## About this task

**Navigate**




You must have the Reporting file type delegated developer access to change the scope from Global to Service Portfolio Management Premium when creating custom indicators for the application. Administrators grant the Reporting file type delegated developer access. For information regarding obtaining delegated developer access, refer to Create indicators in Service Portfolio Management Premium.

When you create an indicator and associate it with a job in an application, both the indicator and the job must be in the same scope. Jobs and indicators available in the Service Portfolio Management Premium base system are in the correct Service Portfolio Management Premium scope. However, when you create a custom indicator, by default it is created in the Global scope. To associate a custom indicator with a Service Portfolio Management Premium job, you need to first change the scope from Global to Service Portfolio Management Premium.



## Procedure

1. Click the Settings icon in the banner.
2. In **System Settings**, click **Developer**.
3. In **Application**, find and select Service Portfolio Management Premium.
4. Navigate to **Performance Analytics** > **Indicators** > **Automated Indicators** and click **New** to create an indicator in the Service Portfolio Management Premium scope.
   For details on how to create an automated indicator, refer to Create an automated indicator.

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# Using Service Owner Workspace

Use Service Owner Workspace to monitor the health of your services and your customer satisfaction. View outages, critical incidents, and change requests associated with services and offerings.

**Important:**
As of the San Diego release, Service Owner Workspace is in a planned deprecation. New customers can't find or activate Service Owner Workspace. ServiceNow® continues to support existing customers with Service Owner Workspace. For information on the product replacement and the deprecation process, see Service Owner Workspace.

**Navigate**




With Service Owner Workspace you can monitor metrics and analyze the health of your services from a single user interface. Get to know how metric models are created and configured for service offerings and how they are used in Service Owner Workspace.

## Service Owner Workspace features

Service Owner Workspace features include:

- A view-only, multi-tab interface for monitoring and managing multiple portfolios and related services.
- Dashboards offer immediate access to portfolio and service health and performance metrics, as well as who owns and manages the service.

  **Note:**
  In most cases, data is collected up to the previous day. If there is a current outage or incident, then data does not appear in trend charts or displays.

- Comprehensive layout of all information related to a portfolio and its component services.

Service owners can access the workspace to perform their most common tasks, including:

- View and manage owned IT services, as well as view all IT services the business manages.
- Expand service lists to expose child services and service offerings.
- Select a service to access pertinent information, including service trends, related services and information, improvement initiatives, and associated service offerings.
- View and monitor service performance score reports, customers' scores, and total subscribers.
- Monitor recent and upcoming changes.
- Drill down into service offerings to view availability, SLA compliance, customer satisfaction, offering stability, performance scores, and more.
- View associated unique or critical information about the service offering in the impact stream panel on the right side of the workspace. For example, you can view outages records with a

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unique **Outage Number** identifier. You can also see the outage number on the list view for outages via the **Outage** tab in the report viewer.

**Note:**
The Outage Numbering plugin (com.snc.outage_numbering) must be activated to introduce number data. The plugin is automatically activated for all instances and upgrades except those that already have a number prefix column on the Outage table. Refer to the Activate Outage Numbering plugin [KB0823685] article in the HI Knowledge Base or contact Customer Service and Support if the plugin is not active and you want to move to the base system field.

System administrators can configure the workspace according to the specific needs within the organization:

- Disable particular metrics from displaying in the workspace.
- Configure the metric weights that contribute to performance scores within the workspace.
- Configure the metric thresholds for each metric that displays in the workspace.

Start here: Access Service Owner Workspace.

## Access Service Owner Workspace

Open the Service Owner Workspace to access and display all your portfolios and services at a single location. Monitor and manage your services and offerings from the workspace.

### Before you begin

Role required: service_viewer

### About this task

**Important:**
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**Navigate**




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To access and use Service Owner Workspace, the Service Owner Workspace plugin (com.spm_owner_workspace) must be activated and you must be assigned the Service Viewer [service_viewer] role.

### Procedure

1. Navigate to **All** > **Service Portfolio Management** > **Service Owner Workspace**.
2. Click a portfolio name to expand the layers of services.
3. Click **My Services** to view portfolios that you own and manage.
   Or click **All Services** to view all the services your organization owns and manages.

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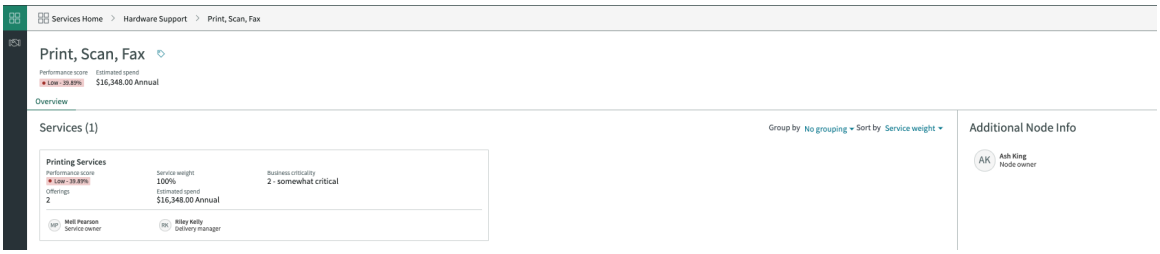
A list of services displays. You can expand each service to see child services within the service taxonomy.




4. Click a service name to view pertinent information about the service.
   The **Overview** dashboard provides a recent snapshot of the service offering performance. View performance over the last 7 days. The **Additional Node Info** sidebar displays who owns and manages the service, as well as the associated **Performance score**, **Taxonomy Nodes** (services), and **Estimated spend** if available.




   To contact a service owner, service offering owner, or associated manager, click the person's name in the workspace and then click the associated email. Phone numbers are also displayed for quick access to service stakeholders.

5. Choose how to group and sort dashboard data in the **Group by** and **Sort by** lists.
   You can group by **No grouping** or **Taxonomy node owner**. You can sort by **Ascending**, **Descending**, **Node weight**, **Performance score**, or **Name**.
6. Click a **Taxonomy Node** (service) to view pertinent information about the service.
   The associated service displays in the **Overview** tab.
7. Click in the **Service** card to drill deeper into the details and view health and performance metrics, as well as any associated service offerings.
   Service health and performance metrics, such as **Service Performance Score**, **Customer Satisfaction**, **Total Subscribers**, **Estimated spend**, and associated **Service Offerings** are displayed.

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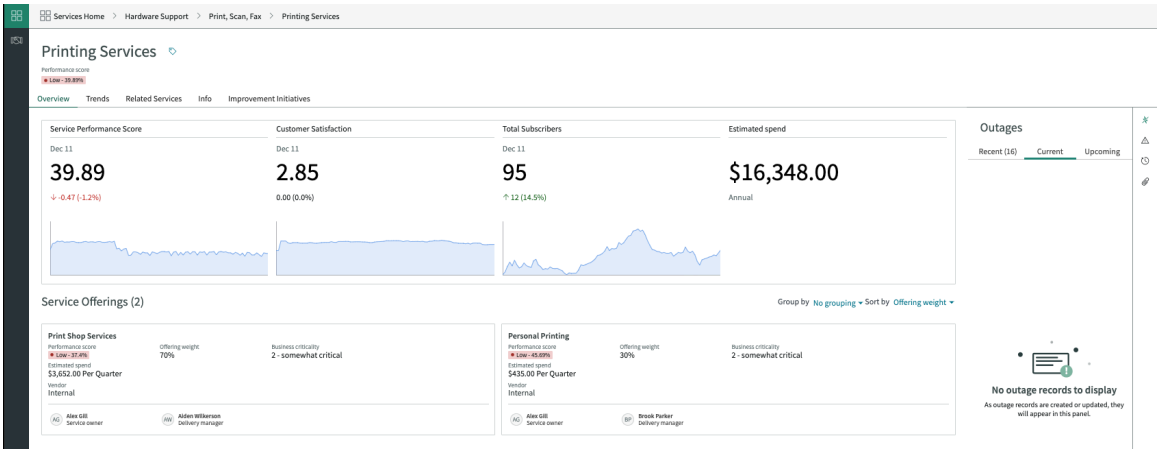


8. Click additional tabs besides the **Overview** tab to display data relevant to the offering, including:
   - **Trends** — View performance over a specified time frame, as well as SLA compliance. The **Trends** tab provides you with a more strategic view of service and offering performance over a longer period of time, so you can determine if performance is trending up or down. The base system includes performance metrics for **Activity**, **Availability**, **Breached SLA**, **Customer Satisfaction**, and **Critical Incidents**. The default time frame for **Trends** performance is 30 days, except for the **Critical Incidents** metric, which shows all open major and P1 incidents per day. Use the drop down menu to change the time frame if desired. Choices include as few as the last 7 days to the last year.

     **Note:**
     Prior to the Quebec release, the **Critical Incidents** metric was called **Stability** and was depicted as a single score widget. The data is now visualized in a time series chart. You need to set the lower and upper boundaries for the **Critical Incident** metric. For details, refer to Service Owner Workspace performance metrics.

   - **Relationships** — View service dependency details. This tab shows offering relationships, for example, which services a service depends on and which services depend on it.

     View the **I depend on** and **Depends on me** sections to see service offering dependencies at the parent service level via a card with a highlighted label reading **Inherited relationship**.

     **Note:**
     Dependencies that a service inherits from a child offering are visually distinct from dependencies defined directly between services.

     Service and offering types are distinguishable in the card by a unique icon and label specifying the type of service and offering. For example, **Business Service**, **Application Service**, and **Technical Service**. When you click on an offering card, the record view of the offering is displayed.

   - **Info** — View the service offering description, performance breakdown, general information, commitments, team, and more. You can also view your service offering to catalog item relationships via this tab. Click to open a catalog item to drill down into more details.

     Monitor fulfilled requests for all associated catalog items in the **Offering Activity** metric. For complete details about service offerings and associated catalog items, refer to Service offering to catalog item relationships.

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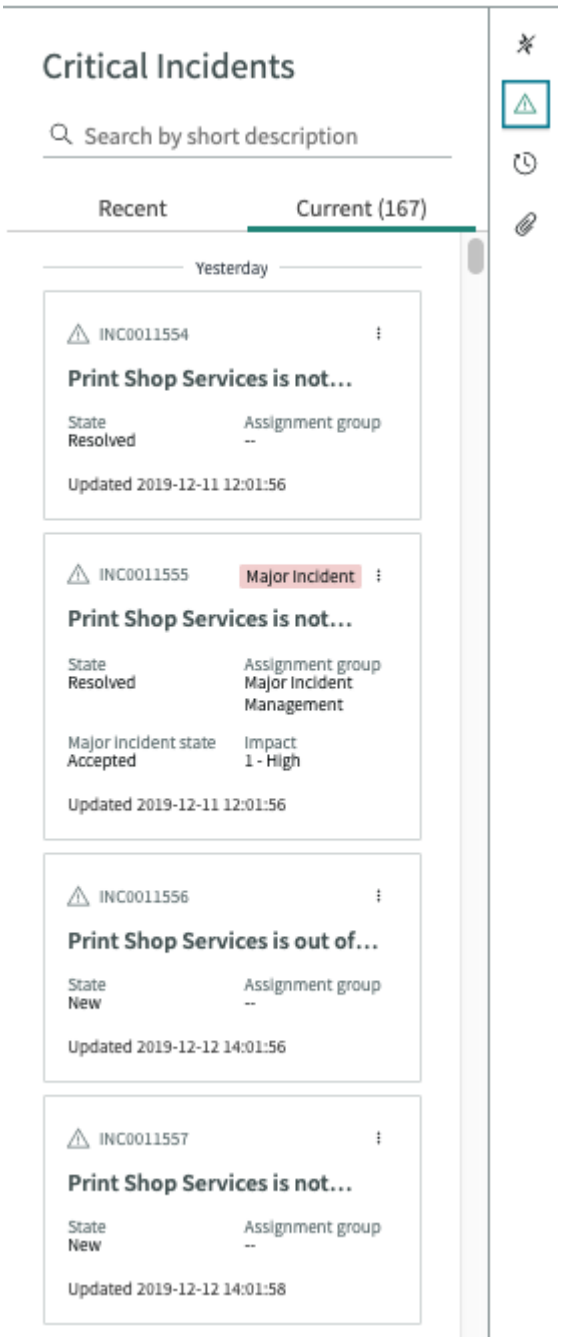
**Note:**
The **Create Catalog Item** action is only available when there is no catalog item mapped to a service offering and there is no catalog item with the same name as the offering. This prevents the issue of having catalog items with the same name.

- **Improvement Initiatives** — View all CIM initiatives as links to the records. This tab displays with activation of the Continual Improvement Management (CIM) plugin (com.sn_cim).

9. Click icons in the impact stream panel, on the right side of the workspace, to display related information about **Outages**, **Critical Incidents**, **Change Requests**, or **Attachments**.
View the associated unique or critical information about the service offering in the impact stream.




10. Click an outage, critical incident, or change request to drill deeper into the details.

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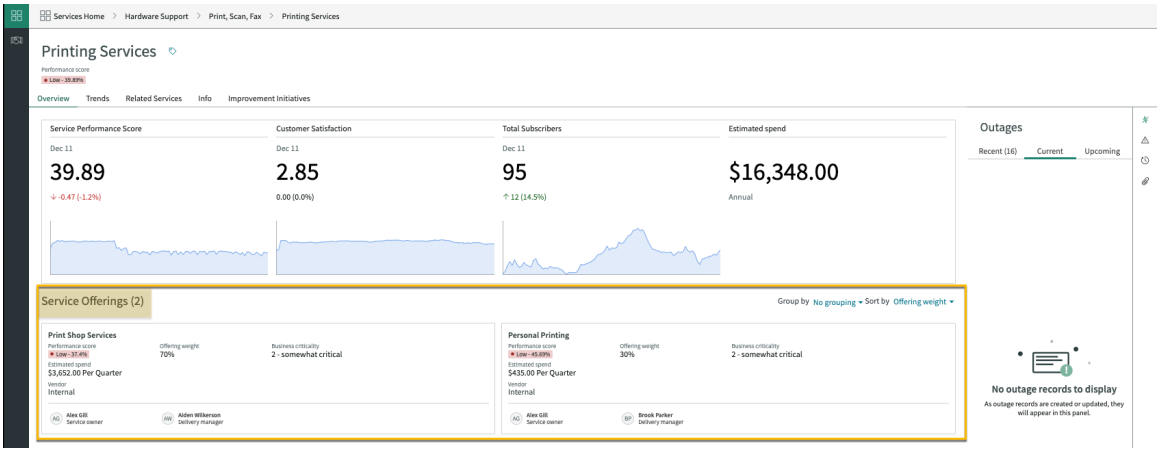
Once you click an impact stream item, for example, a critical incident, you can view all details related to the item and even open the associated record by clicking **Open record**.

Recent, current, and upcoming outage data is available. Click a type of outage for the information you want. Refer to Outages for information about a unique **Outage Number** identifier and activating the Outage Numbering plugin (com.snc.outage_numbering).

11. If the service you are viewing has associated child offerings, click an offering to drill down and view details.




View the offering overview, as well as other pertinent data, such as service offering availability, breached SLAs, customer satisfaction, stability, and activity. Available service offering tabs include, **Overview**, **Trends**, **Relationships**,**Info**, **Catalog Items**, and **Improvement Initiatives**. These tabs similar data as is provided for services. The **Catalog Items** tab displays all catalog items related to the service offering, as well as a short description of the item.

## Service offering to catalog item relationships

Manage the relationships between your service offerings and catalog items by associating your pre-existing catalog items to your service offerings and vice versa. View relationships in both ServiceNow AI Platform form related lists and Service Owner Workspace.

**Important:**
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## Required roles and actions

Service owners and catalog administration managers can edit relevant forms to associate and manage pre-existing service offering to catalog item relationships. This feature is in addition to the **Create Catalog Item** feature that enables you to create a new catalog item.

With the service_editor role, you can add, change, and remove catalog items associated with an owned service offering via the Service Offering form Catalog Item related list. You can also create a catalog item from a service offering via Service Owner Workspace by clicking the **Create Catalog Item** link. A single service offering may have many related catalog items. Click the **Link** button in the Catalog Item related list to make a change.

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**Note:**
If a catalog item is already associated with a service offering, you cannot associate the item to a new offering. You will have to contact a catalog_admin to remove the existing association so that you can make changes.

With the catalog_admin role, you can add, change, and remove service offerings associated with a catalog item via the Catalog Item form Service Offerings related list. A single catalog item can be related to one service offering.

Click the **Link** button in the related list to make a change. You can remove the association if needed with the related list **Delete** button.

**Note:**
If a service offering is already associated to a catalog item, the **Link** button does not appear in the related list. For details about viewing and editing Catalog Items, refer to Create or edit a catalog item.

## Catalog items in Service Owner Workspace

View catalog items related to a service offering in Service Owner Workspace from the offering page **Catalog Items** tab. Click to open a catalog item to drill down into more details and even open up the form view.

Monitor fulfilled requests for all associated catalog items and order guides in the offering **Trend** tab **Activity** metric.

Hover over the **Trends** tab **Activity** metric to view both the catalog item name and the 30 day average running count.

When you click the trend line for an individual catalog item, only **Requested Items** for that catalog item and the offering are visible on the list view of the report viewer.

## Things to keep in mind

- Avoid model phase conflicts between offerings and catalog items.
  - Catalog items can only be associated to service offerings in the **Catalog** phase.
  - The service offering must be operational for catalog items to be active.
  - Inactive catalog items can be associated to operational service offerings.
- Order guides are not referenced as associated items.

  In Service Owner Workspace, **Activity** metrics are driven by catalog items that compose an order guide.

## Service Portfolio Management Premium notifications

Notifications are added with Service Portfolio Management Premium to manage your service offering to catalog item relationships.

Service Portfolio Management Premium includes several email notifications that alert catalog admins when a service offering associated with a catalog item is retired or when a new catalog item has been created from a service offering.

The following notifications are included:

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| Name | Description |
| --- | --- |
| Offering retired<br><br>Table: Service Offering [service_offering] | Sends an email to a specified user group when a service offering that is associated with a catalog item is retired. |
| Catalog Item created from Offering<br><br>Table: Available for Subscribers [sc_cat_item_subscribe_mtom] | Sends an email to a specified user group when a new catalog item has been created from a service offering. The email asks that the new catalog item be reviewed and prepared for activation in the catalog. |

To configure catalog_admin recipients for these notifications, refer to Create a user group.

## Service Owner Workspace Service Offering survey

Subscribers can rate their experience with service offerings via the Service Portfolio Management Premium Service Offering survey. This feedback provides portfolio managers and service owners with valuable information to improve service offering performance and subscriber satisfaction.

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**Navigate**




In the base system, a predefined SPM Service Offering Survey is available. Surveys are sent for operational and retiring service offerings only. Portfolio admins [portfolio_admin] can edit the survey and service editors [service_editor] can configure the associated trigger conditions.

You must have the admin or portfolio_admin role to modify the SPM Service Offering Survey. To view the survey, navigate to **Survey** > **View Surveys**.

The SPM Service Offering Survey is triggered randomly for 10% of service offering subscribers. Only subscribers who have not been polled within the previous three-month time period can receive a survey. Subscribers receive an email with the survey link. The service offering name is displayed and the survey inquires how satisfied the subscriber is with the service or service offering. Subscribers use radio buttons to rate satisfaction on a 1 through 5 scale, with 1 being not satisfied and 5 being very satisfied.

You are encouraged to modify the survey to better match your organizations needs.

Two system properties determine the percentage of subscribers to receive the survey and how often a subscriber is polled.

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- *sn_spm.csat.survey_probability*: Default value is 10% of subscribers are randomly polled.
- *sn_spm.csat.survey_period*: Default value is 90 days. The system does not send a survey to a subscriber who has been polled within the previous 90 days.

Service owners can use the Service Offering form to define how often to send a CSAT survey. The**CSAT survey frequency** field offers the following frequency choices:

- **Never** (default)
- **Daily**
- **Weekly**
- **Monthly**

Service owners can view the last time a survey was sent for an offering in the **CSAT survey last sent** field on the Service Offering form.

Portfolio managers and service owners can review responses and view vendor CSAT weight in Service Owner Workspace.

For more detailed information about working with surveys, trigger conditions, and survey questions, see Surveys.

## Financial Management for Service Owner Workspace

Integrate Service Owner Workspace with Financial Management to access preconfigured service offering cost models. You can use these cost models to evaluate expenses and generate cost lines based on the level of service offering for a defined cost.

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**Navigate**




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## Activation and features

Activate the Financial Management for SPM plugin (com.snc.financial_management_for_spm) to access the preconfigured, base system models. Financial Management for SPM contains demo data and activates related plugins if they are not already active.

The Service Portfolio Management Estimated Spend plugin (com.snc.spm.spend) is available to enhance your Service Owner Workspace experience. With this feature, you can choose to use the default local service offering cost model or access the cost models offered via the Financial Management application.

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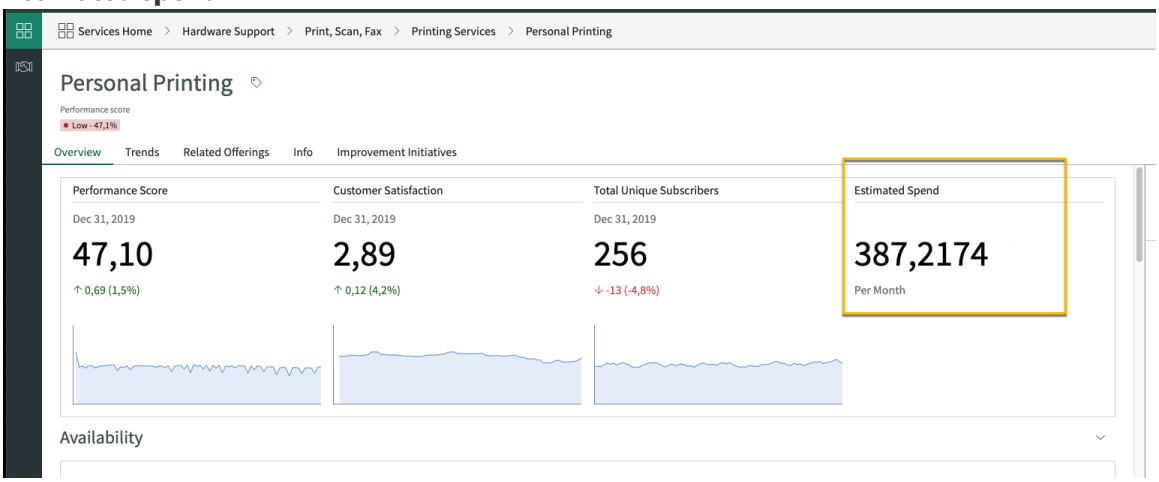
When Service Owner Workspace (com.spm_owner_workspace) and Financial Management for SPM (com.snc.financial_management_for_spm) are activated and the *sn_spm_spend.offering_cost_source* system property is set to the value **Financial Management** the **Estimated Spend** form section displays the fields **Estimated annual spend**, **FM aggregated period**, and **FM aggregated cost**. These fields reveal read-only data stored on the service offering, service, and taxonomy records.

## View calculated spend per offering in Service Owner Workspace

When you choose to use the cost models offered via the Financial Management application, calculated spend per service offering is displayed as a single score widget in Service Owner Workspace. View **Estimated Spend** as part of the **Overview** dashboard displaying associated service offering health and performance metrics.

**Estimated spend**




Service offering spend estimates are combined and summed up per period to the service and portfolio levels within your portfolio taxonomy. Estimated spend at the service and portfolio level enables you to better understand costs and how this aligns with performance throughout your service portfolio. With the estimated spend feature, you can:

- Balance your required service performance with the appropriate spend.
- Compare similar services by weighing spend to performance.
- Verify whether service spend is meeting your desired goals.
- View cost drivers within your service portfolio and the taxonomy structure.
- Compare an internal service spend to external service provider options.

## Local model compared to Financial Management model for estimated spend

Estimated spend calculations run daily as a separate job.

When the system property *sn_spm_spend.offering_cost_source* = **Local Model**, the estimated annual spend for a service offering, service, and taxonomy is determined by adding the estimated annual spends for all child entities. Estimated annual spend data is stored on the service offering, service, and taxonomy records.

When the system property *sn_spm_spend.offering_cost_source* = **Financial Managment**, the estimated spend for a service offering, service, and taxonomy is determined by adding the Financial Management estimated spends for all child entities.

For each node, determine the Financial Management estimated spend for the currently selected Financial Management period by adding all the child entity estimated spends. This happens

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recursively up the entire taxonomy structure, starting with the service offering, to the service, to the taxonomy.

For detailed information about integrating with Financial Management and configuring costing for a service offering, refer to Financial Management for licensed SPM users.

### Configure the estimated spend offering cost source

Define the source used to calculate the estimated cost for service offerings. You can use the default local model or access the preconfigured Financial Management service offering cost models.

## Before you begin

Role required: admin

## About this task

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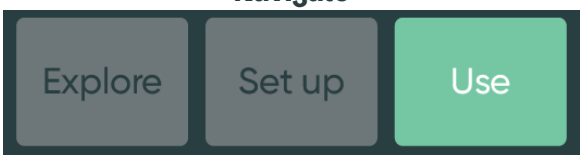
**Navigate**




The Service Portfolio Management Estimated Spend plugin (com.snc.spm.spend) is automatically activated with Service Owner Workspace.

Activate the Financial Management for SPM plugin (com.snc.financial_management_for_spm) to enable the associated cost model.

Service Portfolio Management Estimated Spend provides the *sn_spm_spend.offering_cost_source* system property. With this property, you can define the source used to calculate the estimated cost for service offerings. Values include:

- **Local Model**
- **Financial Management**
- **None**

The default value is **Local Model**.

## Procedure

1. Enter `sys_properties.list` in the navigation filter to open the System Properties [sys_properties] table.
2. Find the *sn_spm_spend.offering_cost_source* system property and set it to the desired value.

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**Note:**
Users can choose not to use the local cost model or the Financial Management model, by selecting **None** as the desired value.

**Estimated spend offering cost source**

| Value | Description |
|---|---|
| **Local Model** | With this default source, the offering Estimated Spend cost is calculated based on the following fields on the Service Offering form:<br>○ **Cost model**: Choices include, **Fixed** and **Per unit**.<br>○ **Estimated spend**: The estimated cost of the offering for the associated time period.<br>When the **Cost model** value is **Fixed**, additional fields appear on the Service Offering form, including: **Offering cost**, **Time period**, and **Cost Unit**.<br>When the **Cost model**is **Per Unit**, additional fields appear on the Service Offering form, including: **Offering cost**, **Time period**, **Units per period**, and **Cost Unit**. |
| **Financial Management** | With this source, the offering **Estimated Spend** cost is calculated based on the following Service Offering form fields, as calculated by the Financial Management application:<br>○ **FM period**: Fiscal calendar period.<br>○ **FM cost**: The actual currency amount. |
| **None** | With this value, or any incorrect values, the system ignores both the local and Financial Management cost models and does not display associated Service Offering form fields. |

3. Click **Update** to save any changes.

# Service Level Management

The ServiceNow® Service Level Management (SLM) application helps to gather service requirements as well as monitor and report with regards to agreed service levels (SLAs).

## Get started

| Explore | Configure |
|---|---|

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Exploring Service Level Management



Configuring Service Level Management

Use



Using Service Level Management

Reference



Service Level Management reference

# Exploring Service Level Management

Use Service Level Management across your organization to monitor and manage the quality of the services.

## Service Level Management overview

Service Level Managers are responsible for negotiating a set of agreements between a service provider and customer that define the scope, quality and speed of the services being provided and ensuring that the agreed service levels are met.

## Service Level Management concepts

The ServiceNow® Service Level Management (SLM) application facilitates you to oversee and control the services within the organization.

Service Level Managers are responsible for a set of agreements between a service provider and customer that define the scope, quality, and speed of the services being provided. The intention of SLM is to provide the customer with an expectation of service within a known timescale and the ability to monitor when service levels are not being met.

The SLM offers the following features:

- Service Level Agreement (SLA) definitions
- Task SLAs
- Integration with other ServiceNow plugins

## Service Level Agreement (SLA) roles

Ensure that users can perform all necessary actions by assigning SLA roles.

| Role | Definition |
| --- | --- |
| sla_admin | Provides full administrative rights to SLM. Users that possess the sla_admin role can configure SLM properties, run SLA repair, view |

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| Role | Definition |
| --- | --- |
| | the SLA Overview dashboard, and manage SLA definitions. They may associate existing workflows or schedules to SLA definitions, but are unable to create workflows. The additional roles required to create workflows or schedules must be granted explicitly. See Base system roles for more information. |
| sla_manager | Lets users define SLA definitions, view SLA repair logs, and view the SLA Overview dashboard. Does not let users change SLM property values or define SLA condition types. |

## Service Level Agreement (SLA) definitions

Use the SLA Definition record to define a specific set of criteria that would result in an SLA being generated. Define some of the following parameters:

- Table: The task table that the SLA is defined for.
- Duration: The time duration in which the service must be provided to the customer.
- Schedule: The schedule, which indicates valid working and non-working days that the service provider follows to deliver the service. The selected schedule is used to determine when the SLA breaches.
- Conditions: The conditions under which the SLA starts, pauses, stops, or resets.

## Task SLA definitions

When an SLA definition is triggered against a particular task, the task SLA record is generated and contains all the tracking data for the specific SLA on that record. For example, if an SLA definition exists for P1 incidents a task SLA record attaches to the P1 incident record and captures all the data associated with it. Often there are multiple task SLA records against a single task because many definitions apply.

**Note:**
This feature is available only in new instances starting with Jakarta or a later release. The Problem Management Best Practice – Jakarta plugin (com.snc.best_practice.problem.jakarta) plugin must be activate.

On the Task SLA form, you can also select the target for the SLA: **Response**, **Resolution**, or **None**.

## Integration with other ServiceNow plugins

The following plugins introduce extra functionality within SLM:

- SLA Contract Add-on
- Service Portfolio Management - SLA Commitments

## SLM Template support in App Engine Studio

Application Templates support Service Level Management tables to be included when creating templates from applications in the App Engine Studio. The SLM tables that can be included in templates are:

- SLA Definition [contract_sla]
- Service Offering SLA [service_offering_sla]

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- SLA Timer Configuration[sla_timer_config]
- SLA timer configuration mapping[sla_timer_config_mapping]

## Define a service contract

A new table of SLA contracts is provided through the **Service Level Management** > **Service Contracts** module. These contracts group together SLAs that relate to a single vendor or customer, as well as the CIs, locations, groups, users, and child contracts that are related to the contract.

The table Service Contract [ast_service] extends the table Contract [ast_contract]. It stores information about service contracts for asset management purposes. To get the service contract functionality, activate the Service Level Management - Contract Management Integration [com.snc.sla.contract2] plugin. Installing the SLA Contract Add-on plugin adds relations to this table to make it useful for Service Management purposes. Once the plugin is installed, the Service Contract record possesses related lists for:

- SLAs
- Contract CIs
- Contract Locations
- Contract Groups
- Contract Users
- Child Contracts

### Service contract table fields

| Field | Description |
|---|---|
| Number | A unique number associated with the contract. |
| Starts | The date on which the contract takes effect. |
| Ends | The date on which the contract expires. |
| Approver | The person who approves the contract. |
| Location | The primary location of the contract, if applicable. If there are multiple, use the Contract locations related list. |
| Active | Whether the contract is currently in use. |
| Automatically renew/extend | Whether the contract has the possibility of being renewed or extended at the end of its term. |
| Vendor | The vendor responsible for the contract. |
| Vendor account | The account the vendor is responsible to. |
| Contract number | The number of the contract defining the Service Contract. |
| Total cost | The total cost of the contract. |
| Payment amount | The amount which has been paid so far. |
| Payment schedule | The duration at which payments are made. |
| Process non-contractual SLAs | If selected, you can have both contractual SLAs as well as non-contractual SLAs, such as OLA and Underpinning contracts, processed for the same task. You can track the |

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**Service contract table fields (continued)**

| Field | Description |
|---|---|
| | contractual SLAs as well as any SLA that is internal to the organization to enhance compliance.<br><br>**Note:**<br>The **Process non-contractual SLAs** check box is available for the zboot and upgrade customers. The system property *com.snc.sla.contract.tables* is not available for zboot customers so that contracts are processed for any table in the system instead of specific tables. |
| Short description | A short description of the Service Contract. |
| Description | A full description of the Service Contract. |

## Add contract field to task form

Depending on how the contract is used, the **Contract** field can be added to any task form by configuring the form. For information about how to configure a form, see Form configuration . As the **Caller**, **Assignment Group**, **Location**, and **Configuration item** fields are populated, the **Contract** field filters appropriately, helping the support desk to associate the ticket to the correct contract.

**Note:**
Do not add the same field to different sections of a form unless the field displays read-only data. Having two or more instances of an editable field can cause data loss and prevent the proper functioning of UI and data policies.

## Service Level Agreement (SLA) breakdown definitions

Using SLA breakdown, the service owner or service desk manager can see detailed task ownership and SLA duration related data for any task SLA record associated with a task. This helps determine which teams and users are contributing to SLA compliance.

SLA breakdown is configurable and typically should be configured for the more significant SLAs such as P1 and P2 resolution. By default, the system deletes SLA breakdown data that is more than one year old. This is performed by a new table cleanup job *sla_breakdown_by_assignment*. Table cleanup jobs are defined in the [sys_auto_flush] table.

**Related topics**

Create SLA breakdown definitions

Configure Service Level Agreement (SLA)

## Service Level Agreement (SLA) processing

The SLA engine performs two passes to evaluate SLA definitions and their conditions based on a task.

The SLA engine performs the following passes:

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1. Checks the SLA definitions that do not have an active SLA record associated to the task. The SLA engine determines if the SLA definition applies to the task and if it needs to create a SLA record. The following condition checks are performed:
   a. If the Start condition is true and the Stop condition is true, do nothing. No SLA record is created, because the Stop condition overrides the Start condition.
   b. If the Start condition is true and the Stop condition is false, a new SLA record is created for this task using the SLA definition. The SLA record is then set to the In Progress stage.
2. Checks all active SLA records associated to the task. The engine determines if the SLA records are changing stage. The condition checks are performed in the following order:
   a. If the Stop condition is true, the SLA changes to **Completed** and becomes inactive.
   b. If both the Reset and Start conditions are true, the SLA changes to **Completed** and a new task SLA is created.
   c. If the Start condition is false, the SLA changes to **Cancelled** and becomes inactive.
   d. If the SLA is active, the Pause condition is true, and the SLA stage is **In Progress**, the SLA is paused.
   e. If the SLA is active, the Pause condition is false, and the SLA stage is **Paused**, the SLA changes back to **In Progress**.

### Actual and business elapsed times

Task SLA records contain two sets of timing information: **Actual elapsed** and **Business elapsed**.

The difference between these two sets of timing is vital when you create and report on SLA definitions.

- **Actual elapsed** values are calculated on a 24x7 basis.
- **Business elapsed** values are calculated based on the schedule specified in the task SLA. The schedule is taken from the SLA definition by default.

> **Note:**
> If no schedule is specified, then the **Business elapsed time** is the same as the **Actual elapsed time**. This can be disabled by changing the *com.snc.sla.always_populate_business_fields* property to false in the SLA Engine. When this property is set to false, the **Business** fields will be 0 or empty.

By default, the related list for the task SLA record displays the actual elapsed time only. You can configure the list to also display the business elapsed time.

## Elapsed times and schedules

Consider a scenario where an SLA has a defined schedule of 9 am to 5 pm on weekdays. With this schedule, the difference between actual and business elapsed times can be significant.

For example, if a task SLA starts at 2 pm on a weekday, its business elapsed time at 9 am on the next weekday is 3 hours while its actual elapsed time is 19 hours.

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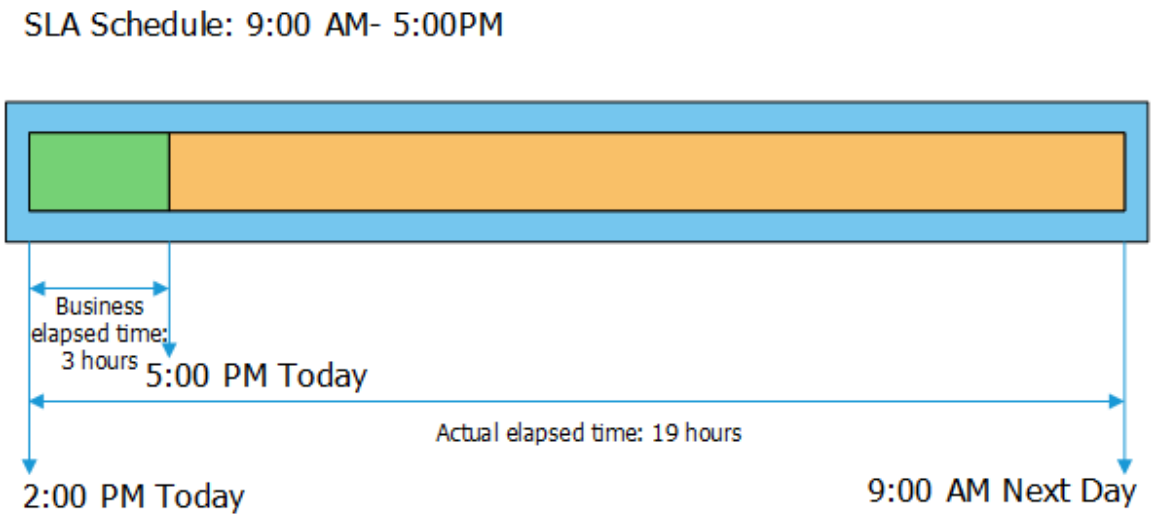
**Business elapsed time vs actual elapsed time**




In addition, if a schedule defines an 8 hour working day, then 24 hours or one day in business elapsed time equates to 3 days in actual elapsed time.

**Exampl of business and actual elapsed times - 24 X 7**




## Example

For example, an incident is opened on Friday, December 12 at 9 pm, outside of the SLA schedule of 8 am to 5 pm on weekdays.

If the current time is the following Monday at 9:30 am, then:

- **Business elapsed time** is 1 hour and 30 minutes because the SLA business timer stopped at 5 pm on Friday and restarted at 8 am on Monday.
- **Actual elapsed time** is 60 hours and 30 minutes, representing the real time between the incident being opened and the current time.

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Elapsed percentages are also similarly calculated. The actual elapsed percentage is over 750% while the business elapsed percentage is 19% on an 8 hour SLA.

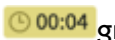
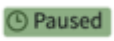
## SLA timer

Use the SLA timer component to track the amount of time that is required to complete the task as defined by the matching SLA definition.

The SLA timer component is designed to visually display the current status of the Task SLA. You can also view more information about the task in the tooltip, such as the SLA definition name, the remaining time to breach, and the percentage completed details. When your task is in-schedule, then the tooltip provides extra information, such as the out-of-schedule details.

The timer component can show any of the following stages depending on the current status of the task.

### SLA timer stages

| Stage | Color code | Description |
|---|---|---|
| In-progress |  | The stage of the timer when the task SLA is in progress. You can find more information about the schedule and time on tooltip. The color code changes for in-progress state:<br>•  green to yellow: When the time to complete reaches 50%<br>•  yellow to orange: When the time to complete reaches 25% |
| Breached |  | The stage of the timer when the time allocated to complete the task SLA is over. The tooltip provides more information on the time that the task was breached. |
| Cancelled |  | The stage of the timer when the task SLA is cancelled. On the tooltip, you can see the time when it was cancelled. |
| Paused |  | The stage of the timer when the task SLA is paused or put on-hold. The color displayed in this stage will correspond to the percentage elapsed when the task SLA was paused. When the stage changes from **Paused** to in-progress the timer starts from time when it was paused. You can find |

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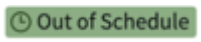
**SLA timer stages (continued)**

| Stage | Color code | Description |
|---|---|---|
| | | more information about the schedule and time on tooltip. |
| Achieved (2010 SLA engine) |  | The stage of the timer when the task SLA is achieved. The information on when it was achieved is seen on the tooltip. |
| Completed |  | The stage of the timer when the task SLA is completed. You can see when the it was completed on the tooltip. |
| Out of Schedule |  | The stage of the timer when the task SLA goes out-of-schedule. You can find more information about the schedule and time on tooltip. |

# Configuring Service Level Management

You can configure various aspects of Service Level Management based on the specific requirements of your organization.

## Service Level Management plugins

You can activate one or more of the Service Level Management plugins if they are not already active. Some plugins include demo data.

You can activate one or more of the following Service Level Management plugins.

### Activate Service Level Management

You can activate the Service Level Management plugin (com.snc.sla) if you have the admin role. This plugin includes demo data and activates related plugins if they are not already active.

**Before you begin**
Role required: admin

**About this task**
Activating this plugin, provides the core SLA functional.ities.

**Procedure**

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.
3. Select **Install** to start the installation process.

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**Note:**
When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

**Related topics**

List of plugins (Washington DC)

### Installed with Service Level Management

Activating the Service Level Management plugin adds or modifies these components: tables, properties, UI actions, UI policies, script includes, client scripts, business rules, email notifications, scheduled jobs, and workflows.

### Tables installed with Service Level Management

Tables are added with Service Level Management.

| Display name [Table name] | Description |
|---|---|
| SLA Definition [contract_sla] | Provides the conditions, duration, and schedule for an SLA Definition. |
| SLA Conditions [sla_condition_class] | Defines how the conditions in the SLA Definition are used to determine the transitions between different stages of each task SLA. |
| SLA Repair Log[sla_repair_log] | Used to provide a log of when the SLA Repair function is set to action. |
| SLA Repair Log Entry [sla_repair_log_entry] | Extends syslog and stores the before or after values of a task SLA record that has been repaired. |
| Task SLA [task_sla] | Associates a task with the SLA Definition that applies to it. |
| SLA Timer Configuration [sla_timer_config] | Stores the timer configuration information. |
| SLA timer configuration mapping [sla_timer_config_mapping] | Stores the Task SLA mapping information. |

### Roles installed with Service Level Management

Roles are added with activation of Service Level Management plugin.

#### Roles installed

| Role title [name] | Description | Contains roles |
|---|---|---|
| sla_admin | Users with this role have full administrative rights to the Service Level Management application | flow_operator |

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### Roles installed (continued)

| Role title [name] | Description | Contains roles |
|---|---|---|
| sla_manager | Users with this role can define SLA definitions and view SLA repair logs. | flow_operator |

### Scheduled jobs installed with Service Level Management

Scheduled jobs are added with Service Level Management.

| Scheduled job | Description |
|---|---|
| SLA update (already breached) | Refreshes the timings in task SLA records that have already breached. This is limited to task SLAs where the breach time is within the last 365 days. This job runs once a day. |
| SLA update (breach after 30 days) | Refreshes the timings in task SLA records where the breach time is more than 30 days away. This is limited to task SLA records where the breach time is within the next 365 days. This job runs every 5 days. |
| SLA update (breach within 1 day) | Refreshes the timings in task SLA records where the breach time is more than 1 hour away and less than 24 hours away. This job runs every hour. |
| SLA update (breach within 1 hour) | Refreshes the timings in task SLA records where the breach time is more than 10 minutes away and less than 1 hours away. This job runs every 10 minutes. |
| SLA update (breach within 10 min) | Refreshes the timings in task SLA records where the breach time is in the next 10 minutes This job runs every minute. |
| SLA update (breach within 30 days) | Refreshes the timings in task SLA records where the breach time is more than 1 day away and less than 30 days away. This job runs once a day. |

### Activate SLA Breakdown definitions

You can activate the SLA Breakdowns plugin (com.snc.sla.breakdowns) if you have the admin role. This plugin includes demo data and activates related plugins if they are not already active.

## Before you begin

Role required: admin

## About this task

SLA Breakdowns plugin (com.snc.sla.breakdowns) activates these related plugins if they are not already active.

### Plugins for SLA Breakdowns

| Plugin | Description |
|---|---|
| Service level management | Provides the core SLA functionality.<br><br>SLA Definitions provide conditions to start, pause, stop, cancel and reset Task SLAs against any Task type. |

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**Plugins for SLA Breakdowns (continued)**

| Plugin | Description |
|---|---|
| [com.snc.sla] | In addition, you can specify a schedule on the definition to define the working hours and also a workflow to run against each Task SLA which is typically used to generate notifications. |

## Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.

3. Select **Install** to start the installation process.

   **Note:**
   When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

   You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

### Related topics

List of plugins (Washington DC)

### Installed with SLA breakdown definitions

Several types of components are installed with the SLA breakdown definitions.

### Plugins installed with SLA breakdowns

Plugins are added with activation of SLA breakdowns.

SLA breakdowns adds the following plugin.

| Plugin | ID | Description |
|---|---|---|
| SLA Breakdowns | com.snc.sla.breakdowns | Provides the ability to generate breakdown data for each Task SLA record. For example, the breakdown data for each Task SLA record can be generated by **Assignment group** or **Assigned to** field. |

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| Plugin | ID | Description |
|---|---|---|
| | | **Note:** You must have up-to-date versions of script includes *TaskSLAController* and *RepairTaskSLAController* before activating the plugin to ensure that breakdown data is generated correctly. If you have customized versions of either of these script includes, any customizations should be incorporated into the versions of these files from the most recent upgrade. |

### Table installed with SLA breakdowns

Tables are added with activation of SLA breakdowns.

SLA breakdowns adds the following tables.

| Table | Description |
|---|---|
| SLA Breakdown Definition<br><br>[sla_breakdown_definition] | A breakdown definition that is associated to a specific task type. For example, Incident. |
| SLA Breakdown Definition Field<br><br>[sla_breakdown_definition_field] | A breakdown definition field (a child record of a breakdown definition). Each record defines a mapping between a field on the associated task table and the breakdown data table. |
| SLA Breakdown Definition to SLA Definition relation<br><br>[sla_definition_sla_breakdown] | The relation between SLA Breakdown Definition and SLA Definitions. |
| SLA Breakdown Core<br><br>[sla_breakdown_core] | The common columns for all SLA breakdown data tables. Each breakdown data table must extend this core table.<br><br>**Note:** In the Madrid release, only the single breakdown data table SLA Breakdown By Assignment [sla_breakdown_by_assignment] is supported. |
| SLA Breakdown By Assignment<br><br>[sla_breakdown_by_assignment] | Contains the breakdown records generated for each Task SLA record that has an associated breakdown definition. |

### Properties installed with SLA breakdowns

Properties are added with activation of SLA breakdowns.

SLA breakdowns adds the following properties.

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| Property | Usage |
| --- | --- |
| com.snc.sla.breakdown_processor.log | Logging level for script include *SLABreakdownProcessor*.<br><br>Type: Choice list<br><br>Default value: Notice<br><br>Location: SLA logging module |

### UI policy installed with SLA breakdowns

UI policies are added with activation of SLA breakdowns.

SLA breakdowns adds the following UI policies.

| UI policy | Table | Description |
| --- | --- | --- |
| Make definition fields read only | SLA Breakdown Definition Field [sla_breakdown_definition_field] | Make read only any fields on the form that are from the parent SLA Breakdown Definition |
| Hide "Fieldname data" field | SLA Breakdown Definition Field [sla_breakdown_definition_field] | The ui policy hides the field “Fieldname data” from the form. This field is only used by scripts that dynamically update other fields on the form and which should not be modified through the UI. |

### Script includes installed with SLA breakdowns

Script includes are added with activation of SLA breakdowns.

SLA breakdowns adds the following script includes.

| Script include | Description |
| --- | --- |
| SLABreakdown | Base class that provides constants for SLA Breakdowns. |
| SLABreakdownDefinition | Extends SLABreakdownDefinitionSNC and in future releases can be used to override default functionality or provide additional methods. For the Madrid release, the script include is read only. |
| SLABreakdownDefinitionSNC | Provides methods for managing records in the sla_breakdown_definition table. |
| SLABreakdownDefinitionAJAX | Provides client callable methods used for managing records in the sla_breakdown_definition table. |
| SLABreakdownDefinitionBreakdownField | Extends SLABreakdownDefinitionBreakdownFieldSNC and in future releases can be used to override default functionality or provide additional methods. For the Madrid release, the script include is read only. |

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| Script include | Description |
| --- | --- |
| SLABreakdownDefinitionBreakdownFieldSNC | Provides methods that determine the available values for breakdown_field on the sla_breakdown_definition_field table. |
| SLABreakdownDefinitionSourceFieldSNC | Extends SLABreakdownDefinitionSourceFieldSNC and in future releases can be used to override default functionality or provide additional methods. For the Madrid release, the script include is read only. |
| SLABreakdownDefinitionSourceFieldSNC | Provides methods that determine the available values for source_field on the sla_breakdown_definition_field table. |
| SLABreakdownDefinitionTaskTables | Extends SLABreakdownDefinitionTaskTablesSNC and in future releases can be used to override default functionality or provide additional methods. For the Madrid release, the script include is read only. |
| SLABreakdownDefinitionTaskTablesSNC | Provides the method that determines the available Task tables for breakdown definitions. |
| SLABreakdownProcessor | Extends SLABreakdownProcessorSNC and can be used to override default functionality or provide additional methods. |
| SLABreakdownProcessorSNC | Provides the methods for generating the breakdown data records for Task SLAs based on the available breakdown definition records. |
| SLABreakdownUtils | Extends SLABreakdownUtilsSNC and can be used to override default functionality or provide additional methods. |
| SLABreakdownUtilsSNC | Provides utility methods used by some of the other SLA breakdown script includes. |
| TaskSLABreakdownUtils | Extends TaskSLABreakdownUtilsSNC and can be used to override default functionality or provide additional methods. |
| TaskSLABreakdownUtilsSNC | Provides methods for the task_sla table. |

### Client scripts installed with SLA Breakdowns

Client scripts are added with activation of SLA breakdowns.

SLA breakdowns adds the following client scripts.

| Script include | Table | Description |
| --- | --- | --- |
| Hide assignment breakdown reports | Task SLA<br><br>[task_sla] | Hides the embedded charts on the Task SLA form when no breakdown data is available. |
| Set available breakdown tables | SLA Breakdown Definition<br><br>[sla_breakdown_definition] | Populates the options in the sla_breakdown_table field. |
| Set fieldname data | SLA Breakdown Definition Field<br><br>[sla_breakdown_definition_field] | Sets data into a hidden field which is then used by the field choice scripts that populate breakdown_field_name and source_field_name. |

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| Script include | Table | Description |
|---|---|---|
| Show 2010 engine message | SLA Breakdown Definition [sla_breakdown_definition] | Displays a message on the form for instances that are running the 2010 SLA engine. |
| Show breakdown data exists message | SLA Breakdown Definition Field [sla_breakdown_definition_field] | Displays a message on the form to explain that fields are read only due to breakdown data existing. |
| Show breakdown data exists message | SLA Breakdown Definition [sla_breakdown_definition] | Displays a message on the form to explain that fields are read only due to breakdown data existing. |
| Update already defined task tables | SLA Breakdown Definition [sla_breakdown_definition] | Disables options in the task_table field for task types that already have a breakdown definition. |
| Warning on setting inactive | SLA Breakdown Definition [sla_breakdown_definition] | Prompts for confirmation when a breakdown definition is updated to be inactive. |

### Business rules installed with SLA breakdowns

Business rules are added with the activation of SLA breakdowns.

SLA breakdowns adds the following business rules.

| Business rule | Table | Description |
|---|---|---|
| Clear SLA Breakdown definitions cache | SLA Breakdown Definition to SLA Definition relation [sla_definition_sla_breakdown] | Clears the SLA breakdown definitions cache whenever a record is inserted, updated, or deleted. |
| Clear SLA Breakdown definitions cache | SLA Breakdown Definition Field [sla_breakdown_definition_field] | Clears the SLA breakdown definitions cache whenever a record is inserted, updated, or deleted. |
| Clear SLA Breakdown definitions cache | SLA Breakdown Definition [sla_breakdown_definition] | Clears the SLA breakdown definitions cache whenever a record is inserted, updated, or deleted. |
| Delete active breakdown data on inactive | SLA Breakdown Definition [sla_breakdown_definition] | Deletes any breakdown data records for active Task SLA records when the breakdown definition is updated to inactive. |
| Get breakdown table data | SLA Breakdown Definition [sla_breakdown_definition] | Populate data on the scratchpad that is required by client scripts. |

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| Business rule | Table | Description |
|---|---|---|
| Get SLA breakdown data | Task SLA<br>[task_sla] | Populate data on the scratchpad that is required by client scripts. |
| m2mSLABreakdownRestrictBreakdownDefs | Global<br>[global] | Script to restrict the available values in the sla_breakdown_definition column in many-to-many table sla_definition_sla_breakdown. |
| m2mSLABreakdownRestrictSLAs | Global<br>[global] | Script to restrict the available values in the sla_definition column in many-to-many table sla_definition_sla_breakdown. |
| Process changes to tables | SLA Breakdown Definition<br>[sla_breakdown_definition] | Perform additional processing when either the sla_breakdown_table or task_table is changed. |
| Process SLA Breakdowns | Task SLA<br>[task_sla] | Creates and updates breakdown data whenever a Task SLA record is created or updated. |
| Set field values into scratchpad | SLA Breakdown Definition Field<br>[sla_breakdown_definition_field] | Populate data on the scratchpad that is used by other business rules or client scripts. |

### Activate SLA timeline

You can activate the SLA timeline plugin (com.snc.sla.timeline) if you have the admin role. This plugin activates related plugins if they are not already active.

#### Before you begin

Role required: sla_admin

#### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.

3. Select **Install** to start the installation process.

   **Note:**
   When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears:
   `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

   You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

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**Related topics**

List of plugins

### Script includes installed with SLA timeline

When SLA timeline is activated, script includes are installed.

SLA timeline adds the following script includes.

| Script include | Description |
|---|---|
| SLATimeline | This script include generates the timeline data for a task SLA record by replaying the task's history and using the SLATimelineAPI to determine the appropriate stage transitions and timings for the task SLA. |
| SLATimelineAPI | This script include provides a number of functions that simulate how the SLA engine processes a particular task and SLA definition without actually creating any task SLA records. |
| SLATimeLineV2SNC | This script include is used by SLA Timeline internal REST API to inspect audit history of a Task and extract task SLA details to be presented on the UI. |
| ReadOnlyTaskSLAContoller | This script include is a helper script include and is for internal use. This script include is called by SLATimeLineV2SNC to process the task SLA stage details. |

### Activate Service Level Management - SLA Timer Config API

You can activate the Service Level Management - SLA Timer Config API plugin (com.sn_slm_timer) if you have the admin role.

## Before you begin

Role required: admin

## About this task

Activating this plugin provides the ability to set a preferred SLA for a given task through configuration which is dynamic, such as First SLA to breach, or declarative through a hierarchical mapping of first to match SLA definitions. This plugin includes demo data and activates related plugins if they are not already active.

## Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.
3. Select **Install** to start the installation process.

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**Note:**
When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

**Related topics**

List of plugins (Washington DC)

### Installed with Service Level Management - SLA Timer Config API

The Service Level Management - SLA Timer Config API (com.sn_slm_timer) plugin installs the admin role.

## Roles installed

| Role title | Description | Contains roles |
|---|---|---|
| sn_slm_timer.sla_timer_admin | Users with this role has full administrative rights to the Service Level Management timer configuration. | sn_sla_definition_read |

### Script Includes installed with SLA Timer Config API

When SLA Timer Config API is activated, script includes are installed.

SLA Timer Config API adds the following script includes.

| Script include | Description |
|---|---|
| SLATimerConfigAPI | This script includes provides various functions to process and identify the task SLA that is about to breach. |

## Configure Service Level Agreement (SLA)

Configure SLAs to define a set amount of time for a task to reach a certain condition, to ensure that incidents are closed or resolved according to the expectations set for customers.

### Service Level Agreement (SLA) definition

An SLA definition is used to create and progress SLAs, enabling you to use an SLA system for your organization's tasks.

An SLA definition record defines the timings, conditions, workflows, and other information required to create and progress task SLAs.

For example, the default **Priority 1 resolution (8 hour)** SLA Definition defines the Task SLAs to attach to incidents with a P1 - Critical priority, specifies appropriate conditions for those Task SLAs, and uses the default SLA workflow to create events such as to send a notification, when an incident's Task SLA reaches 50% of its allotted time.

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### Create an SLA definition

You can create one or more Service Level Agreement (SLA) definitions and use them to create an SLA record. This SLA record enables you to use an SLA system for your organization's task.

## Before you begin

When you create an SLA definition, avoid using dot-walked fields that change frequently in any of the SLA conditions (start, stop, pause, and reset). The SLA engine features, such as SLA Timeline and SLA Repair replays the audit history of the Task record that the task_sla is attached to. The SLA engine does not replay the audit history of any dot-walked fields from that Task, rather only considers the final state of the dot-walk fields.

For example, a pause condition is set to an incident dot-walk field `incident.company.cost_center`. The value of the Cost Center is first set to Finance and later changed to Engineering. When the SLA repair runs, only the final value of the Cost Center is considered. So, if the SLA pause condition is: `incident.company.cost_center is Engineering`, SLA Repair pauses immediately, because the SLA Repair does not consider the previous Cost Center value: Finance. This condition also applies to SLA Timeline (as well as when executing the SLA Engine asynchronously).

Now, if the requirement is to pause when incident.company.cost_center is Engineering and not Finance, then the audit history must be on the Task record using a custom field. Create a custom field (in this example on the incident table) such as: u_company_cost_center and a business rule to populate the field when either the company changes or the Cost Center of the company changes. In this approach, instead of setting the SLA pause condition to the dot-walked field, it is set against the custom field. The given approach ensures that the task_sla, SLA repair, and SLA Timeline always shows the same results.

**Note:**
The deeper the dot walk, the more business rules are required.

Role required: admin

## Procedure

1. Navigate to **All** > **Service Level Management** > **SLA** > **SLA Definitions**.
2. Click **New**.
   The **SLA Definition** form is displayed.
3. On the form, fill in the fields.

#### SLA Definition form

| Field | Description |
|---|---|
| Name | Name that identifies the SLA definition. |
| Type | Select the type of agreement being defined: **SLA**, **OLA**, or **Underpinning contract**.<br>**Note:**<br>Type is used for reporting purposes only. |
| Target | Select the target of the agreement being defined: **None**, **Response**, or **Resolution**. Target is used for filtering, searching, and reporting purposes only. |

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| Field | Description |
| --- | --- |
| | **Note:**<br>This feature is available only in new instances starting with Jakarta or a later release. |
| Table | Table that determines the records tracked by the SLA. SLAs can be defined for any table that extends the task table, including incident, change request, and service catalog tasks.<br>**Note:**<br>Starting with the Helsinki release, you can and create an SLA definition for configuration items and business services for Event Management. |
| Flow | Select the flow to run when the SLA definition attaches to a Task record. Selecting a flow disables the **Workflow** field. |
| Workflow | Select the workflow to run when the SLA definition attaches to a Task record. Selecting a workflow disables the **Flow** field. |
| Vendor | Select the vendor associated with the SLA definition. |
| Service Commitment | A flag that helps to differentiate between a normal SLA definition and a service offering SLA definition. |
| Enable logging | Check box to activate debug logging just for the specific SLA definition. The debug logging information includes details of the conditions that have matched or not matched. The information also provides the before and the after values for the task SLA and task records. |
| Duration type | Specify the method for calculating the duration of the SLA. The duration can either be a **User specified duration**, or a **Relative Duration**, such as **Breach on Due Date** or **End of next business day**. |
| Duration | Specify the length of time the SLA runs before it is marked **Breached**. This field appears when the duration is **User specified duration**.<br>**Note:**<br>The number of days specified in this field is converted to 24-hour blocks. If the **Schedule** field identifies a schedule with eight-hour days, a duration of **1 Day** sets the SLA to breach three business days later. |
| Relative duration works on | Specify the record that the relative duration should be calculated for. Select either **Task record** or **SLA record**. This field appears only when the relative duration is specified. |
| Schedule source | Specify the schedule to be used when creating task SLAs. You can specify one of the following options:<br>○ **No schedule**: If the **No Schedule** option is selected, the SLA calculates the schedule duration based on a 24 x 7 schedule.<br>○ **SLA definition**: If the **SLA definition** option is selected, the **Schedule** choice list appears.<br>**Schedule**: Specify the hours during which the SLA timer runs. |

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| Field | Description |
| --- | --- |
| | ○ **Task field**: This option title is determined from the option selected in the Table field, for example, if the Incident option is selected in the Table field, this option becomes the Incident field. If the **Task table field** option is selected, the **Schedule source field** list appears.<br><br>Schedule source field: Select the appropriate field from the task such as an incident or problem that provides the schedule. For example, **Configuration item** > **Schedule**. |
| Timezone Source | Specify the time zone source to be used when creating task SLAs. You can specify one of the following time zones:<br>○ **The caller's timezone**.<br>○ **The SLA definition's timezone**: If the **The SLA definition's timezone** option is selected, the **Timezone** choice list appears.<br><br>**Timezone**: Specify a time zone for the SLA. The time zone can be the system time zone or active standard geographical time zones.<br><br>○ **The CI location's timezone**.<br>○ **The task's location's timezone**.<br>○ **The caller's location's timezone**. |
| Tabs | |
| Start condition | Define the conditions under which the SLA is attached.<br><br>From the **When to cancel** list, you can choose the conditions under which the SLA is canceled.<br>○ **Start conditions are not met** option: If one or more of the specified start conditions change, the SLA is canceled. This option is selected by default.<br>○ **Cancel conditions are met** option: The start condition must be met only once, thereafter the SLA is canceled only when the cancel condition is met.<br>○ **Never** option: The SLA is never canceled.<br><br>**Retroactive start**:  to choose a date and time field from the task that provides the start time of the task SLA. If you select the **Retroactive start** check box, the **Set start to** field and the **Retroactive pause time** check box appear.<br>○ **Set start to** field: Offers the date and time fields available on the task type that this SLA definition applies to. For example, if you select **Retroactive start** on a Priority 1 SLA definition and choose **Created** in the **Set start to** field, then the SLA is attached with the start time that is the date and time from the **Created** field on the incident.<br>○ **Retroactive pause time** check box: Enables the calculation of retroactive pause time on the specific SLA definition. For example, if you select **Retroactive start** on a Priority 1 SLA definition and then |

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| Field | Description |
|---|---|
| | select the **Retroactive pause time** check box, the SLAs that have enabled retroactive start can recover prior to the pause time.<br><br>**Note:**<br>The **Retroactive pause time** check box is available only when the duration is a user-specified duration. |
| Pause condition | Define the conditions under which the SLA suspends increasing elapsed time.<br><br>From the **When to resume** list, you can choose the conditions under which the SLA resumes increasing elapsed time.<br>○ **Pause conditions are not met** option: If one or more of the specified pause conditions no longer match, the elapsed time continues to increase. The **Pause conditions are not met** option is selected by default.<br>○ **Resume conditions are met** option: If one or more of the specified resume conditions match, the elapsed time continues to increase. |
| Stop condition | Define the conditions under which the SLA completes. If all these conditions match, then the task SLA completes regardless of whether it is breached. |
| Reset condition | Determines whether the existing task is canceled or completed on task SLA reset. Defines the conditions under which the running SLA is canceled or completed and a new SLA is attached. For a new SLA to be attached, the start condition must match.<br><br>Reset condition also helps to configure SLAs when the value of any specific field on the task record changes, changes to, or changes from a specific value. For example, the value of the **Location** field in the task record is 101 Broadway East, Seattle,WA. If you set the SLA reset condition as **Location changes from** 101 Broadway East, Seattle,WA, any change in the value of the **Location** field resets the SLA of the task record. |
| Fields that can be added by configuring the form | |
| Condition type | Select the condition type to determine when an SLA attaches, pauses, completes, or resets. |

## Configure SLA retroactive start and pause

You can use retroactive start to retain timing information for an SLA when a task record changes. Retroactive pause prevents immediate breaches and notifications when retroactive start is enabled for SLA definitions.

### Before you begin

Role required: admin

### About this task

When a task record changes, typically a new SLA may be attached, with a new set of timing information. This is useful if you are re-assigning an incident to another group and want to attach a new SLA record with new timing information.

However, you may want to retain time information for the task in specific situations. For example, an incident is raised with a priority of **3 - Moderate** and the priority changes to **1 - Critical** after

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3 hours. A priority 1 SLA is attached to the incident at that time. You can use retroactive start to ensure this SLA timing is adjusted retroactively to count from when the incident was first created, rather than from when the incident's priority changed. This reflects the actual time the user contacted you.

You can use the retroactive pause property to apply pause times to the new SLA.

### Procedure

1. Navigate to **All** > **Service Level Management** > **SLA** > **SLA Definitions**.
2. Open the relevant SLA definition record.
3. In the **Start Condition** section, select the **Retroactive start** check box.
4. From the **Set start to**, select the event from which the SLA starts.

   This option determines the start time used for every task SLA record created from this SLA definition.

   For example, you can select **Opened** to start the SLA from when the task form was initially opened to create the record, which accurately reflects the time the end user contacts the service desk. Alternatively, you can select **Created** to start the SLA from when the task form was initially saved.

5. To enable the retroactive pause property, select the **Retroactive pause** check box.
   Enabling this property ensures that the new task SLA record gets any pause time that would have been accumulated during the period between the retroactive start time and now. This pause time increases the breach time with the appropriate amount.
6. Click **Update**.

### What to do next

When retroactive start is enabled, it may result in task SLAs being breached as soon they attach, which will trigger multiple notifications. To prevent the workflow from being processed for these breached SLAs, set the *com.snc.sla.workflow.run_for_breached* property to false.

## Configure the SLA timer

Configure the SLA timer to determine which task SLA must be displayed as part of the timer component.

### Before you begin

Role required: sla_admin, sla_manager, itil, sn_slm_timer.sla_timer_admin, or admin

### About this task

All Service Level Agreement (SLAs) attached to a task, such as an incident, problem, or change are of equal importance. However, on various scenarios and user interfaces, you might want to configure a hierarchy of preferred SLAs. After configuring the hierarchy, you can determine from the list the most important or preferred SLA that can be displayed.

The *slm-timer-config-api* application enables you to set a preferred SLA for a given task. You can use the configuration that is either dynamic, such as **First SLA to breach**, or declarative from a hierarchical mapping of first to matching SLA definitions.

The SLA timer configuration provides the following demo data which also serves as an example to customize.

**Do not show SLA timer**

Use this configuration if you don’t want to show the timer component.

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**Show SLA that will breach first**

Use this configuration to determine the task SLA that has the earliest breach time.

**Incident Response and Resolution Team**

Use this configuration if you prefer to display Task SLA matching specific SLA Definition in the timer component. This configuration creates a hierarchy of SLA Definitions to be displayed.

The **SLA Timer Configuration** application comes only with demo data. However, you should create your own configuration records. You can use the demo data as a guide to help ensure that the preferred task SLA record is shown against a particular task.

### Procedure

1. Navigate to **All** > **Service Level Management** > **Administration** > **SLA Timer Configuration**.
2. Select **New**.
3. On the forms, fill in the fields.

| Name | Description |
|---|---|
| Name | Enter the name of the SLA timer configuration |
| SLA timer source | Choose any one of the following:<br>**None**<br>When you don't want to show the timer.<br>**First to breach**<br>When you want to display the task SLA with the earliest breach time.<br>**Note:** When a task SLA with the earliest breach time pauses, goes out of schedule, or is completed, then the next task SLA is displayed.<br>**Task to SLA mapping**<br>When you want to create your own display hierarchy of task SLAs. If you choose this option, you must define the SLA Definition mappings to ensure that a preferred SLA definition is set. |
| Show completed | Select if you want to display the preferred task SLA that includes the breached stage. If this option is selected, on complete, it will not move to the next SLA priority. |

4. Select **Update**.

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5. Open the SLA configuration that you created.
6. If the SLA timer **Source** is set to `Task to SLA Mapping`, then you must configure the mappings.
7. To configure the task to SLA mapping, select **New** in the **SLA timer configurations mappings** related list.
8. On the form, fill in the fields.

| Name | Description |
|---|---|
| SLA timer config | Select the timer config from the look-up list. If created from related list, the timer config is auto-populated with the parent record. |
| Order | The hierarchical order of the task SLA. This value is pre-populated. However, you can edit it based on your requirements. |
| Table | Select the table that the task belongs to, for example, Incident, Problem, or Change. This selection is used as a reference qualifier on the SLA definition. |
| SLA definition | Select the SLA definition that is available for the table. |

**Note:**
If there is an identical mapping for the **Order** or **SLA definition** in the selected table, the configuration is prevented using business rules. This check ensures that only one preferred SLA definition is set at each level in the hierarchy.

9. Select **Submit**.

**Trouble?**

If no configuration sys_id is provided to the sla-timer-configuration API, then the default behavior is:

- **SLA Timer source**: First to Breach
- **Show cancel**: true
- **Show complete**: true

However, you must not provide a configuration sys_id to the application. Set up your own configuration, even if it's identical to the default behavior.

## Extend SLA condition rules

You can create custom SLA condition class and condition rule records.

Custom SLA condition class and condition rule records enable you to modify the logic around one or more of the transitions involved in task SLA processing. The custom records can then be applied globally to the processing of all task SLA records or on a per SLA definition basis.

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### Create a custom SLA condition rule

You can create custom SLA condition rules to determine whether an SLA should attach, pause, complete, reattach, or cancel. SLA condition classes contain script to define processing for an SLA condition rule. Create an SLA condition rule after the SLA condition class is defined.

#### Before you begin

Role required: admin

#### Procedure

1. Define an SLA Condition Class.
   Navigate to **System Definition** > **Script Includes** and click **New**.

   Within the script in the SLA Condition Class, provide methods to modify one or more of the default SLA transitions (attach, pause, complete, reattach, cancel), defining the conditions for SLA processing. For example, the *attach* method defines when an SLA is created and attached to a task. The methods need to test a condition, referencing the condition fields on the SLA Definition form.

2. Create an SLA Condition Rule.
   a. Navigate to **Service Level Management** > **SLA Condition Rules** and click **New**.
   b. Name the SLA Condition Rule.
   c. Select the Script Include defined above in the **Class Name** reference field.

### Example: Example of an SLA Condition Class

For example, including the following method in an SLA Condition Class attaches the SLA if its condition matches the SLA's `start_condition` field:

```
attach: function() {
      return (this._conditionMatches(this.sla.start_condition));
   },
```

The following is an example which shows the format of a script include that would extend the *SLAConditionBase* class and provide methods for each of the SLA transitions:

```
var SLAConditionLocal = Class.create();

SLAConditionLocal.prototype =
 Object.extendsObject(SLAConditionBase, {

   attach: function() {
     // insert script here
   },

   pause: function() {
     // insert script here
   },

   complete: function() {
     // insert script here
   },

   reattach: function() {
     // insert script here
```

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```
    },

    cancel: function() {
      // insert script here
    },
});
```

### Invoke an SLA condition rule globally

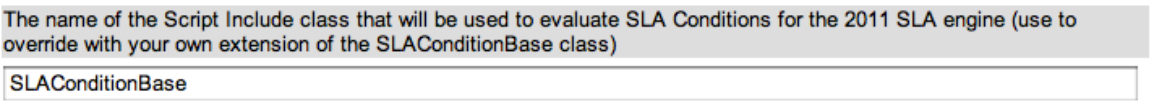
You can globally change the default set of SLA condition rules.

#### Before you begin
Role required: admin

#### About this task
By default, the *SLAConditionBase* is used for the SLA condition rules. This can be changed by doing the following:

#### Procedure

1. Navigate to **All** > **Service Level Management** > **SLA Properties**.
2. Change the value of the *com.snc.sla.default_conditionclass* SLA property to the new condition rule name:




**Note:**
This is the default condition rule, if no condition rule is specified on an SLA definition.

#### Related topics

SLA condition rules

### Invoke SLA condition rules on a specific SLA definition

You can change the SLA condition rules for a specific SLA definition.

#### Before you begin
Role required: admin

#### About this task
In cases where a particular SLA requires that specific SLA condition rules should be used, you can specify the condition rule to be used within the relevant SLA definition form.

#### Procedure

1. Navigate to **All** > **Service Level Management** > **SLA** > **SLA Definitions**.
2. Open an SLA definition record.
3. Configure the form to add the **Condition type** field to the form.
4. Specify the appropriate SLA condition rule in the **Condition type** field

**Note:**
If no condition rule is defined, the global default condition rule is used.

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### Related topics

SLA condition rules

## Create SLA breakdown definitions

You can define an SLA breakdown to capture, store, and relay detailed task ownership information and duration for all task SLA records related to a specific task (incident). SLA breakdown is configurable and you can configure it on the basis of a specific SLA definition.

### Before you begin

Role required: admin

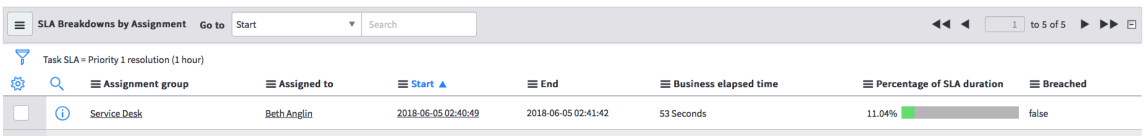
### About this task

SLA breakdown data includes:

- Task SLA
- SLA Definition
- Assigned to
- Assignment Group
- Start time
- End time
- Business time during this period
- Total % of allocated SLA Duration
- Whether the Task SLA is breached during this period

**Note:**
SLA breakdown is on a per task-type basis. For example, once you define a breakdown definition for Incident that uses the breakdown table [SLA Breakdown by Assignment], you cannot define another breakdown definition for this task type.

#### SLA breakdown by assignment




### Procedure

1. Navigate to **All** > **Service Level Management** > **Breakdowns** > **Breakdown definitions**, and click **New**.
2. On the form, fill in the fields.

#### SLA Breakdown Definitions

| Field | Description |
|---|---|
| Name | Name of the SLA breakdown. |
| Task table | Task table on which the definition is applicable. |
| SLA breakdown table | Table where the SLA breakdown data is stored. |

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| Field | Description |
| --- | --- |
| | **Note:** For the Madrid release, only a single breakdown table is available: [SLA Breakdown by Assignment]. |
| Active | Check box to select if the SLA breakdown definition is active. |

3. Click **Submit**.
   The SLA Breakdown Definition Fields and the SLA Definitions related lists appear.
4. Under the **SLA Breakdown Definition Fields** tab, click **New** and fill in the fields.

| Field | Description |
| --- | --- |
| Breakdown field name | Field in the breakdown table that is mapped with the field that you select in the source field. |
| Source field name | Field in the task record table which is mapped to the breakdown field. |

5. Click **Submit**.
   The breakdown field and the associated source field appears under the **SLA Breakdown Definitions Field** tab.
6. Under the **SLA Definitions** tab, click **Edit** to relate one or more SLA definitions to the breakdown definition.
7. In the slush bucket, under Collection, select SLA Definitions to related to SLA Breakdown Definition.
   The breakdown is applied on this task record.
8. Click **Save**.
   The selected SLA Definitions appear.

## Using Service Level Management

Use the Service Level Agreement (SLA) to define a set amount of time for a task to reach a certain condition, to ensure that incidents are closed or resolved according to the expectations set for customers.

### SLA calculation

SLAs are calculated and assessed by a business rule and scheduled jobs that run in the background.

The mechanisms that control SLA Workflow and SLA Automation are independent of each other. You may have a requirement to send out email notifications from the SLA Workflow displaying the current elapsed percentage of the SLA. However, this does not work because using percentage in a notification only displays the most recently calculated value of the Task SLA. This results in inaccurate values sent out in email when using SLA calculated values in a Task SLA email notification.

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One solution is to specify elapsed percentage in SLA notifications by using notifications for each percentage level. For example, an email notification for "75 percent SLA Warning" is created and a special event is used to trigger that notification. The event can be called "sla.warning.75". Another solution is hard-coding these email notifications to trigger at a specified duration percentage, and configure the workflow linked to that SLA definition to send an email notification after waiting an elapsed percentage.

### Run the 2011 SLA engine asynchronously

By default in the 2011 SLA engine, the SLA processing is performed by the *Run SLAs* business rule. This business rule runs synchronously and is the suggested configuration.

#### Before you begin

Role required: sla admin, admin

#### About this task

SLA processing runs asynchronously. For example, you can run this for performance reasons, such as to avoid delays when a user saves a new incident record. While the SLA engine is running asynchronously, there can be a short delay before the Task SLA records are available after updating a Task. Refresh the form to see the updated Task SLAs.
Use synchronous processing to get the best user experience. Asynchronous processing mode is used only when there a performance issues.

**Note:**
In the 2010 engine, the *Process SLAs* business rule runs the asynchronous processing.

#### Procedure

1. Navigate to **All** > **Service Level Management** > **Properties** > **SLA Engine**.
2. Select **Yes** for the **Execute the 2011 SLA Engine asynchronously** (*com.snc.sla.engine.async*) property.
3. Click **Save**.

### Recalculate SLA times automatically

By default when a user opens a task, the SLA timing information for that task is not automatically recalculated.

#### Before you begin

Role required: admin

#### About this task

You can enable this information to be automatically recalculated each time the task is opened, to provide current information rather than information from the last scheduled job.

#### Procedure

1. Go to **Service Level Management** > **Properties** > **SLA Engine**.
2. For the **Recalculate Task SLA records when a task's form is displayed** property, select the **Yes** check box.

   **Note:**
   This property is disabled by default because there is a potential performance impact when several users concurrently open tasks.

3. Click **Save**.

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### Use exact times in SLA calculations

When business percentages are used for SLA calculations, they are rounded up to two decimal places.

#### Before you begin
Role required: admin

#### About this task
As a result, breaches can occur when SLA calculations are rounded up to 100%. You can enable SLA calculations to instead use the business time or actual time left.
For example, a business percentage of 99.951% is rounded up to 100%, which causes a breach.

For more accurate SLA calculations, enable the SLA engine property for using the exact value of the business time left if a schedule is specified or the actual time left if the SLA has no schedule specified.

#### Procedure

1. Go to **Service Level Management** > **Properties** > **SLA Engine**.
2. For the **Use field "business_time_left" to calculate breach time instead of "business_percentage" field** property, select the **Yes** check box.
3. Click **Save**.

## Repair Service Level Agreement (SLA)

SLA Administrators can repair SLA records to ensure SLA timing and duration information is accurate.

Repair of SLAs is useful to determine accurate timing information if your system has SLA records that contain incorrect values. For example, you may need to repair SLA records as a result of:

- Changing the SLA definition or SLA schedule for any task SLA that is still active.
- Changing the conditions of the SLA definition for any task SLA that is still active.
- Some other system anomaly.

The repair function removes the SLA record, then recreates and recalculates it from the start, including recreating the workflow. The repair uses the history from the Task and if appropriate will also create new Task SLAs that did not previously exist. For example, a new Task SLA may be needed if a new SLA Definition has been added since an associated Incident was created or updated.

SLA repair does not use the history of dot-walk fields but considers only the final state of the dot-walk fields. For example, if a pause condition is set to an incident dot-walk field as `incident.caller_id.location` and in real time the location is set to London, and later changed to San Diego. Then, when the SLA repair runs, only the final location is considered. So, if SLA is in pause state when the `incident.caller_id.location` is San Diego, repair pauses immediately as it does not consider the previous London location.

The workflow used when recreating the SLAs is controlled by system properties and can be found by navigating to **Service Level Management** > **Properties** > **SLA Repair**. Any workflow that is used in the repair process will attempt to follow a repair path when processing the SLA Percentage Timer activities. This can be used to avoid running activities that are not needed for the repair over and over again.

You can repair single SLAs from the relevant form or multiple SLAs from relevant lists.

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**Note:**
SLA repair is not available on SLA definitions, as running a repair operation for an SLA definition could affect large numbers of records on your system, with significant performance impact.

You can also configure and manage SLA repair functions.

#### Configure SLA repair

Administrators can set SLA repair properties and view repair logs.

## Enable or disable SLA repair

The Repair SLA function is enabled for all new installed instances running the 2011 engine, but is disabled by default for upgraded instances. If disabled, no SLA repair functions are available, including all SLA repair modules, SLA repair logs, and UI actions.

**Note:**
Repair actions will not be available for instances that are not running the 2011 engine. To enable or disable SLA repair, use the *com.snc.sla.repair.enabled* repair property. You can also configure SLA workflow usage.

## View repair logs

An SLA repair log record is created each time a repair action takes place with details such as who initiated the repair and start and end date and time. The log record contains a number of child **SLA Repair Log Entry** records related to it. Each repair log entry has a type of either **Before repair** or **After repair** that will contain the appropriate values from each Task SLA record that is repaired. If there is only a **Before repair** entry record for a task SLA, this indicates that it has been deleted. If there is only an **After record**, the repair function has created a task SLA that did not previously exist.

Navigate to **Service Level Management** > **Repair Logs** to view repair log information:

- **Active Repairs**: view repairs that are still in progress.
- **My Repairs**: view repairs you have run.
- **All Repairs**: view all repairs.
- **Repair Entries**: view SLA Repair Log entries for all repairs that have run.

#### Repair SLA from a form

You can repair task SLA records from the Task form, or from the task SLA form for an SLA associated to a Task.

### Before you begin

Role required: admin

### About this task

You can also repair multiple task SLA records from a list.

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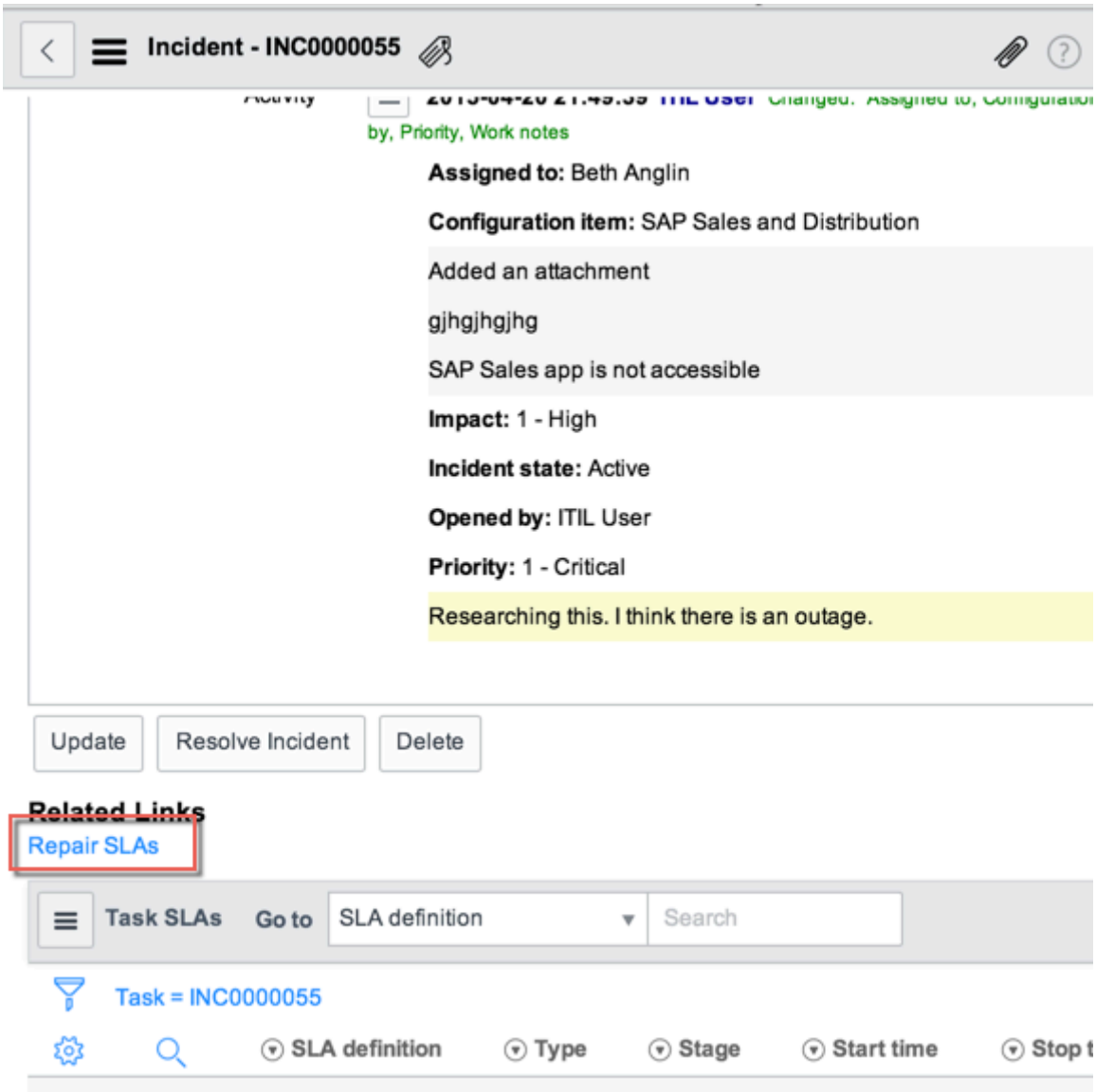
### Procedure

1. To repair all SLAs associated to a specific task, open that form and select the **Repair SLAs** related link.




2. Alternatively, to repair a specific SLA on a specific Incident record, open the Incident record, open the SLA record associated with that incident, then select the **Repair** button on that SLA form.
   The SLAs selected are repaired. When the repair process is completed, the user selecting to repair receives a standard notification of the repair results.

> **Note:**
> Closing the progress dialog box does not stop the repair process. You can go to **Active repairs** or **My repairs** and click **Show progress** to view the progress dialog again.

#### Repair SLAs from a list

You can repair multiple SLA records from a list of task or SLA records.

### Before you begin

Role required: admin

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### About this task
You can also repair SLA records from the relevant Task form, or from the SLA form for the SLA associated with the task.

### Procedure
1. Navigate to a list of SLA records or task records.
2. Check the records to repair against.
3. Select the **Repair SLAs for selected** list action.
4. Alternatively, to repair SLAs for all records on that list, select the **Repair for all filtered definitions** related link.
   The SLAs selected are repaired. When the repair process is completed, the user selecting to repair receives a standard notification of the repair results.

**Note:**
Closing the progress dialog box does not stop the repair process. You can go to **Active repairs** or **My repairs** and click **Show progress** to view the progress dialog again.

### Related topics
Repair Service Level Agreement (SLA)

## View SLA timeline
View an SLA timeline to review its details and its progress over time.

### Before you begin
Role required: itil, sla_admin, sla_manager

### Procedure
Open an SLA timeline from the SLA definition form, Task form, or Task SLA form.
The SLA timeline for the selected task or incident is displayed. It includes SLA report details and a visual representation of the SLA's progress over the lifetime of the task.

## Add custom business rules to Service Level Agreement (SLA)
You can add custom business rules to your SLAs.

### Before you begin
Role required: admin

### Procedure
Select one of the following methods to add custom business rules.

| Option | Description |
| --- | --- |
| **Use setWorkflow(false)** | Prior to updating your task, add a call to `setWorkflow(false)` on the GlideRecord object for the task within the business rule that is updating the task. This prevents the busi ness rules from being processed. |

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| Option | Description |
| --- | --- |
| | **Note:** The setWorkflow(false) disables processing of all engines and the update does not appear in the audit history of the task.<br><br>For example, a script that copies the breach time to a custom field on the task.<br><br>`(function(){ if (current.planned_end_time.changes()) { var taskGr = current.task.getRefRecord();`<br>`taskGr.u_sla_breach_time = current.planned_end_time;`<br>`taskGr.setWorkflow(false);`<br>`taskGr.update(); } )();` |
| **Create a sys_trigger (Schedule job) to update the task** | In your custom business rule, use the **Script** field to generate a scheduled job to update the task. To ensure that the scheduled job is queued for processing immediately, it must be of type Run once, and have next action time of Now.<br><br>**Note:** The `ScheduleOnce` script include includes functions to specify the target record and when to run the scheduled job. This enables you to specify the script to be executed and call another function to create the appropriate record in the `sys_trigger` table.<br><br>For example, a script to create a scheduled job that copies the breach time from the task SLA to a custom field on the task.<br><br>`(function(){ if (current.planned_end_time.changes()) { var scheduleJob = new ScheduleOnce();`<br>`scheduleJob.setDocument(t.task.getRefRecord());`<br>`scheduleJob.script =` |

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| Option | Description |
| --- | --- |
| | "current.u_sla_breach_time.setValue('" + current.getValue('planned_end_time') + "');current.update();"; scheduleJob.schedule(); } )(); |

## Add custom business rules to Service Level Agreement (SLA) considerations

Prior to adding custom business rules to the task SLA table, you must consider a few points regarding the processing and calculation of the task SLA based on your organization's needs.

## Add custom fields to the task SLA table

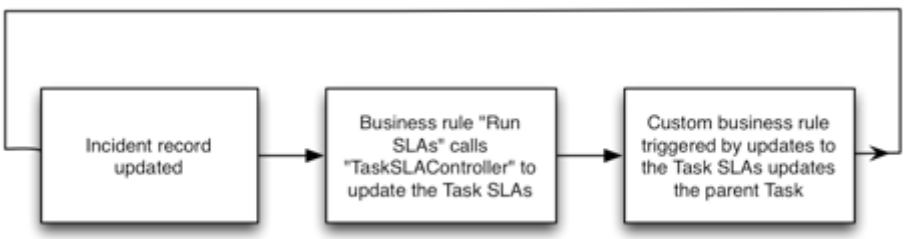
You can add custom fields to the task SLA table and write business rules to populate them. This does not impact the SLA engine. However, you must consider performance implications, if any, of these business rules since task SLAs are updated frequently during their lifecycle.

## Points to consider

- Business rule that directly updates the parent task when an SLA is updated.

  Avoid writing a business rule on the task SLA table that updates the parent task directly. Doing so causes recursive processing of the business rules. This is represented in the diagram.

  **Recursive business rule**

- Business rule that updates the default fields on a task SLA.

  Avoid writing a business rule on the task SLA table that updates the default fields. These default fields are managed and updated by the SLA engine and any updates made to them might result in the following.

  - Fields being ignored, overwritten, or both the next time the SLA is calculated.
  - Incorrect calculations of other values on the task SLA.

## Monitoring Service Level Agreement (SLA)

You can view the details for every task SLA record created for a task.

In the task SLA record, you can view the task SLA details such as the stage the task SLA is in and if it has breached.

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You can also view the target of the agreement being defined: **None**, **Response** or **Resolution**.

Target is used for filtering, searching, and reporting purposes only.

**Note:**
This feature is available only in new instances starting with Jakarta or a later release. The Problem Management Best Practice – Jakarta plugin (com.snc.best_practice.problem.jakarta) plugin must be activate.

In addition, you can get an overview of the timings for the task SLA such as the actual and business elapsed time and percentage, and the actual and business time left in days and hours.

### Verify SLA definition using SLA timeline

You can verify that a task is mapped appropriately with a defined SLA using the SLA timeline. If a task is mapped with the SLA definition, the SLA timeline displays a graphical representation of the progress of the task SLA.

#### Before you begin
Role required: admin

#### Procedure

1. Navigate to **All** > **SLA** > **SLA Definitions**.
2. Click the SLA Definition that you want to verify.
3. Click the **Validate SLA Definition** related link.
   The SLA Timeline page appears.
4. From the SLA Definition Picker, select the SLA definition for which you want to confirm if an appropriate task is mapped.
5. From the Task Record Picker, select the task that must be mapped to the SLA definition.
   If the selected task is mapped to the SLA definition, then the SLA timeline displays a graphical progress of the task SLA.

**Note:**

When a selected task does not have any task SLA attached to it, the SLA timeline still displays the update to the task when the Show all Task updates check box is selected. This information can be used for debugging the task SLA.

## Service Level Management reference

Reference sections provide additional information about components installed with Service Level Management.

### Flows for SLA

Use the flow actions to send SLA notifications when the duration specified in the SLA definition is crossed.

You can create and edit flows using the Flow Designer. The default flow that is available with the Service level management plugin is **Default SLA flow**.

The **Default SLA flow** creates the events that send out notifications. For example, it creates an event to send a notification to the user assigned to a task, such as an incident, when the task SLA reaches 50% of its allotted time.

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The **SLA Notification and Escalation flow** creates the events that send out notifications. When a task reaches 50% of its allotted SLA duration, a notification is sent to the assignee and the user listed in the **Supported by** field on the configuration item. At 75% and 100%, a notification is sent to the assignee and the assignee's manager.

**Note:**
This feature is available only in new instances starting with Orlando or a later release.

**Related topics**

Flow Designer

## SLA notifications

SLA sends notifications at certain events defined in the workflow.

By default, SLA notifications are sent on three occasions:

1. SLA is at 50% of the duration specified in the SLA Definition: Notification is sent to the user in the **Assigned to** field mentioned in the incident form and the **Supported by** field in the configuration item form.
2. SLA is at 75% of the duration specified in the SLA Definition: Notification is sent to the user in the **Assigned to** field mentioned in the incident form and the manager of the user.
3. SLA is breached: Notification is sent to the user in the **Assigned to** field mentioned in the incident form and the manager of the user.

**Related topics**

Workflows for SLA

## Workflows for SLA

SLA typically uses workflows to send notifications.

You can create and edit workflows with the Workflow Editor. The default workflow that is available with the Service level management plugin is **Default SLA Workflow**.

The **Default SLA Workflow** creates the events that send out notifications. For example, it creates an event to send a notification to the user assigned to a task, such as an incident, when the task SLA reaches 50% of its allotted time.

The **SLA Notification and Escalation Workflow** creates the events that send out notifications. When a task reaches 50% of its allotted SLA duration, a notification is sent to the assignee and the user listed in the **Supported by** field on the configuration item. At 75% and 100%, a notification is sent to the assignee and the assignee's manager.

**Note:**
This feature is available only in new instances starting with Jakarta or a later release. The Problem Management Best Practice – Jakarta plugin (com.snc.best_practice.problem.jakarta) plugin must be activate.

**Related topics**

Workflow editor

## SLA duration types

You can select one of two SLA duration types to define the length of time within which a task must be completed before the SLA is breached.

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If an SLA schedule is defined, the duration works along with the schedule. In a user-specific duration, you can choose to specify the length of time that an SLA must run before it is marked as breached. Relative durations specify durations that are relative to the start time of the task SLA and are defined using a script.

When you define an SLA, you can select either a **user specified duration** or a **relative duration**.

**User specified duration**

Specifies a static duration period, such as **8 hours**, along with a business schedule. The **Duration** field is displayed, enabling you to specify the length of time in days, hours, minutes, and seconds that the SLA must run before it is marked as **breached**. The number of days specified in the **Duration** field is converted to 24- hour blocks.

Each time that you set a duration, an example breach time information message is displayed at the top of the form. This information assists you in understanding how the breach date is calculated. For example, if the current date is January 1, 2015, the time is 10:30 am, and the duration is set to 10 hours and no schedule has been selected, the following information message is displayed: `An SLA starting now will end breach on 2015-01-01 20:30 (Actual elapsed time: 10 Hours).`

**Relative duration**

Specifies a duration relative to the start time of the task SLA and is defined using a script. For example, you can select a relative duration such as **Breach on Due Date**, **End of next business day** or **Next business day by 4pm**. The set of relative durations is defined in the core configuration using script-based duration calculations.

**Note:**
Pause conditions are not compatible with relative durations.

You can use a relative duration within the Service Level Management application in the following ways:

- Specify a relative duration.
- Relative duration usage scenarios.

**Specify a relative duration**

To specify a relative duration, select an option such as **Next business day by 4pm** or **End of next business day** from the list of available relative durations in the **Duration type** field.

When you select a relative duration such as **Next business day by 4pm**, the **Relative duration works on** field appears. You can specify the record that the relative duration should be calculated for. You can select to use **Task record** or **SLA record** and the record you select is available as **current** for the relative duration script.

**Note:**
If a relative duration is selected, the example breach date information message is not displayed.

If your task record has a target date and time field, you can create an SLA with a relative duration based on that field.

**Relative duration usage scenarios**

If a schedule is selected in the SLA definition, the SLA duration works with the SLA schedule. For example, an SLA might have a user-specified duration of **16 hours**

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with the schedule as **8-5 weekdays**. If this SLA starts to run for a task at 8:00, it breaches at 16:00. The breach time is calculated from the schedule that defines working time as eight hours per day from Monday to Friday. So the 16-hours duration equates to two days later in the schedule.

The **Breach on Due Date** sets the breach time of the SLA to the date and time from the **Due Date** field of the task that the SLA is attached to.

If the **Due Date** field is empty or occurred in the past, the breach time of the task SLA is calculated to be one second ahead of the task SLA start time. If the date and time in the **Due Date** field is outside the schedule for the task SLA, the breach time is set to the next available scheduled time. For example, if the SLA definition specifies a task SLA schedule as 08:00-16:00 and the value in the **Due Date** field is **Wednesday 11th Jan 2017 20:30**, the breach time is set to **Thursday 12th 2017 Jan 08:00**.

If your task record has a target date and time field, you can create an SLA with a relative duration based on that field.

## Schedules within SLA

Schedules within SLA enable you to define the time periods during which the SLAs accumulate business time.

Schedules are typically based on the working hours of the resource or departments to whom a task is allocated. When you define an SLA, you can select a schedule during which the SLA will accumulate business time. You can specify the schedule that each SLA must use in the SLA definition form.

## Schedules in SLA definitions

You can specify the schedule to be used when creating new task SLAs in the **Schedule source** field. You can specify one of the following options:

- **No schedule**: If the **No Schedule** option is selected, the SLA will calculate based on a 24 x 7 schedule.
- **SLA definition**: If the **SLA definition** option is selected, the **Schedule** drop-down list appears.
- **Schedule**: Specify the hours during which the SLA timer runs. These set of schedules are defined in the core configuration. For example, you can select a schedule of **8-5 weekdays** or **8-5 weekdays excluding holidays**.
- **Task table field**: This option picks its title from the option selected in the **Table** field earlier on the **SLA Definition** form. For example, if **Incident** is selected in the **Table** field, then this option appears as **Incident field**. If the **Task table field** option is selected, the **Schedule source field** drop-down list appears.
- Schedule source field: Select the appropriate field from the task such as an incident or problem that will provide the schedule. For example, Configuration item > Schedule.

## SLA duration and schedules

Schedules have an impact on the duration specified in an SLA definition.

This impact is reflected in the timings that are taken into consideration while calculating an SLA.

**Note:**
If a schedule is not selected for an SLA, the SLA will run 24X7.

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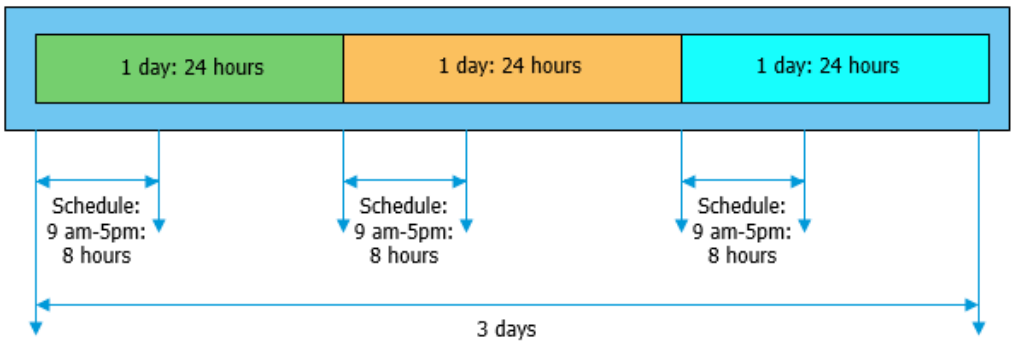
Consider a scenario where you select a duration of one day, which is 24 hours, and a schedule of 9 am to 5 pm, which is 8 hours. The SLA calculation will distribute the 24 hours across three working days of 8 hours each. So a team working on a task associated with this SLA has 3 days to complete the task before the SLA is breached.

**Time distribution**




## Time zones in SLAs

You can specify the geographical time zone that is used for schedule calculation.

Specify the time zone source to be used when creating task SLAs. You can select one of the following options:

- **The caller's timezone**: If this option is selected and the caller has not selected a time zone, then the system time zone is used.
- **The SLA definition's timezone**: If the **The SLA definition's timezone** option is selected, the **Timezone** list appears.

**Timezone**: Specify a time zone for the SLA. The time zone can be the system time zone or active standard geographical time zones.

- **The CI location's timezone**
- **The task location's timezone**
- **The callers' location's timezone**

**Note:**
If you select a time zone source other than the **The SLA definition's timezone** and the time zone derived from the time zone source is empty, the system time zone is used.

## SLA conditions

SLA conditions determine when a task SLA record is attached, paused, resumed, reset, canceled, and completed.

On the SLA definition, you specify up to six conditions that are evaluated each time a task record is created or updated. For example, for an SLA to attach to a task, the start conditions must match and stop conditions must not match.

SLA conditions work in the following ways:

- SLA conditions
- SLA condition evaluation

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## SLA conditions

You can set up to six SLA conditions: start, cancel, pause, resume, stop, reset.

**Start condition**

Enables you to define the conditions under which the SLA will be attached.

You can choose the conditions from the **When to cancel** list under which the SLA will be canceled.

- **Start conditions are not met** option: If one or more of the specified start conditions change, then the SLA will be canceled. The **Start conditions are not met** option is selected by default.
- **Cancel conditions are met** option: The start condition has to be met only once, thereafter the SLA will only cancel when the cancel condition is met.
- **Never** option: The SLA will never be canceled.

Select **Retroactive start** to choose a date and time field from the task that will provide the start time of the task SLA. If you select the **Retroactive start** check box, the **Set start to** field appears offering the date and time fields available on the task type that this SLA definition applies to. For example if you select **Retroactive start** on a Priority 1 SLA definition and then choose **Created** in the **Set start to** field, then the SLA is attached with the start time being the date and time from the **Created** field on the Incident.

**Cancel condition**

Enables you to define the conditions under which the SLA will cancel. You can specify the cancel conditions at the same time when you specify the start conditions.

**Pause condition**

Enables you to define the conditions under which the SLA will suspend increasing elapsed time.

You can choose the conditions from the **When to resume** list under which the SLA will resume increasing elapsed time.

- **Pause conditions are not met** option: If one or more of the specified pause conditions no longer match, then the elapsed time will continue to increase. The **Pause conditions are not met** option is selected by default.
- **Resume conditions are met** option: If one or more of the specified resume conditions match, then the elapsed time will continue to increase.

**Resume condition**

Enables you to define the conditions under which under which the SLA will resume increasing elapsed time. You can specify the resume conditions at the same time when you specify the pause conditions.

**Stop condition**

Enables you to define the conditions under which the SLA completes. If all of the specified stop conditions match, then the task SLA will complete regardless of whether it is breached.

**Reset condition**

Enables you to define the conditions under which the running SLA will be completed and a new SLA will be attached. For a new SLA to be attached, the start condition must match.

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Reset condition also helps to configure SLAs when the value of any specific field on the task record changes, changes to or changes from a specific value in the record. For example, the value of the **Location** field in the task record is 101 Broadway East, Seattle,WA. If you set the SLA reset condition as **Location changes from** 101 Broadway East, Seattle,WA, any change in the value of the **Location** field resets the SLA of the task record.

## SLA condition evaluation

Every task in the system is evaluated in the following order:

- Process new SLAs-- Determine if a new SLA record must be attached to a task
- Process existing SLA records attached to a task.

SLA conditions are evaluated in the following ways:

- Attach if start condition matches and both the stop and cancel conditions don't match.
- Complete if the stop condition matches.
- Pause if the pause condition matches.
- Resume if the pause condition doesn't match or resume condition matches.
- Reattach if both the reset and the start conditions match.
- Cancel if the start condition doesn't match or cancel conditions matches.

Consider this evaluation order when you create conditions. For example, if your Start condition is a subset of your Stop condition, the Stop condition will always match when the Start condition matches and the SLA will never attach. This includes processing any new SLAs that were just created.

Similarly, if your Pause condition is a subset of your Start condition, the SLA will attach but will permanently be in Paused state. As soon as the Pause condition does not match, the equivalent Start condition will also not match and that task SLA record will be canceled.

In addition, if you create a SLA definition with a Start condition and a Pause condition that are mutually exclusive, your SLA will never pause but will always be canceled first. For example, for an SLA definition where the Start condition is **State is one of "New, Active"** and the Pause condition is **State is "On Hold"**, when the Task is updated to state **On Hold**, the start condition will no longer match and the task SLA will be canceled.

## SLA transitions

SLA records pass through a series of transitions during processing.

The following transitions exist for an SLA:

- Attach: when an SLA is created and bound to a task.
- Pause: when an SLA should temporarily stop tracking time.
- Resume: when an SLA should resume tracking elapsed time.
- Complete: when an SLA is marked complete.
- Reattach: when an SLA is marked completed and a new copy is reapplied.
- Cancel: when an SLA is cancelled.

SLA conditions determine what action is performed on a task SLA record.

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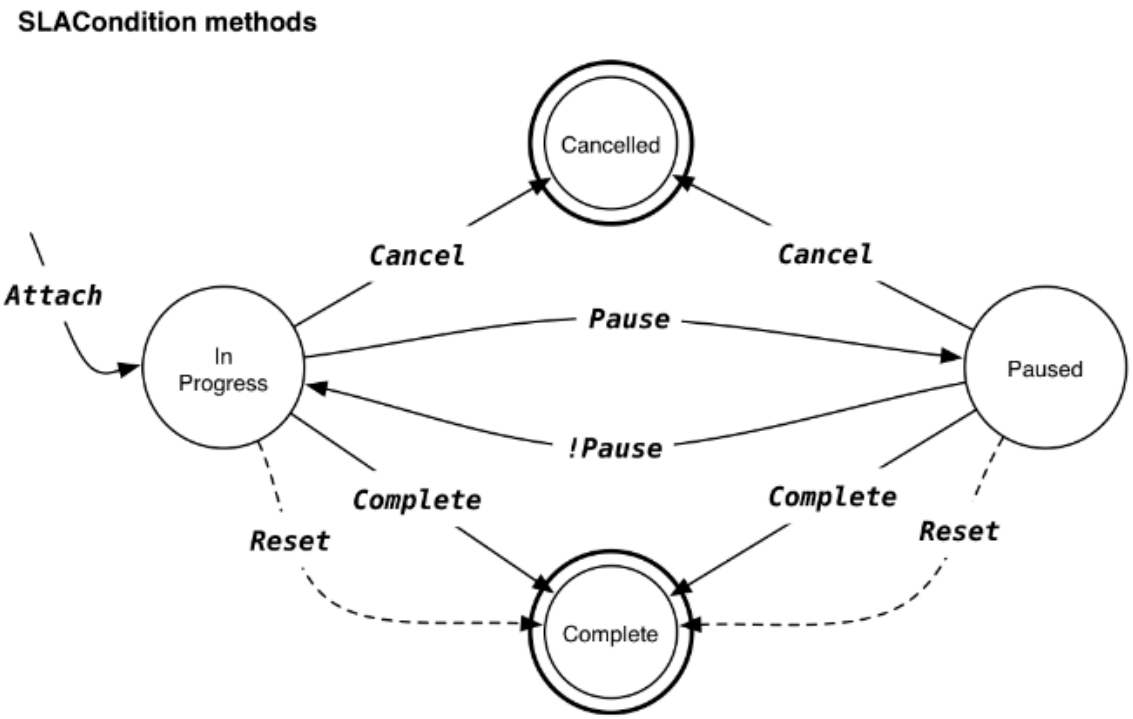
| SLA condition | Resultant action on task SLA record |
|---|---|
| If Start condition matches and both Stop and Cancel conditions don't match | Attach |
| If Start condition matches, and **When to Cancel** is set to **Start conditions are not met** | Cancel if one or more of the specified start conditions no longer match. |
| If Start condition matches, and **When to Cancel** is set to **Cancel conditions are met** | Cancel when cancel conditions match. |
| Pause condition matches | Pause |
| If Pause condition matches, and **When to Resume** is set to **Pause conditions are not met** | Resume if one or more of the specified paused conditions no longer match. |
| If Pause condition matches, and **When to Resume** is set to **Resume conditions are met** | Resume if one or more of the specified resume conditions match. |
| Start and Reset | Reattach |
| Stop | Complete |
| Cancel | Cancel |

### SLA condition methods when the default cancel and resume conditions are selected

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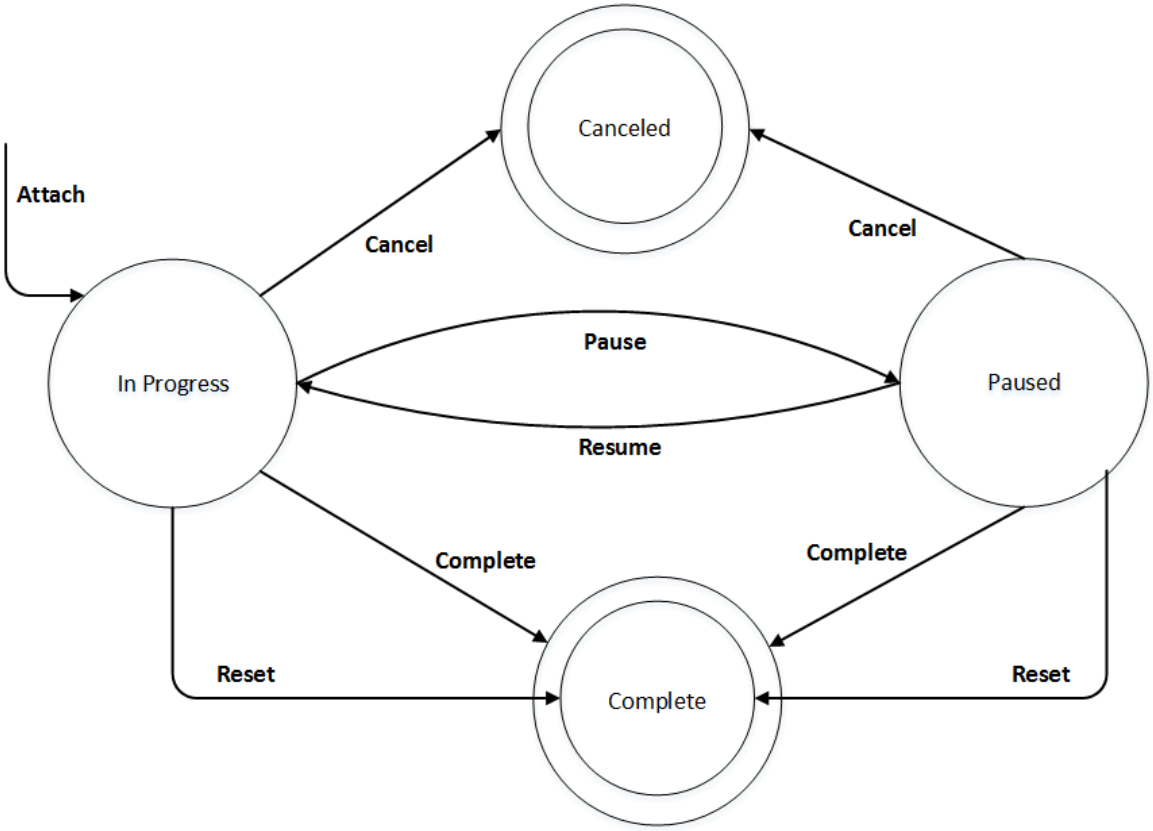
**SLA Conditions Methods when the cancel and resume conditions are selected**




Each of these conditions is defined as a method within a Script Include, referenced by an SLA Conditions Rule record.

## SLA condition rules

SLA condition rules control how the different conditions you define in an SLA definition are combined to determine whether an SLA should attach, pause, complete, reattach, or cancel.

The way that the conditions in an SLA definition are interpreted, to control transitions in state, can be varied using SLA Condition Rules. SLA Condition Rules are defined globally, and can be overridden for specific SLA definitions.

**SLAConditionBase** is the default set of SLA condition rules.

Navigate to **Service Level Management** > **Administration** > **SLA Condition Rules** to see a list of SLA condition records.

### SLAConditionBase script

The `SLAConditionBase` script include implements the default SLA transitions.

The `SLAConditionBase` script include implements the default SLA condition processing.

To view the script, navigate to **Service Level Management** > **Administration** > **SLA Condition Rules**, then click on the **SLAConditionBase** entry to view details. The record in the **Class name** field is the script include that defines the condition processing.

**Note:**
We recommend you do not modify this script , but use it as an example for creating your own script includes.

The following diagram shows how the transitions work:

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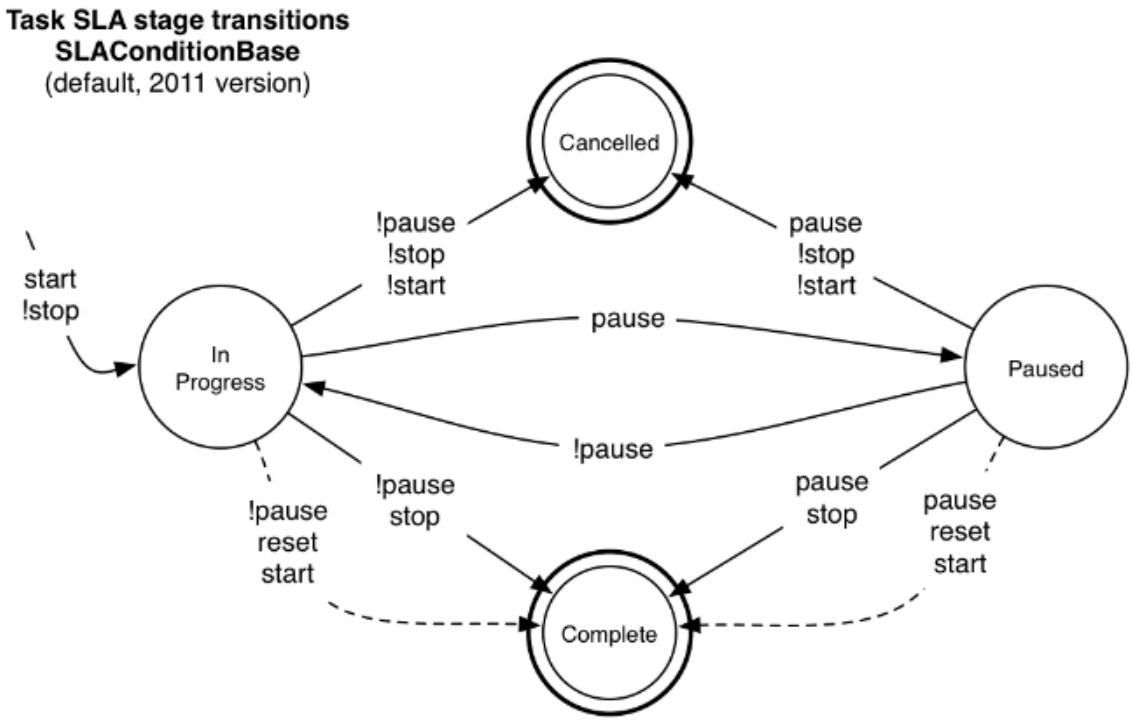
### SLAConditionBase




### SLAConditionSimple script

The `SLAConditionSimple` script include provides an example modification of default SLA condition processing.

The `SLAConditionSimple` script include is one of the default supplied SLA condition rules. This shows an example of how you can modify and extend condition processing, by overriding the SLAConditionBase methods, with a 'simple' variation that interprets each condition to match a particular transition. For example, for an SLA to attach only the start condition is checked. This affects attach, reattach, and cancel.

To edit this script, navigate to **Service Level Management** > **Administration** > **SLA Condition Rules**, then click on the **SLAConditionSimple** entry to view or modify details. Click **Class name** field to open the script include that defines the condition processing.

The following diagram shows how the transitions work:

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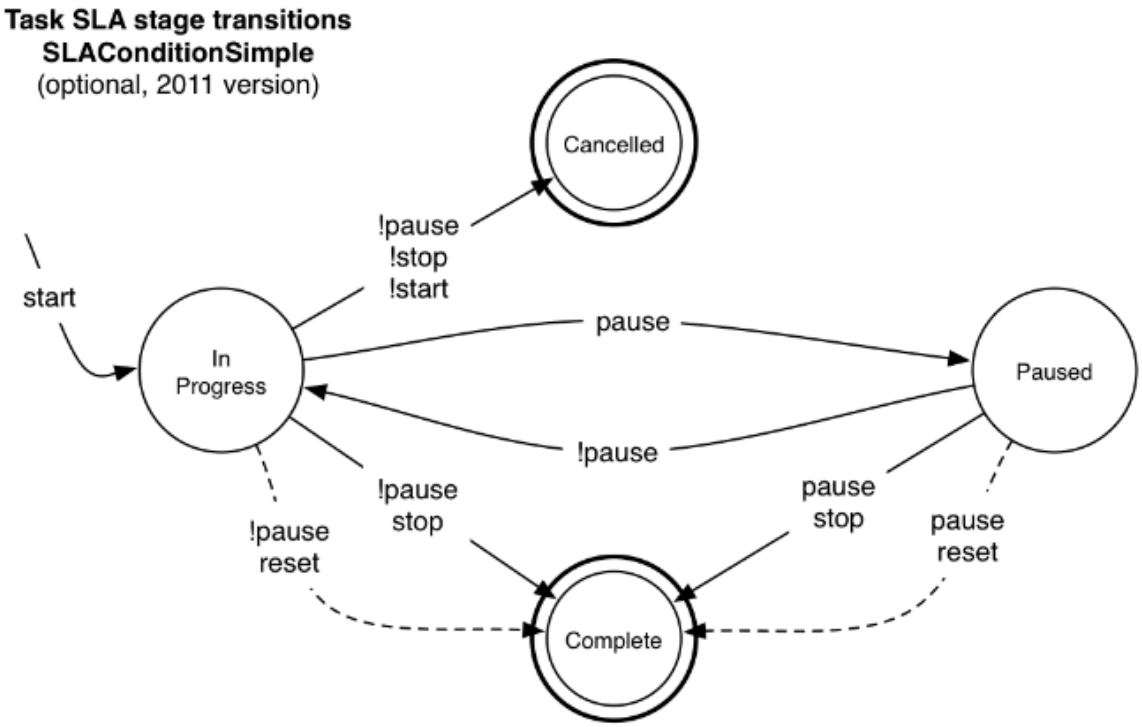
**SLAConditionSimple**




## Service Level Agreement (SLA) process example

As work is done on the relevant task, the SLA may change stage appropriately, depending on the information defined for that SLA in the relevant SLA definition.

### Before you begin

Role required: admin

### About this task

For example, if an incident is resolved within the time specified, the SLA stage is typically set to **Complete**.

Similarly, if the incident does not reach the required condition within the set amount of time, the Task SLA record associated to that Incident marked as **Has Breached**. For example, by default, if a P1 incident is not resolved within 8 hours, the Task SLA for that incident will have **Has Breached** set to **true**.

This example demonstrates how an SLA can be attached to an incident, then progressed to completion.

### Procedure

1. Navigate to **All** > **Incident** > **Create New**.
2. Set both **Impact** and **Urgency** to **1**.
   This setting changes the **Priority** to **1 - Critical**.
3. Save the form.
   The **Task SLA** Related List should now have a Priority 1 SLA attached to this incident.

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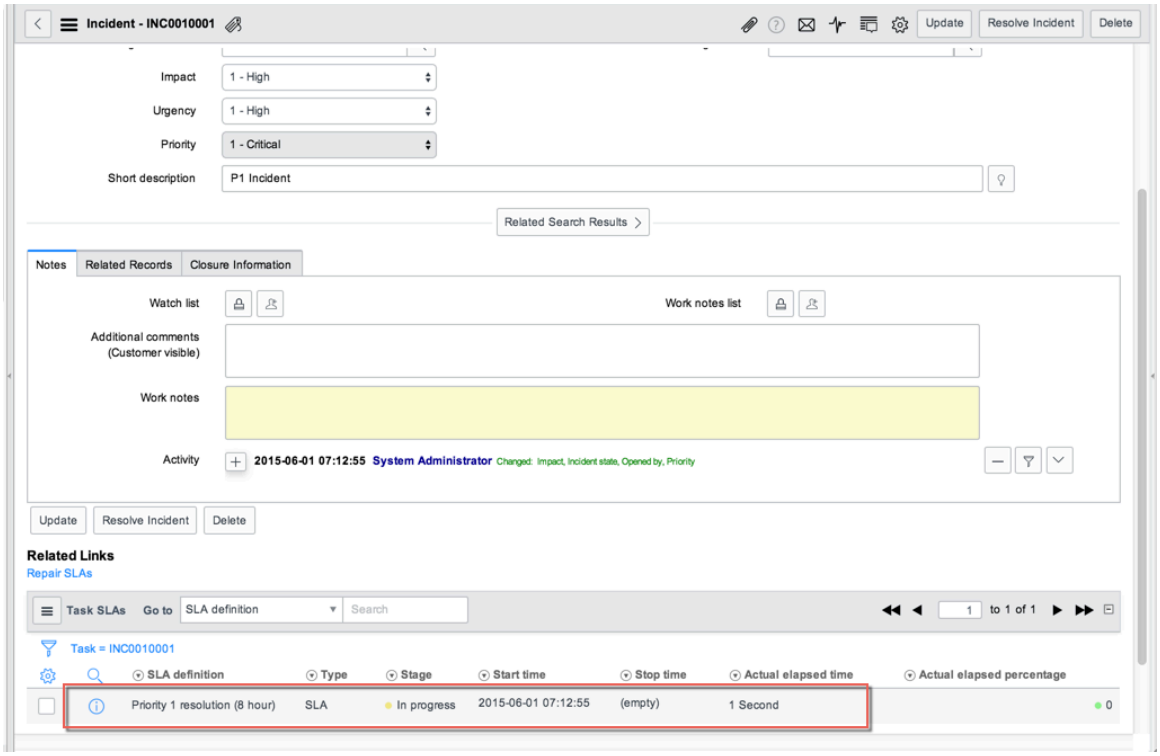
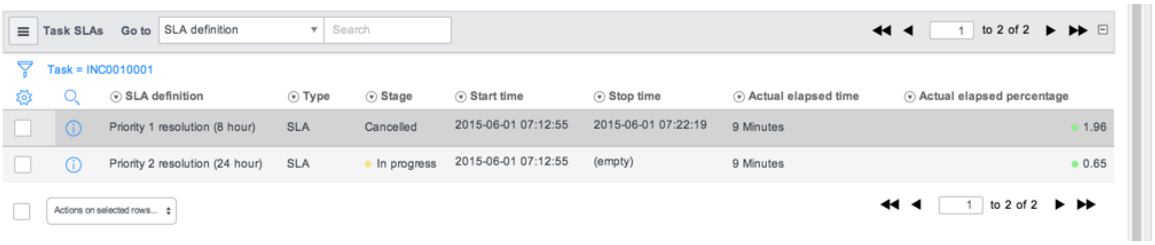


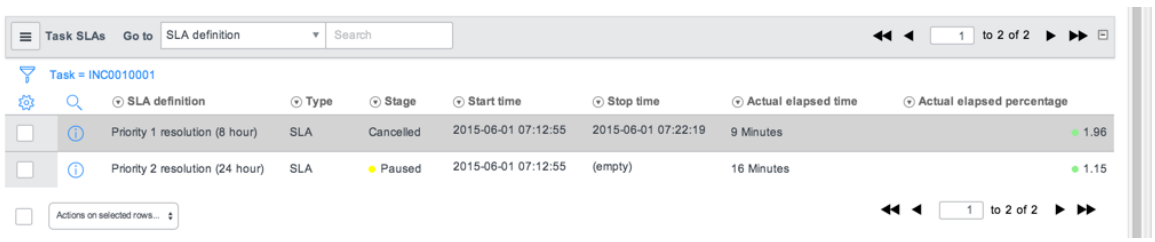

**Note:**
The default **Priority 1 resolution (8 hour)** SLA definition record is used to create and attach this Task SLA.

4. Change the **Impact** to **2**, which changes the **Priority** to **2 - High**, then save the form.
The Priority 1 SLA is now marked **Cancelled**, and a Priority 2 SLA has been attached, because of the conditions on the SLAs.




5. Change the **Incident State** to **Awaiting User Info**, then save the form.
**Awaiting User Info** is a **Pause** condition on the Priority 2 SLA, so the SLA is marked **Paused**.

**Note:**
The pause duration on Task SLA gets updated only after the SLA moves out of pause.




6. Change the **Incident State** to **Active**, then save the form.

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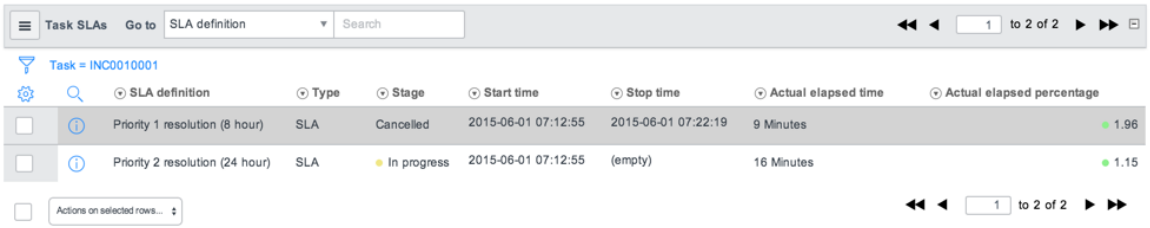
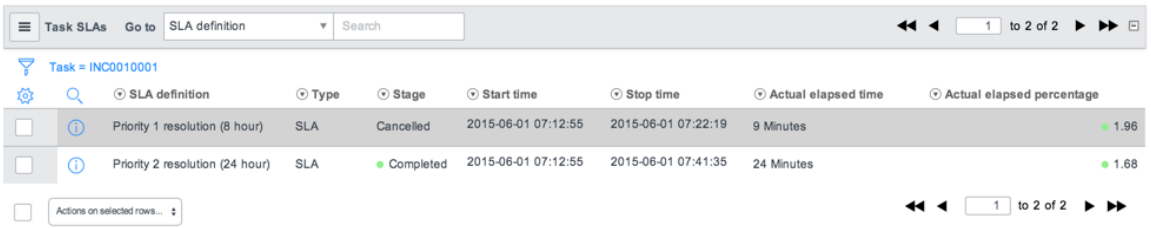
Because the incident is no longer in a **Pause** condition, it resumes timing.




7. Enter any **Close code** and **Close notes** values in the **Closure Information** section of the incident.
8. Change the **Incident State** to **Resolved**, then save the form.
   The SLA is marked **Completed**.




## Scheduled jobs for SLA

SLA has default scheduled jobs to regularly refresh the time calculations on each active task SLA.

- SLA update (breach after 30 days): repeats every 5 days
- SLA update (breach within 1 day): repeats every hour
- SLA update (breach within 1 hour): repeats every 10 minutes
- SLA update (breach within 10 min): repeats every 1 minute
- SLA update (breach within 30 days): repeats every day
- SLA update (already breached): repeats every day

> **Note:**
> By default, the *`SLA update (already breached)`* scheduled job will calculate either for up to one year after it was breached or if 1000% of its allocated time is breached. You can set this maximum actual elapsed percentage value property in the SLA Engine properties.

Scheduled job runs more frequently when the task SLA is closer to being breached.

### Related topics

Event scheduling

Create a scheduled job

SLA engine properties

## SLA Repair workflow

You can configure workflow usage for SLA repair operations.

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## Workflow usage

The SLA repair workflow is used if SLA repair functionality is enabled.

When the SLA repair function is in progress and new task SLA records are created, the workflow will follow a repair path through the workflow. The repair path is based on the result of the **SLA Percentage Timer** activities. While repair is in progress, the result of this activity will be **repair**, which enables the workflow to follow a different path in order to skip certain actions, such as generating events for notifications. This avoids duplicate notifications from being sent out during the repair process for each SLA that is repaired.

To specify that the SLA repair function should use the SLA's original workflow for repair operations, go to **Service Level Management** > **Properties** > **SLA Repair** and remove the selection from the *com.snc.sla.repair.use_repair_workflow* repair property.

**Note:**
If you choose to use a non-default repair workflow, or a workflow you have changed, you should modify this workflow to ensure it includes appropriate repair conditions on the **SLA Percentage Timer** activities. When a task SLA is repaired, the repair transitions are followed for any activities that occurred in the past. For example, the Default SLA Repair workflow configures the repair conditions to follow repair transitions.

## Workflows for new or upgraded instances

For new instances, the SLA Repair function uses the Default SLA workflow, which incorporates repair activities. For upgrades, the SLA Repair function uses the Default SLA Repair workflow because the Default SLA workflow will not be updated in case it has been customized.

To change the default workflow the SLA repair function uses, go to **Service Level Management** > **Properties** > **SLA Repair** and set the *com.snc.sla.repair.workflow* repair property.

## SLA timeline

The SLA timeline is a feature of the Service Level Management application. The SLA timeline detail helps you understand the progress of an SLA. The timeline provides detailed insight to the task updates which triggered stage changes during the life cycle of a task SLA.

The SLA timeline detail helps you to:

- View the progress of SLAs, OLAs, and underpinning contracts.
- View related task updates.
- Identify the reason a task update triggered a specific stage in the task SLA.
- Debug and verify a task SLA and the SLA definition.

**Note:**
This feature is available only on the SLA Engine 2011 version.

Role required: itil, sla_admin, sla_manager

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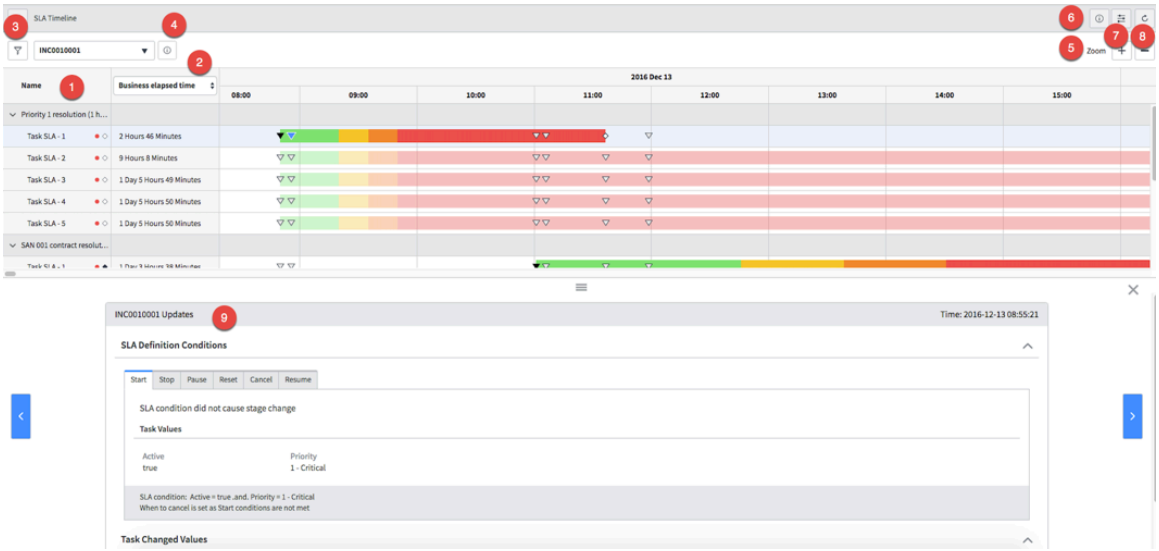
## SLA Timeline




## SLA Timeline field description

| Levels | Field | Description |
|---|---|---|
| 1 | Name | Specifies the SLA definition name and lists the task SLAs that result from the SLA definition. This field also displays, in the form of symbols, the last known stage, and the completion or the cancellation status, if any, of the task SLA. |
| 2 | Preference to see **Business elapsed time** or **Business time left** on timeline row | **Business elapsed time:**<br><br>Specifies the business time that has accumulated from the beginning of the SLA to its end.<br><br>**Business time left:**<br><br>Specifies the business time that is remaining by which the SLA task must be completed.<br><br>**Note:**<br>The selected option from the choice list is saved as a user preference and is selected by default when you navigate to the SLA timeline in the future. Whether you set the system property **Always populate business fields on a Task SLA** to true or false, the SLA timeline always populates the **Business fields for representation**. |
| 3 | | Enables filtering of the data displayed by the SLA timeline . You can filter data by selecting the following options:<br><br>• **Show only breached**: When selected, displays the task SLAs that are breached. This check box appears only when the SLA engine property **Enable compatibility with 2010 'breached' stage for SLAs** is set to false.<br>• **SLA Stage**: Select to view the task SLA records that match the final stage of a specific task SLA. |

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**SLA Timeline field description (continued)**

| Levels | Field | Description |
|---|---|---|
| | | **Note:** If the SLA engine property **Enable compatibility with 2010 'breached' stage for SLAs** is set to true, the **Completed** stage appears as **Achieved** and the **Breached** check box appears under the SLA stage.<br>• **SLA Definitions**: Select to view the task SLA records for a specific SLA definition. |
| 4 |   | Lets you view detailed information about the task when you click the information icon. |
| 5 |  | Provides several zoom in/out levels to control SLA timeline zoom resolution.<br>**Note:** If the duration of any task SLA is more than 1 year, then the 5-minutes view is disabled because of performance issues and browser limitations. The condition is applicable for all the browsers.<br>For IE and EDGE:<br>• The 5-minutes view is not available for any task SLA that has a duration of more than 35 days.<br>• The 8-hours view is not available for any task SLA that has a duration of more than 10 months, and the default view is set to 16 hours.<br>• The 16-hours view is not available for any task SLA that has a duration of more than 21 months, and the default view is set to 24 hours. |

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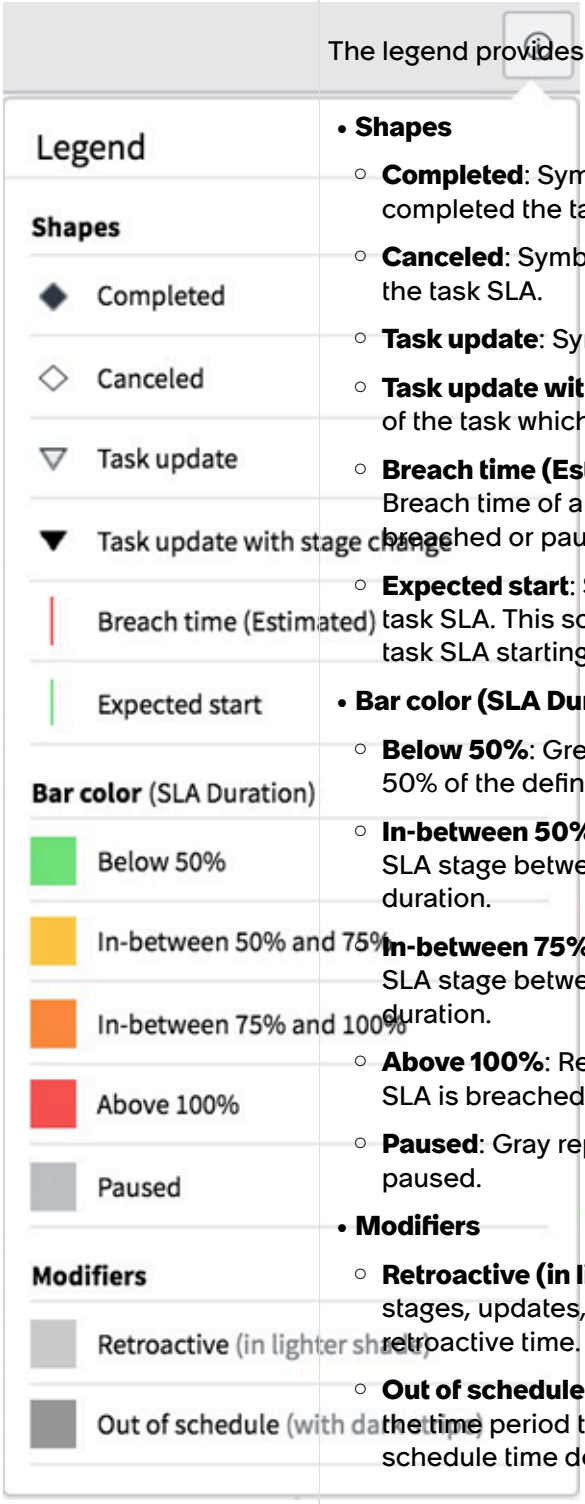
**SLA Timeline field description (continued)**

| Levels | Field | Description |
|---|---|---|
| 6 |  | The legend provides the following categories.<br>• **Shapes**<br>○ **Completed**: Symbolizes a task update which completed the task SLA.<br>○ **Canceled**: Symbolizes a task update which canceled the task SLA.<br>○ **Task update**: Symbolizes an update of the task.<br>○ **Task update with stage change**: Symbolizes an update of the task which also led to the change in SLA stage.<br>○ **Breach time (Estimated)**: Symbolizes estimated Breach time of an in-progress task SLA that is not yet breached or paused.<br>○ **Expected start**: Symbolizes estimated Start time of a task SLA. This scenario is encountered for a retroactive task SLA starting in the future.<br>• **Bar color (SLA Duration)**<br>○ **Below 50%**: Green represents a task SLA stage below 50% of the defined SLA duration.<br>○ **In-between 50% and 75%**: Yellow represents a task SLA stage between 50% and 75% of the defined SLA duration.<br>○ **In-between 75% and 100%**: Orange represents a task SLA stage between 75% and 100% of the defined SLA duration.<br>○ **Above 100%**: Red represents a task SLA stage after the SLA is breached.<br>○ **Paused**: Gray represents a task SLA stage when it is paused.<br>• **Modifiers**<br>○ **Retroactive (in lighter shade)**: Represents the stages, updates, and out-of-schedules that are in the retroactive time.<br>○ **Out of schedule (with center stripe)**: Represents the time period that the task SLA was outside of the schedule time defined in the SLA definition. |

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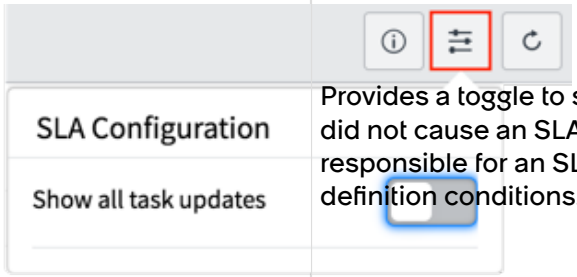
**SLA Timeline field description (continued)**

| Levels | Field | Description |
|---|---|---|
| 7 |  | Provides a toggle to show and hide task updates that did not cause an SLA stage. Task updates that are not responsible for an SLA stage change can help debug SLA definition conditions. |
| 8 |  | Refreshes the information on the SLA timeline. |
| 9 | Task SLA Details | Displays the details of a task SLA, depending on where you click the timeline.<br><br>**Stage details**: When you click the update on the task SLA timeline, the stage details section appears with the following information:<br>• Summary of the changes or useful information relevant to the selected stage.<br>• Information on stage start and stage end such as the start and the end time, actual elapsed time and percentage, actual time left, pause duration. The stage information also displays any breach of the SLA.<br><br>**Note:**<br>If no schedule is attached to the SLA definition, then business values are hidden and actual values are displayed. If any schedule is attached to the SLA definition, both the business and the actual values are displayed.<br><br>**Task update details**: When you click the task update, the **Task update details** section appears with the following information:<br>• **SLA definition conditions**: Displays the respective conditions of the task SLA and the values for the related columns at that point for the task. A blue check mark appears for the conditions that affect the SLA stage change.<br>• **Time**: Displays the date and the time when an update takes place in the task SLA. It also displays the delta changes that occurred in the task for that update.<br><br>**Out of schedule details**: When you click the out of business schedule on the task SLA timeline, the outside business period details section appears with the following information: |

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**SLA Timeline field description (continued)**

| Levels | Field | Description |
|---|---|---|
| | | • **Start date**: Displays the start date of the selected task SLA.<br>• **End date**: Displays the end date of the selected task SLA.<br>• **Duration**: Displays the duration of the current out of schedule selection.<br>• **Total out of schedule duration**: Displays the total out-ofschedule hours until the end of the current selection.<br>**Note:**<br>Click ‹ and › to navigate to the left and right task update in the details section. |

**Note:**

The SLA timeline receives information about the task from the audit history and refers to the current SLA definition to pull data for the SLA timeline. The SLA timeline displays task SLA information as though the SLA repair is already executed, irrespective of whether it is executed or not.

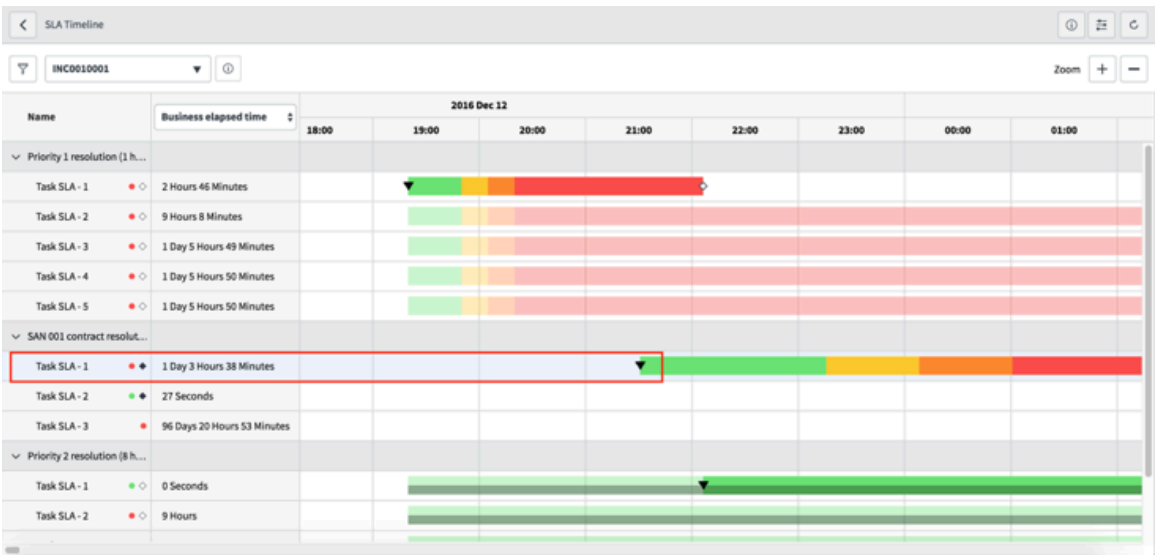
### Related topics

- Use SLA timeline to determine business schedule
- Use SLA timeline to understand SLA stage change
- Use SLA Timeline to validate a new SLA definition
- Understand why an SLA did not trigger as expected

## Understand why an SLA did not trigger as expected

Describes the conditions when an SLA might not trigger as expected.

Using Task SLA -1 (highlighted in the screenshot) as an example, an SLA Manager may have expected this SLA to trigger earlier.

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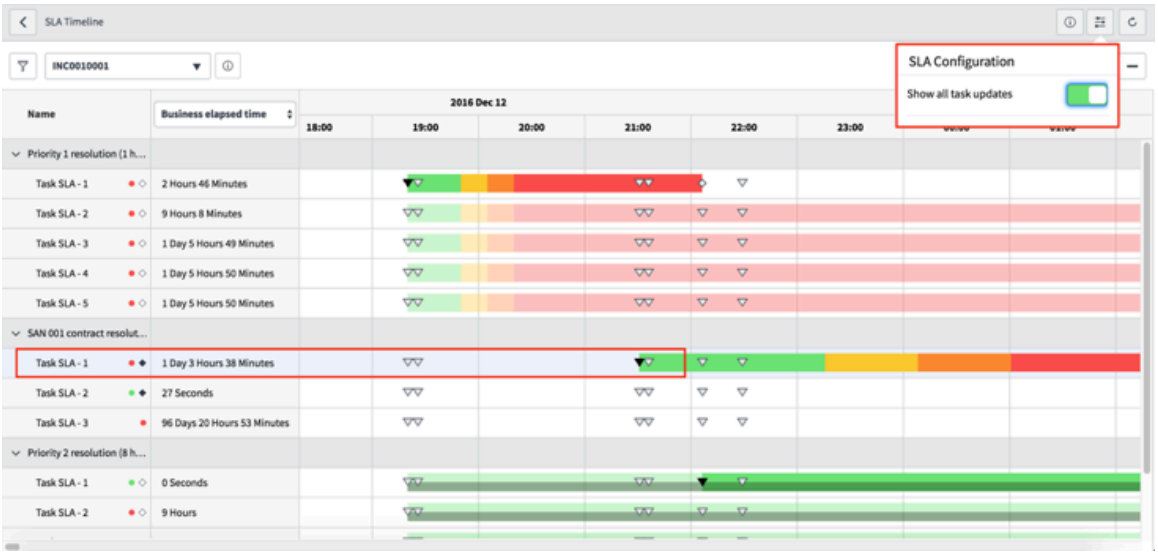
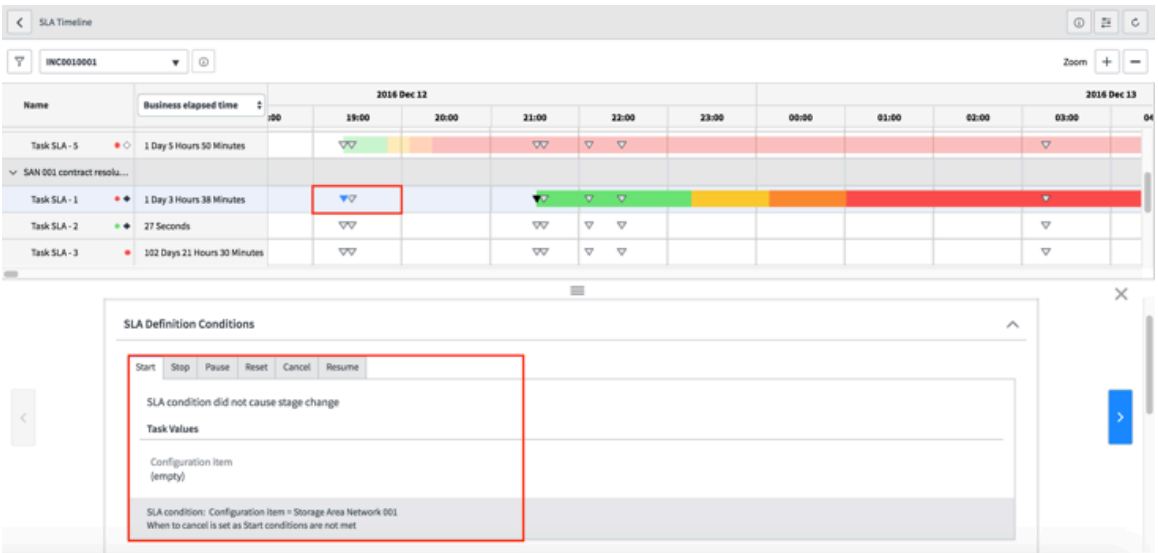
To troubleshoot this inconcistency, the SLA Manager can enable **Show all task updates** from the settings menu in the upper right of the SLA Timeline. The SLA timeline displays task updates that do not cause an SLA stage change as a white triangle.




If you click the first or second task updates that did not cause a stage change, the details section displays the SLA start conditions and the task values that are key to trigger the start condition. In this case, the Configuration Item field is not populated and the SLA Definition conditions are defined to trigger when the Configuration Item is defined as the CI SAN 001.




On inspecting the details for the task update that triggered the SLA start condition, you can find that the configuration item is set to Storage Area Network 001 and this matches the SLA Definition start condition.

**Show all task updates** is a powerful tool to help SLA Managers understand why an SLA may not have behaved as expected.

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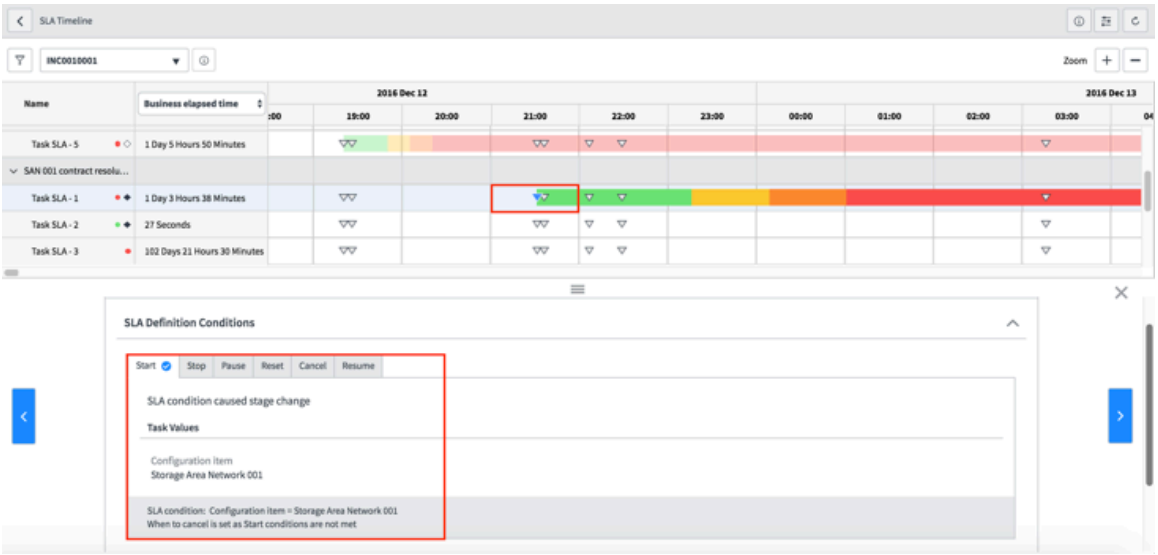
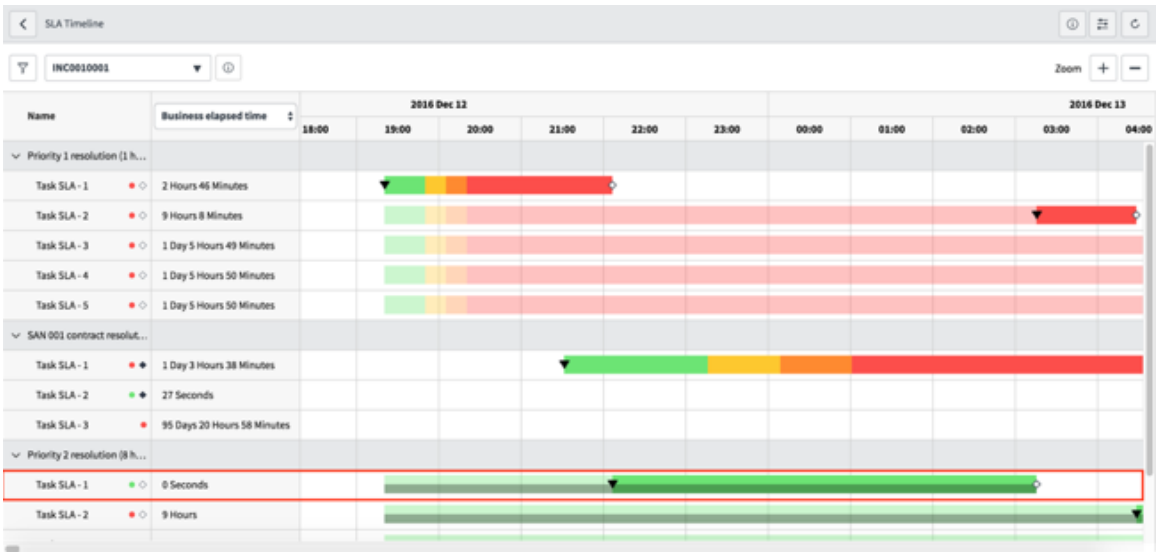



## Use SLA timeline to determine business schedule

This example demonstrates how to use the SLA timeline to determine the business schedules and business percentage time related to a task SLA.

### SLA timeline




In the example above, the business percentage for the priority 2 incident is 0 seconds. The dark stripe in the SLA timeline determines the time when the SLA was out-of-schedule. The SLA time is not calculated during the out-of-schedule time. So, the business elapsed time is 0 since the total duration of this SLA is out of schedule.

If you want more detail of the out-of-schedule duration, you can hover over the dark stripe for summary detail or click it. The Out of Schedule detail section provides information on the details of the schedule such as when the out of schedule started, when it ended, the current duration of that out of schedule time and the total duration of all out of schedule time for the entire SLA. This provides detailed insight into when the SLA was accumulating time and the periods of time it did not accumulated time.

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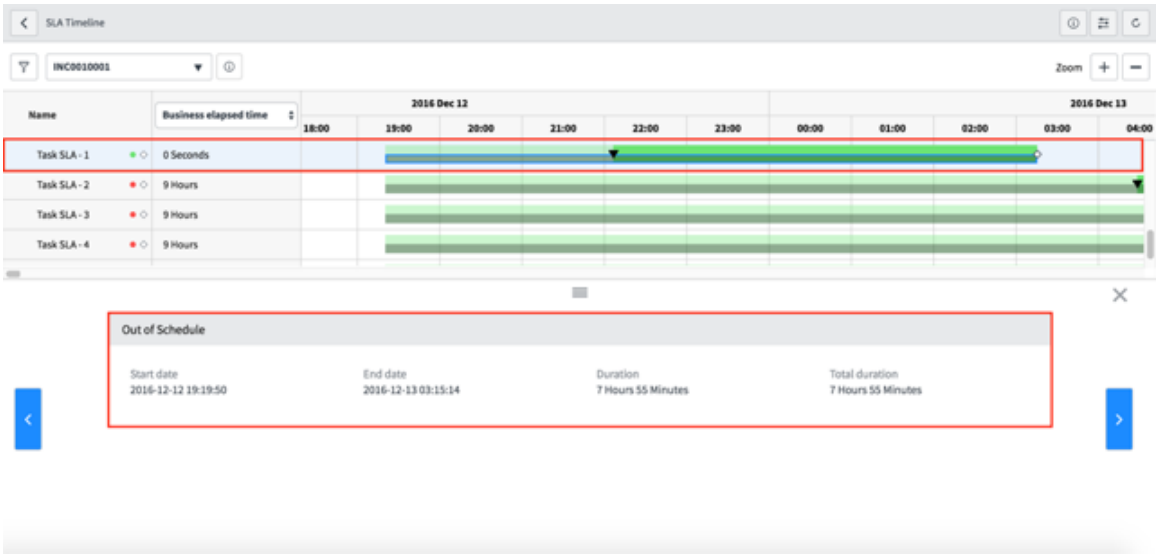
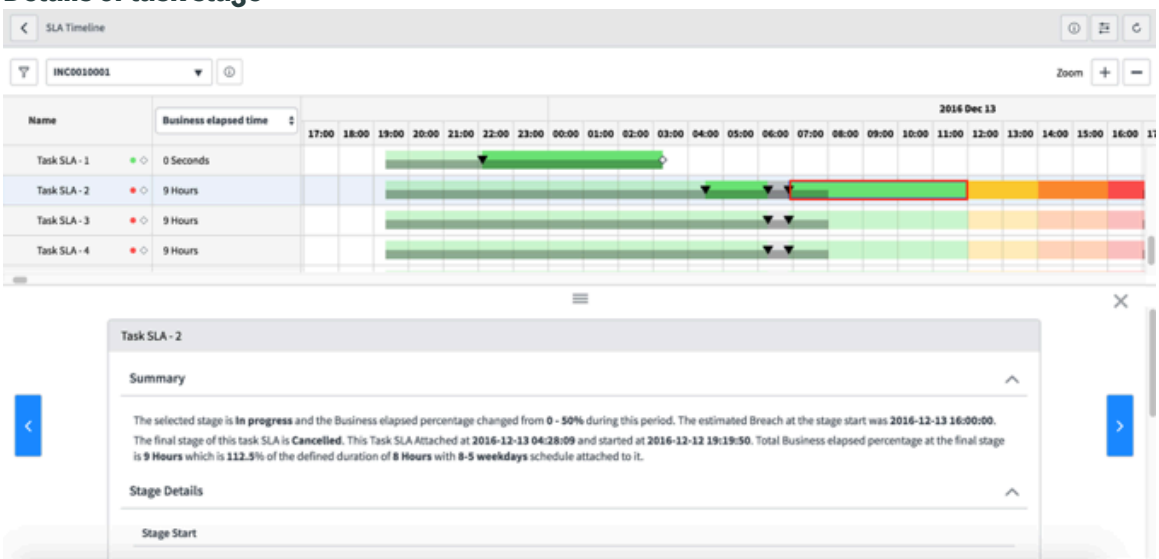
### Out of schedule details




Using another example, you can understand in details how business time in an SLA is calculated. In the example below, the total SLA defined duration for Task SLA-2 is 8 hours. The highlighted area shows that the SLA is out of schedule from 07:00AM until 08:00AM and starts accumulating time at 8:00AM reaching 50% of it's total duration at 12:00PM. From 12:00PM to 14:00PM the SLA accumulates from 50 – 75% of it's total duration and from 14:00PM to 16:00PM it accumulates from 75 – 100% of it's total duration, ultimately breaching at 16:00PM.

At any time, you can hover over any stage to get a summary of it's detail or click a stage to get comprehensive detail of that SLA's stage, including a summary and detail of the stage start and stage end.

### Details of task stage




### Use SLA timeline to understand SLA stage change

Describes how you can understand SLA stage changes using SLA timeline.

Using Task SLA-2 as an example, you can see a period of retroactive and out of schedule time preceding the task update that caused the SLA to attach to INC0010001. The task update is represented by the first triangle. When this event is selected, the detail pane displays and the Start tab has a blue check and is highlighted indicating this is the SLA Definition condition this event met and the task values which matched the SLA Definition start condition.

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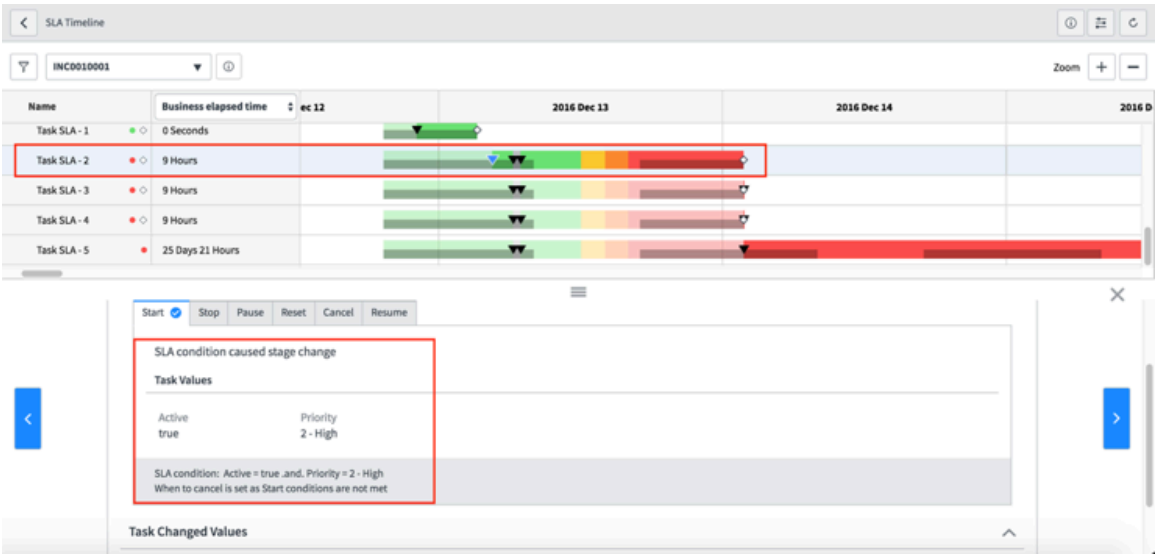
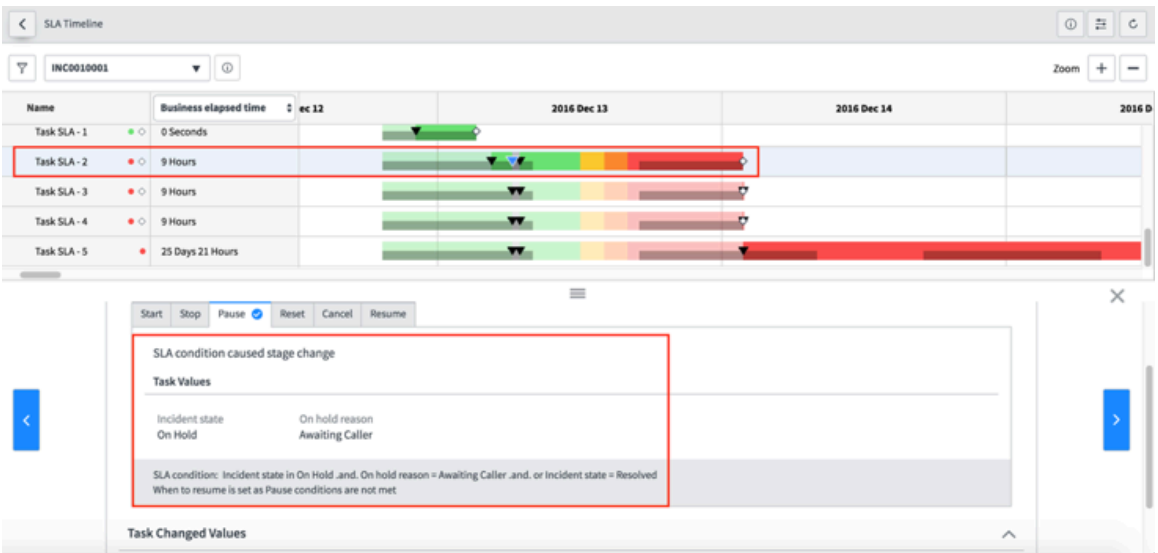



When the second task update represented by the second black triangle, which triggered an SLA stage change occurs, you can see that it triggers a pause condition. If you select this event in the timeline, the detail pane displays the highlighted Pause that contains a blue check indicating a match. Once again, the task values which match the SLA Definition condition are displayed so you easily know why the stage change occurred.




Similarly, when the third task update which triggers a stage change occurs, you can see this resumes the SLA. When that update is clicked, the Stage details section highlights the Resume tab which now contains a blue check and provides detailed information about the task update that occurred and the SLA conditions those updates matched.

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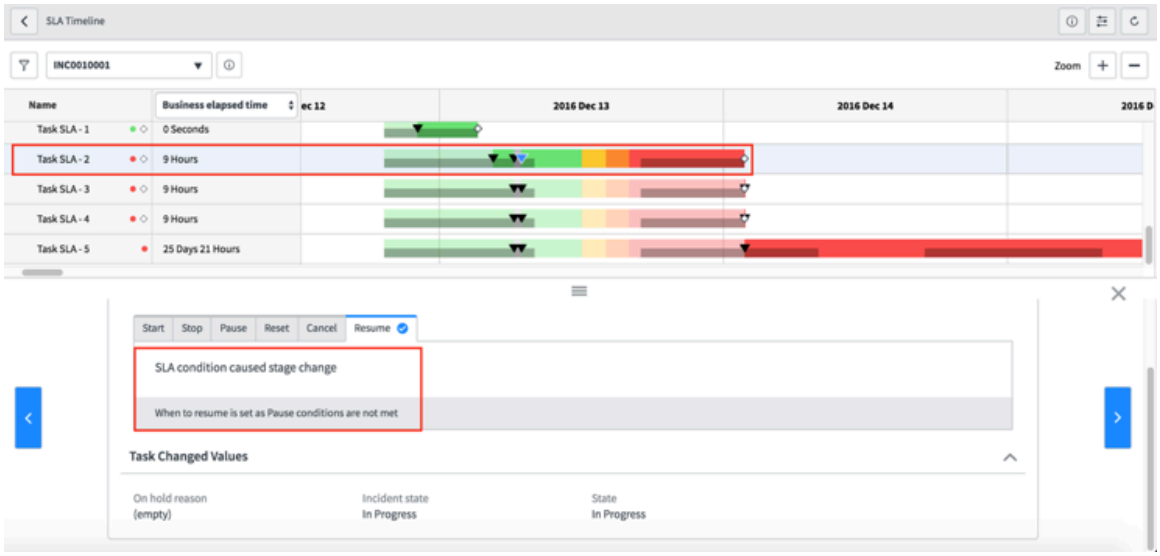
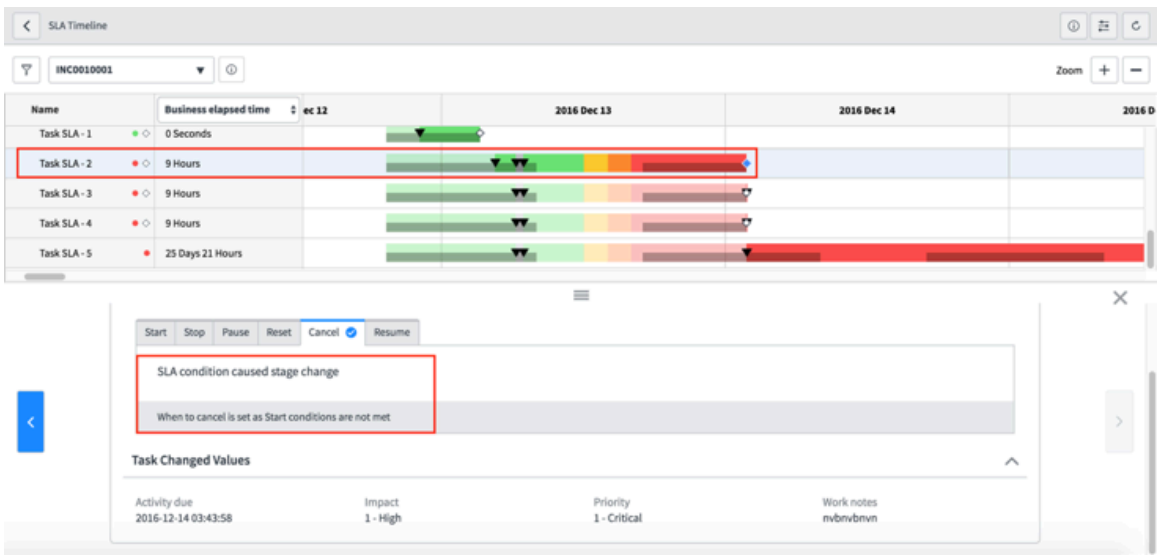


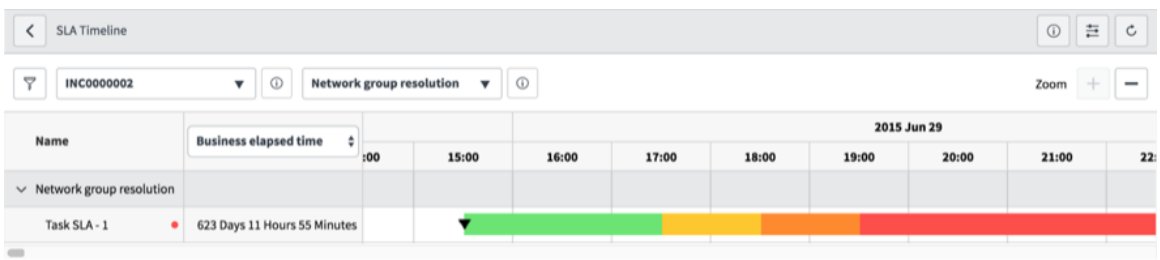

The SLA continues to accumulate time, until it is breached and this is visually represented by the yellow, orange, and the red colors. Eventually, another task update occurs which triggers the SLA's cancel conditions that is represented by the white diamond. The Stage details section highlights the conditions for the task SLA cancellation. In this case, the SLA Definition is defined to cancel when the 'Start conditions are not met'.




## Use SLA Timeline to validate a new SLA definition

When a new SLA Definition is created the SLA Timeline can be used to see how the SLA will behave against existing task records.

From the SLA Definition form, open the SLA Timeline by clicking the Validate SLA Definition related link. Select a task by using the task picker in the upper left. The SLA Definition automatically populates for you. When a task is selected that matches your SLA Definition, the SLA Timeline allows you to inspect the different elements of the SLA.

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## Service Level Agreement (Legacy) engines

If you are on an earlier version of the SLA engine, you can upgrade to the 2011 engine to make use of the complete service level management functionality.

The SLA engine has three versions:

| SLA engine version | Description |
|---|---|
| Escalation engine (pre-2010) | Tracks only one SLA per task. |
| The 2010 engine (the Service level management plugin) | Supports multiple SLAs per task. Business rules handle the processing of these SLAs while workflows handle notifications. The majority of logic is in a single large business rule called Process SLAs. |
| The 2011 engine (also part of the Service level management plugin) | The 2010 SLA engine functionality is concentrated into a number of script includes.<br><br>Provides retroactive pause calculations and enables the customization of SLA condition processing through the use of condition rules. |

### Legacy SLA fields

Previously, only a single SLA could be attached to a task via the Escalation engine. The information for the SLA was stored in the task table using the **SLA Due**, **Made SLA**, and **Escalation** fields.

The Task SLA engine now enables multiple SLAs to be attached to a single task, making the earlier task fields redundant. Their equivalents are in the **task_sla** table for each SLA attached to the task.

- **Task SLA**, **Breach time**: This is equivalent to the SLA Due field
- **Task SLA**, **Has breached**: This will be true if the SLA has breached, the opposite of **Made SLA** field.
- There is no equivalent field for **Escalation** field. Notifications can be sent via the SLA workflow and an increase in priority can trigger additional SLAs to be attached to the task.

**Note:**
The **Business Duration** field is neither part of the Escalations Engine nor the Task SLA Engine.

The fields on the **Task** are considered legacy and are not updated by the Task SLA engine. In case these fields are being updated, the legacy Escalation engine may still be running. This can happen if you have upgraded from Express or a previous instances.

To prevent the Escalation engine from running, set the *com.snc.sla.run_old_sla_engine* property to false. If this property is set to false and the fields are still being updated, check the customizations made to your instance.

### Upgrade SLA to 2011 engine

You can upgrade SLA processing to use the 2011 Engine.

#### Before you begin

Role required: admin

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### About this task

The service level management plugin was enhanced with the ability to script the condition rules for SLA transitions, giving control over how the conditions in an SLA Definition are used. Please review the documentation before enabling the enhancements to understand how the new engine will impact existing customizations

**Note:**
Activating the 2011 SLA engine will deactivate all business rules on the `task_sla` table (except for the rule *`Task SLA Empty Schedule Warning`*, which is part of the 2011 engine). If you have added any additional business rules or customized the default business rules, these will not be automatically deactivated. So you should review these customizations, and manually deactivate such business rules, before making this change.

The default Process SLAs rule on the `task` table will also be deactivated, so any customizations to this script must be incorporated into the new SLA engine.

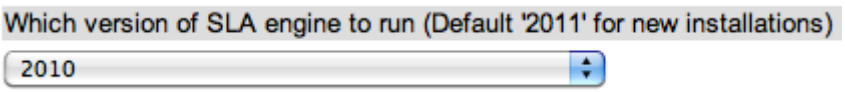
In addition, breach information is removed from the **Stage** field, and stored in the new **Has breached** field.

To enable the new functionality:

### Procedure

1. Navigate to **All** > **Service Level Management** > **SLA Properties**.
2. Change the following property from 2010 to 2011:

**Example**




By default, the 2011 Engine sets the **Stage** field to **In Progress**, shaded red to indicate the breached status, and sets the **Has Breached** field to true. The SLA continues to run until the stop conditions are met.

## Organize the migration process

There are several ways to convert the old SLAs to the new Task SLAs.

### Before you begin

Role required: admin

### About this task

Perform the following steps to organize the conversion process:

### Procedure

1. Convert the old SLAs to new SLA Definitions, but leave the Active flag unchecked on each one.
2. Back up the old SLAs by exporting the table to XML.
3. Deactivate the old SLAs, setting the **Run the old SLA engine (System Policy -> SLA Management)** system property (*`com.snc.sla.run_old_sla_engine`*) to **false**. This setting deactivates the legacy SLA engine preventing both engines from running and conflicting. This property is set to true by default, but will be set to false by the new SLA plugins, effectively deactivating the old SLAs.
4. Activate the new SLA Definitions by checking the Active flags on each one.

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5. Navigate to **Incident** > **Open** and use the List Editor to "touch" each record.
   As each record is updated, the new Task SLA will attach to each incident. If there are too many open incidents to effectively touch using the List Editor, run a business rule that will update every open incident.

### Convert an SLA to an SLA Definition

You must replicate the default SLA record as a new SLA definition.

#### Before you begin
Role required: admin

#### About this task
To convert old SLAs to SLA Definitions:

#### Procedure

1. Transfer the **Name** and **Table** fields.
2. If desired, check the **Retroactively Start** checkbox.
   If checked, this will cause the SLA to calculate from the moment the record is created (or from the date and time on the selected task), rather than the moment the SLA is attached. This is especially helpful for Task SLAs that will attach to active incidents that have old SLAs currently running.
3. Transfer the **Conditions** field to the **Start Conditions** field.
   Make sure to add **Active is True** as well, so that the new Task SLAs don't attach to closed incidents when they are updated.
4. Define a new set of **Pause Conditions** and **Close Conditions**.
5. Set the **Duration Type** and **Duration** fields.
   The old SLAs did not support relative duration, so to define the Task SLA to behave similarly to the old SLA, select **User Defined Duration** as the **Duration Type** and put the total length of time of all of the escalations here.

   **Example**
   For instance, an old SLA that has escalations of 4 hours to Moderate, 2 hours to High, and 2 hours to Overdue, the new Task SLA should have **Duration** set to **Days 0 Hours 08:00:00**.
6. Calendars have been replaced by Schedules, so if schedules haven't been defined yet, they will need to be.
7. Instead of escalations, attach an SLA Workflow.
   There is a default SLA workflow, however, you must create a new workflow to replicate the escalation levels on the old SLA. Escalation Levels are defined hour-by-hour, whereas the SLA Workflow uses a percentage timer.

   **Example**
   So for the above example of 4 hours to Moderate, 2 hours to High, and 2 hours to overdue, the workflow will need a 50% timer and then two 25% timers. The new task SLA records do not use the **Escalation** or **Made SLA** fields on the task record.

#### Example:
The following example is an old SLA for Priority 1 incidents to be resolved on a Monday-Friday (8-5) Calendar, with escalations to Moderate at 4 hours, to High at 2 hours, and to Overdue at 2 hours:

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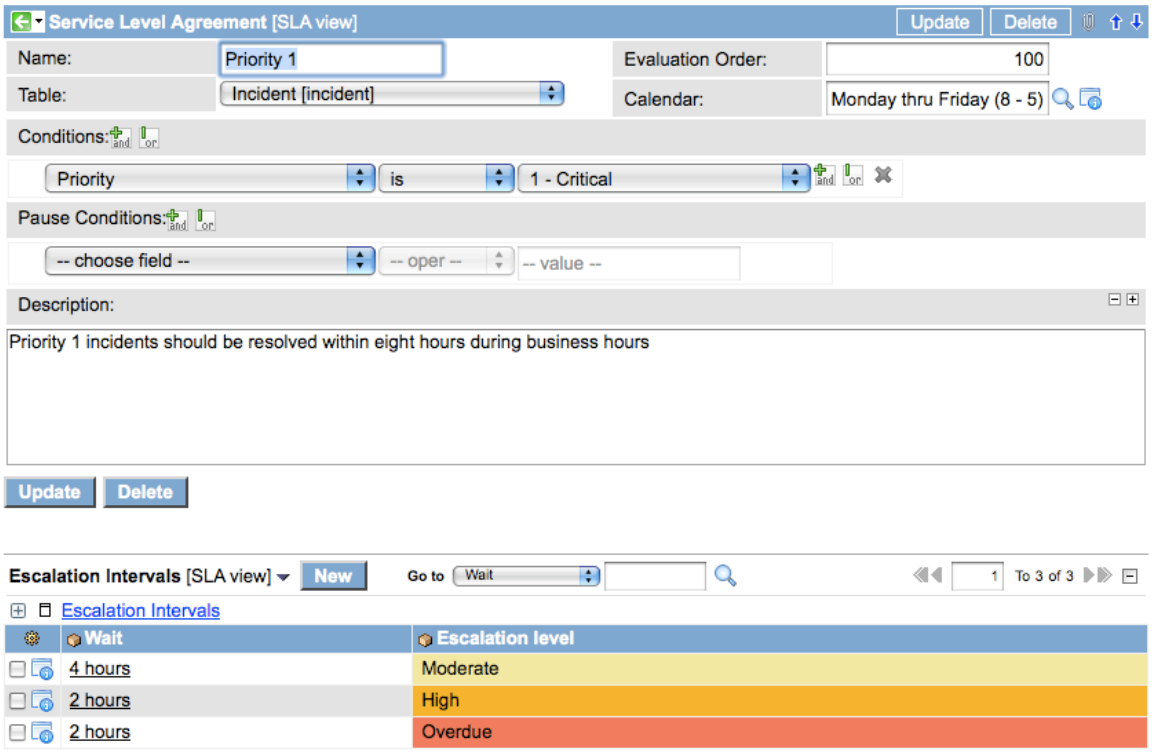
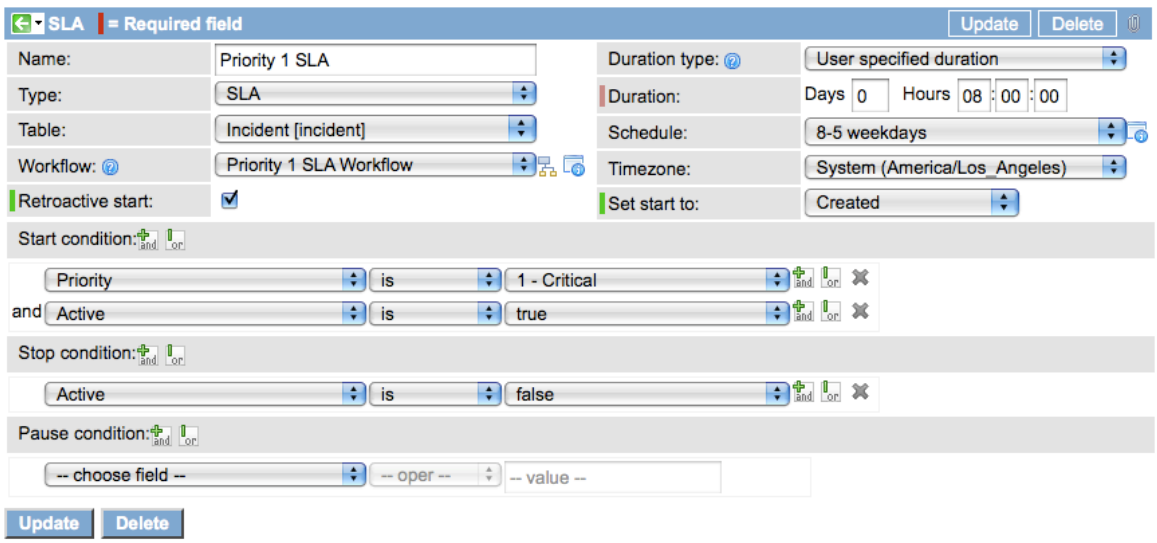
### Old SLA example




This is the new Task SLA created from the same information:

### New SLA example




This is the workflow which powers the new Task SLA.

**Note:**
This example workflow responds to each escalation by firing off an event. A business rule can be configured to respond to escalation events, or the workflow can be adjusted to match the organization's process.

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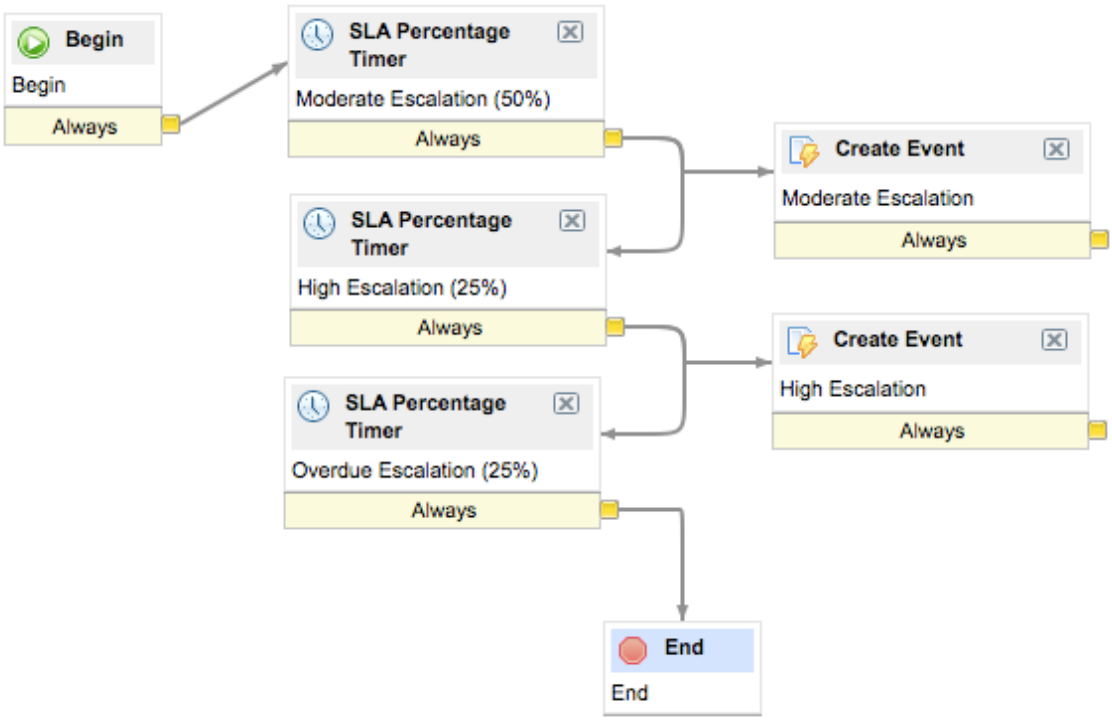
### New SLA workflow




### Reactivate escalation engine

Escalation engine is replaced with 2011 SLA Engine.

#### Before you begin

Role required: admin

#### About this task

ServiceNow Express used the legacy Escalation Engine to process SLAs. If for any reason a customer who has upgraded from ServiceNow Express to ServiceNow Enterprise wants to reactivate the Escalation engine, they can follow the steps below.

#### Procedure

1. Navigate to sys_properties.list.
2. Update the property *com.snc.sla.run_old_sla_engine* to `true`.

**Note:**

ServiceNow recommends using the 2011 SLA Engine.

## Task SLA table

The Task SLA [task_sla] table stores Task SLA records for the SLAs attached to particular tasks.

For each task, attached SLAs are accessible in a related list on the Task's form.

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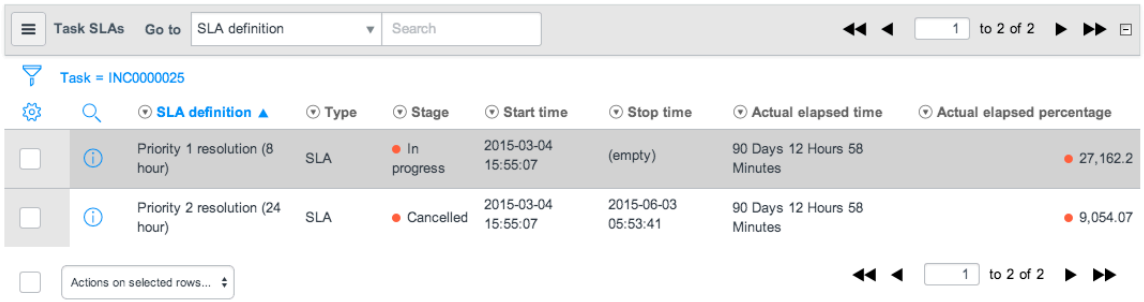
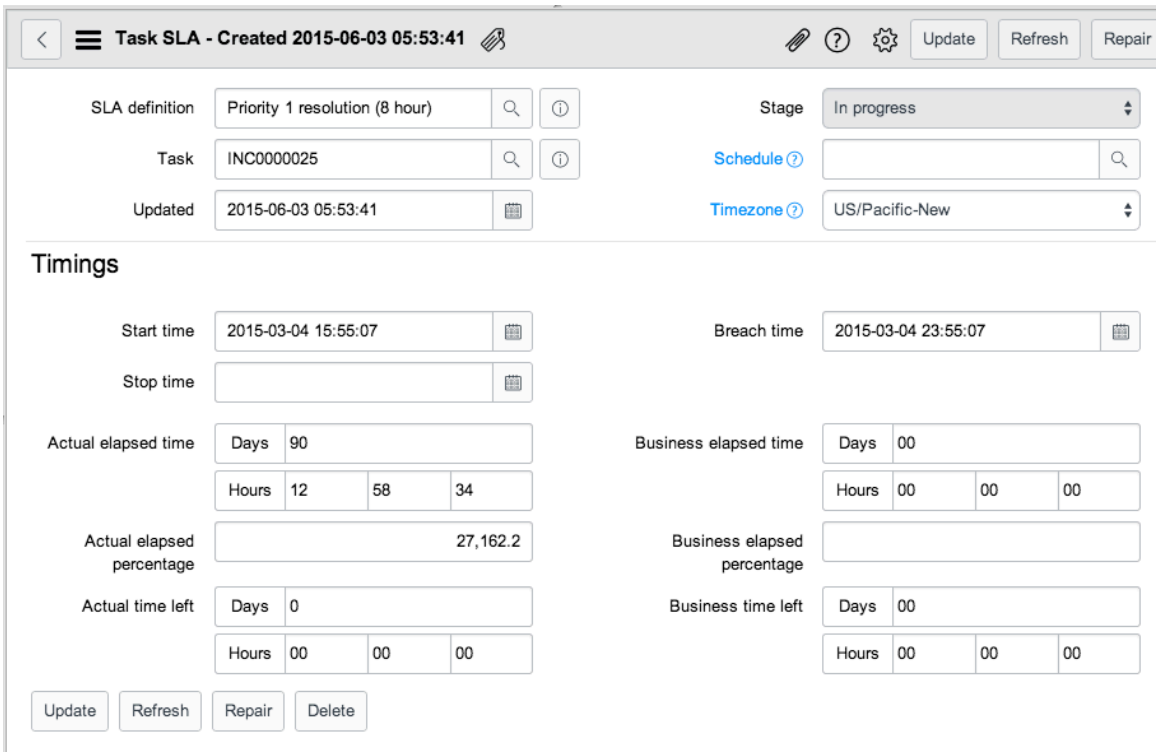
### Task SLA table




The SLA form for a task shows further details:

### Task SLA form




## Stage values

The following **Stage** values are defined:

- **In progress**
- **Cancelled**
- **Paused**
- **Completed**

> **Note:**
> The **Breached** stage value is also available for systems either using the 2010 SLA engine, or running in compatibility mode.

## Timing information

The **Timings** fields on the Task SLA contain the crucial information powered by the SLA Engine:

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**Task SLA Time-Based Fields**

| Field | Description |
|---|---|
| Start time | The time the SLA was started. |
| Stop time | The time the SLA ended. |
| Breach time | The time the SLA will breach, adjusted for business pause duration (for task SLAs with a schedule specified) or pause duration (for task SLAs with no schedule).<br>**Note:**<br>Breach time is the same as Planned end time. |
| Actual Elapsed Time | Time between start time and now (minus pause duration). |
| Actual Elapsed Percentage | Percentage of total SLA that has elapsed (minus pause duration). |
| Actual Time Left | Time remaining until SLA breach. |
| Business Elapsed Time | Time within the specified schedule between start time and now (minus pause duration). |
| Business Elapsed Percentage | Percentage of total SLA that has elapsed within the specified schedule (minus pause duration). |
| Business Time Left | Time within the schedule remaining until SLA breach. |
| Original breach time | The date/time the SLA would breach, as calculated when the SLA is first attached.<br>**Note:**<br>You may have to configure the form to see this field. |

## Service level management overview dashboard

The Service Level Management Overview Dashboard provides insight into Service Level Agreement (SLA) information relevant to the logged-in user. By default, the Overview dashboard is available to users who possess the itil role.

The Overview Dashboard is enabled by default for new customers. Customers upgrading from a prior release have to enable the Service Level Management Dashboard plugin (com.snc.sla.overview) to activate this feature.

You can navigate to the dashboard in the following ways:

- **Service Level Management** > **Overview**
- **Self – Service** > **Dashboard** > **SLA Overview**

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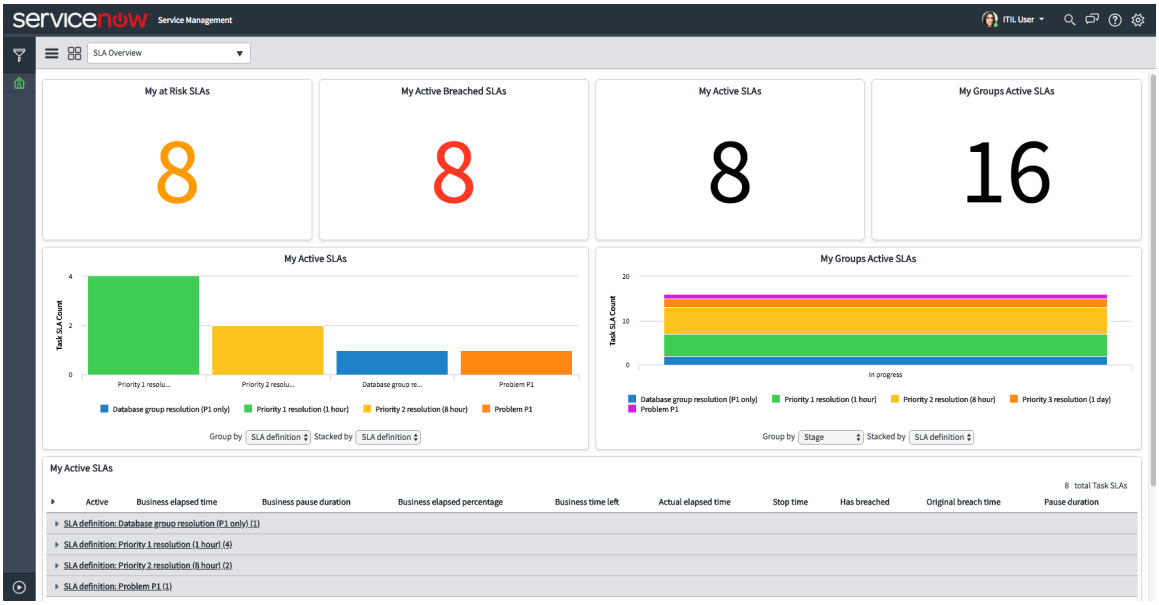
### SLA overview dashboard




| UI component | Description |
|---|---|
| My at Risk SLAs | Number of active task SLAs for tasks assigned to the logged in user that have not yet breached but have elapsed 75% of the duration of the SLA. |
| My Active Breached SLAs | Number of active task SLAs for tasks assigned to the logged in user that have breached. |
| My Active SLAs (count) | Number of active task SLAs for tasks assigned to the logged in user. |
| My Groups Active SLAs (count) | Number of active task SLAs for tasks assigned to groups that the logged in user is a member of. |
| My Active SLAs (bar chart) | Displays a bar chart of active task SLAs for tasks assigned to the logged in user. The data can be grouped and/or stacked on some of the fields available in the task SLA records. |
| My Groups Active SLAs (bar chart) | Displays a bar chart of active Task SLAs for Tasks assigned to groups that the logged in user is a member of. The data can be grouped and/or stacked on some of the fields available in the task SLA records. |
| My Active SLAs (list) | Displays a list of active task SLAs for tasks assigned to the logged in user. The data can be grouped on some of the fields available in the task SLA records. |

## Platform Analytics Solutions for Service Level Management

This Platform Analytics Solution contains preconfigured dashboards. These dashboards contain actionable data visualizations that help you improve your business processes and practices.

## Enabling the Platform Analytics Solution

Use the Performance Analytics widgets on the dashboard to visualize data over time, analyze your business processes, and identify areas of improvement. With solutions, you can get value from Performance Analytics for your application with minimal setup.

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**Note:**
Solutions include some dashboards that are inactive by default. You can activate these dashboards to make them visible to end users according to your business needs.

For unlimited access to all features of this Platform Analytics Solution, purchase a Performance Analytics subscription. For more information, see Activating your Performance Analytics subscription.

To enable the solution for Service Level Management, an admin navigates to **System Definitions** > **Plugins** and activates the Service Level Management PA Dashboard (com.snc.pa.sla.overview) plugin.

To use this Platform Analytics Solution, you must have an entitlement to use Performance Analytics with Service Level Management.

## Domain separation and 'Run As' user

In some solutions, System Administrator is the **Run As** user for data collection jobs in the Platform Analytics Solutions. In other solutions, the **Run As** user for data collection jobs is left blank. Verify that the **Run As** user exists on the instance, and that this user has the appropriate level of access. An inappropriate **Run As** user can cause errors or limit the data that is collected. This setting only has an effect if domain separation is enabled.

### Related topics

Platform Analytics Solutions

Activate your Performance Analytics subscription

### Service level management PA dashboard

The Service Level Agreement (SLA) Overview module provides a Performance Analytics (PA) Dashboard to review SLA information at a glance.

Users with the itil role can access the dashboard.

You can navigate to the PA dashboard in the following ways:

- **Service Level Management** > **Overview**
- **Self – Service** > **Dashboard** > **SLA Overview (Premium)**

This dashboard has the following requirements:

- An entitlement to use Performance Analytics with Service Level Management.
- The Service Level Management PA Dashboard (com.snc.pa.sla.overview) plugin, which contains this dashboard.
- The SLA Breakdowns plugin (com.snc.sla.breakdowns) plugin, because some of the reports are generated from the breakdown data.

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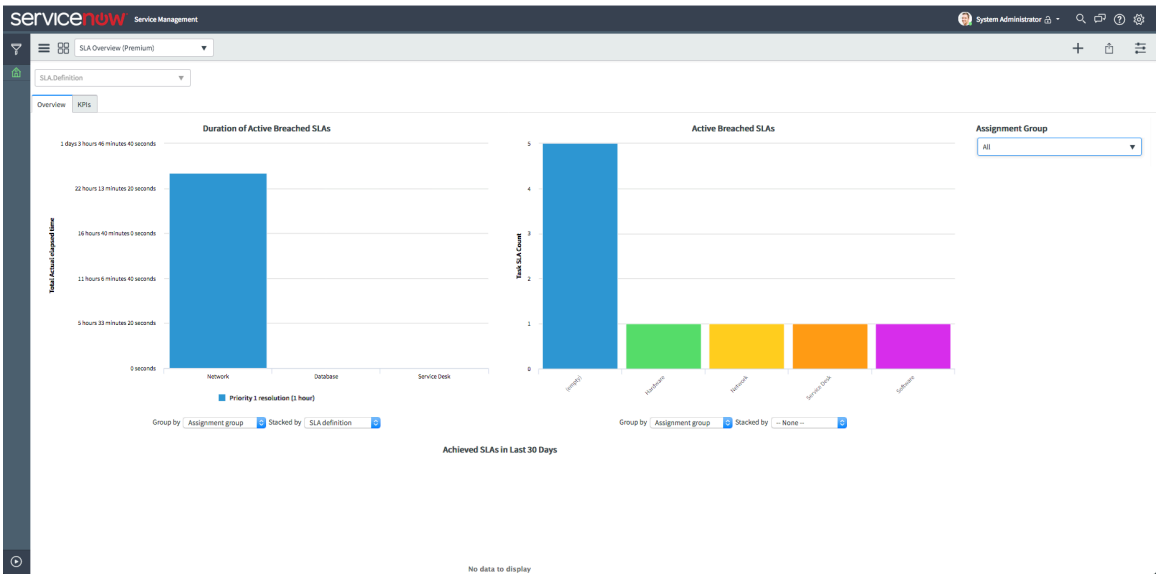
## Overview tab

### SLA PA dashboard - Overview




| UI component | Description |
|---|---|
| Duration of Active Breached SLAs | Uses available SLA breakdown data to generate a report showing time spent working on breached task SLAs that are still active and the SLA Definition Type is SLA.<br><br>Use the Group by and Stacked By breakdown lists to show different representations of this data, for example: Group by Assignment group and Stacked By SLA Definition.<br><br>The Assignment Group filter on the right can be used to limit the data shown in this report to a specific group. |
| Active Breached SLAs | This chart shows all breached task SLAs that are still active and the SLA Definition Type is SLA.<br><br>Use the Group by and Stacked By breakdown lists to show different representations of this data, for example: Group by Assignment group and Stacked By SLA Definition.<br><br>The Assignment Group filter on the right can be used to limit the data shown in this report to a specific group. |
| Achieved SLAs in Last 30 Days | This chart shows all task SLAs that completed in the last 30 days without breaching and where the SLA Definition Type is SLA.<br><br>Use the Group by and Stacked By breakdown lists to show different representations of this data, for example: Group by Assignment group and Stacked By SLA Definition. |

## KPI tab

The KPI dashboard uses the following Performance Analytics indicators:

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| Indicator | Version introduced |
|---|---|
| Average durations of breached task SLA closed today | London |
| Number of closed task SLA today | London |
| Average duration of achieved SLA today | London |
| Number of achieved closed task SLA today | London |
| Achieved SLAs Today | London |

**Note:**
These indicators are calculated on a daily basis to provide trend analysis.

Further operations are performed on the Performance Analytics indicators to generate the following KPIs on the dashboard:

### KPIs based on Performance Analytics indicators

| UI component | Description |
|---|---|
| % of Active Breached SLAs (Daily) | Shows the % of active task SLAs that breached yesterday. |
| Average Assignment Duration (Breached) | Shows the average duration of individual assignments for breached task SLAs completed yesterday. The KPI that provides the data captures this value on a daily basis to provide trend analysis.<br><br>This report is based on SLA breakdown data and so shows data only for SLA definitions that are linked to an SLA Breakdown definition. |
| % of Achieved SLAs (Daily) | Shows the % of task SLAs that were completed yesterday without breaching. The KPI that provides the data captures this value on a daily basis to provide trend analysis. |
| Average Assignment Duration (Achieved) | Shows the average duration of individual assignments for achieved task SLAs completed yesterday. The KPI that provides the data captures this value on a daily basis to provide trend analysis.<br><br>This report is based on SLA breakdown data and shows data only for SLA definitions that are linked to an SLA Breakdown definition. |
| Average Duration of Assignments for Breached SLAs | Shows the average duration of individual assignments for breached task SLAs completed yesterday broken down by either Assignment group or SLA Definition. Use the **Breakdown** field to change which breakdown data is displayed.<br><br>The KPI that provides the data captures this value on a daily basis to provide trend analysis.<br><br>This report is based on SLA breakdown data and shows data only for SLA definitions that are linked to an SLA Breakdown definition. |

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**KPIs based on Performance Analytics indicators (continued)**

| UI component | Description |
|---|---|
| Average Duration of Assignments for Achieved SLAs | Shows the average duration of individual assignments for achieved task SLAs completed yesterday broken down by either Assignment group or SLA Definition. Use the **Breakdown** field to change which breakdown data is displayed.<br><br>The KPI that provides the data captures this value on a daily basis to provide trend analysis.<br><br>This report is based on SLA Breakdown data and shows data only for SLA definitions that are linked to an SLA Breakdown definition. |

## Domain separation and Service Level Management

Domain separation is supported in Service Level Management. Domain separation enables you to separate data, processes, and administrative tasks into logical groupings called domains. You can control several aspects of this separation, including which users can see and access data.

## Support level: Standard

- Includes all aspects of **Basic** level support.
- Application properties are domain-aware as needed.
- Business logic: The service provider (SP) creates or modifies processes per customer. The use cases reflect proper use of the application by multiple SP customers in a single instance.
- The instance owner must configure the minimum viable product (MVP) business logic and data parameters per tenant as expected for the specific application.

Sample use case: An admin must be able to make comments required when a record closes for one tenant, but not for another.

For more information on support levels, see Application support for domain separation.

## Service Level Management overview

- Service Level Management helps customers monitor, measure, and report on agreed service level agreements (SLAs); SLA definitions encapsulate these agreements.
- Users can see only content in the domain to which they have access.

## How domain separation works in Service Level Management

The intention of SLM is to provide customers with an expectation of service within a known timescale and the ability to monitor when service levels are not being met. To learn specific terms and definitions see Service Level Management concepts.

- SLA definitions and task SLAs have domain fields. However, task SLAs are created only in the domain of its attached task record.
- SLA definitions must be defined in a tenant domain (or global) in order for task SLAs to be created and attached to a given task (or extensions).

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- Task SLAs attach to a task if an SLA definition exists in the task records domain or in an ancestor domain.
- Task SLAs always inherit the domain of its attached task record, which includes the workflow running on the task SLA record. If a task record ever flips, the task SLA also slips.
- If an SLA definition exists in an ancestor's domain, the definition can be overridden in a sub-domain (delegated administration).

## Service Level Management domain-separated tables

- SLA definition [contract_sla]
- Task SLA [task_sla]

## Service Level Management use cases

- An ESS user in the ACME domain logs in and creates an incident, at which point an SLA is attached. The SLA is created in the domain of the associated task record (incident), which is the ACME domain. The ESS user is not able to read SLA records. These are restricted to the following roles:
  - Administrator
  - ITIL
  - SLA Administrator
  - SLA Manager
- An ITIL user in the Acme domain logs in and creates an incident. The process above is the same except that the ITIL user can read the SLA record attached to the incident.
- If an SLA definition exists in the Acme domain and doesn't meet the needs of an Acme sub-domain (Acme child) an SLA Administrator can remediate. SLA Administrators can navigate to the ACME SLA definition when their session domain is ACME child, make the relevant changes, and save them. The SLA Administrator is alerted that an override has been created.
- An ITIL user sets the session domain to Acme child and creates an incident. The task SLA is created using the SLA definition from Acme child.

### Related topics

Domain separation for service providers

## Quick start tests for Service Level Management

Validate that Service Level Management still works after you make any configuration change such as apply an upgrade or develop an application. Copy and customize these quick start tests to pass when using your instance-specific data.

Service Level Management quick start tests require activating the Service Level Management - ATF Tests plugin (com.snc.service_level_management.atf).

### Service Level Management quick start tests

| Test | Description | Release version |
|---|---|---|
| SLM: Service Level Management Task SLA completed workflow | Tests that a user can create a task SLA and complete the workflow. | Orlando |

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**Service Level Management quick start tests (continued)**

| Test | Description | Release version |
|---|---|---|
| SLM: Service Level Management Task SLA cancelled workflow | Tests that a user can create a task SLA and cancel the workflow. | Orlando |
| SLM: Service Level Management Task SLA timer REST API | Tests that the SLA Timer API response matches data expected by SLA Timer Seismic component. | Paris |

**Related topics**

Quick start tests

## Configure Service Level Agreement (SLA) properties

You can configure the SLA engine, logging, and repair properties based on the requirements within your organization.

### Before you begin

Role required: admin

### Procedure

1. Navigate to **All** > **Service Level Management** > **Properties**.
2. Select one of the following:

**SLA Engine**

configure properties for the SLA engine.

**SLA Logging**

configure logging properties for SLA Script Includes and logging output destination.

**SLA Repair**

configure properties for the SLA Repair process.

### SLA engine properties

Administrators can manage the SLA engine using SLA engine properties.

Navigate to **Service Level Management** > **Properties** > **SLA Engine** to view SLA engine properties.

**SLA Engine Properties**

| Property name | Description |
|---|---|
| *com.snc.sla.calculation.percentage* | Maximum 'Actual elapsed percentage' value after which the 'SLA - update calculations' scheduled job will stop regularly |

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### SLA Engine Properties (continued)

| Property name | Description |
| --- | --- |
| | calculating the SLA's time values. This is used to prevent 'long since breached' records from being unnecessarily updated. Setting to '0' will stop all calculations and leaving this blank will allow all SLAs to be calculated.<br><br>By default, this is set to 1,000%, so that recalculation stops after the breach is exceeded by a factor of 10.<br><br>• Type: integer<br>• Default value: 1000 |
| *com.snc.sla.maximum_duration* | Maximum duration in days that is allowed in the SLA definition.<br><br>• Type: integer<br>• Default value: 1095 |
| *com.snc.sla.engine.version* | Run the 2011 SLA engine (2010, 2011)<br><br>• Type: choice list<br>• Default value: 2011 |
| *com.snc.sla.engine.async* | Run the 2011 SLA engine asynchronously after task insert or update operations.<br><br>• Type: true \| false<br>• Default value: false |
| *com.snc.sla.compatibility.breach* | Enable compatibility with 2010 'breached' |

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### SLA Engine Properties (continued)

| Property name | Description |
| --- | --- |
| | status of SLAs (default: false)<br><br>Only enable if you require the old way of showing breached status (in the stage value), for reporting purposes. Using only the 'breached flag' is preferred<br><br>• Type: true \| false<br>• Default value: false |
| *com.snc.sla.default_conditionclass* | The name of the Script Include class that will be used to evaluate SLA Conditions for the 2011 SLA engine (use to override with your own extension of the SLAConditionBase class)<br><br>• Type: String<br>• Default value: SLAConditionBase |
| *com.snc.sla.workflow.run_for_breached* | An update to a Task can result in an SLA being attached that is already breached - for example when an Incident that has already been open for a while is upgraded to a high priority with a short resolution SLA.<br><br>By default if there is a workflow specified in the SLA Definition it will not run if the Task SLA is attached and the Planned End Time has already passed. |

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**SLA Engine Properties (continued)**

| Property name | Description |
| --- | --- |
| | Enable this property if you would like the workflow to run for a Task SLA that is already breached when it is attached to the Task.<br>• Type: true \| false<br>• Default value: false |
| *com.snc.sla.calculate_planned_end_time_after_breach* | Continue to re-calculate the "Planned End Time" of SLAs after they have breached<br>• Type: true \| false<br>• Default value: false<br>**Note:** zboot customers do not have this property available in the SLA Engine Properties page. |
| *com.snc.sla.calculation.use_time_left* | Use field business_time_left to calculate breach time instead of business_percentage field. Using business_time_left is more accurate because the business_percentage field is rounded to 2 decimal places. This means that once the business percentage reaches 99.995%, it is recorded as 100%, and the task SLA is marked as breached. |

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**SLA Engine Properties (continued)**

| Property name | Description |
|---|---|
| | • Type: true \| false<br>• Default value: false |
| *glide.sla.calculate_on_display* | Recalculate Task SLA records when a Task form is displayed. This ensures that the task SLAs calculations are up to date but this may increase form load time.<br>• Type: true \| false<br>• Default value: false |
| *com.snc.sla.always_populate_business_fields* | When this property is set to true, the business fields such as Business elapsed time will be populated with the same values as those in the actual fields when there is no schedule specified on the Task SLA.<br>If the property is false, the business fields will be empty when a Task SLA has no schedule.<br>• Type: true \| false<br>• Default value: true for new instances, false for upgraded instances |

### SLA logging properties

Administrators can configure SLA logging using SLA properties.

Navigate to **Service Level Management** > **Properties** > **SLA Logging** to view SLA logging properties.

The **Logging level for...** properties set logging levels for relevant script includes. This allows you to activate extra logging targeted at whenever that script include is invoked via a task SLA. For example, if you know of an issue with the **TaskSLAworkflow** script include, you can use **the**

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**com.snc.sla.workflow.log** property to enable logging on that script include. These properties are all set to **Notice** level by default.

**SLA Logging Properties**

| SLA Logging Property | Description |
|---|---|
| com.snc.sla.task_sla_controller.log | Logging level for TaskSLAController |
| com.snc.sla.task_sla.log | Logging level for TaskSLA |
| com.snc.sla.condition.log | Logging level for SLAConditionBase |
| com.snc.sla.workflow.log | Logging level for TaskSLAworkflow |
| com.snc.sla.calculatorng.log | Logging level for SLACalculatorNG |
| com.snc.sla.repair.log | Logging level for SLARepair (SLA repair must be enabled to use this) |
| com.snc.sla.log.destination | Logging output destination.<br><br>Select the log destination: either output to both the Database and node logs (the default), or output to node logs only.<br><br>Database and node logs (**gs.log**) are visible as system logs from ServiceNow, node logs (**gs.print**) only appear in log files. |

## Logging levels

The following logging levels are available for the **Logging level for...** properties:

**Logging Levels**

| Level | Name | Description |
|---|---|---|
| Emerg | Emergency | Total failure. |
| Alert | Alert | System corruption of a database, for example. |
| Crit | Critical | Typically used for hardware errors, for example. |
| Err | Errors | Errors |
| Warning | Warnings | Warnings |
| Notice | Notice | Possible action required but not essential. |
| Info | Informative | No action required. |
| Debug | Debugging | Generally not used except for capturing everything for fault-finding. |

**Note:**
By default, logging levels are set to **Notice**

### SLA repair properties

Administrators can manage the SLA repair function using system properties.

Navigate to **Service Level Management** > **Properties** > **SLA Repair** to view SLA repair properties.

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### SLA repair properties

| Property name | Description |
|---|---|
| com.snc.sla.repair.enabled | Enable SLA repair. When enabled the Repair modules and UI Actions will be activated.<br>• Type: true / false<br>• Default value: true for new instances and false for upgraded instances |
| com.snc.sla.repair.use_repair_workflow | When repairing SLAs, use the Repair workflow instead of the one configured on the SLA Definition.<br>• Type: true / false<br>• Default value: false for new instances, true for upgraded instances<br>• Learn more: Configure SLA repair |
| com.snc.sla.repair.workflow | The name of the Repair workflow.<br>• Type: string<br>• Default value: Default SLA Repair workflow |

## Migrate to service level management

Migrate SLA processing from the escalations engine to use the service level management functionality.

The two core differences between the old SLA engine and the new service level management plugin are that tasks can now run multiple SLAs simultaneously, and the escalation concept has been replaced with the more robust Workflow Editor. This allows administrators greater control on what actions, notifications, and events are triggered by tasks, to take into account more mature Service Level processes.

If an instance has been using the original SLA engine and has just activated the Service Level Agreements (SLA) Plugin, the old SLAs will not work. For the old SLAs to work, they must be converted to the new SLA Definition records, which will attach the appropriate Task SLA records to the matching Task records. This is done manually by creating new SLA Definition records that reflect the definition of the old SLA. Old SLAs will continue to function, but any time a task is updated, the appropriate new Task SLAs will attach.

Once new Task SLAs are implemented, they will attach themselves to any new or updated incident, including ones which already have old SLAs attached. If the new Task SLA is set to retroactively start, it will automatically calculate the duration from that point in the past, which means that the duration will still be accurate.

When enabled, the property **Compute prior SLA pause time for new, retroactive SLAs (2011 SLA engine only)** calculates the pause time when a retroactive SLA is attached.

For example: if a retroactive SLA attaches to an incident one hour after its creation, and meets the pause conditions for half an hour, then the elapsed time is half an hour rather than the full hour.

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**Note:**
This property is only used with audited tables. Tables which are not audited ignore the pause time before the creation of the record.

# ITSM Success Dashboard indicators

ITSM Success Dashboard indicators provide insights to the IT leadership team and process owners so that they can measure the performance of their ITSM implementation using the KPIs defined by ServiceNow.

Success Dashboard is available for IT Service Management and HR Service Delivery and is delivered via the following applications:

- ITSM Success Dashboard indicators

  The IT leaders can view the performance of the ITSM KPIs implemented.

- HR Service Delivery Success Dashboard indicators

  The HR leaders can view the performance of the HR KPIs implemented. For more information on HR Success Dashboard indicators, visit HR Success Dashboard indicators.

Success Dashboard Overview

## Request apps on the Store

Visit the ServiceNow Store website to view all the available apps and for information about submitting requests to the store. For cumulative release notes information for all released apps, see the ServiceNow Store version history release notes.

## Get started

| Explore | Configure |
| --- | --- |
|  |  |
| Learn about ITSM Success Dashboard concepts and features. | Configure environment, tools, and user access. |

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Use



Learn how you can use ITSM Success Dashboard.

Reference



Get details about ITSM Success Dashboard components such as roles and dependent applications.

### Troubleshoot and get help

Contact Customer Service and Support

## Exploring ITSM Success Dashboard indicators

Get an overview of the ITSM Success Dashboard indicators to understand the different components in the dashboard and how you can use the dashboard for your organization.

The IT leadership team can analyze and understand the key metrics such as call deflections and self-service to measure the success of the ITSM implementation. The leadership team can view the following insights:

- The number of times users are able to solve their problems on their own.
- The number of times users are able to submit their requests and issues without the help of tier 1 agents.
- The channels (knowledge articles, virtual agent conversations, catalog submissions) that are contributing to self-solve and call deflection.
- The number of times Predictive Intelligence successfully predicted an incident field, which in turn has a downstream impact on the resolution time.
- The formulae and definitions of the data being presented.
- The data trend for month-on-month, quarter-on-quarter, or year-on-year.
- The Key Performance Indicators (KPIs) metrics on the dashboard for a selected period. For more information to view metrics for a selected period, see View metrics for selected period in ITSM Success Dashboard indicators.

Also, process owners can view the records that contribute to these insights, do a deep dive analysis, and drive improvement plans.

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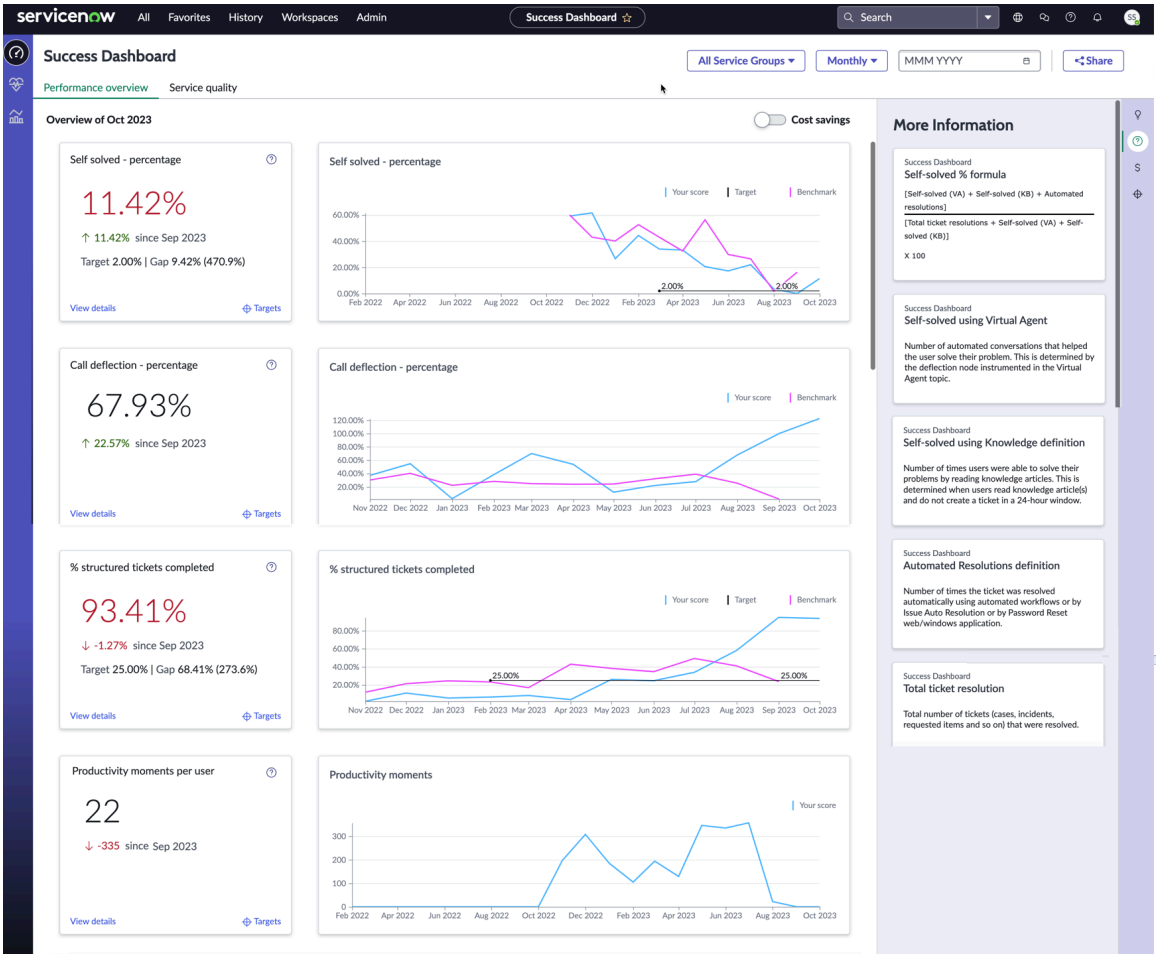
### ITSM Success Dashboard indicators overview




## ITSM Success Dashboard indicator components

Analyze performance and self-solve data visually and drive business outcomes with the help of the ITSM Success Dashboard components.

## Now Assist for ITSM Success Dashboard

With the Now Assist for Success Dashboard, you can summarize the chat conversations and incident details, generate the incident resolution notes to share with other agents, and wrap up incidents faster.

The **Self-solved using QnA** KPI in the ITSM Success Dashboard uses Now Assist and AI search QnA as contributing indicators. You can interact with a Virtual Agent, read the Knowledge base article, get a summarized/succinct response by Now LLM in Virtual Agent or on the portal. This interaction, subsequently does not create an incident, access any knowledge base article, or interact with a live agent in the next 24 hours.

To update the live agent script include see, Update the live agent script include.

## Proactive Engagement for DEX

The **Self-solved using Proactive Engagement for DEX** KPI listed under the self-solved percentage, helps the users resolve their digital experience issues. It proactively suggests the resolutions and resolves the issue.

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## Getting started with the Admin Console

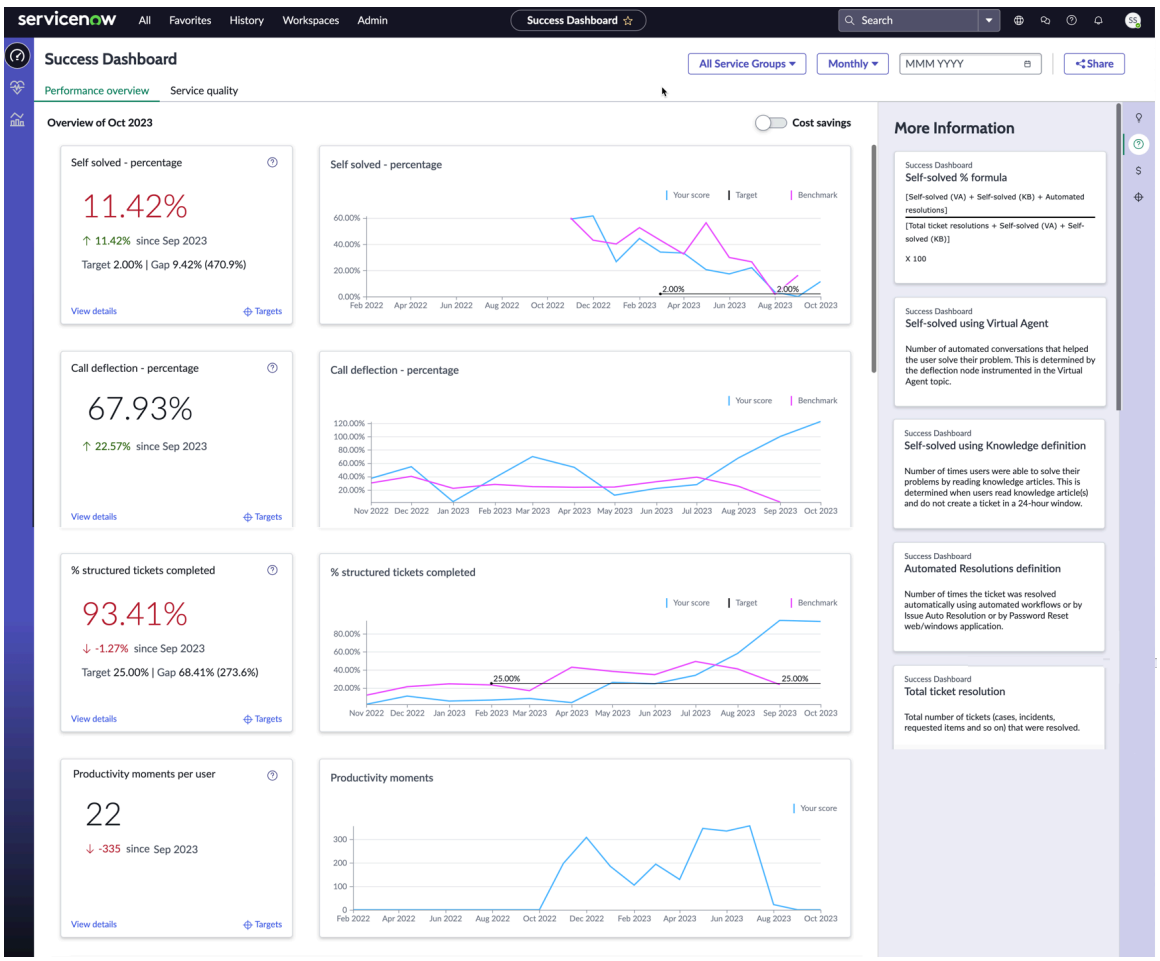
With the Admin Console, you can access the ITSM Success Dashboard, Operational Success, and Benchmarks dashboard. The Admin Console displays all the admin-related work at a glance and tasks that need attention, including installation of the related application and configuration settings.

As an admin, you see the role-specific variant of the landing page. Admin landing pages include the following items:

- Related applications that have a latest update available.
- Related applications that aren't activated or installed.
- Configurations for all the installed applications.
- Common questions and more information related to the applications.

## Performance overview in the ITSM Success Dashboard indicators

Measure the key performance indicators (KPIs) like Self-solved percentage, Call deflection percentage, Requests completed, and Successful predictions on the **Performance overview** tab. For more information, see ITSM Success Dashboard KPI definitions and formulas.




## Service quality in the ITSM Success Dashboard indicators

Measure the key performance indicators (KPIs) like Customer satisfaction score, Mean time to resolve, % Breached SLA, and % First assignment resolution on the **Service quality** tab. For more information, see ITSM Success Dashboard KPI definitions and formulas.

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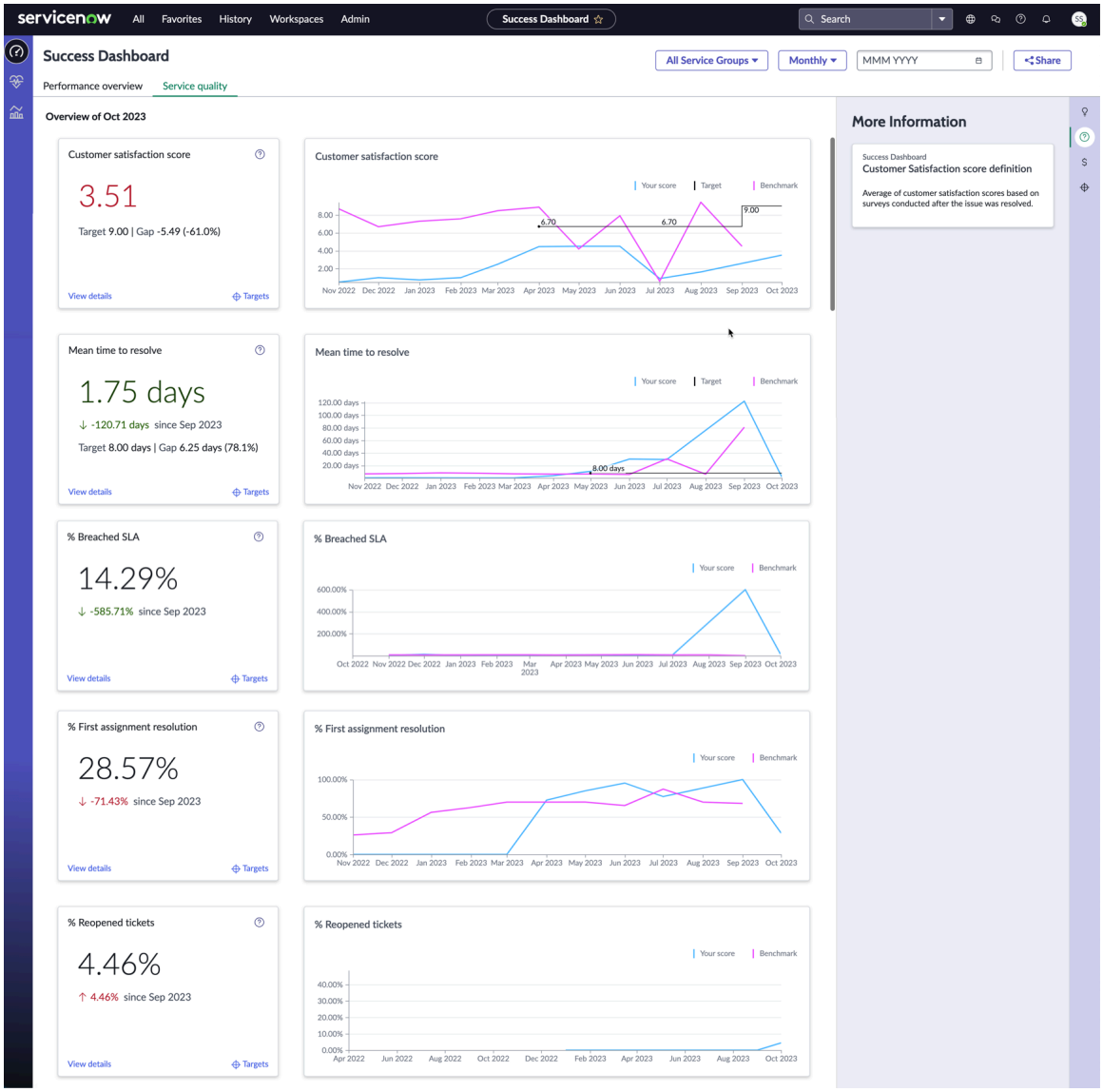


## Cost savings in the ITSM Success Dashboard indicators

View the overall estimated cost saved by using the ITSM Success Dashboard capabilities for Knowledge articles, Predictive Intelligence, Virtual Agent conversations, and Catalog submissions.

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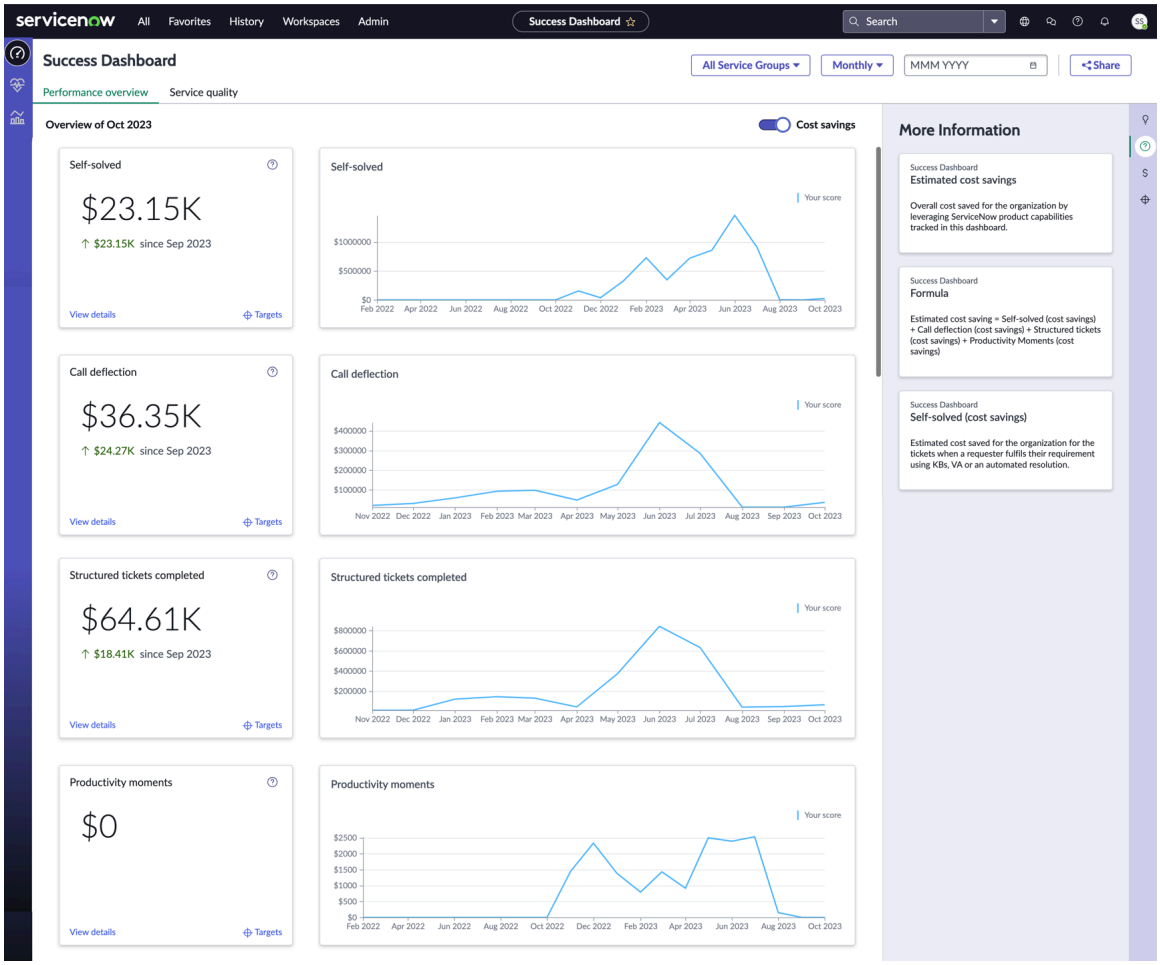


## Scorecards in the ITSM Success Dashboard indicators

View the aggregation of the daily values for KPIs in the selected period in the scorecards with the following information.

### Scorecard widget




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- **Current period score**: View the aggregated score for the current time period. Select one of the following options:
  - **Monthly:** View the data aggregated monthly. For counts, this data is the monthly sum of the daily values. For percentages, this data is the monthly average of the daily percentages.
  - **Quarterly:** View the data aggregated quarterly. For counts, this data is the quarterly sum of the daily values. For percentages, this data is the quarterly average of the daily percentages.
  - **Yearly:** View the data aggregated yearly. For counts, this data is the yearly sum of the daily values. For percentages, this data is the yearly average of the daily percentages.
- **Comparison with previous period**: View the percentage change compared to the previous period aggregation. Data is displayed in a month-over-month, quarter-over-quarter, and year-over-year comparison based on the availability of the data.

## Info icons in the ITSM Success Dashboard indicators

Use the info icons to view the short description of the indicator and understand how the indicator value is calculated.

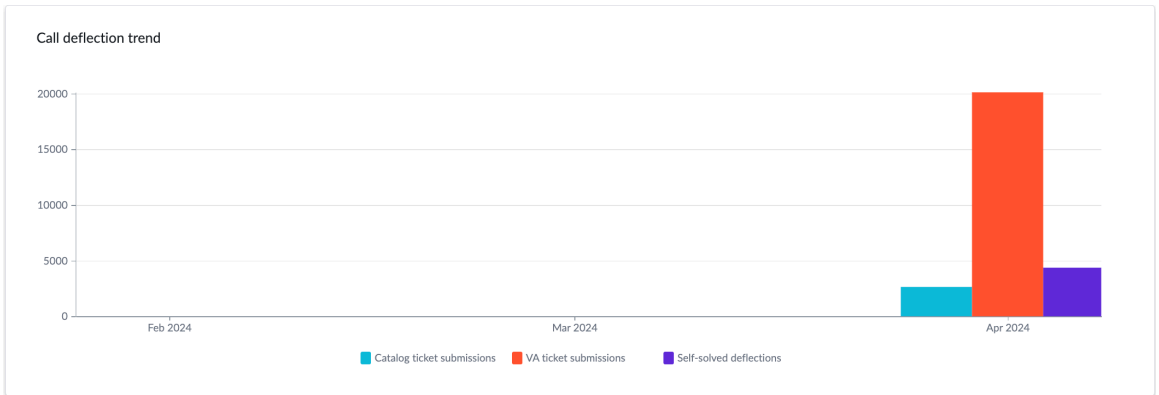
### Info icon



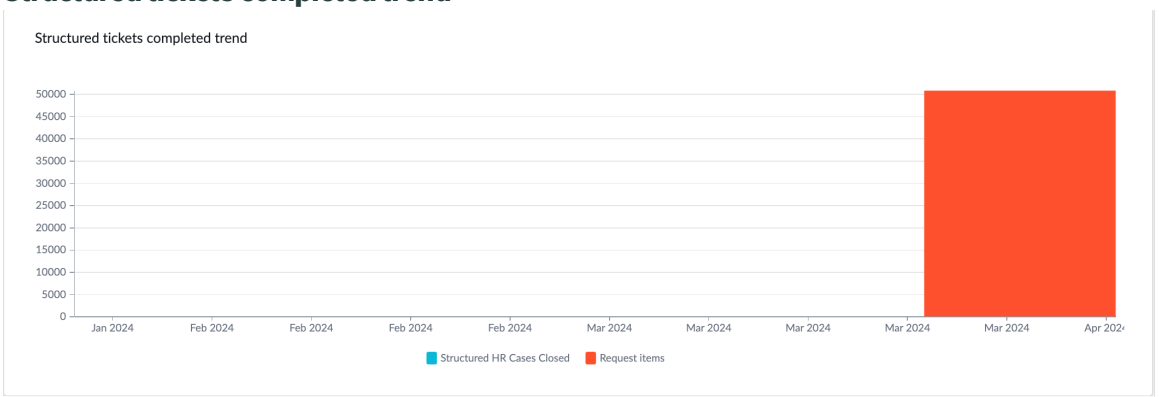
## Trends in the ITSM Success Dashboard indicators

View the trend of the aggregated scores for the selected metric scorecard.

### Call deflection trend




### Structured tickets completed trend




## View details in the ITSM Success Dashboard indicators

See the constituent drill-down views and their contextual descriptions for KPIs. The detailed information can be viewed by selecting **View details**.

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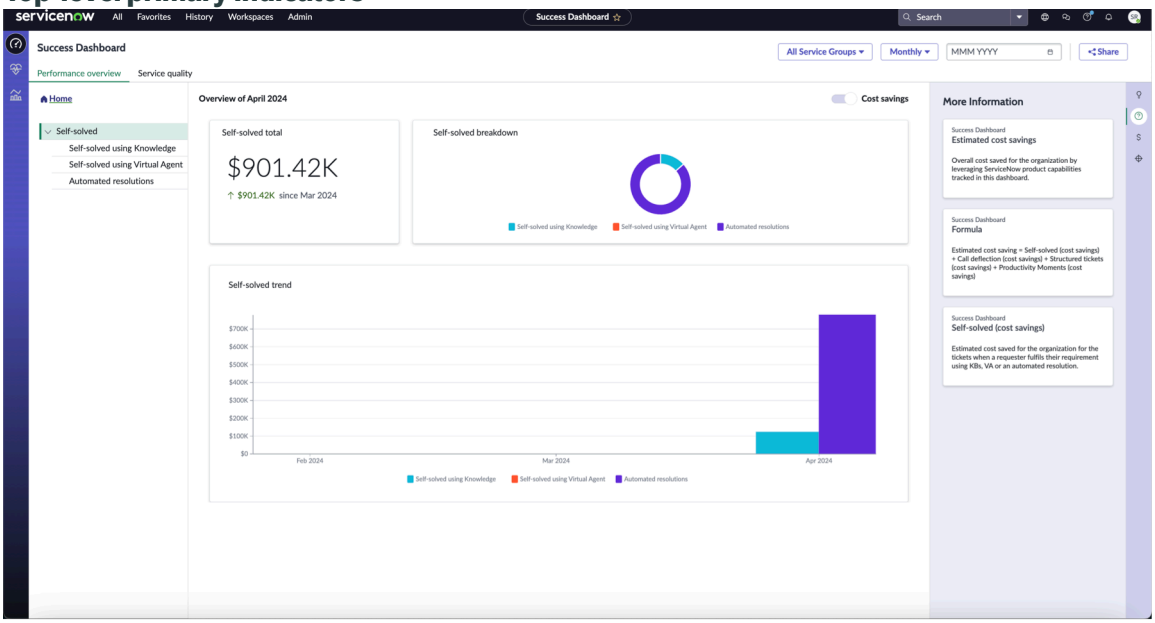
- View the primary indicators.

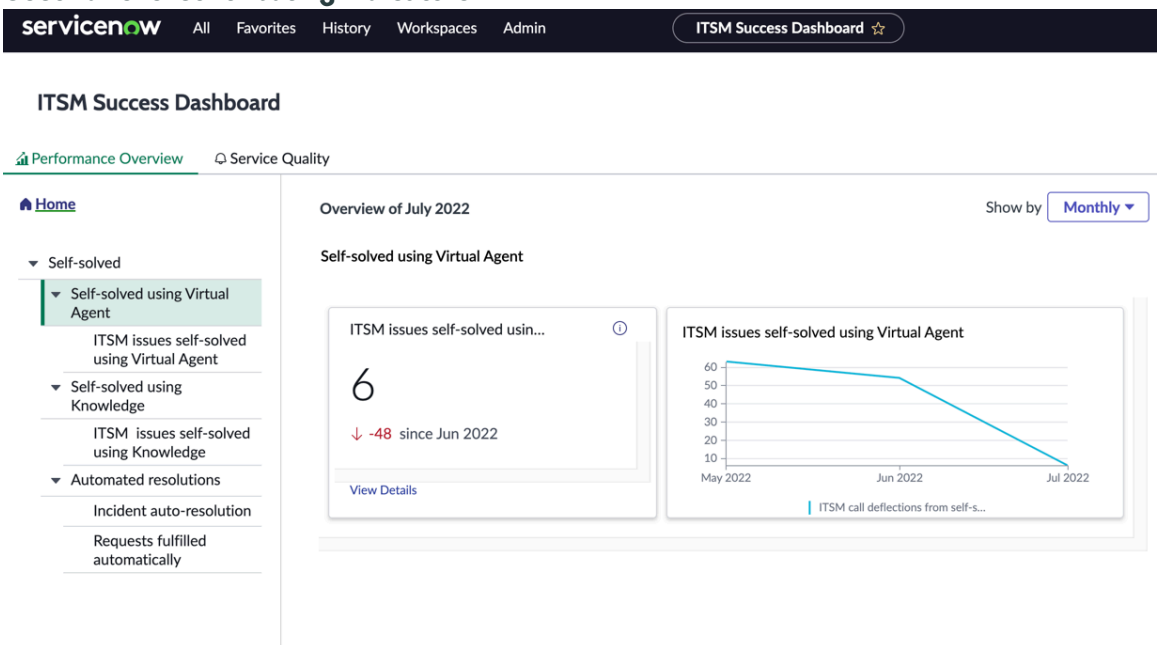
**Top-level primary indicators**




You can replace or add new indicators to suit your implementation in addition to the base system indicators. See Configure Success Dashboard indicators KPIs for more details.

- View the contributing indicators.

**Second-level contributing indicators**




You can view a graph of the contributing indicators scores over time along with the KPI value.

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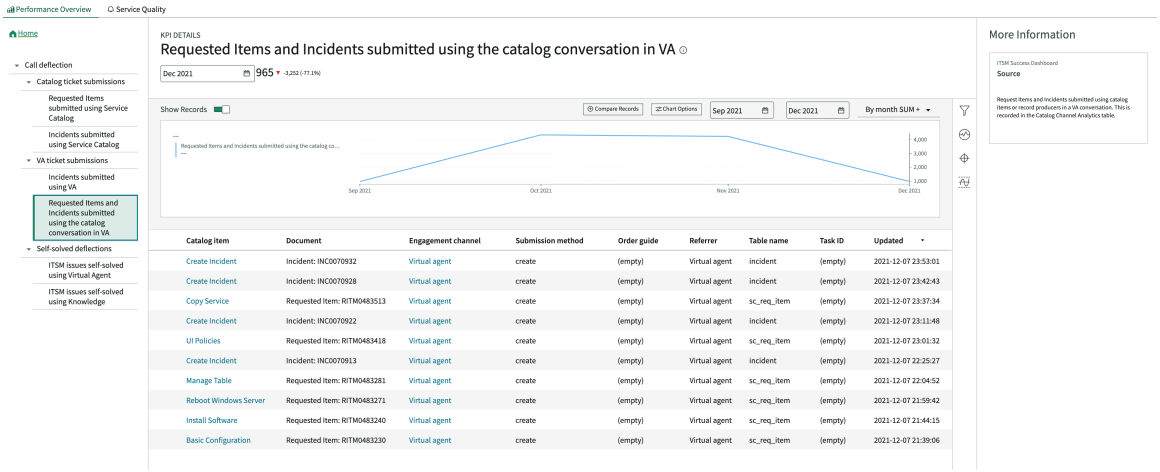
- View the record-level breakdown.

**Record-level breakdown indicators**




This level of drill down helps you view the record-level details of the indicator when you have the `sn_sd.success_dashboard_details_read` user permissions. See KPI details for more information.

**Note:**

You need to have the sn_sd.success_dashboard_details_read access to the records of the table to view the transactions in this level.

## View cost saving details in the ITSM Success Dashboard indicators

Enable Cost savings and view the drill-down views and their contextual descriptions for KPIs. The detailed information can be viewed by selecting **View Details**.

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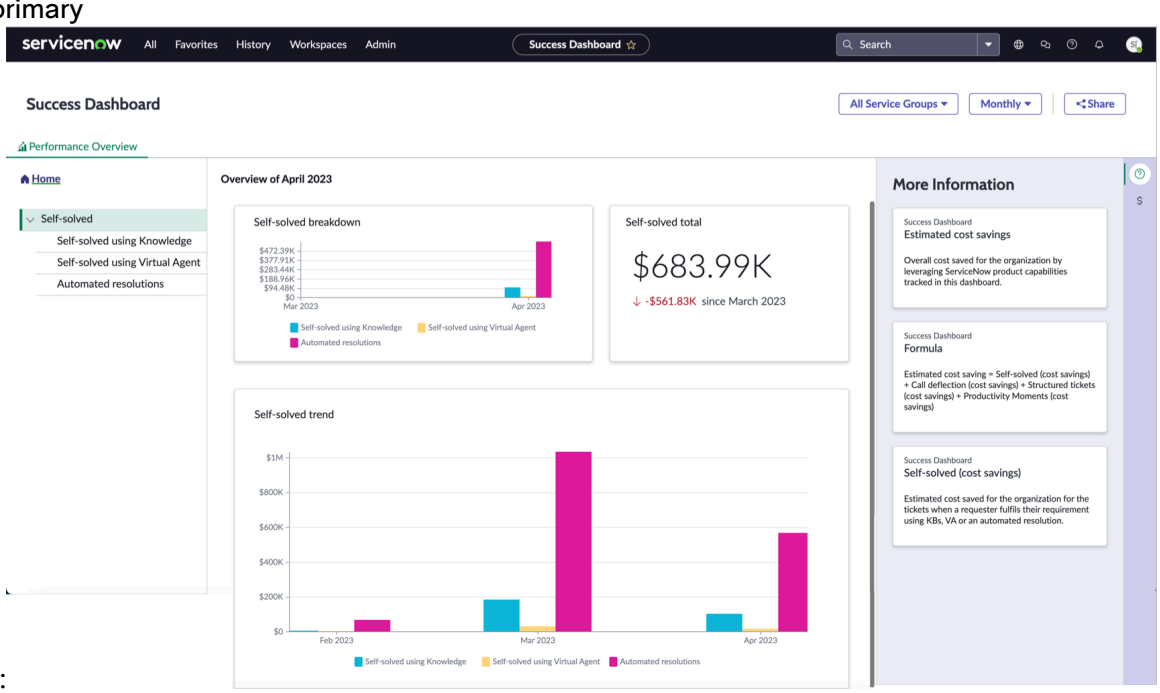
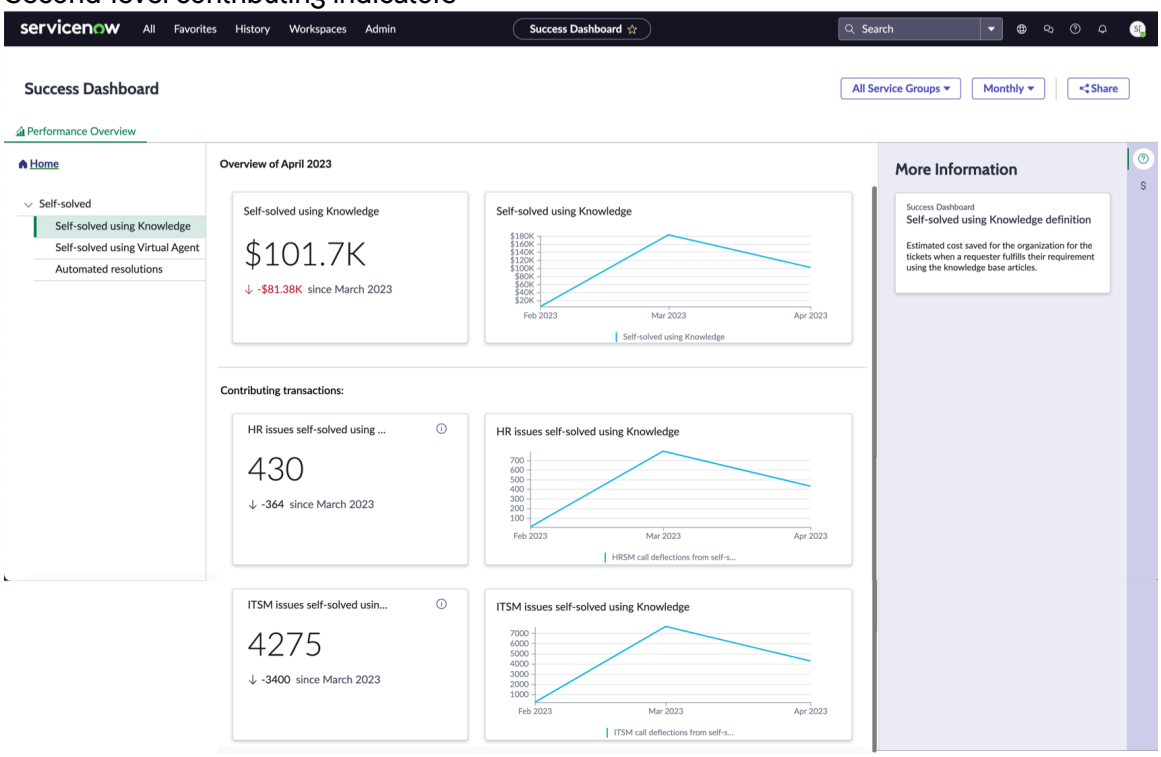
- View the primary




indicators:

- Second-level contributing indicators




## Contextual side panel in the ITSM Success Dashboard indicators

View the contextual formula and definitions, insights, and cost savings in the **More information**, **Insights**, and **Cost Savings** side panel respectively for the selected metric or KPI.

More Information side panel.

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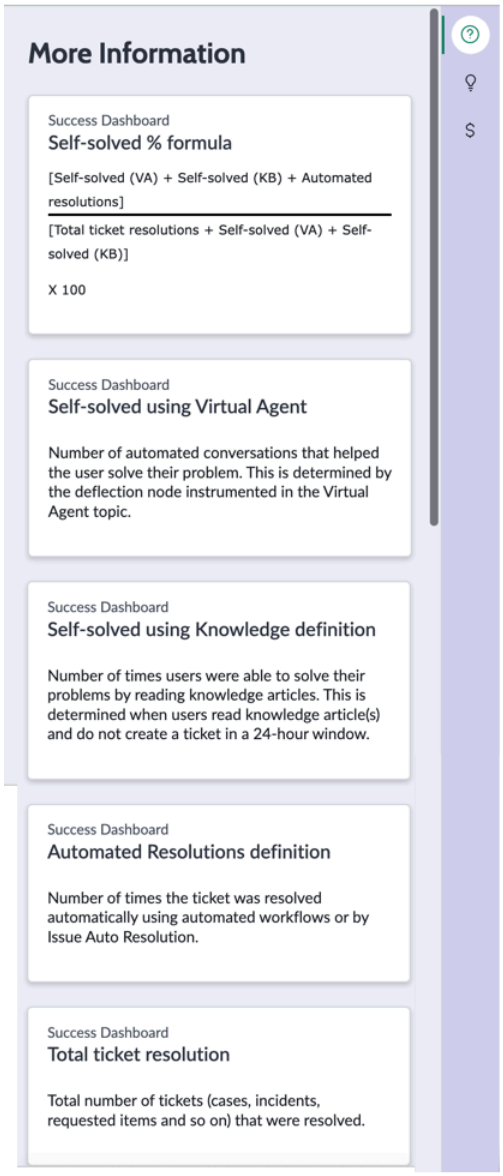
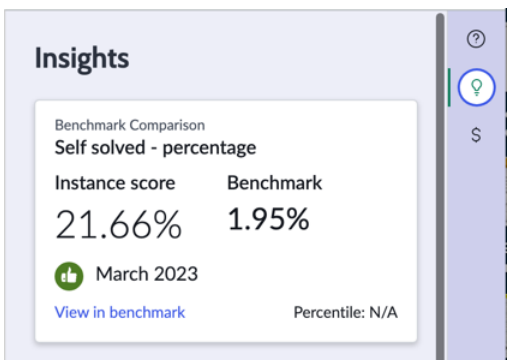



## Insights side panel

View the insights of the KPIs.




## Cost Savings side panel

View the amount saved for the KPI.

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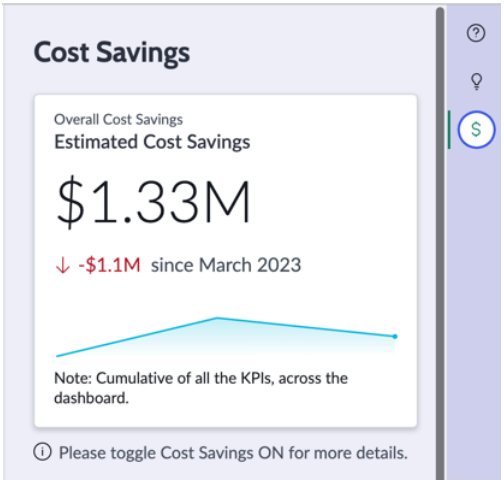



## View process insights on the ITSM Success Dashboard

View the process insights on the ITSM Success Dashboard to analyze the process bottlenecks and take steps from the analyst workbench to improve the metrics.

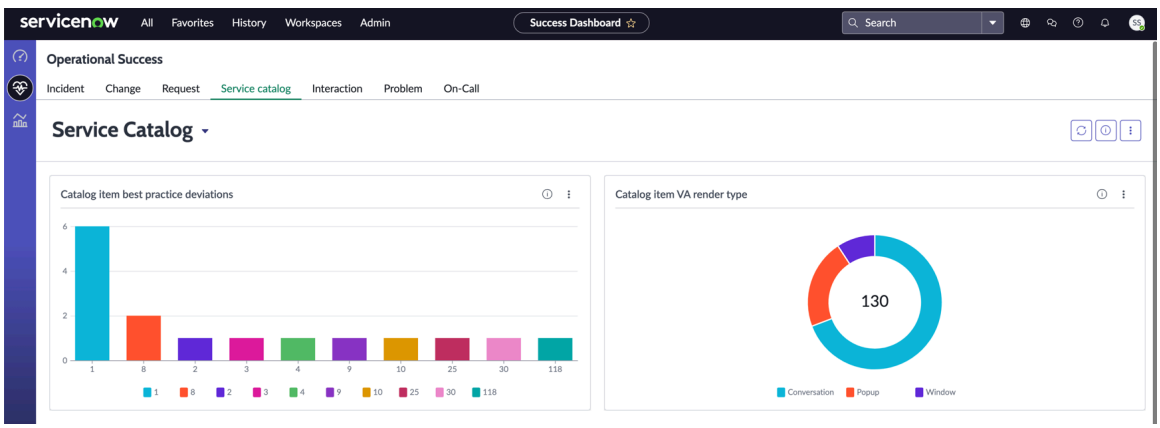
On the **Service Quality** tab, select **Insights** on the contextual side panel, then select **View in Analyst Workbench**.

Only the top two insights that are the least efficient are displayed in the contextual side panel. The process insights are executed in the incident table only in the base system.

## Operational Success dashboard in the ITSM Success Dashboard indicators

The Operational Success dashboard provides a consolidated view of the end-to-end performance of the IT processes that are implemented in your organization.

The dashboard showcases a snapshot of the performances for the Incident, Major Incident, Change, Request, Service Catalog, Interaction, Problem, and On-Call Scheduling applications. These indicators help teams and the leadership focus on areas that have an impact on business outcomes.




# Configuring ITSM Success Dashboard indicators

Set up the ITSM Success Dashboard indicators so that IT leadership teams and process owners can start using the dashboard.

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## Get started with ITSM Success Dashboard

1. Procure ITSM Pro license for ServiceNow IT Service Management applications.
2. Install the ITSM Success Dashboard application (sn_sd_itsm). For more information, see Install ITSM Success Dashboard.
3. Configure the knowledge base for IT Service Management. For more information, see Configure the knowledge base for ITSM Success Dashboard indicators.
4. Configure Virtual Agent topics with VA deflection nodes. For more information, see Configure Virtual Agent topics for ITSM Success Dashboard using deflection nodes.
5. Set fulfillment automation level of catalog item. For more information, see Set fulfillment automation level of catalog item for the Success Dashboard indicators.
6. Configure the Key Performance Indicators (KPI)s in the ITSM Success Dashboard. For more information, see Configuring ITSM Success Dashboard indicators.
7. Run the `UpdateFormulasSD` script to recalculate formulas. For more information, see Run Update formula script for ITSM Success Dashboard indicators.
8. Activate Performance Analytics jobs. For more information, see Activate Performance Analytics jobs for ITSM Success Dashboard indicators.

You can utilize the admin console to access the updated user interface, which showcases all relevant applications and necessary updates. From the admin console, you can create landing pages specific to their organization and configure all associated applications.

## Install ITSM Success Dashboard indicators

You can install the ITSM Success Dashboard indicators application (sn_sd_itsm) if you have the admin role. The application installs related ServiceNow® Store applications and plugins if they are not already installed.

### Before you begin

- Ensure that the application and all of its associated ServiceNow Store applications have valid ServiceNow entitlements. For more information, see Get entitlement for a ServiceNow product or application.
- Install the following plugins before installing the ITSM Success Dashboard application from the store
  - Performance Analytics
  - Performance Analytics Premium
  - Self-service analytics

Role required: admin

### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the  ITSM Success Dashboard indicators application (sn_sd_itsm) using the filter criteria and search bar.

   You can search for the application by its name or ID. If you cannot find the application, you might have to request it from the ServiceNow Store.

   In the list next to the **Install** button, the versions that are available to you are displayed.

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3. Select a version from the list and select **Install**.

   In the Install dialog box that is displayed, any dependencies that are installed along with your application are listed.

4. If you're prompted, follow the links to the ServiceNow Store to get any additional entitlements for dependencies.
5. Select **Install**.

## ITSM Success Dashboard Admin console

The ITSM Success Dashboard offers valuable insights to both the leadership team and process owners, enabling them to assess the performance of their product implementation.

The performance is assessed by utilizing the established key performance indicators (KPIs). This process categorizes configuration activities and provides information in each category such as planning guidance, pre-setup steps, and links to useful help content.

https://player.vimeo.com/video/1000871409?h=510f53d6b4&badge=0&autopause=0&player_id=0&app_id=58479

## Prerequisites

- User Roles: You can assign different roles based on specific access requirements. For more information on the ITSM Success Dashboard roles, see Success Dashboard indicators user roles and responsibilities
- Review and configure self-service KPIs: You can review and configure the self-service KPIs for Knowledge deflection, Virtual Agent deflection, and Catalog Item fulfillment level.
- Performance Analytics jobs: Activate Performance Analytics jobs to collect daily and historical data for the ITSM Success Dashboard indicators.
- Process Mining projects: Review and Configure the process mining KPIs.

## Advanced Options

Configure the ITSM Success Dashboard KPIs and its related attributes from the advanced options.

- System properties: Configure and manage the behavior of the features for the ITSM Success Dashboard.
- Attribute cost savings to contributing indicators: Review the time savings and the persona group association to contributing indicators based on your organization.
- Key performance indicators (KPIs): Enable the ITSM Success Dashboard and configure settings to understand and use the KPIs and formulas.
- Contributing indicators: Modify the base system contributing indicators associated with the primary indicators, or add additional contributing indicators based on your implementation.
- Contextual Help content: Add or modify the contextual help content to be displayed for the primary or contributing indicators.

### Set the refresh interval for Success Dashboard indicators

Set the refresh interval to calculate the number of incidents deflected within the defined time range when a user reads the KB article recommended by the Virtual Agent.

**Before you begin**
Role required: sn_sd.success_dashboard_admin

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### Procedure

1. Navigate to **All** > **Success Dashboard** > **Getting Started**.
2. Select **Review and Configure** in **Configure Knowledge deflection** card.
3. Select **Settings** tab.
4. Select a deflection pattern under Knowledge deflection.
5. Select **Edit**.
6. Update the value in **Window** field.

   This is the refresh interval for the report to be executed.
7. Right-click on the header and select **Save**.

## Configure the knowledge base for ITSM Success Dashboard indicators

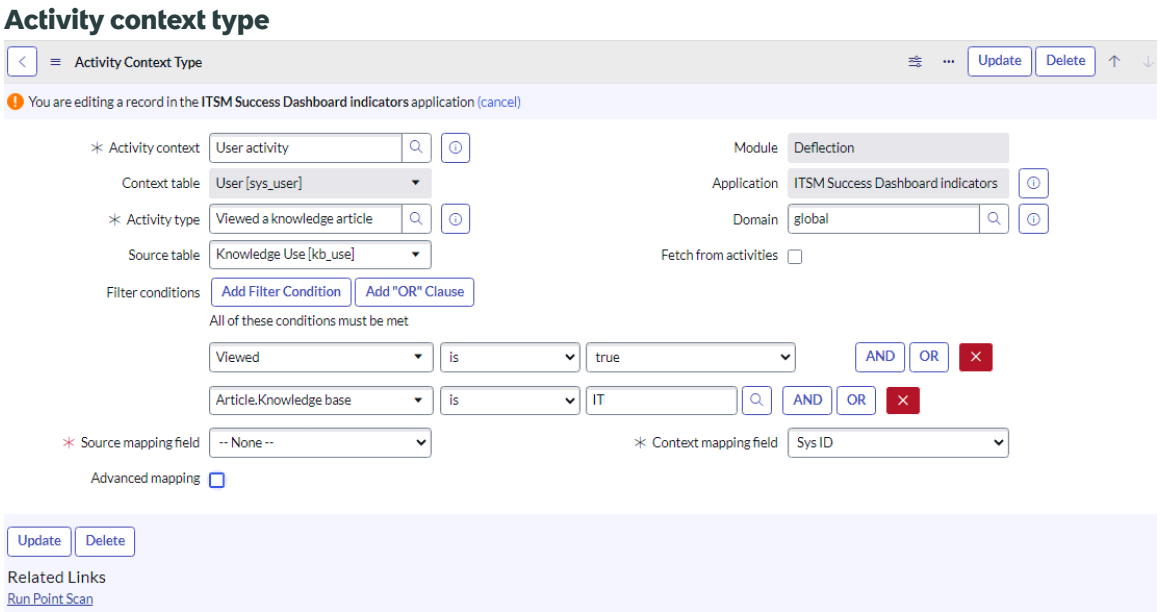
Include only the relevant knowledge bases related to IT while determining the **Self-solved using Knowledge** KPI in ITSM Success Dashboard indicators.

### Before you begin

Role required: admin

### Procedure

1. Navigate to **All** > **Self-Service Analytics** > **Activity Context**.
2. Select **User activity** from the list.
3. In the **Activity Context Types** tab, select the Preview icon corresponding to Viewed a knowledge article activity type.
4. Select **Open record**.
5. In the Activity Context Type form, change the filter condition to include the relevant knowledge bases.




6. Select **Update**.

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### Configure Virtual Agent topics for ITSM Success Dashboard

Configure the Virtual Agent (VA) topics for ITSM Success Dashboard indicators so that data is displayed correctly if you have topics other than the base system topics.

There are two different ways the base system measures success for Virtual Agent usage:

- Using deflection nodes in Virtual Agent topics which provides highly accurate and requires medium effort in tracking. For more information on how to use the deflection nodes, see Configure Virtual Agent topics for ITSM Success Dashboard using deflection nodes.
- Using self-service activity analytics which provides mid-high accuracy and requires zero effort in tracking. For more information on how to configure using the self-service analytics, see Configure Virtual Agent topics for ITSM Success Dashboard using self-service analytics.

### Configure Virtual Agent topics for ITSM Success Dashboard using deflection nodes

Map the topics with deflection patterns of the **ITSM VA Default** deflection tracker. Deflection trackers helps in analysing the performance of a conversation and how helpful Virtual Agent topics are for users.

#### Before you begin

Role required: admin

Modify the URL for the **Link Output** in a topic to set the referrer to va so that when a catalog item is submitted, the item is calculated as a submission from Virtual Agent

## Using knowledge deflection nodes

#### About this task

#### Procedure

1. Navigate to **All > Virtual Agent > Designer**.
2. Select the topic for which you want to add the deflection tracker.
3. Enable the flow chart view by disabling the **Table View** toggle switch.
4. Drag and drop the **Deflection** node from the **Utilities** section to the place in the flowchart where you want to add the deflection pattern.
5. Enter the following details in the Deflection Properties pane on the right.

**Deflection input parameters**

| Field | Value |
|---|---|
| Deflection Configuration | ITSM VA Default |
| Deflection Pattern | ○ **ITSM VA-Self-Resolving:** When the node in the topic indicates that Virtual Agent is able to resolve the user problem completely without creating an IT ticket (incident or request) and consequently contributing to the Self-solved KPIs.<br>○ **ITSM VA-Triage & Created:** When the node in the topic indicates that an IT ticket (incident or request) was submitted using Virtual Agent and consequently contributing to the call deflection KPIs. |
| Activity Table | Table where the deflection activity occurs. This table is associated with the primary activity table. For more information, see Create deflection configurations and patterns. |

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| Field | Value |
|---|---|
| Activity Ids | List of comma-separated activity system IDs. |

6. Select **Save**.
7. Select **Link Output** in the flow chart.
8. Select the url in the **Link** field in the Link response pane on the right.
9. Append the URL with `&referrer=va`.
10. Select **Save**.

**Related topics**

Tracking deflections using deflection topic blocks

Create deflection configurations and patterns

### Configure Virtual Agent topics for ITSM Success Dashboard using self-service analytics

Configure the Virtual Agent (VA) topics for ITSM Success Dashboard indicators using the self-service analytics.

#### Before you begin
Role required: admin

#### Procedure

1. Navigate to **All** > **Success Dashboard** > **Getting Started** > **Success Dashboard** > **Virtual Agent deflection**.
2. Select **Review and Configure**.
3. Select **Review** tab.
4. Select a deflection pattern under Virtual Agent deflection.
5. Update the value in **Refresh Window** field.

   This is the refresh interval for the report to be executed.
6. Select the fields under **Incidents considered**.
7. Select the **Virtual Agent topics considered**.
8. Select **Save**.

### Update the live agent script include

Live agent configuration is used in the self-solved deflections (Deflection using KB articles, Deflection using QnA AIS, Deflection using QnA LLM, and Deflection using ITSM VA). While configure these deflections, we need to update the live agent script include. Update the `SSADeflectionHelper` script to override the `checkInteraction` function.

#### Before you begin
Role required: admin

#### About this task
An agent interaction is where the interaction is not through a virtual agent interaction. The interaction could be through Walk up experience, phone, video or with a live agent. The base system instrumentation checks whether the employee created an incident or interacted with an agent after reading an article or interacting with a Virtual Agent.

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The *SSADeflectionHelper* script overrides the check interaction function and helps in setting up the live agent interaction.

### Procedure

1. Navigate to **All** > **System Definition** > **Script Includes**.
2. Open the *SSADeflectionHelper* script include and modify the script as follows.
   a. Override the function *checkInteraction* from *SSADeflectionHelperSNC*

```
checkInteraction: function(openedFor, windowStart, windowEnd)
 {
        var interactionRecord = new
 GlideRecord('interaction');
        // Pulling Virtual Agent User sysId from
 com.glide.cs.va.sys_user property
        var vaUser =
 gs.getProperty('com.glide.cs.va.sys_user');
        var windowConditions = 'opened_for=' + openedFor +
 '^sys_created_on>=' + windowStart + '^sys_created_on<=' +
 windowEnd;
        var interactionConditions =
 'virtual_agent!=true^ORstateINon_hold,closed_abandoned^ORsys
_created_by=system^ORopened_for.web_service_access_only!=fals
e^opened_for.web_service_access_onlyISNOTEMPTY^ORopened_for.i
nternal_integration_user!=false^opened_for.internal_integrati
on_userISNOTEMPTY^assigned_to!=' + vaUser +
 '^ORassigned_to=NULL';
        var encodedQuery = windowConditions + '^' +
 interactionConditions;
        interactionRecord.addEncodedQuery(encodedQuery);
        interactionRecord.setLimit(1);
        interactionRecord.query();
        if (interactionRecord.next()) {
            return true;
        }
        return false;
    },
```

   b. Update the following line to update the live agent interaction conditions:

```
var interactionConditions =
 'virtual_agent!=true^ORstateINon_hold,closed_abandoned^ORsys
_created_by=system^ORopened_for.web_service_access_only!=fals
e^opened_for.web_service_access_onlyISNOTEMPTY^ORopened_for.i
nternal_integration_user!=false^opened_for.internal_integrati
on_userISNOTEMPTY^assigned_to!=' + vaUser +
 '^ORassigned_to=NULL';
```

```
checkInteraction: function(openedFor, windowStart, windowEnd) {
    var interactionRecord = new GlideRecord('interaction');
    // Pulling Virtual Agent User sysId from com.glide.cs.va.sys_user property
    var vaUser = gs.getProperty('com.glide.cs.va.sys_user');
    var windowConditions = 'opened_for=' + openedFor + '^sys_created_on>=' + windowStart + '^sys_created_on<=' + windowEnd;
    var interactionConditions = 'virtual_agent!=true^ORstateINon_hold,closed_abandoned^ORsys_created_by=system^ORopened_for.web_service_access_only!=false^opened_for.
    web_service_access_onlyISNOTEMPTY^ORopened_for.internal_integration_user!=false^opened_for.internal_integration_userISNOTEMPTY^assigned_to!=' + vaUser +
    '^ORassigned_to=NULL';
    var encodedQuery = windowConditions + '^' + interactionConditions;
    interactionRecord.addEncodedQuery(encodedQuery);
    interactionRecord.setLimit(1);
    interactionRecord.query();
    if (interactionRecord.next()) {
        return true;
    }
    return false;
},
```

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### Set fulfillment automation level of catalog item for the Success Dashboard indicators

Set the fulfillment automation level of catalog items from any Service group that are fulfilled without any manual intervention to Fully-automated tracking of the requested items with an end-to-end automated fulfilment.

#### Before you begin
Role required: admin or catalog_admin

#### Procedure

1. Navigate to **All** > **Success Dashboard** > **Getting Started** > **Success Dashboard** > **Catalog Item fulfilment level**.
2. Select **Configure**.
3. Select the catalog item for which you want to set the fulfillment automation level.
4. Select **Update as Fully automated**.

### Activate Performance Analytics jobs for ITSM Success Dashboard indicators

Activate the Performance Analytics (PA) jobs to collect daily and historical data for the ITSM Success Dashboard indicators.

#### Before you begin
Role required: admin

#### Procedure

1. Navigate to **All** > **Success Dashboard** > **Getting Started** > **Success Dashboard** > **Performance Analytics (PA) jobs**.
2. Select **Activate PA jobs**.
3. Activate the scheduled jobs by selecting the **Active** check box corresponding to the job.
4. To run the scheduled jobs for historical data collection:
   a. Navigate to the required historical data collection job.
   b. Select **Execute Now** to see the past 60 days data in the dashboard.

**Note:**
The number of days for which the data has been collected can be customized.

### Configure Success Dashboard indicators KPIs

Success Dashboard indicators has a prescriptive methodology for measuring performance. But you can reconfigure the source of the Key Performance Indicators (KPIs) by replacing the available indicators in the base system or by adding more indicators.

For example, your organization may have a different method to determine **Self-solved using Knowledge**. You cannot change the definition of **Self-solved percentage** and **Call deflection** that use `Self-solved using Knowledge`, but you can replace or add the KPIs and its constituents.

There are two major types of indicators:

- Primary indicators: The indicators prescribed by ServiceNow.

**Warning:**
You must not modify any primary indicators as these are prescribed by ServiceNow®. Modifying these KPIs might impact your scores.

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- You can view the primary indicators in the Primary Indicator Registry table (`sn_sd_primary_indicator_registry`).
- You can view the corresponding Performance Analytics indicators in the Primary Indicator table (`sn_sd_primary_indicator`).

  Primary indicators are of the following types:

  - Manual: The formulae for these indicators are made up of other primary indicators.
  - Automatic: The formulae for these indicators are automatically calculated based on the contributing indicators.

- Contributing Indicators: The indicators listed in the Contributing Indicator Registry (`sn_sd_contributing_indicator_registry`) table and that point to primary indicators.
  - When these indicators are registered with automatic primary indicators, the formula of the primary indicator is automatically updated to include these indicators in the sum.
  - When these indicators are removed from the registry or marked inactive, the formula of the primary indicator is updated to remove this indicator from the sum. For example:

    ```
    Self-solve (manual primary indicator) = Self-solved using
     Virtual Agent (automatic primary indicator) + Self-solved
     using Knowledge (automatic primary indicator) + Automated
     Resolutions (automatic primary indicator)
    ```

    Where:

    - Self-solved using Virtual Agent = Any Service group issues self-solved using VA (the only contributing indicator registered for this primary indicator)
    - Self-solved using Knowledge = Any Service group issues self-solved using Knowledge (the only contributing indicator registered for this primary indicator)
    - Automated Resolutions (automatic primary indicator) = Incident or HR ticket auto-resolution (the only contributing indicator registered for this primary indicator)

### Add contributing indicators

Add new contributing indicators based on your organizational preferences.

## Before you begin

Role required: sn_sd.success_dashboard_admin

## About this task

Your organization can add the new contributing sources as the primary indicator. For example, determining the automated catalog request completions can be added to Automated Resolutions.

## Procedure

1. Create a Performance Analytics (PA) indicator and its data collection job that measures the daily score (count) of the metric that you want to measure.
   The description set for this PA indicator is used to describe the indicator when the user selects the information icon on the score card. Alternatively, if you already have a PA indicator that measures daily scores of the metric you want to measure, you can directly proceed to register and use the PA indicator.

   For information on permissions required to create a PA indicator, see Performance Analytics roles for more details.

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2. Register the PA indicator against the Primary Indicator that it must be reported in by creating a record in the Contributing Indicator Registry table (sn_sd_contributing_indicator_registry).

   a. Navigate to **All** > **Success Dashboard** > **Getting Started** > **Success Dashboard** > **Key performance indicators (KPIs)**.

   b. Select the row context menu against the KPI you want to add the contributing indicator.

   c. Select **Add contributing indicator**.

   d. On the form, fill in the fields.

**Contributing Indicator Registry form**

| Field | Description |
|---|---|
| Name | Unique identifier contributing indicator. |
| Contributing Indicator | Performance Analytics indicator of the metric. |
| Primary KPI | The primary indicator where the new indicator is being added to. |
| Service group | Service group of the performance indicator.<br>**Note:** ITSM or HR must be selected as a service group, as required. |

   e. Select **Add**.

   f. **Optional:** Add More information context cards for this indicator so that the user viewing the primary and contributing indicator details understands this KPI.
   See Update more information cards for details.

   g. In the **Persona Group Time Savings** related list, click **New**.

   h. On the form, fill in the fields.

**Persona Group Time Saving form**

| Field | Description |
|---|---|
| Persona Group | Option to select the persona group fr the contributing indicator. |
| Time saved | Option to enter the time that will be saved to complete the request. |

   i. Right-click the header and select **Save**.

**Note:**
You can also update the values for the indicators in **Persona Group Time Savings** section for the out of the box indicators that are **Automatic** type.

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### Add time savings

Add new time savings as a contributing indicator based on your organizational preferences.

#### Before you begin

Role required: sn_sd.success_dashboard_admin

#### Procedure

1. Navigate to **All** > **Success Dashboard** > **Getting Started** > **Success Dashboard** > **Key performance indicators (KPIs)**.
2. Select the row context menu for **Contributing KPI type** to add the time savings option as a contributing indicator.
3. Update the **Persona group** and **Time Saved**details.
4. Select **Add**.
5. Update the existing time savings for the requested items by selecting the record and select **Remove**.

**Note:**
You can update the record only in the application scope.

### Update more information cards

Configure and update the **More Information cards** in the side panel.

#### Before you begin

Role required: sn_sd.success_dashboard_admin

#### Procedure

1. Navigate to **All** > **Success Dashboard** > **Getting Started** > **Success Dashboard** > **Key performance indicators (KPIs)**.
2. Select the row context menu for **Contributing KPI type** to update the more information record.
3. Modify the content of the record based on your requirement.
4. Select **Add**.

#### What to do next

Associate the new context information card with an indicator. To associate a new context information card to a primary or contributing indicator, perform the following steps:

1. Navigate to **All > sn_sd_indicator_context_information.list**.
2. Select **New**.
3. On the form, fill in the following fields:

**Indicator Context Information**

| Field | Description |
|---|---|
| Icon | Name of the icon that appears beside the tagline. You can select from any of the icons available in the gallery. |
| Tagline | Short label of the card. |
| Heading | Short heading that provides context on what the card explains. |

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| Field | Description |
|---|---|
| Content | HTML text that describes the card. |
| Footer | Footer of the card. |

4. Select **Submit**.
5. Navigate to **All > sn_sd_m2m_indicator_context_information.list**.
6. Select **New**
7. On the form, fill in the following fields:

#### M2m Indicator Context Information

| Field | Description |
|---|---|
| Indicator Context information | The record that is being created. |
| Contributing Indicator Registry (if applicable) | The contributing indicator with which the card is associated with. |
| Primary Indicator (if applicable) | The primary indicator with which the card is associated with. |
| Order | The order in which the card should appear. |

8. Select **Submit**.

### Create a cost savings indicator for ITSM Success Dashboard

Create a cost savings indicator in ITSM Success Dashboard to determine and display the time saved for the contributing indicators when agents work on an incident.

#### Before you begin
Role required: sn_sd.success_dashboard_admin

#### Procedure

1. Navigate to **All** > **Success Dashboard** > **Getting Started** > **Success Dashboard** > **Key performance indicators (KPIs)**.
2. In the Customize Cost Savings card, select **For ITSM**.
3. On the form, fill in the fields.

#### Cost savings

| Field | Description |
|---|---|
| Select the contributing indicator | Option to select a performance metric from the drop-down menu to add or modify time-saving measures.<br>Select **Next**to go to **Time savings** section.<br>Select **Cancel & Exit** to cancel the setup. |
| Time savings | Option to select the persona group. |

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| Field | Description |
|---|---|
| | Select **Add**. |
| Time savings action | ○ Persona group – Select a persona group from the drop-down menu.<br>○ Contributing indicator registry – This field is populated based on the selected indicator.<br>○ Time saved – Define the time saved.<br>Select **Mark Complete**. |
| Review updates | Verify that the values provided are accurate.<br>Select **Mark Complete**. |

### Modify the currency code for ITSM Success Dashboard indicators

Modify the currency code for ITSM Success Dashboard indicators.

#### Before you begin

Role required: sn_sd.success_dashboard_admin

#### Procedure

1. Navigate to **All** > **Success Dashboard** > **Getting Started**.
2. On the **Configure System properties** card, select **Configure Properties For ITSM**.
3. Select *sn_sd.success_dashboard_currency*.
   If a message appears indicating that you need to change to the Success Dashboard Core application, select the word **here** in the message
4. Modify the **Value** field, enter your desired currency code.
5. Select **Update**.

## Operational Success Admin Console

The Operational Success dashboard provides a consolidated view of the end-to-end performance of the IT processes that are implemented.

## Prerequisites

User Roles: You can assign different roles based on specific access requirements.

## Configure

Tabs and dashboards: Map a KPI category such as Incident, Problem, Change, Request, and so on as an Operational Success dashboard tab to view the ITSM processes performance in your organization. Use this option to map the Performance Analytics dashboard associated with these KPI categories.

## Advanced options

Review and configure the data visualization available in the base system for Incident, Problem, Change, Request, Interaction, Service catalog, Major Incident, Password Reset, and Walk-up Experience.

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### Create an operational success dashboard

Create a KPI category and map with the operational dashboard to view the performance of the ITSM processes in your organization.

#### Before you begin

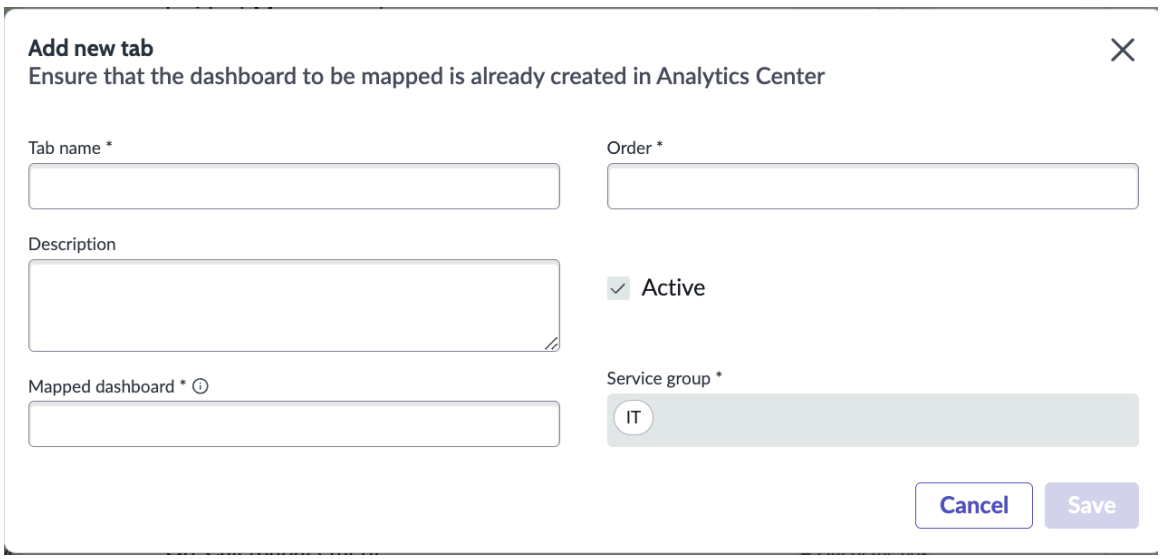
Role required: sn_sd.success_dashboard_admin

#### Procedure

1. Navigate to **All** > **Success Dashboard** > **Getting Started** > **Operational Success** > **Operational Success: Tabs and dashboard**.
2. Select **Review and configure**.
3. Select **Add new tab**.
4. On the form, fill in the fields.

**Add new tab**

| Field | Description |
|---|---|
| Tab name | Unique name of the dashboard. |
| Mapped Dashboard | Dashboard type of the new KPI category that is to be associated. |
| Order | Order of the dashboard. |
| Service group | The specific service group the new dashboard belong to. |




5. Select **Save**.

#### Result

The new dashboard appears on the Operational success dashboard.

## Benchmarks admin console

The ServiceNow® Benchmarks application gives you instant visibility into your key performance indicators (KPIs) and trends, as well as comparative insight relative to industry averages of your peers and to the industry top performers.

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- User Roles: You can assign different roles based on specific access requirements.
- Opt in to Benchmarks: You can opt in to Benchmarks by accepting the opt-in agreement. Once you opt in, you have visibility into your service management key performance indicators and trends. It also provides a comparative insight relative to the industry averages of your peers.

For more information, see Getting started with the ITSM Success Dashboard admin console.

## Run Update formula script for ITSM Success Dashboard indicators

Run the `UpdateFormulasSD` script to recalculate all the formulas in ITSM Success Dashboard indicators if you see outdated data in the dashboard.

### Before you begin

Role required: admin

### Procedure

1. Navigate to **All** > **System Definition** > **Scheduled Jobs**.
2. Open the `UpdateFormulasSD` list from the list.
3. Select **Execute Now**.

> **Note:**
> `UpdateFormulasSD` is a scheduled job that executes once in 24 hours.

## Identify and add the automation opportunities on ITSM Success Dashboard

Identify and add the automation opportunities that lead to faster incident resolutions using Virtual Agent.

### Before you begin

Role required: sn_sd.success_dashboard_details_read

### Procedure

1. Navigate to **All** > **Success Dashboard** > **Success Dashboard**.
2. Access the automation discovery report.
   a. Select the **Performance overview** tab.
   b. Select **Insights** ( ) on the contextual side panel.
   c. On the Automation opportunities card, select **View in Automation Discovery**.
   The list of automation opportunities for Virtual Agent is displayed.
3. Select a topic to be added to Virtual Agent, and then select **Add to VA**.

### Result

The list of topics are now added to the as the opportunities for Virtual Agent for faster incident resolution.

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# Maximise the benefits of using the ITSM Success Dashboard indicators

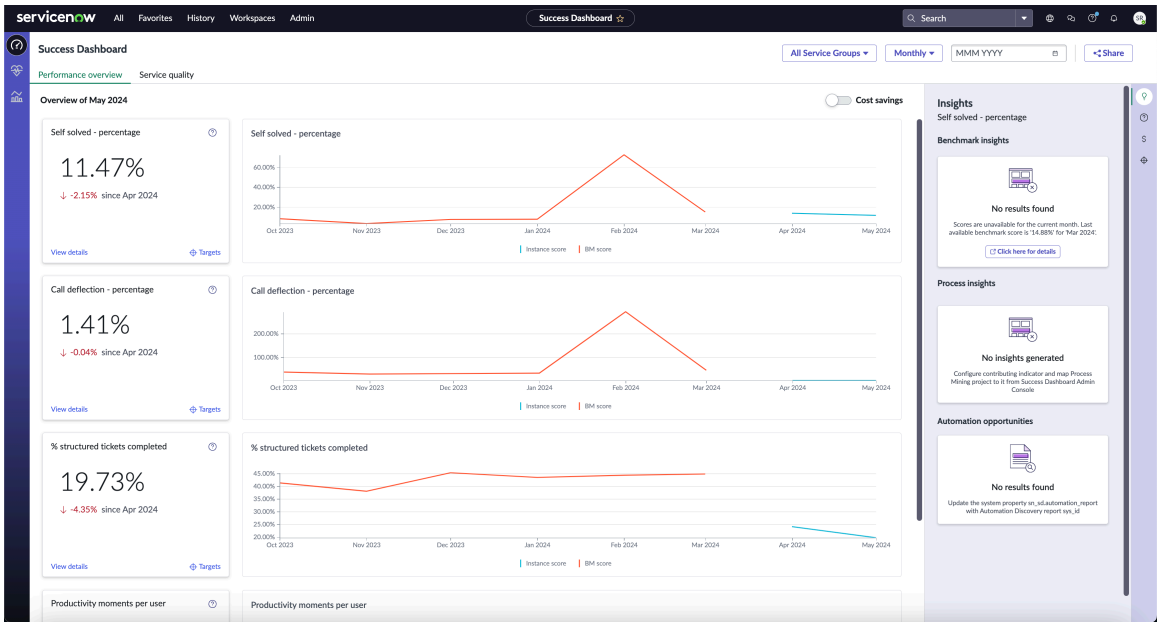
Use the ITSM Success Dashboard indicators to measure the performance of your ITSM implementation using the Key Performance Indicators (KPIs) defined by ServiceNow.

## Monitoring the KPIs period over period

View and monitor the ITSM Success Dashboard indicators to measure the performance of your ITSM implementation using the Key Performance Indicators (KPIs) defined by ServiceNow.

You can access the aggregated KPI data in the ITSM Success Dashboard indicators by navigating to **All>** > **Success Dashboard** > **Success Dashboard** if you have the sn_sd.success_dashboard_admin, sn_sd.success_dashboard_read, or sn_sd.success_dashboard_details_read role.

For more information on the ITSM Success Dashboard indicator components, see ITSM Success Dashboard indicator components.




You can monitor data by any of the following time aggregations.

- **Monthly:** Shows the data aggregated monthly. For counts, this data is the monthly sum of the daily values. For percentages, this data is the monthly average of the daily percentages.
- **Quarterly:** Shows the data aggregated quarterly. For counts, this data is the quarterly sum of the daily values. For percentages, this data is the quarterly average of the daily percentages.
- **Yearly:** Shows the data aggregated yearly. For counts, this data is the yearly sum of the daily values. For percentages, this data is the yearly average of the daily percentages.

Once the time aggregation is set, all the score-cards show the data for that period.

For more information on the dashboard components, see HR Success Dashboard indicators components.

For more information on the KPI definitions and formulas, see HR Success Dashboard indicators KPI definitions and formulae.

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## Share the Success Dashboard indicators

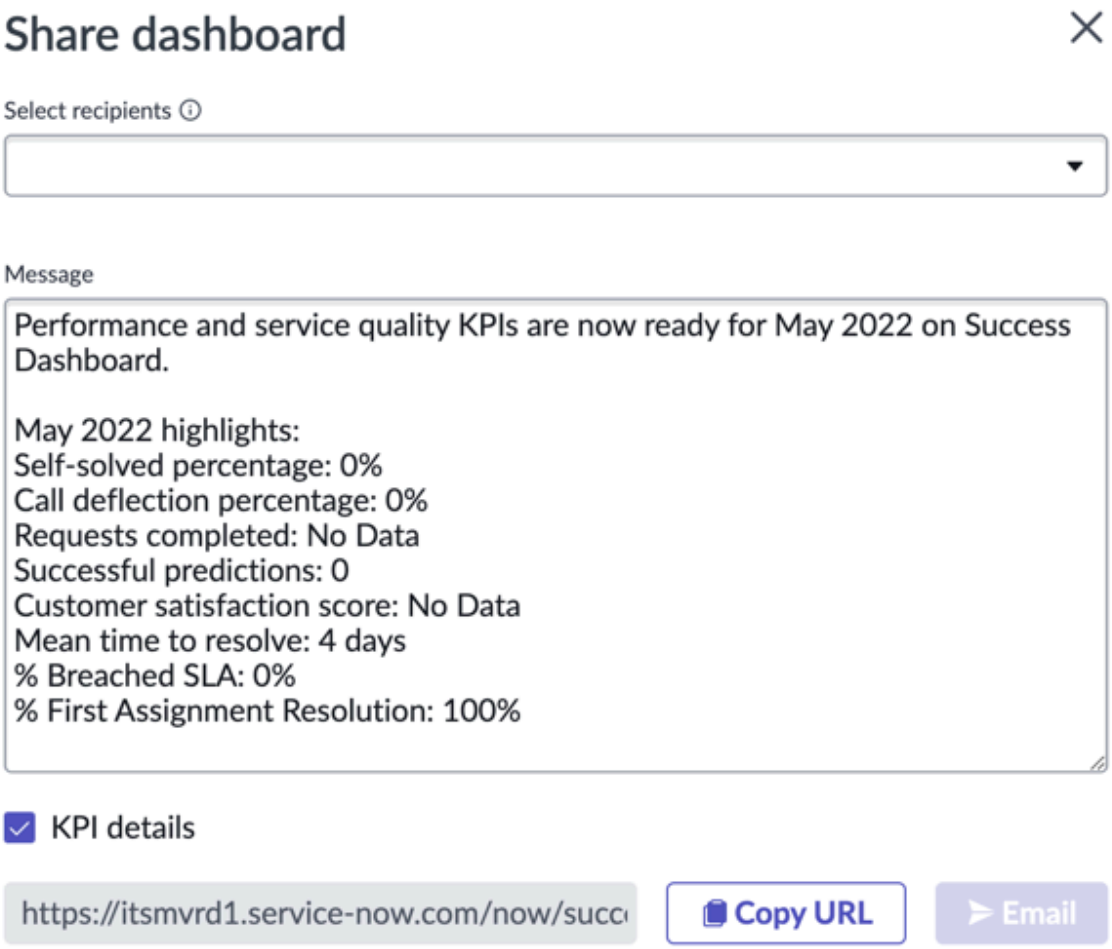
Share the Success Dashboard indicators with your respective leadership teams, ITSM or HR to view the dashboard and measure the performance of their respective implementations.

### Before you begin

Role required: sn_sd.success_dashboard_admin, or sn_sd.success_dashboard_read, or sn_sd.success_dashboard_details_read

### Procedure

1. Navigate to **All>** > **Success Dashboard** > **Success Dashboard**.
2. Select **Share dashboard**.
3. In the Share dashboard dialog box, select the recipients with whom you want to share the dashboard from the **Select recipients**




list.

4. **Optional:** Modify the default message that is sent to the recipients in the **Message** field.
5. **Optional:** Select the **KPI details** option to add the KPI information in the message.
6. Select **Email** to send the email to the selected recipients.
7. **Optional:** Select **Copy URL** to copy a link to the dashboard and send it through different means.

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## Benchmarks for Success Dashboard indicators

You can view the global benchmark score for the Success Dashboard KPIs and trends along with comparative insight relative to the customers using Success Dashboard.

You must enable the Benchmarks and allowed to share the organization's indicators data. For more information on Success Dashboards KPIs, refer Benchmark KPIs.

## Estimated Cost Savings for Success Dashboard indicators

Estimated Cost Savings provides the data to measure the success of the product by calculating the total amount saved by the agents for Virtual Agent, Knowledge, and Service Catalog.

View the total estimated cost saved and its breakdowns to measure benefits from the product capabilities:

- Overall estimated cost saved by specific ServiceNow® product capabilities ITSM Success Dashboard
- Contribution by individual channels like Virtual Agent conversations, Knowledge articles, and Service Catalog submissions
- Formulas and definitions of the data presented on the dashboard
- Data trending monthly, quarterly, and yearly

## Key features

This dashboard provides the following features:

- Centralized view with prescribed KPIs, computing cost savings for the overall cost saved that includes Self-solved, Call deflection, Structured tickets completed, and Successful predictions
- Monthly, quarterly and yearly aggregation of the KPIs
- Contextual help explaining a selected KPI and its formula
- Ability to configure persona groups, the hourly salary for each persona group, and the time saving for each persona group per indicator
- Ability to view the cost saved for individual components on the dashboard

## Viewing the dashboard

To view the dashboard, you must have the sn_sd.success_dashboard_admin, sn_sd.success_dashboard_read, or sn_sd.success_dashboard_details_read role. Navigate to **All** > **Success Dashboard** > **Success Dashboard**.

## View metrics for selected period in ITSM Success Dashboard indicators

View the Key Performance Indicators (KPIs) metrics on the ITSM Success Dashboard for a selected period to analyze the performance.

### Before you begin

Role required: user

### Procedure

1. Navigate to **All** > **Success Dashboard** > **Success Dashboard**.
2. Select **Performance Overview** tab.
3. Select **Show calendar**.

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4. Select the year, and the month.
5. Select **OK**.

**Note:**

The values of all the KPIs including the contributing KPIs for the selected criteria is displayed on the dashboard. The data is refreshed for each selected criteria.

## Create target for the KPI in the Success Dashboard

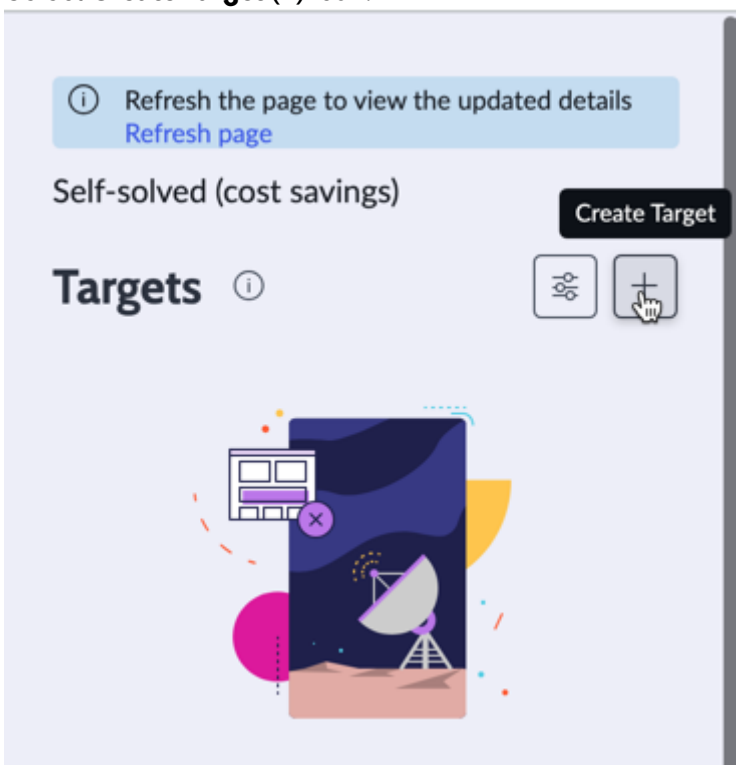
Create a target for a KPI to be on par with the benchmark score or the organizational targets.

### Before you begin

Role required: user

### Procedure

1. Navigate to **All** > **Success Dashboard** > **Success Dashboard**.
2. Select **Performance Quality** tab.
3. Select **Targets**.
4. Select **Create Target** (+) icon.




5. On the form, fill in the fields.

#### KPI targets

| Field | Description |
|---|---|
| New value | Option to enter the target value for your KPI. |
| Target start date | Option to select the target start date. |

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| Field | Description |
|---|---|
| Target review date | Option to select the date to review the target. |

6. Select **Save**.

**Note:**
Select **Refresh** to view the target set on the trendline.

## ITSM Success Dashboard indicators reference

Reference topics provide additional information about components installed with ServiceNow ITSM Success Dashboard indicators.

### Success Dashboard indicators user roles and responsibilities

Leaders and process owners of both ITSM and HR can configure and use the Success Dashboard indicators to measure the success of the implementation.

The Success Dashboard indicators roles and the tasks are uniform across Service groups; ITSM or HR. The following are the user roles and responsibilities:

| User role and responsibilities | Required role |
|---|---|
| As a dashboard admin, you can:<br>• Configure the dashboard settings<br>• Manage KPIs by adding or removing a contributing indicator.<br>• Share the dashboard | sn_sd.success_dashboard_admin |
| As an IT leader or process owner, you can<br>• View the dashboard and KPIs<br>• View the breakdowns at a high level<br>• Share the dashboard | sn_sd.success_dashboard_read |
| As a process owner, you can<br>• View the dashboard and KPIs<br>• View the breakdowns at record-level<br>• Share the dashboard | sn_sd.success_dashboard_details_read<br>**Note:** To view the transactions in this level, you must have the sn_sd.success_dashboard_details_read access to the records of the table. |

### ITSM Success Dashboard indicators KPI definitions and formulas

Enable ITSM Success Dashboard and configure settings to understand and use the Key Performance Indicators (KPIs) and formulas.

#### Performance overview

ITSM Success Dashboard uses the following KPIs and definitions:

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- **Self-solved percentage:** Calculated from the daily average number of times your users achieved a resolution without intervention from Tier 1 Agents in the report range. Includes numbers from Self-solved using Virtual Agent, Self-solved using Knowledge and Automated resolutions (For example, Incident auto-resolution via Virtual Agent). See the formula:

```
[Self-solved using Virtual Agent + Self-solved using Knowledge
 + Automated resolutions] / [Total ticket resolutions +
 Self-solved (VA) + Self-solved (KB)] x 100
```

  - **Self-solved using Virtual Agent:** Number of automated conversations that helped the user solve their problem. In the base system, this is determined by the `ITSM-self-resolving` deflection pattern instrumented in the Virtual Agent topic and recorded in the Deflection Metrics table. The topics shipped with ITSM VA Conversations already have these nodes instrumented but must be instrumented in all other topics.

    **Note:**
    To use a different method to determine this KPI, see Configure Success Dashboard indicators KPIs.

  - **Self-solved using NOW Assist:** Number of automated conversations that helped the user solve their problem. In the base system, this is determined by the `ITSM-self-resolving` deflection pattern instrumented in the NOW Assist topic and recorded in the Deflection Metrics table. The topics shipped with ITSM NOW Assist Conversations already have these nodes instrumented but must be instrumented in all other topics.
  - **Self-solved using Knowledge:** Number of times users were able to solve their problems by reading knowledge articles. In the base system, this is determined when users read the knowledge articles and do not create an incident in a 24-hour window.

    **Note:**
    To use a different method to determine this KPI, see Configure Success Dashboard indicators KPIs.

  - **Automated Resolutions:** Number of times the ticket was resolved automatically. In the base system, the indicators contributing to this metric are Incident Auto Resolution and Request Fulfilled Automatically.
    - The Incident Auto Resolution value is determined by the deflection node configured in the Issue Auto Resolution Virtual Agent topic.
    - The Request Fulfilled Automatically value is the number of requested items that are fulfilled using automated workflows. When the catalog item uses an automated workflow, the **Fulfillment automation level** field of the catalog item must be set to **Fully-automated** for it to be included in this metric.
    - **Accounts unlocked using Password Reset apps**: Number of times users were able to unlock their accounts successfully using Password Reset apps.
    - **Passwords updated using Password Reset apps**: Number of times users were able to update their account passwords using the Password Reset apps.

    **Note:**
    To use a different method to determine this KPI or add more sources (for example, automated catalog workflows), see Configure Success Dashboard indicators KPIs.

  - **Total ticket resolutions:** Number of incidents resolved + Number of requested items closed.
- **Call deflection:** Calculated from the number of times per day requesters performed the actions, Ticket submissions using Service Catalog, Ticket submissions using Virtual Agent,

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Self-solved using Virtual Agent and Self-solved using Knowledge without Tier 1 agent intervention. See the formula:

```
[Catalog ticket submissions + VA ticket submissions +
 Self-solved (VA) + Self-solved (KB)]/ [Total tickets submitted
 + Self-solved (VA) + Self-solved (KB)] x 100
```

- **Catalog ticket submissions:** Incidents and requested items submitted using Service Catalog in Service Portal or Now Mobile app.
- **VA ticket submissions:** Number of times the ticket was submitted using Virtual Agent. In the base system, this is determined by the `ITSM - Triage & Created` deflection pattern instrumented in the Virtual Agent topic. The topics shipped with ITSM VA Conversations already have these nodes instrumented but must be instrumented in all other topics that create incidents.

  **Note:**
  If you use a different method to determine this KPI or add more sources (for example, automated catalog workflows), you can use the steps described in Configure Success Dashboard indicators KPIs.

- **NOW Assist ticket submissions:** Number of times the ticket was submitted using NOW Assist. In the base system, this is determined by the `ITSM - Triage & Created` deflection pattern instrumented in the NOW Assist topic. The topics shipped with NOW Assist Conversations already have these nodes instrumented but must be instrumented in all other topics that create incidents.
- **Total tickets submitted:** Incidents created + RITMs created.

- **Structured tickets:** Total number of requested items completed successfully in the report range.
- **Productivity moments per user:** Productivity Moment is calculated when the ServiceNow products helped a user to be more productive while working in their day to day operations.
  - **Productivity in search per user**: The number of times the NLU prediction model accurately understood the intent of the user's conversation or auto-selected a topic.
  - **Productivity in routing per user**: Successful predictions of incident fields such as assignment group, or category by Predictive Intelligence solutions, counted when the prediction made by the solution is the same as final value when the incident was closed.
  - **Productivity in fulfilment per user**: Includes any productivity gains achieved where ServiceNow is helping the employees to save time to resolve a ticket

**Note:**

- If you use a different method to determine this KPI, you can do so using the steps described in Configure Success Dashboard indicators KPIs.
- Navigate to **All** > **Success Dashboard** > **Getting Started** > **Success Dashboard** > **Key performance indicators (KPIs)** to access the list of all the KPIs available.

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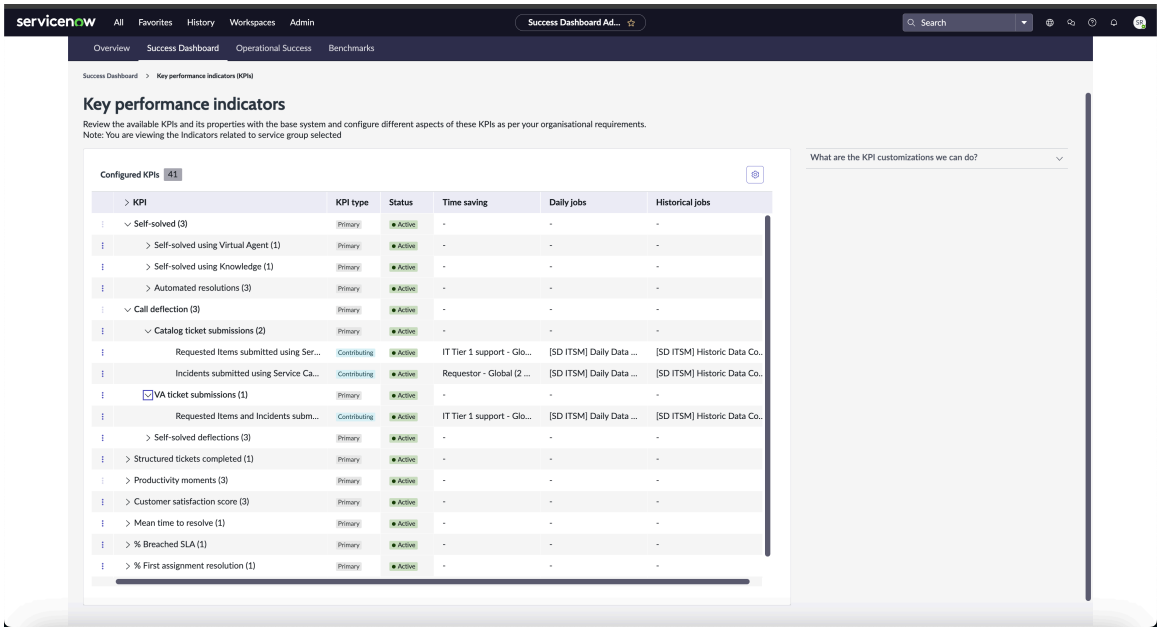


## Service Quality

- **Customer Satisfaction Score:**Calculated from the daily average score of the surveys conducted after an issue was resolved through a ticket or through virtual agent.
- **Mean-time to resolve:** Calculated from the daily average of the time between the ticket creation and ticket closure.
- **% Breached SLAs:** Calculated from the daily average number of issues that were closed after having breached an SLA.
- **% First assignment resolution**: Calculated as the percentage of tickets that were resolved without having to reassign the ticket to a different group.
- **% Reopened tickets:** Calculated from the percentage of resolved tickets that were reopened during a specified period.

## Operational Success

An operational KPI is a quantifiable measure that tracks the efficiency and effectiveness of day-to-day operations in your organization. The KPIs can be organized in a dashboard that highlights the areas that are running efficiently and the areas that need attention.

By monitoring operational KPIs, you can identify areas for improvement, optimize processes, and ultimately achieve their strategic goals. Here are some techniques to use the operational KPIs:

- Ensure your KPIs match your organization's business goals. Define your KPIs that contribute to achieving those objectives.
- Focus on the most critical KPIs that add value to the organization's growth.
- Track and review KPIs regularly. Monitor your progress and modify the KPIs as required by the organization's goals.
- Use data to drive decisions: Identify trends, uncover root causes, and use insights to improve processes and performance.
- Use the data to identify trends and use insights to improve processes and performance.

To create a new operational dashboard, refer Create an operational success dashboard.

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### Incident

| KPI | Description |
|---|---|
| Overdue incidents | Number of open incidents that are pass the due date. |
| Incidents nearing SLA | Percentage of the incidents nearing the SLA threshold. This is based on the percentage of SLA elapsed where the elapsed percentage is between 50-75%,76- 85%, 86-95%, above 95%. |
| Open incidents not updated | Number of open incidents that aren't updated as per the age. This is categorized as per the age of an incident that are between 1-5, 6-10, 10-30, and greater than 30 days. |
| Incidents created (by priority) | Distribution of the Incidents created priority wise |
| Incidents by activity channel | Total number of closed incidents created from different sources. |
| Mean time to resolve an incident (by priority) | Mean time to resolve the incidents priority wise |
| Average incident reassignment | Average number of times that incidents were reassigned. |
| % high priority incidents | Percentage of P1 and P2 incidents that are successfully closed |
| Average number of incidents created per user | Average number of the incidents that are created by a specific user |
| % Incidents associated with Problem | Percentage of the incidents that are associated with problem |
| Total outages due to incidents | Total outages in hours because of incidents. |

KPIs for Major Incident.

### Major incident

| KPI | Description |
|---|---|
| Overdue major incidents | Number of the major incidents that have breached the SLA. |
| Open major incidents (by age and assignment) | Total number of open major incidents assigned/not assigned distributed over the age. |
| Open major incidents (by services and state) | Distribution of major incidents between various services and state. |
| Major incidents nearing resolution SLA | Percentage of the major incidents nearing the SLA. This is based on the percentage of SLA elapsed where the elapsed percentage is between 50-75%,76- 85%, 86-95%, above 95%. |

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### Major incident (continued)

| KPI | Description |
|---|---|
| Closed major incidents (by services) | Distribution of closed major incidents between various services. |
| Mean time to take actions on a major incident | Average time taken for a major incident to be proposed, acknowledged and resolved. |
| % Major incidents breached SLA | Percentage of major incidents that breached SLA. |
| % Major incidents closed without post incident report | Number of major incidents that are closed without having a post incident report (PIR). |
| % Major incidents associated with problems | Percentage of the major incidents associated with problems. |
| Outages due to major incidents | Total outages (in hours) caused due to major incidents. |

KPIs for Change.

### Change KPIs

| KPI | Description |
|---|---|
| Open changes (by age and priority) | Priority wise distribution of the open change requests priority wise. This is categorized in days between 0-1, 2-5, 6-30, 31-90, and above 90 days. |
| Open emergency changes (by age and priority) | Priority wise distribution of the emergency change requests that are still open. This is categorized in days between 0-1, 2-5, 6-30, 31-90, and above 90 days. |
| New change request (by risk) | Distribution of the new change requests by risk. |
| Average age of open changes (by risk) | Average age of a change requests based on risk. |
| Change success score (by assignment group) | Distribution of the change requests by assignment group. |
| Closed changes (by priority) | Priority wise distribution of the changes requests that are successfully closed. |
| Mean time to close a change (by priority) | Mean time to close the change request priority wise. |
| % Successful change with issues (by model and type) | Distribution of the change requests closed with issues distributed by change model and change type. |
| % Successful change without issues (by model and type) | Distribution of the change requests that are successfully closed with some issues by change model and change type. |

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### Change KPIs (continued)

| KPI | Description |
|---|---|
| Incidents caused by change requests | Total number of incidents that are created because of a change request. |
| % Failed changes | Percentage of the change requests that are not successfully completed. |
| % Unauthorized changes | Percentage of the unauthorized change requests that are created. |
| Outages due to change | Total outages in hours because of change. |

KPIs for Request.

### Request

| KPI | Description |
|---|---|
| Open requested items (by stages) | Distribution of the requested items that are open by stages. |
| Open requested items (by states) | Distribution of the requested items by state. |
| Active requested items due within 5 days | Total number of open requested items that are due in 5 days. |
| Open requested items (by age) | Distribution of the requested items in open state. This is categorized in days between 0-1, 2-5, 6-30, 31-90, and above 90 days. |
| Mean time to fulfill a requested item | Average time taken to fulfill a requested item. |
| Mean time to fulfill a requested item (by category and catalog items) | Mean time to fulfill a requested item for different catalog categories and catalog items. |
| Closed requested items (by states) | Distribution of the requested items by their closed state i.e. Skipped, Complete, Incomplete. |
| Request items created from various channels | Distribution of the requested items created from different sources. |
| Requested items from incidents (by category and catalog items) | Requested items created from incidents for different catalog categories and catalog items. |

KPIs for Service Catalog.

### Service Catalog KPIs

| KPI | Description |
|---|---|
| Catalog Item best practice deviations | Number of deviations from the best practices for active catalog items. |
| Catalog item VA render type | Catalog items distributed by how they will be rendered on a Virtual Agent bot. |
| Catalog item fulfilment automation level distribution | Distribution of the catalog items that are fulfilled automatically. |

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### Service Catalog KPIs (continued)

| KPI | Description |
|---|---|
| Catalog item translation coverage | Language wise distribution of the catalog items that are translated. |

KPIs for Interaction.

### Interaction KPIs

| KPI | Description |
|---|---|
| Interactions with task associated (by task type) | Number of interactions that are associated with a task and are distributed by task type. |
| % First call resolution | Percentage of the interactions that are closed in the first call and no tasks are created. |
| Closed interaction (by channel) | Distribution of the closed interactions created from different channel. |

KPIs for Problem.

### Problem KPIs

| KPI | Description |
|---|---|
| Open problems (by age and priority) | Problems currently open distributed over age and priority. |
| Open problems (by state and age) | Problems currently open distributed over age and state. |
| % open critical problems (by state) | Percentage of critical problem that are categorized by state. |
| % open problems classified as known error | Percentage of problem with associated Known Error articles. |
| Average reassignment of open problems (by category) | This is the average number of times problems have been reassigned. |
| Closed problems (by age and priority) | Closed problems by age and priority. |
| Mean time to close a problem | Average time taken to close a problem. |

KPIs for On-Call Scheduling.

### On-Call Scheduling KPIs

| KPI | Description |
|---|---|
| Active escalations (by priority and acknowledgement status) | Priority wise distribution of on-call escalations based on their escalation status. |
| Acknowledged escalations (by level, shift and groups) | Distribution of acknowledged escalations based on level/shift/groups. |
| Escalations not acknowledged (by level, shift and groups) | Distribution of escalations that are not acknowledged by level/shift/groups. |

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### On-Call Scheduling KPIs (continued)

| KPI | Description |
|---|---|
| Contact attempts acknowledged | Total count of contact attempts acknowledged based on level and contact attempts. |
| % Escalations acknowledged (by groups) | Percentage of the escalations that are acknowledged. |
| % Escalations not acknowledged (by groups) | Percentage of the escalations that are not acknowledged. |
| Mean time to acknowledge an escalation (by group) | Mean time to acknowledge an escalation based on escalation level. |
| Mean time to acknowledge an escalation (by level) | Mean time to acknowledge an escalation based on escalation level. |
| Total On-call hours (by user) | Total number of hours the user was available for On-call. |

KPIs for Password Reset.

### Password Reset KPIs

| KPI | Description |
|---|---|
| Password Reset Top Users (last 30 days) | Shows distribution of users who raised the maximum number of password reset requests in the last 30 days. |
| Password Reset Enrollment By Verification | Shows distribution of verifications across different password reset snapshots. |
| Password Reset - Failed Verifications (last 7 days) | Shows distribution of failed password resets by verification type in the last 7 days. |
| Password reset failed verification | Shows distribution of failed password resets by verification type. |
| Password Request Status (last 7 days) | Shows distribution of password reset requests across different processes in the last 7 days. |
| Blocked Users (last 7 days) | Shows distribution of users who were blocked in the last 7 days. |
| Password Change Top Users (last 30 days) | Shows distribution of users who changed their password most frequently in the last 7 days. |
| Password Requests By Action | Shows distribution of different password reset actions. |
| Password Requests (last 7 days) | Shows distribution of different password reset requests by process in the last 7 days. |

KPIs for Walk-up Experience.

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**Walk-up Experience KPIs**

| KPI | Description |
|---|---|
| Walk-up interactions created and closed | Walk-up interaction created and closed weekly. |
| Walk-up location consumables (by stockroom) | Consumable inventory per stockroom. |
| % Walk-up interactions with tickets created (by location) | Percentage of closed Walk-up interaction with tickets associated. |
| Walk-up interactions (by hour of the day) | Walk-up interaction created distributed over each hour of the day. |
| % Walk-up interactions (by type) | Percentage Walk-up interaction distributed over check-in, online check-in and appointment. |
| Walk-up interactions as appointments (remote vs in-person) | Walk-up interactions appointment scheduled. |
| Average service time and wait time | Average wait and service time for Walk-up interactions distributed. |
| % Abandoned walk-up interactions | Percentage abandoned walk-up interaction. |
| Unassigned walk-up interactions (by location) | Unassigned open interactions in Walk-up queue. |
| Walk-up interactions (by day of the week) | Walk-up interaction created per day in a week. |
| Exit survey CSAT score | Sentiment survey for the walk-up concluded at the tech lounge. |

# Task Outage

CI unavailability, or outage, is the actual down time of a CI. Whenever there is an outage for any of the CI items, the outage information is stored in the Outage [cmdb_ci_outage] table. The Task-Outage table [task_outage] maintains the mapping between the Task [task] table and the Outage [cmdb_ci_outage] table.

## Activate Task-Outage Relationship

Activate the Task-Outage Relationship plugin (com.snc.task_outage) to track outage duration.

### Before you begin

Role required: admin

### About this task

The Task-Outage Relationship plugin creates a many-to-many relationship between the Task [task] table and the Outage [cmdb_ci_outage] table.

### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.

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3. Select **Install** to start the installation process.

   **Note:**
   When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

   You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

**Related topics**

List of plugins (Washington DC)

### Components installed with Task-Outage Relationship

The Task Outage table is installed with activation of the Task-Outage Relationship plugin (com.snc.task_outage).

**Note:**
The Application Files table lists the components that are installed with this application. For instructions on how to access this table, see Find components installed with an application.

### Table installed

| Table | Description |
|---|---|
| Task Outage<br><br>[task_outage] | A many-to-many table that stores references to the Task [task] and Outage [cmdb_ci_outage] tables. |

## Add the Outage UI action to another task form

By default, the *Create Outage* UI action is available on the incident and problem forms, and can be added to other task forms. For new instances from Jakarta only, this feature is also available on the change request form.

**Before you begin**
Role required: admin

**Procedure**

1. Navigate to **All** > **System Definition** > **UI Actions**.
2. Select the UI Action **Create Outage** on the Task [task] table.
   By default, the condition is:

```
current.getRecordClassName() == 'incident' ||
current.getRecordClassName() == 'problem'
```

3. Modify the **Conditions** field as described in the following examples.

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| Option | Description |
| --- | --- |
| **To add this UI action to the Ticket [ticket] table** | `current.getRecordClassName() == 'incident' || current.getRecordClassName() == 'problem' || current.getRecordClassName() == 'ticket'` |
| **To use the UI action on only the Problem [problem] table** | `current.getRecordClassName() == 'problem'` |

4. Click **Update**.

## Associate a task with an outage

You can associate multiple tasks with a defined outage.

### Before you begin
Role required: itil

### About this task
The administrator must configure the Outage form to include the Tasks related list.

### Procedure

1. Navigate to the outage record.
2. Click **Edit** in the Tasks related list.
   All incident and problem tasks are listed. For new instances in Jakarta, change requests are also listed.
3. Use the filter or the search field above the **Collection** box to locate the task to associate to the outage.

   **Example**
   For example, filter for the same configuration item or business service, or look for tasks created on the same day as the outage.
4. Move the associated tasks to the **Task List** box on the right.
5. Click **Save**.

## Create an outage from a task

Create an outage from a task record to understand the down time of a configuration item.

### Before you begin
Role required: itil or admin

### About this task
The **Create Outage** UI action is added for the Task [task] table. When the Task-Outage Relationship plugin (com.snc.task_outage) is activated, the Outages related list is added to the related list of the task forms such as Incident, Problem, or Change. If you have the admin role, you can assign multiple tasks to an outage by configuring the Tasks related list to appear on the Outages form.

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### Procedure

1. Open the task record.
2. Right-click the header form and select **Create Outage**.
3. On the form, fill in the fields.

| Field | Entry |
|---|---|
| Number | Unique number that identifies the outage. |
| Configuration Item | Look up icon to select configuration item from the list. |
| Type | Type of the outage. |
| Begin | The date and time when the outage starts. You can click the **Begin Outage Now** related link to populate the field with the current date and time. |
| End | The date and time when the outage ends. When the outage ends, open the record and enter the date and time manually. You can also click the **End Outage Now** related link to populate the field with the current date and time. |
| Duration | Duration of the outage in days and hours. |
| Task number | The parent task record number from which you have created the outage. |
| Short description | A brief description of the outage. |

4. Click **Submit**.

## Domain separation and task outage

Domain separation is supported in task outage. Domain separation enables you to separate data, processes, and administrative tasks into logical groupings called domains. You can then control several aspects of this separation, including which users can see and access data.

### Support level: Basic

- Business logic: Ensure that data goes into the proper domain for the application's service provider use cases.
- The application supports domain separation at run time. The domain separation includes separation from the user interface, cache keys, reporting, rollups, and aggregations.
- The owner of the instance must set up the application to function across multiple tenants.

Sample use case: When a service provider (SP) uses chat to respond to a tenant-customer's message, the customer must be able to see the SP's response.

For more information on support levels, see Application support for domain separation.

### Task outage overview

Task-Outage Relationship [cmdb_ci_outage] is domain separated. Outages are now data separated, meaning they can be exposed to the appropriate personas without risk of data exposure. Fulfillers can view any Task-Outage Relationship records regardless of the domain

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that the records belong to. The Task-Outage Relationship table is installed when administrator activates the optional Task-Outage Relationship plugin.

**Related topics**

Domain separation for service providers

# Task Intelligence for ITSM

ServiceNow® Task Intelligence for ITSM uses machine learning to set up, deploy, and track solution-based models to achieve important business outcomes.

## Get started

| | | |
|---|---|---|
| Explore<br>  <br>Learn about Task Intelligence for ITSM concepts and features. | Configure<br>  <br>Configure environment, tools, and user access. | Manage<br>  <br>Learn how you can use Task Intelligence for ITSM. |
| Monitor<br>  <br>Learn about monitoring and analyzing Task Intelligence for ITSM models | Reference<br>  <br>Get details about Task Intelligence for ITSM components, such as roles and dependent applications. | |

## Troubleshoot and get help

- Ask or answer questions in the Task Intelligence for ITSM community
- Search the Known Error Portal for known error articles
- Contact Customer Service and Support

# Exploring Task Intelligence for ITSM

With Task Intelligence for ITSM, you can set up and deploy machine learning solution models to predict and recommend incident field information.

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## Task Intelligence for ITSM overview

Task Intelligence for ITSM enables you to create, configure, and deploy solution models to predict incident fields information. Predicting incident field information helps to categorize incidents in applications such as Service Operations Workspace.

The incident prediction models enable the agents to focus more on incident resolution and spend less filling in the field information. These models can help lower the meantime to resolve (MTTR) of tasks. You can also track and monitor how the solution models are performing and modify the parameters of the model accordingly.

Task Intelligence for ITSM enables the agents to do the following:

- Solve issues faster for better service and experiences
- Focus#bn#meaningful, high-value work
- Reduce#error#ates#and#drive down#costs
- Improve time to value with intuitive experiences

The Admin Console for Task Intelligence for ITSM provides the admin a no-code experience for deploying Task Intelligence solution models. Using machine-learning models, the application enables you to automate and optimize incident prediction and incident categorizations. The models use statistics to predict future data by training with your past data.

Task Intelligence for ITSM supports Utah patch 5 and later releases.

## Task Intelligence for ITSM workflow

The workflow for Task Intelligence for ITSM includes the following:

1. Task Intelligence for ITSM: Use this application to set up and configure an incident prediction model to predict and recommend incident fields on the incident form. To configure and use a model, you must do the following:
   a. Set up an incident prediction model: Set up a model using the default template available with the base system.
   b. Train your model: Train the model with your data.
   c. Set your preferences: Set the prediction preferences and behavior for the model.
   d. Deploy the model: Deploy the model to predict incident field information.
   e. Monitor and analysis: Monitor how the model is performing and analyze the performance result data.
   f. Edit your model: Based on the analysis of the performance results, edit your model and deploy it again.
2. Go to the Advanced Recommended actions for ITSM application configuration to configure where, how, and when the model must be implemented in the Service Operations Workspace application. For more information, see Recommended Actions for ITSM in Service Operations Workspace.
3. Get incident predictions and recommendations in the incident form of Service Operations Workspace.

## Task Intelligence for ITSM benefits

Task Intelligence for ITSM provides the following benefits:

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| Benefit | Feature | User |
| --- | --- | --- |
| Create and deploy solution-based incident prediction models to predict incidents fields for new IT service incidents. This helps in incident categorization | Create an incident prediction model in Task Intelligence for ITSM | Administrator |
| Export an incident prediction model in Task Intelligence for ITSM to another instance so you can use the model in the other instance without recreating the model from scratch. | Export an incident prediction model | Administrator |
| Monitor the performance results of the model. | Monitoring and Analytics for Task Intelligence for ITSM | Analyst |
| Edit the incident prediction model based on the performance results and deploy again. | Edit an incident prediction model in Task Intelligence for ITSM | Administrator |

## Task Intelligence for ITSM Admin Console

Admin Console for Task Intelligence for ITSM provides you with an interface to create, train, access, set preferences, deploy, and monitor predictive models used for incident predictions and categorization.

ServiceNow® Task Intelligence for ITSM admin console supports the following features:

- Define the purpose of the solution model and set its prediction preferences and behavior. Then train the model with your data, and deploy it to predict and recommend incident fields.
- Use the incident field information to help categorize incidents and reduce the incident handle time for agents.
- Track and monitor the performance of the deployed model.
- Edit the deployed model based on its performance results, then train and deploy the model again.

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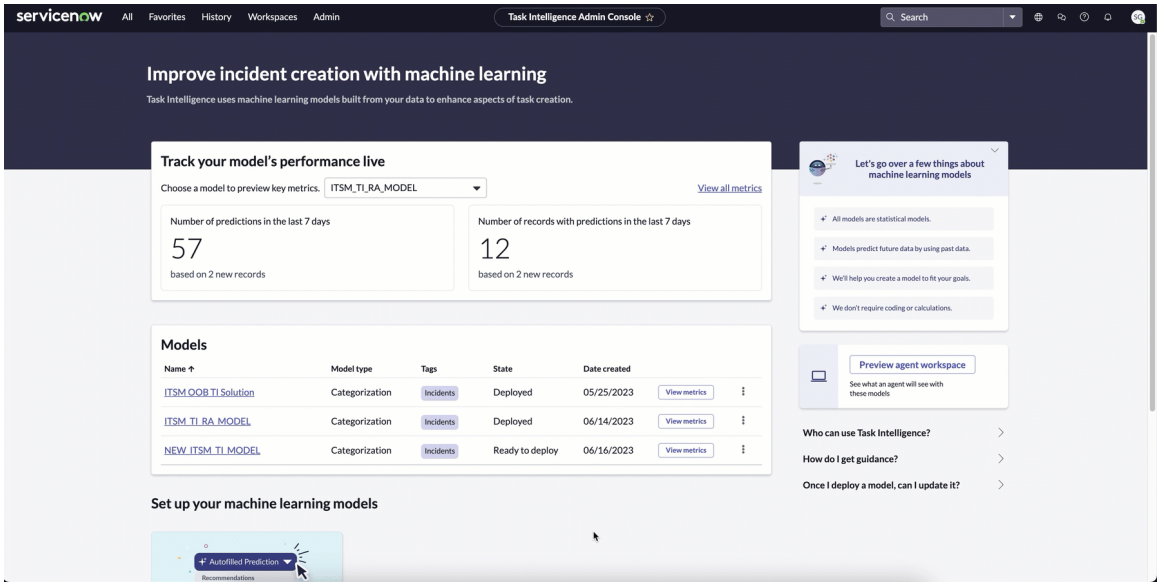


# Configuring Task Intelligence for ITSM

Configure Task Intelligence for ITSM so agents can use the application to create incident prediction models and predict the incident fields in Service Operations Workspace.

## Configuration overview

Configuring Task Intelligence for ITSM involves installing the application from ServiceNow® Store.

## Install Task Intelligence for ITSM

You can install the Task Intelligence for ITSM application (com.snc.itsm_ml_task) if you have the admin role. The application installs related ServiceNow® Store applications and plugins if they aren't already installed.

### Before you begin

- Ensure that the application and all of its associated ServiceNow Store applications have valid ServiceNow entitlements. For more information, see Get entitlement for a ServiceNow product or application.
- Review the Task Intelligence for ITSM application listing in the ServiceNow Store for information on dependencies, licensing and subscription requirements, and release compatibility.
- Installing Task Intelligence for ITSM requires the ITSM Pro Package subscription.

Role required: admin

### About this task

The following items are installed with Task Intelligence for ITSM:

- Store applications
- Roles
- Tables

For more information on what is installed, see Components installed with Task Intelligence for ITSM.

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### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the Task Intelligence for ITSM application (com.snc.itsm_ml_task) using the filter criteria and search bar.

   You can search for the application by its name or ID. If you can't find the application, you might have to request it from the ServiceNow Store.

   In the list next to the **Install** button, the versions that are available to you are displayed.
3. Select a version from the list and select **Install**.

   In the Install dialog box that is displayed, any dependencies that are installed along with your application are listed.
4. If you're prompted, follow the links to the ServiceNow Store to get any additional entitlements for dependencies.
5. **Optional:** If demo data is available and you want to install it, select the **Load demo data** check box.
   Demo data comprises the sample records that describe application features for the common use cases. Load the demo data when you first install the application on a development or test instance.

   **Important:**
   If you don't load the demo data during installation, it's unavailable to load later.
6. Select **Install**.

## Managing Task Intelligence for ITSM models

Use the machine learning capabilities of Task Intelligence for ITSM to predict and recommend incident field information and help categorize incidents.

Managing Task Intelligence for ITSM involves the following tasks.

### Creating an incident prediction model

You can create and deploy solution-based incident prediction models to predict incidents fields for new IT service incidents. Creating a model involves the following steps:

- Set up a model: Set up an incident prediction model using a template available in the base system.
- Train a model: Train a model to make predictions using your data.
- Assess your model: Assess the results from the model training, view sample results for the predicted fields, and select the prediction preferences and behavior for your model.
- Deploy your model: Deploy your model to predict incident fields on incident forms.

### Editing an incident prediction model

Edit an incident prediction model that has already been trained and deployed. Change the model configurations, view the updated training results, and redeploy the model.

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## Exporting an incident prediction model

Export an incident prediction model in Task Intelligence for ITSM to another instance so you can use the model in the other instance without recreating the model from scratch.

## Create an incident prediction model in Task Intelligence for ITSM

Create and deploy solution-based incident prediction models to predict incidents fields for new IT service incidents.

With an incident field prediction model, you can choose what the model uses to predict information. If you're an admin, you can decide when you want it to make predictions, what you want it to predict, and what data to use for those predictions. You can select the following information:

- Output fields, or the fields that the model predicts
- Input fields, or the fields used to predict the output fields
- Conditions that choose the set of records to train the model
- The prediction behavior: auto-fill, recommend, or run in the background

After customizing your model, you can view the test results and deploy the model.

The model uses previous case records to train. You can see how the model would have predicted fields for past cases, providing you with an estimate of how the model performs when deployed.

## Base system model

Task Intelligence for ITSM comes with a base system **ITSM OOB TI Solution** model for predicting the Incident fields.

When you install the Task Intelligence for ITSM plugin in your production instance, the model is installed and is trained on your data automatically. This model is auto-deployed. The model starts predicting data in the background and doesn’t impact the Incident form.

The prediction data is then stored in the prediction tables. You can navigate to **All** > **Task Intelligence for ITSM** > **Monitoring** to view the performance results of this model. Based on these results, you can edit the model to show the predictions in Service Operations Workspace. You can configure the model to use the predictions to either auto-fill or give recommendations for the output fields on an incident form.

To edit and redeploy the base system model, you can navigate to the Setup page. From the model list, select **ITSM OOB TI Solution** and edit the model. For more information on how to edit the model, see Edit an incident prediction model in Task Intelligence for ITSM.

This model is linked with a base system rule in the Recommended Actions for ITSM configuration. An admin isn't required to go to the Recommended Actions for ITSM application to configure any rules for this model.

To set up a new model using a template, see Set up your incident prediction model.

### Set up your incident prediction model

Use Task Intelligence for ITSM to set up your incident prediction model and train it with your data to make predictions. Access your model's performance results, set the prediction preferences and behavior, and deploy your model.

#### Before you begin

Role required: sn_ti_admin.tia_admin or admin

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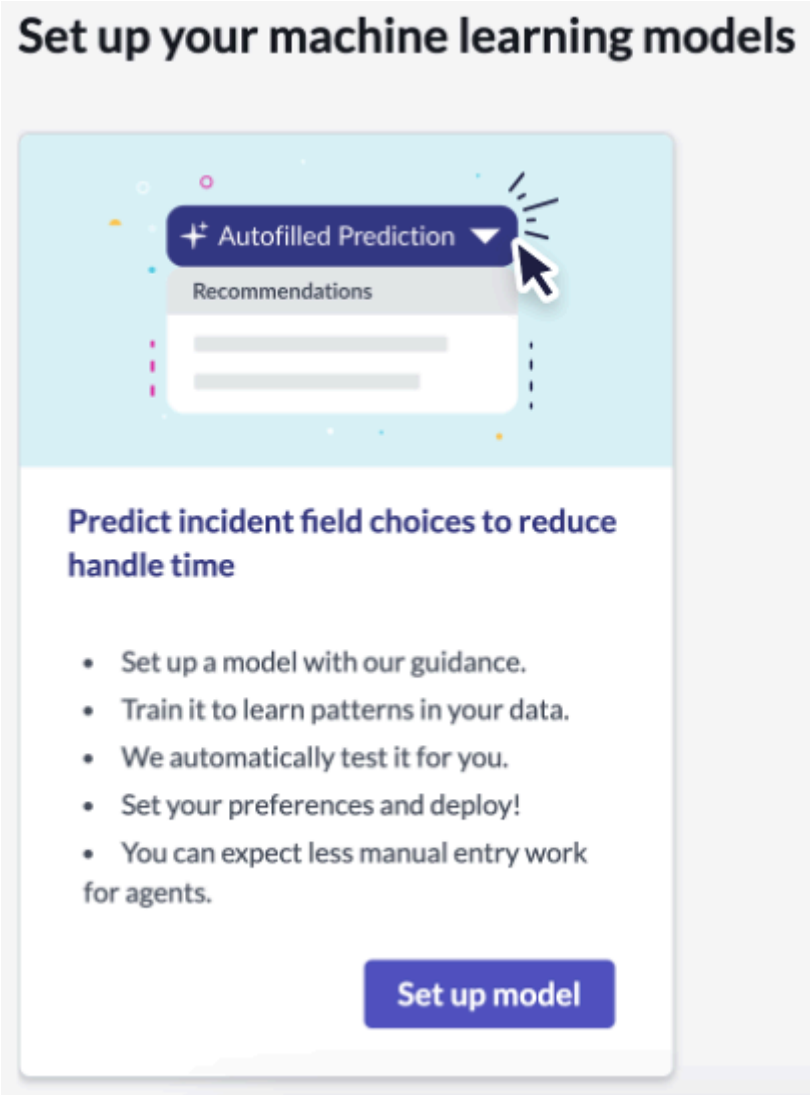
### Procedure

1. Navigate to **All** > **Task Intelligence for ITSM** > **Setup** to access the Task Intelligence Admin Console.
2. Select **Set up model**.




This action opens the model and displays the introductory pages. Each page in the model asks you questions and helps you select the information needed to build an effective model.

#### Train your model

Train your incident prediction model with data to predict the incident fields.

### Before you begin

You can set up a task intelligence model or use the base system template that is shipped with Task Intelligence for ITSM. For more information on setting up a new model, see Set up your incident prediction model.

Role required: sn_ti_admin.tia_admin or admin

### About this task

When you train a machine learning model, the model learns patterns from past data to make predictions about new data. Models are trained using large amounts of data so that they can learn patterns. A large data set makes the learned patterns statistically significant. As you answer

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questions about your information systems, business process, and service operations, the system actively learns from your responses.

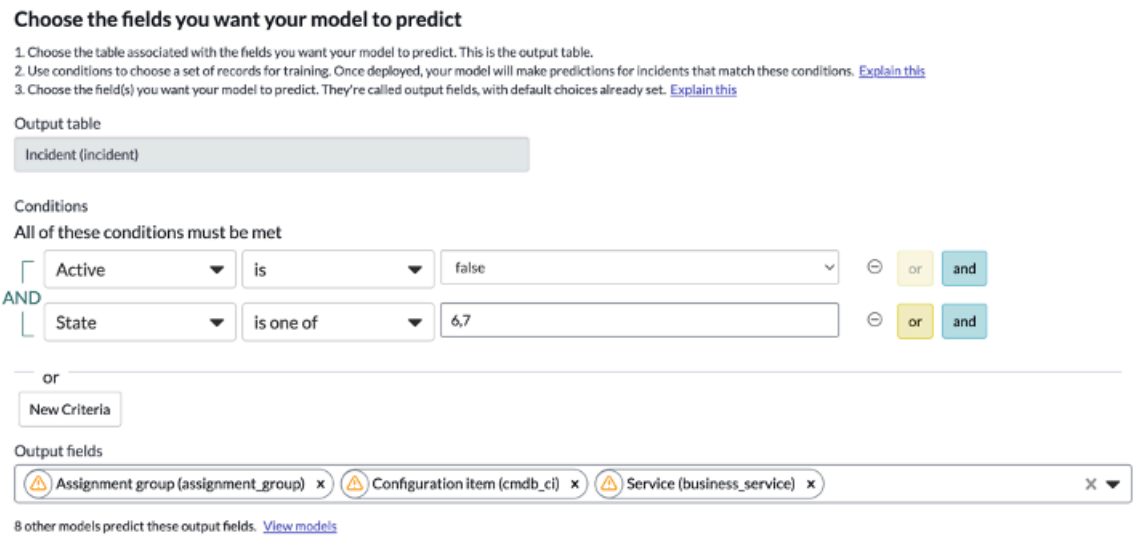
You can select the table and fields that you want to predict, such as the Output table and Output fields. Also, you can select the tables and fields that you want the model to use to predict the incident information, such as the Input table and Input fields.

Select this information to tell the model what to look for during training.

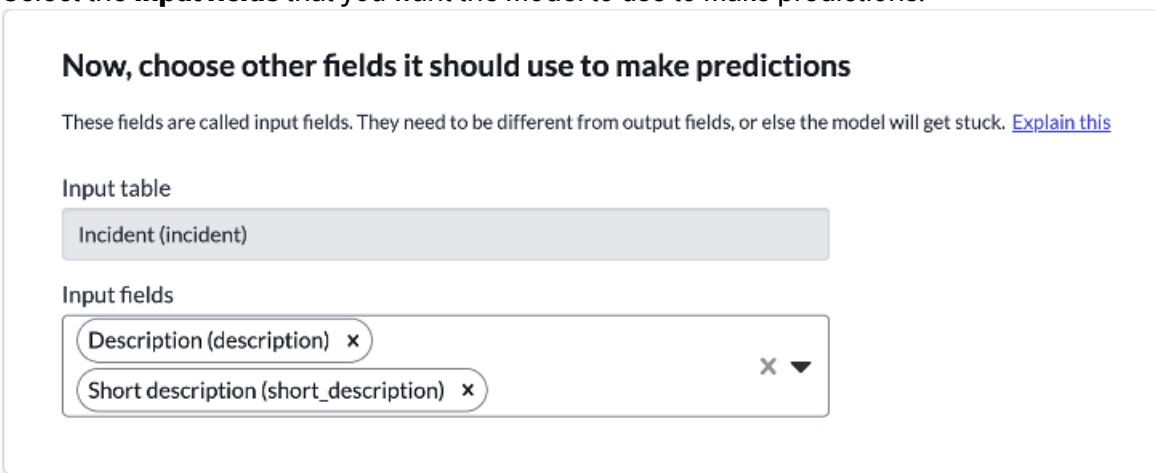
**Note:**
You can either use the recommended settings or customize the settings to fit your needs.

### Procedure

1. Enter a name for the model.
2. Select the **Output table** you want the model to predict.
3. Select **Conditions** to choose a set of records to use for training.
   The selected conditions determine how the model is trained. These conditions provide the requirements that a record must meet to make the predictions.
4. Select the **Output fields** you want the model to predict.




5. Select the **Input table** in the training data that you want the model to use to make predictions.
6. Select the **Input fields** that you want the model to use to make predictions.




7. Review the resulting **Number of records** in the training data based on the selected conditions.

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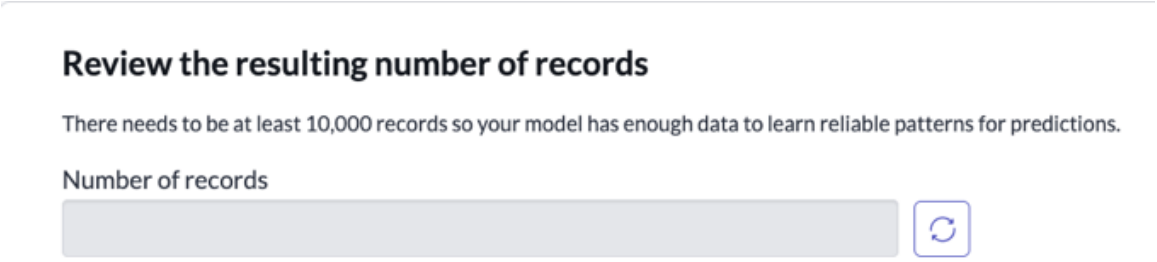
The records that are counted include the number of fields, parameters, and data that the model uses to train. Based on the provided information and the set conditions, the number or records gets updated automatically. The model needs a minimum of 10,000 records for effective training. If this minimum number hasn't been reached, try selecting different conditions. You can also click the refresh icon ( ) to refresh the number.




8. Select **Launch training**.

### Result

If you're training the model on a large amount of data, training can take some time. You can request that the system sends you an email when the training is done.

## Assess your model

Assess the results from the model training and view sample results for the predicted fields. Reviewing the results gives you a preview of how your model will perform after being deployed. Based on the sample results, select the prediction preference and behavior for each field.

### Before you begin

You must train your model with various data. For more information on how to train your model, see Train your model.

Role required: sn_ti_admin.tia_admin or admin

### About this task

The model has flexible options. Based on the sensitivity and requirements of each incident field on the Incident form, you can do the following actions:

- Auto-fill the predicted value in the incident field.
- Recommend the predicted value in the incident field.
- Monitor and run the prediction model for the incident field in the background only.
- Turn off the predictions for the incident field.

### Procedure

1. View the number value in the **Estimated number of autofilled fields** section.
   The number helps you predict how your model performs when deployed.
2. Select **View sample results** to see the sample results for each predicted field.
3. Select the **Comparison** button to see the details for a selected result.
4. Choose one of the following options from the **Prediction preference** drop-down list for each field.

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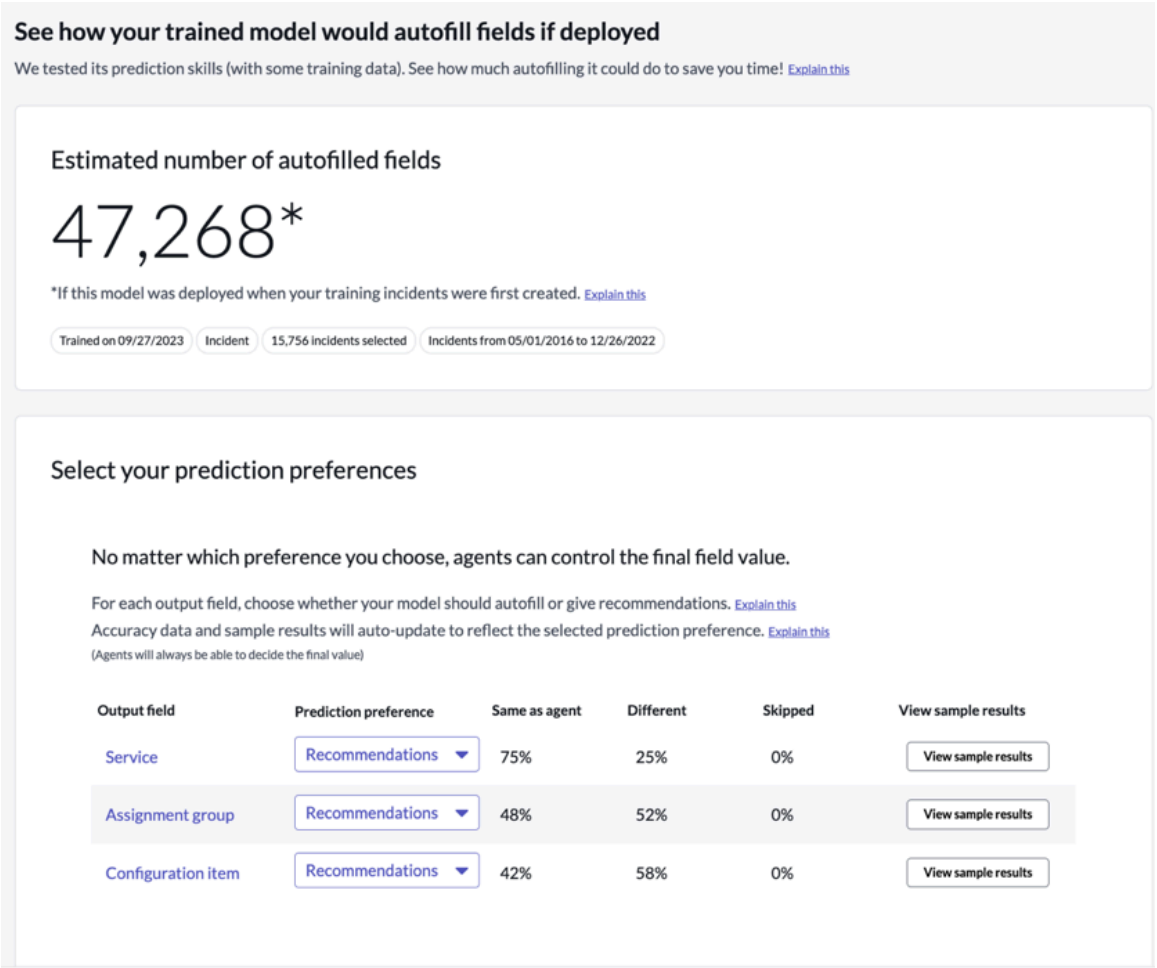


5. Select **Save & continue**.

### Deploy your model

Deploy the incident prediction model to predict the incident field information.

## Before you begin

You must access the model and set the preferences for your model. For more information on setting model preferences, see Assess your model.

Role required: sn_ti_admin.tia_admin or admin

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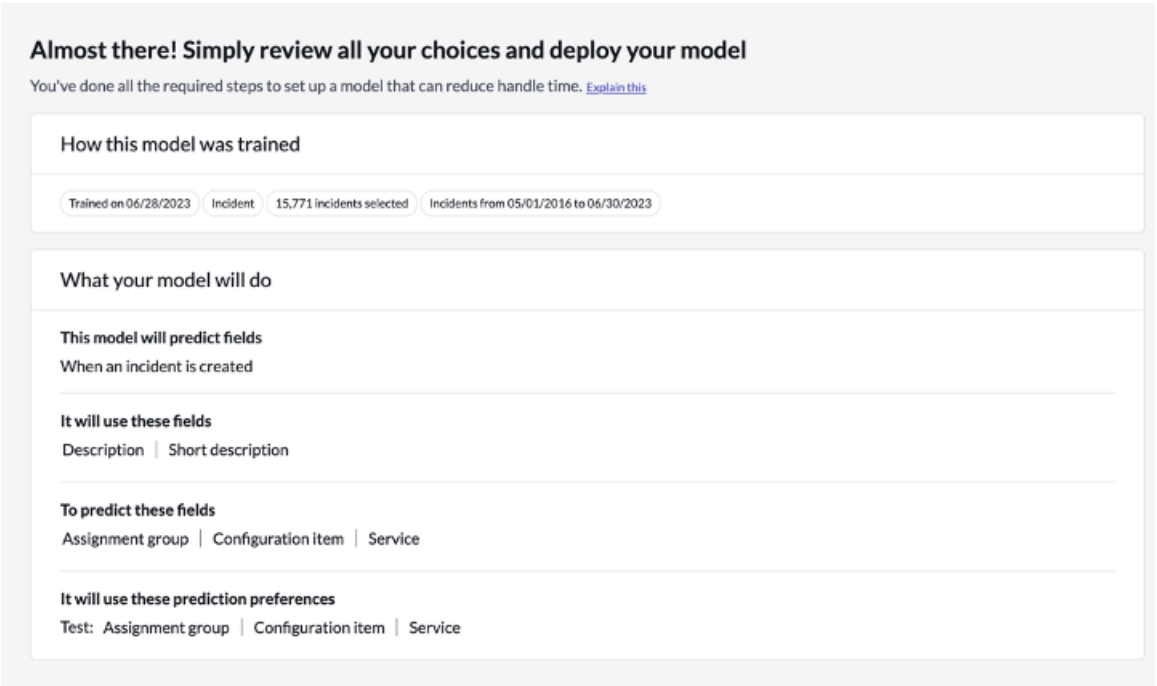
## Procedure

1. Review your choices from the previous pages and information about how the model was trained.




2. Select **Deploy** to deploy the model.

## Result

A pop-up appears confirming that your model was deployed.

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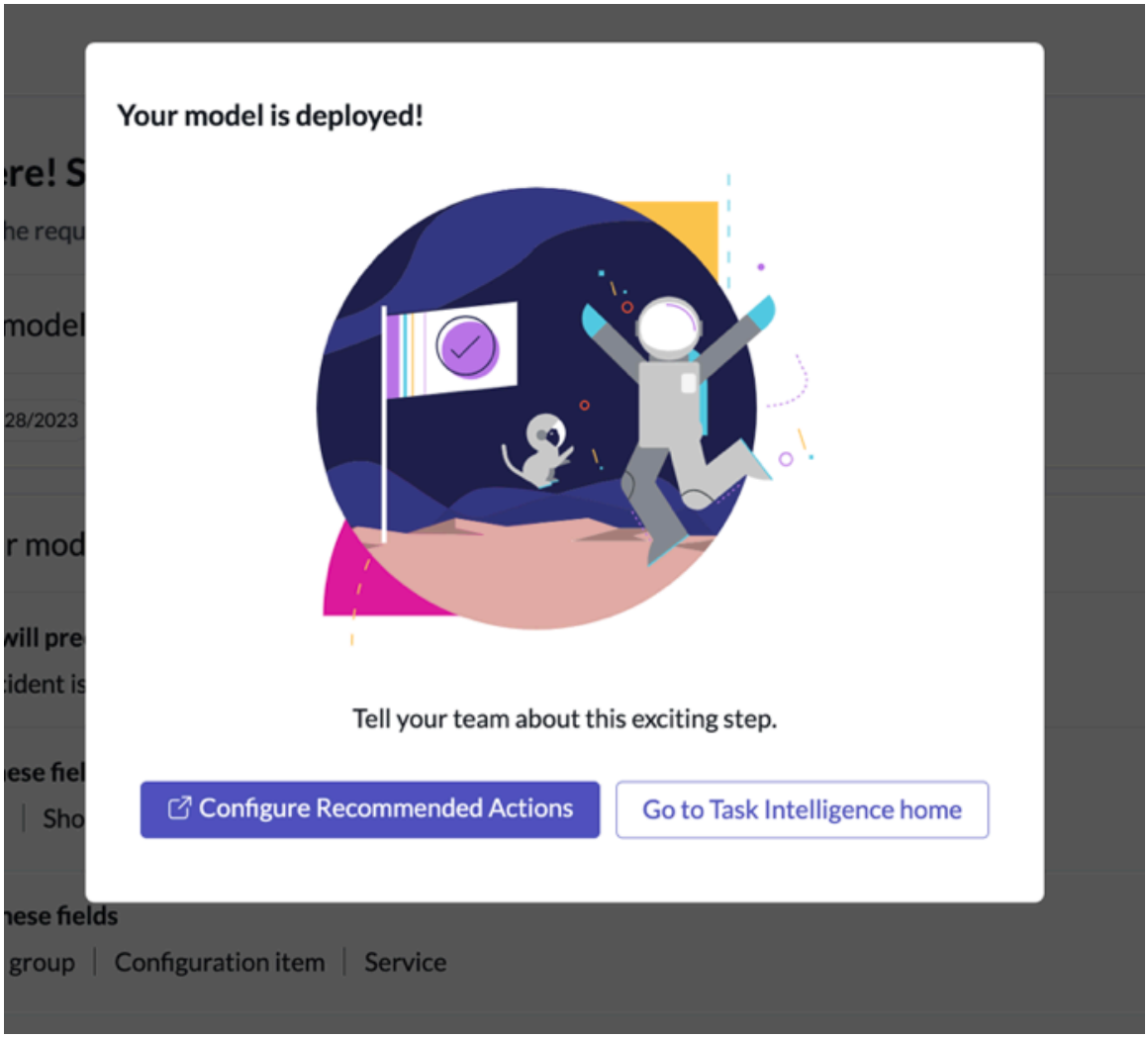


### What to do next

Select **Configure Recommended Actions** to configure the implementation of the incident prediction model in the incident fields. For more information, see Recommended Actions for ITSM in Service Operations Workspace.

## Edit an incident prediction model in Task Intelligence for ITSM

Edit an incident prediction model that has already been trained and deployed. Change the model configurations, view the updated training results, and redeploy the model.

### Before you begin

An incident prediction model must already be created, trained, and deployed. For more information on how to create a model, see Create an incident prediction model in Task Intelligence for ITSM.

Role required: sn_ti_admin.tia_admin or admin

### About this task

You have two options for editing your model: view the current training results or retrain the model. The first time you edit a model, a pop-up appears to ask you which option you would like to take.

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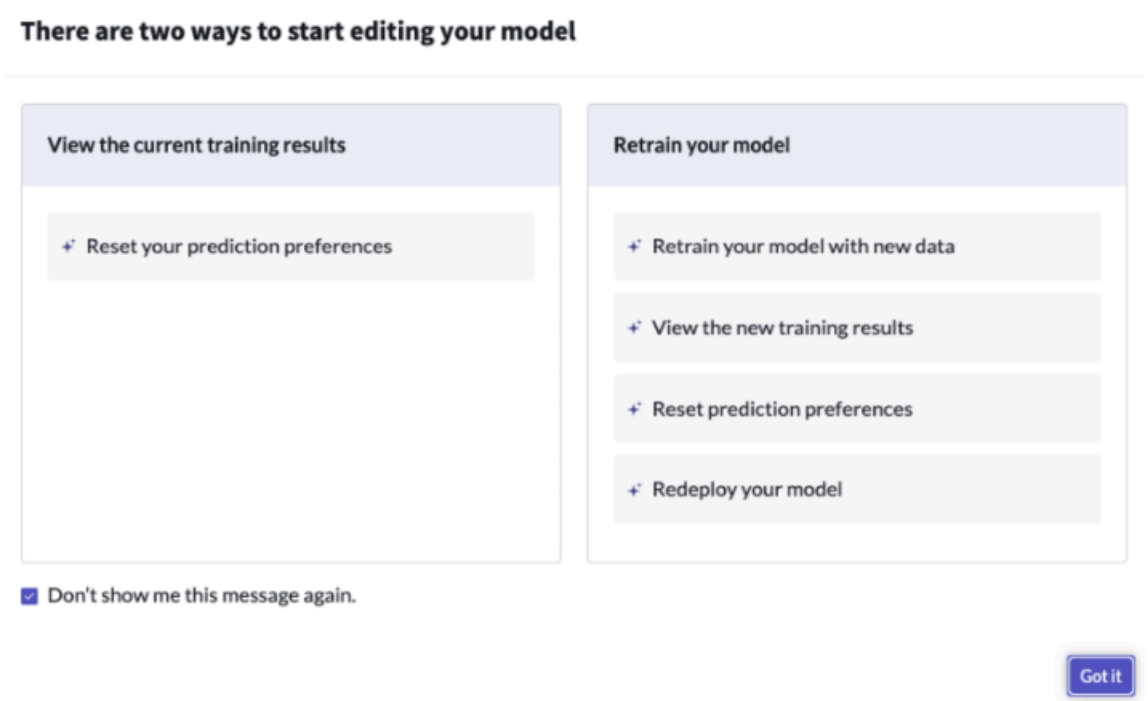


Resetting your prediction preferences enables you to change how visible the predictions are for agents. Retraining your model enables you to select new data for training, which changes the prediction capabilities of the model.

While you can retest your incident prediction model, it doesn't change the prediction skills. Edit your incident prediction model to reset your prediction preferences. Edit your field prediction models to retrain the models with new data, predict different fields, or change the prediction preferences.

Changes aren't saved until you redeploy the model. The updated model replaces the previous model.

### Procedure

1. Navigate to **All** > **Task Intelligence for ITSM** > **Setup**.
2. From the **Models** list, select the menu ( ⋮ ) icon of the model you want to edit, and then select **Edit Model**.
3. Modify the fields that you want the model to predict or the fields used to make predictions.
4. Select **Launch training**.
   A warning message appears.

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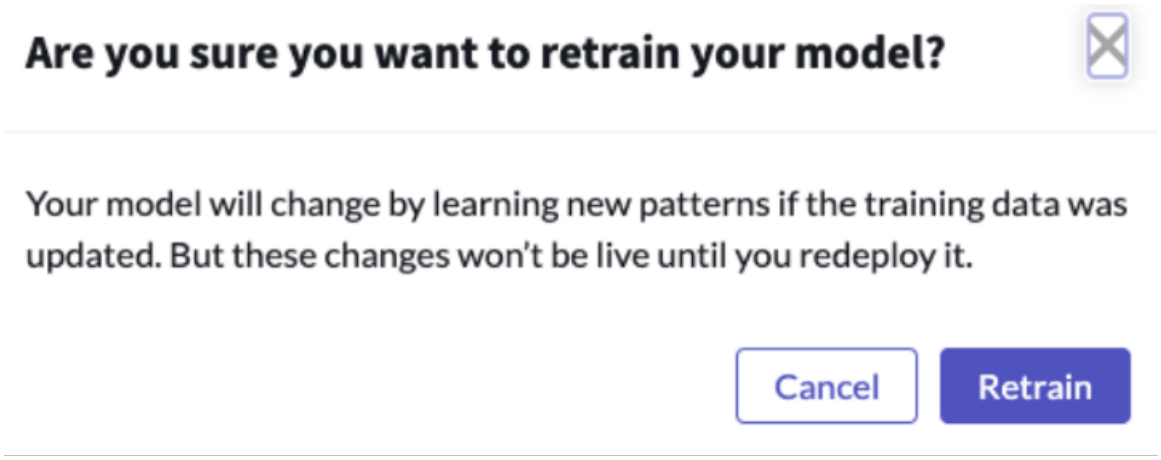
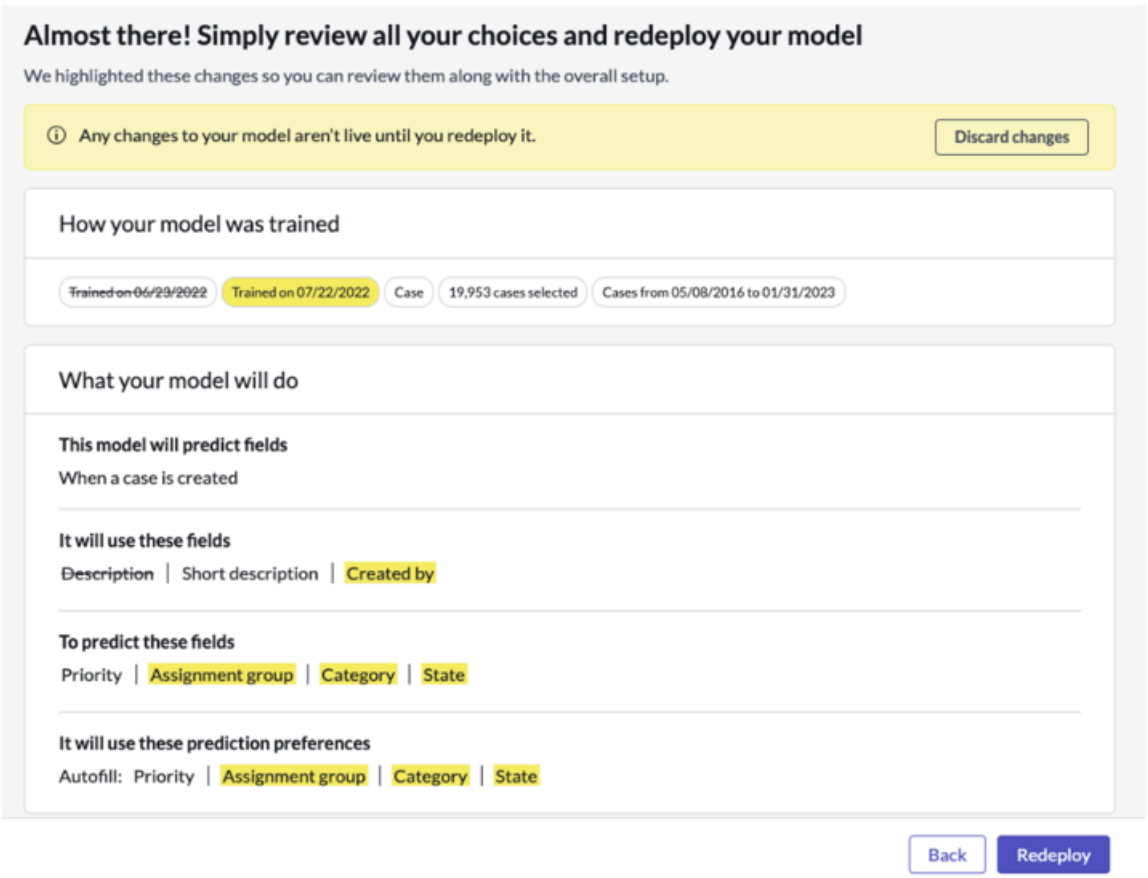



5. Select **Retrain**.
   The new training results page loads.
6. Select the **Compare models results** button to show both the previous results and the new results.
7. Select **Save & continue**.
8. Set your preferences for displaying the predictions or running them in the background.
9. Select **Save & continue**.
   The **Deploy your model** screen loads and shows the changes that you made indicated in yellow. If you don't want to deploy the changes, select **Discard changes**.




10. Review the model and select **Redeploy**.

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### Result
Your updated model is deployed.

## Export an incident prediction model

Export an incident prediction model in Task Intelligence for ITSM to another instance so you can use the model in the other instance without recreating the model from scratch.

### Before you begin
Role required: admin

### Procedure

1. Navigate to **All** > **Task Intelligence for ITSM** > **Setup**.
2. In the Models list, select the menu ( ⋮ ) icon of the model you want to export, and then select **Export model**.
   A new tab opens with authentication steps.
3. Select **Allow**.

### Result
The XML file of your model downloads to your browser.

### What to do next
You can use the XML file to transfer the model to another instance using update sets. For more information update sets, see System update sets.

# Monitoring and Analytics for Task Intelligence for ITSM

You can view the impacts of your trained incident prediction models. Monitor model performance overtime, track business value, and view what predictions your agents did and didn't use.

To access the Task Intelligence Analytics dashboard, navigate to **All** > **Task Intelligence for ITSM** > **Monitoring**.

Use the **Model** drop-down list to select a model. Select **Apply** to open the model's configuration.

The Analytics dashboard contains the following sections:

- Get an overview
- See how your trained model is doing

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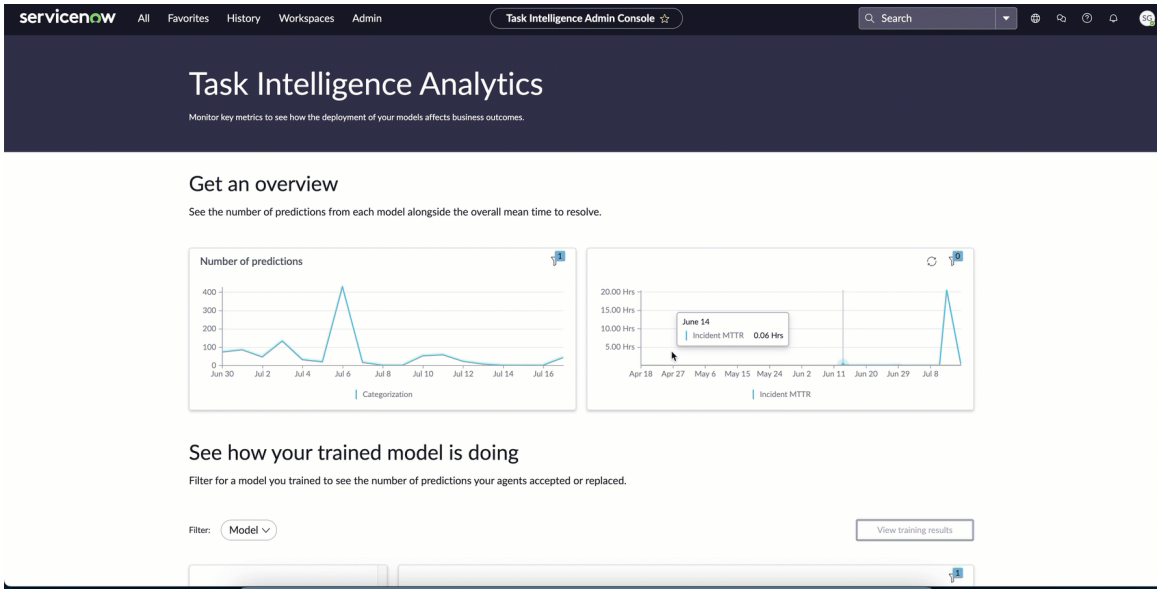


## Get an overview

The Analytics dashboard uses visuals to represent the performance overview of the model.

**Number of predictions**

The line graph shows the number of fields that the model predicted over time. As the model continues to learn, it can increase the number of predictions.

**Incident Mean time to resolve (MTTR)**

The line graph shows the average amount of time that it takes to resolve incidents over time. As the model makes more predictions, the MTTR must decrease as the predictions help agents.

## See how your trained model is doing

The Analytics dashboard uses visuals to track how the model used predictions over time.

**Predictions agents accepted**

The line graph shows the correct predictions that agents used over time during incident management. If this number is trending downwards, consider retraining your model. For more information on editing a trained model, see Edit an incident prediction model in Task Intelligence for ITSM.

**Predictions agents replaced**

The line graph shows the incorrect predictions that agents removed over time during incident management. If this number is trending upwards, consider retraining your model. For more information on editing a trained model, see Edit an incident prediction model in Task Intelligence for ITSM.

# Task Intelligence for ITSM reference

Reference topics provide additional information about components installed with Task Intelligence for ITSM.

## Components installed with Task Intelligence for ITSM

Several types of components are installed with the activation of the Task Intelligence for ITSM application plugin (com.snc.itsm_ml_task), including tables, user roles, and ServiceNow store applications.

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## Roles installed

| Role title [name] | Description | Contains roles |
|---|---|---|
| Task Intelligence Admin<br>[sn_itsm_ml_task.ti_admin] | Admin user with rights to all actions in the application. Creates, edits, and monitors all Task Intelligence models. | • sn_incident_read<br>• sn_ti_admin.tia_admin |
| Task Intelligence Analyst<br>[sn_itsm_ml_task.ti_analyst] | Views and monitors Task Intelligence models through the Analytics dashboard. | • sn_incident_read<br>• sn_ti_admin.tia_analyst |

## Tables installed

| Table | Description |
|---|---|
| Task Intelligence Admin Template<br>[sn_ti_admin_template] | Contains template records, which are inserted by other applications, that specify the defaults for model training settings, implementation plans, and UI display information. |
| Task Intelligence Admin Help<br>[sn_ti_admin_help] | Contains help records that are displayed in a collapsible panel inside the application. Contents are filtered by the chosen template and setup page. |
| Task Intelligence Admin Feature<br>[sn_ti_admin_feature] | High-level business unit feature for incident categorization and incident field detection. |
| Task Intelligence Admin Statistic<br>[sn_ti_admin_statistic] | Groups statistic cards to a template and UI page. |
| Task Intelligence Admin Page<br>[sn_ti_admin_page] | Records of URL page fragments that are referenced in the help table. |
| Task Intelligence Admin Statistic Card<br>[sn_ti_admin_statistic_card] | Stores the statistic card's three-line scriptable content and its card description used in a card flip or tooltip. |
| Task Intelligence Admin Solution<br>[sn_ti_admin_solution] | Stores how the state of each ML model set progresses for the solution types, such as incident categorization and classification. |
| Task Intelligence Admin Model Prediction<br>[sn_ti_admin_model_prediction] | Stores the model test prediction for prebuilt models. |
| Task Intelligence Admin Tag<br>[sn_ti_admin_tag] | Contains the tags provided by other business units and a created solution by an admin. Tags help business unit partners search the models. |

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| Table | Description |
| --- | --- |
| Task Intelligence Admin Implementation Detail<br><br>[sn_ti_admin_implementation_detail] | Contains implementation options specified by business units, which are listed as options for a chosen template. When an Admin Console user role chooses an implementation plan, the business unit decides how to display model results for end users. |
| Task Intelligence Admin Model<br><br>[sn_ti_admin_model] | Stores the snapshot configuration view of the production and staging models for a solution. |
| Task Intelligence Admin Context<br><br>[sn_ti_admin_context] | Contains context-specific data from monitoring graphs that show different model performance. |
| Task Intelligence Admin Application Page<br><br>[sn_ti_admin_application_page] | Contains data related to the application page, fields, and forms. |
| Task Intelligence Admin Landing Card<br><br>[sn_ti_admin_landing_card] | Contains data related to the information cards displayed on the landing page of Task Intelligence for ITSM. |
| Task Intelligence Admin Landing Page<br><br>[sn_ti_admin_landing_page] | Contains information related to the landing page of the admin console. |

### Store applications installed

| Store application | Description |
| --- | --- |
| Advanced Recommended actions for ITSM<br><br>[com.snc.uib.sow_itsm_ra_advanced] | Enables you to configure and display relevant actions to agents based on record context. Agents can follow the actions to help customers and resolve issues. |
| Task Intelligence Admin Console<br><br>[com.sn_ti_admin] | Enables you to setup, manage, and monitor incident prediction models that help categorize incidents. |

## Collaboration services

Collaboration services provides a way to communicate and collaborate in real-time. You can directly use a collaboration tool from task records and as a channel within communication plans.

### Compatibility

Compatible with all the releases starting with the Madrid release.

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### Key features

- Slack
  - Create dynamic slack channels for tasks and import back.
  - Slash commands to get incident details directly from slack and perform basic operations on incident.
  - Initiate chat with slack users/channels directly from incidents.
  - Archive the slack channel when the task is closed.
- ServiceNow for Microsoft Teams
  - Initiate a chat using Microsoft Teams directly from tasks.
  - Import message history into a task record from Microsoft Teams, manually or automated.
  - Send individual notification and collaboration on Major Incident and Incident Communication Plan using Slack or Microsoft Teams.
  - For information about ServiceNow for Microsoft Teams integrations, see ServiceNow for Microsoft Teams.
- ServiceNow for Zoom
  - Initiate a chat using Zoom Team Chat directly from tasks.
  - Import message history into a task record from Zoom Team Chat.
  - For information about ServiceNow for Zoom integrations, see ServiceNow for Zoom.
  - Access ServiceNow Employee Center in the Zoom application. For information about ServiceNow Employee Center in Zoom, see Make Employee Center capabilities available in Zoom.

## Install Collaboration services

You can install the Collaboration services application (sn_tcm_collab_hook) if you have the admin role.

### Before you begin

- Ensure that the application and all of its associated ServiceNow Store applications have valid ServiceNow entitlements. For more information, see Get entitlement for a ServiceNow product or application.
- Collaboration services requires the following ServiceNow Store applications. Ensure that these applications are installed before you install Collaboration services.

  **Required ServiceNow Store applications**

  **Slack Spoke for ServiceNow IntegrationHub [com.sn.slack.ahv2]**

  If you want Slack integration for tasks or task communication management, install the Slack Spoke for ServiceNow IntegrationHub application. The application provides actions that you can use when designing flows. These actions allow you to communicate with Slack APIs.

  **ServiceNow for Microsoft Teams**

  If you want to integrate ServiceNow for Microsoft Teams, install the IT Service Management integration with Microsoft Teams or HR Service Delivery integration with Microsoft Teams applications as required. For more information on the integration, see ServiceNow for Microsoft Teams.

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**ServiceNow for Zoom**

If you want to integrate ServiceNow instance with Zoom, for complete information, see ServiceNow for Zoom.

Role required: admin

### About this task

For the tables that are installed with Collaboration services, refer Components installed with Collaboration services

.

### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the  application () using the filter criteria and search bar.

   You can search for the application by its name or ID. If you cannot find the application, you might have to request it from the ServiceNow Store.

   Visit the ServiceNow Store website to view all the available apps and for information about submitting requests to the store. For cumulative release notes information for all released apps, see the ServiceNow Store version history release notes.

3. In the Application installation dialog box, review the application dependencies.

   Dependent plugins and applications are listed if they will be installed, are currently installed, or need to be installed. If any plugins or applications need to be installed, you must install them before you can install .

4. **Optional:** If demo data is available and you want to install it, select the **Load demo data** check box.
   Demo data comprises the sample records that describe application features for the common use cases. Load the demo data when you first install the application on a development or test instance.

   **Important:**
   If you don't load the demo data during installation, it's unavailable to load later.

5. Select **Install**.

## Components installed with Collaboration services

Several types of components are installed with activation of the Collaboration services application.

**Note:**
The Application Files table lists the components that are installed with this application. For instructions on how to access this table, see Find components installed with an application.

### Tables installed

**Note:**
The tables are installed when you activate the Task Communications Management plugin (com.snc.task_communication_management).

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| Table | Description |
| --- | --- |
| Communication Channel Definition — Slack<br><br>[comm_channel_def_slack] | Extends the Communication Channel Definition [comm_channel_definition] table. |
| Communication Channel — Slack<br><br>[comm_channel_slack] | Extends the Communication Channel Definition [comm_channel] table. |
| Communication Plan — Collaboration Service Data<br><br>[comm_plan_collab_data] | Stores Collaboration Service related data. |

## Setting up Slack for communication

The Slack spoke requires creating a custom app on your Slack account to generate OAuth 2.0 tokens for the Slack spoke.

For more information, refer to Set up Slack spoke.

## Configure Slack as a communication channel for a communication task

Configure Slack as a mode of communication for a communication task to send direct message to the users.

### Before you begin

Role required: admin

### Procedure

1. Navigate to **All** > **Incident** > **Communication Plan Definitions**.
2. Open the communication plan where you want to add Slack as a communication channel for a communication task.
3. Open the communication task definition for which you want to add Slack as the mode of communication.
4. Click the **Add Channel – Slack** related links.
5. Click **Submit**.
   Slack gets added as a communication channel for the communication task.

## Import messages from an incident

You can import messages from a slack channel for an incident and append them in the **Comments** to store all important messages in the ServiceNow® instance.

### Before you begin

- Role required: sn_incident_write, itil, or admin
- You must be a member of the private slack channel to import messages from the private channel.

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- Your ServiceNow® email ID must be associated with your slack account.
- This feature is compatible with:
  - Collaboration Services store app - minimum version 3.04
  - Slack store app - minimum version 1.4.x

### About this task

Importing messages helps agents to view the history of the incident, allow the requester to see all discussions about their incident in one place. This helps to capture the information required for post-ticket review and continuous improvement processes.

### Procedure

1. Navigate to **All** > **Incident** > **Open**.
2. Select the incident for which you want to import messages.
3. Click the **View Slack Channels** related link.

   The View Slack Channels form appears. The form shows all the available slack channel for that incident.
4. Click **Import messages** for the channel that you want to import the messages from.

   The Import messages from Slack form appears. The form shows all the messages on that channel sorted by date.
5. On the form, fill in the fields.

**Import messages from Slack form**

| Field | Description |
|---|---|
| Search | Field to enter a keyword and search for a specific message. |
| Include reply threads in search | Option to include threads in search. |
| Filter by | ○ **Shared by**: The messages will be filtered based on the selected users.<br>○ **Date**: The messages will be filtered based on the **Start** and **End**dates that you select. |
| Import messages as | ○ **Additional comments**: The messages will be appended under Additional comments.<br>○ **Work notes**; The messages will be appended under Work notes. |
| Include attachments | Option to include attachments while importing messages. |

6. Click **Import messages**.

## Process flow for Slack communication

Collaborate with the stakeholders from major incident management workbench using slack for an open and transparent communication.

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Define a communication plan to manage the communication process. The plan includes tasks to achieve the plan goal and the stakeholders whom you must contact in the process.

When you create communication tasks for a plan, select slack as a mode of communication. To know how to define a channel for any communication task, refer to Define a communication channel. Keeping in mind the fact that it not always possible to plan for a communication plan or task in advance, you have the option to create adhoc communication plan and its tasks from an incident. When any task record meets the conditions in the communication plan, the plan gets attached with the task record. If for a major incident, a communication plan gets attached to the incident which has communication channel as slack for any of its tasks, you can send slack notifications from the major incident workbench.

**Note:**
The slack communication is a one-way communication from ServiceNow application to slack. The contacts in the slack cannot reply to the person who initiated the slack communication. Also, the users in slack must be employees of the organization. For example, the email address that they share for participating in a slack collaboration must be their email address of that organization.

Slack communication uses the following subflows:

- TCM Slack – Add Users to Channel
- TCM Slack – Archive Channel
- TCM Slack – Create Channel
- TCM Slack – Send Message
- TCM Slack – Remove User From Channel

## Slack communication through workbench

- In the major incident workbench, under the **Communicate** tab, you can find all the communication tasks for the plan.
- For the task where you have selected slack as a channel, you can click **Compose** to start a slack communication. For information on how to create a communication plan, refer to Add communication plan from the major incident workbench
- In the dialog box, the **To** field includes the contacts that you have added while creating the communication contact for the plan.
- The **Message** field includes the message you are intending to convey to the recipients.

## Add a collaborative communication task

In major incident workbench, you can add a collaborative communication task to collaborate and understand the progress of communication plan and its related tasks.

### Before you begin

- Role required: major_incident_manager
- This feature is compatible with:
  - Collaboration Services store app - minimum version 3.04
  - Slack store app - minimum version 1.4.x

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### Procedure

1. Navigate to **All** > **Incident Major incident** > **Open**.
2. Select the incident for which you want to add a collaborative communication task.
3. Click **View Workbench**.
4. Click the **Collaborate** tab, and then click **Add** that appears in the Collaborative Communication Tasks section.
5. On the form, fill in the fields.

**Collaborative communication task plan form**

| Field | Description |
|---|---|
| Communication Plan | List to select a new communication plan or to select an existing plan and add communication tasks to the plan |
| Plan Short description | Brief description of what the communication plan is all about. |
| Task Short description | Brief description of what the communication task is all about. |
| Channel | Option to select **Slack chat** as a channel for collaboration. |
| Frequency | Frequency at which a specific task must be executed. A task can be executed only once or on specific durations |
| Due in(Minutes) | Time span when the task must be executed after the task initiates. For recurring tasks, it also indicates the time span after which the task must repeat. |

6. Click **Next**.
7. In the **Manage Recipients** tab, add the users required to be involved in the major incident collaborative communication task, and click **Add**.

## Create a Slack channel for a collaborative communication task

Create a Slack channel for a collaborative communication task to collaborate and discuss the communication task details.

### Before you begin

Role required: major_incident_manager

### Procedure

1. Navigate to **All** > **Incident** > **Major Incident Open**.
2. Select the relevant major incident.
3. Click **View Workbench**.
4. Click the **Collaborate** tab.
   The Collaborative Communication Tasks section appears.
5. Click **Initiate** for the task that you want to create a Slack channel.

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6. On the form, fill in the fields.

**Initiate form**

| Fields | Description |
|---|---|
| Add participants | Individual users or groups whom you want as participants to the channel. |
| Recommended and Selected | Columns to personalize your list. Select the items in the **Recommended** column and move them to the **Selected** column using the right-arrow icon ( ). |
| Channel name | Unique name for the channel that differentiates it from the rest of the channels in Slack. |
| Channel topic | Description about the purpose of the channel. |
| Include a brief message for participants | Brief message that you want to send to the participants. |
| Private channel | Option to indicate whether the slack channel is private or public. |

7. Click **Start**.
   A slack channel is created, and you see the **View channel** and **Import messages** buttons next to the task.
8. To view the channel on slack, click **View channel**.
9. To import messages, click **Import messages**.
   For more information on how to import messages, see import-messages-from-incident.

## Slack integration - Incident Management

With Slack integration, you can create a dedicated channel for incident responders to collaborate during an incident enabling bidirectional integration with slack. You can create and update an incident, view information such as who is on-call for a group or view the list of incidents assigned to you.

### Request apps on the Store

Visit the ServiceNow Store website to view all the available apps and for information about submitting requests to the store. For cumulative release notes information for all released apps, see the ServiceNow Store version history release notes.

### Compatibility

The Collaboration Services store app version 2.0.x is compatible with all the releases starting with the Paris Patch 3 release.

### Key features

- Send a direct message to the caller
- Assign the incident to a user

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- Create a collaboration channel for an incident
- View and join a channel from an incident
- Create and update incident using a Slash Command
- View who is on-call for a group

## System requirements

- Incident Management (com.snc.incident)
- Collaboration Services plugin (sn_tcm_collab_hook) version 2.0.x
- Slack Spoke for ServiceNow IntegrationHub plugin (com.sn.slack.ahv2) version 1.3.x and the necessary Integration Hub license to use Slack as a collaboration channel.

> **Note:**
> The Slack spoke requires creating a custom app on your Slack account to generate OAuth 2.0 tokens for the Slack spoke. For more information, refer Set up Slack spoke.

## Create slack channel for an incident

Create a private or a public slack channel to collaborate with support teams or send a communication to keep stakeholders informed.

### Before you begin

- Role required: sn_incident_write, itil, or admin
- Plugins required:
  - Collaboration Services plugin (sn_tcm_collab_hook) version 2.0.x
  - Slack Spoke for ServiceNow Integration Hub plugin (com.sn.slack.ahv2) version 1.3.x
- Ensure you have set up interactivity and shortcuts for slack. For more information, refer configure slack app.

### About this task

The system property *sn_tcm_collab_hook.slack_on_task* enables the slack feature on a task table. By default, the value is incident. If you want to enable the slack feature on other task tables such as problem or change_request, add the table names in the **Value** field.

### Procedure

1. Navigate to **All** > **Incident** > **Open**.
2. Open an active incident record.
3. Click the **Create Slack Channel** related link.

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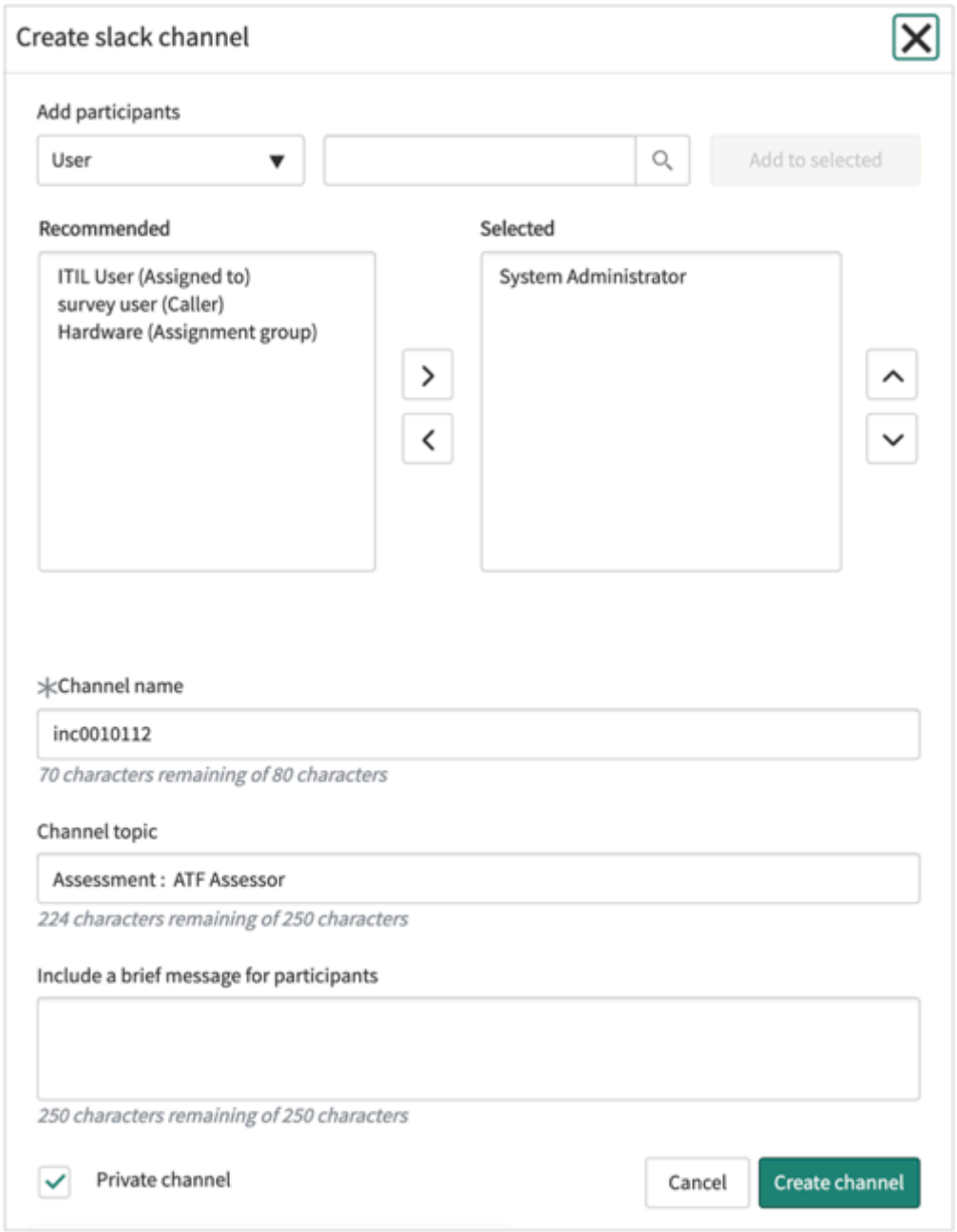
**Create slack channel**




4. On the form, fill in the fields.

**Create slack channel form**

| Fields | Description |
|---|---|
| Add participants | Individual users or groups whom you want as participants to the channel. |
| Recommended and Selected | Columns to personalize your list. Select the items in the **Recommended** column and move them to the **Selected** column using the right-arrow icon ( ). |

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| Fields | Description |
|---|---|
| Channel name | Unique name of the channel that differentiates it from the rest of the channels in Slack. |
| Channel topic | Description about the purpose of the channel. |
| Include a brief message for participants | Brief message that you want to send to the participants. |
| Private channel | Option to indicate whether the slack channel is private or public. If you select the check box, the channel is created as a private channel else it is created as a public channel. |

5. Click **Create channel**.
   A slack channel is created and an invitation is sent to the participants. Any duplicate user is removed from the selected participant list before the notification is sent. The participants can click **Skip** or **Join Channel** to ignore or join a slack channel.

## View or join slack channel from an incident

View all slack channels associated with an incident to know if a required slack channel already exists before you create a new one. You can also import messages from a slack channel.

### Before you begin

- Role required: sn_incident_write, itil, or admin
- Plugins required:
  - Collaboration Services plugin (sn_tcm_collab_hook) version 2.0.x
  - Slack Spoke for ServiceNow Integration Hub plugin (com.sn.slack.ahv2) version 1.3.x

### About this task

The system property *sn_tcm_collab_hook.slack_on_task* enables the slack feature on a task table. By default, the value is incident. If you want to enable the slack feature on other task tables, such as problem or change_request, add the table names in the **Value** field.

**Note:**
When an incident becomes inactive, the associated slack channels get archived.

### Procedure

1. Navigate to **All** > **Incident** > **Open**.
2. Open an active incident record.
3. Click the **View Slack Channels** related link.

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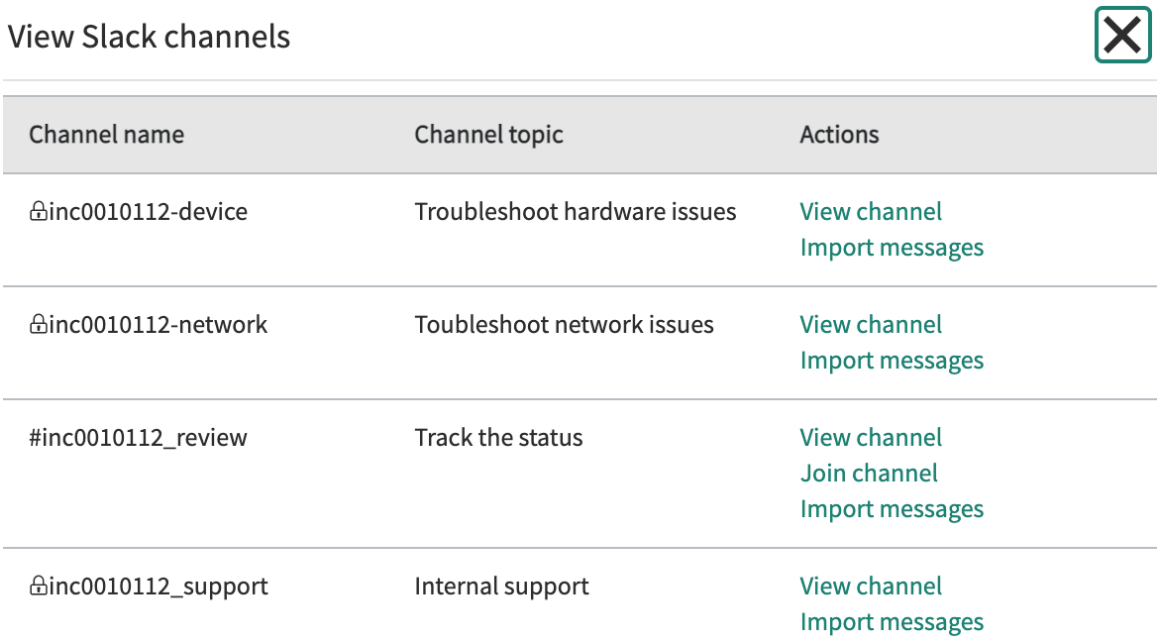
### View slack channels




All the dedicated slack channels for the incident are displayed.

**Note:**
The **Join channel** option appears only for public channels.

4. **Optional:** Click **View channel** to open the slack channel.
5. Click **Join channel** to join any slack channel.
6. To import messages from any slack channel, click **Import messages**.

### Add form section to view slack channels

View unarchived slack channels associated with an incident in the form section. The form section saves you the effort of opening the available channel list manually from the related list.

#### Before you begin

Role required: personalize_form or admin

#### Procedure

1. Navigate to **All** > **Incident** > **Open**.
2. Open an incident record.
3. Click the Additional actions icon and select **Configure** > **Form Layout**.
   For more information, refer Configuring form layouts.
4. Under **Form view and section**, in the **Section** field, click **New**.
5. In the **Section caption** field, enter a name for the section such as Slack Channels and click **OK**.
6. From the **Available** column, select **View Slack Channels** and move it to the **Selected** column using the right-arrow icon ( ).
7. Click **Save**.

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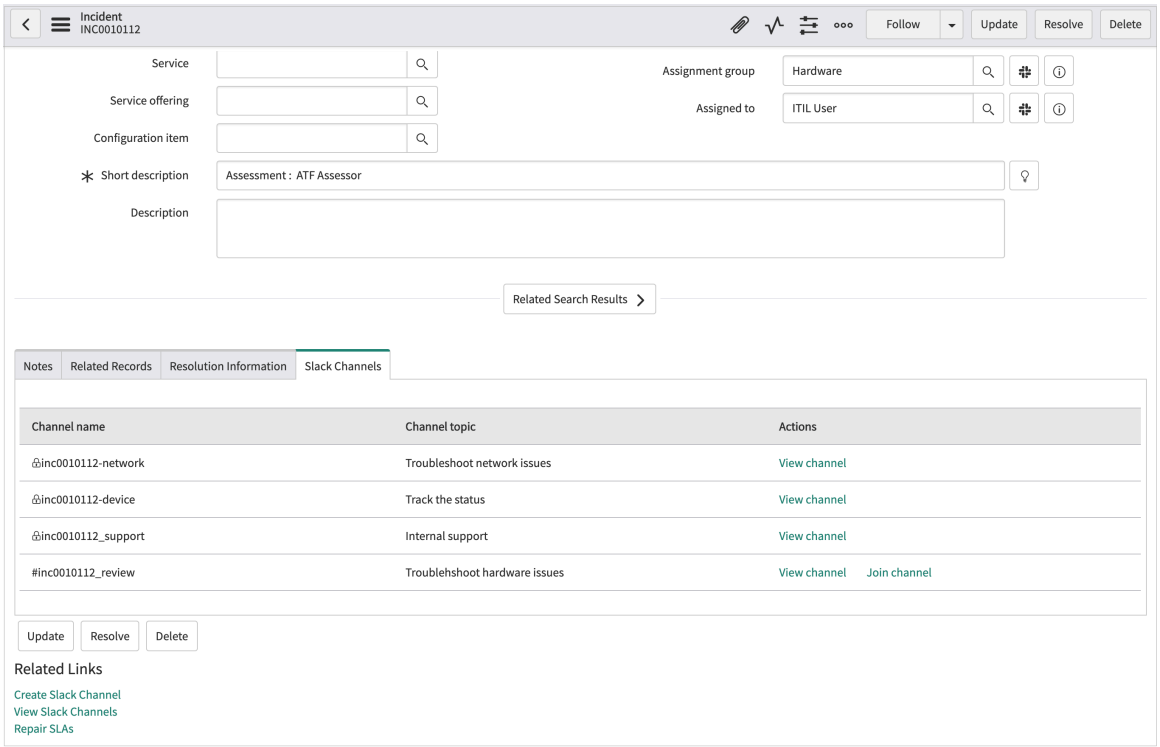
The new section displays all the active slack channels.

**Slack channels associated with the incident**




## Set up slack for a user or group

Set up slack from an incident to communicate and work together in channels with a user or a group.

### Before you begin

Role required: admin

### About this task

To enable slack for the **Assignment group** field, ensure you have set up a slack channel for that group. For more information, refer Associate existing slack channel with a group.

### Procedure

1. Download the `Fix script to add Slack field decorators` update set to get the fix scripts from ServiceNow Store app.
2. Import the update set file.
   For more information, refer Import an update set.
3. Navigate to **System Definition** > **Fix Scripts**.
4. Open the *`Add Slack Field Decorator`* fix script.
5. **Optional:** In the **Scripts** field, edit the script to indicate the table and the field for which you want to enable the slack communication.
6. Click **Run Fix Script**.

   The slack icon ( ) appears next to the following fields mentioned in the script.

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- **Caller**
- **Assignment group**
- **Assigned to**

Clicking the icon takes you to the direct message with the user on slack or slack channel for an assignment group.

### Related topics

Open slack from an incident

## Associate existing slack channel with a group

Associate an existing slack channel to reach out to an assignment group from an incident. Assignment groups are a great way to contact all your stakeholders at once.

### Before you begin

Role required: sn_slack_ah_v2.slack_admin or admin

### Procedure

1. Navigate to **All** > **Slack** > **Slack Channel Cache** and click **New**.
2. On the form, fill in the fields.

| Field | Description |
|---|---|
| Channel Name | Name of the existing slack channel. |
| Channel ID | Unique ID given by slack for a channel. |
| Channel Topic | Description about the purpose of the channel. |
| Channel Link | URI scheme to deep link into native Slack client of user. Example: slack://channel?team={TEAM_ID}&id={CHANNEL_ID}, where <TEAM_ID> is slack workspace id and <CHANNEL_ID> is the unique Id for the slack channel.<br>**Note:**<br>For more information, refer Deep linking into Slack. |
| Document ID | Group record for which channel is intended to be used.<br>○ Table: Group [sys_user_group]<br>○ Document: <Reference to a group> |
| Is Archived | Option to indicate whether the slack channel is active or inactive. |
| Is Private | Option to indicate whether the slack channel is private or public. |

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| Field | Description |
|---|---|
| | **Note:** It is strongly recommended to associate a public slack channel. In case of private channel, and you are not a member of it, the navigation link may break. |
| Creator | User who creates the slack channel cache record. |

3. Click **Submit**.

## Open slack from an incident

Open slack from an incident and send message to a user or an assignment group to exchange incident information. You do not need to manually search for a user in slack to send a message.

### Before you begin

Role required: sn_incident_read, sn_incident_write, itil, or admin

### About this task

The slack icon ( ) appears for the fields that you include in the fix script. For example, if you have the **Caller**, **Assigned to**, and the **Assignment group** fields for incident in the fix script, then the icon appears for these fields.

### Procedure

1. Navigate to **All** > **Incident** > **Open**.
2. Open an active incident record.
3. Click the slack icon ( ) that appears next to the **Caller**, **Assigned to**, or the **Assignment group** fields.
4. In the Open Slack dialog window, click **Open Slack**.
   A direct message with the user on slack or a slack channel opens for the group.

## Slack slash commands

Slash commands provides a quick way to invoke your app to perform specific actions from Slack.

You need to configure slash commands to execute the commands. Only a user with the sn_incident_write, itil or admin role can execute the commands.

### Slash commands

| Commands | Description |
|---|---|
| /now help | Provides list of available ServiceNow commands with description. |
| /now create incident | Creates an incident with the inputs provided by the user. |
| /now list incidents | Lists all active incidents assigned to the user. |

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**Slash commands (continued)**

| Commands | Description |
|---|---|
| /now oncall [group name] | Displays shifts and members who are currently on-call for a group.<br><br>**Note:**<br>Only a user with the itil or the admin role can execute this command. |
| Slash commands that can be run only from channels associated with ServiceNow | |
| /now comment [comment] | Posts a comment in the **Additional comments** field of the associated incident. |
| /now note [note] | Posts a note in the **Work notes** field of the associated incident. |
| /now assigntome | Assigns associated incident to the slack user. |
| /now assign [@slack_user] | Assigns associated incident to a specific user. |

# Vendor Management Workspace

Monitor the performance of your company's vendors and manage all vendor-related information using the ServiceNow® Vendor Management Workspace. Assess the performance of your vendors using key performance indicators (KPIs) that you can configure to create vendor metrics.

## Get started

Track and analyze how your vendors are executing on their goals and which areas need attention from a unified, central location. Integrate data from Service Portfolio Management (SPM), Contract Management, Assets, SLA Contracts, Vendor Risk Management, and Continual Improvement Management (CIM) applications.

| Explore | Configure |
|---|---|
|  |  |
| Manage all vendor-related information using Vendor Management Workspace. | Plan and configure your implementation. |

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Integrate



Bring in data from other ServiceNow applications to assess the relationship with your vendors.

Reference



Plan and configure your implementation.

### Troubleshoot and get help

- ServiceNow Community
- Search the Known Error Portal for known error articles
- Contact Customer Service and Support

## Exploring Vendor Management Workspace

Use Vendor Management Workspace to monitor metrics and analyze your vendor's health from a single user interface. Gain insights when you compare top-performing vendors and track compensation your vendors owe you when they breach the service agreement.

### Vendor Management Workspace overview

The video provides an overview of Vendor Management Workspace.

https://player.vimeo.com/video/1014361687?h=6ef117ba57&badge=0&autopause=0&player_id=0&app_id=58479

As a vendor manager, you can:

- Organize your vendors into vendor KPI groups and analyze vendor performance.
- Gain insights into how your vendors are performing in comparison with other vendors in your organization.
- Track the compensation that you vendors owe for breaching service agreements.

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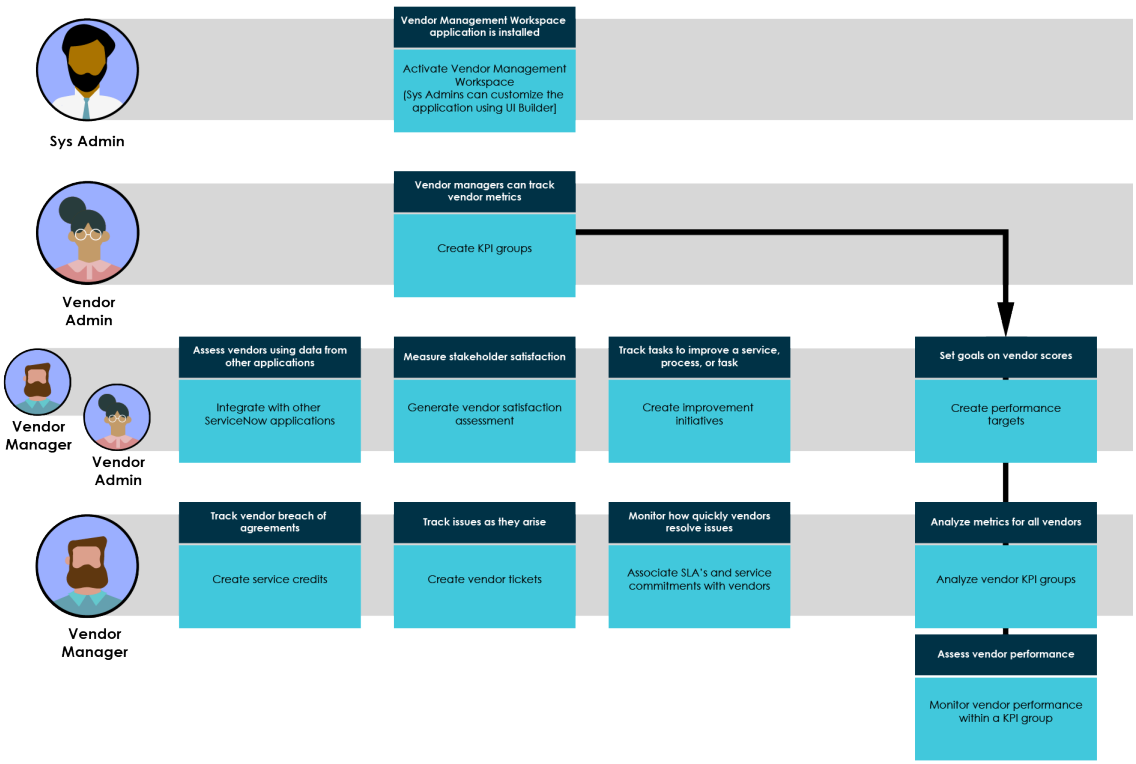
# Vendor Management Workspace workflow




In this workflow:

1. Administrators activate Vendor Management Workspace. The application is installed after the Vendor Manager Workspace (sn_itsm_vendor) plugin is activated. Vendor administrators can then configure the application and vendor managers can use the application.

   **Note:**
   After the administrators activate Vendor Management Workspace, they can also customize Vendor Management Workspace using UI Builder.

2. Vendor admins can create KPI groups so that vendor managers can track vendor metrics.
3. Vendor admins and vendor managers can do any of the following:
   - Integrate with other ServiceNow applications to assess vendors who use data from other applications.
   - Generate vendor satisfaction assessment to measure stakeholder satisfaction.
   - Create improvement initiatives to track tasks to improve a service, process, or a task.
   - Create performance targets to set goals to achieve desired vendor scores.
4. Vendor managers can do any of the following:
   - Create service credits to track vendor breach of agreements.
   - Create vendor tickets to track issues as they arise.
   - Associate SLAs and service commitments with vendors to monitor how quickly vendors resolve issues.

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- Analyze vendor metrics using the vendor KPI group data.
- Monitor vendor performance within a KPI group and assess them.

## Vendor Management Workspace benefits

| Benefit | Feature | Roles |
|---|---|---|
| Add vendors and set up vendor metrics to analyze their performance goals. | Configuring Vendor Management Workspace | Vendor admin |
| Monitor vendor metrics and evaluate vendor health using Vendor Management Workspace. | Managing vendor using Vendor Management Workspace | Vendor manager |
| Bring in data from other ServiceNow applications to assess the relationship with your vendors. | Integrating Vendor Management Workspace with other ServiceNow applications | Vendor admin |
| Create custom web experience in Vendor Management Workspace based on your needs. | Customize a Vendor Management Workspace page using UI Builder | Admin, Workspace admin, or UI builder admin |

## Vendor KPI Groups in Vendor Management Workspace

Learn how you can organize your vendors into vendor KPI groups. You can then define Key Performance Indicators (KPI) to analyze the performance of all vendors within that vendor KPI group. Drill down into the metrics for a vendor, KPI or the KPI group—all from a central location.

As a vendor administrator, you can:

- Create a vendor KPI group for a common set of indicators (KPIs) you use to measure the performance of all vendors in that group.
- Add KPIs to the vendor KPI group.
- Add vendors that you want to measure using the KPIs.
- Define upper and lower thresholds to monitor the indicator status.

As a vendor manager, you can:

- Analyze the performance trends for your vendors as well as the performance for associated service offerings, contracts, improvement initiatives, and SLA definitions.
- Drill down into vendors, a KPI group, or a KPI to view trends and historical performance.

### Understanding Vendor KPI Groups setup and use in Vendor Management Workspace

Learn how you can organize your vendors into Vendor KPI Groups. Understand how you can set up Vendor KPI Groups and how vendor scores get calculated and displayed in the Vendor Management Workspace.

Set up and use the Vendor Management Workspace configurable using User Interface Builder (UIB) with five simple steps:

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1. Organize similar types of vendors into vendor KPI group categories.
2. Add a common set of KPIs that matter most to this type of vendors.
3. Set upper and lower thresholds for each vendor KPI group to monitor the status of the KPIs.
4. Add vendors to the KPI groups.

   For information on setting up KPI groups, see Create KPI groups to track metrics for your vendors.

5. Analyze vendor health using Vendor Management Workspace. For information on using Vendor Management Workspace, see Customize a Vendor Management Workspace page using UI Builder.

**Related topics**

Example: Vendor Management Workspace setup

### Example for Vendor Management Workspace setup

Learn how you can create KPI groups using Vendor Management Workspace with an example.

## Before you begin

Role required: sn_vlm.vendor_admin

## About this task

Let's assume that a vendor manager wants to create a vendor KPI group for all of their software vendors. They want to associate KPIs with the vendor KPI group to measure the performance of all vendors in the vendor KPI group.

## Procedure

1. Create a KPI group.
   a. Navigate to **Vendor Management** > **Configuration** > **KPI Groups**
   b. Click **New**
   c. Create a vendor KPI group for software vendors.
      i. In the **Name** field, enter `Software`.
      ii. In the **Description** field, enter a description such as, "This KPI Group is for software vendors."
      iii. In the **Type** menu, select **Vendors**.
      iv. Right-click the form header and click **Save**.
2. Associate three KPIs with the vendor KPI group to evaluate the software vendors in that group.
   a. In the KPIs related list, click **New**.
   b. In the **KPI**field, click the search icon, select each of the indicators listed below and click **Submit** to add the KPIs to the group.
      - Vendor Satisfaction with the Display Aggregate set to Average.
      - Average Stability - Critical Incidents with the Display Aggregate set to Average.
      - Total Incidents Created with the Display Aggregate set to Sum.
3. Add a weight value, which represents the relative order of importance, for each KPI that contributes towards the vendor score.

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- For Vendor Satisfaction, set the weight value to 60.
- For Average Stability - Critical Incidents, set the weight value to 40.
- For Total Incidents Created, set the weight value to 0, which indicates that it does not contribute to the vendor score calculation.

The combined weight of all indicators added to the KPI group must be equal to 100. If the combined weight is above or below 100, then they are proportionately readjusted to 100.

4. Associate thresholds to the KPI group.
   Define a range for the threshold values and assign a state for each range. For example, you can assign the lower threshold as 0 and the upper threshold as 60 and define the status as critical. .

   Each range has a color associated with it by default. When the vendor score is calculated for the vendors in the vendor KPI group, the score displays the highlighted color associated with the threshold range in the Vendor Management Workspace

   For example:

   a. In the KPI Group Thresholds related list, click **New**.
      - In the **Lower Threshold** field, enter 0.
      - In the **Upper Threshold** field, enter 60.
      - In the **Status** menu, select **Critical**.
      - In the **Order** field, enter 200.
   b. Click **Submit**.

   Here is another example which shows that if the threshold values overlap between two different ranges, the one with a lower order number will be given preference.

   a. In the KPI Group Thresholds related list, click **New**.
      - In the **Lower Threshold** field, enter 50.
      - In the **Upper Threshold** field, enter 80.
      - In the **Status** menu, select **Moderate**.
      - In the **Order** field, enter 300.
   b. Click **Submit**.
   Because the KPI group threshold value of 60 overlaps between the two sets of thresholds set above, the preference is given to the KPI group threshold that has the Critical status because it has a lower order number. Therefore, if the KPI threshold has a value of 60, the highlighted color for that value in Vendor Management Workspace displays in the color set for the Critical status.

5. Add thresholds for the individual KPIs.

   After you set the thresholds, you can view the KPI values in highlighted colors that correspond to each threshold range for the KPI in Vendor Management Workspace.

   a. In the KPIs related list, click the preview icon next to the KPI for which you want to set the threshold and click **Open Record**.
   b. In the KPI Thresholds related list, click **New**.
      - In the **Lower Threshold** field, enter 60.
      - In the **Upper Threshold** field, enter 80.

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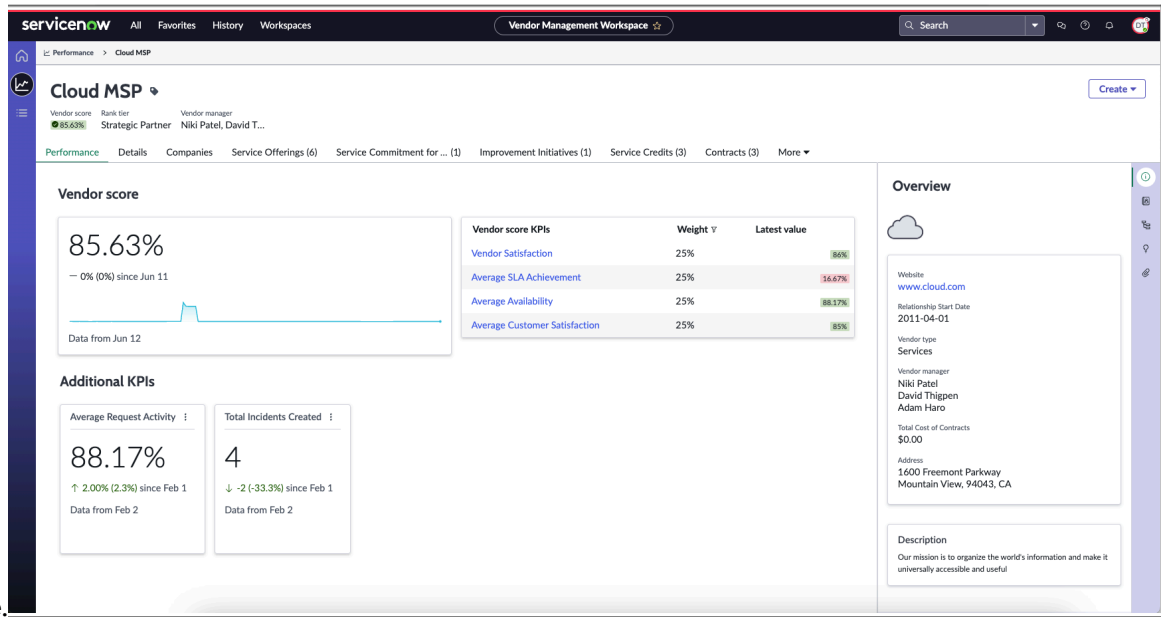
- In the **Status** menu, select **Moderate**.
- In the **Order** field, enter 300.

**c.** Click **Submit**.

The threshold values for the KPI are highlighted with the color based on the threshold range in Vendor Management Workspace.




6. Add vendors to the KPI group.
   a. In the Vendors related list, click **Edit**.
   b. Add the vendors you want to add to the KPI group and click **Save**.

## Vendor Success Indicators in Vendor Management Workspace

Gain insights into how your vendors are performing in comparison with other vendors in your organization. Using the chi-square test, find out which attributes contribute to the success of your vendors.

> **Important:**
> You must install the Success Indicators (com.snc.vendor.insights) plugin separately from the ServiceNow Store. For more information, see Activate Vendor Management Workspace.

You can also see what common characteristics contribute to high performance. Identify gaps that could enhance the performance of your vendors and create improvement initiatives based on these insights. The Vendor Success Indicators application includes the following five modules:

| Module Name | Description |
|---|---|
| Attributes | Identify and set up attributes that may correlate to the success of the vendor performance. Attributes are key data points such as geographical location, or contract costs. For the attributes available by default with your application, see Attributes installed with Vendor Success Indicators. |
| Executions | Displays the table and filter conditions based on the scheduled job that is run to collect the comparison data. |
| Inputs | Collects the data derived by the attributes specific to a vendor when the scheduled job is run. |

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| Module Name | Description |
|---|---|
| Results | Displays high-performing attributes based on the inputs using Predictive Intelligence. |
| Properties | Properties to collect comparison data. For detailed information on properties for Vendor Success Indicators, see Properties installed with Vendor Success Indicators. |

As a vendor admin, you can:

- Configure attributes for vendor success indicators to compare common characteristics against top-performing vendors.
- Run a scheduled job to collect attribute data and generate results that can be viewed on Vendor Management Workspace.

As a vendor manager, you can:

- Understand which attributes were used for comparing the vendors.
- Analyze how your vendors are ranked against the same attributes as compared with all other vendors in your organization.
- Get insights into the attributes that contribute to the success of high-performing vendors.

**Related topics**

Setting up Vendor Success Indicators

Compare your vendor characteristics with high-performing vendors

### Service Credits in Vendor Management Workspace

Track and manage the compensation that your vendors owe your organization when they breach the service agreement you have with them.

Using Service Credits, you can:

- Track the compensation for every breach the vendor has made to the service agreement.
- Analyze the cumulative effect of multiple breaches by the same vendor from one location.
- Determine the credits your vendors owe you based on the breach count or the duration of each breach.
- Mark off credits that you've redeemed, which automatically calculates the amount that the vendor has paid off and the remaining amount, if any, they might still owe your organization.
- Associate service agreement breaches based on an outage, incident, service availability, or for the vendor.
- Create vendor tickets to monitor and resolve issues with your products and services. For more information, see Create a vendor ticket in Vendor Management Workspace.

**Related topics**

Create a service credit in Vendor Management Workspace

## Configuring Vendor Management Workspace

Use Vendor Management Workspace to create vendors, service credits, or vendor tickets and to set up Vendor Success Indicators.

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## Configuration overview

Find tasks that you need to complete to configure Vendor Management Workspace.

| Benefit | Task |
|---|---|
| Turn on Vendor Management Workspace. | Activate Vendor Management Workspace |
| Clone an existing Vendor Management Workspace page and customize it. | Customize a Vendor Management Workspace page using UI Builder |
| Add a vendor to Vendor Management Workspace. | Create a vendor in Vendor Management Workspace. |
| Generate **Vendor Satisfaction Assessment** to assess how satisfied your stakeholders are with the vendors they collaborate with. | Generate the Vendor Satisfaction Assessment in Vendor Management Workspace |
| Create KPI groups to track vendor metrics. | Create KPI groups to track metrics for your vendors |
| Create improvement initiatives in Vendor Management Workspace. | Create an improvement in Vendor Management Workspace |
| Create a service credit in Vendor Management Workspace. | Create a service credit in Vendor Management Workspace |
| Set up Vendor Success Indicators. | Setting up Vendor Success Indicators in Vendor Management Workspace |

## Activate Vendor Management Workspace

The Vendor Manager Workspace (sn_itsm_vendor) plugin is available with the ITSM Pro subscription package. This plugin activates related plugins if they are not already active.

### Before you begin

Role required: admin

### About this task

#### Vendor Management Workspace plugins

| Plugin | Description |
|---|---|
| Vendor Manager Workspace (sn_itsm_vendor)<br><br>**Note:** This is a ServiceNow Store plugin. You must install this plugin separately from the ServiceNow Store. | Activates the Performance Analytics Premium for Service Management (com.snc.pa.premium.service_management) plugin that adds the following functionality to Vendor Management Workspace:<br>• Create indicators, breakdowns, and other records.<br>• Create text analytics widgets.<br>• Use Performance Analytics with external data.<br>• Preserve performance scores beyond 180 days.<br><br>Activates the Continual Improvement Management (com.sn_cim) plugin. This plugin enables you to monitor |

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**Vendor Management Workspace plugins (continued)**

| Plugin | Description |
|---|---|
| | the continual improvement initiatives that your vendors are engaged with. |
| Vendor Success Indicators (com.snc.vendor.insights) | Activates success indicators and adds the following functionality to gain insights into how your vendors are performing in comparison with other vendors in your organization. |
| Vendor Management Mobile (sn_vendor_mobile)<br>**Note:** This is a ServiceNow Store plugin. You must install this plugin separately from the ServiceNow Store. | Activates the Vendor Mobile Agent app |

You can also integrate Vendor Management Workspace with the Vendor Risk Management application when you enable the Vendor Risk Management (app-vendor-risk-management) plugin.

If you have downloaded the Vendor Risk Management application that is available from the ServiceNow Store, you can view the risk rating for your vendors. For more information on downloading the Vendor Risk Management application, refer to Download a GRC application from the ServiceNow Store for the first time.

When you enable the GRC: Vendor Risk Management Workspace (sn_vrm_ws) plugin from the ServiceNow Store you can view Vendor Risk Workspace within the Vendor Management Workspace application.

### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

   You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.
3. Select **Install** to start the installation process.

   **Note:**
   When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

   You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

## Customize a Vendor Management Workspace page using UI Builder

Clone an existing Vendor Management Workspace page variant and customize it based on your needs using the UI Builder.

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### Before you begin
Role required: admin, workspace_admin, or ui_builder_admin

### About this task
All UI Builder pages and page variants are read-only. You can copy a page variant and then customize it. You can create a page variant from scratch or use a page template. For more information, see Create a variant of a page.

**Note:**
After you copy and customize a page variant, any automatic updates applied to the original read-only page variant will not be applied to the page variant that you have customized.

To open your configurable workspace experience in UI Builder, see Open a Configurable Workspace experience in UI Builder

For a list of all workspaces ServiceNow offers to target specific users, see List of workspaces.

### Procedure
1. Navigate to **All** > **UI Builder**.
2. In the UI Builder screen, select **Vendor Management Workspace**.
3. In the **Page** menu, select the page you want to edit.
4. In the **Variants** section, select the menu icon ( ) of the variant you would like to copy select **Duplicate**.
5. In the variant that you've duplicated, select the menu icon ( ) and select **Edit page variant settings**.
6. In the Edit settings pop-up window, do the following:
   - In the **Variant name** field, enter a unique name for the variant.
   - If you would like to use a different page template, in the **Page template** field, select the page template.
   - Select **Save** to keep the changes.

     If you do not want to make any updates, select **Cancel** or select **Delete** to delete the variant.
7. Select the menu icon ( ) and select **Edit conditions**.
   - To add or edit conditions for the variant, in the **Variant Conditions** field, add your preferred conditions for the variant.
   - To display the variant in Vendor Management Workspace, in the **Order** field, set the preferred order number.
8. Select **Done**.

### Related topics
Configuring the Next Experience UI

## Integrating Vendor Management Workspace with other ServiceNow applications

Bring in data from other ServiceNow applications to assess the relationship with your vendors.

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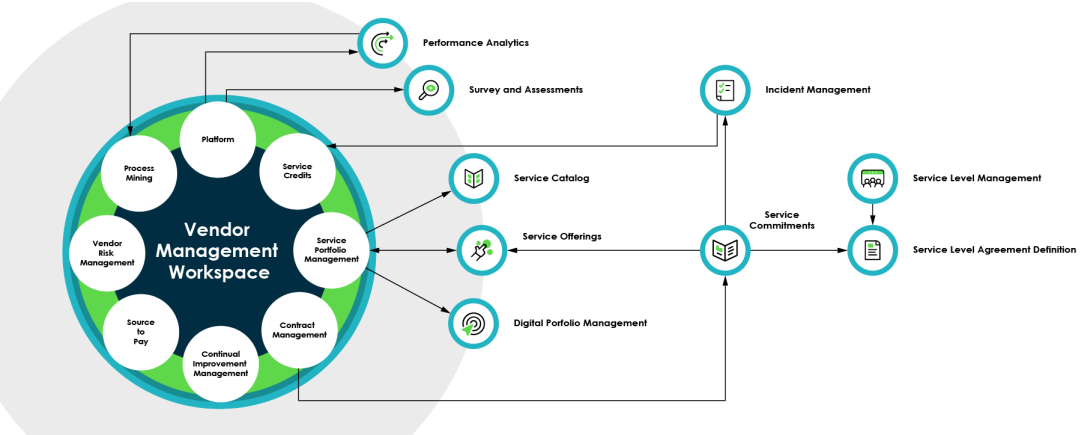
The image shows a comprehensive view of all applications that you could integrate with Vendor Management Workspace.




The table provides a description of each application that can be integrated with Vendor Management Workspace.

### Vendor Management Workspace integration applications

| Application | Description |
|---|---|
| Continual Improvement Management | Monitor, plan, and measure your organization's vendor processes and functions. Track performance improvements or optimization initiatives by viewing the continual improvement initiatives a vendor is engaged in. |
| Contract Management | Manage binding vendor agreements between two parties. Discover how many active contracts a vendor has to evaluate the financial impact the vendor has on your company. |
| Source-to-Pay Operations | Vendor onboarding using supplier table reference on core_company table. |
| Vendor Risk Management | Monitor potential risks associated with vendor third-party relationships. Use a centralized process to view and manage risks associated with your vendor portfolio and completing the vendor assessment and remediation life cycle. |
| Process mining | Discover inefficiencies in your business processes and optimize them. |
| Service Credits | Track and manage the compensation that your vendors owe your organization when they breach the service agreement you have with them. |
| Service Portfolio Management | Document and manage vendor services using a standardized, structured format. |
| Assessments and Surveys | Assess how satisfied your stakeholders are with the vendors they collaborate with. |

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**Vendor Management Workspace integration applications (continued)**

| Application | Description |
|---|---|
| Performance Analytics | Manage key vendor metrics using a dashboard. |
| Incident Management | Restore normal vendor service operations while minimizing business impact. |
| Service Catalog | Request vendor catalog items using self-service. |
| Service Offerings | Refine vendor services to a specific business need. Understand the active service offerings and unique service offering subscribers associated with your vendors. Use this information to evaluate the business impact a vendor has on your company. |
| Digital Portfolio Management (DPM) | Manage solutions such as service and service offerings from one location. |
| Service Commitment | Specific vendor services that define the unique characteristics for a service offering. |
| Service Level Management | Manage vendor requirements on agreed SLAs. Find out how many active SLA definitions a vendor has to monitor their service level agreements with your company. |
| Service Level Agreement Definition | Manage vendor SLA definitions. |

## Browser support for workspaces

**Important:**
Due to significant performance issues, ServiceNow recommends that customers migrate away from Internet Explorer 11. For more information, refer to KB0683275.

## Create a vendor in Vendor Management Workspace

Add vendors to your existing vendor list or modify the existing vendor-related information.

### Before you begin

Role required: sn_vlm.vendor_admin or sn_vlm.vendor_manager

### About this task

Define the information to include in a vendor record. For example, contact and contract information, the assigned vendor manager, and evaluation criteria.

**Note:**
Only users with the admin role can create a new vendor record. Users with the sn_vlm.vendor_manager role can edit existing vendor records.

For administrators, creating a vendor record entails simply adding general vendor information to a new record, for example, the vendor name and address, and updating the list. Vendor managers can then define the vendor record by adding more specific details about the vendor, such as, who manages the vendor, what state the vendor is in, internal and external contacts, and more.

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Before defining the vendor record, vendor managers benefit from reviewing the Company form and planning and collecting all pertinent information about the vendor.

### Procedure

1. To create a new vendor, administrators navigate to **Vendor Management** > **All Vendors** and click **New**.
   Alternatively, to edit an existing vendor record, vendor managers click the name of the vendor to open the Company form. Add to or change form field data as needed. To delete an existing vendor, click the **delete** button in the form header.
2. Fill in the form fields, as appropriate.

#### Company form

| Field | Description |
|---|---|
| Name | The vendor providing this service. Typically this is the company name. |
| Vendor state | Status of the vendor. |
| Website | The URL for the vendor's website. |
| Rank tier | Ranking that represents the organization opinion of the products from this vendor. |
| Vendor manager | Person who manages the vendor. Add yourself as the manager or click the lock icon to add one or more users as vendor managers.<br>**Note:**<br>Select only users who have the sn_vlm.vendor_manager role. |
| Business owner | Person who owns the vendor company. |
| Parent | The vendor's parent company. |
| Notes | Additional information about the vendor. |
| General tab | |
| Vendor type | Type of business that applies to the vendor, for example, service, hardware, or software. |
| Vendor | Check box that's selected by default, to recognize this company as a vendor in the system. |
| Manufacturer | Check box to indicate if this company is a manufacturer. |
| Number of employees | The number of employees for the vendor. |
| Relationship start date | The date when you started engaging with the vendor. |
| Banner image | The image to appear in the vendor scorecard header. This is usually the vendor's company logo.<br>**Note:**<br>The image should be approximately 60–70 pixels high, and in one of these file formats: .jpg, .png, .bmp, .gif, .jpeg, and .ico. |
| Banner text | Text for the vendor scorecard, such as the company slogan. |

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| Field | Description |
|---|---|
| Unique subscribers | The total number of subscribers to the product offered by the vendor. |
| Location tab | |
| Street | Name of the street where the vendor is located. |
| City | Name of the City where the vendor is located. |
| State / Province | Name of the state or province where the vendor is located. |
| Zip / Postal code | Zip code where the vendor is located. |
| Country | Country where the vendor is located. |
| Phone | Vendor's primary contact number. |
| Fax phone | Vendor's fax number. |
| Latitude | The geographical latitudinal coordinate for the vendor location. |
| Longitude | The geographical longitudinal coordinate for the vendor location. |
| Financial tab | |
| Publicly traded | Check box indicating if the vendor is a publicly traded company. |
| Stock symbol | The vendor's stock symbol. |
| Stock price | The vendor's stock price. |
| Total Cost of Contracts | Cost of all contracts. |
| Revenue per year | The annual revenue generated by the vendor. |
| Market cap | The market cap for the vendor. |
| Profit | The vendor's profit margin. |
| Fiscal year | The date on which the vendor fiscal year ends. Click the calendar icon to select the date. |

3. Right click in the header to save the new vendor record.
The following related links and related lists appear.

| Field | Description |
|---|---|
| Related Links | |
| Create Service Credit | Credit that the vendor owes your organization because of a breached business service contract. Click to create a service credit if necessary. |
| See Vendor's Profile | General information, including performance metrics, about the vendor in the Vendor Management Workspace. |
| Companies | Name of companies you want to associate with the vendor. |
| Service Offerings | Business services offered by this vendor. |

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| Field | Description |
|---|---|
| Service Commitment for Vendor | Service commitments negotiated with the vendor. For example, a cloud services vendor commits to 95% uptime. |
| Improvement Initiatives | Improvement initiatives associated with the vendor. |
| Service Credits | Service credits associated with the vendor. |
| Contracts | Contracts established with the vendor and the contract status. |
| SLA Definitions | SLA definitions associated with the vendor. |
| Vendor Catalog Items | Catalog items from the vendor that are available for users to order. |
| Vendor Stakeholders | Stakeholders associated with the vendor via the Assessments and Surveys application. |
| Product Models | Product models related to the vendor for vendors that are designated as manufacturers. |
| Assets | Assets purchased from the vendor that are available for assignment to in use. |

4. Click any related list tab to view existing information or click **New** within a related list to create a new record.
5. Click **Submit** to save your vendor record or click **Update** after editing a vendor record.

## Add a formula indicator to track vendor score

Create a custom formula indicator to add to your calculation for the vendor score. Add the indicator to your KPI group to analyze the score.

### Before you begin

Role required: pa_contributor, pa_data_collector, pa_power_user, or pa_admin

### Procedure

1. Navigate to **All** > **Performance Analytics** > **Indicators** > **Formula Indicators**.
2. Select **New**.
3. Fill in the fields on the form.
   a. In the **Name** field, enter a descriptive name for the formula indicator.
   b. Fill in the **Indicator properties** section.

| Name | Description |
|---|---|
| Direction | ▪ Select **Maximize** if an increase in score is desired.<br>▪ Select **Minimize** if a decrease in score is desired. |
| Unit | Select the percentage (%) value. |
| Precision | Rounding of the fractional results. |

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c. In the **Formula** section, select **Browse for an indicator**.

   The **Add an indicator to a formula** appears.

d. In the **Indicator** field, select the indicator you want to add to the formula.

e. Click **Select**.

f. Add any mathematical operators such as +, -, *, or %.

g. If you need to add more indicators, select the **Browse for an indicator** link and add more indicators to the formula based on the score you want to calculate.

4. Select and hold (or right-click) the form header and select **Save**.
5. Add a vendor breakdown for the indicator.
   a. In the Breakdowns related list, select **Edit**.
   b. Select **Vendors** from the Collection list and add it to the Breakdowns list.
   c. Select **Save**.
6. Add the indicator to the vendor KPI group.
   a. Navigate to **All** > **Vendor Management** > **Configuration** > **KPI Groups**.
   b. Select the KPI group to which you want to add the formula indicator.
   c. In the KPIs related list, select **New**.

      The KPIs form appears.

   d. In the **KPI** field, select the formula indicator you've created.
   e. In the **Order** field, set the order number.
   f. Select **Submit**.

> **Note:**
> In the KPI Group form, make sure the combined weight of all KPIs in the KPIs related list adds to 100. If the combined weight is over 100, then the weight will be proportionately readjusted to 100.

### Result

The formula indicator is added to the KPI group and is used for calculating the vendor score in Vendor Management Workspace.

For detailed information on creating a formula indicator, see Create a formula indicator.

## Generate the Vendor Satisfaction Assessment in Vendor Management Workspace

Use Assessments and Surveys to assess how satisfied your stakeholders are with the vendors they collaborate with. Generate assessments using the Vendor Satisfaction Assessment metric type that comes with the Vendor Management Workspace application.

### Before you begin

Role required: assessment_admin or sn_vlm.vendor_manager

### About this task

The **Vendor Satisfaction Assessment** metric type is used to measure the satisfaction of stakeholders who collaborate with your vendors. This metric type uses the **Vendor Satisfaction** metric category to determine the vendor satisfaction score that displays in Vendor Management

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Workspace. Any new categories that are added to the metric type do not contribute towards the calculation of the vendor satisfaction score.

### Procedure

1. Navigate to **All** > **Vendor Management** > **Assessment Administration** > **Types**.
2. Set the desired conditions for the Company [core_company] table.
   a. Select **Vendor Satisfaction Assessment**.
   For descriptions of the assessment metric type fields, refer to Configure an assessment.
   b. Select the **Conditions** tab.
   c. Add the desired filter conditions for the Company [core_company] table.
   d. Click **Update**.
3. Associate users to the metric categories for the assessment.
   a. In the **Metric Categories** tab, select **Vendor Satisfaction**.
   b. In the **Users** tab, select **Edit**.
   c. Add all users you want to associate with vendors to the Users List for Vendor Satisfaction.
   d. Select **Save**.
4. Associate users with vendors.
   a. Navigate to **Vendor Management** > **Assessment Administration** > **Stakeholders**.
   b. Select the Vendor Satisfaction Assessment metric type.
   c. Select a user from **Category Users**.
   d. Select the vendor you want to associate the user with from **Assessable Records**.
   e. Select **Associate**.
   f. **Optional:** Associate additional users to vendors.
5. **Optional:** Verify the association of users to vendors.
   a. Navigate to **All** > **Assessments** > **Advanced** > **Assessment Stakeholder**.
   b. Verify the association between the user and the vendor.

   **Note:**
   The **Category user** field lists all users and the **Assessable record** field display the associated vendors.
6. Generate the assessment.
   a. Navigate to **All** > **Vendor Management** > **Assessment Administration** > **Types**.
   b. In the **Assessment Metric Types** record, select **Vendor Satisfaction Assessment**.
   c. Select **Generate Assessments**.

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**Related topics**

Configure an assessment

Survey Management

Assessment metrics

## Create KPI groups to track metrics for your vendors

Create key performance indicator (KPI) groups and include KPIs that matter most for your vendors. Associate the KPI groups with your vendors, set thresholds to monitor indicator status, and analyze vendor performance.

### Before you begin

Configure Performance analytics indicators that you want to add to each vendor KPI group. For a list of indicators that are available by default refer to Installed with Vendor Management Workspace.

The indicators must have a vendor breakdown on the Company [core_company] table with associated vendors.

You can configure and track up to six KPIs with a percentage value that contribute towards the vendor score. Add 15 more KPIs with any unit value to analyze additional data.

For each indicator, configure:

- A weight value—A numeric value that indicates the percentage of contribution towards the vendor score. This value represents the importance of that indicator relative to other indicators within that KPI group. Each indicator is weighted against 100% of the combined weight of all indicators added to the KPI group. If the combined weight is over or under 100 %, then the weight of the indicators will be proportionately readjusted to 100.
- Order of priority—You can also establish the order of priority in which you want these indicators to appear on the vendor profile.
- Thresholds—Define upper and lower limit values to assess vendor performance for each indicator.

Role required: sn_vlm.vendor_admin

### Procedure

1. Navigate to **All** > **Vendor Management** > **Configuration** > **KPI Groups**.
2. Create a KPI group.

   **Note:**
   You can also open an existing KPI group, create a copy of it, and modify it based on your needs.

   a. Click **New**.
   b. In the **Name** field, enter a name for the KPI group.
   c. From the Type menu, select **Vendors**.
   d. Right-click the form header and click **Save**.
3. Add KPIs to a KPI group.

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a. In the KPIs related list, click **New**.

| Field | Description |
|---|---|
| Indicator | Descriptive name for the indicator. |
| Indicator display name | Business-friendly name for the indicator. This name displays in the Vendor KPI Groups widget in Vendor Management Workspace. |
| Weight | The percentage of the total score you would like to attribute to this indicator. The combined weight of all indicators added to a KPI group must equal to 100. |
| Order | The order of priority in which you want this indicator to display in the Vendor Score Metrics widget in Vendor Management Workspace. |
| Lower Threshold | Lower limit defined for this indicator. You can view the highlighted value seen in Vendor Management Workspace vendor profile. |
| Upper Threshold | Upper limit defined for this indicator. You can view the highlighted value seen in Vendor Management Workspace. |

b. In the **KPI** field, select the KPI to apply for this vendor.

> **Note:**
> The KPI could also have child KPIs that you could drill down into.

c. Click **Submit**.

4. Set KPI thresholds for a KPI group.
   a. In the KPI Group Thresholds related list, click **New**.
   b. In the **Lower Threshold** field, enter the lower threshold limit to be used for the status defined for the KPI group.
   c. In the **Upper Threshold** field, enter the upper threshold limit to be used for the status defined for the KPI group.
   d. In the **Order** field, enter a number for the defined threshold limits. This number must be unique for each set of limits.
   e. In the **Status** field, select the status for the defined threshold as critical, positive, or warning.

> **Note:**
> The corresponding icon for each status displays in the manager workspace when the **Show Icon** check box is enabled for the status. This is enabled by default for the critical status.

5. Add vendors to the KPI groups.
   a. In the Vendors related list, click **Edit**.
   b. Move the desired vendors from the Collection to the Vendors list.
   c. Click **Save**.

### What to do next

Associate the KPI group to vendors.

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## Create an improvement in Vendor Management Workspace

Create an improvement initiative for a vendor to track and manage tasks for improving a service, process, or tasks related to vendors.

### Before you begin

The Continual Improvement Management (com.sn_cim) plugin must be activated. For more information on activating the plugin, see Request Continual Improvement Management.

You can view your vendor initiatives by navigating to **Vendor Management** > **Improvement Initiatives**.

Role required: sn_vlm.vendor_manager, sn_vlm.vendor_admin, or admin

### Procedure

1. Navigate to **Vendor Management** > **Workspace**.
2. Click the Vendor Home icon.
3. From the list, go to **Vendors** > **All Vendors**.
4. Select a vendor to create the improvement initiative.
5. Create an improvement initiative.
6. In the **Vendor** field, select the vendor for which you want to create the initiative.
7. In the **Service offering** field, select the service offering for which you want to set improvement goals.
8. Fill in all required fields to complete the initiatives.
   For information on field descriptions, see Improvement field descriptions
9. **Optional:** If you want to add supporting documents, click **Browse** and select the file.
10. Click **Save**.

## Create a service credit in Vendor Management Workspace

Create a service credit record each time the vendor breaches the agreement. The breaches are typically associated with an outage, incident, or SLA breaches.

### Before you begin

From Vendor Management Workspace, you can create service credits from an incident, outage, or service availability record based on the conditions listed in the table below.

| Record | Conditions for creating a service credit |
|---|---|
| Incident | • The incident state is **On Hold**.<br>• The on hold reason is **Awaiting Vendor**. |
| Outage | The configuration item field in the outage record must be configured to a service offering. |
| Service availability | The service offering must be configured in the service availability record. |

Role required: sn_vlm.vendor_manager

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You must have the sn_incident_read role enabled to view service credit reports.

### Procedure

1. Navigate to **All** > **Vendor Management** > **Workspace**.
2. Click the Vendor Home icon.
3. Create a service credit from a vendor, incident, outage, or a service offering.
4. Click **New**.
   Fill in the following fields as required:

| Field | Description |
|---|---|
| Number | System generated reference number for this credit record. |
| Vendor | Name of the vendor. |
| Service offering | Service offering related to this vendor. |
| Service commitment | Specific service commitment that affects this vendor credit. |
| Service availability | Business service availability commitment that affects this vendor credit. |
| Related incident | Number of any incidents related to these vendor products. |
| Related outage | Actual outage that created the vendor credit. The value in this field is from the **Short description** in the outage record. |
| Vendor contract | Contract for this vendor, if any. Choose a contract for the specified vendor. These contracts can be in any state. |
| Reference number | Any reference that pertains to this credit, for example, a confirmation number from the vendor or the name of a contact. |
| Breach penalty time | Duration of the breach. This value is the elapsed time of the credit-generating event and is inherited from the **Service commitment** selected. |
| Breach penalty amount | Total amount of credit due from this event, inherited from the **Service commitment** selected. |
| Per | Unit for calculating the breach penalty amount, inherited from the **Service commitment** selected. |
| Credit used | Check box indicating that credit from this vendor has been recovered. |
| Notes | Notes pertaining to this credit record, for example, to keep track of recovered credit. |

5. Click **Save**.

## Create a vendor ticket in Vendor Management Workspace

Create vendor tickets to monitor how quickly your vendors resolve issues for your products and services.

### Before you begin

Role required: sn_vlm.vendor_manager

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### Procedure

1. Navigate to **All** > **Vendor Management** > **Workspace**.
2. Select the List icon.
3. Select the incident, outage, or a service availability list to create a vendor ticket.
4. Create a vendor ticket from an incident, outage, or a service availability.

| Record | Conditions to set for creating a vendor ticket |
|---|---|
| Incident | ○ The incident state is **On Hold**.<br>○ The on hold reason is **Awaiting Vendor**. |
| Outage | The configuration item field in the outage record must be configured to a service offering. |
| Service availability | The service offering must be configured in the service availability record. |

5. In the **Vendor** field, select the vendor associated with the incident.
6. In the **Vendor Ticket** field, enter a ticket or incident number provided by the vendor.
   This ticket is the vendor identification number for the issue that's being resolved by the vendor.
7. Select **Save**.

## Setting up Vendor Success Indicators in Vendor Management Workspace

Configure attributes that can give you meaningful insights when comparing top-performing vendors.

**Important:**
You must install the Success Indicators (com.snc.vendor.insights) plugin separately from the ServiceNow Store. For more information, see Activate Vendor Management Workspace.

You can configure either tables or indicators to define attributes. The base evaluating table for the vendor success indicator is the Company [core_company] table.

Use properties to configure the Vendor Success Indicators. For more information, see Properties installed with Vendor Success Indicators.

### Set up table attributes in Vendor Management Workspace

Configure attributes for a table to compare them with top-performing vendors.

#### Before you begin
Role required: sn_vlm.vendor_admin

#### About this task
The fields for a selected table display all supported string and numeric data types. The allowed data types are defined in the *sn_app_ml_insights.attr_datatype_inclusion_list* system property. For more information, see Properties installed with Vendor Success Indicators.

#### Procedure

1. Navigate to **All** > **Vendor Management** > **Success Indicators** > **Attributes**.
2. Click **New**.

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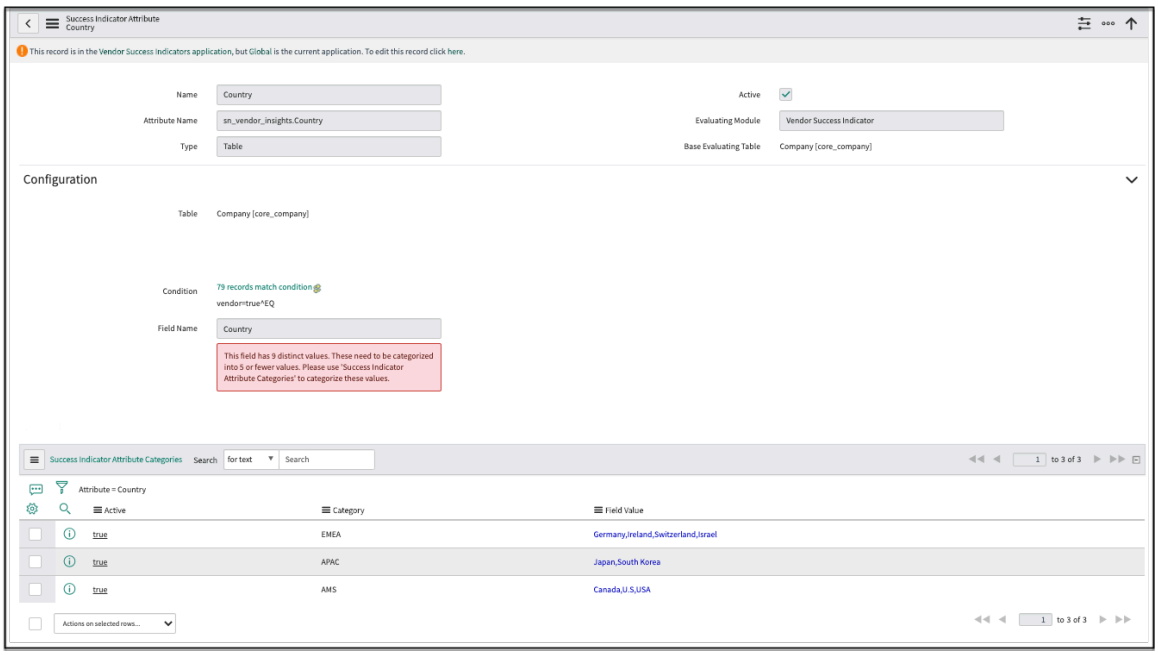
3. In the **Name** field, enter a unique name for the evaluating attribute.
4. In the **Type** field, select **Table**.
5. Set up the field attributes.

**Example:**
Example 1: In the example configuration shown in the following image:

- The table used for configuring the vendor success attributes is the same as the base table, Company [core_company].
- The field name selected, which is Country, is a string data type.

The pop-up message shows that the attribute Country has nine distinct values.

The nine values for Country are Germany, Ireland, Switzerland, Israel, Japan, South Korea, Canada, U.S., and USA. You have the option of configuring the attributes for Country by grouping them into categories such as EMEA, APAC, and AMS.




Example 2: In the example configuration shown in the following image:

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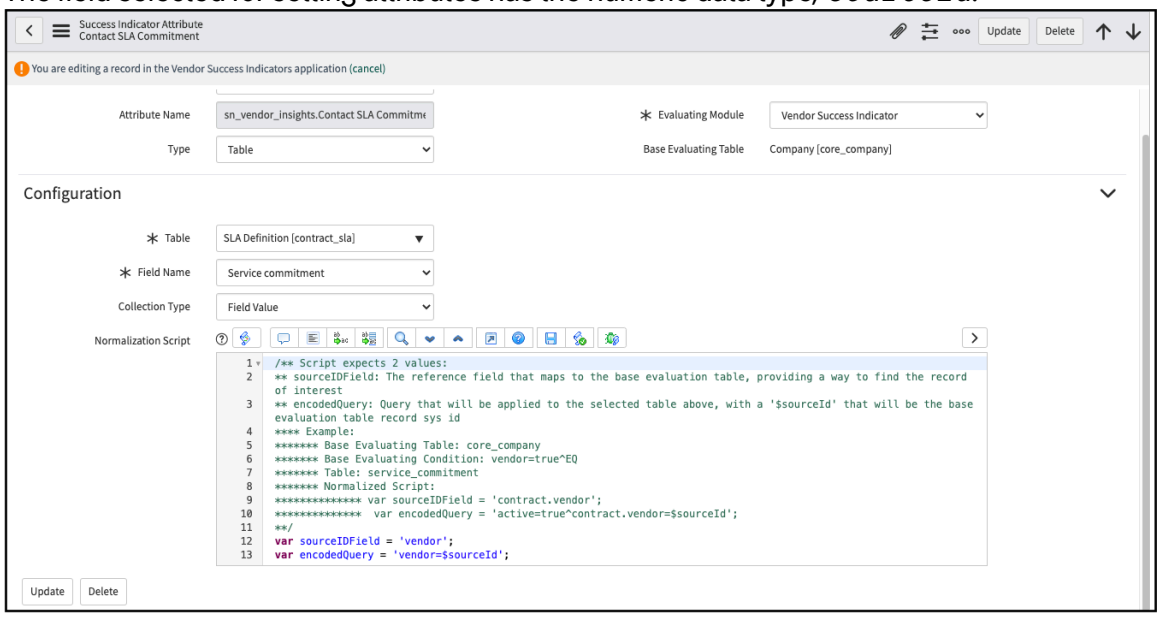
- The table used for configuring the vendor success attributes is not the same as the base table, Company [core_company].
- The field selected for setting attributes has the numeric data type, *sourceId*.




## Set up indicator attributes in Vendor Management Workspace

Configure indicator attributes to compare them with top-performing vendors.

### Before you begin

Role required: sn_vlm.vendor_admin

**Note:**
For an overview on how to set up Vendor Success Indicators, see Setting up Vendor Success Indicators in Vendor Management Workspace.

### Procedure

1. Navigate to **All** > **Vendor Management Workspace** > **Success Indicators** > **Attributes**.
2. Click **New**.
3. In the **Name** field, enter a unique name for the evaluating attribute.
4. In the **Type** field, select **Indicator**.
5. In the Configuration section, from the **Indicator** field, select an indicator with the Company [core_company] breakdown from which you want to derive attributes.
   The **High** and **Low** fields are automatically populated based on the recommended values and the **Direction** field is set to **Maximize** by default.
6. Click **Submit**.

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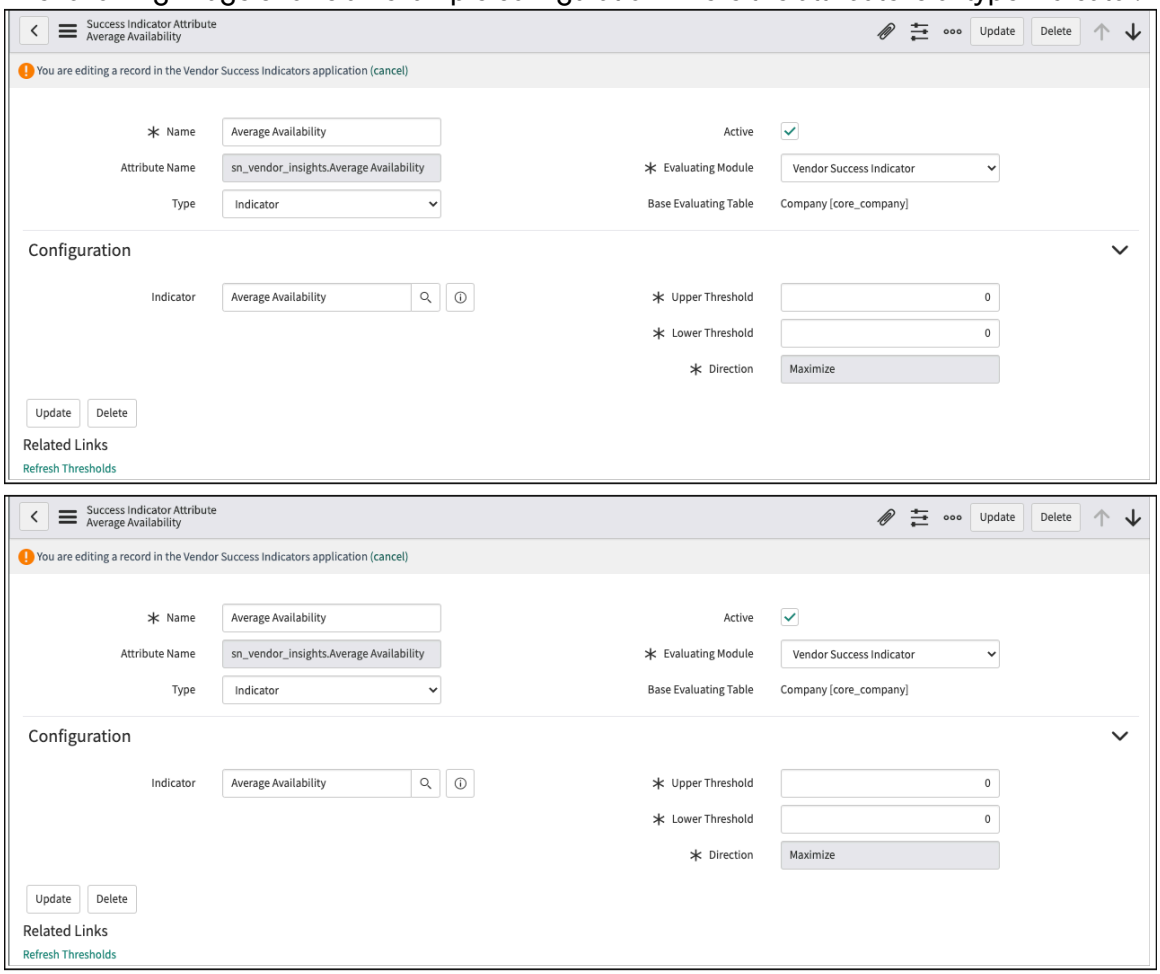
**Example:**
The following image shows an example configuration where the attribute is of type indicator.




Success Indicator Attribute
Average Availability
Update
Delete
You are editing a record in the Vendor Success Indicators application (cancel)
Name
Average Availability
Active
Attribute Name
sn_vendor_insights.Average Availability
Evaluating Module
Vendor Success Indicator
Type
Indicator
Base Evaluating Table
Company [core_company]
Configuration
Indicator
Average Availability
Upper Threshold
0
Lower Threshold
0
Direction
Maximize
Update
Delete
Related Links
Refresh Thresholds

# Managing vendor using Vendor Management Workspace

Analyze vendor KPI groups and compare vendor characteristics with high-performing vendors using Vendor Management Workspace.

## Vendor Management Workspace landing page

Monitor vendor metrics, the number of recently created contracts, the ones that are ending soon and the number of active improvement initiatives at any given time. See which characteristics contribute to the success of your vendors. View how your vendors are ranked against those characteristics in comparison to other vendors.

You can clone an existing landing page and customize it using the Next Experience UI Builder. For more information, see Customize a Vendor Management Workpace page using the Next Experience UI Builder.

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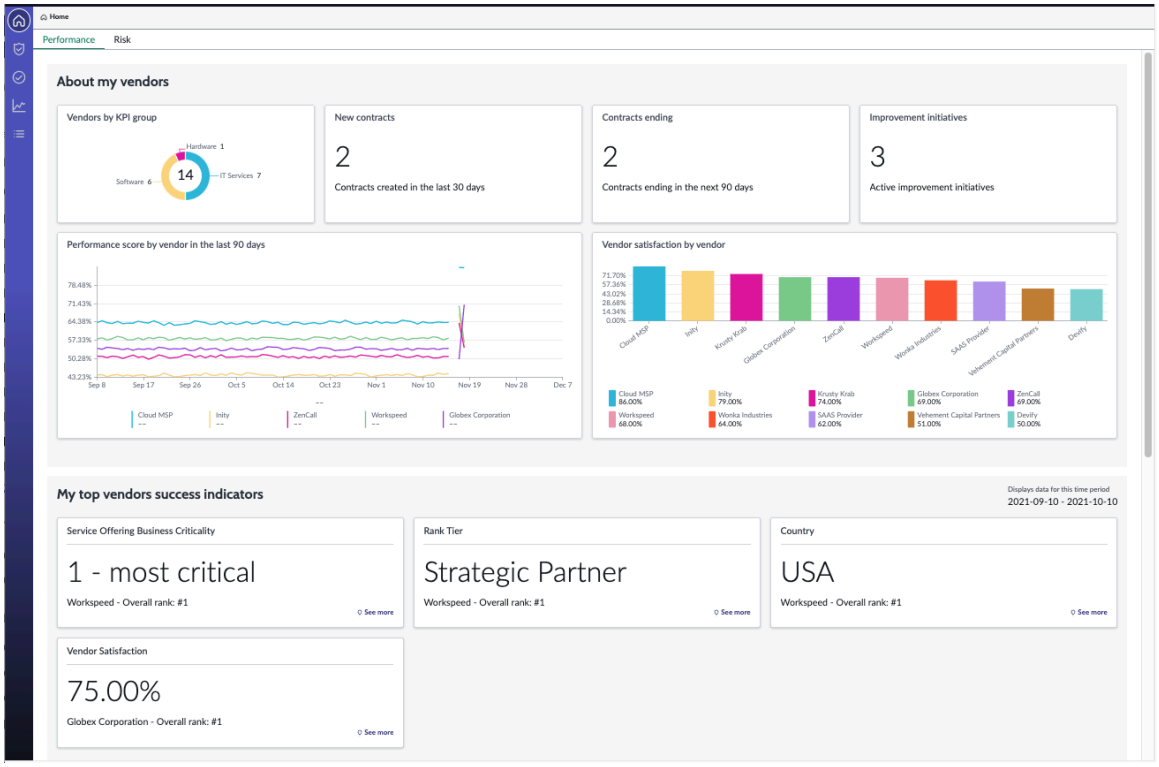


## Required Vendor Manager Workspace roles

If you have the Vendor Manager [sn_vlm.vendor_manager] role, you can access the Vendor Management Workspace landing page.

## Use cases

| End user and goal | Required role |
| --- | --- |
| As a vendor manager, you can analyze real-time details such as:<br>• Breakdown of vendors by KPI groups.<br>• How many new contracts were created in the last 30 days.<br>• How many contracts are ending in the next 90 days.<br>• Number of continual improvement initiatives that are currently open.<br>• The top five vendor success indicators. | Vendor Manager [sn_vlm.vendor_manager]<br><br>To view reports on catalog items ordered, the sc_req_item access control list (ACL) must be enabled. |

## Indicators

**Vendor score**

Vendor performance of all vendors in your organization that's based on their vendor score for the last 90 days.

**Vendor satisfaction**

Satisfaction of stakeholders who collaborate with your vendors.

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## Breakdowns

The indicators breakdown is by vendors.

## Data visualizations

Select a visualization to drill down and analyze further details.

| Title | Type | Source table | Description |
|---|---|---|---|
| Vendors by KPI group |  Donut | Company [core_company] | Breakdown of vendors KPI groups. |
| New contracts | Single  score | Contract [ast_contract] | Number of contracts created in the last 30 days. |
| Contracts ending | Single  score | Contract [ast_contract] | Number of contracts ending the next 90 days. |
| Improvement initiatives | Single  score | Improvement Initiative [sn_cim_register] | Number of active improvement initiatives. |

## Analyze Vendor KPI Groups

After you set up vendor KPI Groups, you can analyze the metrics related to all of your vendors in one location. You can search all vendor-related information such as incidents, outages, improvement initiatives, and vendors and find associated records.

### Before you begin

Role required: sn_vlm.vendor_manager

### About this task

In workspace, you can sort the list by vendor types and analyze the performance of each vendor type in a single view. You can then drill down to each vendor and analyze additional data. You can also add attachments for the vendor profile in the **Vendor Details** section and download added attachments.

### Procedure

1. Navigate to **All** > **Vendor Management** > **Workspace**.
2. Analyze the vendor score.
   For information on how the vendor score is calculated, refer to Calculating the vendor score.

   The color indicator that highlights the vendor score in the header shows you how the vendor is performing based on the set threshold.

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**Note:**
The **VMW:Update Vendor Score** scheduled job is set to run daily. If you want to view updated score, you can run this scheduled job at any time.

3. Click each indicator widget to view the breakdown for that metric.

   You can view:

   - A single-score widget that displays the indicator metric.
   - A time-series widget that shows the trend line for the selected KPI group and date range.
     - When you select the end date as the day before the current date, you can view the actual and the forecast trend for the selected KPI.
     - You can select a specific day in the time-series to analyze the vendor performance for the selected KPI on that day.
   - A breakdown of related service offerings for the selected KPI group and date range.
   - Threshold for each indicator highlighted to provide a visual indication for each service offering

     **Note:**
     You can analyze the key performance indicator (KPI) status such as Critical, Positive, or Warning for each vendor if your system administrator has enabled the display of the indicator status in Vendor Management Workspace. The indicator status to display KPI thresholds defined as critical is enabled by default.

   For the breakdown on the Vendor Satisfaction indicator, you can also view the Assessments Completed widget that displays the results of vendor satisfaction surveys.

4. Add supporting documents to a vendor profile.

   a. In the **Vendor Details** section, click the attachments icon .

   b. Click **Browse** and select the desired file to attach to the profile.

   c. Optionally, you can click the ellipses icon and download, replace, or remove the attachment.

## Compare your vendor characteristics with high-performing vendors in Vendor Management Workspace

Monitor the attributes that define your vendor performance and compare them with top-performing vendors.

### Before you begin

**Important:**
You must install the Success Indicators (com.snc.vendor.insights) plugin separately from the ServiceNow Store. For more information, see Activate Vendor Management Workspace.

Role required: sn_vlm.vendor_manager

Vendor Success Indicators uses the chi-square test that compares two values to see if they're statistically different from what is expected.

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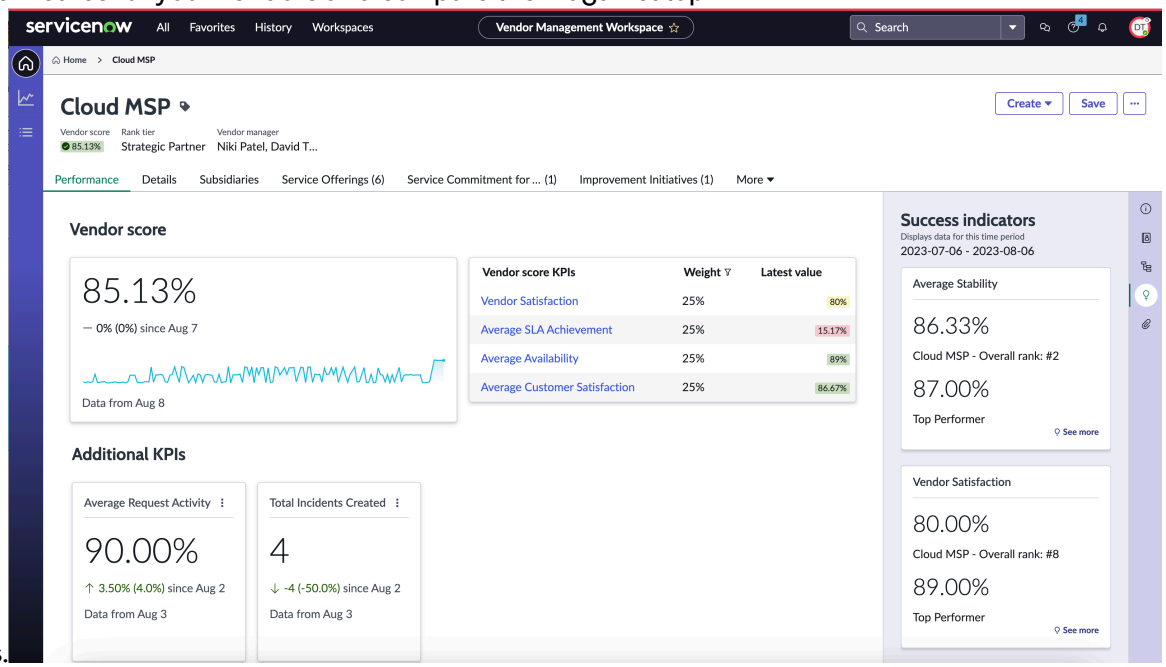
**Note:**

- The comparisons depend on how well the density curve of the chi-square value is distributed between the vendor characteristics.
- When the degree of freedom is 1, then the p-value that measures probability between your comparisons must be less than 0.05 to have a statistical significance.
- Ideally, your comparison data must include at least 5 vendor records each that have values closer to the upper and lower thresholds.

## Procedure

1. Navigate to **All** > **Vendor Management** > **Workspace**.
2. Select a vendor.
3. Select the Success Indicators icon ( ).
4. Analyze the metrics for your vendors and compare them against top performers.




**Note:**

Vendors must meet the following criteria for evaluating against top-performing vendors:

- Have a vendor KPI group assigned to them
- Have a valid vendor score

Only vendors who have a vendor KPI group assigned to them and also have a valid vendor score will be used for evaluating against top-performing vendors.

The preceding image shows an example of success indicators for the company Cloud MSP. The success indicators provide insight into the top five attributes across all vendors that contribute to high performance. These indicators are displayed in the order of their contribution to the performance ranking which is as follows:

**a.** Average Availability

**b.** Average SLA Achievement

**c.** Avg Perf Score of SO

**d.** Avg. Customer Satisfaction

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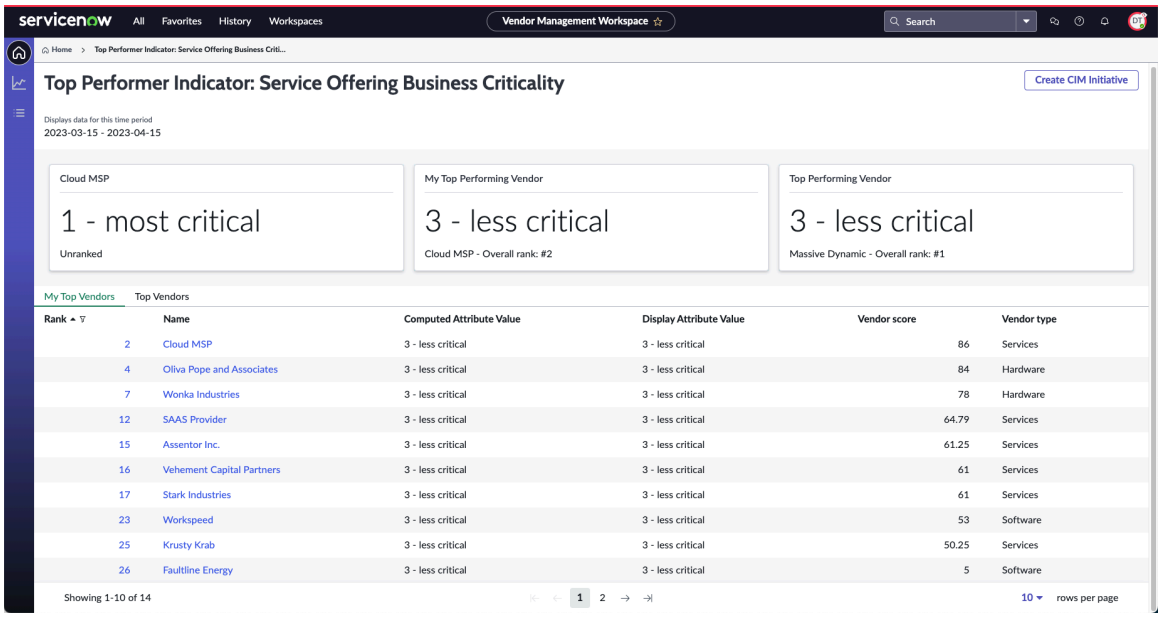
For numeric attributes, the interpretation of the value depends on the direction set for the indicator.

5. Select **See more** to drill down into the data.
   The following image shows the drill down data for the Average Performance Score for Service Offerings.




### Descriptions for the single-score widget drill-down data

| Name | Description |
|---|---|
| Vendor display name<br><br>[Example: Cloud MSP] | Displays the score for the selected attribute. The **Rank** field shows the overall vendor ranking for the attribute.<br><br>**Note:**<br>If the score falls outside the range of ranked vendors, the ranking displays as unranked. |
| My Top Performing Vendor | For the selected attribute, displays the score for the attribute. It also displays the ranking of the highest performing vendor among all the vendors that you manage. |
| Top Performing Vendor | For the selected attribute, displays the score for the attribute. It also displays the ranking of the highest performing vendor among all vendors in your organization. |

### Descriptions for the list view drill-down data

| Name | Description |
|---|---|
| My Top Vendors | Displays the ranking and success indicator attribute details of all vendors that you manage. |
| Top Vendors | Displays the ranking and success indicator attribute details of all vendors in your organization. |

You can select a rank or the name of a vendor to view the vendor profile.

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## Compare vendor performance within a vendor KPI group

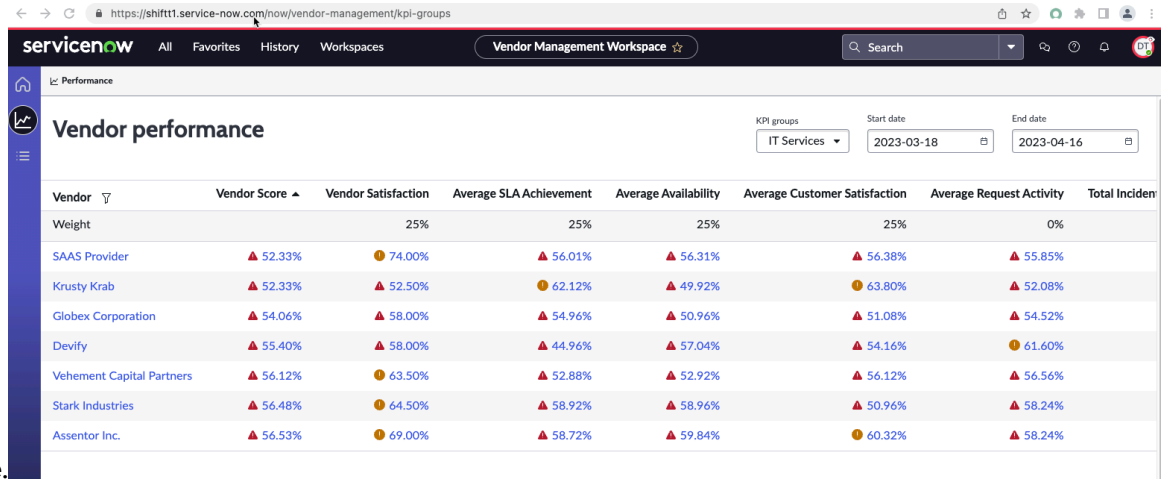
Monitor the performance of all vendors within a KPI group to assess their performance.

### Before you begin

Role required: sn_vlm.vendor_manager

### Procedure

1. Navigate to **All** > **Vendor Management** > **Workspace**.
2. Click the Performance icon ( ).
3. From the KPI groups list, select the group for which you want to compare vendor performance.
4. In the **Start date** field, click the calendar icon and select the date from which you want to start analyzing the data.
5. In the **End date** field, click the calendar icon and select the date up to which you want to analyze the data.
   The vendors and the indicator scores display for the selected KPI group and the date range.




| Vendor | Vendor Score | Vendor Satisfaction | Average SLA Achievement | Average Availability | Average Customer Satisfaction | Average Request Activity | Total Inciden |
|---|---|---|---|---|---|---|---|
| Weight | | 25% | 25% | 25% | 25% | 0% | |
| SAAS Provider | 52.33% | 74.00% | 56.01% | 56.31% | 56.38% | 55.85% | |
| Krusty Krab | 52.33% | 52.50% | 62.12% | 49.92% | 63.80% | 52.08% | |
| Globex Corporation | 54.06% | 58.00% | 54.96% | 50.96% | 51.08% | 54.52% | |
| Devify | 55.40% | 58.00% | 44.96% | 57.04% | 54.16% | 61.60% | |
| Vehement Capital Partners | 56.12% | 63.50% | 52.88% | 52.92% | 56.12% | 56.56% | |
| Stark Industries | 56.48% | 64.50% | 58.92% | 58.96% | 50.96% | 58.24% | |
| Assentor Inc. | 56.53% | 69.00% | 58.72% | 59.84% | 60.32% | 58.24% | |

## Add targets for vendor score KPIs

Set key performance indicator goals for an indicator that contributes to the vendor score so that you can monitor and improve baseline measurements.

### Before you begin

Role required:

To set a global target, you need the pa_target_admin and sn_vlm.vendor_manager roles.

To set a personal target, you need the sn_vlm.vendor_manager role.

### Procedure

1. Navigate to **All** > **Vendor Management** > **Workspace**.
2. Click the Performance icon ( ).
3. Click on a performance score for an indicator for which you want to set a target.
4. Click the target icon ( ) to display the target pane.
5. Set the KPI target.

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**Related topics**

Performance Analytics targets

## Associate contracts with vendors

Create a contract and associate it with the vendor who is responsible for the contract.

### Before you begin

Role required: sn_vlm.vendor_manager

### Procedure

1. Navigate to **Workspaces** > **Vendor Management Workspace**.
2. Select the List icon.
3. Go to **Contracts** > **All Vendor Contracts**.
4. Select **New**.
5. Fill in the fields on the form.
   For information on the field descriptions, see Create a contract.

   **Note:**
   The start date must be the current day or a day before the current day.

6. Select **Save**.
   In the List menu, go to **Contracts** > **My Vendor Contracts** to view the contract you've created.

## Associate SLAs and Service Commitments with Vendors

Create a vendor SLA and a service commitment and associate that with a vendor.

### Before you begin

Role required: sn_vlm.vendor_manager and sla_manager

### Procedure

1. Navigate to **Workspaces** > **Vendor Management Workspace**.
2. Select the List icon.
3. Create an SLA definition.
   a. Go to **Service Levels** > **All Vendor SLAs**.
   b. Select **New**.
   c. Fill in the fields on the form.
      For information on field descriptions, see Create an SLA definition.
   d. Select **Save**.
4. Create an SLA breakdown definition.
   a. In the SLA definition that you've created, select the **SLA Breakdown definitions** tab.
   b. Select **New**.

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c. In the **SLA breakdown definition** field, select the definition.

d. Select **Save**.

5. Create a service commitment.

a. In the SLA definition that you've created, select the **Service commitments** tab.

b. Select **New**.

c. Fill in the fields on the form.

d. Select **Save**.
In the List menu, go to **Service Levels** > **My Vendor SLAs** to view the vendor SLA and service commitment you've created.

## Identifying bottlenecks using Process Mining integration with Vendor Management Workspace

Get insights into your vendors' performance and analyze anomalies or bottlenecks within the process when you drill down into a Key Performance Indicator (KPI).

**Important:**
You must add the Process Optimization analyst (sn_process_optimization_analyst) role manually to perform tasks related to the Process Mining. For information on adding a role, see Create a role.

### Create a Process Mining project for a KPI group

Create projects for each KPI group for which you want to mine the data.

#### Before you begin

Your administrator must have enabled the *sn_itsm_vendor.enable.po.vm* system property to enable the mining. For more information on this system property, see Installed with Vendor Management workspace.

Role required: sn_process_optimization_analyst

#### About this task

**Important:**
The process mining projects for Vendor Management Workspace are created only for the incident table. Only templates of type **Default** are supported for creating the projects.

#### Procedure

1. Navigate to **All** > **Vendor Management** > **Configuration** > **KPI Groups**.
2. Select a KPI group.
3. Select **Initiate Process Mining**.
The process mining is run on vendors within the KPI group and on all automated and formula indicators in the KPI group. If you're using a formula indicator for process mining, you can select any indicator source that is used in the formula.

**Note:**
When you select **Initiate Process Mining** and mine the vendor data for the first time, it creates the project and then adds the vendors to the project. When you add a KPI that is not part of the same table as the other KPIs, or if you add or remove vendors from the KPI group within this project, the changes are synchronized when the *Process Mining - VM Remine Projects* scheduled job runs the next time. You can also select **Initiate Process Mining** and run it to synchronize the changes immediately.

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A corresponding project is created in the **All** > **Vendor Management** > **Configuration** > **VM Projects** module. When the mining is complete, the **Mining state** field changes to **Available**.

When you navigate to **Vendor Management** > **Configuration** > **Process Mining Project Mapping**, you can see the relationship between the indicator, KPI group, project definition, and the table for the project you've mined.

### Get insights into your vendors' performance

Get insights into process bottlenecks and find potential areas that you could optimize. You can also view variation analysis.

#### Before you begin

Role required: sn_process_optimization_analyst

- The *Process Mining - VM Remine Projects* job fetches projects that have not been mined based on the settings in the *sn_itsm_vendor.po_mining.run_frequency* system property. For more information, see Installed with Vendor Management Workspace.
- You must have mined the project for that KPI group for which you want to analyze process insights. For more information, see Create a Process Mining project for a KPI group.

#### About this task

The data is mined starting with the beginning of the previous month. For example, if the current date is June 26, 2023 then the data is mined starting at May 1, 2023.

#### Procedure

1. Navigate to **Workspaces** > **Vendor Manager Workspace**.
2. Select the List icon.
3. Go to **Vendors** > **All Vendors**.
4. Select the vendor for which you want to analyze process insights.
5. Drill down into a KPI, for example, Total incidents created.
6. Select the **Process analysis** tab and perform process insights and variation analysis.

**Note:**

- Select the **Vendor Breakdown** tab to view the details of the relationship of vendors to a table.
- Process mining can only be performed on KPIs based on the incident table.

You can analyze the process insights for the last 30 days, excluding the current day, for which you've mined the data. For more information on business insights, see View business insights.

#### Related topics

Analyze and get process insights

## ITSM Vendor Management Mobile for Vendor Management Workspace

Using the ITSM Vendor Management Mobile app, vendor managers can access vendor details including vendor performance and monitor issues that are most important to them.

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### ITSM Vendor Management Mobile dashboard

Analyze vendors by KPI group. You can see which contracts were created in the last 30 days and which ones are ending in the next 90 days. Monitor improvement initiatives for your vendors.

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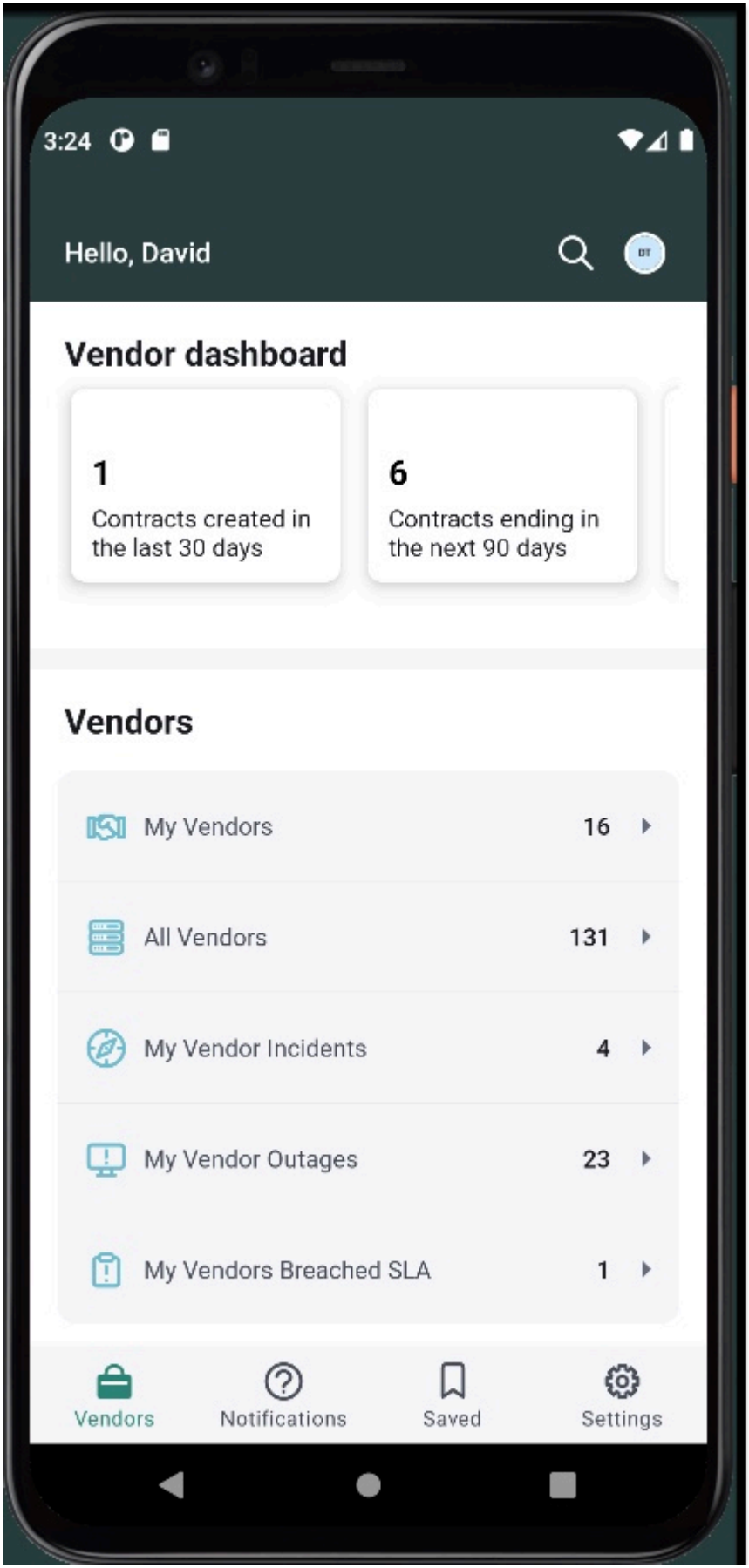


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## Required Vendor Management Mobile roles

If you have the Vendor Manager [sn_vlm.vendor_manager] role, you can access the Vendor Management Mobile landing page.

## Use cases

| End user and goal | Required role |
| --- | --- |
| As a vendor manager, you can analyze real-time details such as:<br>• Breakdown of vendors by KPI groups.<br>• How many new contracts were created in the last 30 days.<br>• How many contracts are ending in the next 90 days.<br>• Analyze improvement initiatives for your vendors. | Vendor Manager [sn_vlm.vendor_manager] |

## Data visualizations

| Title | Type | Source table | Description |
| --- | --- | --- | --- |
| Vendors by KPI group |  <br>Donut | Company [core_company] | Breakdown of vendors by metric model. |
| New contracts | Single<br>  <br>score | Contract [ast_contract] | Number of contracts created in the last 30 days. |
| Contracts ending | Single<br>  <br>score | Contract [ast_contract] | Number of contracts ending the next 90 days. |
| Improvement initiatives | Single<br>  <br>score | Improvement Initiative [sn_cim_register] | Number of improvement initiatives created for your vendors. |

## Lists

Access the following vendor lists on the Vendor Management Mobile dashboard.

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| Name | Description |
|---|---|
| My Vendors | List of all vendors managed by the vendor manager. |
| All Vendors | List of all vendors in your organization. |
| My Vendor Incidents | List of all incidents monitored by the vendor manager. |
| My Vendor Outages | List of all outages monitored by the vendor manager. |
| My Vendors Breached SLA | List of breached SLAs monitored by the vendor manager. |

### Access Vendor Management Mobile on your ServiceNow agent app

Install the ServiceNow agent app to enable the application on your mobile device. Scan the QR code or manually enter the address of your instance in the agent app to access your instance on the mobile device.

#### Before you begin

To enable you to manage and monitor vendor incidents, outages, and breached SLAs on your mobile app, your system administrator should have completed the following tasks:

- On your ServiceNow desktop application instance, install Vendor Manager Workspace (sn_itsm_vendor) plugin.
- On your ServiceNow desktop application instance, install the Vendor Management Mobile (sn_vendor_mobile) plugin.
- Ensure that the application and all of its associated ServiceNow Store applications have valid ServiceNow entitlements. For more information, see Get entitlement for a ServiceNow product or application.

Role required: sn_vlm.vendor_manager

#### Procedure

1. On your mobile device, install the ServiceNow Agent app from the Apple App Store or Google Play Store.
2. Tap the Agent app icon on your mobile device.
3. Enter the address for the instance.
4. Tap **Login**.
5. Tap the Vendors icon (Vendors) to open the Vendor Management Mobile landing page.

### Get notified about the vendors you manage using the Vendor Management Mobile application

Receive notifications when a P1 incident is created or resolved. You can also get notified if another incident gets upgraded to P1 or when a vendor outage occurs.

#### Before you begin

Role required: sn_vlm.vendor_manager

#### About this task

You must set your notification preferences in your desktop application to receive the notifications in your ITSM Mobile Agent application.

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### Procedure

1. Enable notifications on your desktop application instance.
   a. Select your profile and the select **Preferences**.
   b. Select **Notifications**.
   c. Select **Core UI**.
   d. Enable **Allow Notifications**.
   e. In the **IT Service Management** section, enable the following notification:
      - Incident opened for vendor
      - Outage opened for vendor
2. Receive notifications on your mobile application when the following tasks are triggered:
   - A P1 incident is created or resolved
   - Another incident gets upgraded to a P1 incident
   - A vendor outage record is created

#### Access information related to your vendors using the Vendor Management Mobile application

Look up information related to your vendors such as incidents or outages created for your vendors or breached SLAs.

### Before you begin

Role required: sn_vlm.vendor_manager

### Procedure

1. Log into your Vendor Management Mobile application on your mobile device.
2. Do any of the following.

## Vendor Management Workspace reference

When you activate the Vendor Management Workspace plugin (sn_itsm_vendor), the application installs components such as roles, tables, properties, and indicators.

### Installed with Vendor Management Workspace

Vendor Management Workspace provides a single destination for you to view and manage your vendors.

### Vendor Management Workspace

When you activate the Vendor Management Workspace (sn_itsm_vendor) plugin, the following components are installed.

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### Roles installed with Vendor Management Workspace

| Role title [name] | Description | Contains roles |
|---|---|---|
| Vendor admin<br><br>[sn_vlm.vendor_admin] | Can create, edit, or delete vendor types and KPI groups in Vendor Management Workspace | sn_vlm.vendor_manager |
| Vendor Manager<br><br>[sn_vlm.vendor_manager] | Views and manages vendors using Vendor Management Workspace.<br><br>Configures vendor performance metrics for use in Vendor Management Workspace. | • pa_viewer<br>• service_viewer<br>• service_credit_mgr |

### Table installed with Vendor KPI Groups

| Name | Description |
|---|---|
| KPI Vendors<br><br>[sn_itsm_vendor_kpi_group_m2m_vendor] | Store the relationship between KPIs and vendors. |

### Scheduled jobs

| Name | Description |
|---|---|
| *Process Mining - VM Remine Projects* | • Automatically runs once a day.<br>• Automatically updates the project when vendors are added or removed.<br>• Fetches all projects that haven't been mined from the time-period specified in the **sn_itsm_vendor.po_mining.run_frequency** system property; for example, the last 7 days. |

Navigate to **Vendor Management** > **Configuration** > **Vendor Properties** to set the properties for Vendor Management Workspace.

### Properties installed with Vendor Management Workspace

| Property | Description |
|---|---|
| sn_itsm_vendor.enable.po.vm | Enables the integration of Process Mining with Vendor Management Workspace. When enabled, you can initiate process mining and mine Process Mining projects and analyze process analysis in Vendor Management Workspace. |

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### Properties installed with Vendor Management Workspace (continued)

| Property | Description |
|---|---|
| | • **Type:** true \| false<br>• **Default value:** false |
| sn_itsm_vendor.po_mining.run_frequency | Fetches all projects that haven't been mined for the specified time-period. The *Process Mining - VM Remine Projects* job fetches the data based on the time specified in this property.<br>• **Type:** Integer<br>• **Default value:** 7 |

## Installed with Vendor Success Indicators in Vendor Management Workspace

Using the Vendor Success Indicators application, you can compare the performance of your vendors against other top-performing vendors.

**Important:**
You must install the Success Indicators (com.snc.vendor.insights) plugin separately from the ServiceNow Store. For more information, see Activate Vendor Management Workspace.

### Scheduled Job installed with Vendor Success Indicators

| Name | Description |
|---|---|
| Vendor Success Indicator Weekly Scheduled Job | Runs weekly and gathers vendor attributes data for the past 30 days. The job then computes the correlation of the attributes with high-performing vendors using Predictive Intelligence. |

### Properties installed with Vendor Success Indicators

| Name | Description |
|---|---|
| sn_app_ml_insights.top_n_results | Top N results to retrieve from the Insight Results table for further analysis. Default value is 5. |
| sn_app_ml_insights.max_records_to_process | Maximum number of records to be processed by the Success Indicator job. Default value is 50000. |
| sn_app_ml_insights.attr_category_string_value_lim | Maximum number of string values allowed before creating categories. Default value is 5. |
| sn_app_ml_insights.keep_last_n_runs | The number of the most recent executions to be retained after you run the table cleaner. Default value is 2. |
| sn_app_ml_insights.attr_datatype_inclusion_list | Comma separated list of valid data types to use for defining Vendor Insights attributes. |

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### Properties installed with Vendor Success Indicators (continued)

| Name | Description |
|---|---|
| | Default value is boolean,currency,date,datetime,due_date,field_name,glide_da |
| sn_app_ml_insights.chi_squared_critical_value | The critical value for a chi-square test that compares two values to see if there is a statistical significance. Default value is 3.84. |
| sn_app_ml_insights.chi_squared_threshold | The threshold for the critical value for the chi-square test. Default value is 5. |

### Attributes installed with Vendor Success Indicators

| Attribute Name | Attribute Type | Default value |
|---|---|---|
| | **Performance analytics indicators** | |
| Average Availability | Average Availability | true |
| Average SLA Achievement | Average SLA Achievement | true |
| Average Stability | Average Stability | true |
| Avg Customer Satisfaction | Average Customer Satisfaction | true |
| Avg Perf Score of SO | Average Performance Score of Service Offering | true |
| Vendor Satisfaction | Vendor Satisfaction | true |
| | **Table attributes** | |
| Contract SLA Commitment | SLA Definition [contract_sla] | true |
| Contract SLA Type | SLA Definition [contract_sla] | true |
| Country | Company [core_company] | true |
| Rank Tier | Company [core_company] | true |
| Relationship Start | Company [core_company] | false |
| Service Commitment Type | Service commitment [service_commitment] | true |
| Service Offering Business Criticality | Service Offering [service_offering] | true |
| Total Contract Cost | Company [core_company] | false |
| Unique Subscribers | Company [core_company] | true |
| Vendor State | Company [core_company] | false |
| Vendor Type | Company [core_company] | false |

## Vendor KPI Groups in Vendor Management Workspace reference

Use Vendor KPI Groups that are provided by default to analyze vendor performance.

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## Vendor KPI Groups

The following Vendor KPI Groups are available by default:

- IT Services—includes KPIs to analyze vendor performance related to IT Services.
- Vendor Fulfillment—includes KPIs to analyze vendor performance related to fulfillment.
- Software—includes KPIs to analyze vendors related to software applications.
- Hardware—includes KPIs to analyze vendors related to hardware applications.

Each KPI group provided by default has the following related lists:

- KPIs—indicators with a vendor breakdown that measure the performance of your vendors.

  Each indicator that contributes towards the vendor score has a weight associated with it.
- KPI group thresholds—defines threshold values to indicate the status of each KPI group.
- Vendors—list of vendors to analyze their performance.

### IT Services KPI Group

The table below shows the indicators in this KPI group. All indicators that have the unit as percentage are used to calculate the vendor score.

| Indicators name | Unit | Description |
|---|---|---|
| Average Customer Satisfaction | Percentage | Measures CSAT scores based on service offerings. |
| Vendor Satisfaction | Percentage | Provides monthly breakdown of vendor satisfaction scores. |
| Average SLA Achievement | Percentage | Calculates average value for SLAs that have been successfully completed. |
| Average Availability | Percentage | Calculates average value achieved for incident SLAs. |
| Average Request Activity | Percentage | Average value calculated from fulfilled request items derived from service portfolio catalog items. These items must be connected to service offerings. |
| Total Incidents Created | Number | The total number of incidents created for vendors. |

### Vendor Fulfillment KPI Group

The table below shows the indicators in this KPI group. All indicators that have the unit as percentage are used to calculate the vendor score.

| Indicator | Unit | Description |
|---|---|---|
| Average Customer Satisfaction | Percentage | Measures CSAT scores based on service offerings. |
| Vendor Satisfaction | Percentage | Provides monthly breakdown of vendor satisfaction scores. |

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| Indicator | Unit | Description |
|---|---|---|
| Average Incident SLA Achievement | Percentage | Calculates average value achieved for incident SLAs that have been successfully completed. |
| Average Request Fulfillment SLA Achievement | Percentage | Calculates average value for SLAs that have been successfully completed. |
| Total Incidents Created | Number | The total number of incidents created for vendors. |
| Average Request Activity | Percentage | Average value calculated from fulfilled request items derived from service portfolio catalog items. These items must be connected to service offerings. |

**Software KPI Group**

The table below shows the indicators in this KPI group. All indicators that have the unit as percentage are used to calculate the vendor score.

| Indicator | Unit | Description |
|---|---|---|
| Vendor Satisfaction Score | Percentage | Provides monthly breakdown of vendor satisfaction scores. |
| Vendor Requested Items | Number | Provides the count of the vendor-requested catalog items. |
| Manual SLA from External Source | Percentage | Calculates the manually added SLAs. |

**Hardware KPI Group**

The table below shows the indicators in this KPI group. All indicators that have the unit as percentage are used to calculate the vendor score.

| Indicator | Unit | Description |
|---|---|---|
| Vendor Satisfaction Score | Percentage | Provides monthly breakdown of vendor satisfaction scores. |
| Vendor Requested Items | Number | Provides the count of the vendor-requested catalog items. |
| Manual SLA from External Source | Percentage | Calculates the manually added SLAs. |

## Vendor score indicator

The **Vendor Score** indicator is an automated indicator. It used for calculating and displaying the vendor score. The calculation is done based on all indicators added to the KPI group for evaluating vendor performance.

## Schedule job

The *VMW Update Vendor Score* scheduled job runs daily and updates the score. You can run this job on-demand to get updated scores at any time.

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The *VMW Update Vendor Profile* scheduled job runs monthly and updates all vendor profiles. You can run this job on-demand to get updated vendor profiles at any time.

## Calculating the vendor score

The vendor score calculation is based on the weight of each indicator and the KPI score. The table below provides an example of how a vendor score is calculated.

**Important:**
The Service Offering Metric Data [service_offering_metric_data] table along with the following four indicators have been deprecated in the Utah release:

- Average SLA Achievement [ServiceOffering.MetricData.SLA.Daily]
- Average Customer Satisfaction [ServiceOffering.MetricData.CSAT.Daily]
- Average Availability [ServiceOffering.MetricData.Availability.Daily]
- Average Request Activity [ServiceOffering.MetricData.Activity.Daily]

Therefore, if you have the Vendor Management Workspace application integrated with Service Portfolio Management, and if you are upgrading to the Service Portfolio Management standard portfolio, the metric data from the legacy indicators are no longer available. For information on Service Portfolio Management, see Service Portfolio Management portfolios.

You can calculate the vendor score using the indicators that have a percentage value. You can also create custom formula indicators and add them to your vendor score calculation. For more information, see Add a formula indicator to track vendor score.

### Vendor score calculation

| Indicator | Indicator weight | KPI score | Indicator score that contributes towards vendor score |
|---|---|---|---|
| Vendor Satisfaction | 10.00% | 54.42% | 5.442% |
| Average Customer Satisfaction | 55.00% | 83.00% | 45.65% |
| Average Availability | 25.00% | 88.50% | 22.125% |
| Average SLA Achievement | 10.00% | 100.00% | 10.00% |
| **Total** | | | **83.217%** |

The total vendor score has been rounded up to 83.22%. The score is also highlighted in the header with colors that are distinct for the defined threshold values for the KPI group.

**Note:**
The vendor score is impacted based on the whether the direction for the indicator is set to maximize or minimize. Below is an example that shows how the vendor score is impacted based on the indicator direction.

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**Vendor score impacted by indicator direction**

| Indicator | Direction | Indicator weight | Indicator metric score | Indicator score that contributes towards vendor score |
|---|---|---|---|---|
| Vendor Satisfaction | Maximize | 10.00% | 54.42% | 5.442% |
| Average Customer Satisfaction | Maximize | 55.00% | 83.00% | 45.65% |
| Average Availability | Minimize | 25.00% | 88.50% | 2.875%<br>[(100 - 88.5) x.25] |
| Average SLA Achievement | Minimize | 10.00% | 100.00% | 0% |
| **Total** | | | | **53.967%** |

## Domain separation and Vendor Management Workspace

Domain separation is supported in Vendor Management Workspace. Domain separation enables you to separate data, processes, and administrative tasks into logical groupings called domains. You can control several aspects of this separation, including which users can see and access data.

## Support level: Standard

- Includes all aspects of **Basic** level support.
- Application properties are domain-aware as needed.
- Business logic: The service provider (SP) creates or modifies processes per customer. The use cases reflect proper use of the application by multiple SP customers in a single instance.
- The instance owner must configure the minimum viable product (MVP) business logic and data parameters per tenant as expected for the specific application.

Sample use case: An admin must be able to make comments required when a record closes for one tenant, but not for another.

For more information on support levels, see Application support for domain separation.

The Vendor Management Workspace application uses performance analytics to collect data and provides domain separation support.

## Request Vendor Management Workspace Domain Separation

The Domain Support - Domain Extensions Installer plugin (com.glide.domain.msp_extensions.installer) must be activated by ServiceNow personnel. After this plugin has been activated, as an administrator, you can activate the Performance Analytics - Domain Support plugin (com.snc.pa.domain_support) plugin.

The Performance Analytics - Domain Support plugin (com.snc.pa.domain_support) must be activated to enable the features for Vendor Manager Workspace

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**Related topics**

Domain separation for service providers

### Configure domain separation for Vendor Management Workspace

Configure domain separation for Vendor Management Workspace to collect vendor scores and analyze the data for a specific domain. Configure domains for vendor score metric models.

## Before you begin

Role required: pa_data_collector or admin

## Procedure

1. Configure a domain to collect vendor score performance analytics data for that domain.
   a. Navigate to **Performance Analytics** > **Data Collector** > **Domain Configurations**.
   b. Create a domain configuration for Vendor Management Workspace
      i. Click **New**.
      ii. In the **Name** field, enter a name for the configuration.
      iii. In the **Configuration type** menu, select **Conditions**.
      iv. In the Aggregate options section, select the **Collect children**check box to collect scores from all child domains.
   c. Right-click the form header and click **Save**.
   d. Add the following performance analytics jobs to the related list:

      **Note:**
      If you do not have the Jobs related list, you must configure the form to display the related list.

      - VMW Scheduled Data Collection
      - VMW Weight Collection
      - VMW Daily Data Collection
      - VMW Vendor Score Collection

   e. Click **Update**.
   For more information on creating or scheduling a data collection job, refer to Create or schedule a data collection job

   **Note:**
   The Performance Analytics application:
   - Runs the job and collects the score as the **Run as** user.
   - Collects the scores only for the domain in which the logged-in user runs the job. The scores are not visible to vendor admins or vendor managers who are not part of that domain in Vendor Manager Workspace.
   - Automatically adds database queries that limit results from the domain to the indicator source queries when the application runs a job for a domain configuration.

2. Configure a domain to assign a vendor score metric model to a domain.
   a. Navigate to **Vendor Manager Workspace** > **Vendor Score Metric Models**
   b. Do any of the following:

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### Quick start tests for Vendor Management Workspace in configurable workspace

Validate that Vendor Manager Workspace still works after you make any configuration change such as apply an upgrade or develop an application. Copy and customize these quick start tests to pass when using your instance-specific data.

Vendor Management Workspace quick start tests require activating the Vendor Manager Workspace plugin (com.snc.vlm.vmw) and loading demo data.

**Vendor Management Workspace - Tests test suite**

| Test | Description | Release version |
|---|---|---|
| VLM: Create a Vendor | Track problems with the Vendor Manager Workspace plugin after upgrade. Create a new vendor. | New York |

**Related topics**

Quick start tests

# ITSM Predictive Intelligence Workbench

The ServiceNow® ITSM Predictive Intelligence Workbench application provides prebuilt use case templates and guides you through your machine learning implementation to create intelligent ITSM business processes.

**Note:**

Starting with the Yokohama release, the ITSM Predictive Intelligence Workbench application is completely deprecated and no longer deployed, enhanced, or supported. To get the latest experience for this functionality, you can install the Task Intelligence for ITSM plugin (com.snc.itsm_ml_task) or the Predictive Intelligence plugin (com.glide.platform_ml). For more information, see Task Intelligence for ITSM and Predictive Intelligence.

For details, see the Deprecation Process [KB0867184] article in the Now Support Knowledge Base.

## Exploring ITSM Predictive Intelligence Workbench

The ITSM Predictive Intelligence Workbench application is built to help you get started using machine learning to quickly solve and expedite your IT incidents.

The workbench includes prebuilt use case templates that systematically guide you through the process of creating and training new predictive models, evaluating and testing them, and finally adding them to your business process to add value to your IT organization.

Guided machine learning provides next steps and helps you make informed decisions while you increase your knowledge of machine learning.

Once you train your use cases, they are usable immediately. Using Performance Analytics capabilities, you can monitor your successfully implemented use cases to ensure the best model efficacy. Define thresholds and monitor whether your models are performing as expected or if they are under-performing with the **Predictive Intelligence for Incidents** dashboard.

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The ITSM Predictive Intelligence Workbench application depends on activation of the Predictive Intelligence application, which is available with the ITSM Pro SKU.

## Who needs ITSM Predictive Intelligence Workbench

Business process architects use Predictive Intelligence Workbench functionality to get started with machine learning-based use cases. You can determine your business value, monitor your models, and view related statistics using the Predictive Intelligence Workbench dashboard.

If you are a process architect or owner, or someone who is championing machine learning for your IT organization, ITSM Predictive Intelligence Workbench can help you streamline your incident case load. Trained predictive models can resolve your incidents through past similar resolutions or by recommending relevant knowledge base articles to help expedite your incident investigation and resolution processes. This frees up valuable time for IT professionals who often need to spend time on more complex and challenging issues.

No prior knowledge or experience with artificial intelligence or machine learning is required when you use ITSM Predictive Intelligence Workbench. The application includes templates with prebuilt guidance to assist you in creating, training, evaluating, testing, and producing, your unique predictive models. You can also link to your knowledge base articles to support your IT incident case load, as well as access the many features of the Predictive Intelligence platform application.

## Benefits from ITSM Predictive Intelligence Workbench

Cutting-edge artificial intelligence and machine learning technologies are widely adopted throughout many industries. The ITSM Predictive Intelligence Workbench application provides you with the machine learning tools you need to quickly and effectively resolve your IT incident tasks and improve your IT organization. The process of creating and implementing your predictive models can result in valuable business analysis and operations optimization.

## ITSM Predictive Intelligence Workbench User Experience

### Simple, streamlined model creation, evaluation, testing, and integration

Evaluate and test different model versions. When a retrained model version doesn't perform as well as the previous version, you can tune it, view the winning model version, and mark it as active.

View your trained models on the Use case guided steps page. When a model is integrated, the integration data is indicated parenthetically next to the model name. You can also see the **Created on** and **Trained on** dates and the **Active version** number for the model. Integrated models appear at the top of the list.

Identify the model with the highest net automation score as the green highlighted winning model. When two models have the same net automation score, the most recently created model is highlighted in green.

Use the faceted filters feature on the **Use cases - All Created Use Cases** page to filter by **Domain**, model **State**, and **Model training status**.

Use the faceted filters feature on the **Use cases - Create new from Template** page to filter by **Domain**, **Setup Help**, and **Business Value**.

Quickly find use case templates or use cases with a search filter added to the **Use cases - All Created Use Cases** and **Use cases - Create new from Template** pages.

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Identify **Integrated** and **In progress** models by unique icons and easily recognize when a model training has failed or a model is underperforming with icons and flags on the Use cases - All page.

Edit model names and short descriptions as needed.

Deactivate a previous model version or select a previous model version to activate.

Know whether you have the necessary required data before starting the process of creating a use case. A message notifies you if data is insufficient.

Download a .CSV file of your model batch test or go to the test phase to view the results.

**Dot-walking for input fields**

Access fields on related tables from a form, list, or script.

**Right to left language support**

For users who read from right to left, this language support is added.

## ITSM Predictive Intelligence Workbench administration

Administrators can activate the necessary plugins for ITSM Predictive Intelligence Workbench. Users with the piwb_admin role can configure the application to meet specific requirements.

Predictive Intelligence Workbench admins can perform the following tasks:

- Configure Predictive Intelligence Workbench property settings, such as the minimum number of predictions for evaluating use cases that underperform and the minimum percentage of net automation to show a pretrained model.
- Create a Predictive Intelligence Workbench user group and assign users necessary roles to move through the model implementation process.
- Configure notifications to alert Predictive Intelligence Workbench users via email for the following events:
  - When a new model is trained and ready for evaluation.
  - When batch testing is initiated and when test results are available.

### Activate ITSM Predictive Intelligence Workbench

ITSM Predictive Intelligence Workbench  is available with activation of the core Predictive Intelligence Workbench (com.sn_piwb_ml) plugin and the Predictive Intelligence Workbench ITSM content (com.sn_piwb_itsm_content) plugin.

#### Before you begin

Role required: admin

#### About this task

The ITSM Predictive Intelligence Workbench -related plugins require activation of the Predictive Intelligence application. Predictive Intelligence is available with activation of the Predictive Intelligence (com.glide.platform_ml) plugin and the Predictive Intelligence Reports (com.glide.platform_ml_pa) plugin, which require an ITSM Pro package subscription. For more details, refer to Install Predictive Intelligence.

#### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the plugin using the filter criteria and search bar.

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You can search for the plugin by its name or ID. If you cannot find a plugin, you might have to request it from ServiceNow personnel.

3. Select **Install** to start the installation process.

**Note:**
When domain separation and delegated admin are enabled in an instance, the administrative user must be in the **global** domain. Otherwise, the following error appears: `Application installation is unavailable because another operation is running: Plugin Activation for <plugin name>.`

You will see a message after installation is completed. For information about the components installed with a plugin, see Find components installed with an application.

### Components installed with ITSM Predictive Intelligence Workbench

Several roles are installed with activation of the Predictive Intelligence Workbench plugin.

**Note:**
The Application Files table lists the components that are installed with this application. For instructions on how to access this table, see Find components installed with an application.

Two plugins are available to obtain feature ITSM Predictive Intelligence Workbench functionality.

- Predictive Intelligence Workbench (com.sn_piwb_ml): Provides a common framework for creating and managing use cases.

  **Note:**
  Requires activation of Predictive Intelligence and Predictive Intelligence Reports plugins, which are available with an ITSM Pro subscription.

- Predictive Intelligence Workbench ITSM content (com.sn_piwb_itsm_content): Enables access to ITSM -specific content that provides implementation guidance for use cases created through Predictive Intelligence Workbench Also, with this plugin you can access the **Predictive Intelligence for Incidents** dashboard to communicate value across multiple applications within IT Service Management.

  **Note:**
  Requires activation of Predictive Intelligence Workbench, Performance Analytics - Content Pack - ITSM Dashboards, and Incident plugins.

## Predictive Intelligence Workbench

### Roles installed with Predictive Intelligence Workbench

| Role title [name] | Description | Contains roles |
|---|---|---|
| Predictive Intelligence Workbench admin<br><br>[piwb_admin] | Predictive Intelligence Workbench administrator. Configures the Predictive Intelligence Workbench property settings.<br><br>Can create and manage use cases. | • piwb_manager<br>• ml_admin |

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### Roles installed with Predictive Intelligence Workbench (continued)

| Role title [name] | Description | Contains roles |
|---|---|---|
| Predictive Intelligence Workbench manager<br><br>[piwb_manager] | Typically a business process architect. Can create and manage use cases.<br><br>Configures the Predictive Intelligence Workbench property settings.<br><br>Monitors the **Predictive Intelligence for Incidents** dashboard. | • ml_admin<br>• piwb_viewer<br>• pa_admin |
| Predictive Intelligence Workbench viewer<br><br>[piwb_viewer] | Can view the **Predictive Intelligence for Incidents** dashboard. | • pa_viewer<br>• ml_report_user |

**Note:**
All new records are created and updated through the Predictive Intelligence Workbench application. Only users with the maint role can update the base system tables.

### Tables installed with ITSM Predictive Intelligence Workbench

| Table | Description |
|---|---|
| Usecase Prediction Run<br><br>[piwb_prediction_run] | Used to define the test prediction type for a use case, whether it is a single or batch test. |
| PIWB Use Case Template<br><br>[piwb_usecase_template] | Used to create a use case template. Extends the Application File [sys_metadata] table. |
| Setup Assistant Tracker<br><br>[piwb_usecase_sa_tracker] | Used to track the status of the guided path steps (Stage or Task). |
| PIWB Setup Assistant Stage Task<br><br>[piwb_sa_stage_task] | Used to store the tasks for each stage of setup assistant plan . Extends the PIWB Setup Assistant Base Task [piwb_sa_task_base] table. |
| PIWB Setup Assistant Plan<br><br>[piwb_sa_plan] | Used to define the Setup Assistant Plan (Guided Path) for each type of use case. |
| PIWB Setup Assistant Base Task<br><br>[piwb_sa_task_base] | Used to create a new Setup Assistant Base Task record and to make the task active. |
| PIWB Use Case<br><br>[piwb_usecase] | Used to create a new use case per prebuilt template (piwb_admin and piwb_manager can |

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**Tables installed with ITSM Predictive Intelligence Workbench (continued)**

| Table | Description |
|---|---|
| | create, update, and delete; piwb_viewer can only view). |
| PI Solution Model<br><br>[piwb_model] | Used to create a **Predictive Intelligence** solution model and to make the model active (piwb_admin and piwb_manager can create, update, and delete; piwb_viewer can only view). |
| PIWB Setup Assistant Stage<br><br>[piwb_sa_stage] | Extends the PIWB Setup Assistant Base Task [piwb_sa_task_base] table. |
| Usecase Prediction Result<br><br>[piwb_prediction_result] | Used to define a use case prediction result based on the Prediction Run and Model (piwb_admin and piwb_manager can create, update, and delete; piwb_viewer can only view). |
| PI Solution Comment<br><br>[piwb_model_comment] | Used to define a comment on a **Predictive Intelligence** solution for a given class (piwb_admin and piwb_manager can create, update, and delete; piwb_viewer can only view). |

## Domain separation and Predictive Intelligence Workbench

Domain separation is supported in the Predictive Intelligence Workbench application. Domain separation enables you to separate data, processes, and administrative tasks into logical groupings called domains. You can control several aspects of this separation, including which users can see and access data.

## Standard Support level

- Includes **Basic** level support.
- Business logic: Processes can be created or modified per customer by the service provider (SP). The use cases reflect proper use of the application by multiple SP customers in a single instance.
- The owner of the instance needs to be able to configure the minimum viable product (MVP) business logic and data parameters per tenant as expected for the specific application.

## Predictive Intelligence Workbench overview

Predictive Intelligence Workbench enables the creation of machine learning models using historic datasets. A machine learning model can be configured in Predictive Intelligence Workbench per domain, which ensures that the data used by the solution is domain-specific data. After a model is trained for a domain, the model calls for a prediction to be made for resolution, depending on what that domain belongs to. For example, the model predicts an incident or case.

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## How domain separation works in Predictive Intelligence Workbench

An instance owner can train a machine learning model for each domain by creating a model definition for each domain and training those models. In this way each model uses data specific to the corresponding domain.

- Data can be domain separated
- Domain column is present for base system application tables
- Domain-specific configuration is managed by instance owner
- Tenant domains can manage their own application data

### Related topics

Domain separation for service providers

## Configure ITSM Predictive Intelligence Workbench settings

View the default Predictive Intelligence Workbench property settings and configure them to meet your business process needs.

### Before you begin

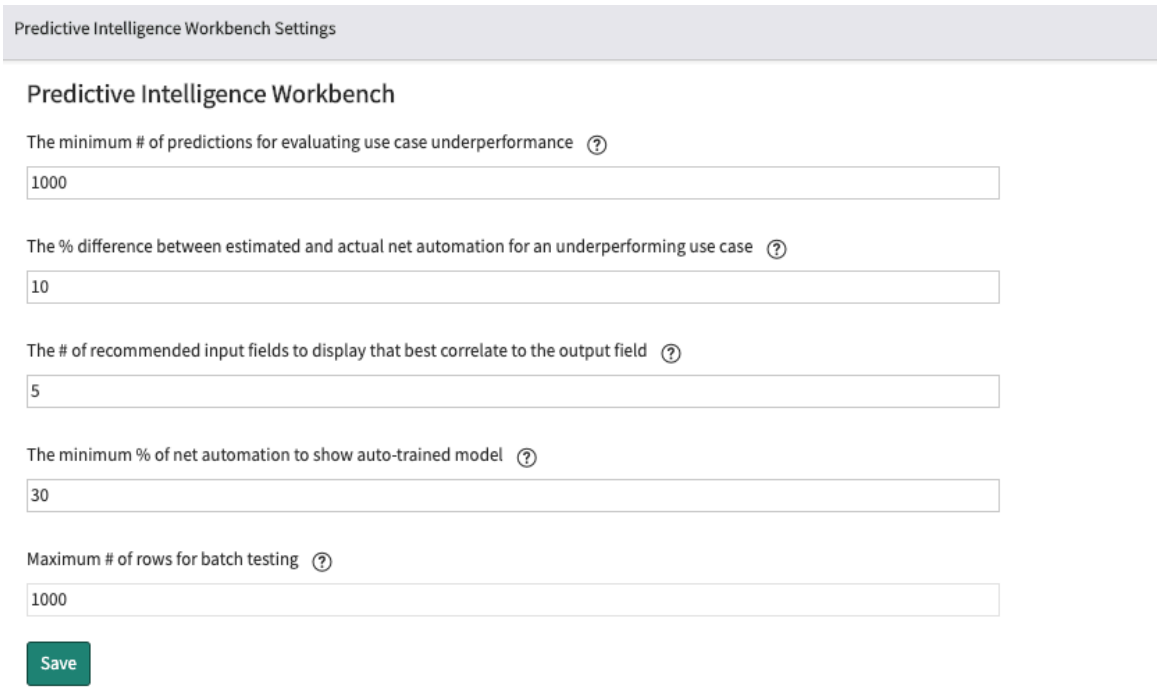
Role required: piwb_admin or piwb_manager

### About this task

Predictive Intelligence Workbench includes several configurable property settings that enable you to define how you want to use and experience the application. For example, decide how many rows you want for batch testing or the minimum percentage of net automation to show that a model is auto trained. Default settings are configured in the base-system application.

### Procedure

1. Navigate to **All** > **Predictive Intelligence Workbench** > **Administration** > **Settings**.
   The Predictive Intelligence Workbench Settings page appears with default setting configurations.

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2. Modify the property settings, if desired, or work within the default parameters.
3. Click **Save** if you make any changes.

## ITSM Predictive Intelligence Workbench notifications

Email notifications are added with Predictive Intelligence Workbench.

Predictive Intelligence Workbench includes several email notifications that alert users throughout the use case model implementation.

Predictive Intelligence process architects creating and training use case models receive an email notification when a use case model is successfully trained and when batch testing has finished successfully. If a use case fails training or if batch testing produces errors, users will receive notifications about these scenarios, as well.

Users can click a link in the email notification to view a newly trained use case or batch test results. They can also download the test results, if desired. Users can receive the following notifications:

| Name | Description |
|---|---|
| Use case model training successful<br><br>Table: PI Solution Model [piwb_model] | Sends an email to a specified user group when a use case model is successfully trained. |
| Batch test run complete | Sends an email to a specified user group when batch testing is complete. |
| Use case Model training failed<br><br>Table: PI Solution Model [piwb_model] | Sends an email to a specified user group when a use case model training has failed. |

Create an ITSM Predictive Intelligence Workbench user group and add users or roles to ensure Predictive Intelligence process architects are notified during the use case model implementation process. Refer to Create an ITSM Predictive Intelligence Workbench user group.

For more details about email notifications for Predictive Intelligence Workbench, refer to Preview email notification.

## Create an ITSM Predictive Intelligence Workbench user group

Create an ITSM Predictive Intelligence Workbench user group and add users or roles to the group to receive email notifications when the use case model training and testing phase is complete.

### Before you begin

Role required: admin

### About this task

Create an ITSM Predictive Intelligence Workbench user group and add either users or roles to the group so that email notifications are sent to alert users throughout the use case model training and testing phases.

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Users can receive notifications for the following Predictive Intelligence Workbench events:

- Use case training is successful
- Batch testing is complete
- Use case training has failed

### Procedure

To create an ITSM Predictive Intelligence Workbench user group and add users, refer to Create a user group.
For more information about the email notifications provided with this application, refer to ITSM Predictive Intelligence Workbench notifications.

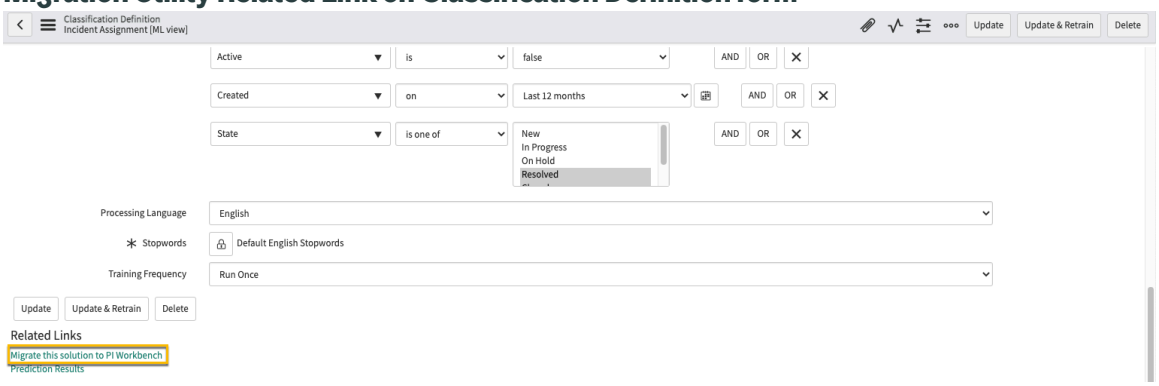
## Predictive Intelligence Workbench Migration Utility

Predictive Intelligence Workbench managers can easily migrate existing compatible Predictive Intelligence solution definitions into Predictive Intelligence Workbench. The Migration Utility enables a simplified configuration and expanded reporting functions.

The Predictive Intelligence Workbench Migration Utility enables existing Predictive Intelligence users with the piwb_manager role to convert a solution definition to a use case. The active solution is then converted into a model associated with the new use case.

A Related Link on the Predictive Intelligence Classification Definition form enables users to migrate a solution definition from Predictive Intelligence directly into Predictive Intelligence Workbench.

**Migration Utility Related Link on Classification Definition form**




The Related Link only appears on the form when there is an active solution definition and that solution is not associated with a Predictive Intelligence Workbench use case.

Users can also access the Migration Utility as a module in the Predictive Intelligence Workbench application.

Clicking the **Migrate this solution to PI Workbench** Related Link or clicking the**Migration Utility** module, takes you to the Migration Utility detail page for the solution definition.

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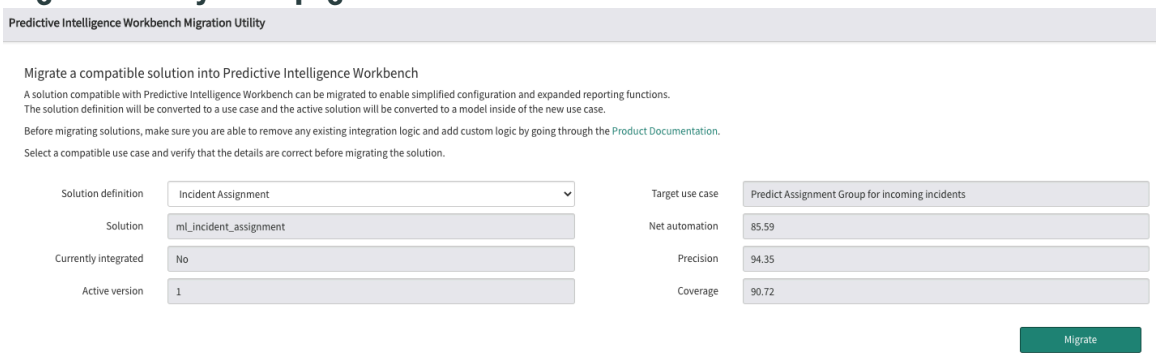
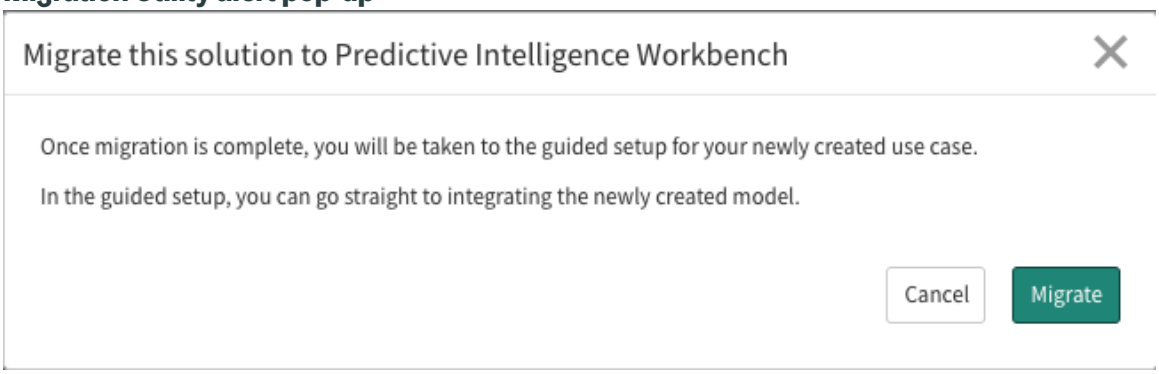
### Migration Utility detail page

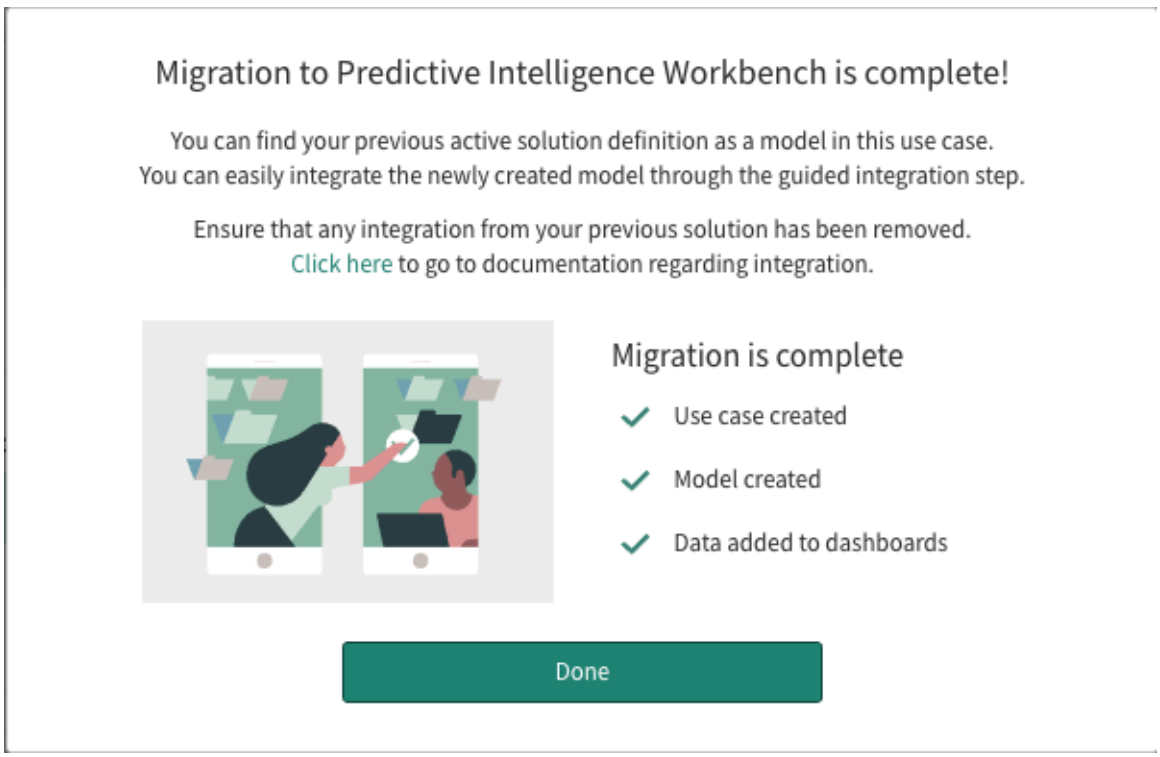



Clicking **Migrate** from the Migration Utility details page alerts you that a new use case will be created in Predictive Intelligence Workbench. You can then follow guided setup to integrate a new model.

### Migration Utility alert pop-up




Clicking **Migrate** from this pop-up alert finalizes the migration.

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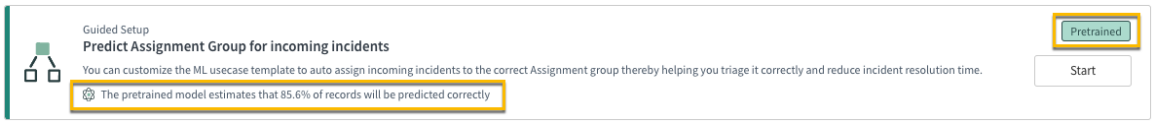
# Predictive Intelligence Workbench pretrained use cases

The pretrain functionality mechanism for use cases enables and trains the machine learning solution definition when you activate the Predictive Intelligence Workbench application.

When a pretrained machine learning solution exists in the system, Predictive Intelligence Workbench highlights the use case templates with the **Pretrained** flag.

**ITSM Predictive Intelligence Workbench pretrained model use case template**




The **Pretrained** flag for use case templates displays when the following criteria are met.

- The Predictive Intelligence Workbench *piwb.instance_eligible_auto_train* system property for pretraining is enabled (true) on the your instance. This property is disabled by default. Requires the piwb_admin role to enable.
- The instance has to be one of the following types:
  - ded-prod
  - shared-prod
  - ded-subprod
  - shared-subprod
- The associated machine learning solution is active and ready for deployment.
- The use case template does not contain an existing pretrained use case.
- The machine learning solution net automation is greater than the threshold value.

  **Note:**
  The default base-system threshold value is 30. You can configure this value via the Predictive Intelligence Workbench *piwb.auto_train_threshold* system property for. Requires the piwb_admin role to modify the default value.

- The machine learning solution is a pretrained base-system solution with an associated record for its definition in the ML Auto Train Solution [ml_autotrain_solution] table.

# Predictive Intelligence Workbench integration and customization

Predictive Intelligence Workbench uses scripted extension points to integrate a trained use case model for prediction.

## Scripted extension points for trained use case integration implementation

The scripted extension point is *PIWBPredictionProcessor* and *PIWBPredictionProcessor_incident* is the default implementation of *PIWBPredictionProcessor* for the Incident [incident] table. *PIWBPredictionProcessor_incident* runs all the predictions for integrated incident-related use case models.

## Customizing default implementation

If you want to customize the default implementation, you can modify the *PIWBPredictionProcessor_incident* script. The business rule *PIWB Prediction*

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– *Incident* on the Incident table calls the *PIWBPredictionProcessor_incident* script for predictions. For details about scripted extension points, refer to Using extension points to extend application functionality.

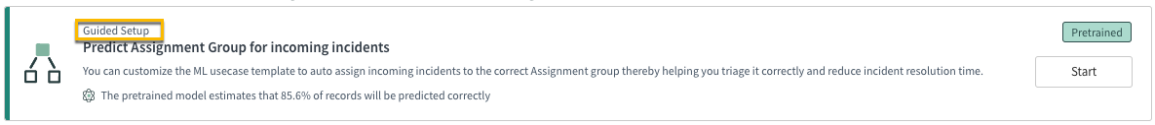
# ITSM Predictive Intelligence Workbench implementation

Use machine learning to optimize your business processes. You can train and implement ITSM Predictive Intelligence Workbench use case models to augment your existing application workflows.

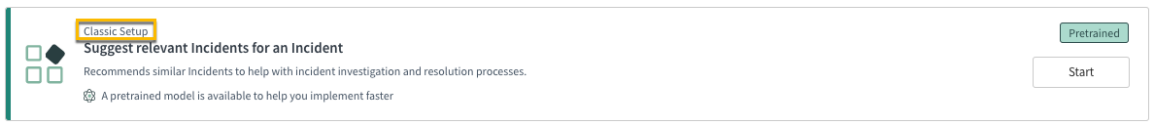
## Explore use case templates

Users with the piwb_admin or piwb_manager role can explore the prebuilt use case templates and create predictive machine learning models. To create a machine learning model, you first select a prebuilt use case template. Some of the prebuilt templates are guided and display the **Guided Setup** flag. These templates include a comprehensive setup process to help ease you through implementation. Non-guided templates display the **Classic Setup** flag.

### ITSM Predictive Intelligence Workbench guided use case template



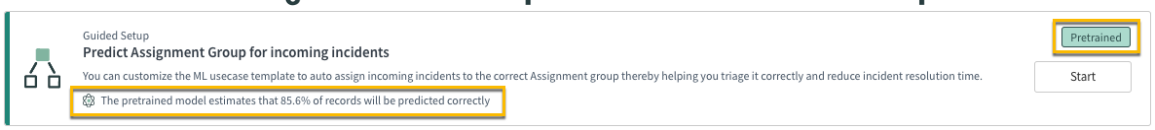

### ITSM Predictive Intelligence Workbench classic setup use case template




Templates with available pretrained models accelerate your setup process, by providing a pre-generated model based on your data. When a template indicates **Pretrained**, this means you can go directly to the evaluation phase of the use case setup. If the pretrained model is acceptable, you can directly integrate it with your business processes. Otherwise, you can tune this model or create another model. You may change the name and description of the use case later. Pretrained models display the estimated percentage of your correctly predicted incidents.

Templates with available pretrained models also display the estimated percentage of the correctly predicted incidents. If the pretrained model is acceptable, you can directly integrate it with your business processes. Otherwise, you can tune this model or create another model. You may change the name and description of the use case later. Pretrained models display the estimated percentage of your correctly predicted incidents.

### ITSM Predictive Intelligence Workbench pretrained model use case template




Non-guided, **Classic Setup** templates provide links to relevant Predictive Intelligence Workbench product documentation or link to the ServiceNow platform Predictive Intelligence application with the **Take me there**button.

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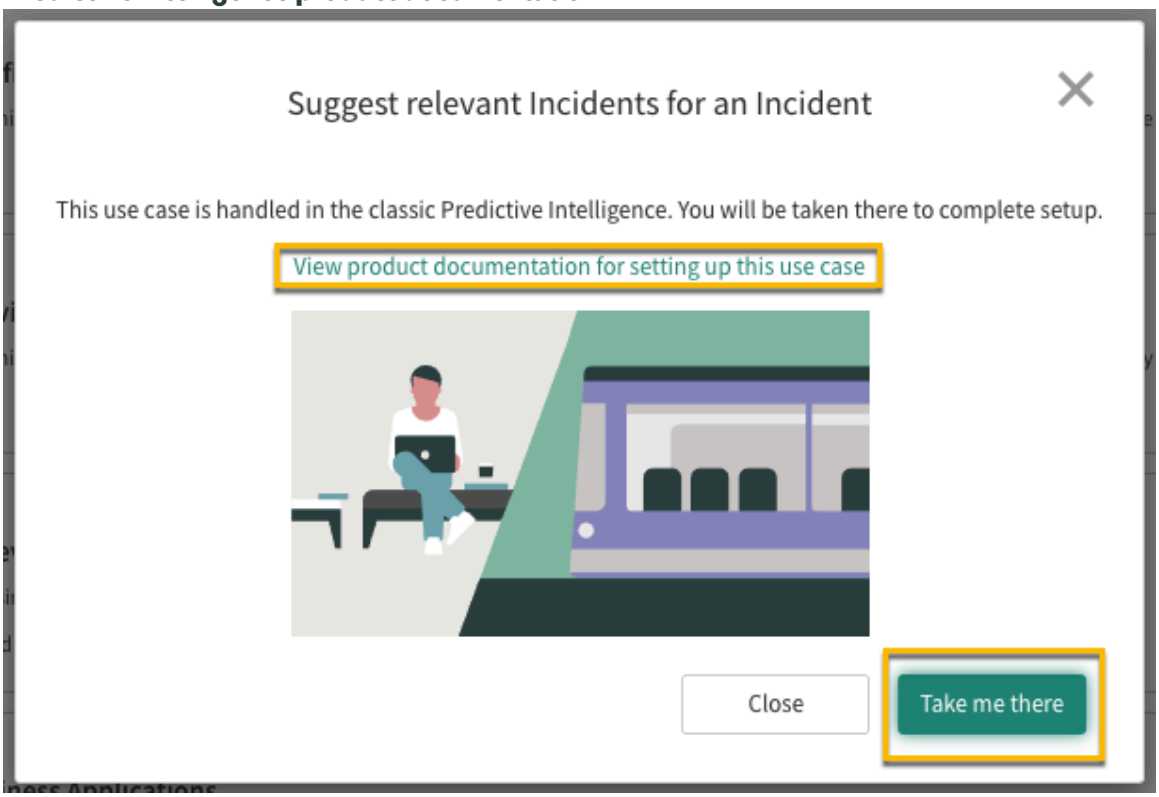
**ITSM Predictive Intelligence Workbench links to product documentation and Predictive Intelligence product documentation**




## Use case creation phases

Creating a predictive machine learning model involves several phases. After you create and train your model you need to evaluate and tune it, test its prediction results, and then integrate it with your business process. Use case model creation phases include:

- Create and train models: Define parameters to create a model that you will train based on your unique data. It is common to create multiple models in this phase. You will tune and refine your models by defining the right combination of coverage and precision to use.
- Test your models: Get prediction results from your models to decide which one is best to integrate with your business process. To see if a model returns a correct result, you can use either the single or batch testing process.
- Integrate the best model: Deploy the best model into your business process. After you determine which model returns the best, correct result, integrate it into production.

> **Note:**
> For details regarding trained use case integration implementation, refer to Predictive Intelligence Workbench integration and customization.

## Predict Assignment Group for incoming incidents

Use this guided template to auto-assign incoming incidents to the correct assignment group to reduce your incident resolution times.

### Before you begin

Role required: piwb_manager or piwb_viewer

### About this task

This template walks you through customizing a use case model to predict the correct assignment group for your incoming incidents. When the use case template shows the label **Pretrained**, you

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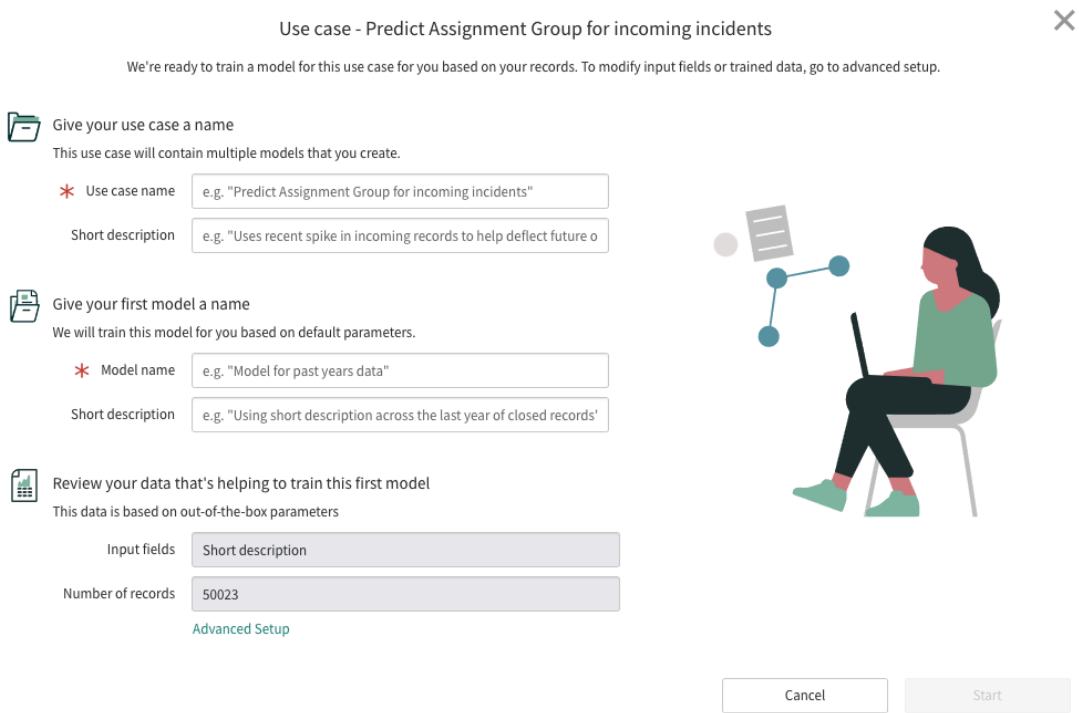
can bypass several implementation steps and are automatically taken to evaluate and tune your models when you click **Start**. Otherwise, you will begin by creating a machine learning model.

### Procedure

1. Navigate to **All** > **Predictive Intelligence Workbench** > **Use Cases** > **Create New from Template**.
2. Select the **Predict Assignment Group for incoming incidents** guided template.




3. In the **Use case - Predict Assignment Group for incoming incidents** pop-up form, provide a unique name for your use case in the **Use case name** field.




> **Note:**
> The use case will contain multiple models that you create. You can use the same name as the template, if desired.

4. Although not mandatory, it's beneficial to provide unique details about the use case in the **Short description** field.

> **Note:**
> Typically the short description provides details about what the goal of the use case is or your purposes for creating the use case.

5. Provide a name for the model in the **Model name** field.

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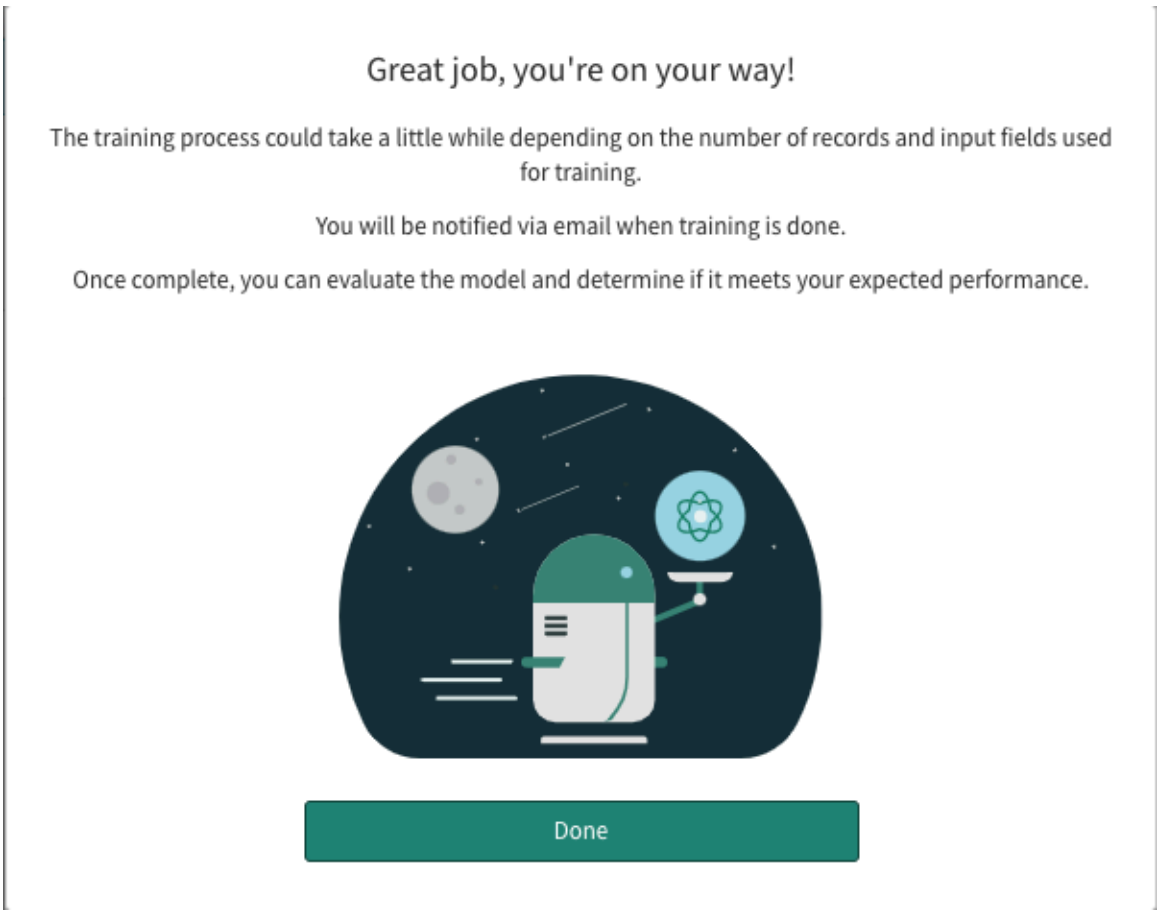
**Note:**
Models are trained based on default parameters. The name of the model should reflect its purpose, for example, "Model for past years data".

6. Review the base system parameters set to help train the model in the **Input fields** and **Number of records** fields.
7. Modify this data by clicking **Advanced Setup**.

**Note:**
By clicking **Advanced Setup** you can change the processing language, review and modify filters used to train the model. You can customize the filters to best represent your business data or add new criteria by clicking **New Criteria**. Review and modify input fields used to generate predictions. Customize the fields to best represent your business data by moving fields between the **Available** and **Selected** lists. Save any changes you make.

8. Click **Start**.
   A pop-up message lets you know your model is created and that training is underway.

**Note:**
To start implementation, you must provide at least a use case name and model name.




9. Click **Done**.
   The use case page displays the name and description of the use case you created. On this page, you can see all the guided implementation phases you will work through to create and implement your use case model.

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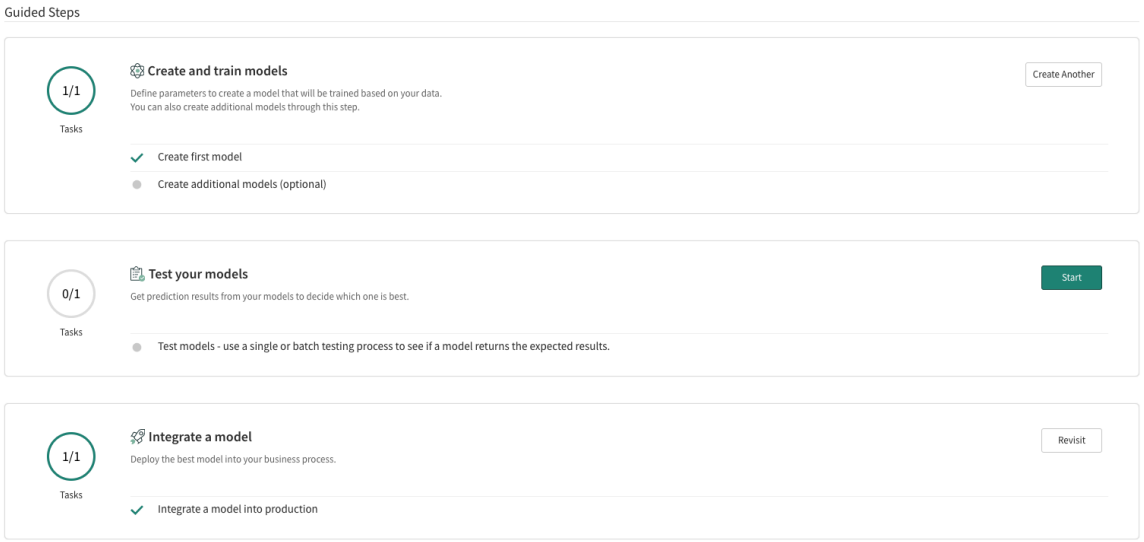
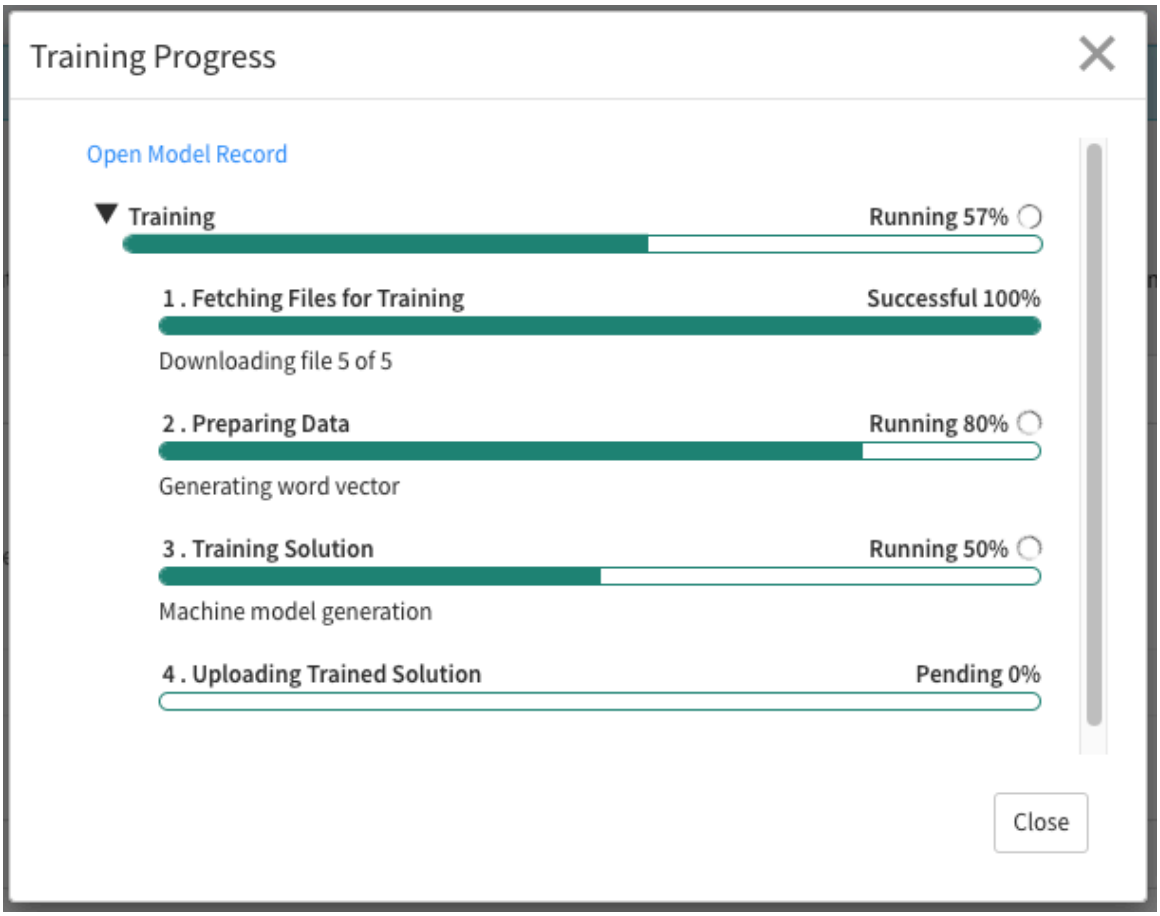



10. Click **View Progress** below the header on the use case setup page to monitor a current training process.




**Note:**
When training is complete, you will receive an email notification letting you know your use case model training was successful. For more information about use case model notifications, refer to ITSM Predictive Intelligence Workbench notifications.

11. Click the model name under **Trained Models** on the use case setup page to view associated data about the trained model.

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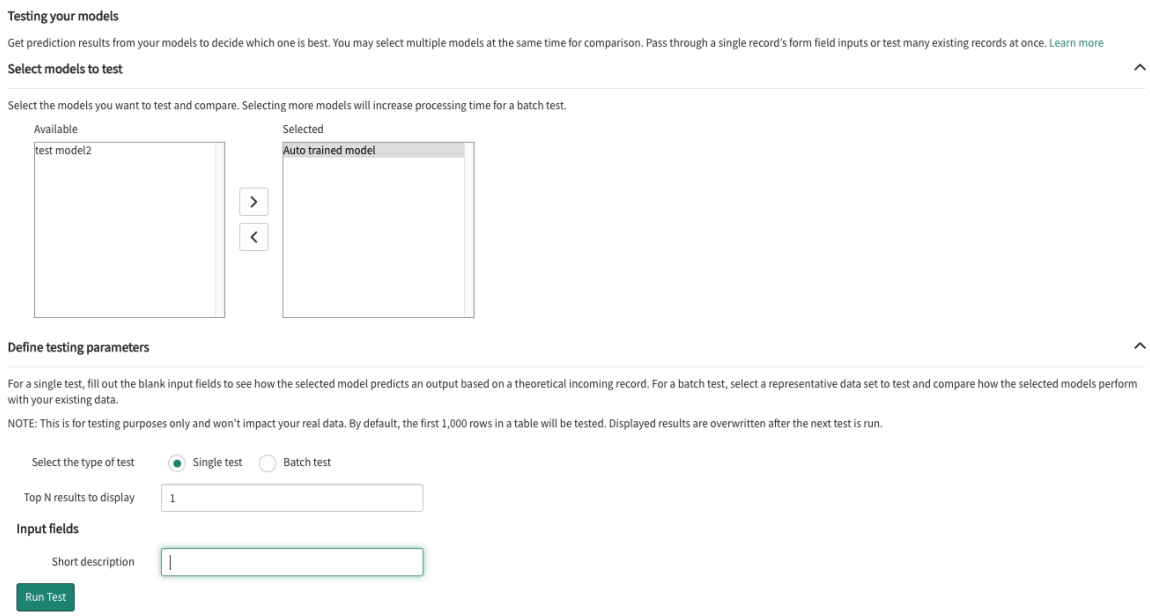
The **Model details** page opens.

12. In the **Retraining Schedule** field of the **Models detail** page you can change the definition, if desired.
    The default value is **Every 30 days**, but you can retrain as often as once to every 180 days
13. If you made schedule retraining changes to the use case model, click either **Update** or **Update and retrain**, to retrain again.
14. To tune a model, click **Tune Values** on the use case setup page under **Trained Models**.
    The tuning page for the use case opens displaying the associated model name with the following data: **Distribution (%)**, **Net Automation**, **Precision (%)**, **Coverage (%)**, and any comments. View the evaluation data used for the use case and associated model.

    **Note:**
    You can only tune values when the model is trained.

15. If desired, tune and refine the model by defining the right combination of coverage and precision to use.
    Double-click in the **Precision (%)** and **Coverage (%)** fields to change values. Changes are automatically saved.
16. If desired, click **Create Another** to create another model associated with your use case in the **Create and train models** section of the setup page.
    Repeat the process to create and train the model.
17. In the **Test your models** section of the use case page, click **Start** to begin the testing process.
    The **Testing your models** page opens.




18. Under **Select models to test**, decide if there are other use case models available that you want to test.
    If so, move them to the **Selected** list.
19. Under **Define testing parameters**, decide if you want to test one use case model.

    If so, select the **Single test** test type. **Single test** is the default.

    **Note:**
    Select **Batch test** when you want to test more than one use case model.

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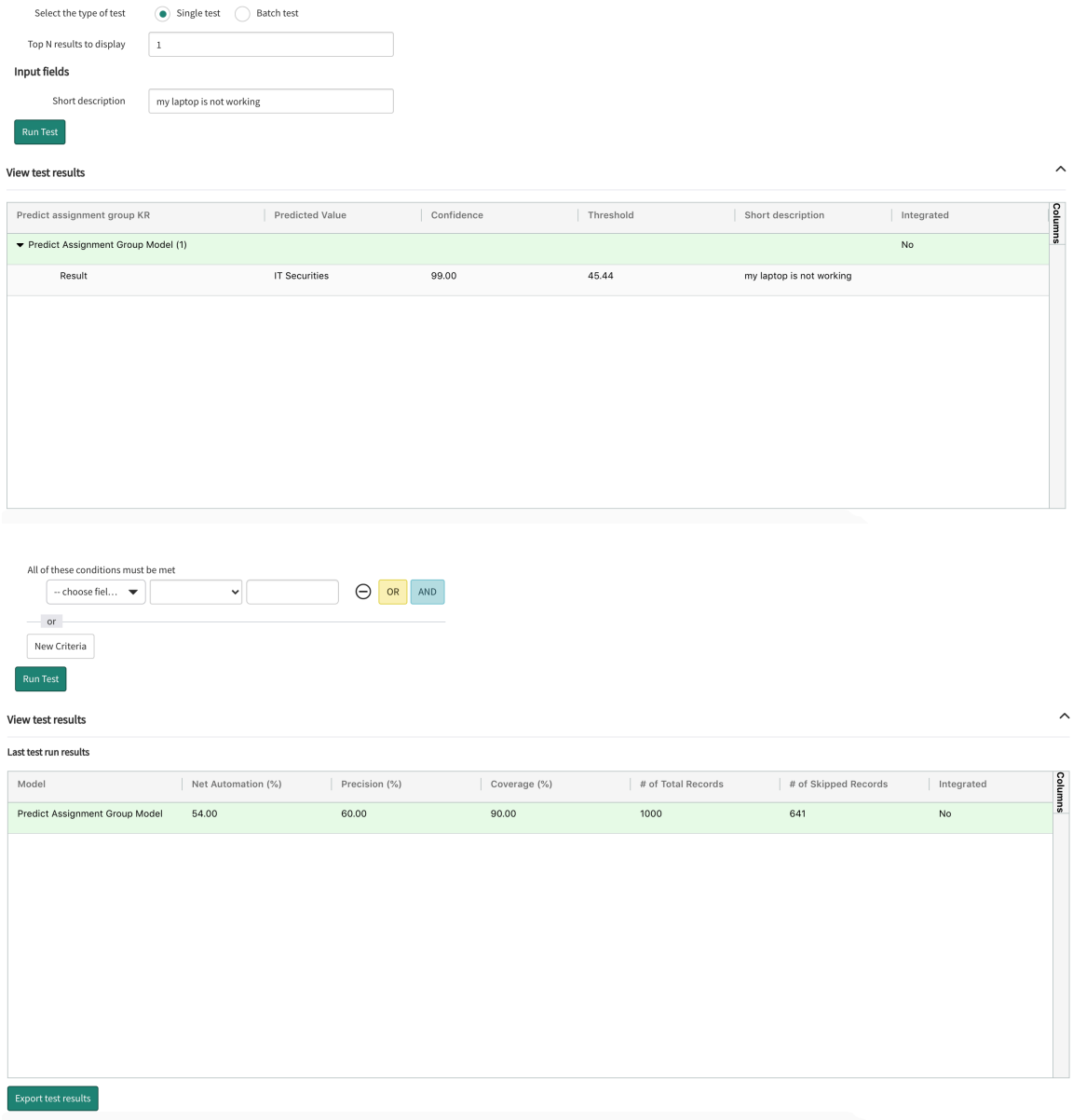
20. Determine the number of top results you want to display.
21. Under **Input fields**, provide a short description of your use case model test.
22. Click **Run Test**.
23. View the test results data for the use case model under **View test results**.




24. If you are ready to integrate your use case model into your business processes, return to the use case set up page and click **Start** in the **Integrate a model** section.
    The **Select a model to integrate** page opens.
25. In the **Select a Model** drop-down menu, select the model you want to integrate.
    The **Select a model to integrate** page opens.

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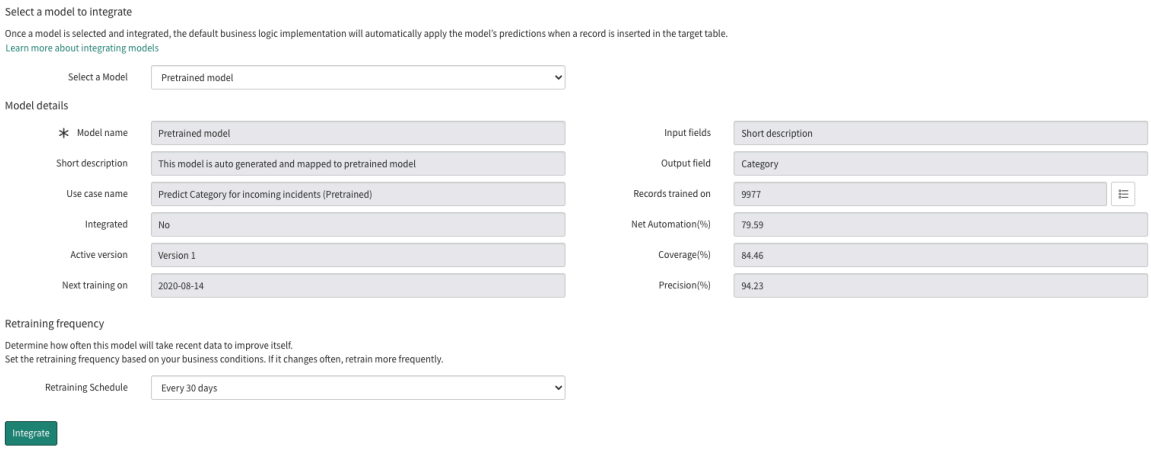



**Note:**
You can change the retraining schedule via this page if you desire. Use the **Retraining Schedule** drop down selection field to change from the default 30 day value.

26. Click **Integrate**.
27. Click **Integrate** again when the pop-up asks you if you are sure you want to perform this action. You have integrated a use case model into your business process.

**Note:**
For details regarding trained use case integration implementation, refer to Predictive Intelligence Workbench integration and customization.

## Predict Category for incoming incidents

Use this guided template to auto-assign incoming incidents to the correct category to reduce your incident resolution times.

### Before you begin

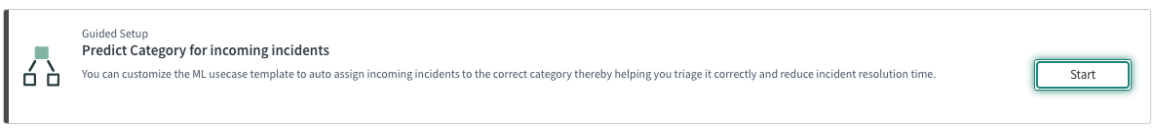
Role required: piwb_manager or piwb_viewer

### About this task

This template walks you through customizing a use case model to predict the category for your incoming incidents. When the use case template shows the label **Pretrained**, you can bypass several implementation steps and are automatically taken to evaluate and tune your models when you select **Start**. Otherwise, you'll begin by creating a machine learning model.

### Procedure

1. Navigate to **All** > **Predictive Intelligence Workbench** > **Use Cases** > **Templates**.
2. Select the **Predict Category for incoming incidents** guided template.




3. In the **Use case - Predict Category for incoming incidents** pop-up form, provide a unique name for your use case in the **Use case name** field.

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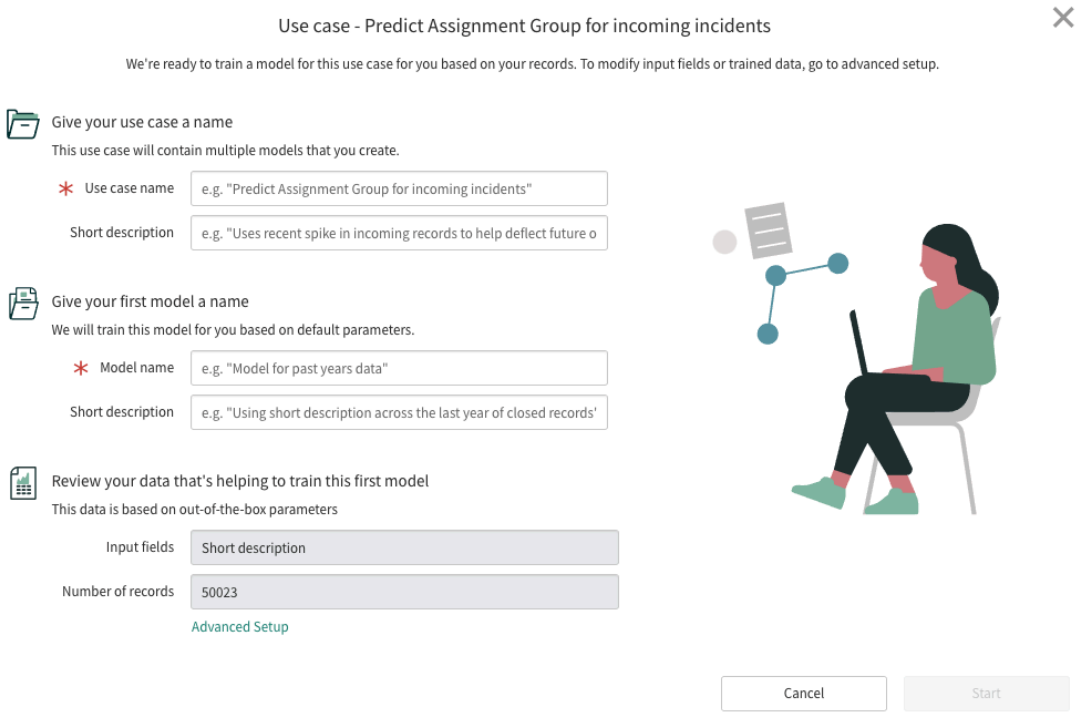


**Note:**
The use case contains multiple models that you create. You can use the same name as the template, if desired.

4. Although not mandatory, it's beneficial to provide unique details about the use case in the **Short description** field.

**Note:**
Typically the short description provides details about what the goal of the use case is or your purposes for creating the use case.

5. Provide a name for the model in the **Model name** field.

**Note:**
Models are trained based on default parameters. The name of the model should reflect its purpose, for example, "Model for past years data."

6. Review the base system parameters set to help train the model in the **Input fields** and **Number of records** fields.
To modify this data, select **Advanced Setup**.

**Note:**
By selecting **Advanced Setup** you can change the processing language, review and modify filters used to train the model. You can customize the filters to best represent your business data or add new criteria by selecting **New Criteria**. Review and modify the input fields used to generate predictions. Customize the fields to best represent your business data by moving fields between the **Available** and **Selected** lists. Save any changes that you make.

7. Select **Start**.
A pop-up message lets you know your model is created and that training is underway.

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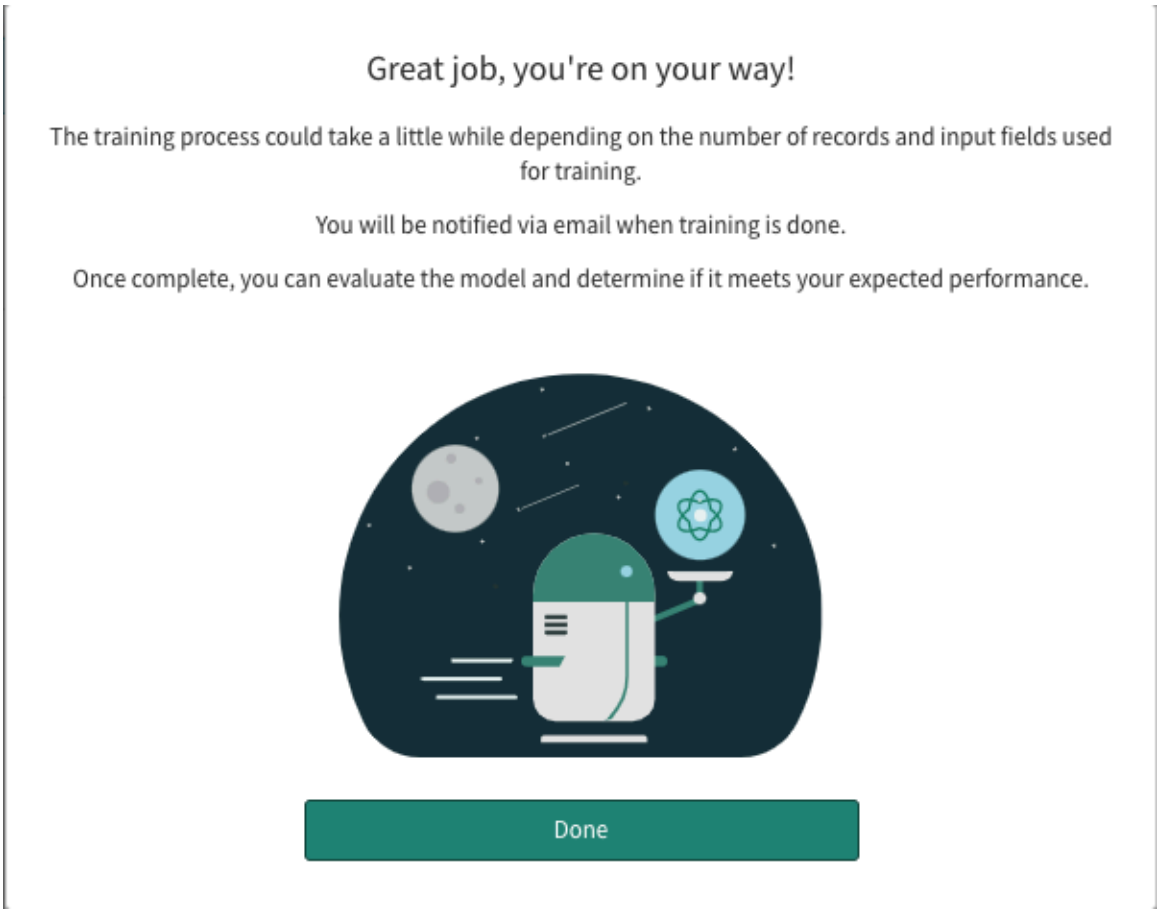
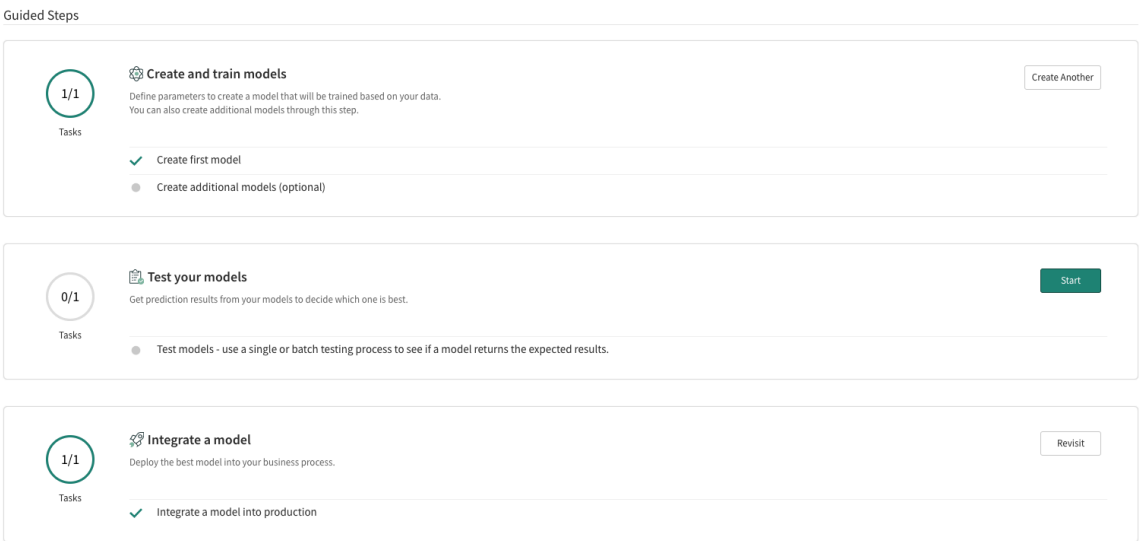
**Note:**
To start implementation, you must provide at least a use case name and model name.




8. Select **Done**.
   The use case page displays the name and description of the use case you created. On this page, you can see all the guided implementation phases you'll work through to create and implement your use case model.




9. Select **View Progress** below the header on the use case setup page to monitor a current training process.

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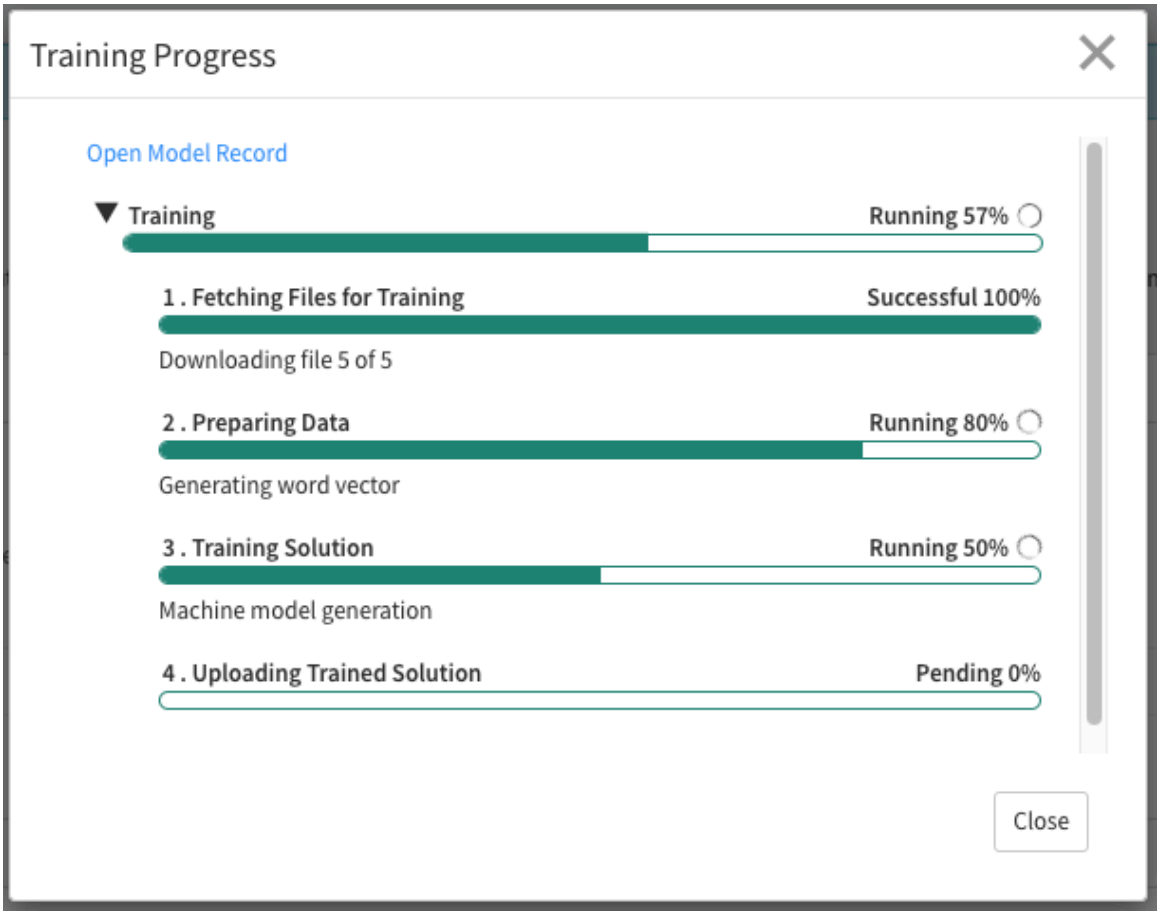


**Note:**
When training is complete, you will receive an email notification letting you know your use case model training was successful. For more information about use case model notifications, refer to ITSM Predictive Intelligence Workbench notifications.

10. Select the model name under **Trained Models** on the use case setup page to view associated data about the trained model.
    The **Model details** page opens.
11. In the **Retraining Schedule** field of the **Models detail** page, you can change the definition, if desired.
    The default value is **Every 30 days**, but you can retrain as often as once to every 180 days.
12. If you made schedule retraining changes to the use case model, select either **Update** or **Update and retrain**, to retrain again.
13. To tune a model, select **Tune Values** on the use case setup page under **Trained Models**.
    The tuning page for the use case opens displaying the associated model name with the following data: **Distribution (%)**, **Net Automation**, **Precision (%)**, **Coverage (%)**, and any comments. View the evaluation data used for the use case and associated model.

    **Note:**
    You can only tune values when the model is trained.

14. If desired, double-click (or use the keyboard shortcut) in the **Precision (%)** and **Coverage (%)** fields to change the values, which tune and refine the model by defining the right combination of coverage and precision to use.
    Changes are automatically saved.

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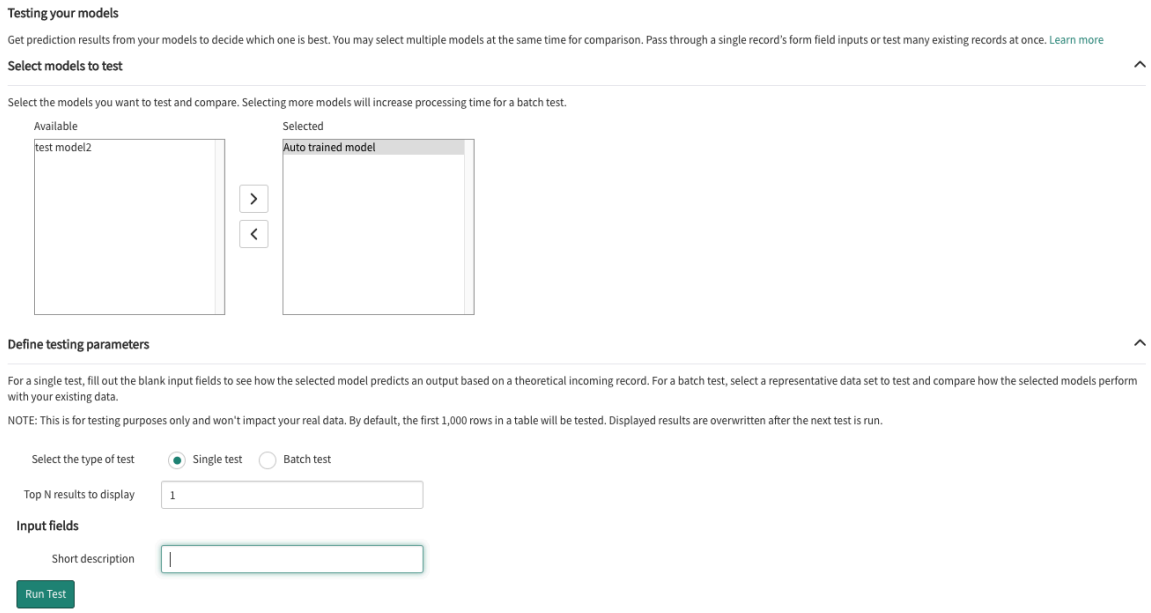
15. If desired, select **Create Another** to create another model associated with your use case in the **Create and train models** section of the setup page.
    Repeat the process to create and train the model.
16. In the **Test your models** section of the use case page, select **Start** to begin the testing process.
    The **Testing your models** page opens.




17. Under **Select models to test**, decide if there are other use case models available that you want to test.
    If so, move them to the **Selected** list.
18. Under **Define testing parameters**, decide if you want to test one use case model.
    If so, select the **Single test** test type. **Single test** is the default.

    **Note:**
    Select **Batch test** when you want to test more than one use case model.

19. Determine the number of top results that you want to display.
20. Under **Input fields**, provide a short description of your use case model test.
21. Select **Run Test**.
22. View the test results data for the use case model under **View test results**.

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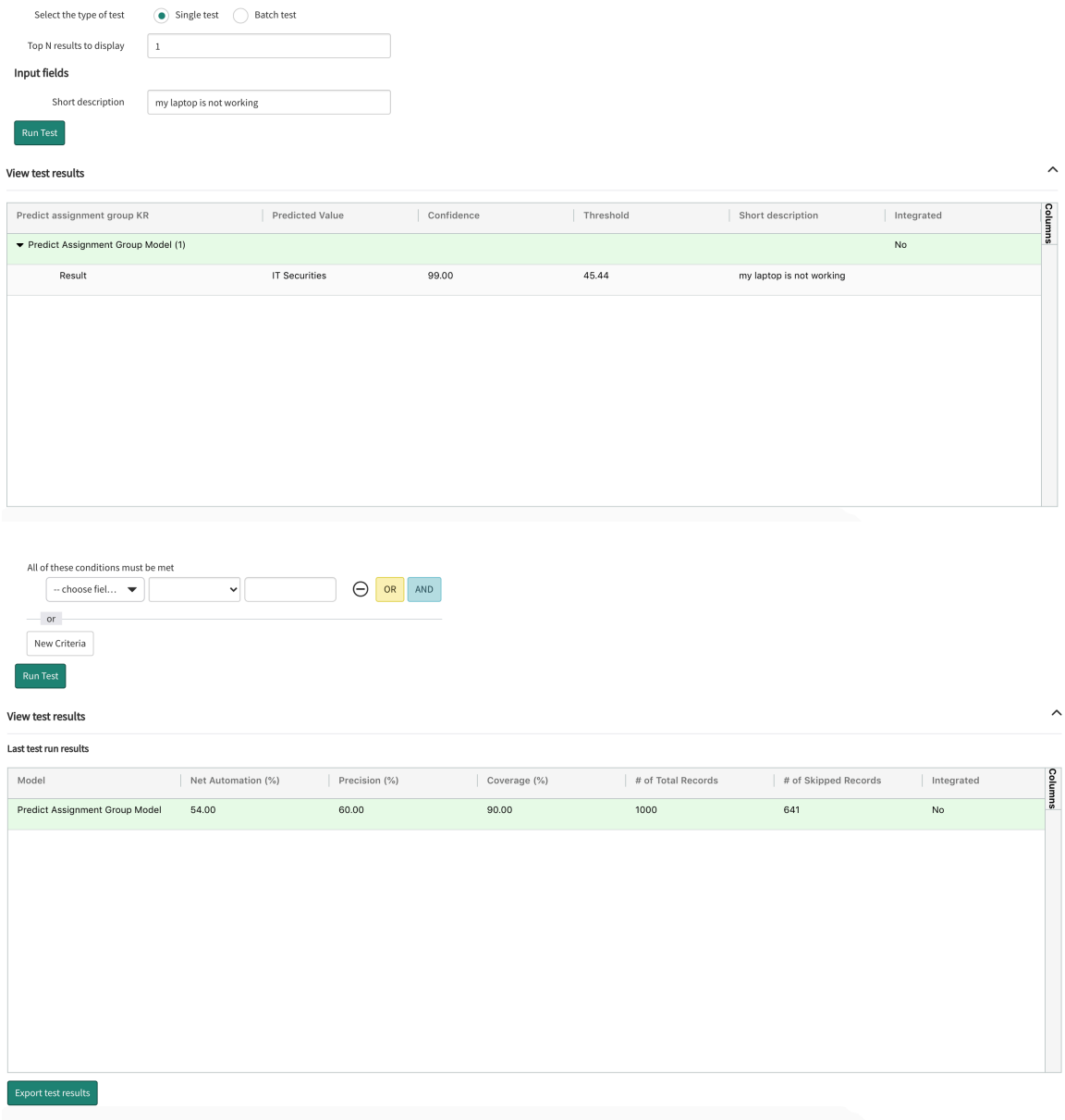


**23.** If you're ready to integrate your use case model into your business processes, return to the use case set up page and select **Start** in the **Integrate a model** section.
The **Select a model to integrate** page opens.

**24.** In the **Select a Model** drop-down menu, select the model you want to integrate.
The **Select a model to integrate** page opens.

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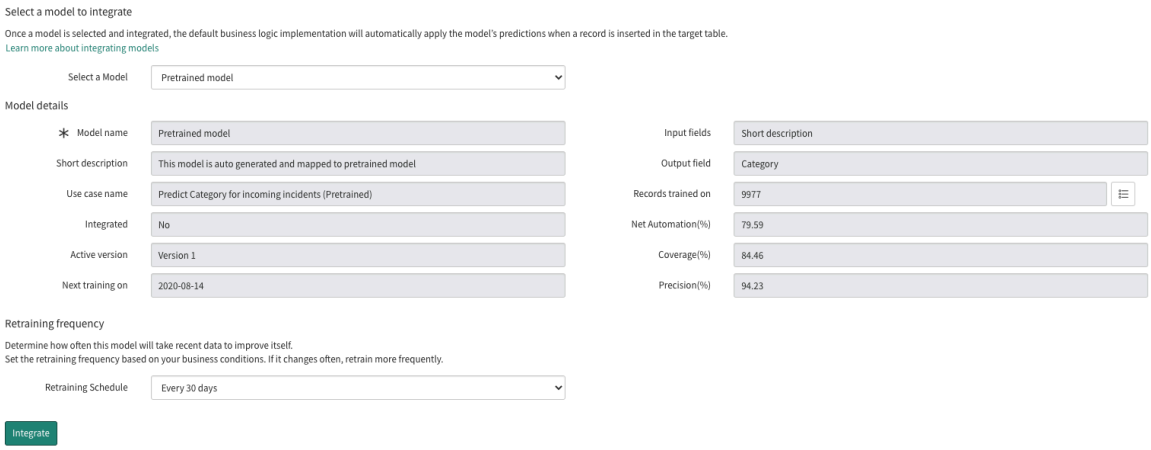


**Note:**
You can change the retraining schedule via this page if you desire. Use the **Retraining Schedule** drop-down selection field to change from the default 30 day value.

25. Select **Integrate**.
26. Select **Integrate** again when the pop-up asks you if you are sure you want to perform this action.
    You have integrated a use case model into your business process.

**Note:**
For details regarding trained use case integration implementation, see Predictive Intelligence Workbench integration and customization.

## Predict Change risk

Use this guided template to implement a data driven approach to predicting change risk. Gain a more precise view into your business change risk.

### Before you begin
Role required: piwb_manager or piwb_viewer

### About this task
This template walks you through customizing a use case model to predict change risk. When the use case template shows the label **Pretrained**, you can bypass several implementation steps and are automatically taken to evaluate and tune your models when you click **Start**. Otherwise, you will begin by creating a machine learning model.

### Procedure
1. Navigate to **All** > **Predictive Intelligence Workbench** > **Use Cases** > **Templates**.
2. Select the **Predict Change risk** guided template.




3. In the **Predict Change risk** pop-up form, provide a unique name for your use case in the **Use case name** field.

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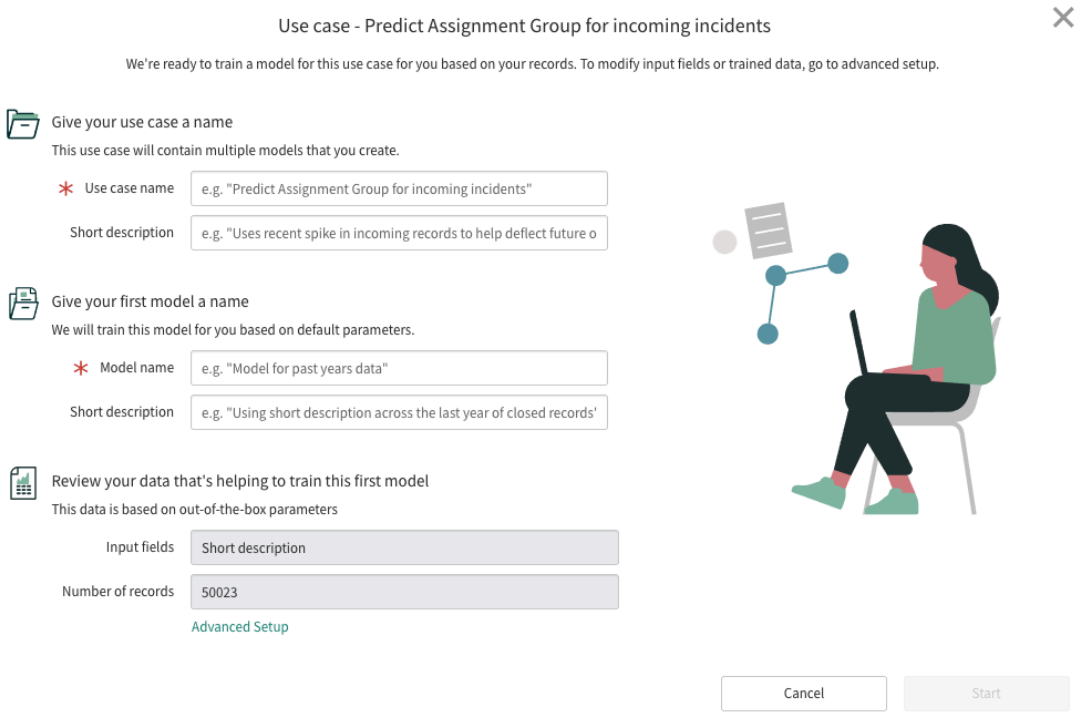


**Note:**
The use case will contain multiple models that you create. You can use the same name as the template, if desired.

4. Although not mandatory, it's beneficial to provide unique details about the use case in the **Short description** field.

**Note:**
Typically the short description provides details about what the goal of the use case is or your purposes for creating the use case.

5. Provide a name for the model in the **Model name** field.

**Note:**
Models are trained based on default parameters. The name of the model should reflect its purpose, for example, "Model for past years data".

6. Review the base system parameters set to help train the model in the **Input fields** and **Number of records** fields.
To modify this data, click **Advanced Setup**.

**Note:**
By clicking **Advanced Setup** you can change the processing language, review and modify filters used to train the model. You can customize the filters to best represent your business data or add new criteria by clicking **New Criteria**. Review and modify input fields used to generate predictions. Customize the fields to best represent your business data by moving fields between the **Available** and **Selected** lists. Save any changes that you make.

7. Click **Start**.
A pop-up message lets you know your model is created and that training is underway.

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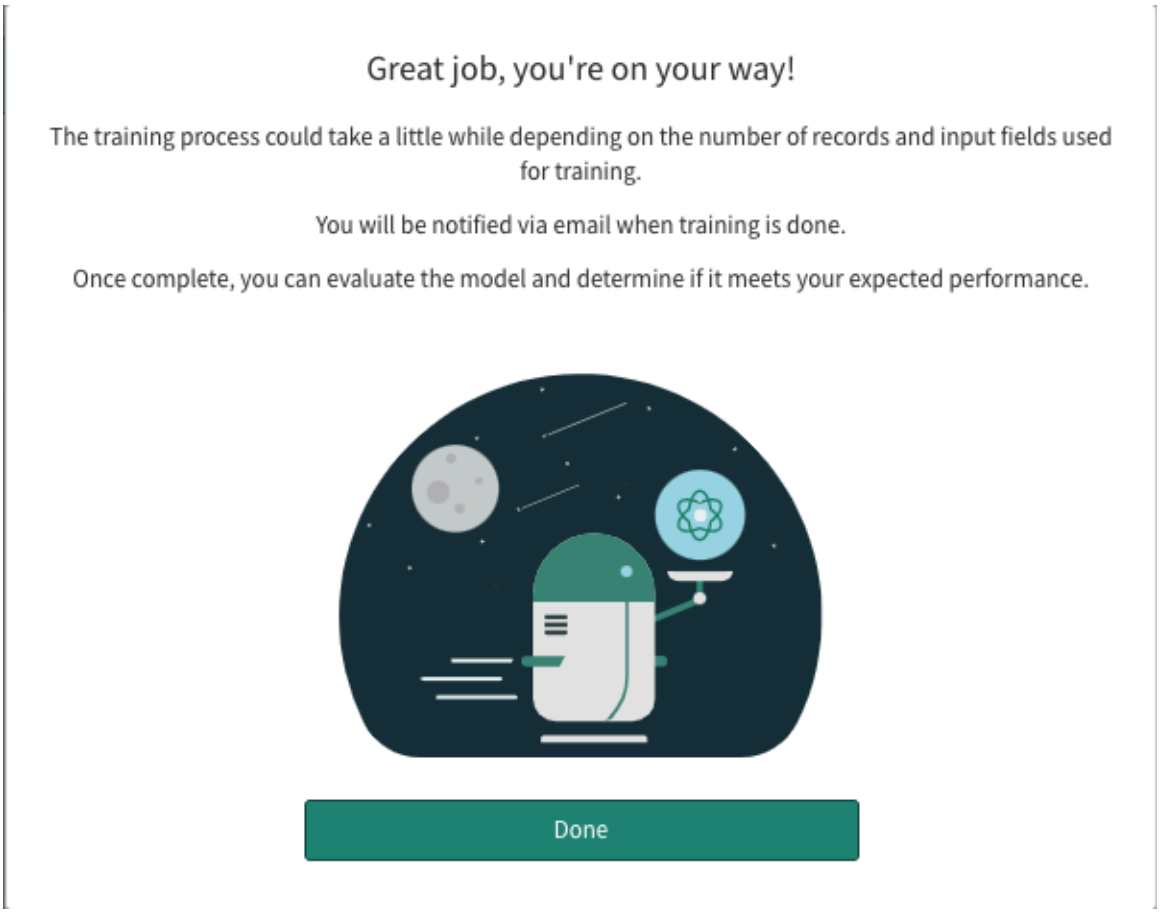
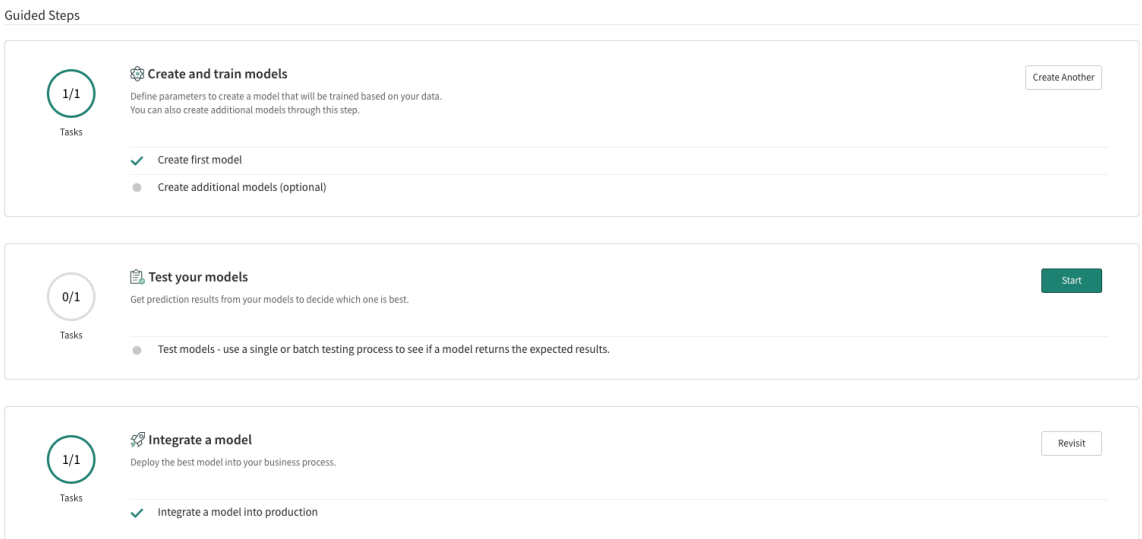
**Note:**
To start implementation, you must provide at least a use case name and model name.




8. Click **Done**.
   The use case page displays the name and description of the use case you created. On this page, you can see all the guided implementation phases you will work through to create and implement your use case model.




9. Click **View Progress** below the header on the use case setup page to monitor a current training process.

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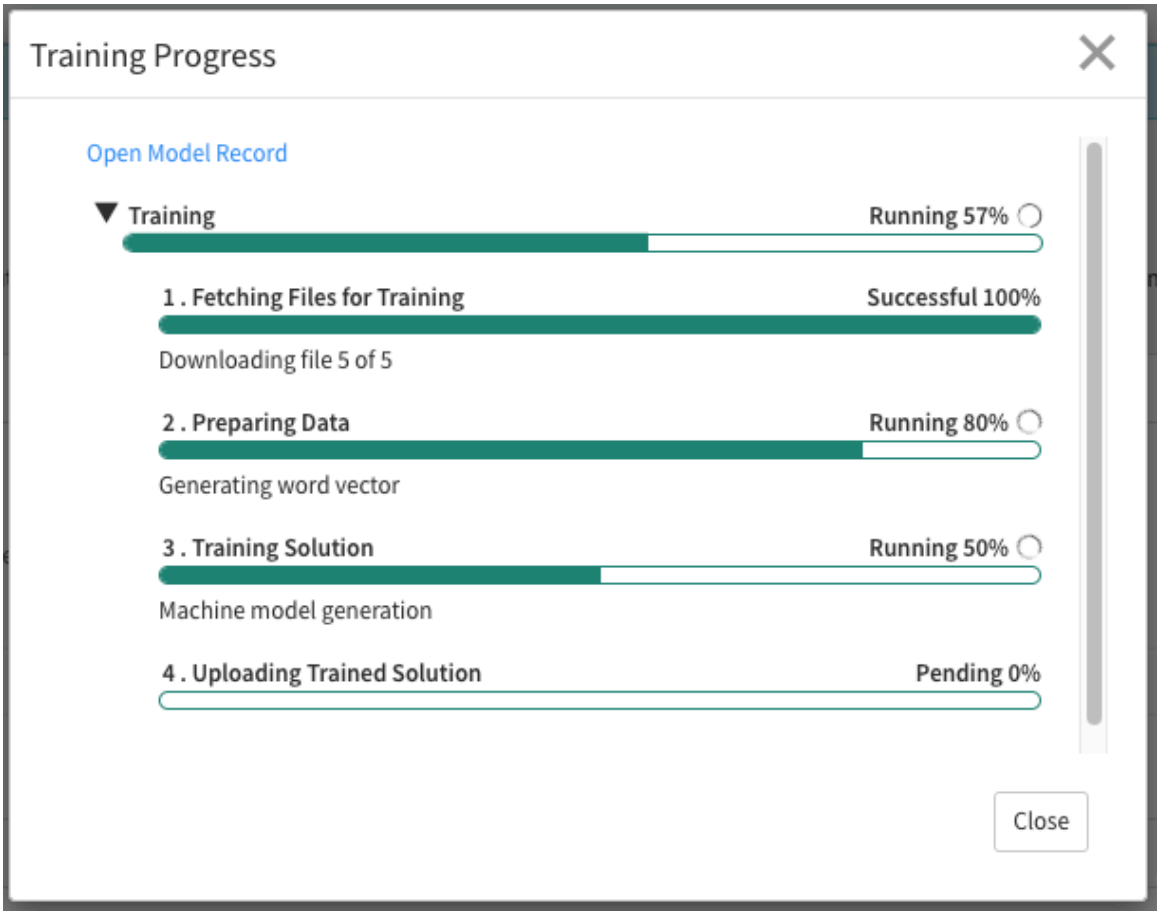


**Note:**
When training is complete, you will receive an email notification letting you know your use case model training was successful. For more information about use case model notifications, refer to ITSM Predictive Intelligence Workbench notifications.

10. Click the model name under **Trained Models** on the use case setup page to view associated data about the trained model.
    The **Model details** page opens.
11. In the **Retraining Schedule** field of the **Models detail** page you can change the definition, if desired.
    The default value is **Every 30 days**, but you can retrain as often as once to every 180 days.
12. If you made schedule retraining changes to the use case model, click either **Update** or **Update and retrain**, to retrain again.
13. To tune a model, click **Tune Values** on the use case setup page under **Trained Models**.
    The tuning page for the use case opens displaying the associated model name with the following data: **Distribution (%)**, **Net Automation**, **Precision (%)**, **Coverage (%)**, and any comments. View the evaluation data used for the use case and associated model

    **Note:**
    You can only tune values when the model is trained.

14. If desired, tune and refine the model by defining the right combination of coverage and precision to use.
    Double-click in the **Precision (%)** and **Coverage (%)** fields to change values. Changes are automatically saved.

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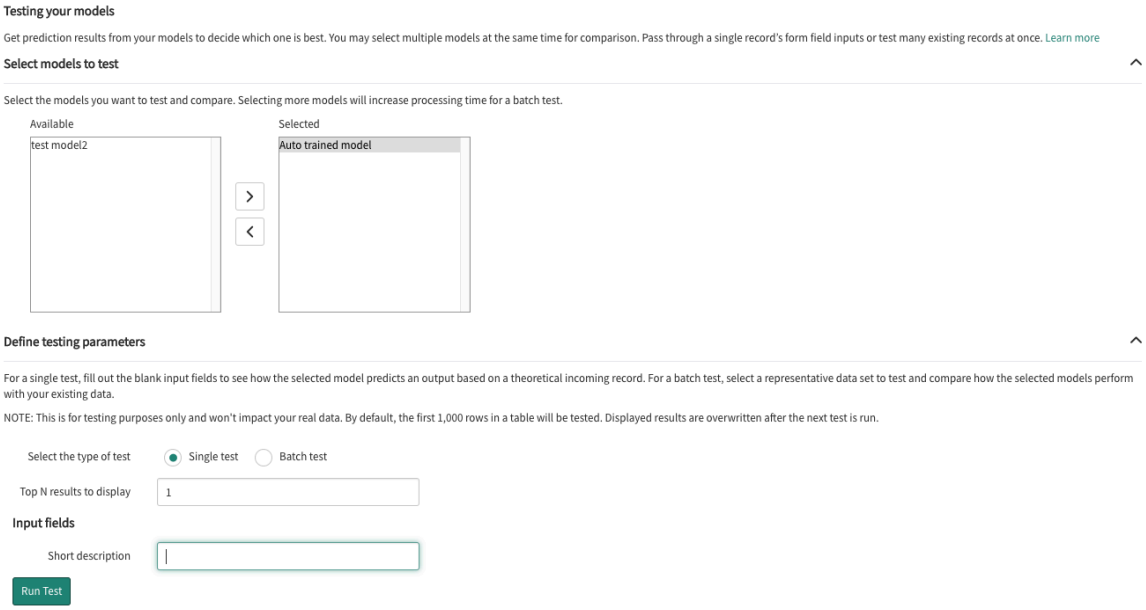
15. If desired, click **Create Another** to create another model associated with your use case in the **Create and train models** section of the setup page.
    Repeat the process to create and train the model.
16. In the **Test your models** section of the use case page, click **Start** to begin the testing process.
    The **Testing your models** page opens.




17. Under **Select models to test**, decide if there are other use case models available that you want to test.
    If so, move them to the **Selected** list.
18. Under **Define testing parameters**, decide if you want to test one use case model.
    If so, select the **Single test** test type. **Single test** is the default.

    **Note:**
    Select **Batch test** when you want to test more than one use case model.

19. Determine the number of top results you want to display.
20. Under **Input fields**, provide a short description of your use case model test.
21. Click **Run Test**.
22. View the test results data for the use case model under **View test results**.

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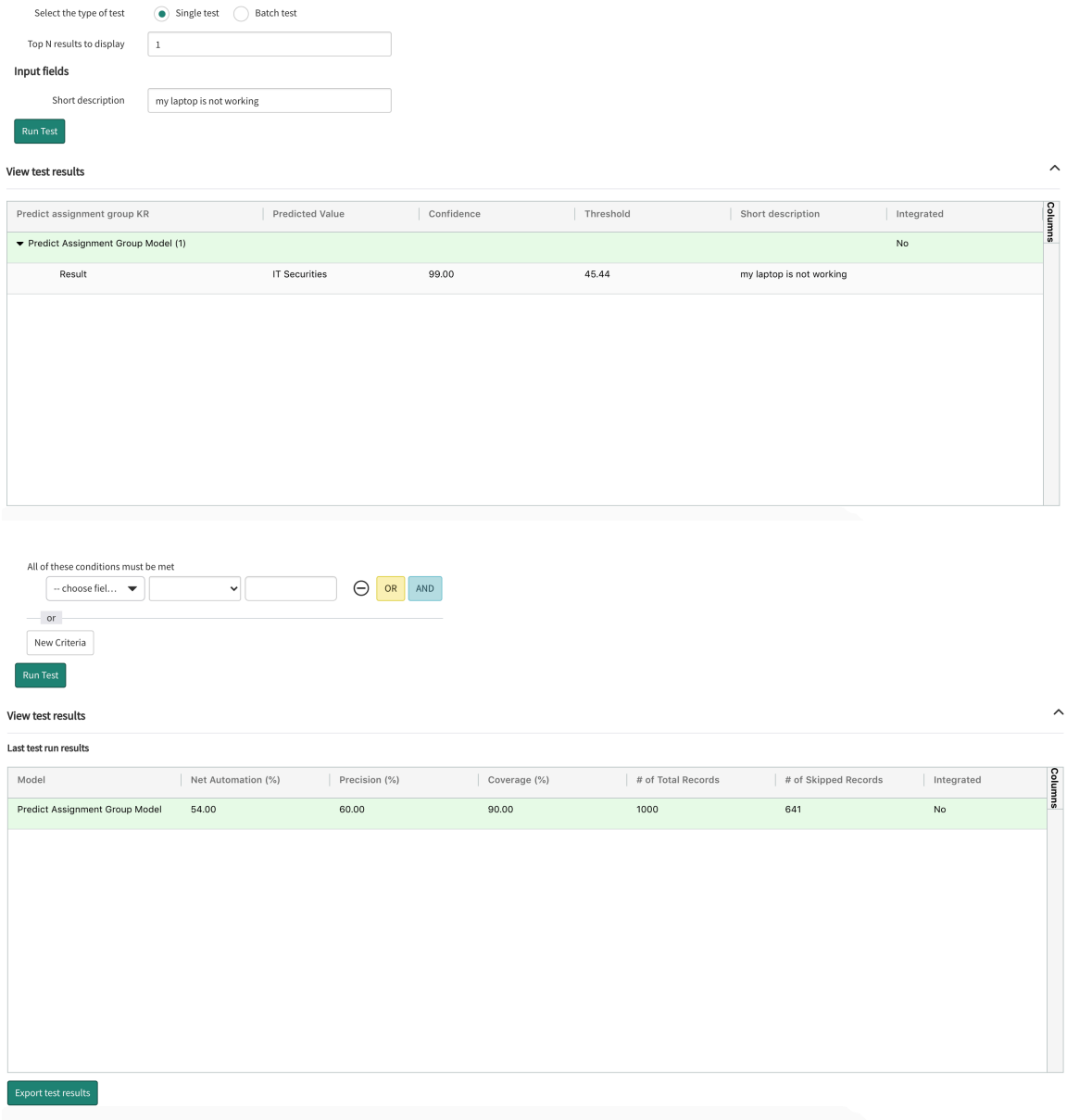





**23.** If you are ready to integrate your use case model into your business processes, return to the use case set up page and click **Start** in the **Integrate a model** section.
The **Select a model to integrate** page opens.

**24.** In the **Select a Model** drop-down menu, select the model you want to integrate.
The **Select a model to integrate** page opens.

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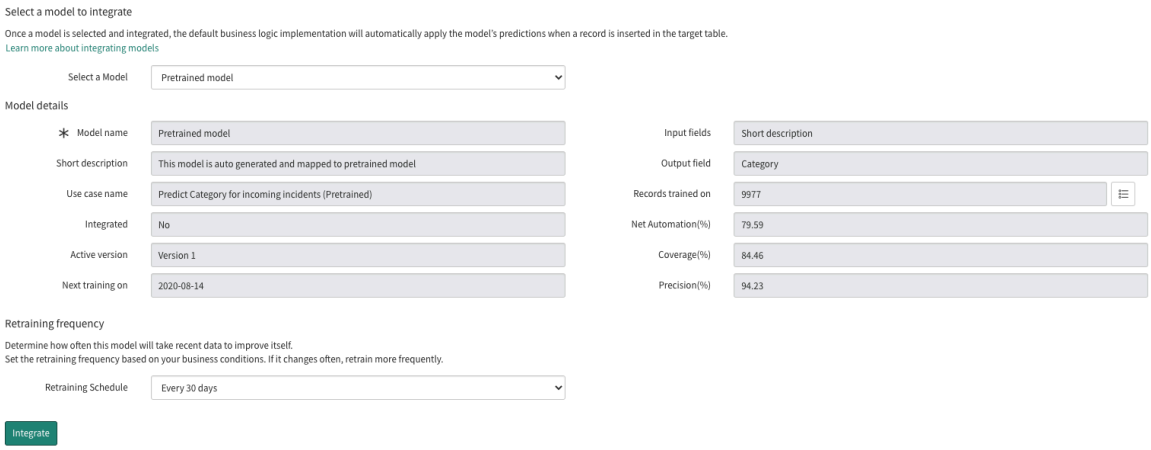



**Note:**
You can change the retraining schedule via this page if you desire. Use the **Retraining Schedule** drop-down selection field to change from the default 30 day value.

25. Click **Integrate**.
26. Click **Integrate** again when the pop-up asks you if you are sure you want to perform this action. You have integrated a use case model into your business process.

**Note:**
For details regarding trained use case integration implementation, see Predictive Intelligence Workbench integration and customization.

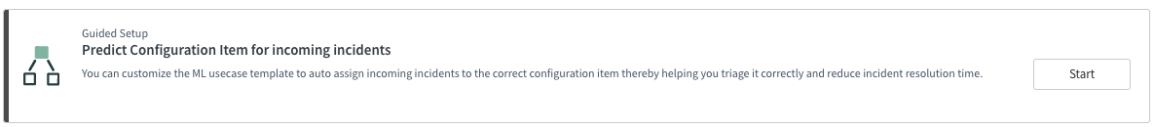
## Predict Configuration Item for incoming incidents

Use this guided template to auto-assign incoming incidents to the correct configuration item to reduce your incident resolution times.

### Before you begin
Role required: piwb_manager or piwb_viewer

### About this task
This template walks you through customizing a use case model to predict the configuration item for your incoming incidents. When the use case template shows the label **Pretrained**, you can bypass several implementation steps and are automatically taken to evaluate and tune your models when you select **Start**. Otherwise, you'll begin by creating a machine learning model.

### Procedure
1. Navigate to **All** > **Predictive Intelligence Workbench** > **Use Cases** > **Templates**.
2. Select the **Predict the Configuration Item for incoming incidents** guided template.




3. In the **Use case - Predict the Configuration Item for incoming incidents** pop-up form, provide a unique name for your use case in the **Use case name** field.

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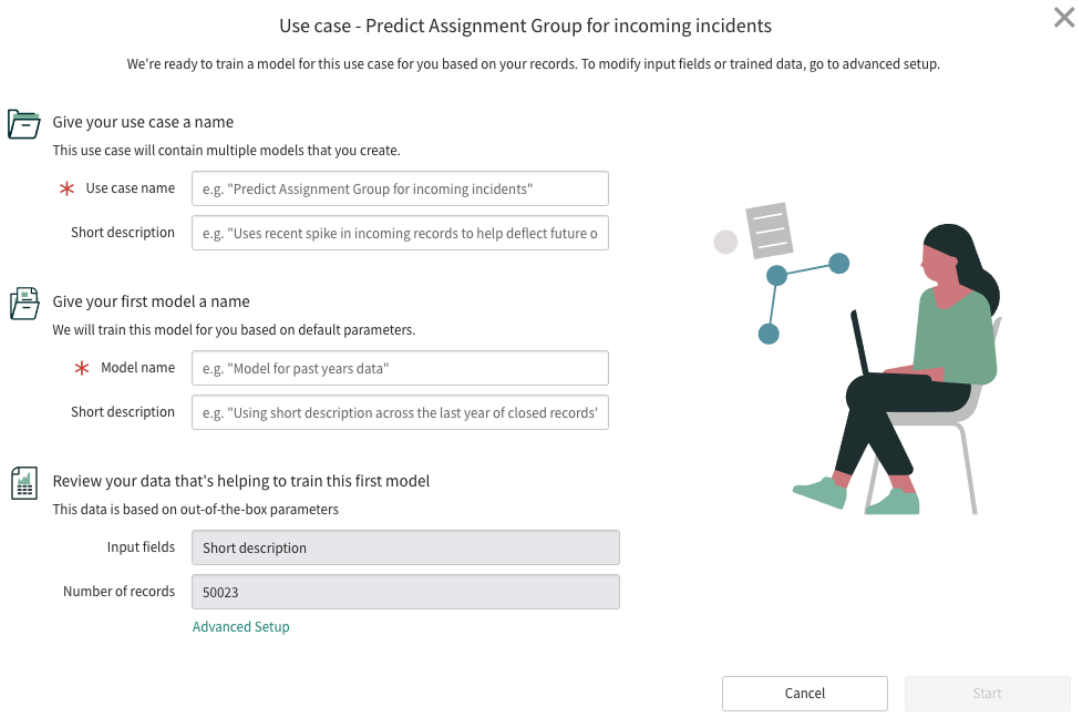


**Note:**
The use case contains multiple models that you create. You can use the same name as the template, if desired.

4. Although not mandatory, it's beneficial to provide unique details about the use case in the **Short description** field.

**Note:**
Typically the short description provides details about what the goal of the use case is or your purposes for creating the use case.

5. Provide a name for the model in the **Model name** field.

**Note:**
Models are trained based on default parameters. The name of the model should reflect its purpose, for example, "Model for past years data."

6. Review the base system parameters set to help train the model in the **Input fields** and **Number of records** fields.
To modify this data, select **Advanced Setup**.

**Note:**
By selecting **Advanced Setup** you can change the processing language, review and modify filters used to train the model. You can customize the filters to best represent your business data or add new criteria by selecting **New Criteria**. Review and modify input fields used to generate predictions. Customize the fields to best represent your business data by moving fields between the **Available** and **Selected** slush buckets. Save any changes that that you make.

7. Select **Start**.
A pop-up message lets you know your model is created and that training is underway.

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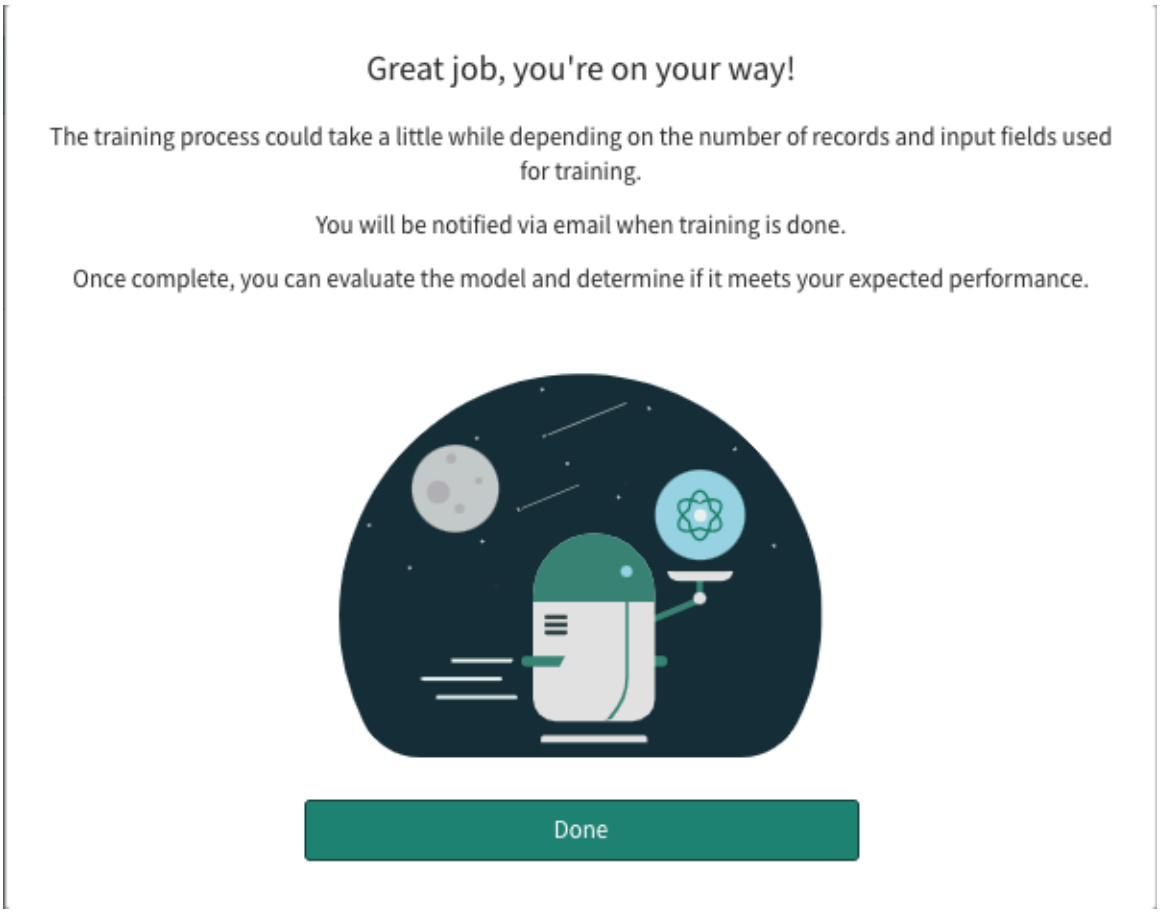
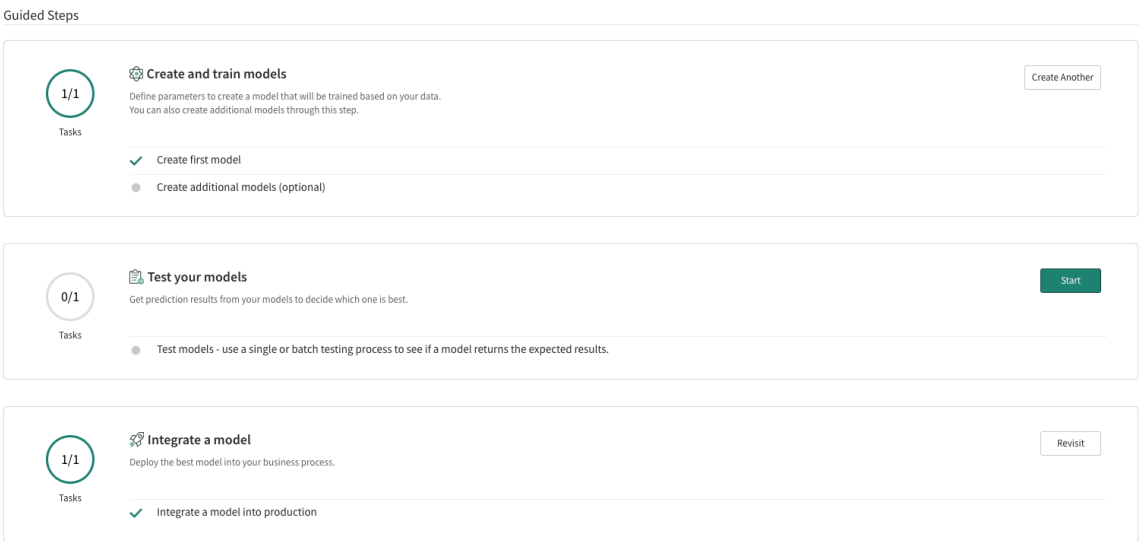
**Note:**
To start implementation, you must provide at least a use case name and model name.




8. Select **Done**.
   The use case page displays the name and description of the use case you created. On this page, you can see all the guided implementation phases you will work through to create and implement your use case model.




9. Select **View Progress** below the header on the use case setup page to monitor a current training process.

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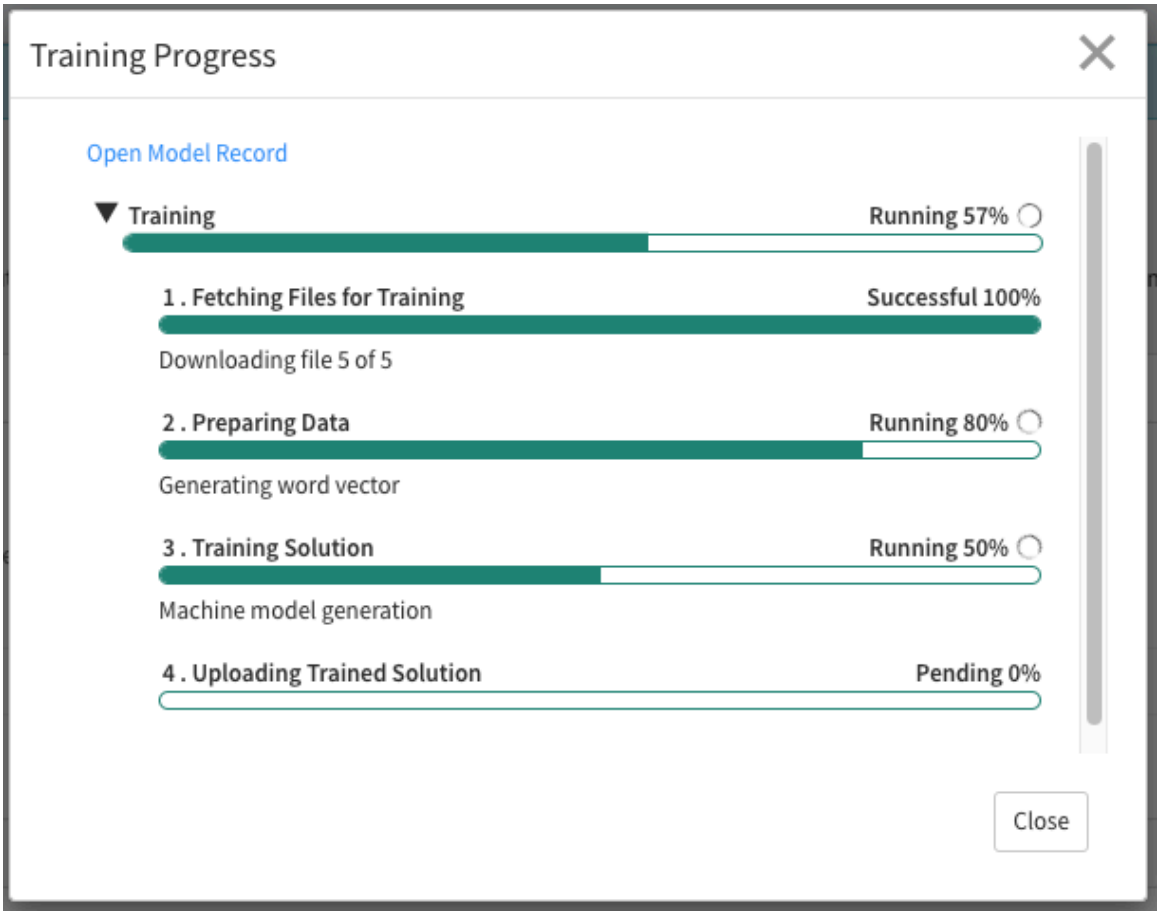


**Note:**
When training is complete, you will receive an email notification letting you know your use case model training was successful. For more information about use case model notifications, refer to ITSM Predictive Intelligence Workbench notifications.

10. Select the model name under **Trained Models** on the use case setup page to view associated data about the trained model.
    The **Model details** page opens.
11. In the **Retraining Schedule** field of the **Models detail** page you can change the definition, if desired.
    The default value is **Every 30 days**, but you can retrain as often as once to every 180 days.
12. If you made schedule retraining changes to the use case model, select either **Update** or **Update and retrain**, to retrain again.
13. To tune a model, select **Tune Values** on the use case setup page under **Trained Models**.
    The tuning page for the use case opens displaying the associated model name with the following data: **Distribution (%)**, **Net Automation**, **Precision (%)**, **Coverage (%)**, and any comments. View the evaluation data used for the use case and associated model.

    **Note:**
    You can only tune values when the model is trained.

14. If desired, double-click (or use the keyboard shortcut) in the **Precision (%)** and **Coverage (%)** fields to change the values, which tune and refine the model by defining the right combination of coverage and precision to use.
    Changes are automatically saved.

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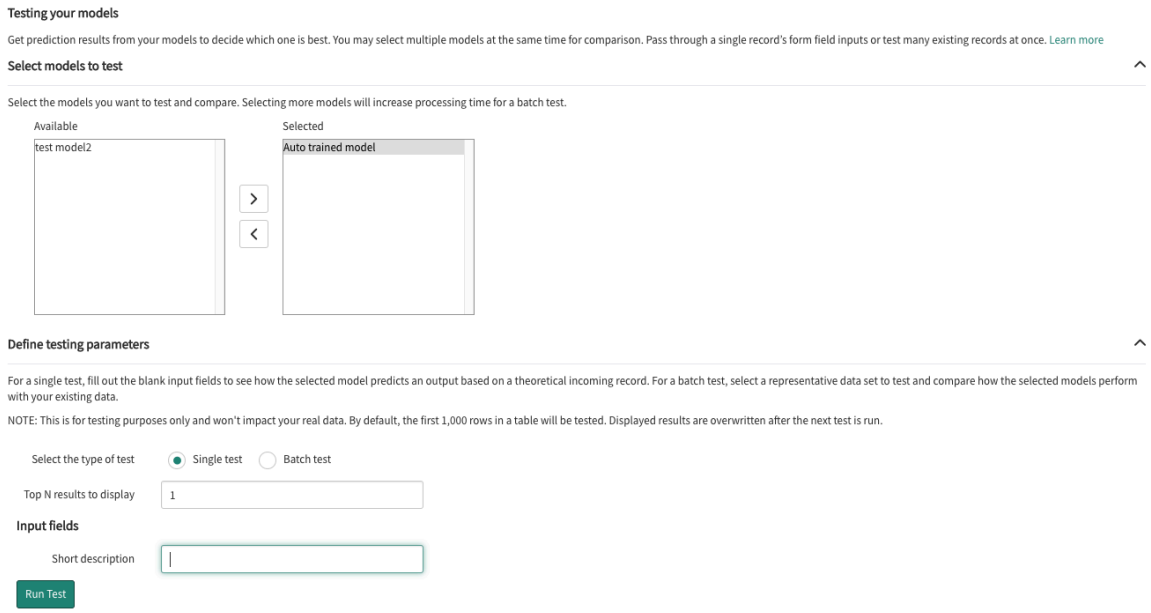
15. If desired, select **Create Another** to create another model associated with your use case in the **Create and train models** section of the setup page.
    Repeat the process to create and train the model.
16. In the **Test your models** section of the use case page, select **Start** to begin the testing process.
    The **Testing your models** page opens.




17. Under **Select models to test**, decide if there are other use case models available that you want to test.
    If so, move them to the **Selected** list.
18. Under **Define testing parameters**, decide if you want to test one use case model.

    If so, select the **Single test** test type. **Single test** is the default.

    **Note:**
    Select **Batch test** when you want to test more than one use case model.

19. Determine the number of top results you want to display.
20. Under **Input fields**, provide a short description of your use case model test.
21. Select **Run Test**.
22. View the test results data for the use case model under **View test results**.

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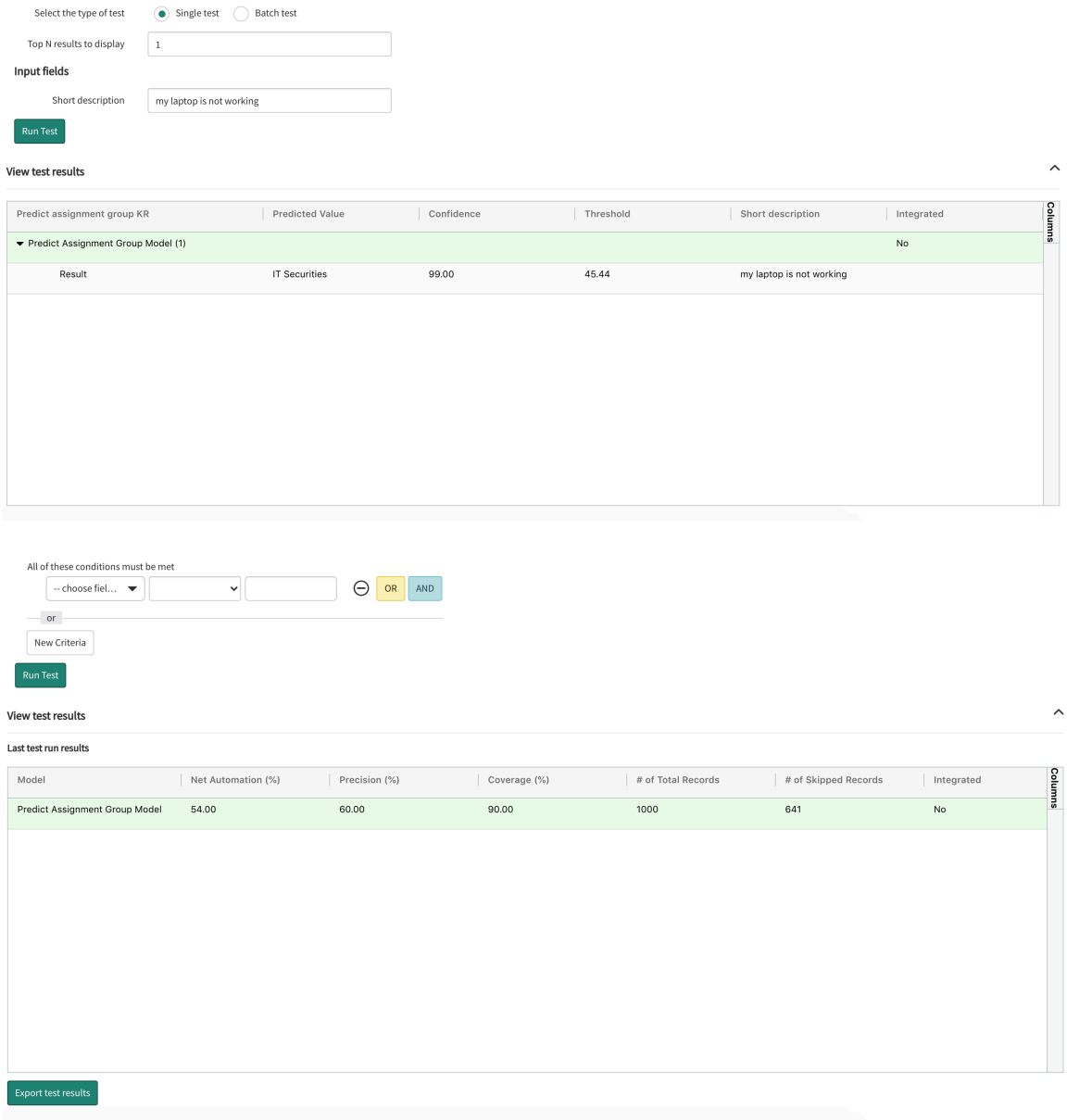


23. If you are ready to integrate your use case model into your business processes, return to the use case set up page and select **Start** in the **Integrate a model** section.
The **Select a model to integrate** page opens.

24. In the **Select a Model** drop-down menu, select the model you want to integrate.
The **Select a model to integrate** page opens.

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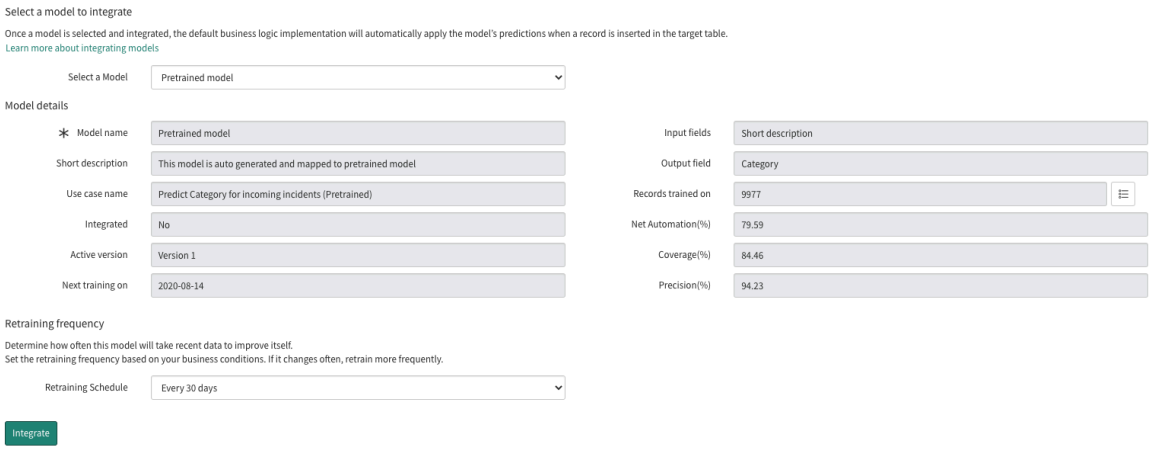



**Note:**
You can change the retraining schedule via this page if you desire. Use the **Retraining Schedule** drop-down selection field to change from the default 30 day value.

25. Select **Integrate**.
26. Select **Integrate** again when the pop-up asks you if you are sure you want to perform this action.
    You have integrated a use case model into your business process.

**Note:**
For details regarding trained use case integration implementation, refer to Predictive Intelligence Workbench integration and customization.

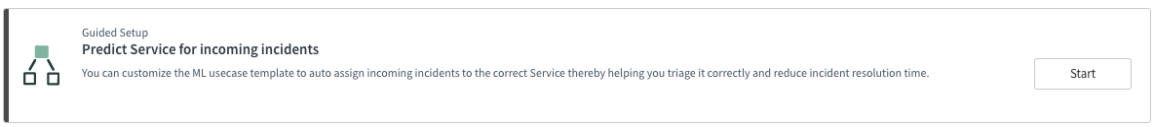
## Predict Service for incoming incidents

Use this guided template to auto-assign incoming incidents to the correct service to reduce your incident resolution times.

### Before you begin
Role required: piwb_manager or piwb_viewer

### About this task
This template walks you through customizing a use case model to predict the service for your incoming incidents. When the use case template shows the label **Pretrained**,you will bypass several implementation steps and are automatically taken to evaluate and tune your models when you click **Start**. Otherwise, you will begin by creating a machine learning model.

### Procedure
1. Navigate to **All** > **Predictive Intelligence Workbench** > **Use Cases** > **Templates**.
2. Select the **Predict Service for incoming incidents** guided template.




3. In the **Use case - Predict Service for incoming incidents** pop-up form, provide a unique name for your use case in the **Use case name** field.

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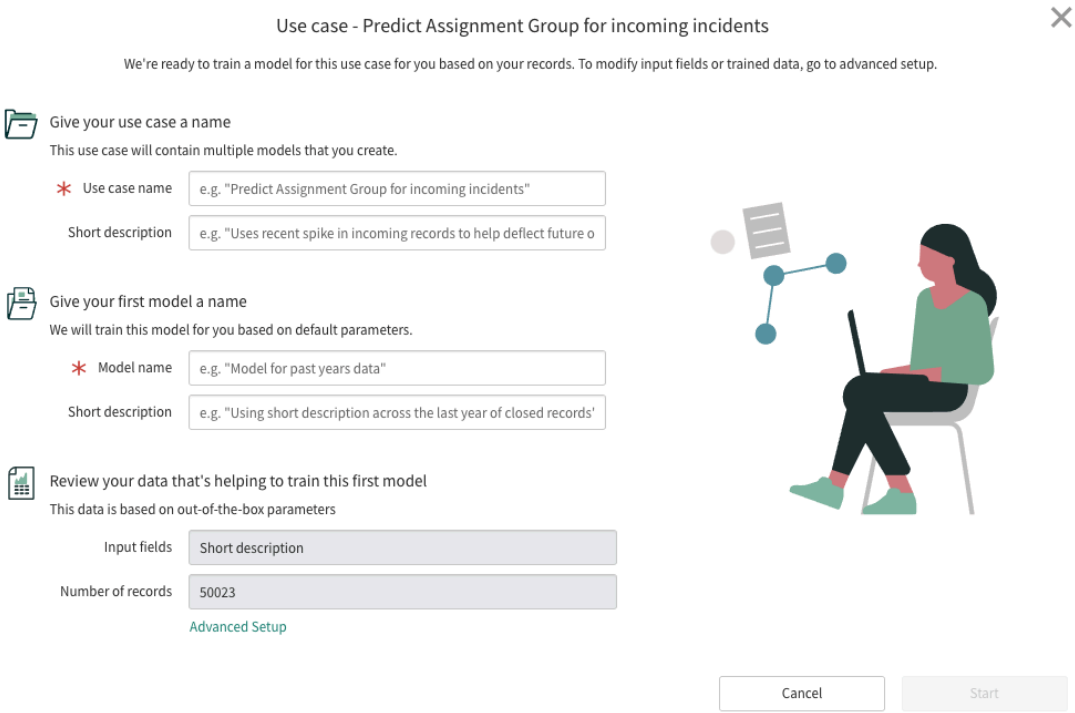


**Note:**
The use case will contain multiple models that you create. You can use the same name as the template, if desired.

4. Although not mandatory, it's beneficial to provide unique details about the use case in the **Short description** field.

**Note:**
Typically the short description provides details about what the goal of the use case is or your purposes for creating the use case.

5. Provide a name for the model in the **Model name** field.

**Note:**
Models are trained based on default parameters. The name of the model should reflect its purpose, for example, "Model for past years data".

6. Review the base system parameters set to help train the model in the **Input fields** and **Number of records** fields.

   To modify this data, click **Advanced Setup**.

**Note:**
By clicking **Advanced Setup** you can change the processing language, review and modify filters used to train the model. You can customize the filters to best represent your business data or add new criteria by clicking **New Criteria**. Review and modify input fields used to generate predictions. Customize the fields to best represent your business data by moving fields between the **Available** and **Selected** lists. Save any changes that you make.

7. Click **Start**.

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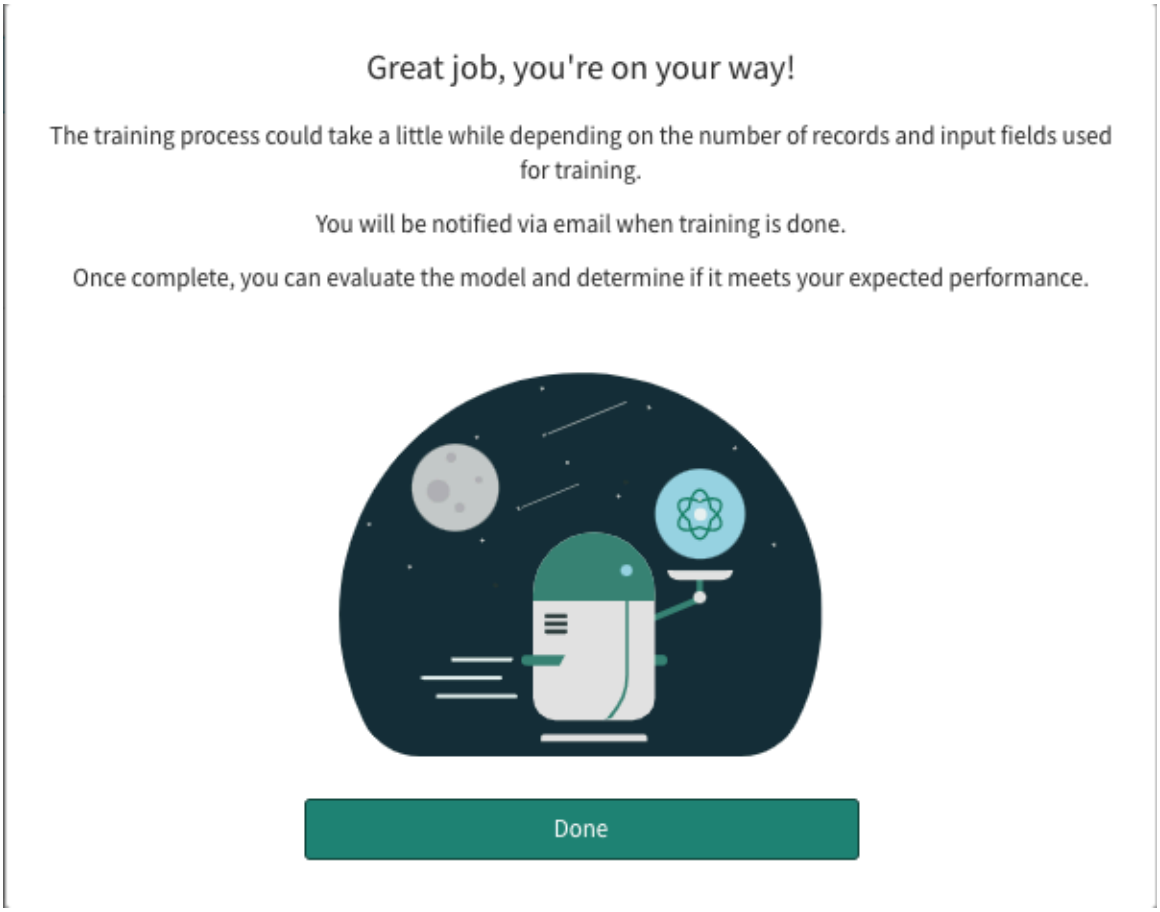
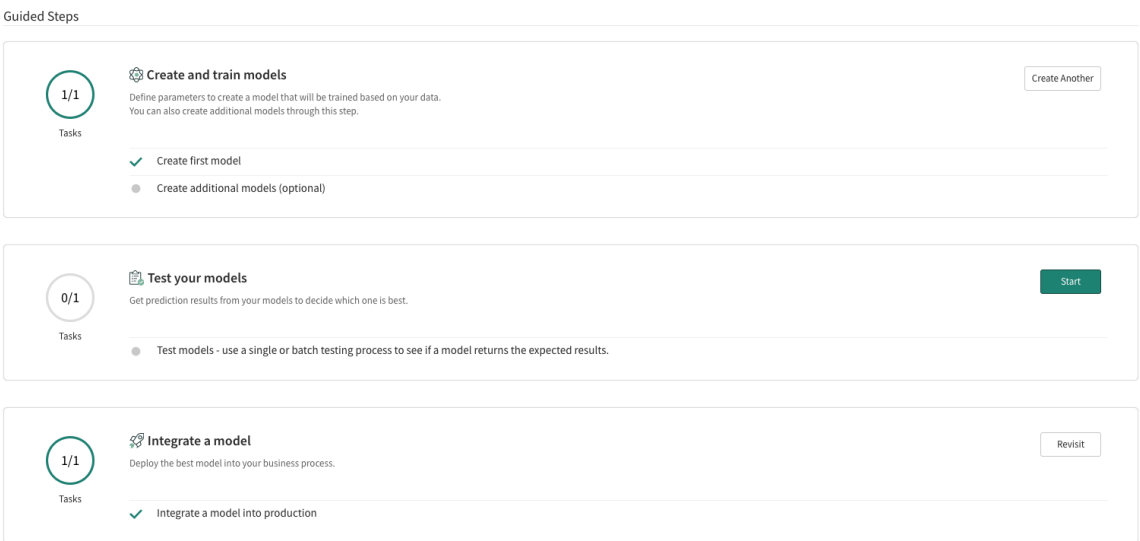
A pop-up message lets you know your model is created and that training is underway.

**Note:**
To start implementation, you must provide at least a use case name and model name.




8. Click **Done**.
   The use case page displays the name and description of the use case you created. On this page, you can see all the guided implementation phases you will work through to create and implement your use case model.

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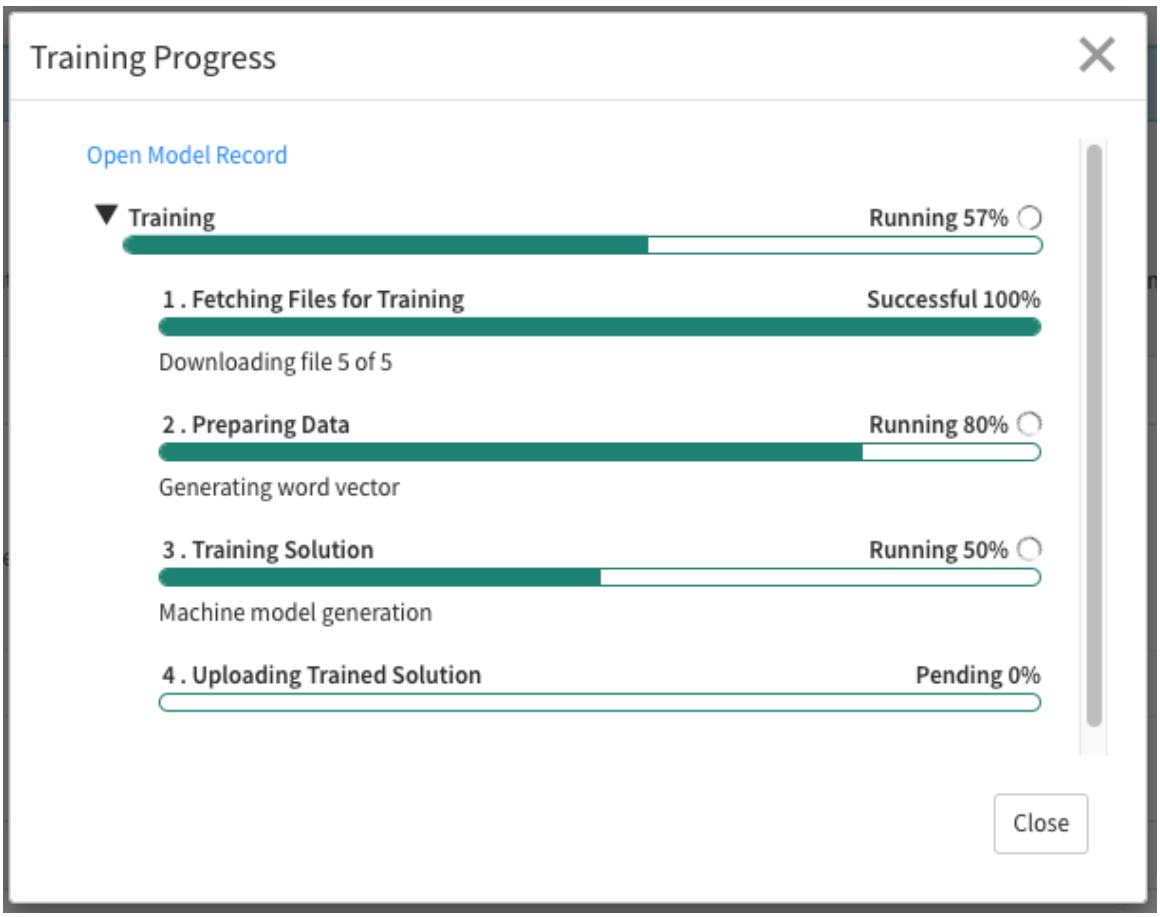
9. Click **View Progress** below the header on the use case setup page to monitor a current training process.




**Note:**
When training is complete, you will receive an email notification letting you know your use case model training was successful. For more information about use case model notifications, refer to ITSM Predictive Intelligence Workbench notifications.

10. Click the model name under **Trained Models** on the use case setup page to view associated data about the trained model.
The **Model details** page opens.
11. In the **Retraining Schedule** field of the **Models detail** page you can change the definition, if desired.
The default value is **Every 30 days**, but you can retrain as often as once to every 180 days.
12. If you made schedule retraining changes to the use case model, click either **Update** or **Update and retrain**, to retrain again.
13. To tune a model, click **Tune Values** on the use case setup page under **Trained Models**.
The tuning page for the use case opens displaying the associated model name with the following data: **Distribution (%)**, **Net Automation**, **Precision (%)**, **Coverage (%)**, and any comments. View the evaluation data used for the use case and associated model

**Note:**
You can only tune values when the model is trained.

14. If desired, tune and refine the model by defining the right combination of coverage and precision to use.

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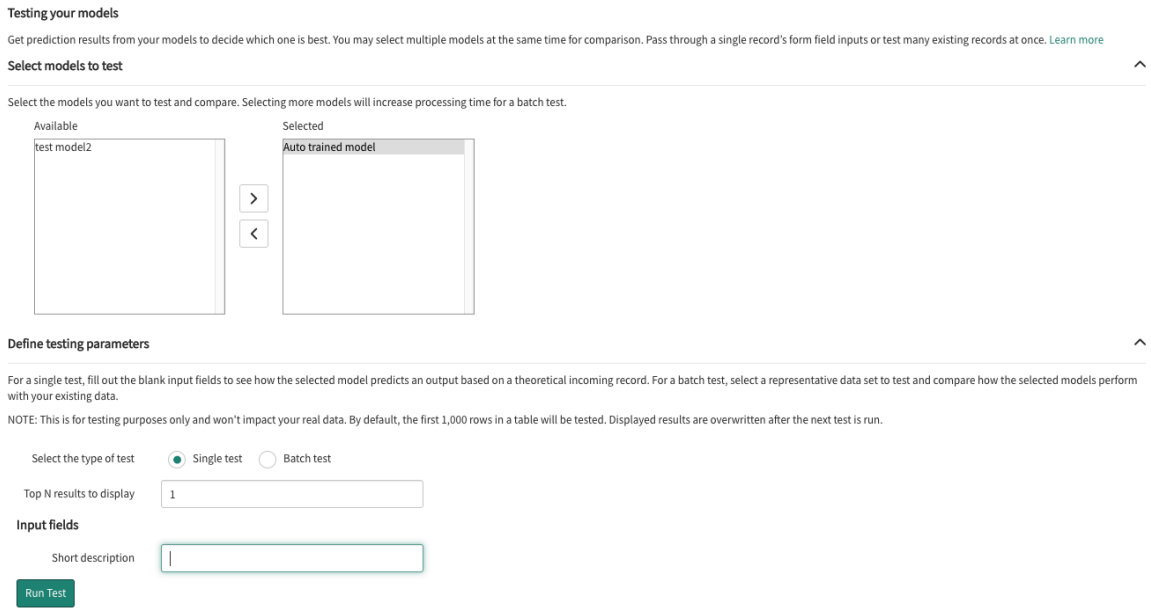
15. Double-click in the **Precision (%)** and **Coverage (%)** fields to change values.
    Changes are automatically saved.
16. If desired, click **Create Another** to create another model associated with your use case in the **Create and train models** section of the setup page.
    Repeat the process to create and train the model.
17. In the **Test your models** section of the use case page, click **Start** to begin the testing process.
    The **Testing your models** page opens.




18. Under **Select models to test**, decide if there are other use case models available that you want to test.
    If so, move them to the **Selected** list.
19. Under **Define testing parameters**, decide if you want to test one use case model.

    If so, select the **Single test** test type. **Single test** is the default.

    **Note:**
    Select **Batch test** when you want to test more than one use case model.

20. Determine the number of top results you want to display.
21. Under **Input fields**, provide a short description of your use case model test.
22. Click **Run Test**.
23. View the test results data for the use case model under **View test results**.

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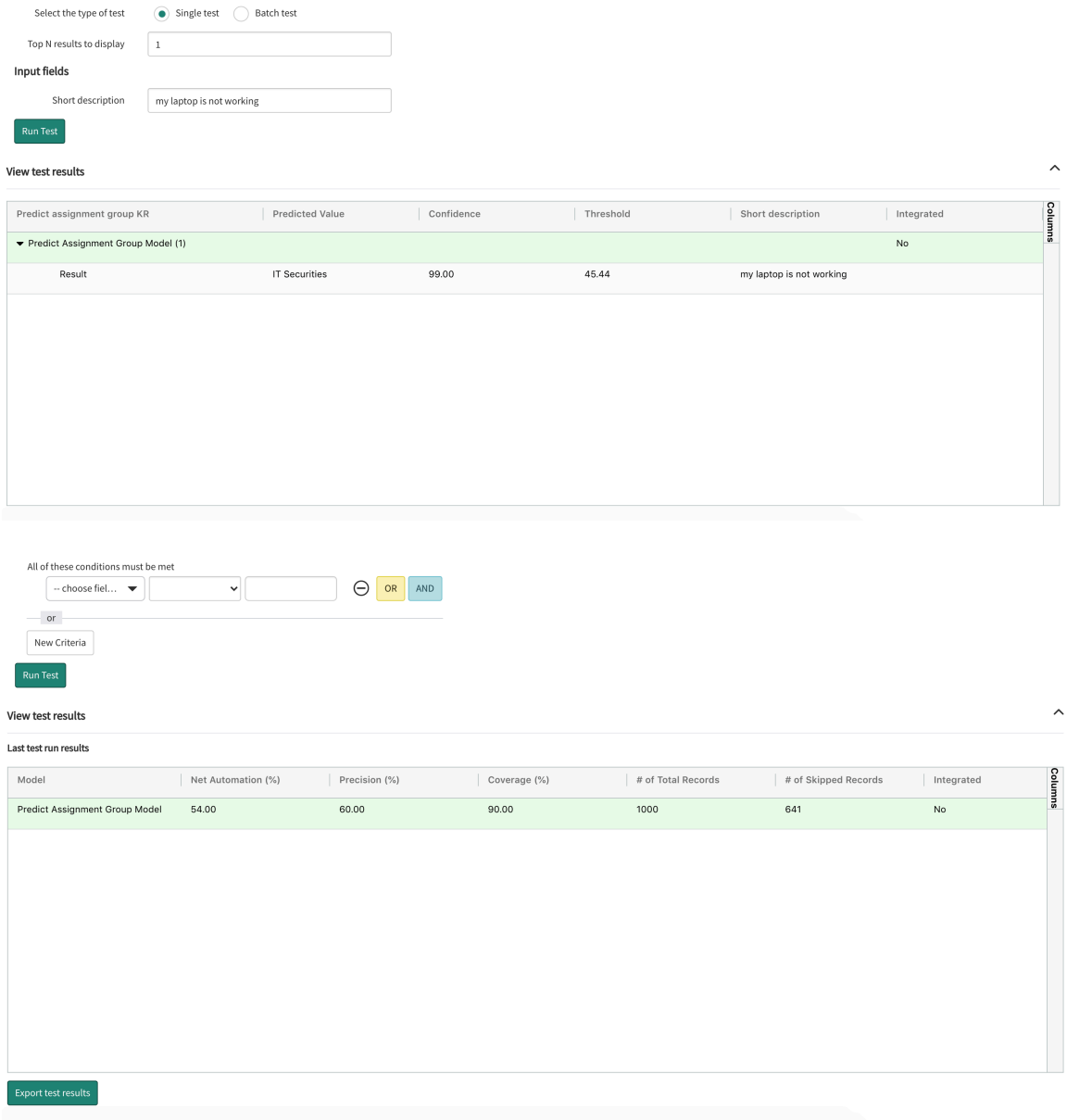


**24.** If you are ready to integrate your use case model into your business processes, return to the use case set up page and click **Start** in the **Integrate a model** section.
The **Select a model to integrate** page opens.

**25.** In the **Select a Model** drop-down menu, select the model you want to integrate.
The **Select a model to integrate** page opens.

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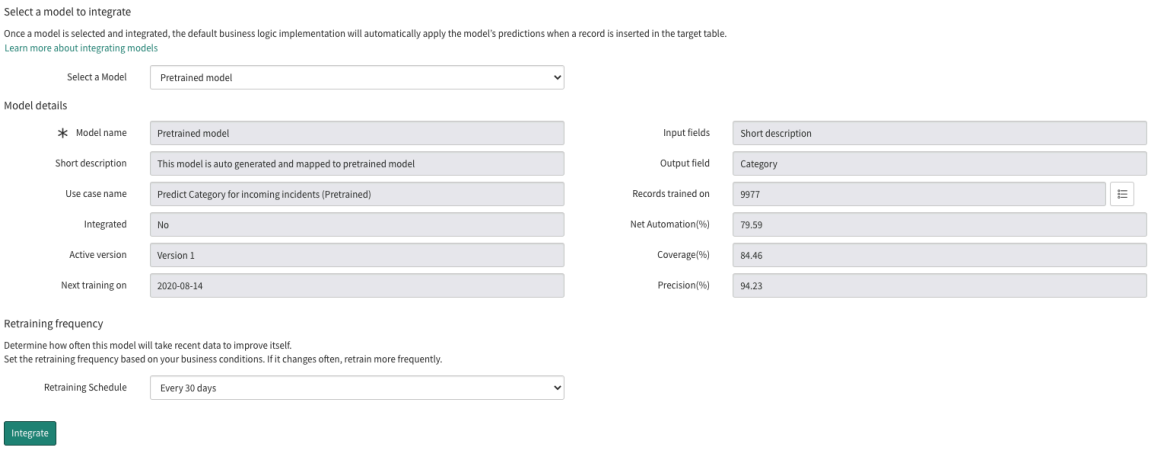


**Note:**
You can change the retraining schedule via this page if you desire. Use the **Retraining Schedule** drop down selection field to change from the default 30 day value.

26. Click **Integrate**.
27. Click **Integrate** again when the pop-up asks you if you are sure you want to perform this action. You have integrated a use case model into your business process.

**Note:**
For details regarding trained use case integration implementation, refer to Predictive Intelligence Workbench integration and customization.

## Similar Business Applications

Use this template to recommend the business application category based on name and description of existing business applications.

### Before you begin

Role required: piwb_manager or piwb_viewer

### About this task

This use case template helps you improve your ITSM business application category recommendations based on name and description of existing business applications. The template also provides a link to the Predictive Intelligence platform application and associated documentation.

The use case uses a similarity-based predictive model that compares an incoming incident with past resolved incidents for smarter resolution. Similar past active incidents are displayed in Agent assist and also in the Incident form via related search.

**Note:**
You will need business users to validate the similar past active incident search results. Contact Customer Service and Support, if necessary, to configure sources for contextual search.

When the use case template shows the label **Pretrained**, you can go directly to the **Testing your models** implementation section. Otherwise, you will begin by creating a machine learning model.

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## Procedure

1. If you started this procedure directly from the Predictive Intelligence Workbench product **Create New from Template** module, and clicked on the product documentation link to get here, skip this step.
   Otherwise, navigate to **Predictive Intelligence Workbench** > **Use Cases** > **Create New from Template**.
2. Select the **Suggest relevant Incidents for an Incident** template.
   The **Suggest relevant Incidents for an Incident** pop-up opens featuring a link to this procedure and a link to the platform Predictive Intelligence product and associated documentation.
3. Create and train a machine learning predictive model.
   Creating a model involves the following: creating a word corpus, defining a similarity prediction rule, defining the initial training frequency, and defining the refresh frequency.

   a. Create a word corpus.

      When creating a word corpus on the Word Corpus Content form, select an incidents-related table, such as Incident [incidents] in the **Table** field and define the time frame that best describes the current usage of words in the **Filter** field. For example, if your IT system experienced a major infrastructure change six months back, use data from the last six months only. In the **Field List** field, define only the fields that best capture the words: **Description**, **Short description**, and **Resolution notes**. Defining these alone is typically enough, since the prediction rule is expected to find incidents based on the short description.

      Creating the word corpus prepares you for the next step, creating the similarity prediction rule.

   b. Create and train a similarity solution.

   c. For this initial model creation, provide the similarity solution definition label `Similar Incidents` in the **Label** field.

   d. Set the **Training Frequency** field to **Run Once**.
      You can reset this configuration after you implement this use case into your business processes and have monitored its performance in the Predictive Intelligence Workbench dashboard.

   e. Set the **Update Frequency** field to **Every 15 minutes**.
      This setting defines the frequency at which past incidents refresh in the search window.

      When possible, and if applicable, use an existing word corpus, created for another use case to reduce your overall word corpora and ease management of these records. In the **Table** field of the Similarity Definition form, select only those inputs for similarity that will be available at prediction time for incoming incidents. You can select more inputs in the **Test Table** field, if required, for comparison. It is best to start with similar fields for both the **Table** and **Test Table** fields.

      The **Filter**field conditions determine the search window for past resolved incidents. Configure the filter conditions to optimize for the best set of resolved incidents to search within. This includes many considerations, such as, time frame, location, category where incidents are relevant, and more.

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f. Click **Submit & Train** to create your similarity solution record and train it.
Alternatively, you can click **Submit** to save your similarity solution record and return to train it later.

4. Evaluation and tune your model.

   If you have a similarity score above 60, but the two incidents do not look similar, you may want to create another model, word corpus, or both by changing inputs and filters. Keep in mind that modifying the solution definition will help you create a new solution, but it will invalidate the previous solution.

   If you want to revert back to the previous solution definition, you will have to reset the parameters and retrain the solution. Therefore, first try creating a new similarity model before creating a new word corpus.

   If you want to adjust the score for your similarity solution, refer to Update your similarity score threshold.

5. Once you have a satisfactory model, test the similarity solution prediction.
   You can manually provide inputs and select the top similar results outcome values.
6. Once you have tested the behavior, configure the user experience layout to show attributed results and actions performed on the results.
   You can configure these results and actions via Workspace UI for Agent assist or via the ServiceNow AI Platform for Contextual Search. Configure actions and search context though **Tables** configuration and user experience and card layout through **Contextual Search** > **Search Result Display Configuration**.
7. Integrate trained models by exporting them to production.

   **Note:**
   For details regarding trained use case integration implementation, refer to Predictive Intelligence Workbench integration and customization.

8. Monitor similarity results and ensure IT agents are providing useful feedback.

   The base-system Predictive Intelligence experience includes a built-in feedback mechanism to discern if the similarity results are useful. Train your IT agents to provide feedback, both online and offline, to capture this data for future reporting. Since this is an unsupervised algorithm, you may need to acquire periodic feedback from the IT agents to check that the similarity model is still providing satisfactory results. This feedback is the only way to determine if the model has drifted and requires new training. Ensure that part of your implementation and integration strategy, as well as your change management process, includes training IT agents to provide similarity results feedback.

9. Communicate the value of Predictive Intelligence to your stakeholders by linking business key performance indicators (KPIs) to machine learning metrics.

   Select one or more KPIs that you think is most beneficial to your IT agents. Create a Performance Analytics dashboard showing the trend of these KPIs. The “likes” you get from your IT agents via the feedback mechanism helps you communicate the value of Predictive Intelligence.

   For information regarding the Predictive Intelligence for Incidents dashboard, see ITSM Predictive Intelligence Workbench dashboard.

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## Similar Demands

Use this template to include the demand name and description as inputs to list similar demands.

### Before you begin

Role required: piwb_manager or piwb_viewer

### About this task

This use case template helps you improve your ITSM business ability to include the demand name and description as inputs to list similar demands. The template also provides a link to the Predictive Intelligence platform application and associated documentation.

The use case uses a similarity-based predictive model that compares an incoming incident with past resolved incidents for smarter resolution. Similar past active incidents are displayed in Agent assist and also in the Incident form via related search.

**Note:**
You will need business users to validate the similar past active incident search results. Contact Customer Service and Support, if necessary, to configure sources for contextual search.

When the use case template shows the label **Pretrained**, you can go directly to the **Testing your models** implementation section. Otherwise, you will begin by creating a machine learning model.

### Procedure

1. If you started this procedure directly from the Predictive Intelligence Workbench product **Create New from Template** module, and clicked on the product documentation link to get here, skip this step.
   Otherwise, navigate to **Predictive Intelligence Workbench** > **Use Cases** > **Create New from Template**.
2. Select the **Suggest relevant Incidents for an Incident** template.
   The **Suggest relevant Incidents for an Incident** pop-up opens featuring a link to this procedure and a link to the platform Predictive Intelligence product and associated documentation.
3. Create and train a machine learning predictive model.
   Creating a model involves the following: creating a word corpus, defining a similarity prediction rule, defining the initial training frequency, and defining the refresh frequency.

   a. Create a word corpus.

      When creating a word corpus on the Word Corpus Content form, select an incidents-related table, such as Incident [incidents] in the **Table** field and define the time frame that best describes the current usage of words in the **Filter** field. For example, if your IT system experienced a major infrastructure change six months back, use data from the last six months only. In the **Field List** field, define only the fields that best capture the words: **Description**, **Short description**, and **Resolution notes**. Defining these alone is typically enough, since the prediction rule is expected to find incidents based on the short description.

      Creating the word corpus prepares you for the next step, creating the similarity prediction rule.

   b. Create and train a similarity solution.

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c. For this initial model creation, provide the similarity solution definition label `Similar Incidents` in the **Label** field.

d. Set the **Training Frequency** field to **Run Once**.
You can reset this configuration after you implement this use case into your business processes and have monitored its performance in the Predictive Intelligence Workbench dashboard.

e. Set the **Update Frequency** field to **Every 15 minutes**.
This setting defines the frequency at which past incidents refresh in the search window.

When possible, and if applicable, use an existing word corpus, created for another use case to reduce your overall word corpora and ease management of these records. In the **Table** field of the Similarity Definition form, select only those inputs for similarity that will be available at prediction time for incoming incidents. You can select more inputs in the **Test Table** field, if required, for comparison. It is best to start with similar fields for both the **Table** and **Test Table** fields.

The **Filter**field conditions determine the search window for past resolved incidents. Configure the filter conditions to optimize for the best set of resolved incidents to search within. This includes many considerations, such as, time frame, location, category where incidents are relevant, and more.

f. Click **Submit & Train** to create your similarity solution record and train it.
Alternatively, you can click **Submit** to save your similarity solution record and return to train it later.

4. Evaluation and tune your model.

If you have a similarity score above 60, but the two incidents do not look similar, you may want to create another model, word corpus, or both by changing inputs and filters. Keep in mind that modifying the solution definition will help you create a new solution, but it will invalidate the previous solution.

If you want to revert back to the previous solution definition, you will have to reset the parameters and retrain the solution. Therefore, first try creating a new similarity model before creating a new word corpus.

If you want to adjust the score for your similarity solution, refer to Update your similarity score threshold.

5. Once you have a satisfactory model, test the similarity solution prediction.
You can manually provide inputs and select the top similar results outcome values.

6. Once you have tested the behavior, configure the user experience layout to show attributed results and actions performed on the results.
You can configure these results and actions via Workspace UI for Agent assist or via the ServiceNow AI Platform for Contextual Search. Configure actions and search context though **Tables** configuration and user experience and card layout through **Contextual Search** > **Search Result Display Configuration**.

7. Integrate trained models by exporting them to production.

**Note:**
For details regarding trained use case integration implementation, refer to Predictive Intelligence Workbench integration and customization.

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8. Monitor similarity results and ensure IT agents are providing useful feedback.

   The base-system Predictive Intelligence experience includes a built-in feedback mechanism to discern if the similarity results are useful. Train your IT agents to provide feedback, both online and offline, to capture this data for future reporting. Since this is an unsupervised algorithm, you may need to acquire periodic feedback from the IT agents to check that the similarity model is still providing satisfactory results. This feedback is the only way to determine if the model has drifted and requires new training. Ensure that part of your implementation and integration strategy, as well as your change management process, includes training IT agents to provide similarity results feedback.

9. Communicate the value of Predictive Intelligence to your stakeholders by linking business key performance indicators (KPIs) to machine learning metrics.

   Select one or more KPIs that you think is most beneficial to your IT agents. Create a Performance Analytics dashboard showing the trend of these KPIs. The “likes” you get from your IT agents via the feedback mechanism helps you communicate the value of Predictive Intelligence.

   For information regarding the Predictive Intelligence for Incidents dashboard, refer to ITSM Predictive Intelligence Workbench dashboard.

## Similar Ideas

Use this template to include the idea name and description as inputs to list similar ideas.

### Before you begin

Role required: piwb_manager or piwb_viewer

### About this task

This use case template helps you improve your ITSM business ability to include the idea name and description as inputs to list similar demands. The template also provides a link to the Predictive Intelligence platform application and associated documentation.

The use case uses a similarity-based predictive model that compares an incoming incident with past resolved incidents for smarter resolution. Similar past active incidents are displayed in Agent assist and also in the Incident form via related search.

**Note:**
You will need business users to validate the similar past active incident search results. Contact Customer Service and Support, if necessary, to configure sources for contextual search.

When the use case template shows the label **Pretrained**, you can go directly to the **Testing your models** implementation section. Otherwise, you will begin by creating a machine learning model.

### Procedure

1. If you started this procedure directly from the Predictive Intelligence Workbench product **Create New from Template** module, and clicked on the product documentation link to get here, skip this step.
   Otherwise, navigate to **Predictive Intelligence Workbench** > **Use Cases** > **Create New from Template**.
2. Select the **Suggest relevant Incidents for an Incident** template.
   The **Suggest relevant Incidents for an Incident** pop-up opens featuring a link to this procedure and a link to the platform Predictive Intelligence product and associated documentation.

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3. Create and train a machine learning predictive model.
   Creating a model involves the following: creating a word corpus, defining a similarity prediction rule, defining the initial training frequency, and defining the refresh frequency.

   a. Create a word corpus.

      When creating a word corpus on the Word Corpus Content form, select an incidents-related table, such as Incident [incidents] in the **Table** field and define the time frame that best describes the current usage of words in the **Filter** field. For example, if your IT system experienced a major infrastructure change six months back, use data from the last six months only. In the **Field List** field, define only the fields that best capture the words: **Description**, **Short description**, and **Resolution notes**. Defining these alone is typically enough, since the prediction rule is expected to find incidents based on the short description.

      Creating the word corpus prepares you for the next step, creating the similarity prediction rule.

   b. Create and train a similarity solution.

   c. For this initial model creation, provide the similarity solution definition label `Similar Incidents` in the **Label** field.

   d. Set the **Training Frequency** field to **Run Once**.
      You can reset this configuration after you implement this use case into your business processes and have monitored its performance in the Predictive Intelligence Workbench dashboard.

   e. Set the **Update Frequency** field to **Every 15 minutes**.
      This setting defines the frequency at which past incidents refresh in the search window.

      When possible, and if applicable, use an existing word corpus, created for another use case to reduce your overall word corpora and ease management of these records. In the **Table** field of the Similarity Definition form, select only those inputs for similarity that will be available at prediction time for incoming incidents. You can select more inputs in the **Test Table** field, if required, for comparison. It is best to start with similar fields for both the **Table** and **Test Table** fields.

      The **Filter**field conditions determine the search window for past resolved incidents. Configure the filter conditions to optimize for the best set of resolved incidents to search within. This includes many considerations, such as, time frame, location, category where incidents are relevant, and more.

   f. Click **Submit & Train** to create your similarity solution record and train it.
      Alternatively, you can click **Submit** to save your similarity solution record and return to train it later.

4. Evaluation and tune your model.

   If you have a similarity score above 60, but the two incidents do not look similar, you may want to create another model, word corpus, or both by changing inputs and filters. Keep in mind that modifying the solution definition will help you create a new solution, but it will invalidate the previous solution.

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If you want to revert back to the previous solution definition, you will have to reset the parameters and retrain the solution. Therefore, first try creating a new similarity model before creating a new word corpus.

If you want to adjust the score for your similarity solution, refer to Update your similarity score threshold.

5. Once you have a satisfactory model, test the similarity solution prediction.
   You can manually provide inputs and select the top similar results outcome values.
6. Once you have tested the behavior, configure the user experience layout to show attributed results and actions performed on the results.
   You can configure these results and actions via Workspace UI for Agent assist or via the ServiceNow AI Platform for Contextual Search. Configure actions and search context though **Tables** configuration and user experience and card layout through **Contextual Search** > **Search Result Display Configuration**.
7. Integrate trained models by exporting them to production.

   **Note:**
   For details regarding trained use case integration implementation, refer to Predictive Intelligence Workbench integration and customization.

8. Monitor similarity results and ensure IT agents are providing useful feedback.

   The base-system Predictive Intelligence experience includes a built-in feedback mechanism to discern if the similarity results are useful. Train your IT agents to provide feedback, both online and offline, to capture this data for future reporting. Since this is an unsupervised algorithm, you may need to acquire periodic feedback from the IT agents to check that the similarity model is still providing satisfactory results. This feedback is the only way to determine if the model has drifted and requires new training. Ensure that part of your implementation and integration strategy, as well as your change management process, includes training IT agents to provide similarity results feedback.

9. Communicate the value of Predictive Intelligence to your stakeholders by linking business key performance indicators (KPIs) to machine learning metrics.

   Select one or more KPIs that you think is most beneficial to your IT agents. Create a Performance Analytics dashboard showing the trend of these KPIs. The “likes” you get from your IT agents via the feedback mechanism helps you communicate the value of Predictive Intelligence.

   For information regarding the Predictive Intelligence for Incidents dashboard, refer to ITSM Predictive Intelligence Workbench dashboard.

## Similar Projects

Use this template to include the project name and description as inputs to list similar ideas.

### Before you begin

Role required: piwb_manager or piwb_viewer

### About this task

This use case template helps you improve your ITSM business ability to include the project name and description as inputs to list similar demands. The template also provides a link to the Predictive Intelligence platform application and associated documentation.

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The use case uses a similarity-based predictive model that compares an incoming incident with past resolved incidents for smarter resolution. Similar past active incidents are displayed in Agent assist and also in the Incident form via related search.

**Note:**
You will need business users to validate the similar past active incident search results. Contact Customer Service and Support, if necessary, to configure sources for contextual search.

When the use case template shows the label **Pretrained**, you can go directly to the **Testing your models** implementation section. Otherwise, you will begin by creating a machine learning model.

### Procedure

1. If you started this procedure directly from the Predictive Intelligence Workbench product **Create New from Template** module, and clicked on the product documentation link to get here, skip this step.
   Otherwise, navigate to **Predictive Intelligence Workbench** > **Use Cases** > **Create New from Template**.
2. Select the **Suggest relevant Incidents for an Incident** template.
   The **Suggest relevant Incidents for an Incident** pop-up opens featuring a link to this procedure and a link to the platform Predictive Intelligence product and associated documentation.
3. Create and train a machine learning predictive model.
   Creating a model involves the following: creating a word corpus, defining a similarity prediction rule, defining the initial training frequency, and defining the refresh frequency.

   a. Create a word corpus.

      When creating a word corpus on the Word Corpus Content form, select an incidents-related table, such as Incident [incidents] in the **Table** field and define the time frame that best describes the current usage of words in the **Filter** field. For example, if your IT system experienced a major infrastructure change six months back, use data from the last six months only. In the **Field List** field, define only the fields that best capture the words: **Description**, **Short description**, and **Resolution notes**. Defining these alone is typically enough, since the prediction rule is expected to find incidents based on the short description.

      Creating the word corpus prepares you for the next step, creating the similarity prediction rule.

   b. Create and train a similarity solution.

   c. For this initial model creation, provide the similarity solution definition label `Similar Incidents` in the **Label** field.

   d. Set the **Training Frequency** field to **Run Once**.
      You can reset this configuration after you implement this use case into your business processes and have monitored its performance in the Predictive Intelligence Workbench dashboard.

   e. Set the **Update Frequency** field to **Every 15 minutes**.
      This setting defines the frequency at which past incidents refresh in the search window.

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When possible, and if applicable, use an existing word corpus, created for another use case to reduce your overall word corpora and ease management of these records. In the **Table** field of the Similarity Definition form, select only those inputs for similarity that will be available at prediction time for incoming incidents. You can select more inputs in the **Test Table** field, if required, for comparison. It is best to start with similar fields for both the **Table** and **Test Table** fields.

The **Filter**field conditions determine the search window for past resolved incidents. Configure the filter conditions to optimize for the best set of resolved incidents to search within. This includes many considerations, such as, time frame, location, category where incidents are relevant, and more.

f. Click **Submit & Train** to create your similarity solution record and train it.
Alternatively, you can click **Submit** to save your similarity solution record and return to train it later.

4. Evaluation and tune your model.

   If you have a similarity score above 60, but the two incidents do not look similar, you may want to create another model, word corpus, or both by changing inputs and filters. Keep in mind that modifying the solution definition will help you create a new solution, but it will invalidate the previous solution.

   If you want to revert back to the previous solution definition, you will have to reset the parameters and retrain the solution. Therefore, first try creating a new similarity model before creating a new word corpus.

   If you want to adjust the score for your similarity solution, refer to Update your similarity score threshold.

5. Once you have a satisfactory model, test the similarity solution prediction.
   You can manually provide inputs and select the top similar results outcome values.
6. Once you have tested the behavior, configure the user experience layout to show attributed results and actions performed on the results.
   You can configure these results and actions via Workspace UI for Agent assist or via the ServiceNow AI Platform for Contextual Search. Configure actions and search context though **Tables** configuration and user experience and card layout through **Contextual Search** > **Search Result Display Configuration**.
7. Integrate trained models by exporting them to production.

   **Note:**
   For details regarding trained use case integration implementation, refer to Predictive Intelligence Workbench integration and customization.

8. Monitor similarity results and ensure IT agents are providing useful feedback.

   The base-system Predictive Intelligence experience includes a built-in feedback mechanism to discern if the similarity results are useful. Train your IT agents to provide feedback, both online and offline, to capture this data for future reporting. Since this is an unsupervised algorithm, you may need to acquire periodic feedback from the IT agents to check that the similarity model is still providing satisfactory results. This feedback is the only way to determine if the model has drifted and requires new training. Ensure that part of your implementation and integration strategy, as well as your change management process, includes training IT agents to provide similarity results feedback.

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9. Communicate the value of Predictive Intelligence to your stakeholders by linking business key performance indicators (KPIs) to machine learning metrics.

   Select one or more KPIs that you think is most beneficial to your IT agents. Create a Performance Analytics dashboard showing the trend of these KPIs. The “likes” you get from your IT agents via the feedback mechanism helps you communicate the value of Predictive Intelligence.

   For information regarding the Predictive Intelligence for Incidents dashboard, refer to ITSM Predictive Intelligence Workbench dashboard.

## Suggest relevant Incidents for an Incident

Use this template to recommend similar relevant incidents to help expedite your incident investigation and resolution processes.

### Before you begin

Role required: piwb_manager or piwb_viewer

### About this task

This use case template helps you improve your ITSM first-call resolution and reduce the time required to investigate resolution steps for incoming incidents. The template also provides a link to the Predictive Intelligence platform application and associated documentation.

The use case uses a similarity-based predictive model that compares an incoming incident with past resolved incidents for smarter resolution. Similar past active incidents are displayed in Agent assist and also in the Incident form via related search.

**Note:**
You will need business users to validate the similar past active incident search results. Contact Customer Service and Support, if necessary, to configure sources for contextual search.

When the use case template shows the label **Pretrained**, you can go directly to the **Testing your models** implementation section. Otherwise, you will begin by creating a machine learning model.

### Procedure

1. If you started this procedure directly from the Predictive Intelligence Workbench product **Create New from Template** module, and clicked on the product documentation link to get here, skip this step.
   Otherwise, navigate to **Predictive Intelligence Workbench** > **Use Cases** > **Create New from Template**.
2. Select the **Suggest relevant Incidents for an Incident** template.
   The **Suggest relevant Incidents for an Incident** pop-up opens featuring a link to this procedure and a link to the platform Predictive Intelligence product and associated documentation.
3. Create and train a machine learning predictive model.
   Creating a model involves the following: creating a word corpus, defining a similarity prediction rule, defining the initial training frequency, and defining the refresh frequency.

   a. Create a word corpus.

      When creating a word corpus on the Word Corpus Content form, select an incidents-related table, such as Incident [incidents] in the **Table** field and define the time frame that best describes the current usage of words in the **Filter** field. For example, if your IT system experienced a major infrastructure change six months back, use data from the

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last six months only. In the **Field List** field, define only the fields that best capture the words: **Description**, **Short description**, and **Resolution notes**. Defining these alone is typically enough, since the prediction rule is expected to find incidents based on the short description.

Creating the word corpus prepares you for the next step, creating the similarity prediction rule.

**b.** Create and train a similarity solution.

**c.** For this initial model creation, provide the similarity solution definition label `Similar Incidents` in the **Label** field.

**d.** Set the **Training Frequency** field to **Run Once**.
You can reset this configuration after you implement this use case into your business processes and have monitored its performance in the Predictive Intelligence Workbench dashboard.

**e.** Set the **Update Frequency** field to **Every 15 minutes**.
This setting defines the frequency at which past incidents refresh in the search window.

When possible, and if applicable, use an existing word corpus, created for another use case to reduce your overall word corpora and ease management of these records. In the **Table** field of the Similarity Definition form, select only those inputs for similarity that will be available at prediction time for incoming incidents. You can select more inputs in the **Test Table** field, if required, for comparison. It is best to start with similar fields for both the **Table** and **Test Table** fields.

The **Filter**field conditions determine the search window for past resolved incidents. Configure the filter conditions to optimize for the best set of resolved incidents to search within. This includes many considerations, such as, time frame, location, category where incidents are relevant, and more.

**f.** Click **Submit & Train** to create your similarity solution record and train it.
Alternatively, you can click **Submit** to save your similarity solution record and return to train it later.

**4.** Evaluation and tune your model.

If you have a similarity score above 60, but the two incidents do not look similar, you may want to create another model, word corpus, or both by changing inputs and filters. Keep in mind that modifying the solution definition will help you create a new solution, but it will invalidate the previous solution.

If you want to revert back to the previous solution definition, you will have to reset the parameters and retrain the solution. Therefore, first try creating a new similarity model before creating a new word corpus.

If you want to adjust the score for your similarity solution, refer to Update your similarity score threshold.

**5.** Once you have a satisfactory model, test the similarity solution prediction.
You can manually provide inputs and select the top similar results outcome values.

**6.** Once you have tested the behavior, configure the user experience layout to show attributed results and actions performed on the results.

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You can configure these results and actions via Workspace UI for Agent assist or via the ServiceNow AI Platform for Contextual Search. Configure actions and search context though **Tables** configuration and user experience and card layout through **Contextual Search** > **Search Result Display Configuration**.

7. Integrate trained models by exporting them to production.

   **Note:**
   For details regarding trained use case integration implementation, refer to Predictive Intelligence Workbench integration and customization.

8. Monitor similarity results and ensure IT agents are providing useful feedback.

   The base-system Predictive Intelligence experience includes a built-in feedback mechanism to discern if the similarity results are useful. Train your IT agents to provide feedback, both online and offline, to capture this data for future reporting. Since this is an unsupervised algorithm, you may need to acquire periodic feedback from the IT agents to check that the similarity model is still providing satisfactory results. This feedback is the only way to determine if the model has drifted and requires new training. Ensure that part of your implementation and integration strategy, as well as your change management process, includes training IT agents to provide similarity results feedback.

9. Communicate the value of Predictive Intelligence to your stakeholders by linking business key performance indicators (KPIs) to machine learning metrics.

   Select one or more KPIs that you think is most beneficial to your IT agents. Create a Performance Analytics dashboard showing the trend of these KPIs. The “likes” you get from your IT agents via the feedback mechanism helps you communicate the value of Predictive Intelligence.

   For information regarding the Predictive Intelligence for Incidents dashboard, refer to ITSM Predictive Intelligence Workbench dashboard.

## Suggest relevant Incidents for a Major Incident

Use this template to recommend similar resolved incidents to help expedite your major incident investigation and resolution processes.

### Before you begin

Role required: piwb_manager or piwb_viewer

### About this task

This use case template helps you improve your ITSM first-call resolution and reduce the time required to investigate resolution steps for incoming incidents. The template also provides a link to the Predictive Intelligence platform application and associated documentation.

The use case uses a similarity-based predictive model that compares an incoming incident with past resolved incidents for smarter resolution. Similar past active incidents are displayed in Agent assist and also in the Incident form via related search.

**Note:**
You will need business users to validate the similar past active incident search results. Contact Customer Service and Support, if necessary, to configure sources for contextual search.

When the use case template shows the label **Pretrained**, you can go directly to the **Testing your models** implementation section. Otherwise, you will begin by creating a machine learning model.

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## Procedure

1. If you started this procedure directly from the Predictive Intelligence Workbench product **Create New from Template** module, and clicked on the product documentation link to get here, skip this step.
   Otherwise, navigate to **Predictive Intelligence Workbench** > **Use Cases** > **Create New from Template**.
2. Select the **Suggest relevant Incidents for an Major Incident** template.
   The **Suggest relevant Incidents for an Major Incident** pop-up opens featuring a link to this procedure and a link to the platform Predictive Intelligence product and associated documentation.
3. Create and train a machine learning predictive model.
   Creating a model involves the following: creating a word corpus, defining a similarity prediction rule, defining the initial training frequency, and defining the refresh frequency.

   a. Create a word corpus.

      When creating a word corpus on the Word Corpus Content form, select an incidents-related table, such as Incident [incidents] in the **Table** field and define the time frame that best describes the current usage of words in the **Filter** field. For example, if your IT system experienced a major infrastructure change six months back, use data from the last six months only. In the **Field List** field, define only the fields that best capture the words: **Description**, **Short description**, and **Resolution notes**. Defining these alone is typically enough, since the prediction rule is expected to find incidents based on the short description.

      Creating the word corpus prepares you for the next step, creating the similarity prediction rule.

   b. Create and train a similarity solution.

   c. For this initial model creation, provide the similarity solution definition label `Similar Incidents` in the **Label** field.

   d. Set the **Training Frequency** field to **Run Once**.
      You can reset this configuration after you implement this use case into your business processes and have monitored its performance in the Predictive Intelligence Workbench dashboard.

   e. Set the **Update Frequency** field to **Every 15 minutes**.
      This setting defines the frequency at which past incidents refresh in the search window.

      When possible, and if applicable, use an existing word corpus, created for another use case to reduce your overall word corpora and ease management of these records. In the **Table** field of the Similarity Definition form, select only those inputs for similarity that will be available at prediction time for incoming incidents. You can select more inputs in the **Test Table** field, if required, for comparison. It is best to start with similar fields for both the **Table** and **Test Table** fields.

      The **Filter**field conditions determine the search window for past resolved incidents. Configure the filter conditions to optimize for the best set of resolved incidents to search within. This includes many considerations, such as, time frame, location, category where incidents are relevant, and more.

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f. Click **Submit & Train** to create your similarity solution record and train it.
Alternatively, you can click **Submit** to save your similarity solution record and return to train it later.

4. Evaluation and tune your model.

   If you have a similarity score above 60, but the two incidents do not look similar, you may want to create another model, word corpus, or both by changing inputs and filters. Keep in mind that modifying the solution definition will help you create a new solution, but it will invalidate the previous solution.

   If you want to revert back to the previous solution definition, you will have to reset the parameters and retrain the solution. Therefore, first try creating a new similarity model before creating a new word corpus.

   If you want to adjust the score for your similarity solution, refer to Update your similarity score threshold.

5. Once you have a satisfactory model, test the similarity solution prediction.
   You can manually provide inputs and select the top similar results outcome values.
6. Once you have tested the behavior, configure the user experience layout to show attributed results and actions performed on the results.
   You can configure these results and actions via Workspace UI for Agent assist or via the ServiceNow AI Platform for Contextual Search. Configure actions and search context though **Tables** configuration and user experience and card layout through **Contextual Search** > **Search Result Display Configuration**.
7. Integrate trained models by exporting them to production.

   **Note:**
   For details regarding trained use case integration implementation, see Predictive Intelligence Workbench integration and customization.

8. Monitor similarity results and ensure IT agents are providing useful feedback.

   The base-system Predictive Intelligence experience includes a built-in feedback mechanism to discern if the similarity results are useful. Train your IT agents to provide feedback, both online and offline, to capture this data for future reporting. Since this is an unsupervised algorithm, you may need to acquire periodic feedback from the IT agents to check that the similarity model is still providing satisfactory results. This feedback is the only way to determine if the model has drifted and requires new training. Ensure that part of your implementation and integration strategy, as well as your change management process, includes training IT agents to provide similarity results feedback.

9. Communicate the value of Predictive Intelligence to your stakeholders by linking business key performance indicators (KPIs) to machine learning metrics.

   Select one or more KPIs that you think is most beneficial to your IT agents. Create a Performance Analytics dashboard showing the trend of these KPIs. The “likes” you get from your IT agents via the feedback mechanism helps you communicate the value of Predictive Intelligence.

   For information regarding the Predictive Intelligence for Incidents dashboard, refer to ITSM Predictive Intelligence Workbench dashboard.

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## Suggest relevant Major Incident for an Incident

Use this template to recommend similar resolved major incidents to help expedite your incident investigation and resolution processes.

### Before you begin

Role required: piwb_manager or piwb_viewer

### About this task

This use case template helps you improve your ITSM first-call resolution and reduce the time required to investigate resolution steps for incoming incidents. The template also provides a link to the Predictive Intelligence platform application and associated documentation.

The use case uses a similarity-based predictive model that compares an incoming incident with past resolved incidents for smarter resolution. Similar past active incidents are displayed in Agent assist and also in the Incident form via related search.

**Note:**
You will need business users to validate the similar past active incident search results. Contact Customer Service and Support, if necessary, to configure sources for contextual search.

When the use case template shows the label **Pretrained**, you can go directly to the **Testing your models** implementation section. Otherwise, you will begin by creating a machine learning model.

### Procedure

1. If you started this procedure directly from the Predictive Intelligence Workbench product **Create New from Template** module, and clicked on the product documentation link to get here, skip this step.
   Otherwise, navigate to **Predictive Intelligence Workbench** > **Use Cases** > **Create New from Template**.
2. Select the **Suggest relevant Major Incident for an Incident** template.
   The **Suggest relevant Major Incident for an Incident** pop-up opens featuring a link to this procedure and a link to the platform Predictive Intelligence product and associated documentation.
3. Create and train a machine learning predictive model.
   Creating a model involves the following: creating a word corpus, defining a similarity prediction rule, defining the initial training frequency, and defining the refresh frequency.

   a. Create a word corpus.

      When creating a word corpus on the Word Corpus Content form, select an incidents-related table, such as Incident [incidents] in the **Table** field and define the time frame that best describes the current usage of words in the **Filter** field. For example, if your IT system experienced a major infrastructure change six months back, use data from the last six months only. In the **Field List** field, define only the fields that best capture the words: **Description**, **Short description**, and **Resolution notes**. Defining these alone is typically enough, since the prediction rule is expected to find incidents based on the short description.

      Creating the word corpus prepares you for the next step, creating the similarity prediction rule.

   b. Create and train a similarity solution.

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c. For this initial model creation, provide the similarity solution definition label `Similar Incidents` in the **Label** field.

d. Set the **Training Frequency** field to **Run Once**.
You can reset this configuration after you implement this use case into your business processes and have monitored its performance in the Predictive Intelligence Workbench dashboard.

e. Set the **Update Frequency** field to **Every 15 minutes**.
This setting defines the frequency at which past incidents refresh in the search window.

When possible, and if applicable, use an existing word corpus, created for another use case to reduce your overall word corpora and ease management of these records. In the **Table** field of the Similarity Definition form, select only those inputs for similarity that will be available at prediction time for incoming incidents. You can select more inputs in the **Test Table** field, if required, for comparison. It is best to start with similar fields for both the **Table** and **Test Table** fields.

The **Filter**field conditions determine the search window for past resolved incidents. Configure the filter conditions to optimize for the best set of resolved incidents to search within. This includes many considerations, such as, time frame, location, category where incidents are relevant, and more.

f. Click **Submit & Train** to create your similarity solution record and train it.
Alternatively, you can click **Submit** to save your similarity solution record and return to train it later.

4. Evaluation and tune your model.

If you have a similarity score above 60, but the two incidents do not look similar, you may want to create another model, word corpus, or both by changing inputs and filters. Keep in mind that modifying the solution definition will help you create a new solution, but it will invalidate the previous solution.

If you want to revert back to the previous solution definition, you will have to reset the parameters and retrain the solution. Therefore, first try creating a new similarity model before creating a new word corpus.

If you want to adjust the score for your similarity solution, refer to Update your similarity score threshold.

5. Once you have a satisfactory model, test the similarity solution prediction.
You can manually provide inputs and select the top similar results outcome values.

6. Once you have tested the behavior, configure the user experience layout to show attributed results and actions performed on the results.
You can configure these results and actions via Workspace UI for Agent assist or via the ServiceNow AI Platform for Contextual Search. Configure actions and search context though **Tables** configuration and user experience and card layout through **Contextual Search** > **Search Result Display Configuration**.

7. Integrate trained models by exporting them to production.

**Note:**
For details regarding trained use case integration implementation, refer to Predictive Intelligence Workbench integration and customization.

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8. Monitor similarity results and ensure IT agents are providing useful feedback.

   The base-system Predictive Intelligence experience includes a built-in feedback mechanism to discern if the similarity results are useful. Train your IT agents to provide feedback, both online and offline, to capture this data for future reporting. Since this is an unsupervised algorithm, you may need to acquire periodic feedback from the IT agents to check that the similarity model is still providing satisfactory results. This feedback is the only way to determine if the model has drifted and requires new training. Ensure that part of your implementation and integration strategy, as well as your change management process, includes training IT agents to provide similarity results feedback.

9. Communicate the value of Predictive Intelligence to your stakeholders by linking business key performance indicators (KPIs) to machine learning metrics.

   Select one or more KPIs that you think is most beneficial to your IT agents. Create a Performance Analytics dashboard showing the trend of these KPIs. The “likes” you get from your IT agents via the feedback mechanism helps you communicate the value of Predictive Intelligence.

   For information regarding the Predictive Intelligence for Incidents dashboard, see ITSM Predictive Intelligence Workbench dashboard.

## Suggest relevant KB articles for an Incident

Use this template to recommend relevant knowledge base articles to help expedite your incident investigation and resolution processes.

### Before you begin

Role required: piwb_manager or piwb_viewer

### About this task

This use case template helps you improve your ITSM first-call resolution and reduce the time required to investigate resolution steps for incoming incidents. The template also provides a link to the Predictive Intelligence platform application and associated documentation.

The use case uses a similarity-based predictive model that compares an incoming incident with relevant knowledge base articles for smarter resolution. Similar past active incidents are displayed in Agent assist and also in the Incident form via related search.

**Note:**
You will need business users to validate the similar past active incident search results. Contact Customer Service and Support, if necessary, to configure sources for contextual search.

When the use case template shows the label **Pretrained**, you can go directly to the **Testing your models** implementation section. Otherwise, you will begin by creating a machine learning model.

### Procedure

1. If you started this procedure directly from the Predictive Intelligence Workbench product **Create New from Template** module, and clicked on the product documentation link to get here, skip this step.
   Otherwise, navigate to **Predictive Intelligence Workbench** > **Use Cases** > **Create New from Template**.
2. Select the **Suggest relevant KB article for an Incident** template.
   The **Suggest relevant KB article for an Incident** pop-up opens featuring a link to this procedure and a link to the platform Predictive Intelligence product and associated documentation.

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3. Create and train a machine learning predictive model.
   Creating a model involves the following: creating a word corpus, defining a similarity prediction rule, defining the initial training frequency, and defining the refresh frequency.

   a. Create a word corpus.

      When creating a word corpus on the Word Corpus Content form, select an incidents-related table, such as Incident [incidents] in the **Table** field and define the time frame that best describes the current usage of words in the **Filter** field. For example, if your IT system experienced a major infrastructure change six months back, use data from the last six months only. In the **Field List** field, define only the fields that best capture the words: **Description**, **Short description**, and **Resolution notes**. Defining these alone is typically enough, since the prediction rule is expected to find incidents based on the short description.

      Creating the word corpus prepares you for the next step, creating the similarity prediction rule.

   b. Create and train a similarity solution.

   c. For this initial model creation, provide the similarity solution definition label `Similar Knowledge Articles` in the **Label** field.

   d. For this initial model creation, set the **Training Frequency** field to **Run Once**.
      You can reset this configuration after you implement this use case into your business processes and have monitored its performance in the Predictive Intelligence Workbench dashboard.

   e. Set the **Update Frequency** field to **Every 15 minutes**.
      This setting defines the frequency at which past incidents refresh in the search window.

      When possible, and if applicable, use an existing word corpus, created for another use case to reduce your overall word corpora and ease management of these records. In the **Table** field of the Similarity Definition form, select only those inputs for similarity that will be available at prediction time for incoming incidents. You can select more inputs in the **Test Table** field, if required, for comparison. It is best to start with similar fields for both the **Table** and **Test Table** fields.

      The **Filter** field conditions determine the search window for past resolved incidents. Configure the filter conditions to optimize for the best set of resolved incidents to search within. This includes many considerations, such as, time frame, location, category where incidents are relevant, and more.

   f. Click **Submit & Train** to create your similarity solution record and train it.
      Alternatively, you can click **Submit** to save your similarity solution record and return to train it later.

4. Evaluation and tune your model.

   If you have a similarity score above 60, but the two incidents do not look similar, you may want to create another model, word corpus, or both by changing inputs and filters. Keep in mind that modifying the solution definition will help you create a new solution, but it will invalidate the previous solution.

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If you want to revert back to the previous solution definition, you will have to reset the parameters and retrain the solution. Therefore, first try creating a new similarity model before creating a new word corpus.

If you want to adjust the score for your similarity solution, refer to Update your similarity score threshold.

5. Once you have a satisfactory model, test the similarity solution prediction.
   You can manually provide inputs and select the top similar results outcome values.
6. Once you have tested the behavior, configure the user experience layout to show attributed results and actions performed on the results.
   You can configure these results and actions via Workspace UI for Agent assist or via the ServiceNow AI Platform for Contextual Search. Configure actions and search context though **Tables** configuration and user experience and card layout through **Contextual Search** > **Search Result Display Configuration**.
7. Integrate trained models by exporting them to production.

   **Note:**
   For details regarding trained use case integration implementation, refer to Predictive Intelligence Workbench integration and customization.

8. Monitor similarity results and ensure IT agents are providing useful feedback.

   The base-system Predictive Intelligence experience includes a built-in feedback mechanism to discern if the similarity results are useful. Train your IT agents to provide feedback, both online and offline, to capture this data for future reporting. Since this is an unsupervised algorithm, you may need to acquire periodic feedback from the IT agents to check that the similarity model is still providing satisfactory results. This feedback is the only way to determine if the model has drifted and requires new training. Ensure that part of your implementation and integration strategy, as well as your change management process, includes training IT agents to provide similarity results feedback.

9. Communicate the value of Predictive Intelligence to your stakeholders by linking business key performance indicators (KPIs) to machine learning metrics.

   Select one or more KPIs that you think is most beneficial to your IT agents. Create a Performance Analytics dashboard showing the trend of these KPIs. The “likes” you get from your IT agents via the feedback mechanism helps you communicate the value of Predictive Intelligence.

   For information regarding the Predictive Intelligence for Incidents dashboard, refer to ITSM Predictive Intelligence Workbench dashboard.

## Suggest relevant Open incidents for an Incident

Use this template to recommend similar open incidents to help expedite your incident investigation and resolution processes.

### Before you begin

Role required: piwb_manager or piwb_viewer

### About this task

This use case template helps you improve your ITSM first-call resolution and reduce the time required to investigate resolution steps for incoming incidents. The template also provides a link to the Predictive Intelligence platform application and associated documentation.

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The use case uses a similarity-based predictive model that compares an incoming incident with past resolved incidents for smarter resolution. Similar past active incidents are displayed in Agent assist and also in the Incident form via related search.

**Note:**
You will need business users to validate the similar past active incident search results. Contact Customer Service and Support, if necessary, to configure sources for contextual search.

When the use case template shows the label **Pretrained**, you can go directly to the **Testing your models** implementation section. Otherwise, you will begin by creating a machine learning model.

### Procedure

1. If you started this procedure directly from the Predictive Intelligence Workbench product **Create New from Template** module, and clicked on the product documentation link to get here, skip this step.
   Otherwise, navigate to **Predictive Intelligence Workbench** > **Use Cases** > **Create New from Template**.
2. Select the **Suggest relevant Open Incidents for an Incident** template.
   The **Suggest relevant Open Incidents for an Incident** pop-up opens featuring a link to this procedure and a link to the platform Predictive Intelligence product and associated documentation.
3. Create and train a machine learning predictive model.
   Creating a model involves the following: creating a word corpus, defining a similarity prediction rule, defining the initial training frequency, and defining the refresh frequency.

   a. Create a word corpus.

      When creating a word corpus on the Word Corpus Content form, select an incidents-related table, such as Incident [incidents] in the **Table** field and define the time frame that best describes the current usage of words in the **Filter** field. For example, if your IT system experienced a major infrastructure change six months back, use data from the last six months only. In the **Field List** field, define only the fields that best capture the words: **Description**, **Short description**, and **Resolution notes**. Defining these alone is typically enough, since the prediction rule is expected to find incidents based on the short description.

      Creating the word corpus prepares you for the next step, creating the similarity prediction rule.

   b. Create and train a similarity solution.

   c. For this initial model creation, provide the similarity solution definition label `Similar Open Incidents` in the **Label** field.

   d. Set the **Training Frequency** field to **Run Once**.
      You can reset this configuration after you implement this use case into your business processes and have monitored its performance in the Predictive Intelligence Workbench dashboard.

   e. Set the **Update Frequency** field to **Every 15 minutes**.
      This setting defines the frequency at which past incidents refresh in the search window.

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When possible, and if applicable, use an existing word corpus, created for another use case to reduce your overall word corpora and ease management of these records. In the **Table** field of the Similarity Definition form, select only those inputs for similarity that will be available at prediction time for incoming incidents. You can select more inputs in the **Test Table** field, if required, for comparison. It is best to start with similar fields for both the **Table** and **Test Table** fields.

The **Filter**field conditions determine the search window for past resolved incidents. Configure the filter conditions to optimize for the best set of resolved incidents to search within. This includes many considerations, such as, time frame, location, category where incidents are relevant, and more.

f. Click **Submit & Train** to create your similarity solution record and train it.
Alternatively, you can click **Submit** to save your similarity solution record and return to train it later.

4. Evaluation and tune your model.

   If you have a similarity score above 60, but the two incidents do not look similar, you may want to create another model, word corpus, or both by changing inputs and filters. Keep in mind that modifying the solution definition will help you create a new solution, but it will invalidate the previous solution.

   If you want to revert back to the previous solution definition, you will have to reset the parameters and retrain the solution. Therefore, first try creating a new similarity model before creating a new word corpus.

   If you want to adjust the score for your similarity solution, refer to Update your similarity score threshold.

5. Once you have a satisfactory model, test the similarity solution prediction.
   You can manually provide inputs and select the top similar results outcome values.
6. Once you have tested the behavior, configure the user experience layout to show attributed results and actions performed on the results.
   You can configure these results and actions via Workspace UI for Agent assist or via the ServiceNow AI Platform for Contextual Search. Configure actions and search context though **Tables** configuration and user experience and card layout through **Contextual Search** > **Search Result Display Configuration**.
7. Integrate trained models by exporting them to production.

   **Note:**
   For details regarding trained use case integration implementation, refer to Predictive Intelligence Workbench integration and customization.

8. Monitor similarity results and ensure IT agents are providing useful feedback.

   The base-system Predictive Intelligence experience includes a built-in feedback mechanism to discern if the similarity results are useful. Train your IT agents to provide feedback, both online and offline, to capture this data for future reporting. Since this is an unsupervised algorithm, you may need to acquire periodic feedback from the IT agents to check that the similarity model is still providing satisfactory results. This feedback is the only way to determine if the model has drifted and requires new training. Ensure that part of your implementation and integration strategy, as well as your change management process, includes training IT agents to provide similarity results feedback.

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9. Communicate the value of Predictive Intelligence to your stakeholders by linking business key performance indicators (KPIs) to machine learning metrics.

   Select one or more KPIs that you think is most beneficial to your IT agents. Create a Performance Analytics dashboard showing the trend of these KPIs. The “likes” you get from your IT agents via the feedback mechanism helps you communicate the value of Predictive Intelligence.

   For information regarding the Predictive Intelligence for Incidents dashboard, see ITSM Predictive Intelligence Workbench dashboard.

## Suggest relevant Resolved Incidents for an Incident

Use this template to recommend similar relevant resolved incidents to help expedite your incident investigation and resolution processes.

### Before you begin

Role required: piwb_manager or piwb_viewer

### About this task

This use case template helps you improve your ITSM first-call resolution and reduce the time required to investigate resolution steps for incoming incidents. The template also provides a link to the Predictive Intelligence platform application and associated documentation.

The use case uses a similarity-based predictive model that compares an incoming incident with past resolved incidents for smarter resolution. Similar past active incidents are displayed in Agent assist and also in the Incident form via related search.

**Note:**
You will need business users to validate the similar past active incident search results. Contact Customer Service and Support, if necessary, to configure sources for contextual search.

When the use case template shows the label **Pretrained**, you can go directly to the **Testing your models** implementation section. Otherwise, you will begin by creating a machine learning model.

### Procedure

1. If you started this procedure directly from the Predictive Intelligence Workbench product **Create New from Template** module, and clicked on the product documentation link to get here, skip this step.
   Otherwise, navigate to **Predictive Intelligence Workbench** > **Use Cases** > **Create New from Template**.
2. Select the **Suggest relevant Resolved Incidents for an Incident** template.
   The **Suggest relevant Resolved Incidents for an Incident** pop-up opens featuring a link to this procedure and a link to the platform Predictive Intelligence product and associated documentation.
3. Create and train a machine learning predictive model.
   Creating a model involves the following: creating a word corpus, defining a similarity prediction rule, defining the initial training frequency, and defining the refresh frequency.

   a. Create a word corpus.

      When creating a word corpus on the Word Corpus Content form, select an incidents-related table, such as Incident [incidents] in the **Table** field and define the time frame that best describes the current usage of words in the **Filter** field. For example, if your IT system experienced a major infrastructure change six months back, use data from the

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last six months only. In the **Field List** field, define only the fields that best capture the words: **Description**, **Short description**, and **Resolution notes**. Defining these alone is typically enough, since the prediction rule is expected to find incidents based on the short description.

Creating the word corpus prepares you for the next step, creating the similarity prediction rule.

**b.** Create and train a similarity solution.

**c.** For this initial model creation, provide the similarity solution definition label `Similar Resolved Incidents` in the **Label** field.

**d.** Set the **Training Frequency** field to **Run Once**.
You can reset this configuration after you implement this use case into your business processes and have monitored its performance in the Predictive Intelligence Workbench dashboard.

**e.** Set the **Update Frequency** field to **Every 15 minutes**.

This setting defines the frequency at which past incidents refresh in the search window. When possible, and if applicable, use an existing word corpus, created for another use case to reduce your overall word corpora and ease management of these records. In the **Table** field of the Similarity Definition form, select only those inputs for similarity that will be available at prediction time for incoming incidents. You can select more inputs in the **Test Table** field, if required, for comparison. It is best to start with similar fields for both the **Table** and **Test Table** fields.

The **Filter**field conditions determine the search window for past resolved incidents. Configure the filter conditions to optimize for the best set of resolved incidents to search within. This includes many considerations, such as, time frame, location, category where incidents are relevant, and more.

**f.** Click **Submit & Train** to create your similarity solution record and train it.
Alternatively, you can click **Submit** to save your similarity solution record and return to train it later.

**4.** Evaluation and tune your model.

If you have a similarity score above 60, but the two incidents do not look similar, you may want to create another model, word corpus, or both by changing inputs and filters. Keep in mind that modifying the solution definition will help you create a new solution, but it will invalidate the previous solution.

If you want to revert back to the previous solution definition, you will have to reset the parameters and retrain the solution. Therefore, first try creating a new similarity model before creating a new word corpus.

If you want to adjust the score for your similarity solution, refer to Update your similarity score threshold.

**5.** Once you have a satisfactory model, test the similarity solution prediction.
You can manually provide inputs and select the top similar results outcome values.

**6.** Once you have tested the behavior, configure the user experience layout to show attributed results and actions performed on the results.

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You can configure these results and actions via Workspace UI for Agent assist or via the ServiceNow AI Platform for Contextual Search. Configure actions and search context though **Tables** configuration and user experience and card layout through **Contextual Search** > **Search Result Display Configuration**.

7. Integrate trained models by exporting them to production.

   **Note:**
   For details regarding trained use case integration implementation, refer to Predictive Intelligence Workbench integration and customization.

8. Monitor similarity results and ensure IT agents are providing useful feedback.

   The base-system Predictive Intelligence experience includes a built-in feedback mechanism to discern if the similarity results are useful. Train your IT agents to provide feedback, both online and offline, to capture this data for future reporting. Since this is an unsupervised algorithm, you may need to acquire periodic feedback from the IT agents to check that the similarity model is still providing satisfactory results. This feedback is the only way to determine if the model has drifted and requires new training. Ensure that part of your implementation and integration strategy, as well as your change management process, includes training IT agents to provide similarity results feedback.

9. Communicate the value of Predictive Intelligence to your stakeholders by linking business key performance indicators (KPIs) to machine learning metrics.

   Select one or more KPIs that you think is most beneficial to your IT agents. Create a Performance Analytics dashboard showing the trend of these KPIs. The “likes” you get from your IT agents via the feedback mechanism helps you communicate the value of Predictive Intelligence.

   For information regarding the Predictive Intelligence for Incidents dashboard, refer to ITSM Predictive Intelligence Workbench dashboard.

## Suggest relevant Open Change requests for an Incident

Use this template to recommend similar open change requests to help expedite your change request investigation and resolution processes.

### Before you begin

Activate the Predictive Intelligence for Incident plugin (com.snc.incident.ml).

Role required: piwb_manager or piwb_viewer

### About this task

This use case template helps you improve your ITSM first-call resolution and reduce the time required to investigate resolution steps for change requests. The template also provides a link to the Predictive Intelligence platform application and associated documentation.

The use case uses a similarity-based predictive model that compares an open change request with past resolved change requests for smarter resolution. Similar open changes are displayed in Agent assist and also in the Incident form via related search.

**Note:**
You will need business users to validate the similar open changes search results. Contact Customer Service and Support, if necessary, to configure sources for contextual search.

When the use case template shows the label **Pretrained**, you can go directly to the **Testing your models** implementation section. Otherwise, you will begin by creating a machine learning model.

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## Procedure

1. If you started this procedure directly from the Predictive Intelligence Workbench product **Create New from Template** module, and clicked on the product documentation link to get here, skip this step.
   Otherwise, navigate to **Predictive Intelligence Workbench** > **Use Cases** > **Create New from Template**.
2. Select the **Suggest relevant Open Change requests for an Incident** template.
   The **Suggest relevant Open Change requests for an Incident** pop-up opens featuring a link to this procedure and a link to the platform Predictive Intelligence product and associated documentation.
3. Create and train a machine learning predictive model.
   Creating a model involves the following: creating a word corpus, defining a similarity prediction rule, defining the initial training frequency, and defining the refresh frequency.

   a. Create a word corpus.

      When creating a word corpus on the Word Corpus Content form, select Incident [incidents] and Change [change] in the **Table** field and define the time frame that best describes the current usage of words in the **Filter** field. For example, if your IT system experienced a major infrastructure change six months back, use data from the last six months only. In the **Field List** field, define only the fields that best capture the words: **Description**, **Short description**, and **Resolution notes**. Defining these alone is typically enough, since the prediction rule is expected to find change requests based on the short description.

      Creating the word corpus prepares you for the next step, creating the similarity prediction rule.

   b. Create and train a similarity solution.

   c. For this initial model creation, provide the similarity solution definition label `Similar Open Change requests` in the **Label** field.

   d. Set the **Training Frequency** field to **Run Once**.
      You can reset this configuration after you implement this use case into your business processes and have monitored its performance in the Predictive Intelligence Workbench dashboard.

   e. Set the **Update Frequency** field to **Every 15 minutes**.
      This setting defines the frequency at which past change requests refresh in the search window.

      When possible, and if applicable, use an existing word corpus, created for another use case to reduce your overall word corpora and ease management of these records. In the **Table** field of the Similarity Definition form, select only those inputs for similarity that will be available at prediction time for change requests. You can select more inputs in the **Test Table** field, if required, for comparison. It is best to start with similar fields for both the **Table** and **Test Table** fields.

      The **Filter** field conditions determine the search window for past resolved change requests. Configure the filter conditions to optimize for the best set of resolved change requests to search within. This includes many considerations, such as, time frame, location, category where change requests are relevant, and more.

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f. Click **Submit & Train** to create your similarity solution record and train it.
Alternatively, you can click **Submit** to save your similarity solution record and return to train it later.

4. Evaluation and tune your model.

   If you have a similarity score above 60, but the two incidents do not look similar, you may want to create another model, word corpus, or both by changing inputs and filters. Keep in mind that modifying the solution definition will help you create a new solution, but it will invalidate the previous solution.

   If you want to revert back to the previous solution definition, you will have to reset the parameters and retrain the solution. Therefore, first try creating a new similarity model before creating a new word corpus.

   If you want to adjust the score for your similarity solution, refer to Update your similarity score threshold.

5. Once you have a satisfactory model, test the similarity solution prediction.
   You can manually provide inputs and select the top similar results outcome values.
6. Once you have tested the behavior, configure the user experience layout to show attributed results and actions performed on the results.
   You can configure these results and actions via Workspace UI for Agent assist or via the ServiceNow AI Platform for Contextual Search. Configure actions and search context though **Tables** configuration and user experience and card layout through **Contextual Search** > **Search Result Display Configuration**.
7. Integrate trained models by exporting them to production.

   **Note:**
   For details regarding trained use case integration implementation, see Predictive Intelligence Workbench integration and customization.

8. Monitor similarity results and ensure IT agents are providing useful feedback.

   The base-system Predictive Intelligence experience includes a built-in feedback mechanism to discern if the similarity results are useful. Train your IT agents to provide feedback, both online and offline, to capture this data for future reporting. Since this is an unsupervised algorithm, you may need to acquire periodic feedback from the IT agents to check that the similarity model is still providing satisfactory results. This feedback is the only way to determine if the model has drifted and requires new training. Ensure that part of your implementation and integration strategy, as well as your change management process, includes training IT agents to provide similarity results feedback.

9. Communicate the value of Predictive Intelligence to your stakeholders by linking business key performance indicators (KPIs) to machine learning metrics.

   Select one or more KPIs that you think is most beneficial to your IT agents. Create a Performance Analytics dashboard showing the trend of these KPIs. The “likes” you get from your IT agents via the feedback mechanism helps you communicate the value of Predictive Intelligence.

   For information regarding the Predictive Intelligence workbench dashboard, see ITSM Predictive Intelligence Workbench dashboard.

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## Suggest relevant Open Problems for an Incident

Use this template to recommend similar open problem records to help expedite your problem investigation and resolution processes.

### Before you begin

Activate the Predictive Intelligence for Incident plugin (com.snc.incident.ml).

Role required: piwb_manager or piwb_viewer

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### About this task

This use case template helps you improve your ITSM first-call resolution and reduce the time required to investigate resolution steps for problem records. The template also provides a link to the Predictive Intelligence platform application and associated documentation.

The use case uses a similarity-based predictive model that compares an open problem record with past resolved problem records for smarter resolution. Similar open problem records are displayed in Agent assist and also in the Incident form via related search.

**Note:**
You will need business users to validate the similar open problem search results. Contact Customer Service and Support, if necessary, to configure sources for contextual search.

When the use case template shows the label **Pretrained**, you can go directly to the **Testing your models** implementation section. Otherwise, you will begin by creating a machine learning model.

### Procedure

1. If you started this procedure directly from the Predictive Intelligence Workbench product **Create New from Template** module, and clicked on the product documentation link to get here, skip this step.
   Otherwise, navigate to **Predictive Intelligence Workbench** > **Use Cases** > **Create New from Template**
2. Select the **Suggest relevant Open Problems for an Incident** template.
   The **Suggest relevant Open Problems for an Incident** pop-up opens featuring a link to this procedure and a link to the platform Predictive Intelligence product and associated documentation.
3. Create and train a machine learning predictive model.
   Creating a model involves the following: creating a word corpus, defining a similarity prediction rule, defining the initial training frequency, and defining the refresh frequency.

   a. Create a word corpus .

      When creating a word corpus on the Word Corpus Content form, select Incident [incidents] and Problem [problem] in the **Table** field and define the time frame that best describes the current usage of words in the **Filter** field. For example, if your IT system experienced a major infrastructure change six months back, use data from the last six months only. In the **Field List** field, define only the fields that best capture the words: **Description**, **Short description**, and **Resolution notes**. Defining these alone is typically enough, since the prediction rule is expected to find problems based on the short description.

      Creating the word corpus prepares you for the next step, creating the similarity prediction rule.

   b. Create and train a similarity solution .

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c. For this initial model creation, provide the similarity solution definition label `Similar Open Problems` in the **Label** field.

d. Set the **Training Frequency** field to **Run Once**.
You can reset this configuration after you implement this use case into your business processes and have monitored its performance in the Predictive Intelligence Workbench dashboard.

e. Set the **Update Frequency** field to **Every 15 minutes**.

This defines the frequency at which past problem records refresh in the search window. When possible, and if applicable, use an existing word corpus, created for another use case to reduce your overall word corpora and ease management of these records. In the **Table** field of the Similarity Definition form, select only those inputs for similarity that will be available at prediction time for problem records. You can select more inputs in the **Test Table** field, if required, for comparison. It is best to start with similar fields for both the **Table** and **Test Table** fields.

The **Filter**field conditions determine the search window for past resolved problem records. Configure the filter conditions to optimize for the best set of resolved problem records to search within. This includes many considerations, such as, time frame, location, category where problem records are relevant, and more.

f. Click **Submit & Train** to create your similarity solution record and train it.
Alternatively, you can click **Submit** to save your similarity solution record and return to train it later.

4. Evaluation and tune your model.

If you have a similarity score above 60, but the two problem records do not look similar, you may want to create another model, word corpus, or both by changing inputs and filters. Keep in mind that modifying the solution definition will help you create a new solution, but it will invalidate the previous solution.

If you want to revert back to the previous solution definition, you will have to reset the parameters and retrain the solution. Therefore, first try creating a new similarity model before creating a new word corpus.

If you want to adjust the score for your similarity solution, refer to Update your similarity score threshold.

5. Once you have a satisfactory model, test the similarity solution prediction.
You can manually provide inputs and select the top similar results outcome values.

6. Once you have tested the behavior, configure the user experience layout to show attributed results and actions performed on the results.
You can configure these results and actions via Workspace UI for Agent assist or via the ServiceNow AI Platform for Contextual Search. Configure actions and search context though **Tables** configuration and user experience and card layout through **Contextual Search** > **Search Result Display Configuration**.

7. Integrate trained models by exporting them to production.

**Note:**
For details regarding trained use case integration implementation, refer to Predictive Intelligence Workbench integration and customization.

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8. Monitor similarity results and ensure IT agents are providing useful feedback.

   The base-system Predictive Intelligence experience includes a built-in feedback mechanism to discern if the similarity results are useful. Train your IT agents to provide feedback, both online and offline, to capture this data for future reporting. Since this is an unsupervised algorithm, you may need to acquire periodic feedback from the IT agents to check that the similarity model is still providing satisfactory results. This feedback is the only way to determine if the model has drifted and requires new training. Ensure that part of your implementation and integration strategy, as well as your change management process, includes training IT agents to provide similarity results feedback.

9. Communicate the value of Predictive Intelligence to your stakeholders by linking business key performance indicators (KPIs) to machine learning metrics.

   Select one or more KPIs that you think is most beneficial to your IT agents. Create a Performance Analytics dashboard showing the trend of these KPIs. The “likes” you get from your IT agents via the feedback mechanism helps you communicate the value of Predictive Intelligence.

   For information regarding the Predictive Intelligence workbench dashboard, refer to ITSM Predictive Intelligence Workbench dashboard.

## Suggest skill assignment by comparing completed work with skills

Use this template to recommend who an assignment is routed to, based on skill set to help expedite your problem investigation and resolution processes.

### Before you begin

Role required: piwb_manager or piwb_viewer

### About this task

**Note:**
The Skill Recommendation plugin (sn.sre) must be activated to use predictive intelligence for recommending skills.#Configure skill recommendations in the **Skill Recommendation** module as part of this procedure.

This use case template helps you improve your ITSM first-call resolution and reduce the time required to investigate resolution steps for problem records. The template also provides a link to the Predictive Intelligence platform application and associated documentation.

The use case uses a similarity-based predictive model that compares an open problem record with past resolved problem records for smarter resolution. Similar open problem records are displayed in Agent assist and also in the Incident form via related search.

**Note:**
You will need business users to validate the similar open problem search results. Contact Customer Service and Support, if necessary, to configure sources for contextual search.

When the use case template shows the label **Pretrained**, you can go directly to the **Testing your models** implementation section. Otherwise, you will begin by creating a machine learning model.

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### Procedure

1. Navigate to **All** > **Skill Recommendation** > **Configuration** to define the properties to recommend skills.

   **Note:**
   By default, the **Enable skill recommendation** property is configured to recommend skills for agents. Clear this check box to disable skill recommendation.

2. If you started this procedure directly from the Predictive Intelligence Workbench product **Create New from Templates** module, and clicked on the product documentation link to get here, skip this step.
   Otherwise, navigate to **Predictive Intelligence Workbench** > **Use Cases** > **Create New from Templates**.
3. Select the **Suggest skill assignment by comparing completed work with skills** template.
   The **Suggest skill assignment by comparing completed work with skills** pop-up opens featuring a link to this procedure and a link to the platform Predictive Intelligence product and associated documentation.
4. Create and train a machine learning predictive model.
   Creating a model involves the following: creating a word corpus, defining a similarity prediction rule, defining the initial training frequency, and defining the refresh frequency.

   a. Create a word corpus.

      When creating a word corpus on the Word Corpus Content form, select Incident [incidents] and Problem [problem] in the **Table** field and define the time frame that best describes the current usage of words in the **Filter** field. For example, if your IT system experienced a major infrastructure change six months back, use data from the last six months only. In the **Field List** field, define only the fields that best capture the words: **Description**, **Short description**, and **Resolution notes**. Defining these alone is typically enough, since the prediction rule is expected to find problems based on the short description.

      Creating the word corpus prepares you for the next step, creating the similarity prediction rule.

   b. Create and train a similarity solution.

   c. For this initial model creation, provide the similarity solution definition label `Similar Open Problems` in the **Label** field.

   d. Set the **Training Frequency** field to **Run Once**.
      You can reset this configuration after you implement this use case into your business processes and have monitored its performance in the Predictive Intelligence Workbench dashboard.

   e. Set the **Update Frequency** field to **Every 15 minutes**.

      This setting defines the frequency at which past problem records refresh in the search window. When possible, and if applicable, use an existing word corpus, created for another use case to reduce your overall word corpora and ease management of these records. In the **Table** field of the Similarity Definition form, select only those inputs for similarity that will be available at prediction time for problem records. You can select more inputs in the **Test Table** field, if required, for comparison. It is best to start with similar fields for both the **Table** and **Test Table** fields.

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The **Filter** field conditions determine the search window for past resolved problem records. Configure the filter conditions to optimize for the best set of resolved problem records to search within. This includes many considerations, such as, time frame, location, category where problem records are relevant, and more.

f. Click **Submit & Train** to create your similarity solution record and train it.
Alternatively, you can click **Submit** to save your similarity solution record and return to train it later.

5. Evaluation and tune your model.

Make sure you run the **Start Skill Prediction** scheduled job every day#o start predicting skills for incidents or agents.

**Note:**
By default, this scheduled job is disabled. When enabled, it is set to run daily at 1:00 AM on all incidents resolved the previous day. The skills are then added to the User Predicted Skill [sn_sre_user_predicted_skill] table and Task Predicted Skill [sn_sre_user_predicted_skill] table.

If you have a similarity score above 60, but the two problem records do not look similar, you may want to create another model, word corpus, or both by changing inputs and filters. Keep in mind that modifying the solution definition will help you create a new solution, but it will invalidate the previous solution.

If you want to revert back to the previous solution definition, you will have to reset the parameters and retrain the solution. Therefore, first try creating a new similarity model before creating a new word corpus.

If you want to adjust the score for your similarity solution, see Update your similarity score threshold.

6. Once you have a satisfactory model, test the similarity solution prediction.
You can manually provide inputs and select the top similar results outcome values.
7. Once you have tested the behavior, configure the user experience layout to show attributed results and actions performed on the results.
You can configure these results and actions via Workspace UI for Agent assist or via the ServiceNow AI Platform for Contextual Search. Configure actions and search context though **Tables** configuration and user experience and card layout through **Contextual Search** > **Search Result Display Configuration**.
8. Integrate trained models by exporting them to production.

**Note:**
For details regarding trained use case integration implementation, refer to Predictive Intelligence Workbench integration and customization.

9. Monitor similarity results and ensure IT agents are providing useful feedback.

The base-system Predictive Intelligence experience includes a built-in feedback mechanism to discern if the similarity results are useful. Train your IT agents to provide feedback, both online and offline, to capture this data for future reporting. Since this is an unsupervised algorithm, you may need to acquire periodic feedback from the IT agents to check that the similarity model is still providing satisfactory results. This feedback is the only way to determine if the model has drifted and requires new training. Ensure that part of your implementation and

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integration strategy, as well as your change management process, includes training IT agents to provide similarity results feedback.

10. Communicate the value of Predictive Intelligence to your stakeholders by linking business key performance indicators (KPIs) to machine learning metrics.

    Select one or more KPIs that you think is most beneficial to your IT agents. Create a Performance Analytics dashboard showing the trend of these KPIs. The “likes” you get from your IT agents via the feedback mechanism helps you communicate the value of Predictive Intelligence.

    For information regarding the Predictive Intelligence workbench dashboard, refer to ITSM Predictive Intelligence Workbench dashboard.

## Manage ITSM Predictive Intelligence Workbench use cases

View your ITSM Predictive Intelligence Workbench use cases to monitor model performance and reevaluate the associated models, if necessary. You can also continue setup of models you started, but did not complete.

### Before you begin

Role required: piwb_admin or piwb_manager

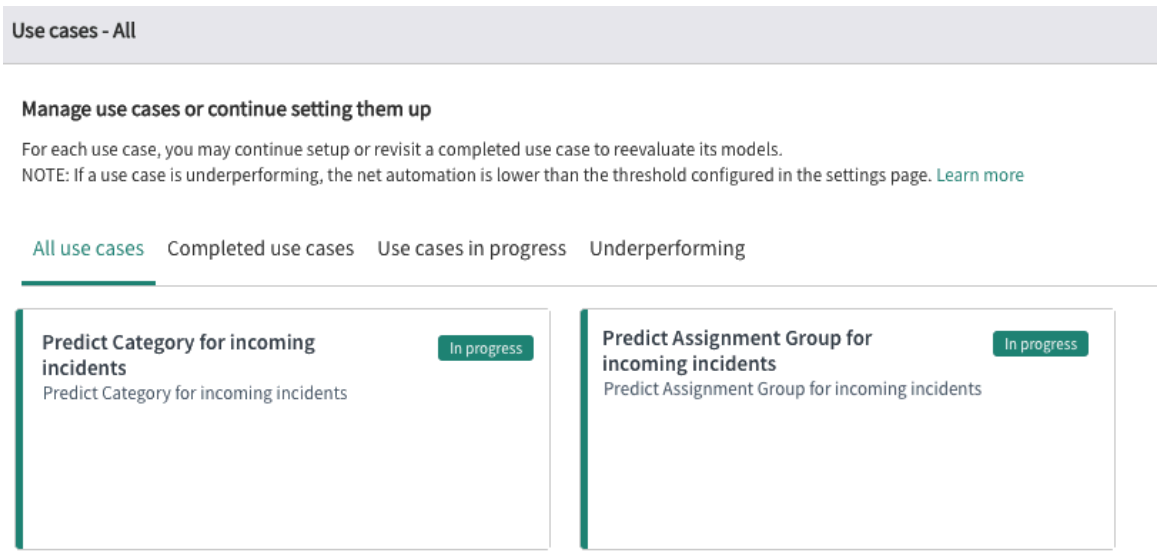
### About this task

Via the Models detail page you can access the **Test** tab to perform the following actions:

- Perform single or batch tests on model versions.
- Export version test results as .csv files and mark versions as active.
- Filter the number of versions based on date range.
- Monitor testing progress with notifications via the guided process.

### Procedure

1. Navigate to **Predictive Intelligence Workbench** > **Use Cases** > **All**.
   The **Use Cases - All** page opens displaying all use cases. The status of the use case is depicted on the card, for example, **In progress**. Other statuses include, **Completed** and **Monitoring**.




2. Click a use case to continue with implementation.

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Or you can evaluate performance if the use case is in the **Monitoring** state.

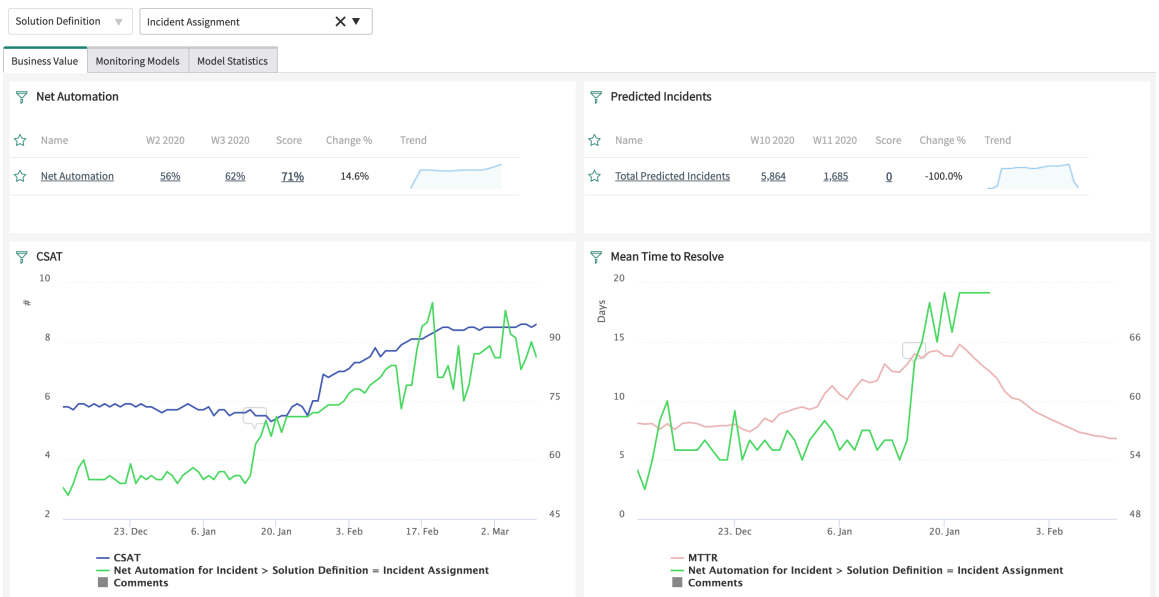
**Note:**
If a use case is under performing, the net automation is lower than the threshold configured in the Settings page. See Configure ITSM Predictive Intelligence Workbench settings.

## ITSM Predictive Intelligence Workbench dashboard

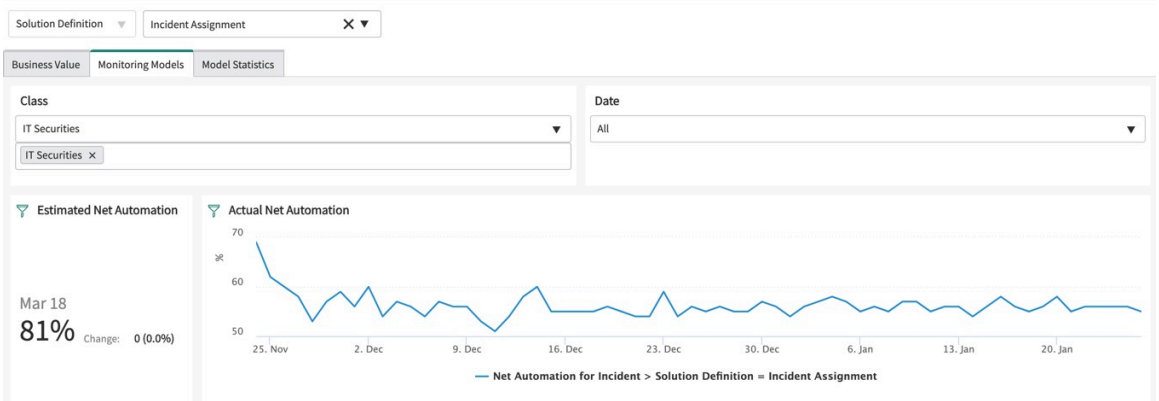
ITSM Predictive Intelligence Workbench provides the Predictive Intelligence for Incidents dashboard to enable you to measure the value of using machine learning to automate your IT business processes. Monitor use case models and view associated statistics. Effectively demonstrate business value to stakeholders with dashboard views.

Know exactly what stage your model workflows are in with automated comments on specific ServiceNow® Performance Analytics indicators. Comments appear on the **Actual Net Automation** indicators. Model stages comments include, when the model is integrated, when an integration is removed, when an existing model is changed to a new model, and when retraining is complete.

### Business Value tab




### Monitoring Models tab




You can view the Net Automation Threshold graph on the **Monitoring Models** tab. This threshold is a computation of the difference between estimated net automation and the underperformance

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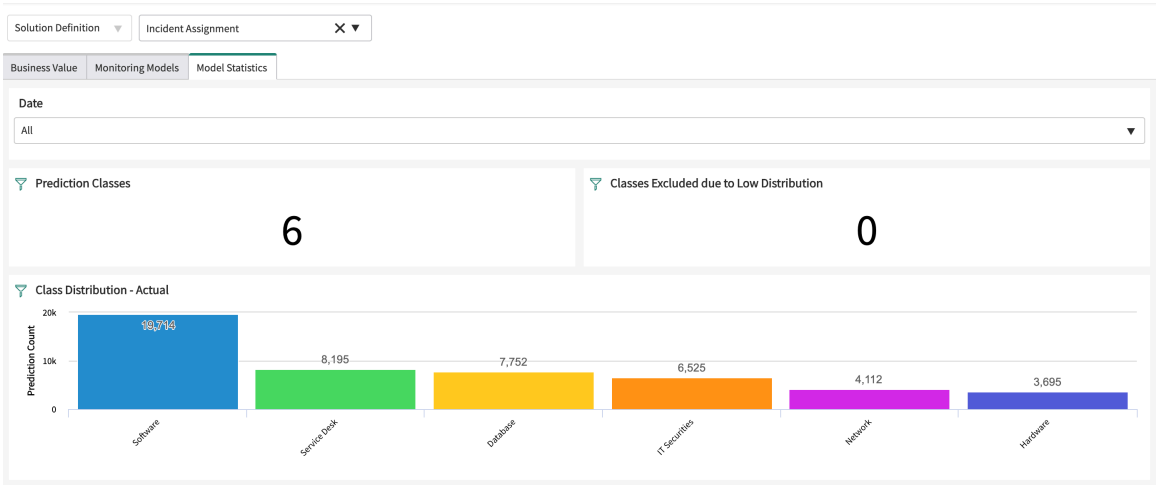
property values. Thresholds are calculated daily and notifications are sent to stakeholders when thresholds are breached.

View automatic comments on the **Actual Net Automation** indicator at various stages of the model monitoring. A comment is generated when any of the following model criteria exists:

- Model is integrated
- Model integration is removed
- Existing model is changed to a new model
- Integrated model is retrained

### Model Statistics tab




## End user and roles

| End user and goal | Required role | Benefits |
|---|---|---|
| Process architect, process owner, or machine learning advocate:<br><br>Visualize operational and automation metric performance.<br><br>Communicate machine learning value to stakeholders to increase the automation capabilities of predictive intelligence. | Predictive Intelligence Workbench manager or viewer<br><br>[piwb_manager]<br><br>[piwb_viewer] | Ability to measure the value of using **Predictive Intelligence** to automate ITSM processes. |

## Indicators

### Prediction Coverage for Incident

The score for this indicator is calculated according to the formula: `if ([[Number of attempted predictions based on Created Today for Incident]]==0){0}else{[[Number of applied predictions based on Created Today for Incident]]/[[Number of attempted predictions based on Created Today for Incident]]*100}`.

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**Number of predicted results based on final value date for incident**

The number of predicted results is based on the final value date for an incident. The score is measured daily as unit #.

**Net Automation for Incident**

The score for this indicator is calculated according to the formula: `[[Prediction Precision for Incident]]*[[Prediction Coverage for Incident]]/100`.

**Number of applied predictions based on Created Today for Incident**

Number of applied predictions based on Created Today for Incident is measured daily as unit #.

**Number of attempted predictions based on Created Today for Incident**

Number of attempted predictions based on Created Today for Incident is measured daily as unit #.

The goal for this indicator is to maximize the quality of predictions.

**Prediction Precision for Incident**

The score for this indicator is calculated according to the formula: `if ([[Number of predicted results based on final value date for Incident]]==0){0}else{[[Number of successful predictions not skipped based on final value date for Incident]]/[[Number of predicted results based on final value date for Incident]]*100}`.

**Estimated Net Automation**

Estimated net automation measured daily as unit %.

**Number of successful predictions not skipped based on final value date for Incident**

Number of successful predictions not skipped based on final value date is measured daily as unit #. It is the count on data source MLPredictorResults.FinalValueDate.Incident, which is using the table: ml_predictor_results.

**Number of Predicted for Incidents**

Number of Predicted for Incidents is measured daily as unit #. It is the count on data source MLPredictorResults.CreatedToday.Incident, which is using the table: ml_predictor_results.

## Breakdowns

Use Case.

## Data visualizations

| Title | Type | Source table | Description |
|---|---|---|---|
| Predictions Skipped | Single Score | sn_piwb_itsm_conte_db_ml_predictor_results | % Estimated Precision<br><br>Estimated precision measured as unit %, based off the data the model was trained on. |

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| Title | Type | Source table | Description |
|---|---|---|---|
| Predictions Skipped | Line  | sn_piwb_itsm_conte_db_predictions_skipped | Predictions Skipped results (num).<br><br>Number of ___, due to low confidence. |
| Class Distribution - Training Data | Bar  | sn_piwb_itsm_conte_db_predicted_classes | Predicted Classes Skipped (line). |
| % Estimated Precision | Single Score  | sn_piwb_itsm_conte_db_predictions_correct | Predictions Correct results (num).<br><br>Number of ___, comparing initial predicted value to final record value. |
| Classes Excluded due to Low Distribution | Single Score  | sn_piwb_itsm_conte_db_excluded_classes | Predicted Classes Excluded (line). |
| Class Distribution - Actual | Bar  | sn_piwb_itsm_conte_db_predictions_incorrect | Predictions Incorrect results (num).<br><br>Number of ___, comparing initial predicted value to final record value. |
| Predicted Correctly | Single Score  | sn_piwb_itsm_conte_db_predictions_correct | Predictions Correct results (line). |
| Predicted Correctly | Line  | sn_piwb_itsm_conte_db_class_distribution_ | Class Distribution results Training Data.<br><br>Distribution of classes in data that the solution was trained on. |
| Predicted Incorrectly | Single Score  | sn_piwb_itsm_conte_db_class_distribution_ | Class Distribution results Actual.<br><br>Current distribution of classes in live data. |
| Predicted Incorrectly | Line  | sn_piwb_itsm_conte_db_predicted_classes | Predicted Classes results<br><br>Number of values the model can return as a prediction. |
| Prediction Classes | Single Score  | sn_piwb_itsm_conte_db_classes_excluded | Classes Excluded due. |

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| Title | Type | Source table | Description |
|---|---|---|---|
| | | | Number of values the model was not confident enough to return as a prediction, due to not enough data. |

**Note:**
Regarding source tables, all indicators and reports are built off of newly added database views, combining ServiceNow platform Predictive Intelligence tables with Predictive Intelligence Workbench use case tables. With these new views, you can filter platform data by use case to better understand its impact on your metrics. All database views for this content application have a prefix of sn_piwb_itsm_conte_dbv.

# Performance Analytics ITSM Dashboards

The ITSM Dashboards content pack provides several Platform Analytics Solutions that contain preconfigured dashboards. This content pack also includes several dashboards and indicators of its own. These dashboards contain actionable data visualizations that help you improve your business processes and practices.

Platform Analytics data visualizations use Performance Analytics indicator data to show you data over time, helping you analyze your business processes and identify areas of improvement. With Platform Analytics Solutions, you can get value from Performance Analytics for your application with minimal setup. You can always create your own objects as well.

**Important:**
Set up and test Platform Analytics Solutions on a non-production instance before enabling them in production.

To enable the solution plugin for ITSM dashboards, an admin can navigate to **System Definitions** > **Plugins** and activate the Performance Analytics - Content Pack - ITSM Dashboards plugin.

## ITSM Dashboard solutions

The ITSM Dashboards plugin (com.snc.pa.itsm_dashboards) activates the following solutions, along with a set of additional dashboards:

- Change Management (com.snc.pa.change)
- Problem Management (com.snc.pa.problem)
- Incident SLA (com.snc.pa.sla)
- Major Incident Management (com.snc.pa.incident.mim)
- Spotlight - Incident Spotlight Content Pack (com.snc.pa.spotlight.incident)

  **Note:**
  For Performance Analytics Spotlight solutions, see Activate Analytics and Reporting Spotlight solutions.

- Fixed Costs (com.snc.fixed_costs)

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### Inactive dashboards

Some dashboards in this content pack are inactive when installed. Complete configuration and run data collection jobs before you activate these dashboards. You can activate dashboards in Dashboard Properties, accessible from the context menu. You have to assign an owner to the dashboard to activate it. For more information about configuring Platform Analytics Solutions, see Configure Platform Analytics Solutions

### Add Self-Service Analytic widgets to the ITSM dashboards

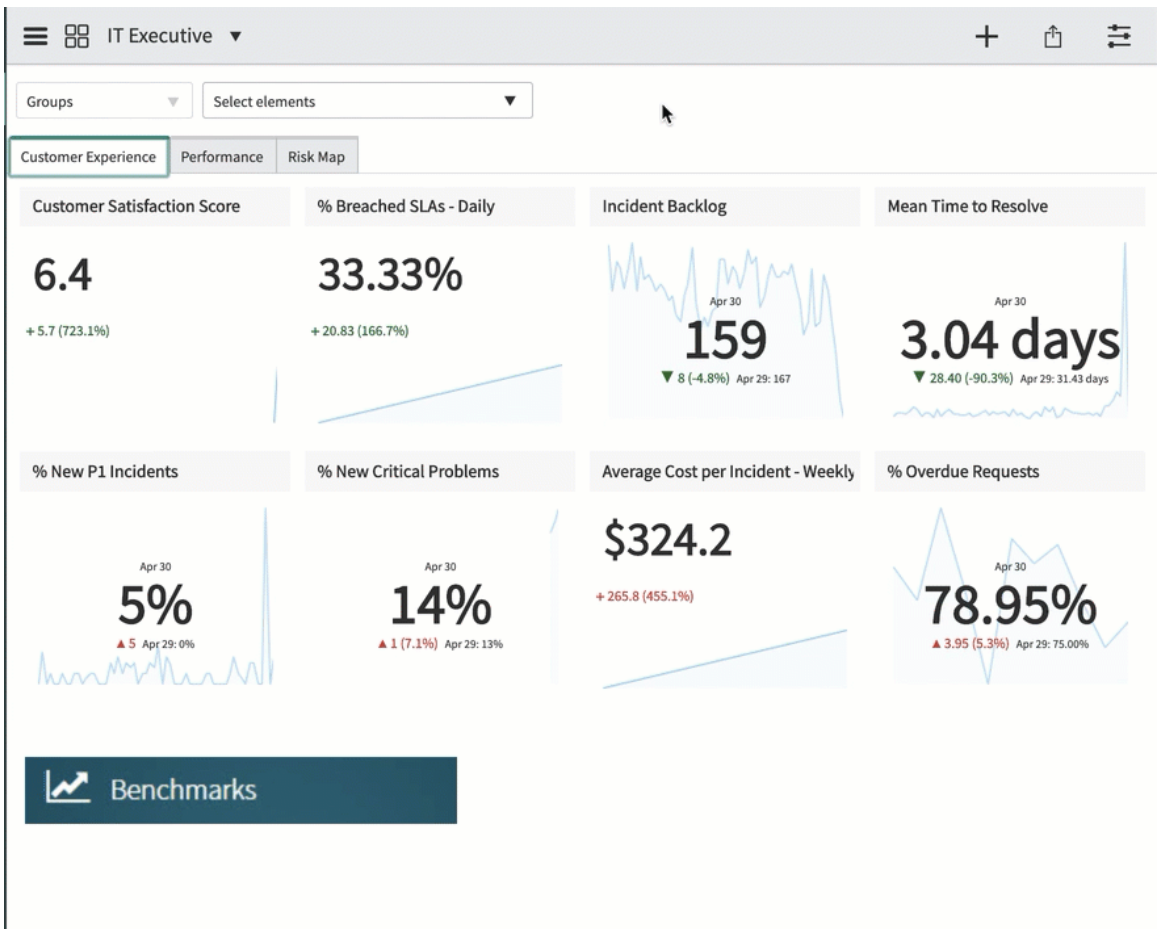
If you have Self-Service Analytics activated on an instance, you can add Self-Service analytics widgets to your Performance Analytics dashboards or a Service Portal. To obtain a ready-made set of indicators and breakdowns, activate the Self-Service Analytics PA (*com.snc.pa.self_service_analytics*) plugin. Find the Self-Service indicators through the Performance Analytics Admin Console, then create widgets and add them to your dashboard or portal. Also activate the [SSA] Self-Service Analytics data collection job.

**Related topics**

- Platform Analytics Solutions
- Activate your Performance Analytics subscription

## IT Executive dashboard

See a high-level view across all of ITSM.

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## End user and roles

| End user and goal | Required role |
| --- | --- |
| IT Executive | None |

## Indicators

**% of new critical incidents**

The result of the formula `( [[Number of new incidents > Priority = 1 - Critical]] / [[Number of new incidents]] ) * 100`

**% of new critical problems**

The result of the formula `( [[Number of new problems > Priority = 1 - Critical]] / [[Number of new problems]] ) * 100`

**% of open incidents not updated in last 5 days**

Number of open incidents not updated in last 5 days as a percentage of number of open incidents, according to the formula `( [[Number of open incidents not updated in last 5 days]] / [[Number of open incidents]] ) * 100`.

**% of open requested items before due date**

The result of the formula `( [[Number of open requested items before due date]] / [[Number of open requested items]] ) * 100`

**% of overdue requested items**

The result of the formula `100 - [[% of open requested items before due date]]`

**Active Breached SLAs Today**

The result in percentage of the formula `([[Number of breach task sla today]]/[[Number of active task sla]])*100`

**Average age open incidents**

The result, in days, of the formula `[[Summed age of open incidents]] / [[Number of open incidents]] / 24`

**Average Cost per Resolved Incident - Weekly**

The result of the formula `[[Cost of Incidents Resolved / By week SUM +]]/[[Number of resolved incidents / By week SUM +]]`. In other words, the weekly sum of the cost of resolved incidents, including partial weeks, divided by the weekly sum of resolved incidents, including partial weeks.

**Average reassignment of open incidents**

The result of the formula `[[Summed re-assignment of open incidents]] / [[Number of open incidents]]`

**Average resolution time of resolved incidents**

The result of the formula `[[Summed duration of resolved incidents]] / [[Number of resolved incidents]] / 24`

**ITSM Average Overall Customer Satisfaction**

Average of the normalized score for the Customer Satisfaction survey, as a result of the formula `[[ITSM normalized satisfaction score]] / [[ITSM survey instances]]`

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**Number of new incidents**

The number of incidents opened today

**Number of new problems**

The number of incidents opened today

**Number of open incidents**

Number of incidents with no Resolved date

**Number of open incidents not updated in last 5 days**

Number of open incidents with an Updated date of more than five days ago

**Number of open requested items**

Number of requests with a registration date on or before today and no closed date, or a closed date after today

**Number of open requested items before due date**

Number of requested items open today (before midnight on collection date) and a due date after midnight on the collection date.

**Number of resolved incidents**

Number of incidents with a value in the Resolved date field

The following indicators do not appear on the dashboard but are used in formulas:

**Cost of Incidents Resolved**

The daily sum of the Value field of incident_metric records where the Definition field value is Incident Resolution Fixed Cost.

**ITSM normalized satisfaction score**

Sum of the normalized score of metric results for the Customer Satisfaction survey

**ITSM survey instances**

Number of the survey instances of the Customer Satisfaction survey

**Number of active task sla**

The count of active SLA tasks on task_sla with a start time before today and a stop time after today.

**Number of breach task sla today**

The count of active SLA tasks on task_sla with a breach time before today

**Summed age of open incidents**

The sum of hours between the time an incident was opened and now

**Summed duration of resolved incidents**

The sum of hours between the time an incident was opened and the time it was resolved

**Summed reassignments of open incidents**

The summed reassignment count of all open incidents

## Breakdowns

- Age (Requested Item, Incident)
- Assignment Group
- Backordered (Requested Item)

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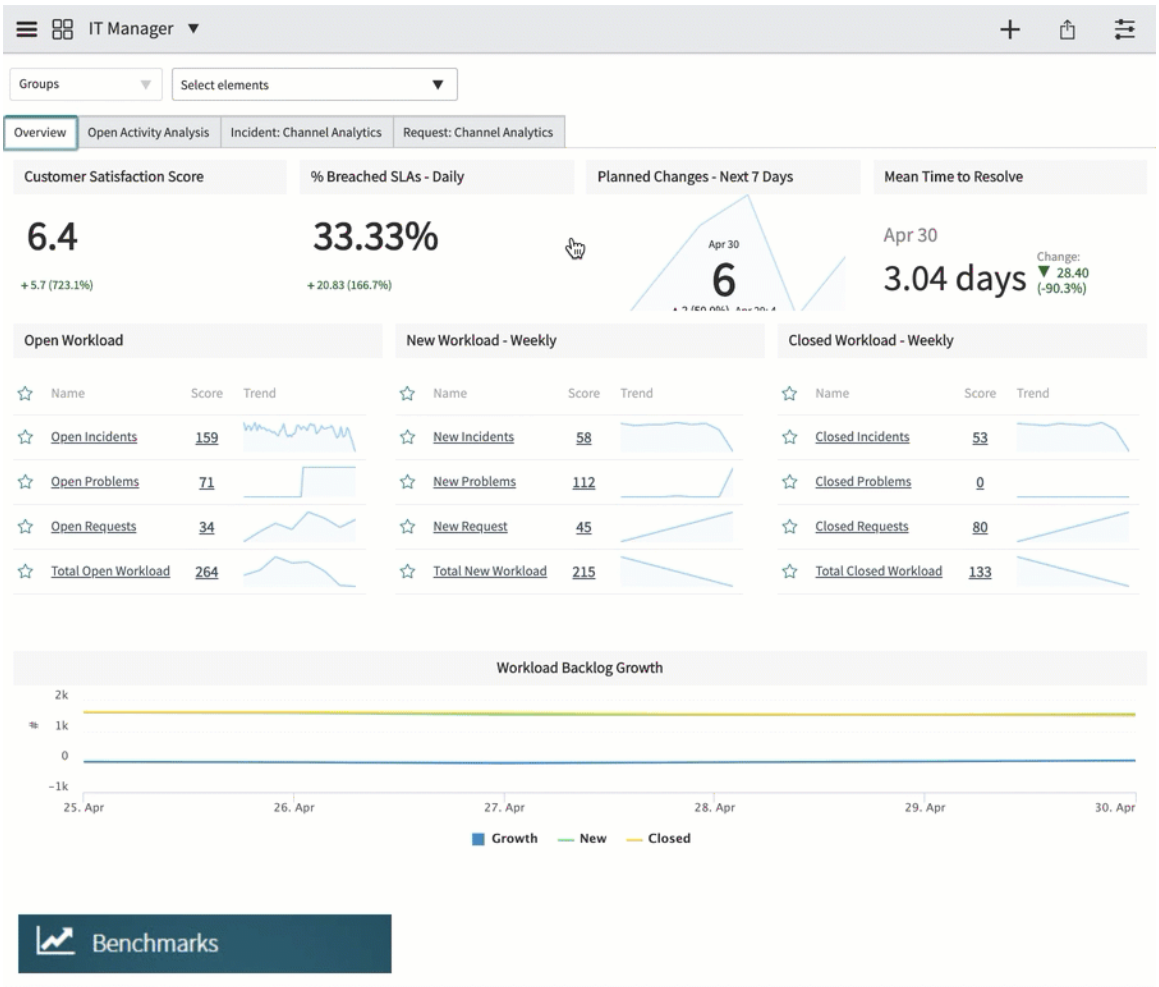
- Category (Incident)
- Contact Type (Incident)
- Item
- Opened by Department
- Priority (Requested Item, Incident, Problem)
- Requested by Department (Requested Item)
- SLA Definition
- Stage (Requested Item)
- State (Change, Request, Problem)

## IT Manager dashboard

Follow the daily and weekly progress of incidents, problems, and requests for your assignment groups.

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## End user and roles

| End user and goal | Required role |
| --- | --- |
| IT Manager - Needs to track the progress of their group in resolving incidents, problems, and requests | pa_viewer is required to see lists of indicators |

## Indicators

**% Closed Requests with Breached SLA**

The results of the formula `([[Number of Closed Requests with Breached SLAs]]/[[Number of closed requests]]) * 100`

**% of incidents resolved by first assigned group**

The results of the formula `( [[Number of resolved incidents by first assigned group]] / [[Number of resolved incidents]] ) * 100`

**% of open incidents missed SLA**

The percentage of open incidents that did not meet the SLA, as calculated by the formula `[[Number of incidents missed SLA]] / [[Number of open incidents]] * 100`

**% of open incidents not updated in last 5 days**

Number of open incidents not updated in last 5 days as a percentage of number of open incidents, according to the formula `( [[Number of open incidents not updated in last 5 days]] / [[Number of open incidents]] ) * 100`.

**% of open incidents with problem**

The result of the formula `[[Number of open incidents with problem]] / [[Number of open incidents]] * 100`

**% of open problems not updated in last 30 days**

The result of the formula `( [[Number of open problems not updated in last 30 days]] / [[Number of open problems]] ) * 100`

**% of open problems with at least one incident**

The result of the formula `[[Number of open problems with at least one open incident]] / [[Number of open problems]] * 100`

**% open and overdue incidents**

The result of the formula `( [[Number of open and overdue incidents]] / [[Number of open incidents that should be resolved in time]] ) * 100`

**% Resolved Incidents with Breached SLA**

The result of the formula `([[Number of Resolved Incidents with Breached SLAs]]/[[Number of resolved incidents]]) * 100`

**Active Breached SLAs Today**

The result in percentage of the formula `([[Number of breach task sla today]]/[[Number of active task sla]])*100`

**Average age of open problems**

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The result, in days, of the formula `[[Summed age of open problems]] / [[Number of open problems]] / 24`

**Average age of open requests**

The result, in days, of the formula `[[Summed age of open requests]] / [[Number of open requests]] / 24`

**Average age open incidents**

The result, in days, of the formula `[[Summed age of open incidents]] / [[Number of open incidents]] / 24`

**Average close time of requests**

The result, in days, of the formula `[[Summed duration of closed requests]] / [[Number of closed requests]] / 24`

**Average Cost per Incident**

The result of the formula `[[Cost of Incidents Resolved]]/[[Number of resolved incidents]]`, when the number of resolved incidents is more than zero.

**Average Cost per Request**

The result of the formula `[[Cost of Requests Completed]]/[[Number of completed requests]]`, when the number of completed requests is more than zero.

**Average Cost per Request - Weekly**

The result of the formula `[[Cost of Requests Completed / By week SUM +]]/[[Number of completed requests / By week SUM +]]`. In other words, the weekly sum of the cost of completed requests, including partial weeks, divided by the weekly sum of completed requests, including partial weeks.

**Average Cost per Resolved Incident - Weekly**

The result of the formula `[[Cost of Incidents Resolved / By week SUM +]]/[[Number of resolved incidents / By week SUM +]]`. In other words, the weekly sum of the cost of resolved incidents, including partial weeks, divided by the weekly sum of resolved incidents, including partial weeks.

**Average reassignments of open and overdue incidents**

The result of the formula `[[Summed reassignments of open and overdue incidents]] / [[Number of open and overdue incidents]]`

**Average resolution time of resolved incidents**

The result of the formula `[[Summed duration of resolved incidents]] / [[Number of resolved incidents]] / 24`

**Closed workload**

The result of the formula `[[Number of closed incidents]] + [[Number of closed problems]] + [[Number of closed requests]]`

**ITSM Average Overall Customer Satisfaction**

Average of the normalized score for the Customer Satisfaction survey, as a result of the formula `[[ITSM normalized satisfaction score]] / [[ITSM survey instances]]`

**New workload**

The result of the formula `[[Number of new incidents]] + [[Number of new problems]] + [[Number of new requests]]`

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**Number of closed complete requests**

Number of requests closed today as complete (State = Complete)

**Number of closed incidents**

The number of incidents closed today

**Number of closed problems**

The number of probems closed today

**Number of closed requests**

The number of requests closed today

**Number of Closed Requests with Breached SLAs**

Count Distinct of SLA tasks [task_sla] with a task type of Request, Has breached = true, Stage != Cancelled, and closed today

**Number of new incidents**

The number of incidents opened today

**Number of new problems**

The number of incidents opened today

**Number of new requests**

The number of incidents opened today

**Number of open changes planned in the next 7d**

The number of Change Request [change_request] records opened today with a Planned Start date between today and the end of next week

**Number of open incident unassigned**

The number of open incidents not assigned to anyone

**Number of open incidents**

Number of incidents with no Resolved date

**Number of open incidents not updated in last 5 days**

Number of open incidents with an Updated date of more than five days ago

**Number of open and overdue incidents**

The number of open incidents related to an SLA task that is not in the Cancelled stage (task_sla.stage) and has an actual elapsed percentage greater than 100% (task_sla.percentage).

**Number of open incidents that should be resolved in time**

The count distinct of open incidents associated with an SLA task [task_sla] that is not in the Cancelled stage.

**Number of open incidents with problem**

The number of open incidents with a value in the Problem field

**Number of open problems**

The number of problems opened on or before today and not yet closed.

**Number of open problems not updated in last 30 days**

Number of open problems with an Updated date of more than 30 days ago

**Number of open problems with at least one open incident**

The count distinct of open incidents where the Problem Active field value is true.

**Number of open requests**

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Number of requests opened on or before today and not yet closed

**Number of requests closed after due date**

Number of requests that are closed after request due date (sc_request.closed_at > sc_request.due_date)

**Number of resolved incidents**

Number of incidents with a value in the Resolved date field

**Number of resolved incidents by first assigned group**

Number of incidents that were resolved by the first group assigned to them

**Open workload**

The result of the formula `[[Number of open incidents]] + [[Number of open problems]] + [[Number of open requests]]`

**Predicted Average Cost of Open Incidents**

The result of the formula `[[Cost of Incidents Resolved / By week SUM +]]/[[Number of resolved incidents / By week SUM +]] * [[Number of open incidents]]`

**Predicted Average Cost of Open Requests**

The result of the formula `[[Cost of Requests Completed / By week SUM +]]/[[Number of requests completed / By week SUM +]] * [[Number of open requests]]`

**Workload backlog growth**

The result of the formula `[[New workload]] - [[Closed workload]]`

The following indicators do not appear on the dashboard but are used in formulas:

**Cost of Incidents Resolved**

The daily sum of the Value field of incident_metric records where the Definition field value is Incident Resolution Fixed Cost.

**Cost of Requests Completed**

The daily sum of the Value field of sc_request_metric records where the Definition field value is Request Resolution Fixed Cost .

**ITSM normalized satisfaction score**

Sum of the normalized score of metric results for the Customer Satisfaction survey

**ITSM survey instances**

Number of the survey instances of the Customer Satisfaction survey

**Number of active task sla**

The count of active SLA tasks on task_sla with a start time before today and a stop time after today.

**Number of breach task sla**

The count of active SLA tasks on task_sla with a breach time before today

**Number of incidents missed SLA**

The number of records on the incident_sla table created on or before today, not yet closed, and that have breached SLA

**Number of open incidents with problem**

The count of open incidents with a Problem referenced in the Problem field.

**Number of Resolved Incidents with Breached SLAs**

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Number of Incident-type SLA tasks that are not cancelled, that were resolved today, and where Has Breached is true

**Summed age of open incidents**

The sum of hours between the time an incident was opened and now

**Summed age of open problems**

The sum of hours between the time a problem was opened and now

**Summed age of open requests**

The sum of hours between the time a request was opened and now

**Summed duration of closed requests**

The sum of hours between the time a request was opened and the time it was closed

**Summed duration of resolved incidents**

The sum of hours between the time an incident was opened and the time it was resolved

**Summed reassignments of open and overdue incidents**

The summed reassignment count of all open Incident SLAs

## Breakdowns

- Age (Request, Incident, Problem, and Change)
- Assignment Group
- Category (Incident, Change)
- Contact Type (Incident, Request)
- Location
- Priority (Request, Incident, Problem, and Change)
- Risk (Change)
- SLA
- SLA Definition
- State (Change, Request, Problem)

## Define fixed costs for IT Manager dashboard

Define generic industry-based fixed costs to analyze impact by channel using the IT Manager dashboard in ITSM Performance Analytics Solutions.

### Before you begin

Role required: admin

### About this task

Use the fixed cost model to analyze the cost for incidents and requests across channels (email, phone, self-service, walk-up, virtual agent) for cost management. For example, view current costs per channel and verify whether costs are reduced over time after implementing a solution.

Cost definitions are stored in the Fixed Cost Definitions [fixed_cost_definitions] table.

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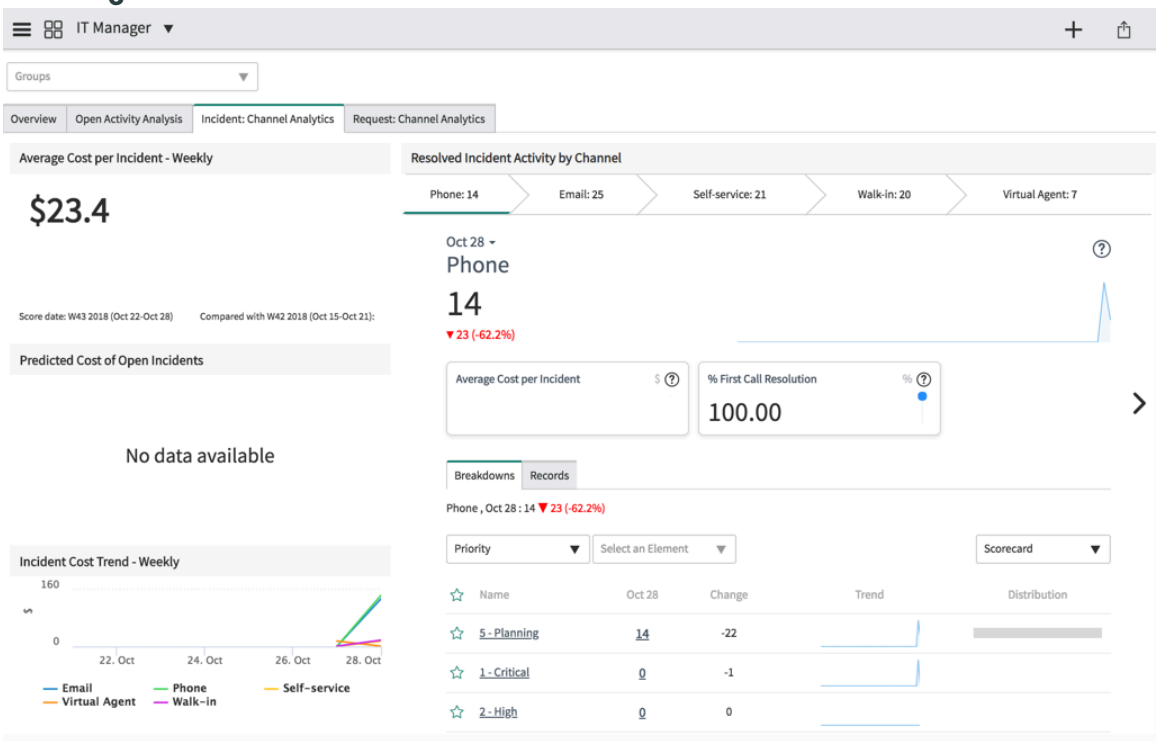
## IT Manager Fixed Costs




## Incident and request KPIs

| Area | KPI |
|---|---|
| Volume | Total number of incidents<br>Total number of requests |
| FCR | Number of incidents resolved on first assignment<br>Number of requests resolved on first assignment |
| MTTR | Average time to resolve an incident<br>Average time to resolve a request |
| SLA | % of incidents that breached SLAs<br>% of requests that breached SLAs |
| CSAT | Average customer satisfaction score |
| Cost | Average cost to resolve an incident<br>Average cost to resolve a service request |

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Breakdown:

- Assignment group
- Agent
- Skill

### Procedure

Navigate to **All** > **Fixed Costs** > **Define Fixed Cost** (see table for field descriptions).

**Fixed Cost Definitions form**

| Field | Description |
|---|---|
| Short Description | Description of the cost. |
| Table | Table that contains the field for the fixed cost condition. |
| Filter | Condition for the fixed cost definition, if applicable. |
| Cost Value | Currency type and fixed cost value. |
| Category | Category of the fixed cost.<br>• Total Fully Loaded Cost<br>• Per Hour Cost |
| Source of the Cost | Source of the fixed cost.<br>• HDI<br>• ServiceNow<br>• Manual |
| Active | Check box to activate the fixed cost definition. Clear the check box to disable. |

## Example: Cost per Network Incident

**Fixed Cost Definitions form**

| Field | Value |
|---|---|
| Short Description | Incident in Network Category |
| Table | Incident [incident] |
| Filter | Category is Network |
| Cost Value | $15.56 |
| Category | Total Fully Loaded Cost |
| Source of the Cost | HDI |
| Active | Selected |

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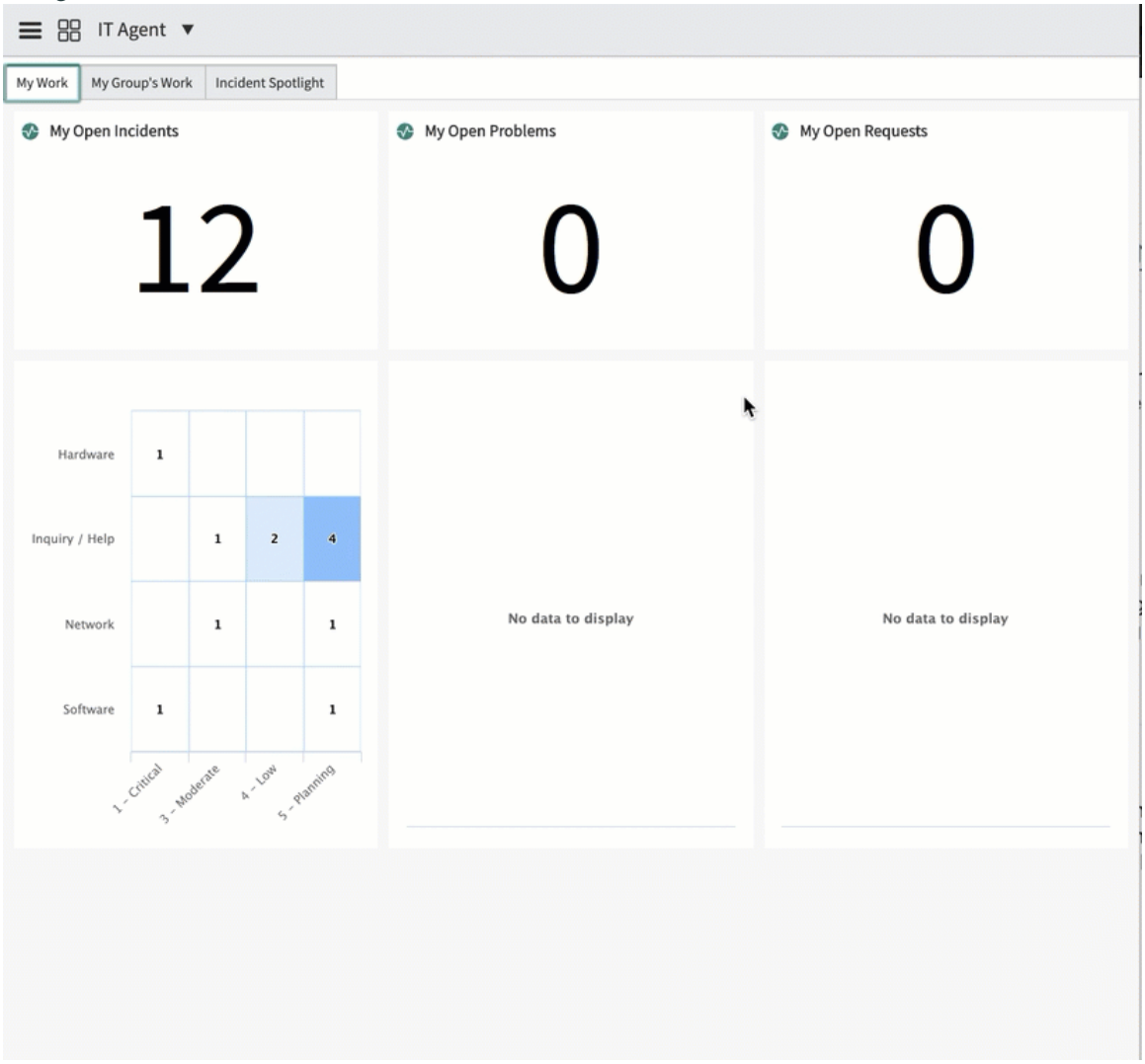
# IT Agent dashboard

View the open incidents, problems, and requests that belong to you and your assignment groups through personalized reports. You can also see which incidents that belong to your assignment groups exceed the Spotlight threshold.

**IT Agent dashboard**




## End user and roles

| End user and goal | Required role |
|---|---|
| IT Agent - see only those incidents, problems, and requests that concern you | None, but to see Spotlight reports you need the pa_spotlight_viewer role. |

## Data visualizations

| Title | Type | Description |
|---|---|---|
| Open unassigned incidents | Single score | Incidents that belong to one of your assignment groups do |

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| Title | Type | Description |
| --- | --- | --- |
| | Single score icon | not have a person assigned to them |
| Open requests | Single score<br>Single score icon | Open requests that belong to you or one of your groups |
| Critical incidents | Single score<br>Single score icon | Incidents with a Priority of 1 - Critical that belong to you or one of your groups |
| My open problems - Heatmap | Heatmap<br>Heatmap icon | Your problems by assignment group and priority |
| Incidents above Spotlight threshold | Single score<br>Single score icon | Incidents belonging to one of your groups that meet enough Spotlight criteria to exceed the Spotlight threshold |
| My open requests | Single score<br>Single score icon | Open requests that belong to you |
| My open incidents - Heatmap | Heatmap<br>Heatmap icon | Your incidents by assignment group and priority |
| Open incidents | Single score<br>Single score icon | Open incidents that belong to you or one of your groups |
| Open incidents not updated in last 7 days | Single score<br>Single score icon | Open incidents that belong to you or one of your groups and have not been updated for the last 7 days |
| My open requests - Heatmap | Heatmap<br>Heatmap icon | Your requests by assignment group and priority |
| Open problems | Single score | Open problems that belong to you or one of your groups |

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| Title | Type | Description |
| --- | --- | --- |
| | Single score icon | |
| Spotlight incidents P1 - Critical | Single score<br>Single score icon | Incidents belonging to your group that exceed the Spotlight threshold and have a priority of P1 - Critical |
| My open problems | Single score<br>Single score icon | Open problems that belong to you |
| Spotlight incidents - Unassigned | Single score<br>Single score icon | Incidents belonging to one of your groups that exceed the Spotlight threshold and have no one assigned to them |
| My open incidents | Single score<br>Single score icon | Open incidents that belong to you |
| Incidents Spotlight - List | List | A list of all incidents that one of your groups own and that exceed the Spotlight threshold |

# ITSM Mobile Agent

The ServiceNow® ITSM Mobile Agent app delivers base system mobile-first experiences designed for IT agents to triage, act on, and resolve incidents on the go.

## ITSM Mobile Agent overview

Watch this three-minute video to learn more about ITSM Mobile Agent. This video covers the ITSM Mobile Agent app overview, installation, and information on how to access the app.

Overview of the ITSM Mobile Agent application.

## Get started

ITSM Mobile Agent assists IT agents with an intuitive interface to manage all their work, view schedules, check who is on call, respond to major incidents, and more. The agent can also view incident details and activity; edit an incident and add comments; resolve, assign, or reassign an incident; and view incident notifications.

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| Explore | Configure | My work applet |
| --- | --- | --- |
|  |  |  |
| Learn about ITSM Mobile Agent concepts, features, and User roles. | Configure environment tools and user access. Configure and enable push notifications. | Create and manage incidents assigned to you. View your shift schedule and request time off. |
| **My team applet** | **Manage major incidents** | **Reference** |
|  |  |  |
| Manage groups and shifts, view group performance and time-off requests. Resolve conflicts and gaps by providing coverage. | View active major incidents, proposed major incidents, candidates, and the Major incidents dashboard. | Settings and domain information about ITSM Mobile agent. |

### Troubleshoot and get help

- Search the Known Error Portal for known error articles
- Contact Customer Service and Support

## Exploring ITSM Mobile Agent

ITSM Mobile Agent provides IT agents with the access needed to perform the various IT Service Management (ITSM) tasks on the go with this mobile application.

### ITSM Mobile Agent overview

ITSM Mobile Agent is a mobile application designed for ServiceNow users who work in IT Service Management (ITSM) roles. It enables IT agents to perform various ITSM tasks and provide support from their mobile devices. The mobile agent app provides features such as ServiceNow® Incident Management, ServiceNow®, Problem Management, ServiceNow® Change Management, and ServiceNow® Service Catalog access. With ITSM Mobile Agent, IT agents can stay connected and collaborate on IT tasks while on the go.

### ITSM Mobile Agent workflow

A general overview of the typical ITSM Mobile Agent workflow:

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1. Incident creation: When a user encounters an issue or incident, they can use ITSM Mobile Agent to create an incident ticket. The ticket can include details such as a description of the problem, priority level, and any relevant attachments.
2. Notification and assignment: After the incident ticket is created, the mobile agent app sends a notification to the assigned IT agent or the appropriate support group. This notification ensures that the incident is promptly handled.
3. Incident management: The assigned IT agent can view the incident details, communicate with the user through the chat functionality of the app, and perform any necessary troubleshooting steps. If necessary, the IT Agent can propose an incident to Major incident.
4. Resolution and closure: The IT agent can resolve the incident with the appropriate resolution code and description.
5. Reporting and analytics: The ITSM Mobile Agent also enables managers to access reports and analytics related to the incident management activities. They can review metrics, identify trends, and gain insights into the performance of the IT service management process.

## ITSM Mobile Agent benefits

| Benefit | Feature | Users |
|---|---|---|
| Incident management | My incidents | All |
| Real-time notifications | All logged-in users receive in-app and push notifications. To configure real-time notifications, see Configurable actionable notifications for ITSM Mobile Agent. | All |
| Team Dashboard and performance metrics | My team dashboard and Performance metrics | Managers |
| Major incident management | Managing major incidents using Major Incident applet | Agent, Managers |
| AI search | AI Search in ITSM Mobile Agent | All |
| Collaboration services | Collaboration Services for ITSM Mobile Agent | Administrator |

## User roles and personas in ITSM Mobile Agent

Learn about the various user roles and persona used to log in to ITSM Mobile Agent.

ITSM Mobile Agent supports the following user persona.

### itil role

The IT agent is the primary user of the ITSM Mobile Agent application. IT agents or technicians responsible for handling and resolving IT incidents and service requests have the itil role

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assigned. They have access to features such as incident management, asset management, knowledge base, ticket management, and On-call schedules. They can create, update, and resolve tickets, view their schedules and shift details, and create time off requests.

An itil user might also have more than one role assigned to them. For example:

- sn_incident_write
- sn_change_write
- sn_request_write

Apart from the itil role, users might have the following additional roles, based on the various features available in ITSM Mobile Agent.

**Additional ITSM Mobile Agent roles**

| Feature | User role |
|---|---|
| Major incidents | major_incident_manager |
| Hardware asset management | approver_user: |
| On-call Scheduling | rota_manager |
| Shift Planning | sn_shift_planning.admin |

## ITSM Mobile Agent features and plugins

Learn about the plugins used in ITSM Mobile Agent.

The ITSM Mobile Agent application offers various plugins that can enhance functionality and provide additional features. Some of the common plugins used with ITSM Mobile Agent include the following:

- com.glideapp.itom.snac [Event management]
- com.sn_hamp [Hardware asset management]
- com.sn_shift_planning [Shift Planning]
- com.sn.slack.ahv2 [Slack spoke-store]
- com.snc.iam [Incident communications management]
- com.snc.incident.mim [Major incident management]
- com.snc.notify [Notify]
- com.snc.on_call_rotation [On-call Scheduling]
- com.snc.pa.incident.mim [Performance Analytics - Major Incident Management]
- com.snc.pa.itsm_dashboards [Performance Analytics - ITSM Dashboards]
- com.snc.tcm_collab_hook [Collaboration services - store]

## AI Search in ITSM Mobile Agent

Intelligent query features enable agents to quickly find the required answers in ITSM Mobile Agent.

Using AI search, agents can easily search find the following records:

- Incidents (MIM, Breached Incidents, At Risk)
- Change tasks

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- Catalog tasks
- Changes
- System users
- Knowledge base articles

You can also toggle between Zing search and AI search if needed.

AI Search in ITSM Mobile Agent offers the following features:

- Navigation tab filters: Filters help users narrow down results on a site.
- Auto-complete: As the user enters text, AI Search predicts the query and helps formulate the user's question.
- Auto-correct typos: Typos are auto-corrected based on indexed content.
- Synonym handling: The search engine also looks for words similar to the search term.
- Genius cards: Genius result cards display the most relevant answers.

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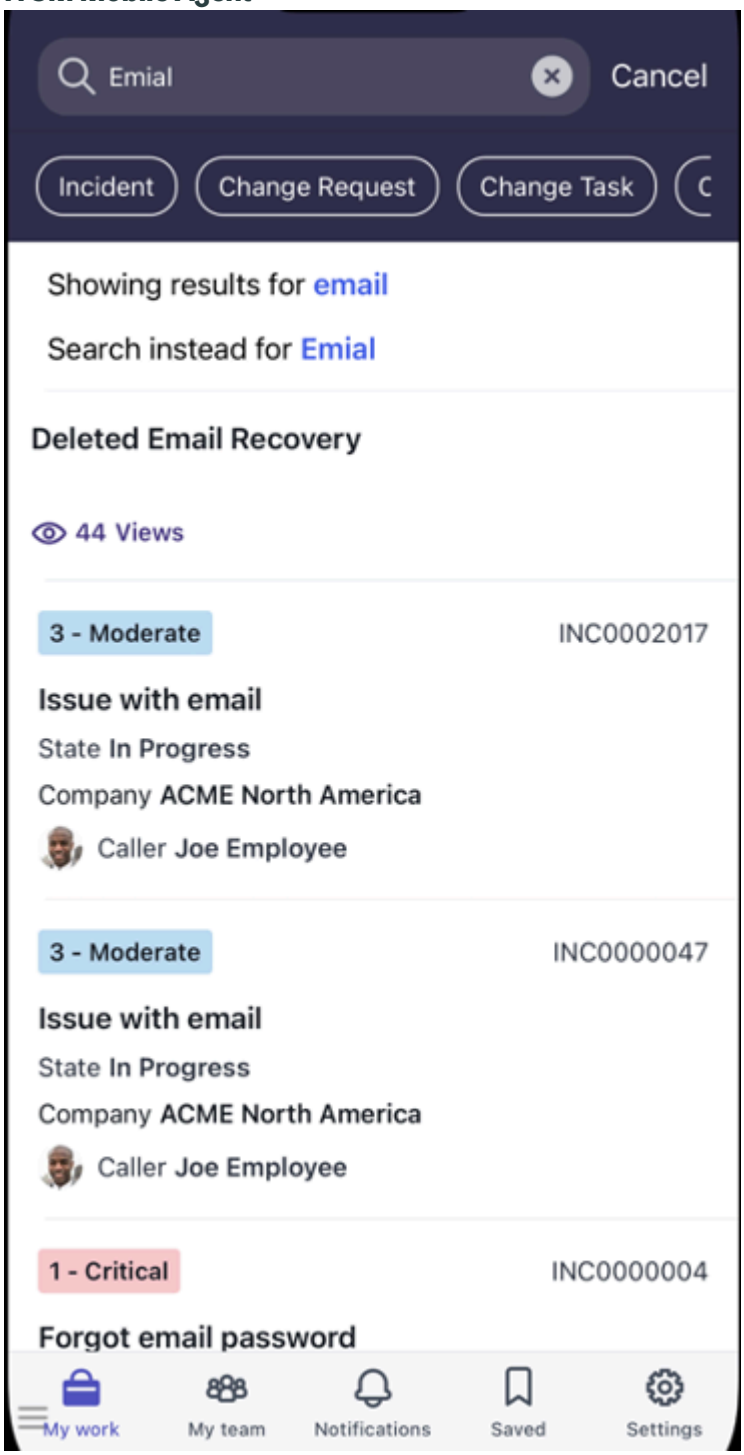
**ITSM Mobile Agent**




For information about AI search, see AI Search.

For information about AI search in mobile, see AI Search in mobile.

The following configurations are added for AI search experience in ITSM Mobile Agent:

- A search application configuration, [AIS] ITSM Mobile Agent Search Configuration. For information about search application configurations, see Search application configurations.
- A search profile, ITSM Mobile Agent Search Profile. For information about search profiles, see Search profiles.

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### Get started with AI search in new or zBoot instances

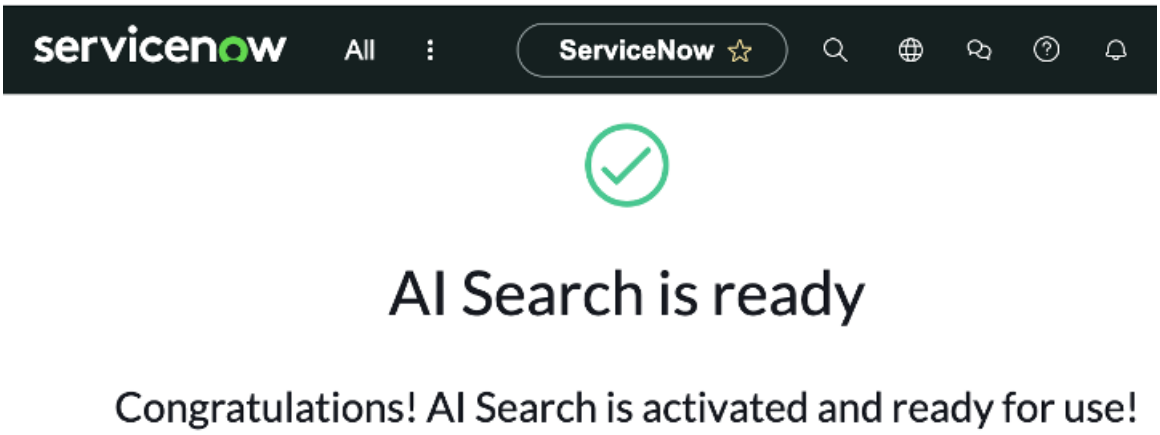
Enable intelligent query features that help agents to quickly find the required answers in ITSM Mobile Agent in new or restarted instances.

#### Before you begin
Role required: ais_admin or admin

#### About this task
AI search is enabled by default in the base system for new and restarted instances. You must publish the associated search profile.

#### Procedure
1. To ensure AI search is enabled, navigate to **All** > **AI Search** > **AI Search Status**.

**AI Search**




2. Publish the AI search-related search profile.
   a. Navigate to **All** > **AI Search** > **Search Experience** > **Search Profiles**.
   b. Click **ITSM Mobile Agent Search Profile**.
   c. Click **Publish**.

### Get started with AI search in upgraded instances

Enable intelligent query features that help agents to quickly find the required answers in ITSM Mobile Agent in upgraded instances.

#### Before you begin
Role required: ais_admin or admin

#### About this task
You can get started with AI search in upgraded instances by using the AI search configuration in the base system.

#### Procedure
1. Enable AI search.
   a. Navigate to **All** > **AI Search** > **AI Search Status**.
   b. Click **Request AI Search**.
2. Activate the AI Search Index Sources (Id: com.glide.ais.index_sources) plugin.

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a. Navigate to **All** > **System Definition** > **Plugins**.

b. Search for the AI Search Index Sources (Id: com.glide.ais.index_sources) plugin.

c. Click **Activate**.

3. Index all search sources.

a. Navigate to **All** > **AI Search** > **AI Search Index** > **Indexed Sources**.

b. Select all data sources.

c. From the **Actions on selected rows** drop down, select **Index All Tables**.

4. Publish the AI search-related search profile.

a. Navigate to **All** > **AI Search** > **Search Experience** > **Search Profiles**.

b. Click **ITSM Mobile Agent Search Profile**.

c. Click **Publish**.

5. Select the AI search-related search application configuration for the global search record.

a. Navigate to **sys_sg_global_search.list**.

b. From the list of search configurations, Click **ITSM Mobile Agent Search**.

c. For the **Search Application Configuration** field, select **[AIS] ITSM Mobile Agent Search Configuration**.

d. Click **Update**.

**Note:**
If you do not want to use the AI search configuration in the base system, migrate your search profiles and other configurations from zing search to AI search. Perform the steps mentioned in Configure AI Search for mobile devices.

### Switch back to Zing search in ITSM Mobile Agent

If AI search is already enabled in ITSM Mobile Agent, enable Zing search configuration to use your own search profiles and configurations. It will enable Zing search in ITSM Mobile Agent and all workspaces.

#### Before you begin

Role required: admin

For information about Zing search in mobile, see Global search for mobile.

#### Procedure

1. Navigate to **sys_properties.list**.
2. Click **New**.
3. On the System property form, add the following information.
   - Name: glide.ais.global_search.use_zing
   - Value: true
4. Click **Submit**.

## Enable dark theme in ITSM Mobile Agent

Enable a dark theme or mode in ITSM Mobile Agent. This option is commonly used to alleviate eye strain and improve readability.

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### Before you begin
Role required: itil, rota_manager, sn_incident_write

### Procedure

1. Open the ITSM Mobile Agent and tap **More**.
2. Tap **Settings** > **Preferences** > **Theme**.
3. Tap **Dark**.

## Filter records

Set additional filters to limit the number of records that are displayed on a screen. Filtering records in the mobile app works like filtering with a condition builder on the ServiceNow AI Platform.

### Before you begin
Role required: itil or group manager

### Procedure

1. To further refine your search results, or to enter additional filter criteria on any list of records that is displayed, tap the filter icon (  ).
2. On the Filters screen that appears, tap the arrow on a field to expand it.
3. From the options available, tap the check box or tap an option for your filter.
   For many of the filters, you can select more than one option.
4. Tap the back icon (  ) or **DONE** to save your changes to a field.
   The criteria you chose displays on the Filters screen. The number of records that match your criteria also display on the top of the screen. Tap **Clear** or **RESET** to remove any filters and restore the default setting.
5. **Optional:** Repeat steps 1- 4 with the Filters screen displayed to continue setting your filter criteria.
6. Tap the and icon (  ) after you set all criteria to create AND conditions.
7. Alternatively, tap the OR icon (  ) to create OR conditions.
8. After you have added all the criteria you want, tap **DONE**.
   The incident records that match your filter criteria display on the screen.

## Collaboration Services for ITSM Mobile Agent

Collaboration services provide a way to communicate and collaborate in real time. You can directly use a collaboration tool from an incident, incident task, and major incident records.

Install the Collaboration services (sn_tcm_collab_hook), Notify (com.snc.notify), Notify connector for Microsoft Teams (com.sn.ms_teams) applications in your instance to use collaboration services on ITSM Mobile Agent.

- Collaboration with incidents

  Initiate and manage the collaboration for incident records from the ITSM Mobile Agent app.

- Collaboration with incident tasks

  Initiate and manage the collaboration for incident task records from the ITSM Mobile Agent app.

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- Collaboration with major incidents

  Initiate and manage the collaboration for major incident records from the ITSM Mobile Agent app.

### Add deep linking support to ITSM Mobile Agent

Deep linking enables instances to support direct communication to a messaging application from a particular record in the system.

#### Before you begin
Role required: itil, itil_admin, or admin

#### About this task
You need to assign the deep linking support on the Mobile Studio.

#### Procedure

1. Log in to your instance.
2. In the Navigation filter, enter `sys_properties.list`.
   The entire list of properties in the System Properties [sys_properties] table appears.
3. Open the record for **glide.sg.allowed_external_deeplinks**.
4. In the form, match the following values:

**System Properties table**

| Field | Value |
|---|---|
| Name | glide.sg.allowed_external_deeplinks |
| Type | String |
| Value | Slack,Teams |

5. Click **Save**.

## Configuring ITSM Mobile Agent

Plan and configure ITSM Mobile Agent.

### Configuration overview
As an administrator, you can configure preferences and application behavior and create tools that improve the effectiveness of Agents and Managers. These are some of the tasks you can perform as an administrator:

- Migrate to latest and supported version of Mobile Agent.
- Create and configure actionable notifications for Mobile Agent.
- Enable push notification categories.

### Install ITSM Mobile Agent

You can install the ITSM Mobile Agent application (sn_itsm_mobile_agt) if you have the admin role. The application installs related plugins if they are not already installed.

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### Before you begin

- Ensure that the application and all of its associated ServiceNow Store applications have valid ServiceNow entitlements. For more information, see Get entitlement for a ServiceNow product or application.

Role required: admin

### Procedure

1. Navigate to **All** > **System Applications** > **All Available Applications** > **All**.
2. Find the ITSM Mobile Agent application (sn_itsm_mobile_agt) using the filter criteria and search bar.

   You can search for the application by its name or ID. If you cannot find the application, you might have to request it from the ServiceNow Store.

   Visit the ServiceNow Store website to view all the available apps and for information about submitting requests to the store. For cumulative release notes information for all released apps, see the ServiceNow Store version history release notes.
3. In the Application installation dialog box, review the application dependencies.

   Dependent plugins and applications are listed if they will be installed, are currently installed, or need to be installed. If any plugins or applications need to be installed, you must install them before you can install ITSM Mobile Agent.
4. **Optional:** If demo data is available and you want to install it, select the **Load demo data** check box.
   Demo data comprises the sample records that describe application features for the common use cases. Load the demo data when you first install the application on a development or test instance.

   **Important:**
   If you don't load the demo data during installation, it's unavailable to load later.
5. Select **Install**.

## Migration from ITSM Mobile to ITSM Mobile Agent

The ITSM Mobile plugin (com.sn_itsm_mobile) was deprecated in Quebec. The existing customers can migrate to ITSM Mobile Agent for enhanced mobile-first experiences in the base system, designed for agents to triage, act on, and resolve incidents on the go. ITSM Mobile Agent application improves productivity with an intuitive interface to manage all the work, view schedules, check who is on-call, respond to major incidents, and more.

For information about getting started with ITSM Mobile Agent, see Log in to ITSM Mobile Agent.

### Deactivate the ITSM Mobile launcher screens and notifications

After you install the ServiceNow Agent app, avoid duplication of launcher screens and notifications from the deprecated ITSM Mobile app.

### Before you begin

Role required: admin

### About this task

After installing the ITSM Mobile Agent app on your instance, you can still view the launcher screens from the ITSM Mobile application when you log in to the ServiceNow Agent app (Android

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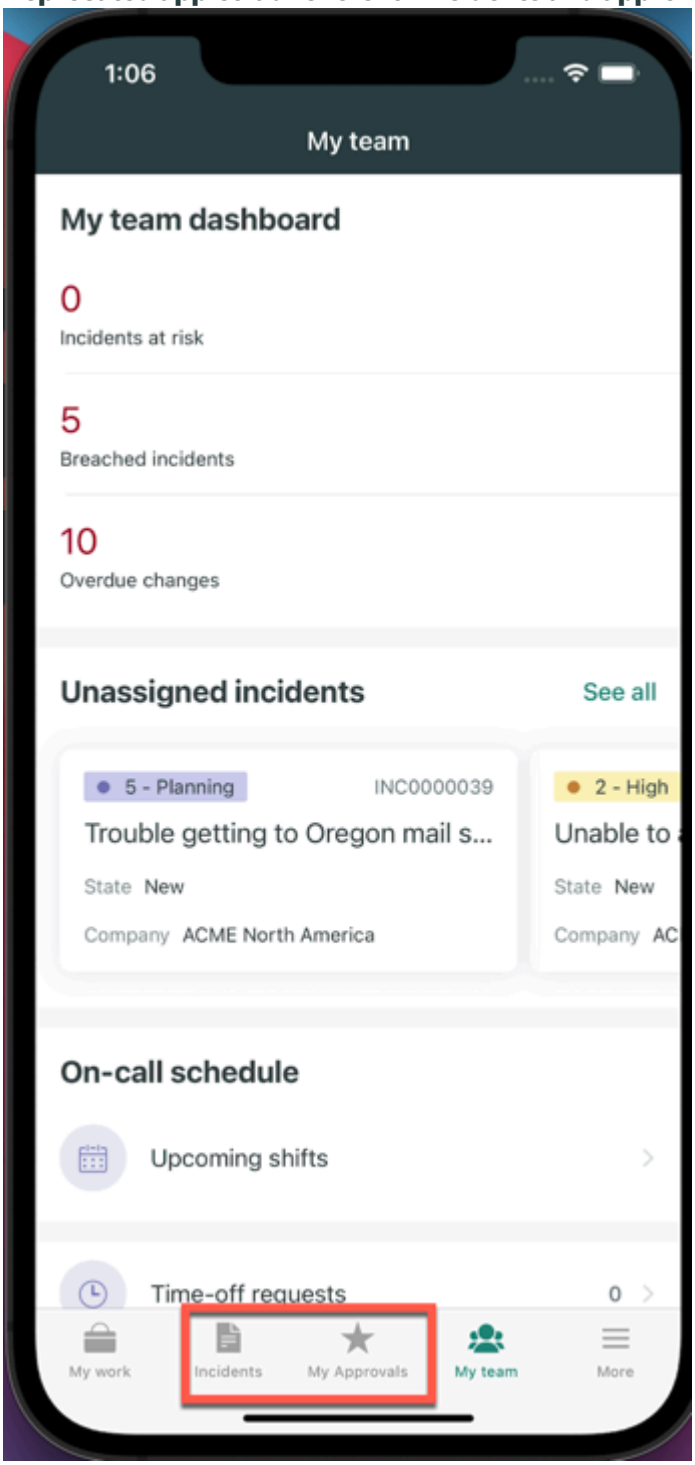
or iOS). Also, you might receive duplicate notifications since both ITSM Mobile and ITSM Mobile Agent apps are active on your instance.

**Deprecated applet launchers for incidents and approvals**




Since no updates are supported on the ITSM Mobile plugin (com.sn_itsm_mobile), it's recommended that customers stop using the related deprecated features. It's also recommended that applets or applet launchers from both plugins (ITSM Mobile and ITSM Mobile Agent) aren't active at the same time.

Since the single-click uninstallation of plugins isn't supported, the deprecated plugin isn't deactivated in the base system. Hence, deactivate the applet launchers and notifications that exist in the deprecated ITSM Mobile plugin.

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### Procedure

1. Navigate to **All** > **System Applications** > **Studio**.
2. From the Select Application pop-up window, open the ITSM Mobile application in the studio.
3. To deactivate the ITSM Mobile launcher screens, perform the following steps:

   a. To deactivate the **Incidents** launcher screen, perform the following steps:

      i. Navigate to **Mobile Studio** > **Applet launchers** > **Incidents**.

      ii. From the header menu, make this launcher screen inactive by using the **Active** toggle switch.

      iii. Click **Save**.

   b. To deactivate the **My Approvals** launcher screen, perform the following steps:

      i. Navigate to **Mobile Studio** > **Applet launchers** > **My Approvals**.

      ii. From the header menu, make this launcher screen inactive by using the **Active** toggle switch.

      iii. Click **Save**.

   When you log into the ServiceNow Agent app, the deprecated launcher screens aren't displayed.

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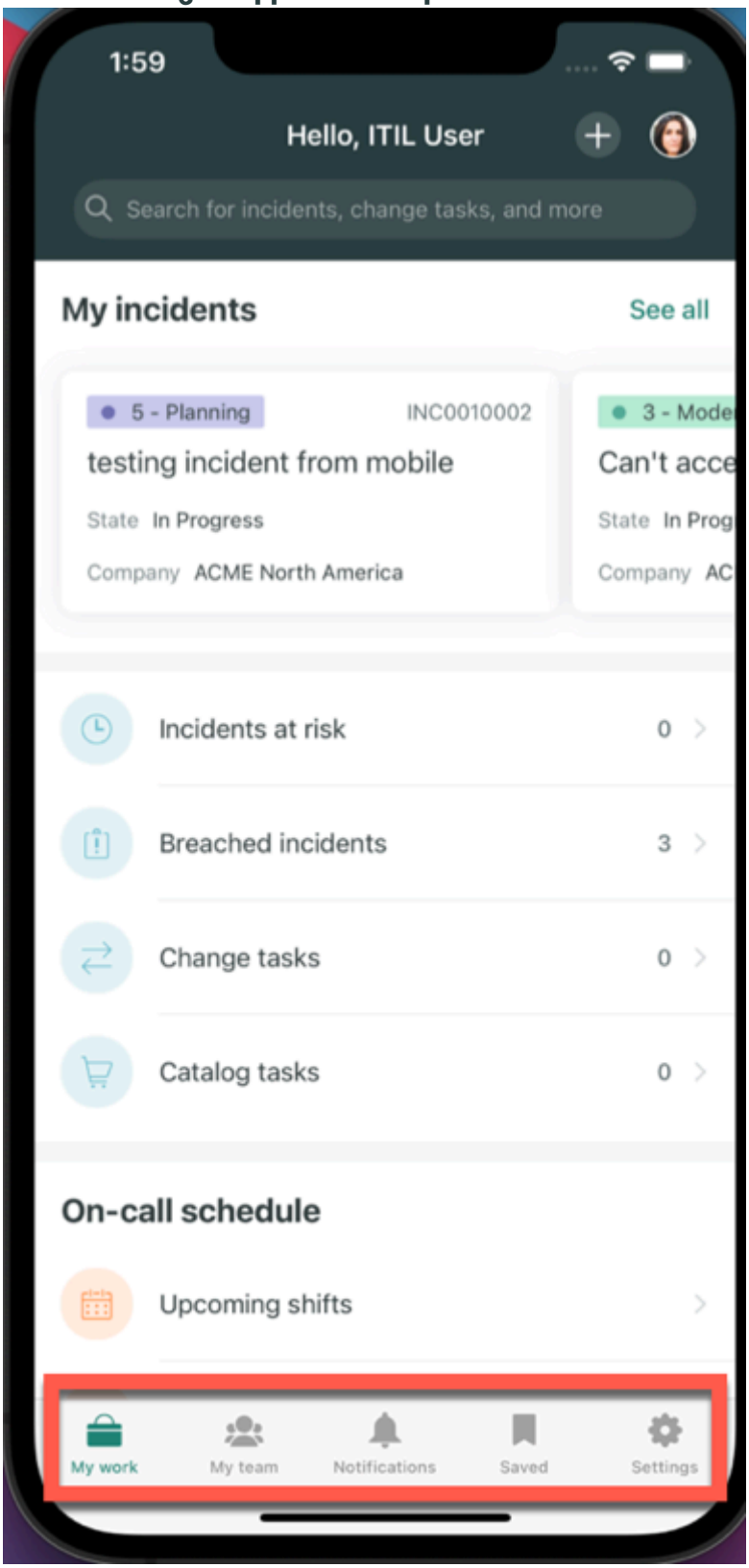
**ServiceNow Agent app without deprecated launcher screens**




**4.** To deactivate the ITSM Mobile notifications, perform the following steps:

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a. To deactivate the notifications related to assigned approvals, perform the following steps:
   i. Navigate to **Notifications** > **Notifications** > **Approval assigned to me**.
   ii. Clear the **Active** check box.
   iii. Click **Update**.

b. To deactivate the notifications related to commented incidents, perform the following steps:
   i. Navigate to **Notifications** > **Notifications** > **Incident commented**.
   ii. Clear the **Active** check box.
   iii. Click **Update**.

### Migrate customizations from the ITSM Mobile application scope to the ITSM Mobile Agent scope

When migrating from ITSM Mobile to ITSM Mobile Agent, an admin must verify if any customizations are defined in the deprecated ITSM Mobile application scope. Such customizations should be deactivated or moved to the ITSM Mobile Agent scope.

The admin must verify if any custom notifications are defined in the deprecated ITSM Mobile application scope. Such notifications should be deactivated or moved to the ITSM Mobile Agent scope.

Similarly, the admin must deactivate or move the custom launcher screens or custom applets to the ITSM Mobile Agent application scope.

**Important:**
To move customizations from the ITSM Mobile application scope to the ITSM Mobile Agent application scope, perform one of the following actions:

- Copy the custom code and paste it in the ITSM Mobile Agent application scope.
- Redefine the code in the ITSM Mobile Agent application scope.

## Migration to ITSM Mobile Agent 5.0.3

Migration to ITSM Mobile Agent 5.0.3 enables the Next Experience theme and accessibility compliance in ITSM Mobile Agent.

This migration includes the following component changes:

- Migration of legacy icon sections to new icon sections. It includes better grouping of icon sections for on-call scheduling and incidents along with color variables for icons.
- Migration of legacy UI parameters to new input form screens. It simplifies the way parameters are defined, enables theming on the input form screen, and supports accessibility enhancements by Mobile Platform.
- Migration of legacy card views to mobile views. It allows using color variables as per theme.
- All styling changes can be done through UI rules instead of UI styles.
- For buttons that perform a positive action, button emphasis has changed from primary to positive.

When customers migrate from any older version to ITSM Mobile Agent 5.0.3, the following steps are automatically performed:

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- When the *plugin.upgraded* event is triggered for the ITSM Mobile Agent (sn_itsm_mobile_agt) application, the *Run clean upgrade for ITSM Mobile Agent* script action is run.
- This script action invokes the following upgrade APIs:
  - For legacy icon sections to new navigation sections, the *cleanUpgradeIconSections()* method from the `sn_itsm_mobile_agt.MobileUtahUpgradeEngine` script include.
  - For old ui parameters to new input form screen, *cleanUpgradeButtonInstance()* method from the `sn_itsm_mobile_agt.MobileUtahUpgradeEngine` script include.
  - For legacy cards to new mobile views, *cleanUpgradeLegacyCards()* method from the `sn_itsm_mobile_agt.MobileUtahUpgradeEngine` script include.
  - A map with key value pairs, *sn_itsm_mobile_agt.MobileIconSectionMigrationConstant*, is introduced where the key is the sys_id of the legacy default configuration and the value is an object with a comma-separated list of metadata for the corresponding new default configuration that is introduced in the upgrade process.
- After the script action is run and performs all the required actions, it is deactivated so that it isn't run again on future upgrades.

## Migration of legacy icon sections to navigation sections

In this case, the `sn_itsm_mobile_agt.MobileIconSectionMigrationConstants` script include contains the following key value pairs:

- Key: sys_id of the legacy default *sys_sg_icon_section* record.
- Value: Object with a comma-separated list of sys_ids of *sys_sg_navigation_section* and *sys_sg_applet_launcher_m2m_section* records.

The `Run clean upgrade for ITSM Mobile Agent` script action upgrade script runs to perform the following steps for each key in the map:

1. Check the following records for customizations.
   - Legacy default *sys_sg_icon_section* record.
   - Compare if the legacy default icon section has at least one new or one less *sys_sg_applet_launcher_m2m_section* record when compared to the new default icon section.
2. Based on customizations, one of the following steps is performed.
   - If any of the above records are customized, the script deactivates the new default *sys_sg_navigation_section* record.
   - If none of the above records are customized, the script deactivates the legacy default *sys_sg_icon_section* record.

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**Note:**

- Custom icon sections that are not available by default continues to function but may not support Next Experience theme and accessibility compliance. Customers must migrate them to navigation sections for better experience.
- For customized icon sections that are available by default, customers must manually review the legacy default icon sections that are still active and move their customizations to the new default navigation sections.
- If customized icon sections are not migrated to the new navigation sections, then users will have a mixed experience that may not be fully compatible with the new Next Experience theme and can lead to accessibility issues.

## Migration of UI parameters to input form screen

In this case, the `sn_itsm_mobile_agt.MobileInputFormScreenMigrationConstants` script include contains the following key value pairs:

- Key: sys_id of the legacy default *sys_sg_button_instance* record.
- Value: Object with comma-separated list of sys_ids of the new default *sys_sg_button_instance* record and other meta data.

The `Run clean upgrade for ITSM Mobile Agent` script action upgrade script then runs to perform the following steps for each key in the map:

1. Check the following records for customizations.
   - Legacy default *sys_sg_button_instance* record.
   - *sys_sg_button* record associated with the *sys_sg_button_instance* record.
   - *sys_sg_ui_parameter* and *sys_sg_action_param_map* records associated with the *sys_sg_button* record.
   - *sys_sg_write_back_action_item* record associated with the *sys_sg_button* record.
2. Based on customizations, one of the following steps is performed.
   - If any of the above records are customized, the script deactivates the new default *sys_sg_button_instance* record.
   - If none of the above records are customized, the script deactivates the legacy default *sys_sg_button_instance* record.

**Note:**

- Custom button instance flows (UI Params) that are not available by default continues to function but may not support Next Experience theme and accessibility compliance. Customers must migrate them to input form screens for better experience.
- For custom button instance flows (UI Params) that are available by default, customers must manually review the legacy default *sys_sg_button_instance* records that are still active and move their customizations to the new *sys_sg_button_instance* flow (refer to the map sn_itsm_mobile_agt.MobileInputFormScreenMigrationConstants). For configuring Input form screens on mobile, see Input form screen.
- If customized UI parameters are not migrated to the new input form screens, then users will have a mixed experience that may not be fully compatible with the new Next Experience theme and can lead to accessibility issues.

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## Migration of item views to new mobile cards

In this case, the `sn_itsm_mobile_agt.MobileIconSectionMigrationConstants` script include contains the following key value pairs:

- Key: sys_id of the legacy default *sys_sg_item_view* record.
- Value: Object with a comma-separated list of sys_ids of *sys_sg_form_screen* and *sys_sg_master_item* records where legacy card (that is, item view) is referenced.

The `Run clean upgrade for ITSM Mobile Agent` script action upgrade script then runs to perform the following steps for each key in the map:

1. Check the following records for customizations.
   - Legacy default *sys_sg_item_view* record.
   - All *sys_sg_ui_style* records associated with the *sys_sg_item_view* record.
2. If any of the mentioned records are customized, the script reverts the *sys_sg_form_screen* and *sys_sg_master_item* records to previous state only if these records are not customized.

**Note:**

- Custom item views that are not available by default will continue to function but may not support Next Experience theme and accessibility compliance. Customers must migrate them to input form screens for better experience.
- For custom icon sections that are available by default, customers must manually review the old default flows which are still active and move their customizations to the new flow. For information about configuring cards on mobile, see Customize a screen using Mobile Card Builder.
- If customized item views are not migrated to new mobile cards, then users will have a mixed experience that may not be fully compatible with the new Next Experience theme and can lead to accessibility issues.

## Configurable actionable notifications for ITSM Mobile Agent

With configurable actionable notifications for ITSM Mobile Agent, you can perform actions based on push notifications without having to open the ITSM Mobile Agent application.

You can associate up to three actions with a push notification. These actions must refer to an existing mobile function. The following function types of actions are supported:

- Action item
- Navigation
- URL
- Chat launcher

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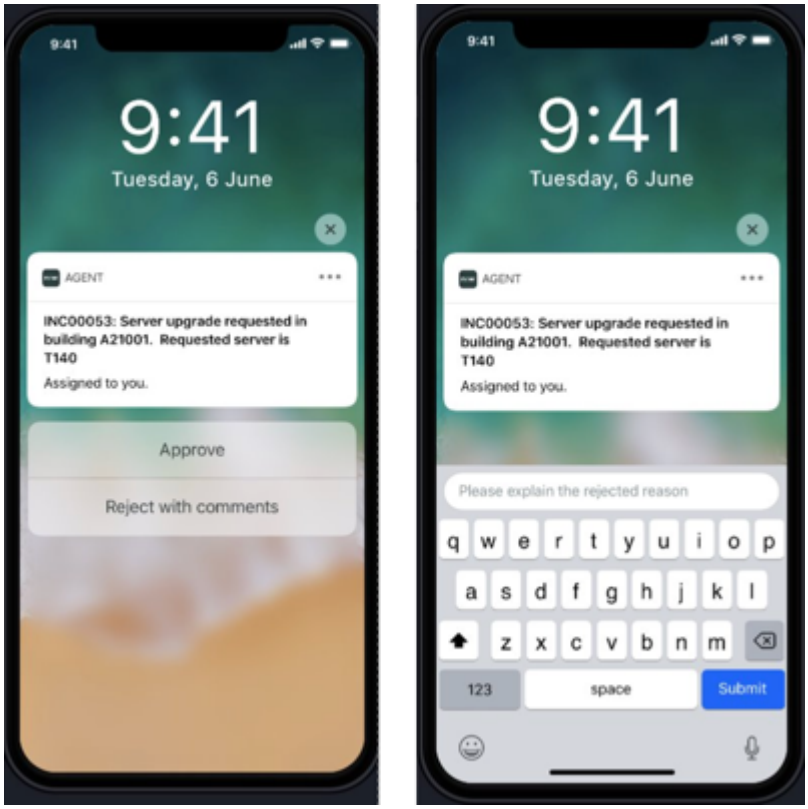


## Process for creating actionable push notifications

Create actionable push notifications using the following process:

1. Create an actionable push notification for ITSM Mobile Agent.
2. Create a push action category.
3. Create function for each push action.
4. Map functions with push actions on the actionable push notification.
5. Create push message content.
6. Create a standard notification.

### Create an actionable push notification for ITSM Mobile Agent

Create a push notification for various actions performed on the ITSM Mobile Agent application.

**Before you begin**
Role required: admin

**Procedure**

1. Navigate to **All** > **System Mobile** > **Mobile Push Notifications** > **Push Notifications**.
2. Click **New**.
3. In the push notification form, fill in the fields.

#### Push notification form

| Field | Description |
|---|---|
| Name | The name of your push notification. |

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| Field | Description |
|---|---|
| | **Note:** This name does not appear to users viewing the notification. |
| Application | The scoped application for your notification. This field automatically uses the current application scope. |
| Actionable | Option for making a notification actionable. |
| Screen | Optional screen associated with your notification. Displays to a user when they tap on the notification. |

4. Click **Save**.

### Result
The notification record is created, and the **Push Action Instances** related list appears on the form.

## Create a push action category

Create a push action category if any of the pre-defined push action categories do not meet the business requirements.

### Before you begin
Role required: admin

### Procedure
1. Navigate to **All** > **System Mobile** > **Mobile Push Notifications** > **Push Action Categories**.

#### Push action categories

| Action | Description |
|---|---|
| accept-reject-back | Displays **Accept** and **Reject** buttons. Users can select an option without opening the app. |
| Accept-Reject-fore | Displays **Accept** and **Reject** buttons. The app opens when the user selects an action. |
| accept-rejectwcomments-back | Displays **Accept** and **Reject** buttons. When users select the **Reject** option, a confirmation dialog box appears that requires the user to provide a message and click Send. |
| ack-escalate-ignore-back | Displays **Acknowledge**, **Escalate**, and **Ignore** buttons. Users can select an option without opening the app. |
| approve-reject-back | Displays **Approve** and **Reject** buttons. Users can select an option without opening the app. |
| approve-rejectwcomments-back | Displays **Approve** and **Reject** buttons. When users select the **Reject** option, a confirmation dialog box appears that requires the user to provide a message and click Send. Users can select an option without opening the app. |

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| Action | Description |
|---|---|
| confirm-reschedule-cancel-back | Displays **Confirm**, **Reschedule**, and **Cancel** buttons. Users can select an option without opening the app. |
| joinbridge-fore | Displays a **Join Meeting** button. Tapping this button opens the app. |
| PromoteWComments-RejectWComments-fore | Displays **Promote** and **Reject** buttons. When users select either option, a confirmation dialog box appears that requires the user to provide a message and click Send. |
| queuerejoin-openincident-back | Displays **Online Check-in** and **Open Incident** buttons. Users can select an option without opening the app. |
| queuestay-queueleave-back | Displays **Stay in Queue** and **Leave Queue** buttons. Users can select an option without opening the app. |
| yes-no-back | Displays **Yes** and **No** buttons. Users can select an option without opening the app. |

2. Click **New**.
3. In the push action category form, enter a name for the category in the **Name** field.
4. Click the lock icon ( ) next to the **Actions** field.
5. Click the reference icon ( ) to display the **Push Actions** list and select the actions for the push action category.
6. Select **Save**.

### Create a push action

Create a push action if any of the pre-defined push actions do not meet the business requirements.

## Before you begin

Role required: admin

## Procedure

1. Navigate to **All** > **System Mobile** > **Mobile Push Notifications** > **Push Actions**.
2. Click **New**.
3. In the push action form, fill in the fields.

### Push action form

| Field | Description |
|---|---|
| Label | Text your users will see in the notification for this action. |
| Application | Scoped application for this record. This field automatically populates. |
| Name | Name of the push action. |
| Foreground | When enabled, the app opens when your users select this action. |
| Response Type | Options are: |

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| Field | Description |
| --- | --- |
| | ○ **Simple**<br>○ **Text response** |
| Placeholder Text | Placeholder text to your users when they initiate the actionable push. |

4. Click **Save**.

### Create functions for notification push actions

Create a mobile function for each function in the action category. These actions perform tasks on your instance based on what the user selects in the notification.

#### Before you begin
Role required: admin

#### Procedure

1. Navigate to **All** > **System Mobile** > **Functions**.
2. Click **New** to create a new function record.
3. Create a function for one of your push actions.
   When selecting a function type in the **Type** field, you must select one of the function types supported for actionable push notifications:
   - Action item
   - Navigation
   - URL
   - Chat launcher

   For information on function types, and detailed steps for creating functions, see Mobile functions.
4. Create additional functions for each push action.
   For example, if you have selected `ack-escalate-ignore-back` as your push notification category, your notification displays the **Acknowledge**, **Escalate**, and **Ignore** buttons. Create a function to determine the behavior of each of these buttons.

#### What to do next
Map functions with push actions for actionable push notifications

### Map functions with push actions for actionable push notifications

Associate functions to the actions for an actionable push notification.

#### Before you begin
Role required: admin

#### Procedure

1. Navigate to **All** > **System Mobile** > **Mobile Push Notifications** > **Push Notifications**.
2. Open a notification.
3. In the **Push Action Instances** related list, click **New**.
4. On the form, fill in the fields.

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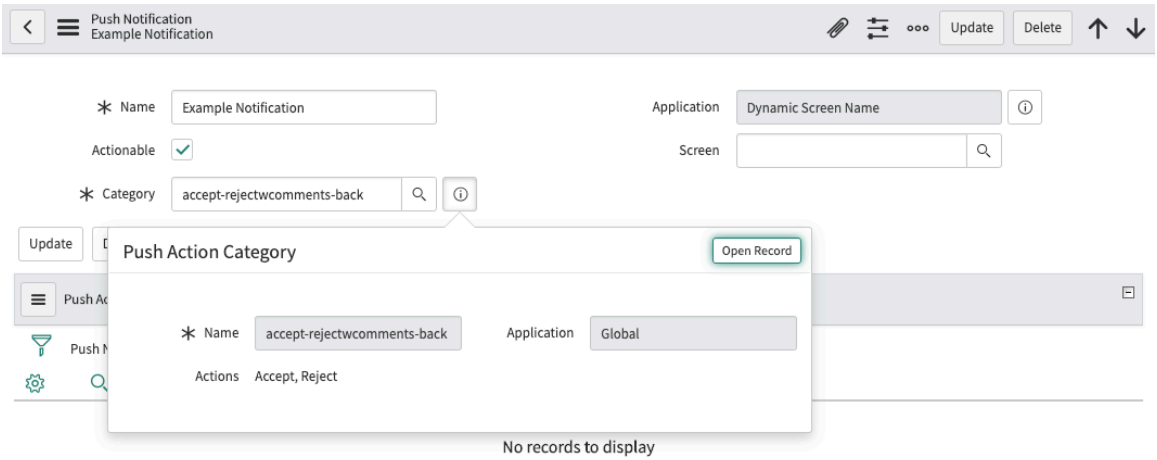
### Push action instance form

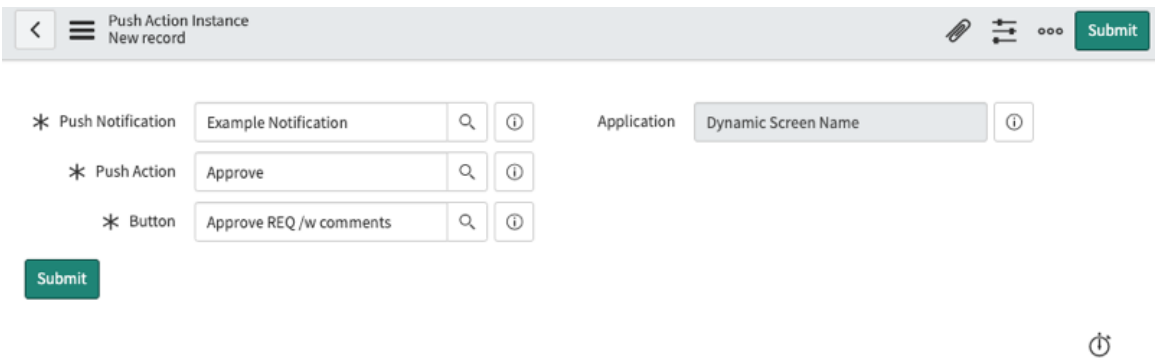
| Field | Description |
|---|---|
| Push Notification | Push notification associated with this push action instance. This field is automatically filled in with your push notification. |
| Application | Scoped application associated with this record. This field is automatically filled in with the current application. |
| Push Action | Push action from your push notification record. Select one of the available actions. |
| Button | Function to associate with the push action. This action triggers when a user uses the action listed in the **Push Action** field. |

5. Click **Submit**.

**Example:**
This example notification uses the *accept-rejectwcomments-back* in the **Category** field. Clicking the preview icon (ⓘ) shows the two actions used by this category: *Accept* and *Reject*.




In the example push action instance, the *Approve* push action is selected in the **Push Action** field, and the *Approve REQ /w comments* function is selected in the **Button** field. The instance executes this function when a user taps the **Approve** button in the notification.




### Create push message content

Create the content of the message to be displayed as a notification.

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### Before you begin
Role required: admin

### Procedure
1. Navigate to **All** > **System Mobile** > **Mobile Push Notifications** > **Push Notifications**.
2. Open the notification.
3. Click **Create Push Message Content** in the Related Links section.
4. On the form, fill in the fields.

#### Push Notification Message Content form

| Field | Description |
|---|---|
| Name | Name of your push message content record. This name is not visible to your users. |
| Application | Scoped application associated with this record. This field is automatically filled in with the current application. |
| Push app | Mobile Agent app on which the push notification is displayed. |
| Push Message Generation | The script that generates the push notification. When you create message content, this script is automatically generated. |

5. Click **Submit**.

## Create a standard notification

Create a record to determine the information to be displayed for a notification.

### Before you begin
Role required: admin

### Procedure
1. Navigate to **All** > **System Notification** > **Push** > **Create Push Notification**.
2. On the form, fill in the fields.

#### Push notification form

| Field | Description |
|---|---|
| Name | Name of your notification. This name is not visible to your users. |
| Active | Option for determining whether the notification is active. The instance does not send inactive notifications to your users. |
| Table | Table containing the records relating to your notification. For example, notifications about new incidents use the Incident [incident] table. |
| Push Message Only | Indicates the notification is a push message only. This field cannot be changed. |

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| Field | Description |
|---|---|
| Category | The category for your notification. This field value is **Uncategorized** by default. |

3. Right-click the form header and select **Save**.
4. Configure the push message for your standard notification.
   a. Click to display the **What to Send** tab.
   b. Click the lock icon ( ) next to the **Push Messages** field.
   c. Click the reference icon ( ) to display the **Push Notification Messages** list.
   d. Click **New**.
   e. On the form, fill in the fields.

**Push Notification Message form**

| Field | Description |
|---|---|
| Name | Name of your push notification message record. This name is not visible to your users. |
| Application | Scoped application associated with this record. This field defaults to the current application. |
| Push App | Mobile Agent app on which the push notification is displayed. |
| Table | Table containing the records relating to your notification. For example, a notification about new incidents would use the Incident [incident] table. |
| Push Message Content | The record for the push message content. |
| Message | Text the user sees in the push notification, for example, `An incident has been assigned to you.` |

   f. Click **Submit**.
5. In the **Notification** form, click **Update**.

## Enable Push notification categories for ITSM Mobile Agent

Enable push notification categories so your users can enable or disable notifications by category.

### Before you begin

Role required: admin

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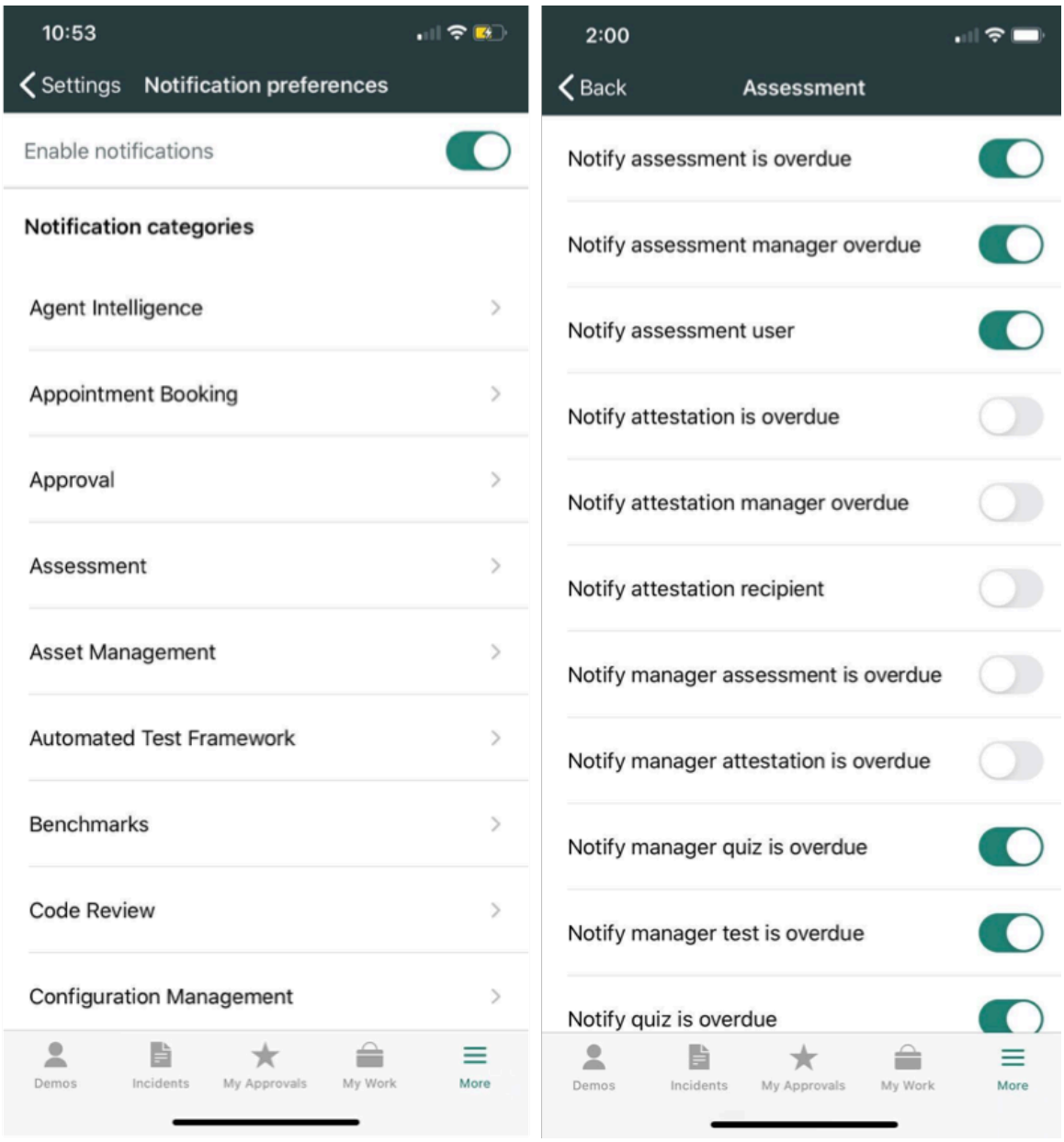
### Procedure

1. Type `sys_properties.list` in the application navigator.
2. In the system properties list, find and open the property with the name *`com.glide.sg.notifications.management`*.

> **Note:**
> If the property does not exist, click **New** and create a true|false property with the name mentioned in the previous step. After changing this property, users must log out and then log back in for the change to take effect.

3. In the **Value** field, enter `true`.
4. Select **Update**.




The user can enable or disable notifications by category. The categories shown in the notification preferences screen are defined in the **Notifications** [sysevent_email_action] table.

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The screen to the left shows all the reference categories defined on this table. The screen to the right shows the record matching the selected category.

After you have updated your system property, your users will be able to enable or disable notifications by the defined categories.

## Enable Override do not disturb to receive critical alerts

Enable the Override do not disturb to receive critical push notifications feature for ITSM Mobile Agent.

### About this task

With the Override do not disturb to receive critical push notifications feature, ITSM managers can reach out to their on-call members even when their phones are set to Do Not Disturb mode.

To enable this feature, you must configure a prompt and reprompt property. The reprompt property resends the pop-up message if the agent didn't initially enable the configuration.

### Before you begin

Role required: admin

### Procedure

1. Navigate to **sys_sg_properties** > **Mobile properties**.
2. On the mobile properties page, switch to **Global scope**.
3. Select **New** and create a new property with the following details:
   - Name: *critical_alerts_request_prompt*
   - Type: **True/False**
   - Value: `true`
   - Mobile Application: **Agent**
4. Select the **Active** option.
5. Ensure that the value is **True** and select **Update** to create and apply the property.

   **Note:**
   After creating this property, users must log out and then log back in for the change to take effect.

6. Log in to the ITSM Mobile Agent application.
7. Select **Open Settings** when prompted to `Enable Override Do Not Disturb To Receive Critical Alerts`.

   **Note:**
   If you log in to ITSM Mobile Agent using an iOS device, when prompted to `Enable Override Do Not Disturb To Receive Critical Alerts`, select **Allow**.

8. On the Do Not Disturb access settings page, select the ITSM Mobile Agent application from the list.
9. Select the **Allow Do Not Disturb** toggle button.
10. Confirm by selecting **Allow**.
    The user starts to receive the critical alerts in Do Not Disturb mode.
11. **Optional:** Configure the following reprompt property if you want to resend the **Override do not disturb to receive critical alerts** pop-up for the agents who didn't enable the property initially:

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a. In the navigation filter, enter `sys_sg_properties`.

b. On the mobile properties page, select **New** and create a property with the name *`critical_alerts_request_reprompt`* and the same configuration as the *`critical_alerts_request_prompt`* property.

### Configure critical notification

Configure the list of critical alerts that you want to receive when your mobile device is in Do Not Disturb mode.

#### Before you begin

Role required: admin

#### About this task

By default, the following notifications are set as critical:

- Major Incident Promotion Notification
- Major Incident- ICA SLA Breached
- Major Incident- ICT SLA Warning

Set any notification as critical and receive alerts when your mobile device is in Do Not Disturb mode.

#### Procedure

1. Navigate to **All** > **System notification** > **Push** > **Push Notification** and open the notification that you want to set as critical.
2. In the selected notification record, select the **What to send** tab.
3. Select the info icon (ⓘ) next to the **Push message** field.
4. Select **Open record** from the **Push Notification Message** pop-up message.
5. Set the *`isCritical`* attribute value to **true** to set the notification as critical.
   If the *`isCritical`* attribute value is set to **false**, the notification isn't treated as a critical alert.

### Configure a customized notification for critical alert

Configure custom notifications as critical with ITSM Mobile Agent.

#### Before you begin

Ensure that the custom notification is listed in the notification table.

Role required: admin

#### Procedure

1. Navigate to **All** > **System notification** > **Push** > **Push Notification** and open the notification that you want to set as critical.
2. In the selected notification record, select the **What to send** tab.
3. Select the info icon (ⓘ) next to the **Push message** field and select **Open record** from the **Push Notification Message** pop-up message.
4. Open the **Push Notification Message Content** table and paste the *`return new sn_itsm_mobile_agt.CriticalPushPayloadBuilder(current, json, attributes).buildJSON();`* attribute in the **Push Message Generation** field.
5. Create a new *`isCritical`* attribute with the attribute type as `string`.

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6. Set the default value for the property as `False`.
7. In the Push Notification Message table, add the *`isCritical`* attribute, and set the value as `true`.

## Log in to ITSM Mobile Agent

Access ITSM Mobile Agent on your mobile to manage incidents, view, and update on-call schedules.

### Before you begin

Roles required: none

Ensure that ITSM Mobile Agent is installed from ServiceNow Store onto your instance. For more information, see Install ITSM Mobile Agent.

On your mobile, install the ServiceNow Agent app (from Apple App Store or Google Play Store). For more information about this app, see Mobile Agent.

### Procedure

1. Tap the mobile app icon on your device, and then tap the plus button to login to an instance.
2. In the instance address field, enter the instance address in one of two ways:

| Option | Description |
|---|---|
| Manual input | Type the instance address in the instance address field.<br>**Note:** You do not need to include `service-now.com` at the end of the instance name. |
| Scan QR code | Tap the QR icon (Scan a QR code), and then scan the QR code given by your administrator. |

3. **Optional:** Enter a nickname for this instance.
   If you have multiple instances added to the device, nicknames can help you quickly locate a ServiceNow AI Platform instance.
4. Tap **Save and Login**.
   The ITSM Mobile Agent landing screen opens. You can search for incidents, change tasks and more using the search bar on top of the landing screen.

## Managing incidents and tasks using My Work applet

Use the My work applet in the ITSM mobile agent to perform various functions from the mobile.

As an agent, you can:

- Easily access incidents, change tasks, and catalog tasks.
- Take quick actions and provide timely updates.
- Add work notes or comments, update incident details, assign incidents to other agents.
- Easily access change requests and request approvals.

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From the main screen of the agent mobile app, you can directly create an incident using a single click.

## Create an incident from app landing page

Create an incident directly from your agent mobile app landing page with a single tap.

### Before you begin

Role required: itil, sn_incident_write, or admin

### Procedure

1. On your agent mobile app landing page, click on the  to create an incident directly from the landing screen.
2. Fill in the fields.

| Field | Description |
|---|---|
| Caller | Tap on the arrow to search and choose a caller to whom this incident should be assigned. |
| Short description | Provide a brief description of the incident. |
| Urgency | Populate the urgency of the incident. The available options are:<br>○ 1 - High<br>○ 2 - Medium<br>○ 3 - Low |
| Impact | Measure of the effect of the incident on business processes. |
| Priority | Identification of how quickly the service desk should address the task. |
| Description | Provide the detailed description of the incident. |
| Service | Tap the arrow to search and choose the service to which the incident belongs. |
| Configuration item | Tap the arrow to choose the configuration item for the incident. |
| Assignment group | Tap the arrow to search and choose an assignment group to which the incident should be assigned. |
| Assigned to | Tap the arrow to search and choose a person from the assignment group. |

## My incidents

Use the My incidents applet to work on the incidents that are assigned to you.

### Before you begin

Role required: none

### About this task

Resolve, reassign the incident, or add comments to an incident assigned to you. Add work notes, view the details of an incident, or edit an incident, all from a single screen on your mobile.

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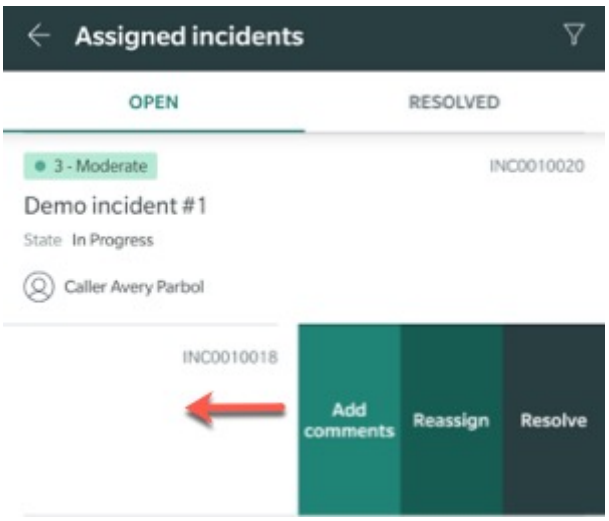
## Procedure

1. On the ITSM mobile agent landing screen, tap **See All** on the **My incidents** applet.
   The **Assigned Incidents** screen opens with a list of incidents.
2. If you want to reduce the number of records on the screen, see Filter records to search for records that match specific search criteria.
3. On the **Assigned incidents** screen with the list of incidents, swipe left on an incident to open the menu.




4. On the menu, choose one of the actions to process the incident.

| Action | Description |
|---|---|
| Add comments | Add any additional comments or work notes about the incident in this field and tap . |
| Reassign | Use this action to reassign an incident to another agent. On the Reassign incident screen, tap the **Assignment group** field to change the assignment group, select the agent from the list in the **Assigned to** field and add any notes in the **Work notes**, and tap to submit. |
| Resolve | On the Resolve incident screen, tap the **Resolution code** field and choose a code for the resolution, add notes in the **Resolution notes** field, and tap . |

5. On the **Assigned incidents** screen, tap a record on the list to open it and view more details.
6. On the **My Incidents** screen, choose one of the actions in the table as appropriate.

| Option | Description |
|---|---|
| DETAILS tab | Choose one to continue. |

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| Option | Description |
| --- | --- |
| | ○ View the fields for details about the incident. The fields with an arrow have additional information.<br>○ At the top right of the screen, tap the menu icon  to reassign, edit, or propose the incident as a major incident.<br>○ Add any additional comments using the **Add comments** button.<br>○ Resolve the incident after adding a resolution code and notes using the **Resolve** button. |
| ACTIVITY tab | View the activity on the incident like field changes or assignment changes. Tap the add icon  to perform any of the following activities on the incident.<br>**a.** *`Record Video`*: Record a video to be attached to the incident.<br>**b.** *`Open Gallery`*: Open your photo gallery to attach an existing image or a video to the incident.<br>**c.** *`Take Photo`*: Take a picture and attach it to the incident<br>**d.** *`Attach File`*: Attach a file from another application to the incident.<br>**e.** *`Add Additional Comments`*: Add any additional comments to the incident.<br>**Note:** The comments can be made visible to the customer if you enable them using the toggle bar on the **Additional Comments** field.<br>**f.** *`Add Work Notes`*: Add your work notes on the incident. |
| RELATED tab | View the related lists of the incident, such as, child incidents, incident tasks, alerts, task SLAs, impacted services, affected CIs, and attached published knowledge articles (translated versions if available). Tap on the arrow to view more details of these related items. |
| CALLS tab | View the list of all the calls related to an incident. Tap on any of the calls to **Add participants** or to **Join call**. Tap on the menu on top of the Conference Call page and tap **End call** to end the call. |

### Collaboration with incidents

Initiate and manage the collaboration for incident records from the ITSM Mobile Agent app.

### Initiate a chat with the caller from an incident

Initiate a chat with the caller from an incident to discuss about the resolution of an incident.

## Before you begin

Role required: itil, itil_admin, or admin

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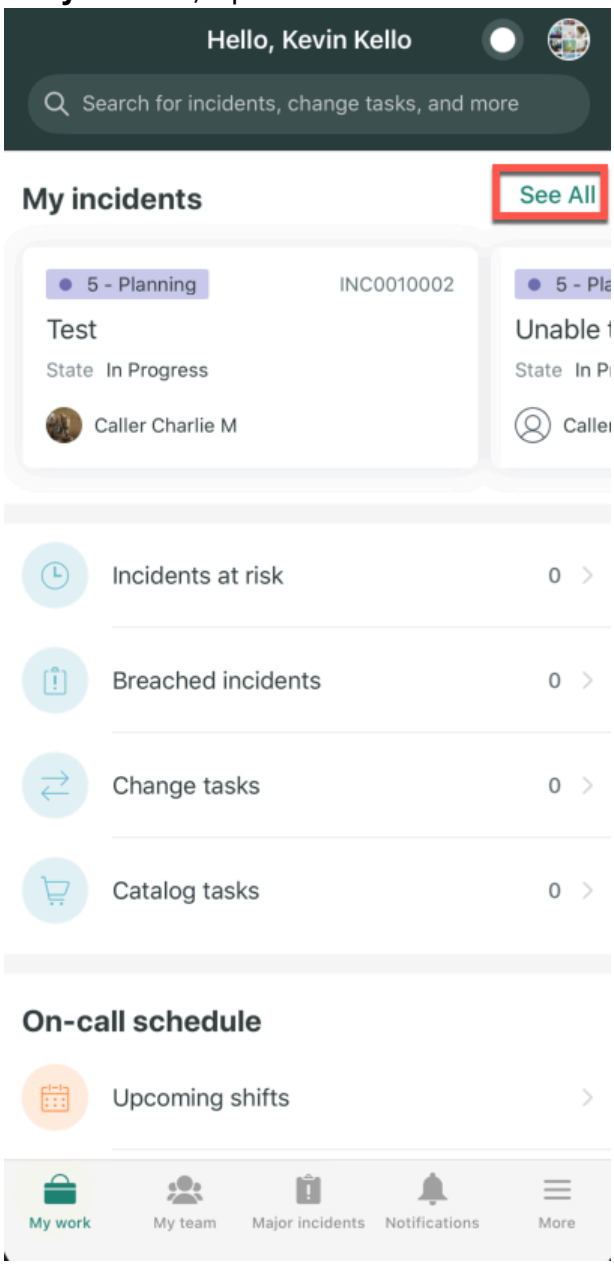
## Procedure

1. Open ITSM Mobile Agent app.
2. In **My work** tab, tap **See All**.




3. Tap the incident record you want to work on.
4. Tap on **Caller**.

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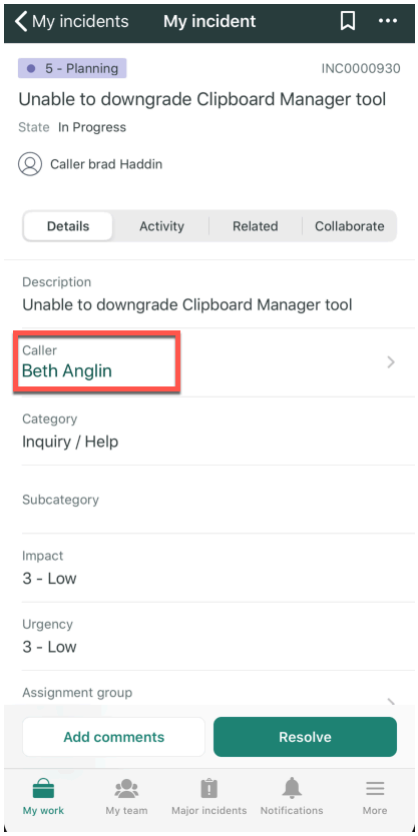


**5.** Do one of the following:

### Caller

| Option | Action |
| --- | --- |
| Initiate chat in Slack | Tap on the Slack contact. |
| Initiate chat in Microsoft Teams | Tap on the Microsoft Teams contact. |

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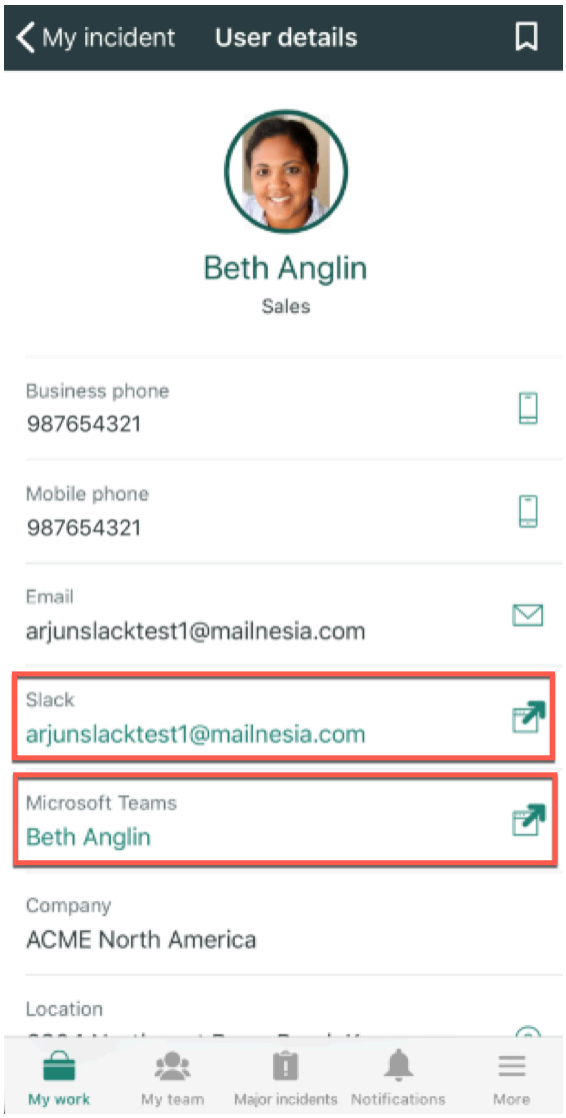


**Note:**
The Slack and the Microsoft Teams contacts display only if the caller has a valid Slack and Microsoft Teams accounts.

### Initiate a chat with the assignment group from an incident

Initiate a chat with the assignment group members from an incident to discuss about the resolution of an incident.

**Before you begin**
Role required: itil, itil_admin, or admin

**Procedure**

1. Open ITSM Mobile Agent app.
2. In **My work** tab, tap **See All**.

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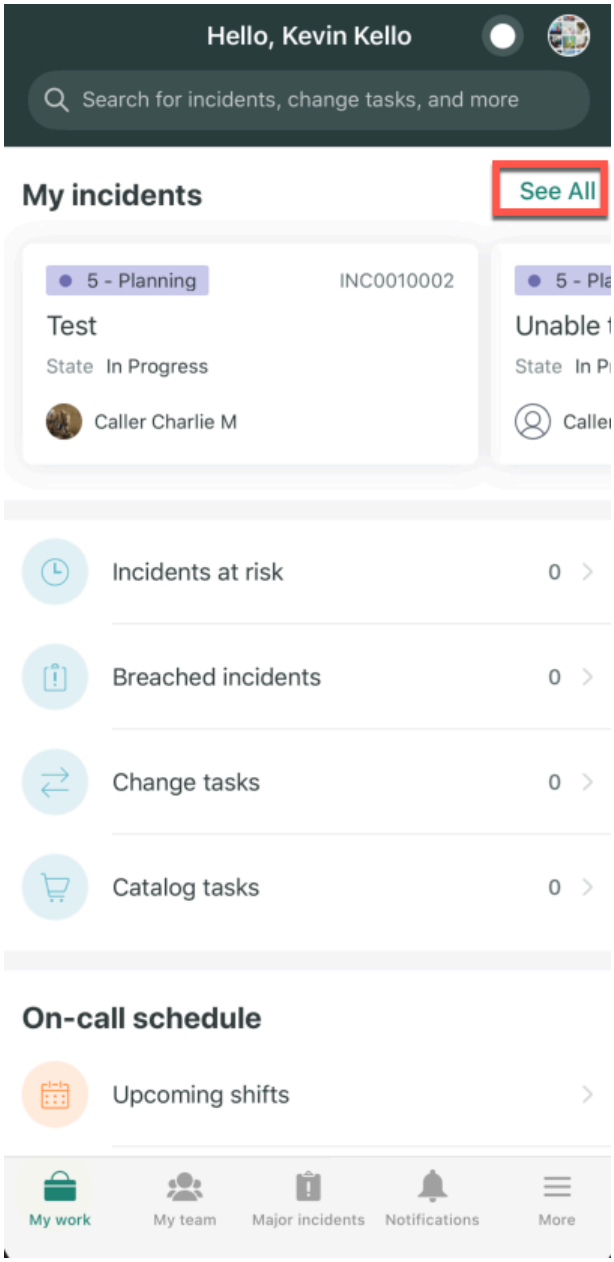


3. Tap the incident record you want to work on.
4. Tap on **Assignment group**.

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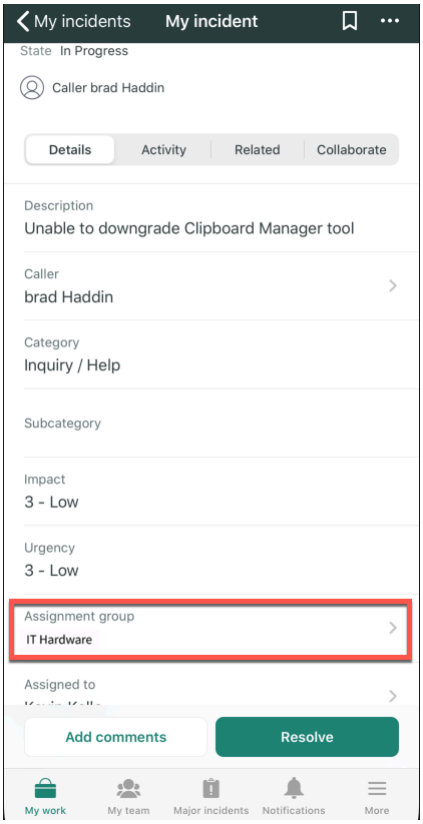


5. Do one of the following:

### Assignment group

| Option | Action |
| --- | --- |
| Initiate chat in Slack | Tap on Slack assignment group. |
| Initiate chat in Microsoft Teams | Tap on the Microsoft Teams assignment group. |

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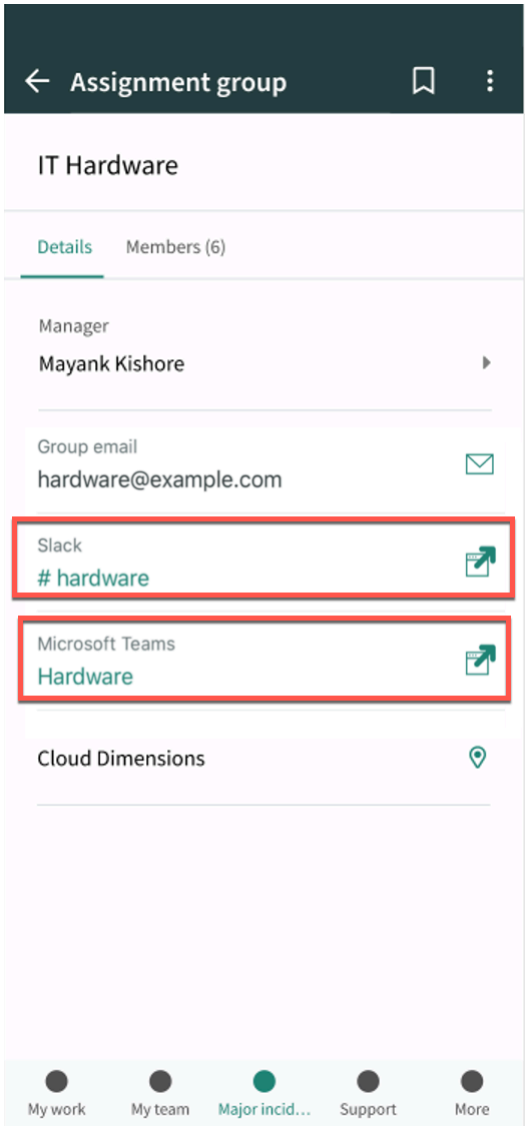


**Note:**
The Slack and the Microsoft Teams assignment group contact will be displayed only if the assignment group has a valid Slack and Microsoft Teams accounts.

You can also interact with a user from the assignment group. Tap on the assignment group, and then tap on a user and select either Slack or Microsoft Teams to initiate a conversation.

### Initiate a conference call with the caller from an incident

Initiate a conference call from an incident to discuss about the resolution of an incident.

#### Before you begin

Role required: itil, itil_admin, or admin

#### Procedure

1. Open ITSM Mobile Agent app.
2. In **My work** tab, tap **See All**.

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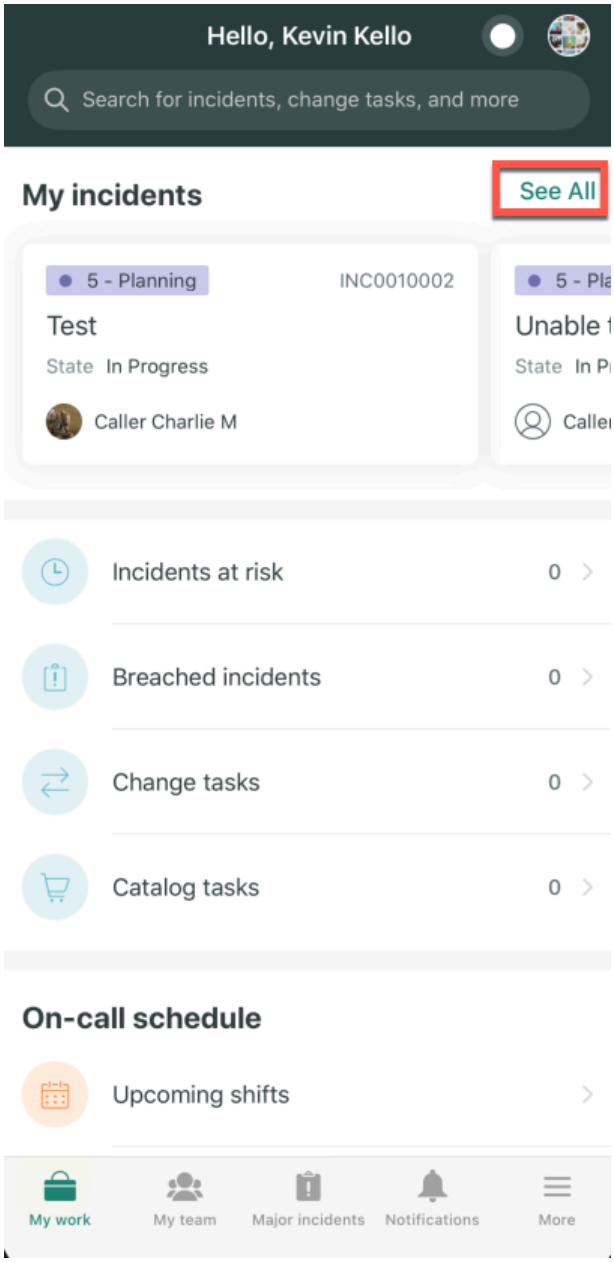


**3.** Tap the incident record you want to work on.

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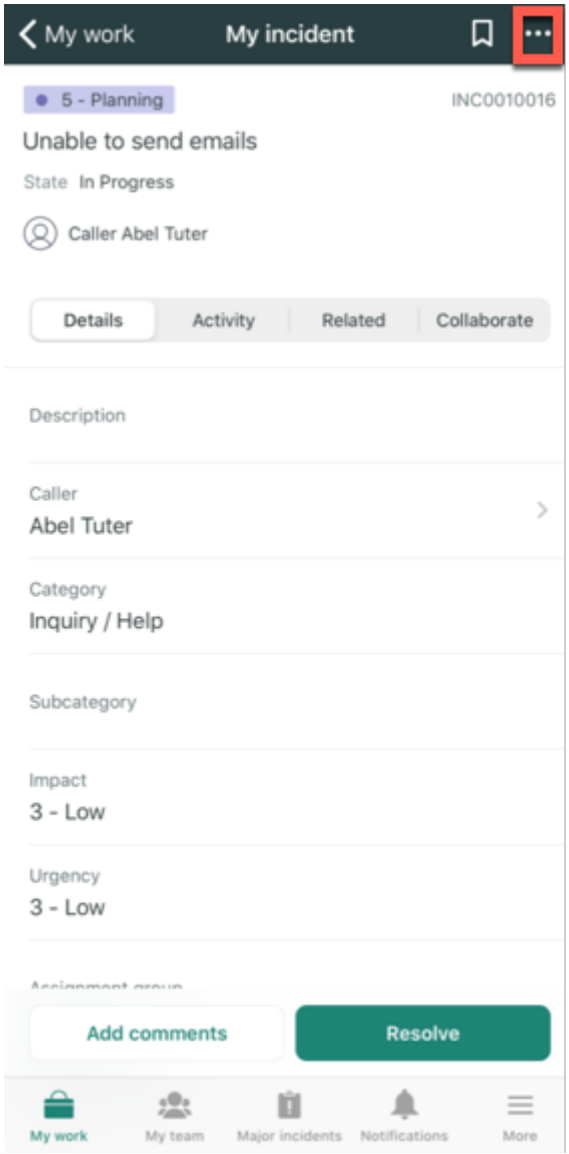


4. Tap ••• .
5. Tap **Start call** button.
6. Provide the following details:
   a. **Conference bridge**: Tap **Conference bridge** and select Microsoft Teams.
   b. **Users**: Select the users.
   c. **Groups**: Select the required group.

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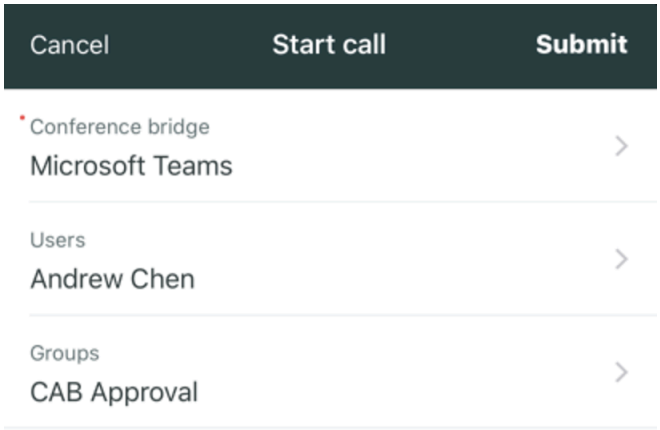


7. Tap **Submit**.

### Add participants to a conference call from an incident

Add participants to an active conference call from an incident to discuss about the resolution of an incident.

#### Before you begin

Role required: itil, itil_admin, or admin

#### Procedure

1. Open ITSM Mobile Agent app.
2. In **My work** tab, tap **See All**.

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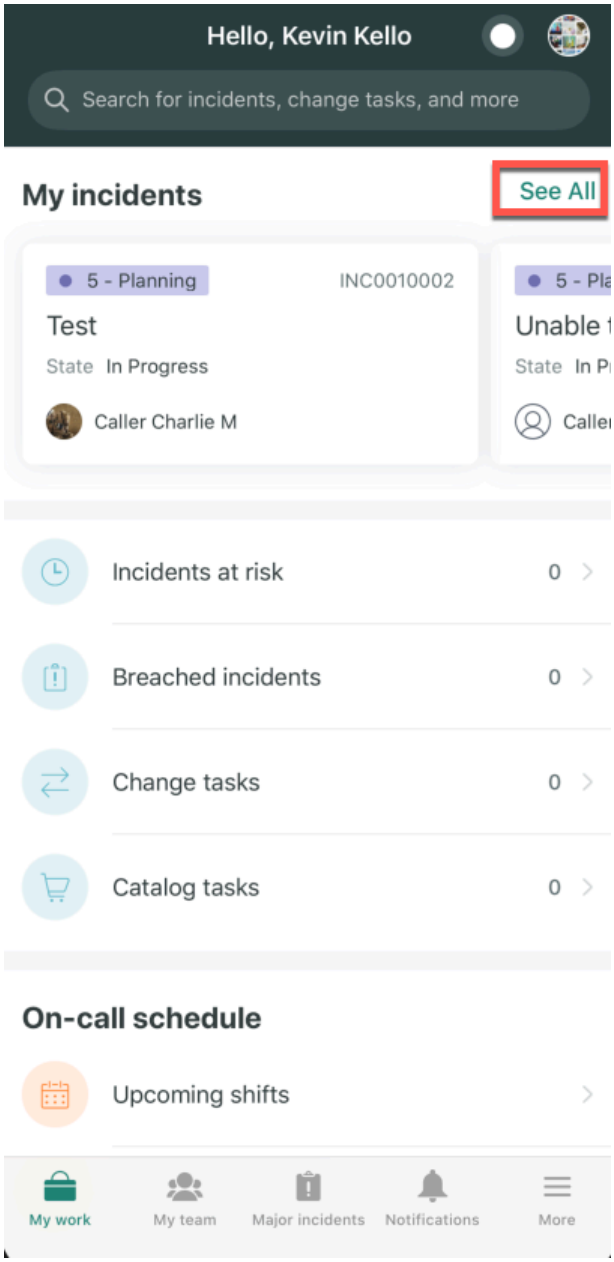


3. Open the incident where the conference call is originated.
4. Tap **Collaborate**.

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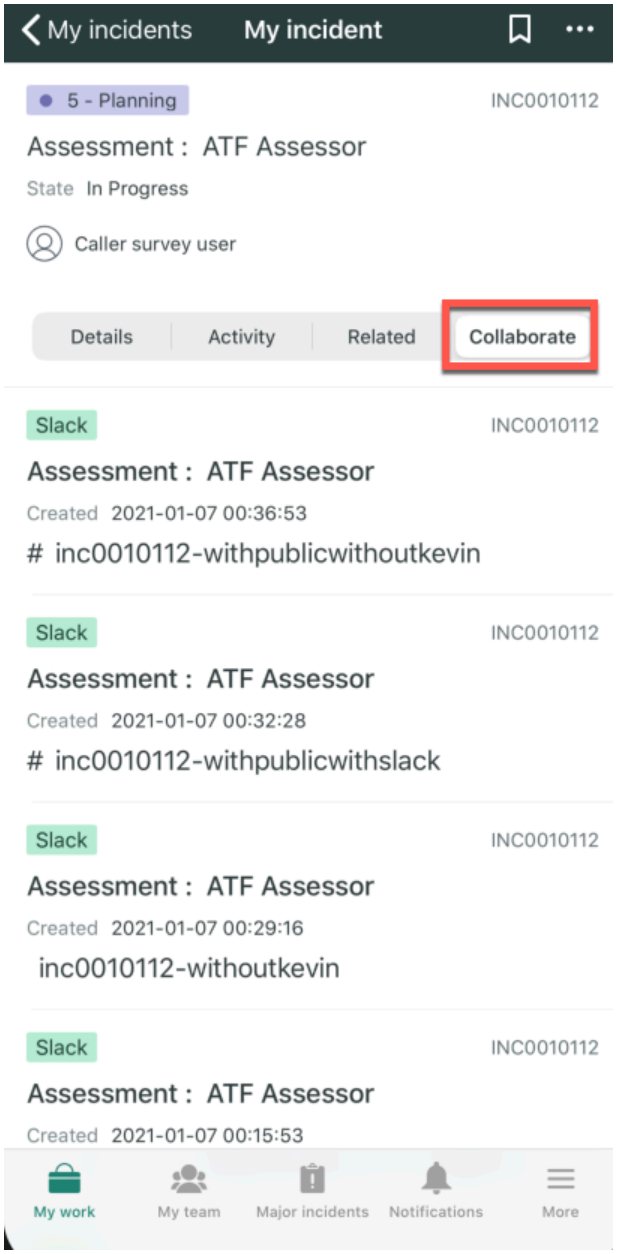


**5.** Tap on the active conference call.

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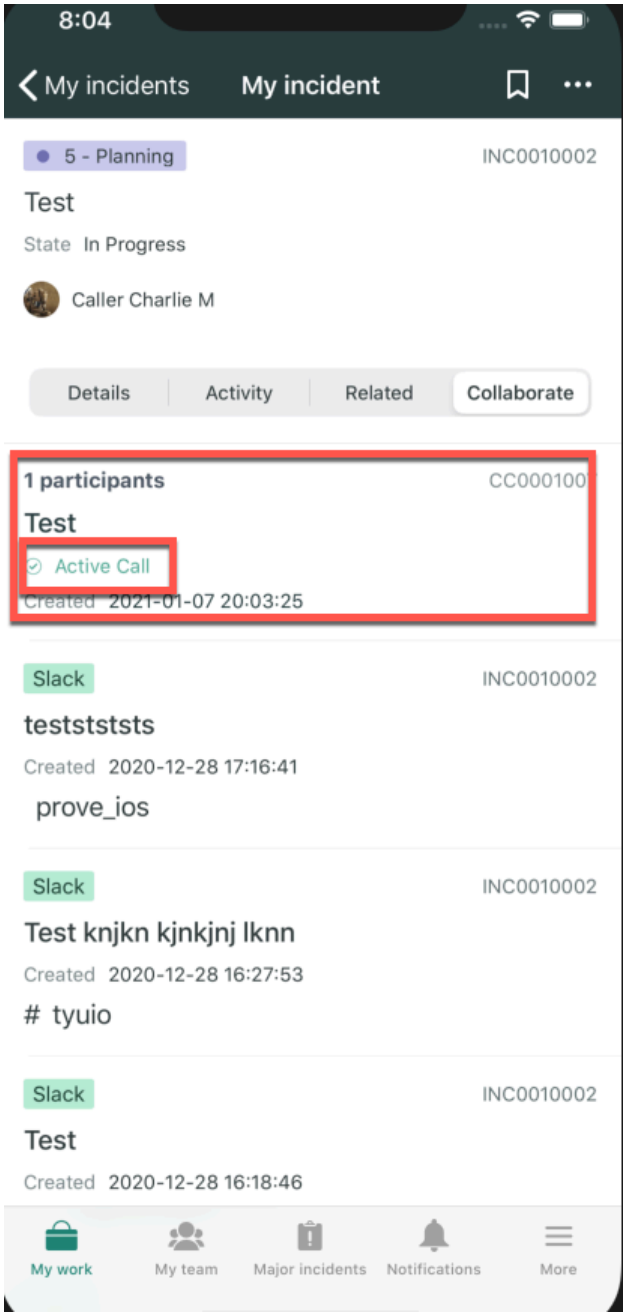


**6.** Tap **Add participants**.

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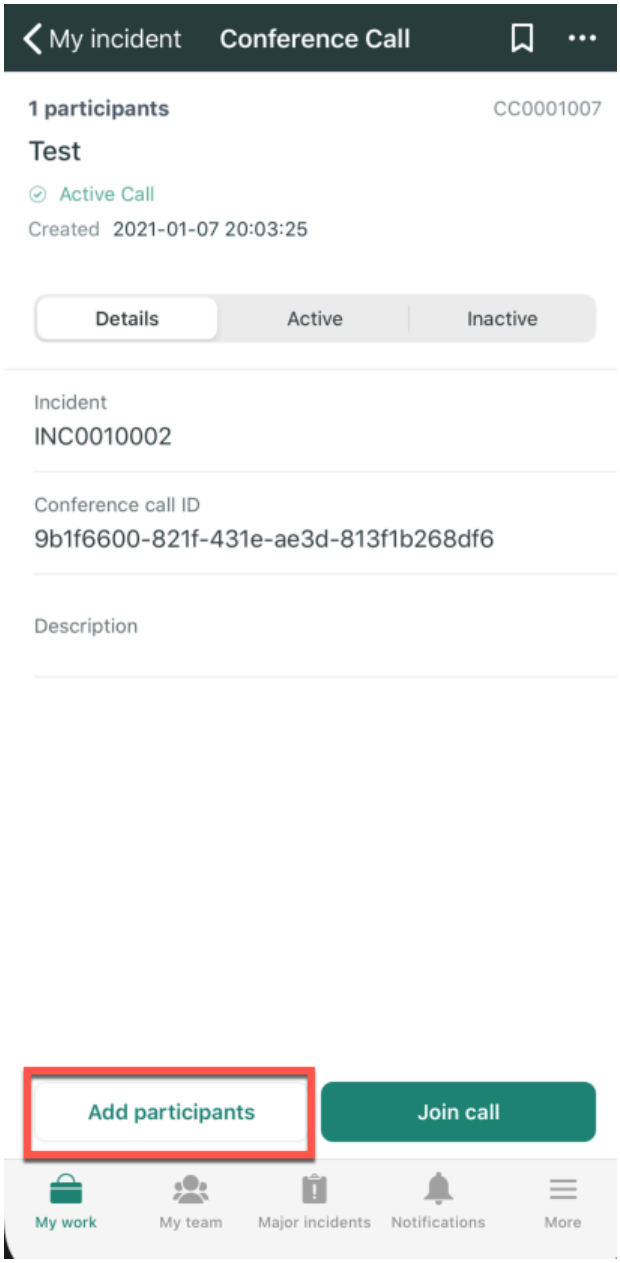


7. Provide the following details:
   a. **Recommended participants**: The list of participants associated with the incident will be displayed. Select the required users, and tap **Submit**.
   b. **Users**: Select the required users, and tap **Submit**.
   c. **Groups**: Select the required group, and tap **Submit**.

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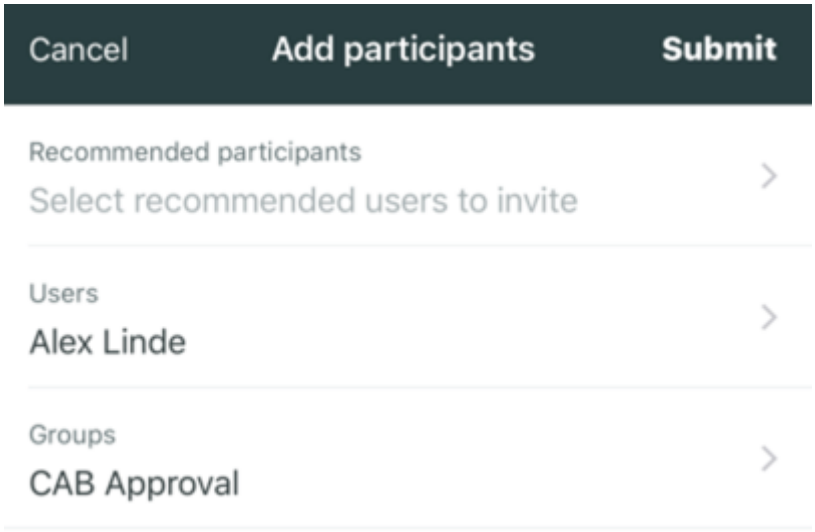


8. In the **Add participants** screen, click **Submit**.

### Join an active conference call from an incident

You can join an active conference call from an incident to discuss about the resolution of an incident.

#### Before you begin

Role required: itil, itil_admin, or admin

#### Procedure

1. Open ITSM Mobile Agent app.
2. In **My work** tab, tap **See All**.

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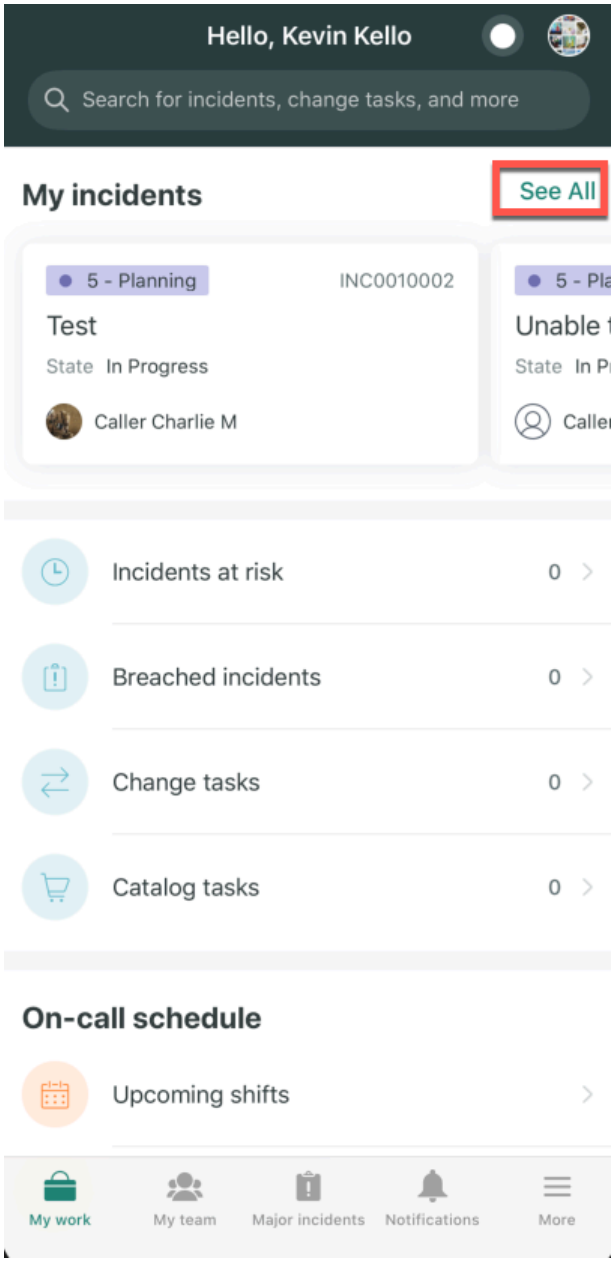


3. Open the incident where the conference call is originated.
4. Tap **Collaborate**.

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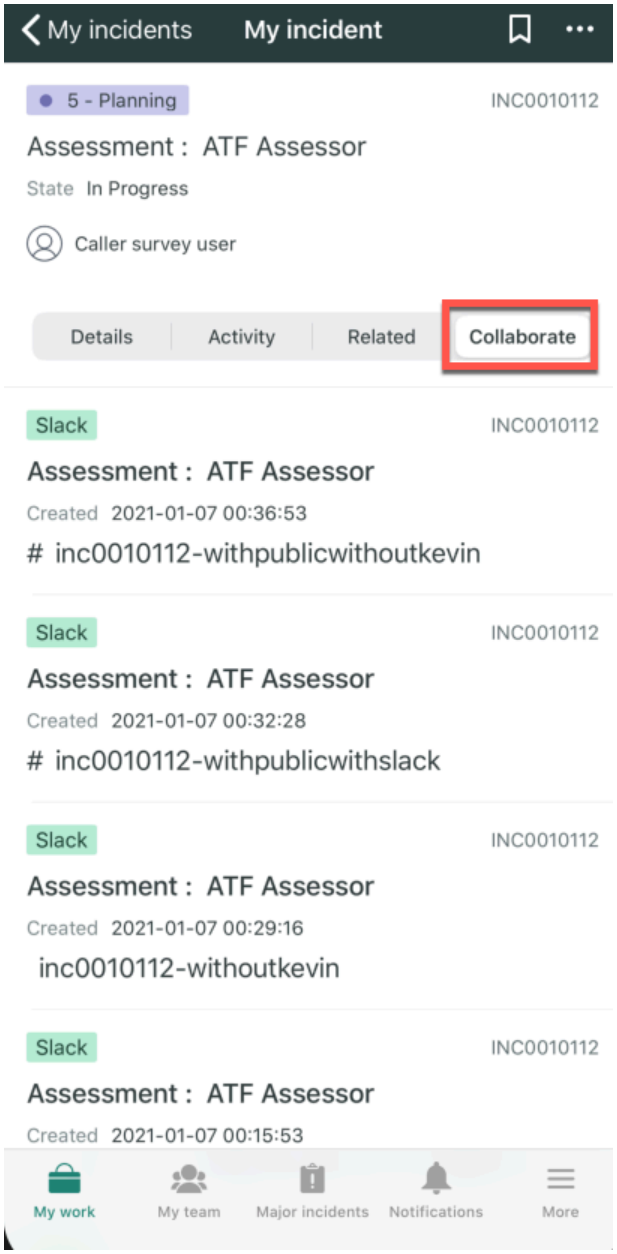


**5.** Tap on the active conference call.

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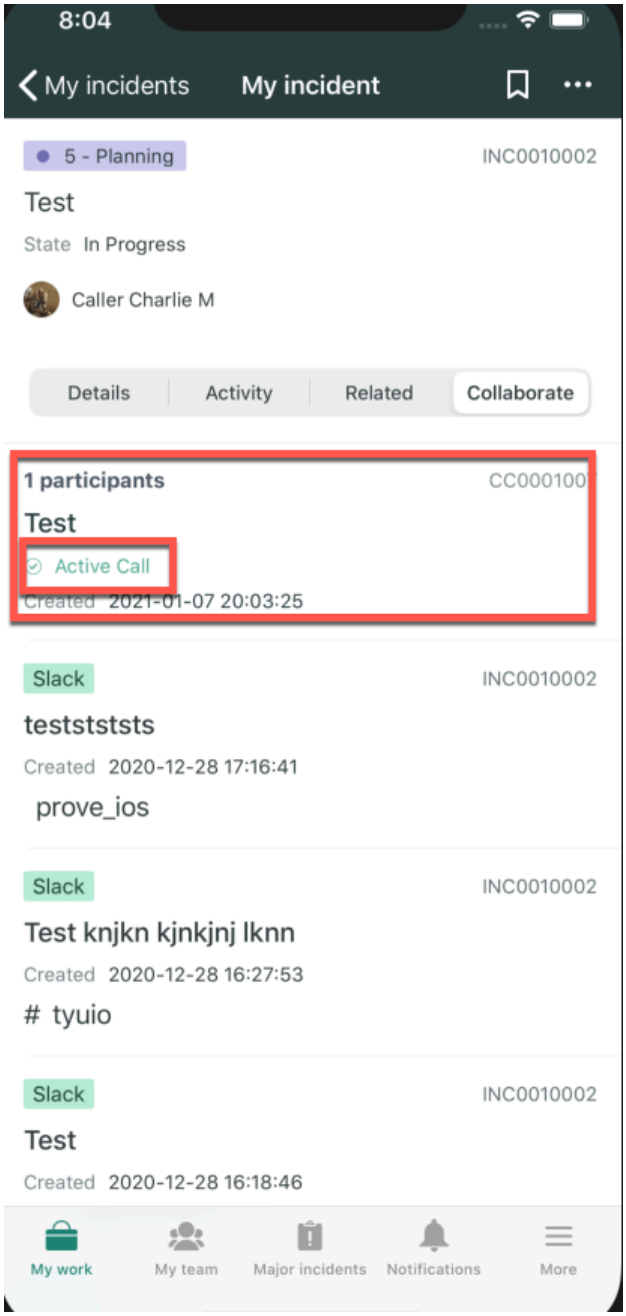


**6.** Tap on the conference call.

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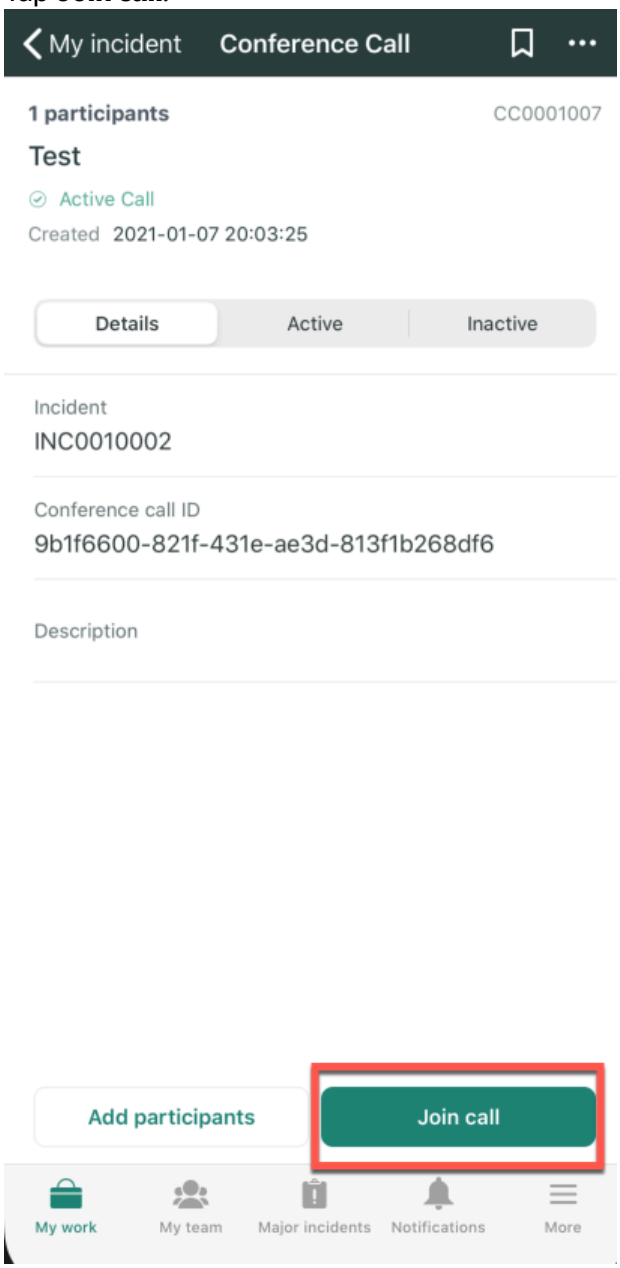
**7.** Tap **Join call**.




## View active collaborations

As an incident manager, you can view all the active collaborations for the incidents.

### Before you begin

Role required: itil, itil_admin, or admin

### Procedure

**1.** Open ITSM Mobile Agent app.

**2.** In **My work** tab, tap **See All**.

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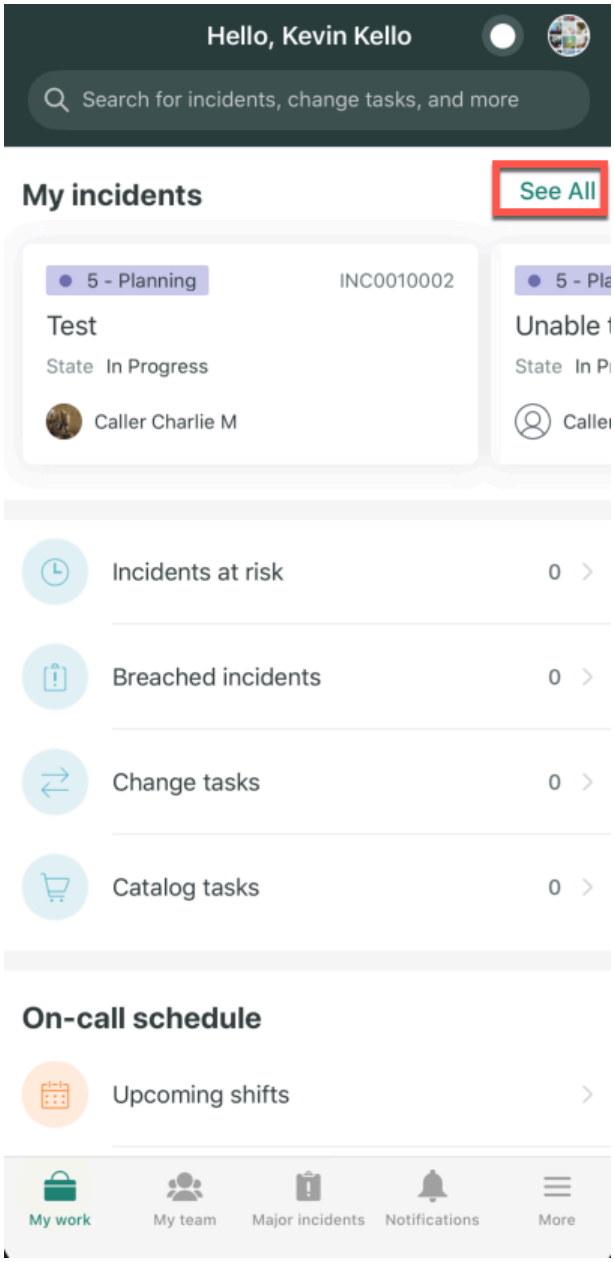


3. Tap on an incident.
4. Tap **Collaborate**.

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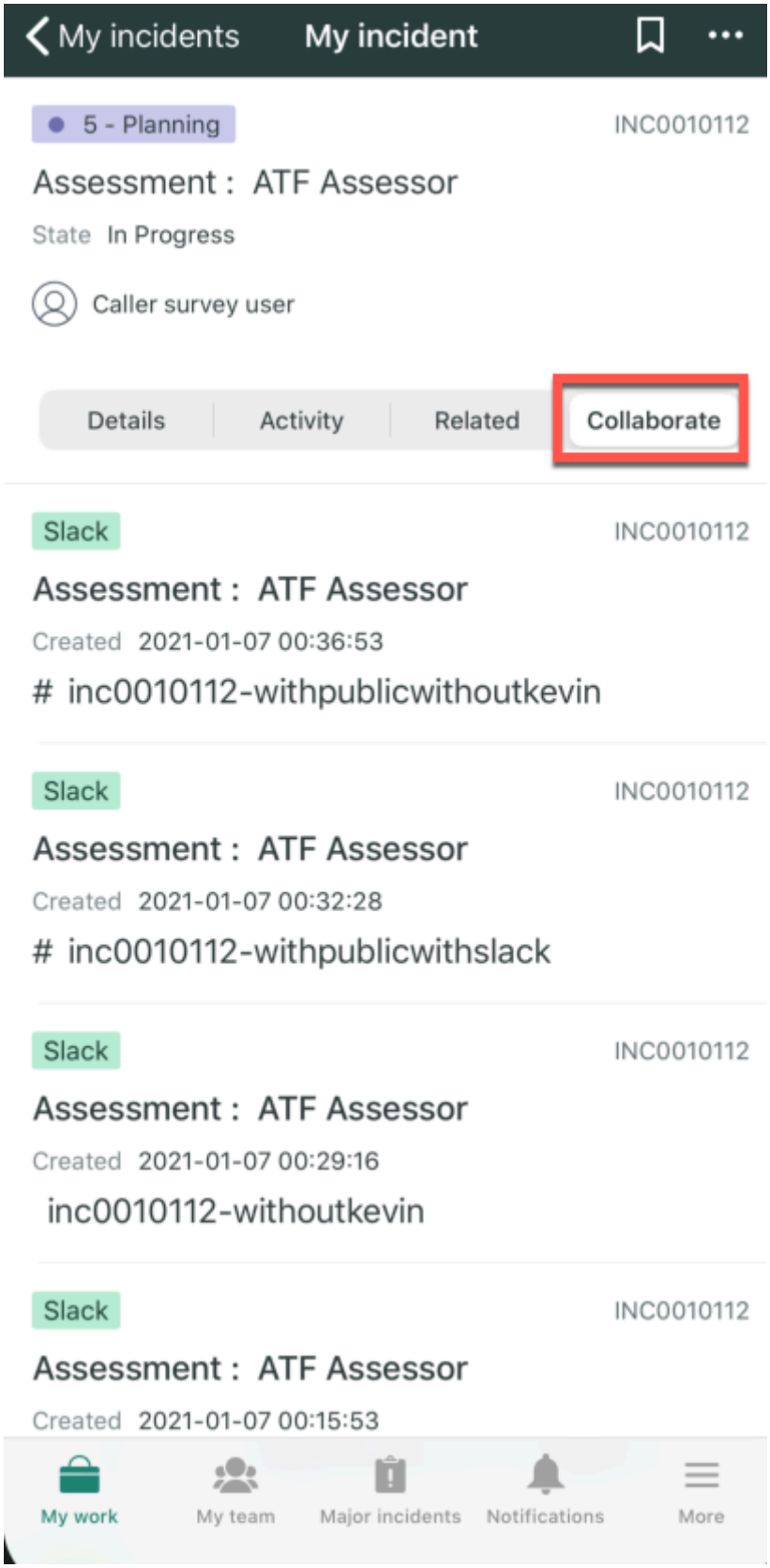


Each collaboration displays:

- Application: Slack / Microsoft Teams
- Collaboration title

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- Incident created date and timestamp
- Channel name: Channel marked with “#” is a public channel. Any user can view the conversation. Channel that doesn’t contain a “#” is a private channel, this channel isn’t accessible to public users. Only the collaborators can view the chat conversation.

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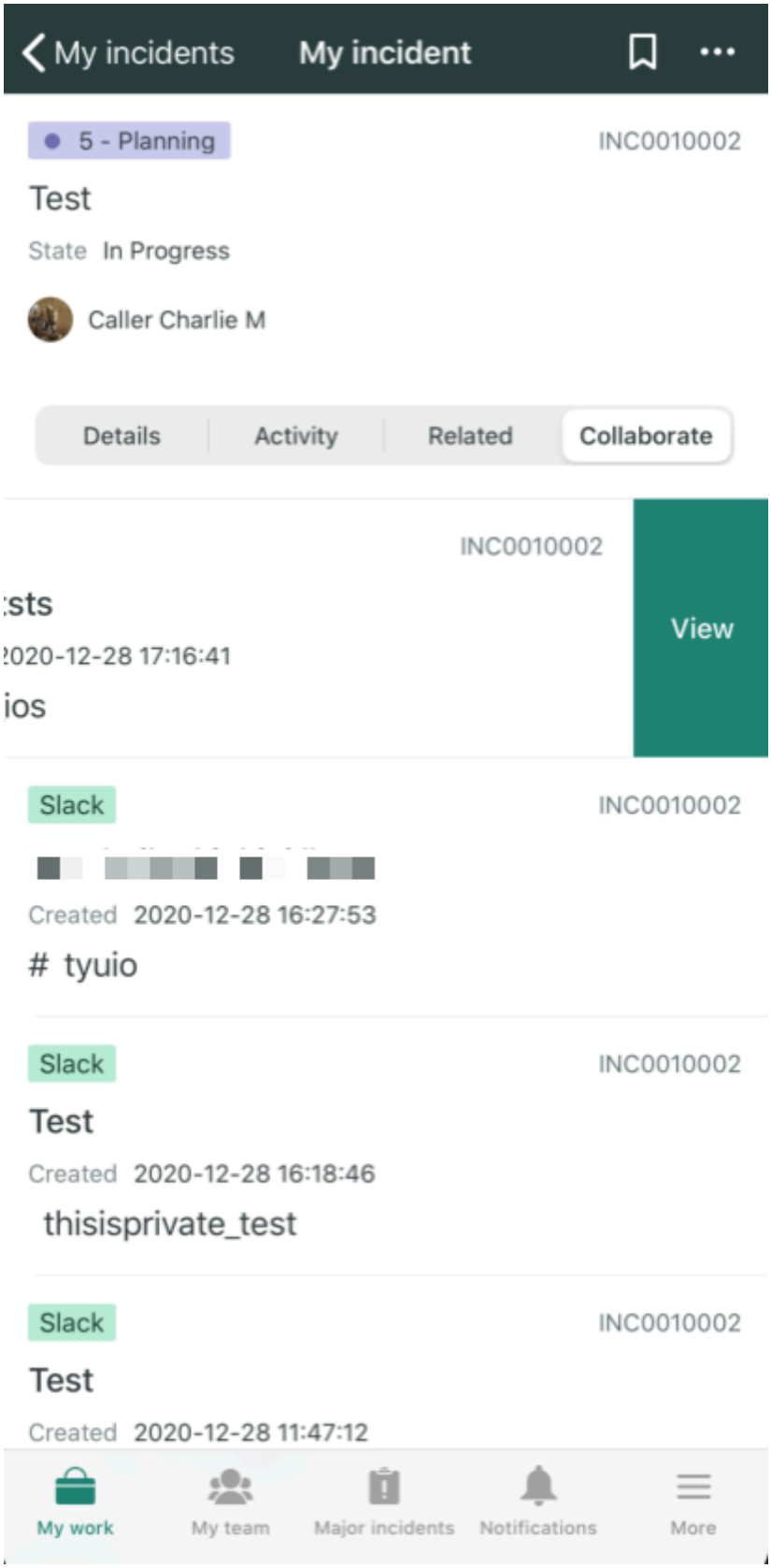
5. Swipe and tap **View** to view the conversation in the respective application.




### View active and inactive participants in the conference call

You can view the participant status in an active conference call.

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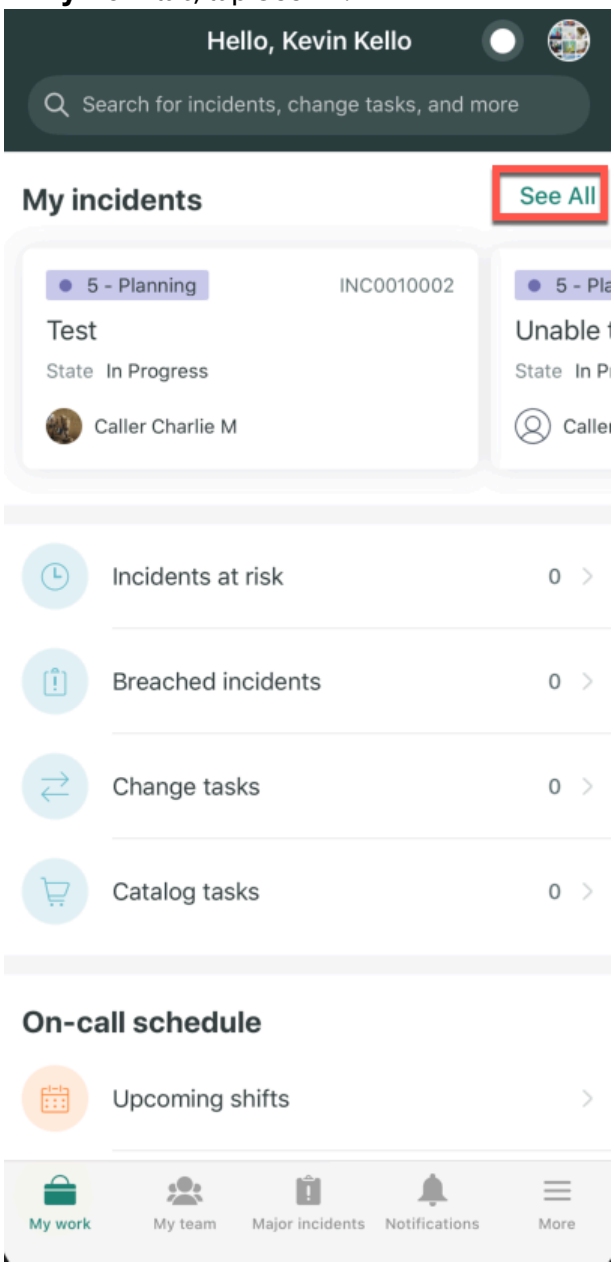
### Before you begin

Role required: itil, itil_admin, or admin

### Procedure

1. Open ITSM Mobile Agent app.
2. In **My work** tab, tap **See All**.




3. Open the incident where the conference call is originated.
4. Tap **Collaborate**.

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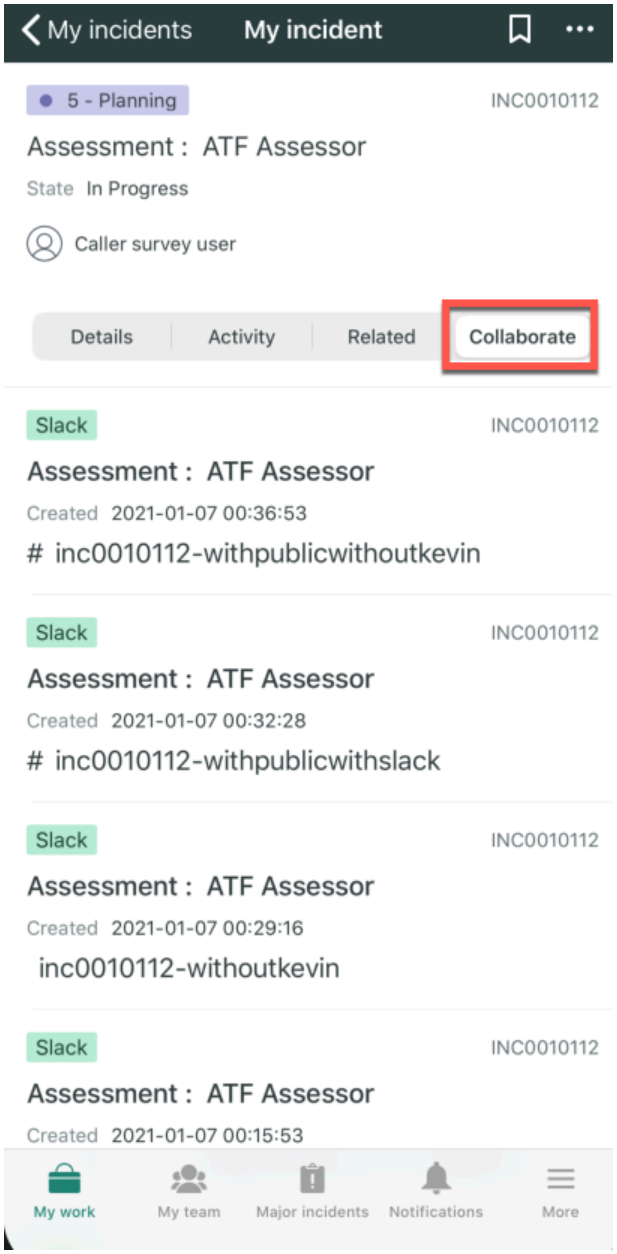


**5.** Tap on the active conference call.

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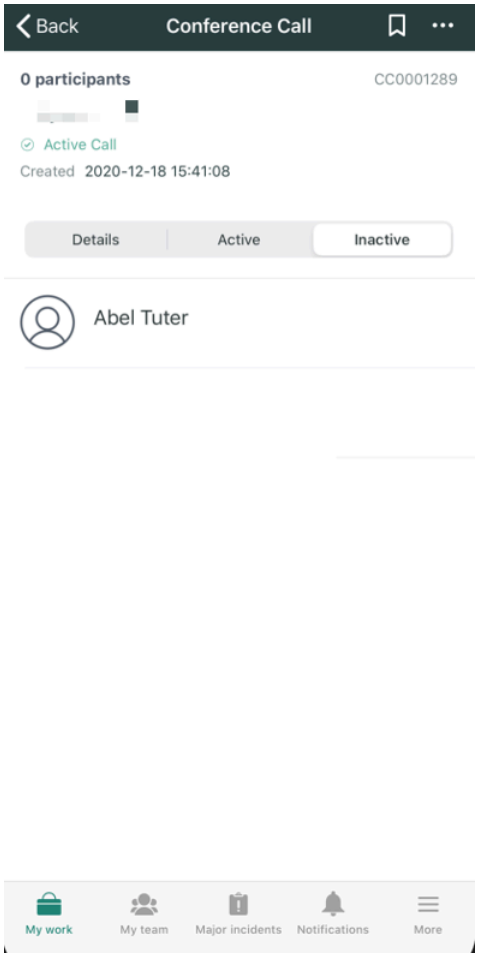


6. Do one of the following:

**Participant status**

| Option | Action |
|---|---|
| **Active** | Tap **Active** to view the active participants |
| **Inactive** | Tap **Inactive** to view the inactive participants |

### End a conference call

As a host or a user with the incident manager role, you can end the conference call.

## Before you begin

Role required: itil, itil_admin, or admin

## Procedure

1. Open ITSM Mobile Agent app.
2. In **My work** tab, tap **See All**.

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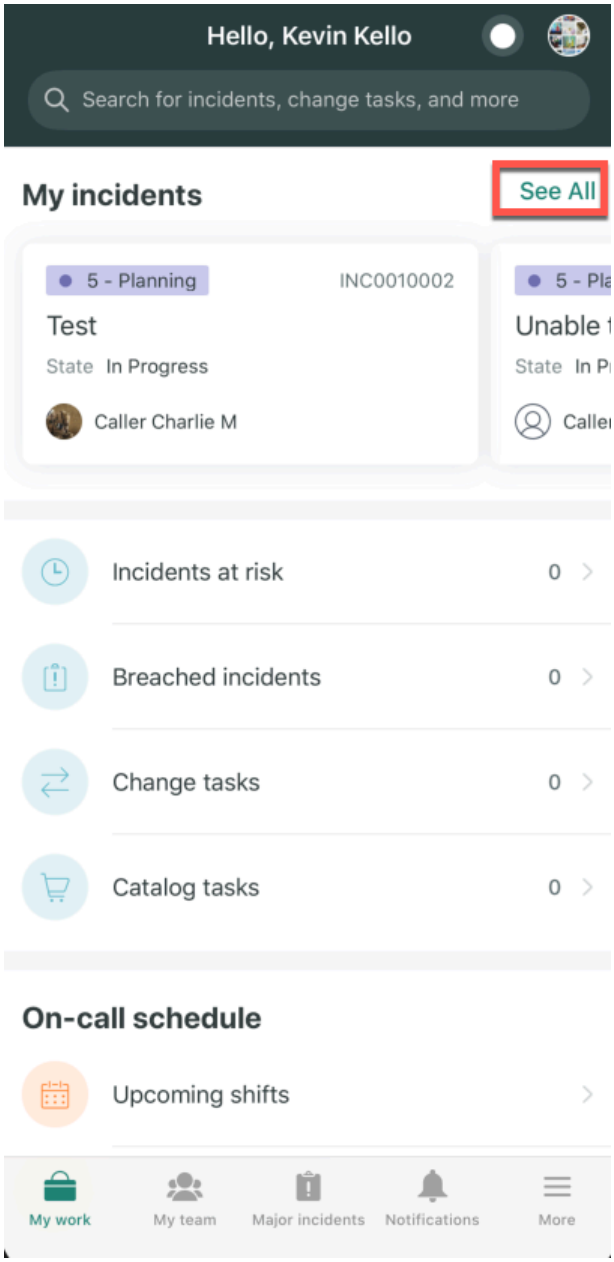


3. Open the incident where the conference call is originated.
4. Tap **Collaborate**.

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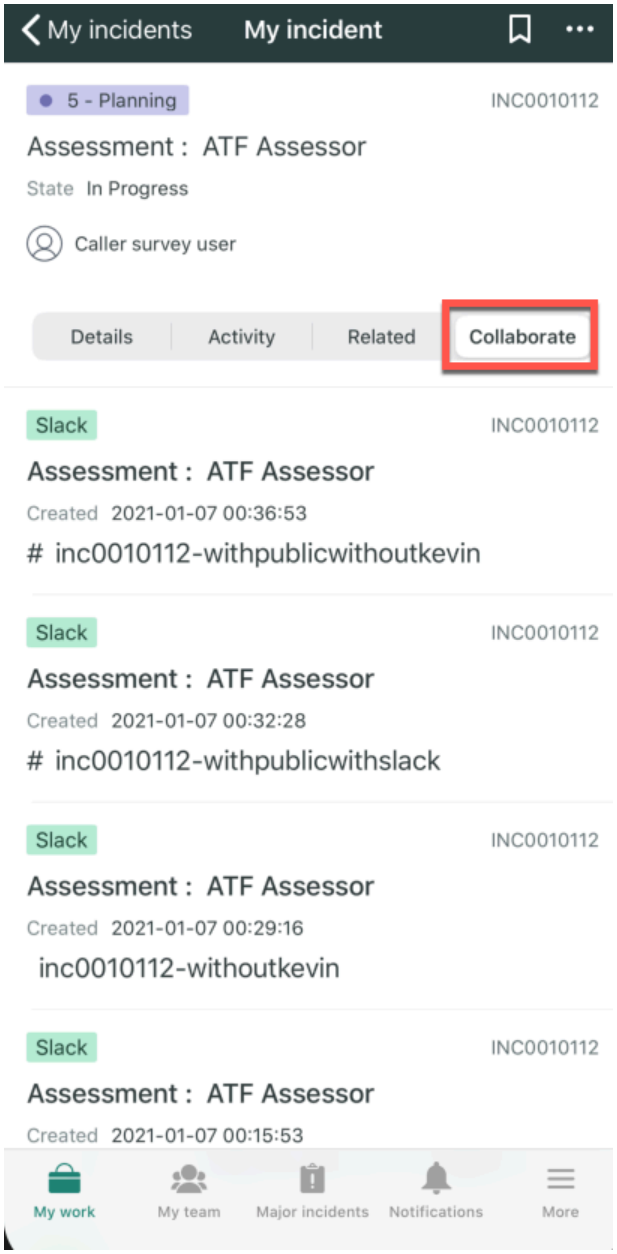


**5.** Tap on the active conference call.

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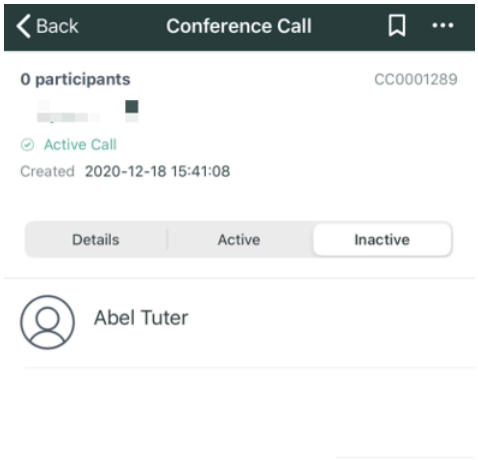


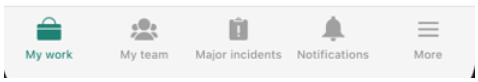


6. Tap ••• .
7. Tap **End call**.

### Collaboration with incident tasks

Initiate and manage the collaboration for incident task records from the ITSM Mobile Agent app.

### Initiate a conference call from an incident task

Initiate a conference call from an incident task record to discuss about the resolution of an incident.

## Before you begin

Role required: itil, itil_admin, or admin

## Procedure

1. Open ITSM Mobile Agent app.
2. In **My work** tab, tap **See All**.

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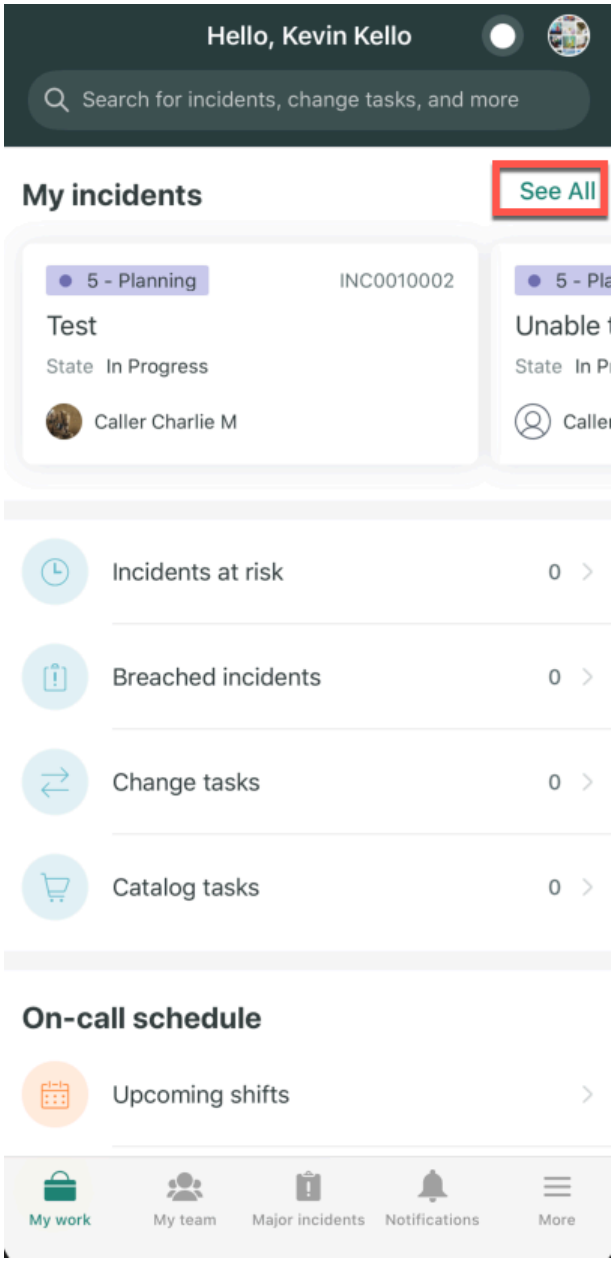


3. Tap the incident record you want to work on.
4. Tap **Related** > **Incident tasks**.

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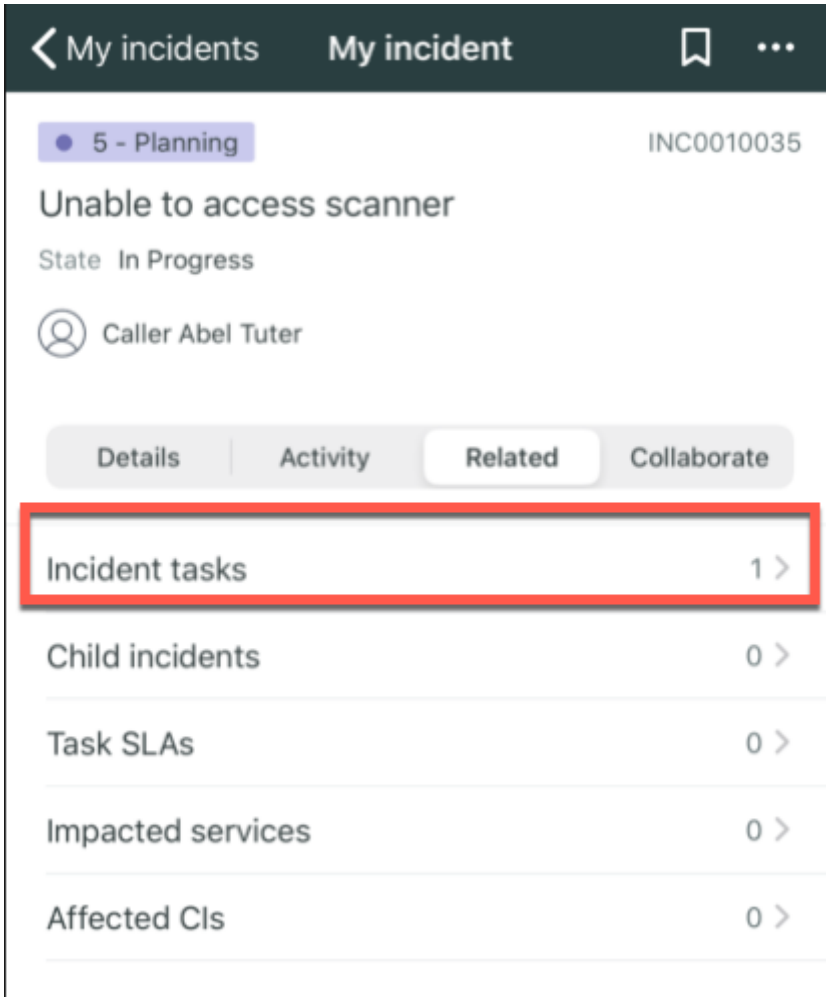


**5.** Tap on the incident task record.

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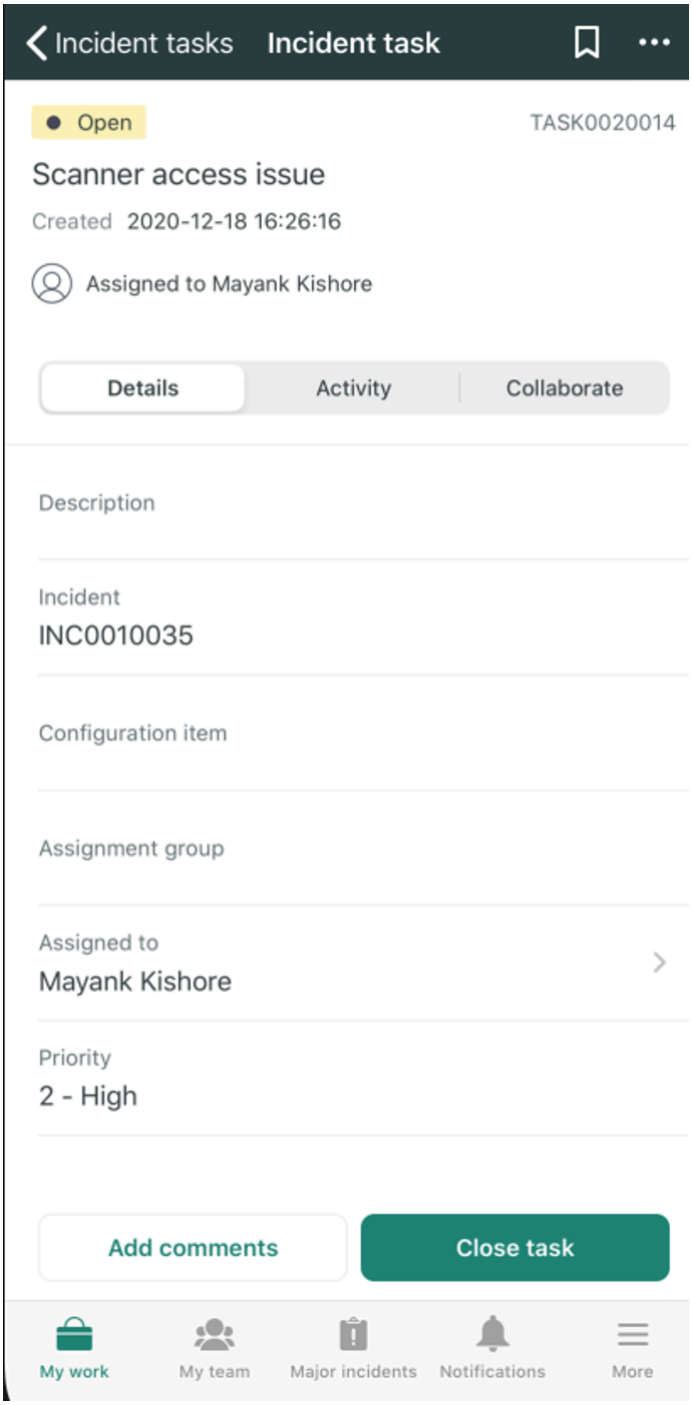


6. Tap ••• .
7. Tap **Start call**.
8. Provide the following details:
   a. **Conference bridge**: Tap **Conference bridge** and select Microsoft Teams
   b. **Users**: Select the users.
   c. **Groups**: Select the required group.

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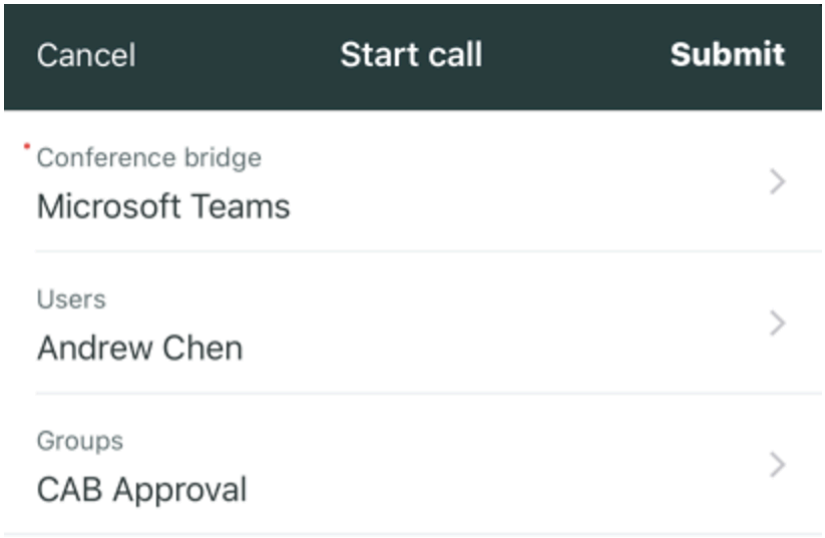


9. Tap **Submit**.

### Add participants to a conference call from an incident task

Add participants to an active conference call with the caller from an incident task to discuss about the resolution of a task.

#### Before you begin

Role required: itil, itil_admin, or admin

#### Procedure

1. Open ITSM Mobile Agent app.
2. In **My work** tab, tap **See All**.

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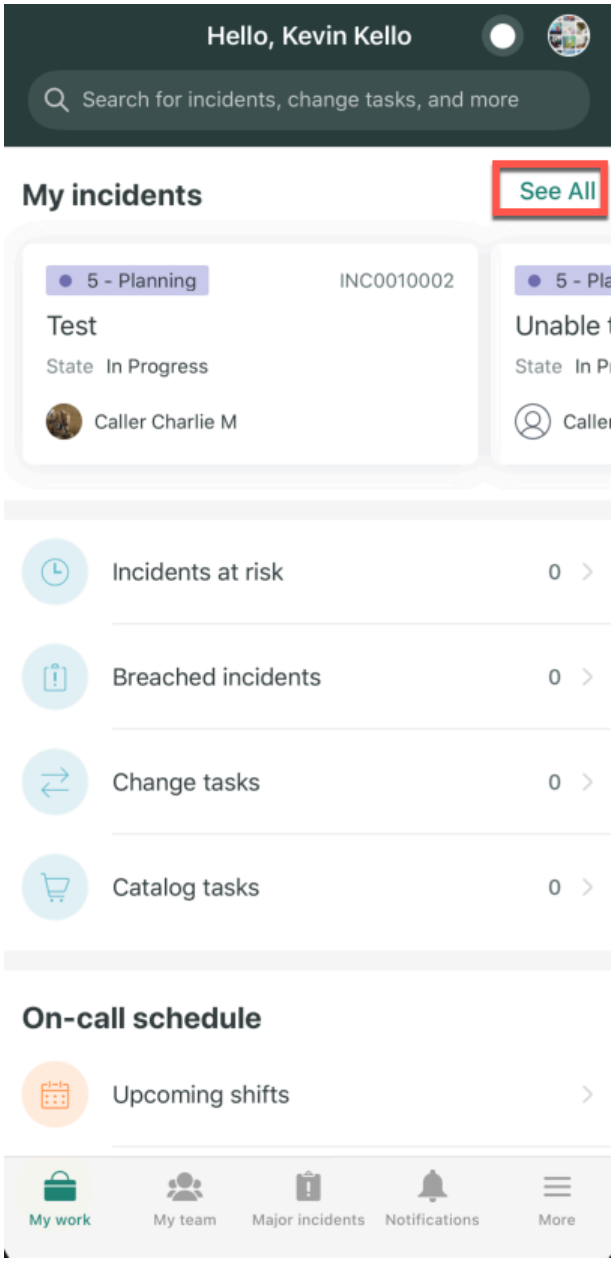


3. Tap the incident record you want to work on.
4. Tap **Related** > **Incident tasks**.

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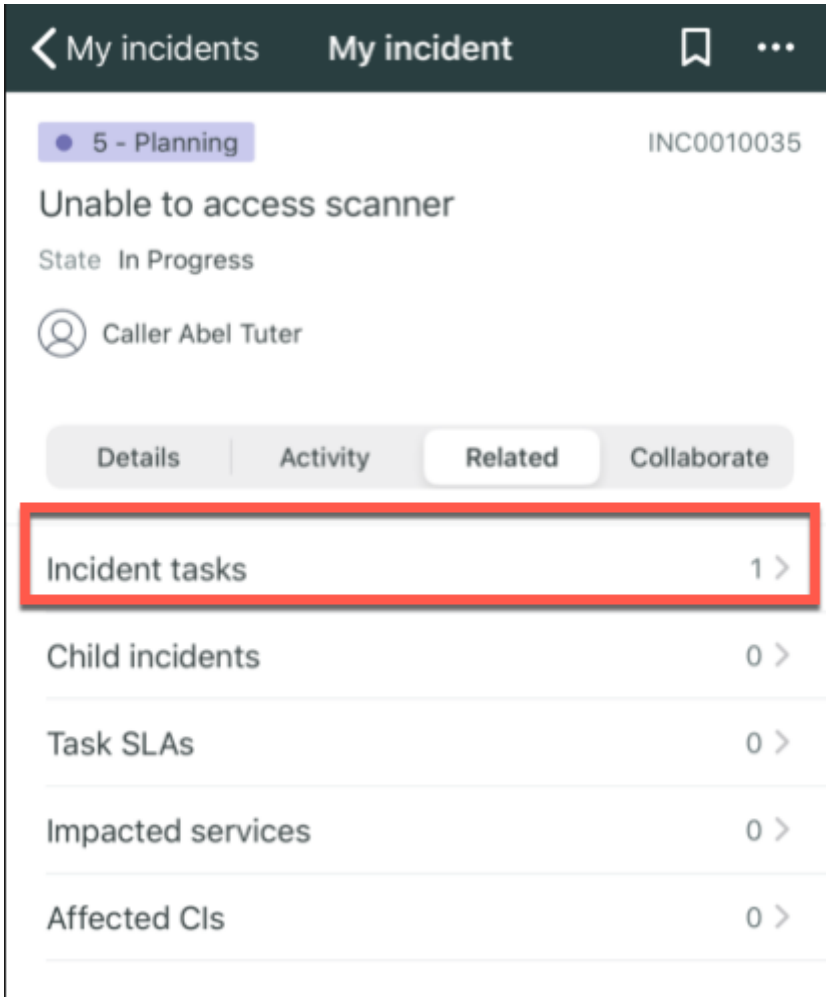


5. Tap on the incident task record.
6. Tap **Collaborate** > **Conference calls** > **Active**.
7. Tap on the conference call.
8. Tap **Add participants**, and provide the following details:
   a. **Recommended participants**: The list of participants associated with the incident will be displayed. Select the required users, and tap **Submit**.
   b. **Users**: Select the required users, and tap **Submit**.
   c. **Groups**: Select the required group, and tap **Submit**.

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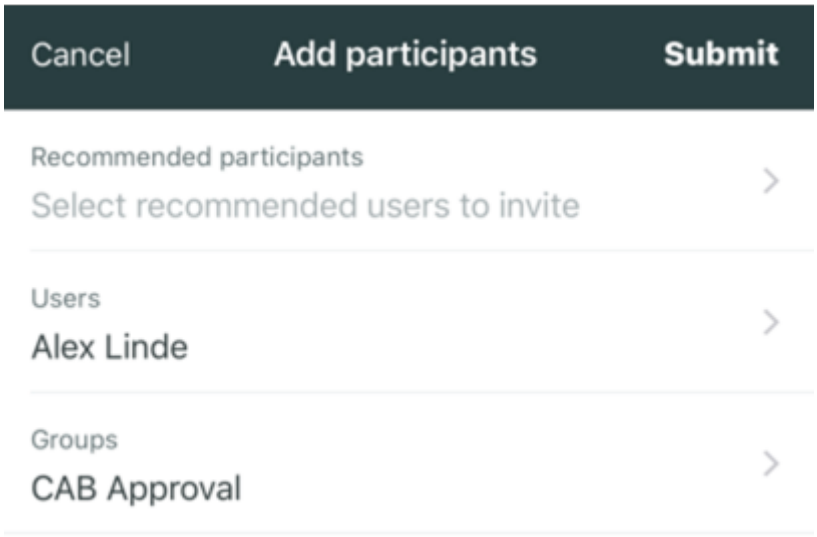


9. In the **Add participants** screen, click **Submit**.

### Join an active conference call from an incident task

You can join an active conference call from an incident task record to discuss about the resolution of an incident.

#### Before you begin

Role required: itil, itil_admin, or admin

#### Procedure

1. Open ITSM Mobile Agent app.
2. In **My work** tab, tap **See All**.

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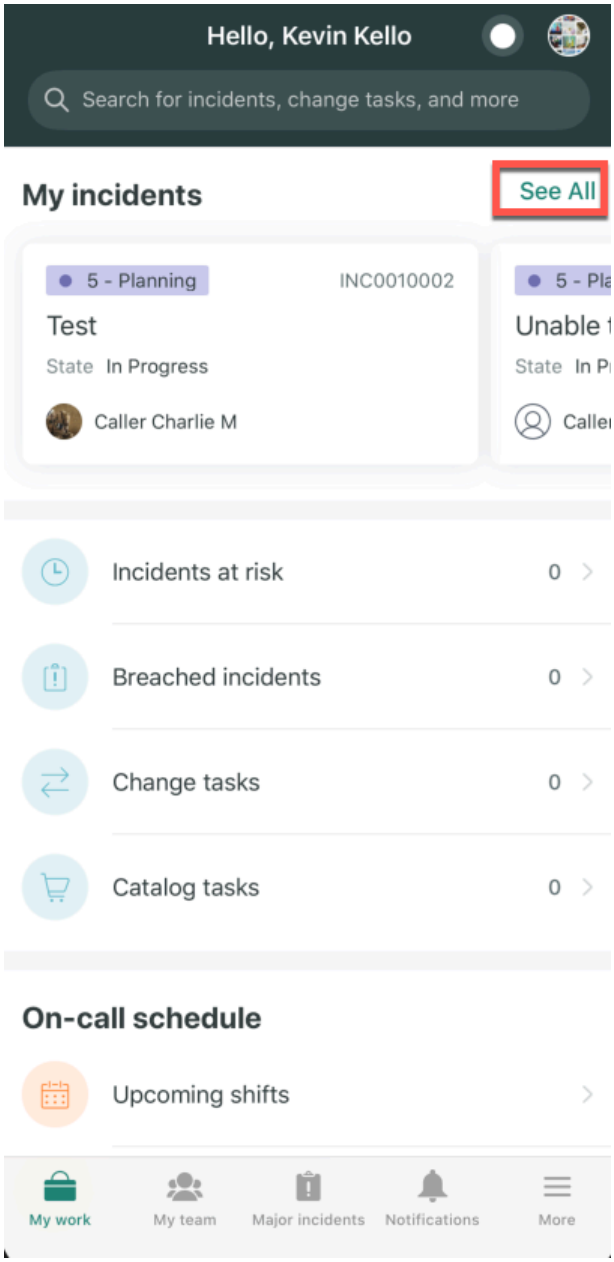


3. Tap the incident record you want to work on.
4. Tap **Related** > **Incident tasks**.

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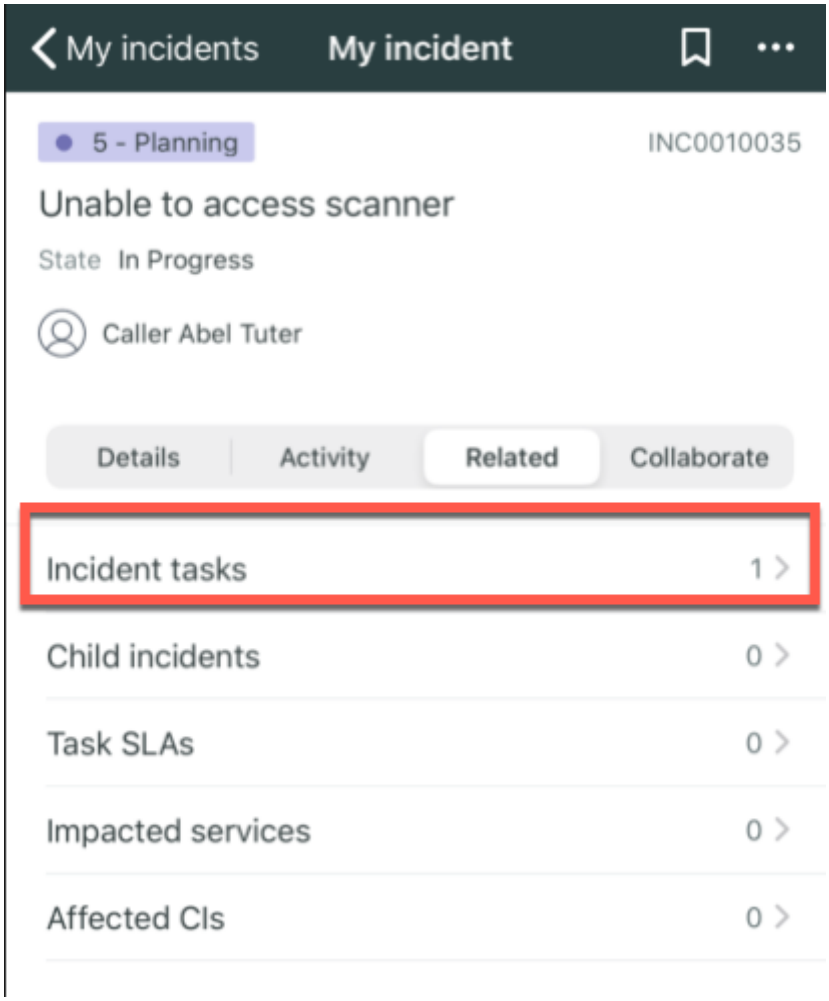


5. Tap on the incident task record.
6. Tap **Collaborate** > **Conference calls** > **Active**.
7. Tap on the conference call.

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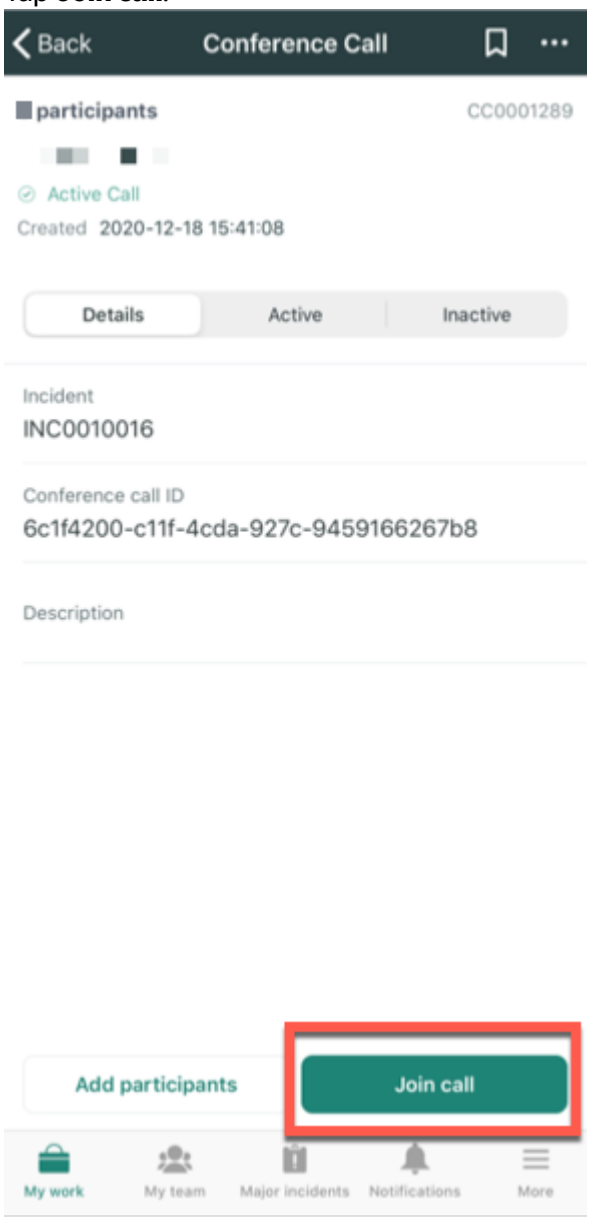
8. Tap **Join call**.




## View active and inactive participants in the conference call

You can view the participant status in an active conference call.

### Before you begin

Role required: itil, itil_admin, or admin

### Procedure

1. Open ITSM Mobile Agent app.
2. In **My work** tab, tap **See All**.

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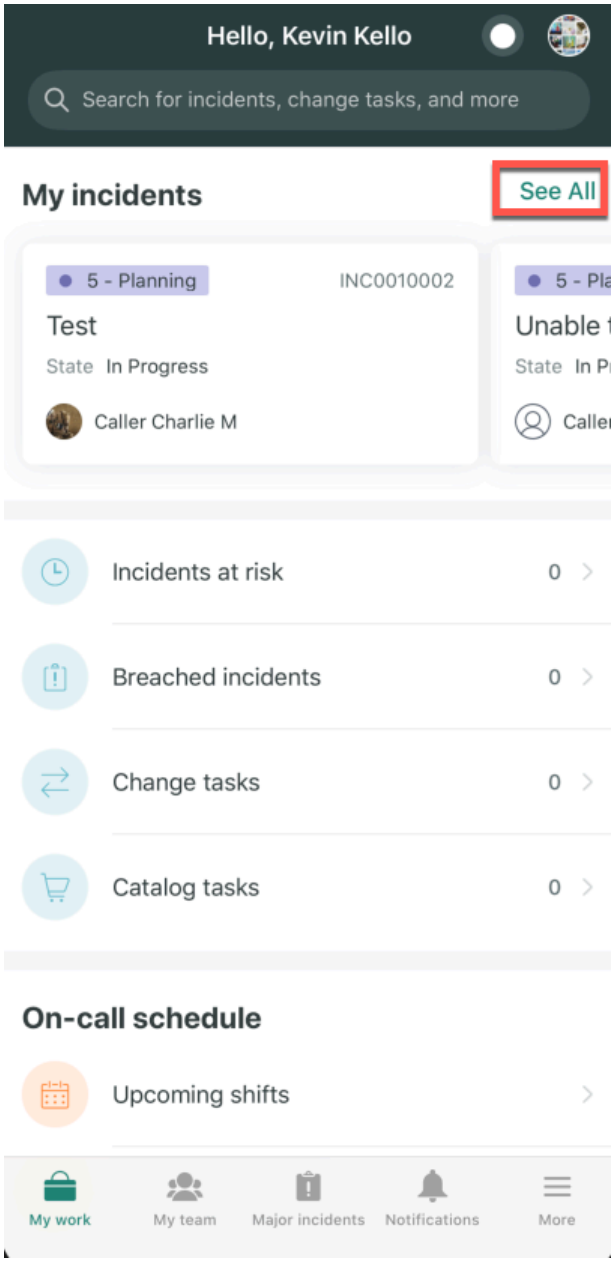


3. Tap the incident record you want to work on.
4. Tap **Related** > **Incident tasks**.

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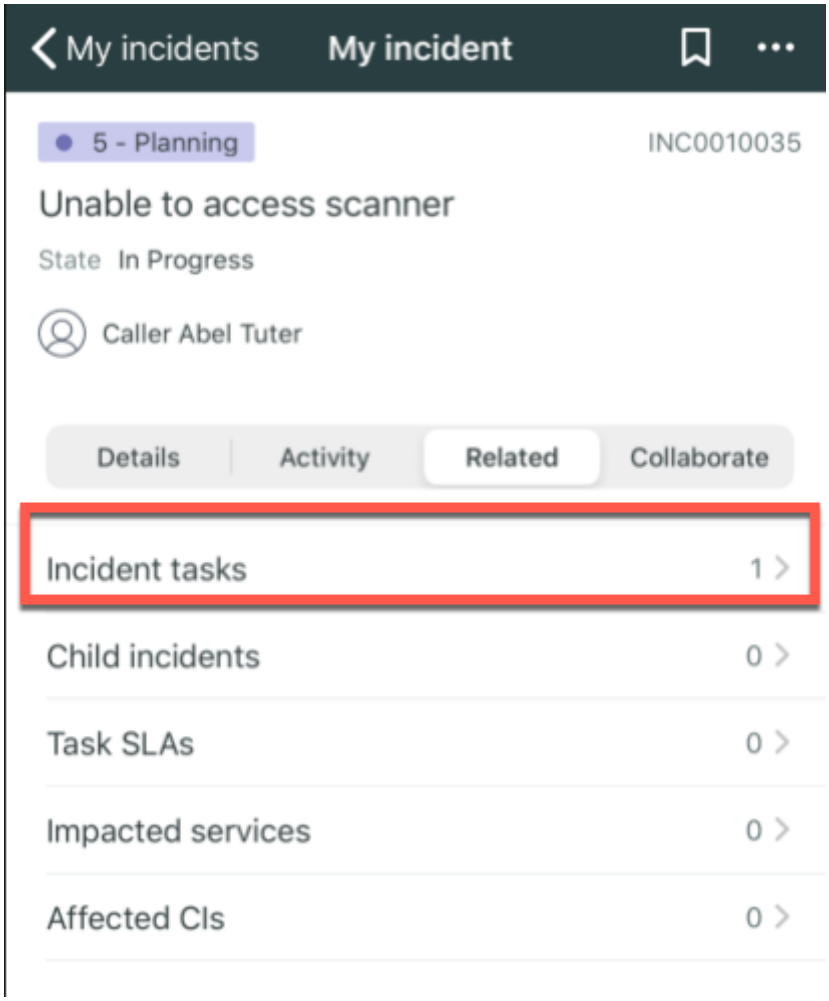


5. Tap on the incident task record.
6. Tap **Collaborate** > **Conference calls** > **Active**.
7. Tap on the conference call.
8. Do one of the following:

### View participant status

| Option | Action |
| --- | --- |
| **Active** | Tap **Active** to view the active participants |

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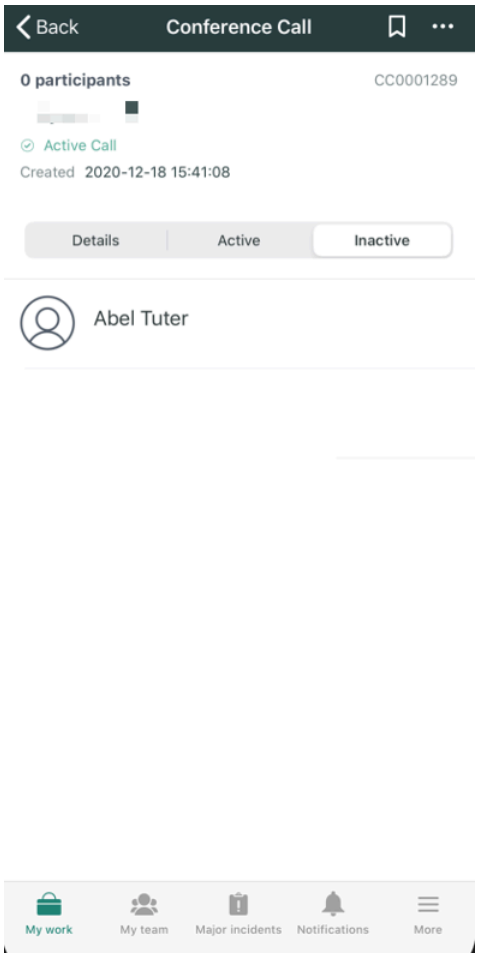
| Option | Action |
| --- | --- |
| **Inactive** | Tap **Inactive** to view the inactive participants |




### End a conference call

As a host or a user with the incident manager role, you can end the conference call.

## Before you begin

Role required: itil, itil_admin, or admin

## Procedure

1. Open ITSM Mobile Agent app.
2. In **My work** tab, tap **See All**.

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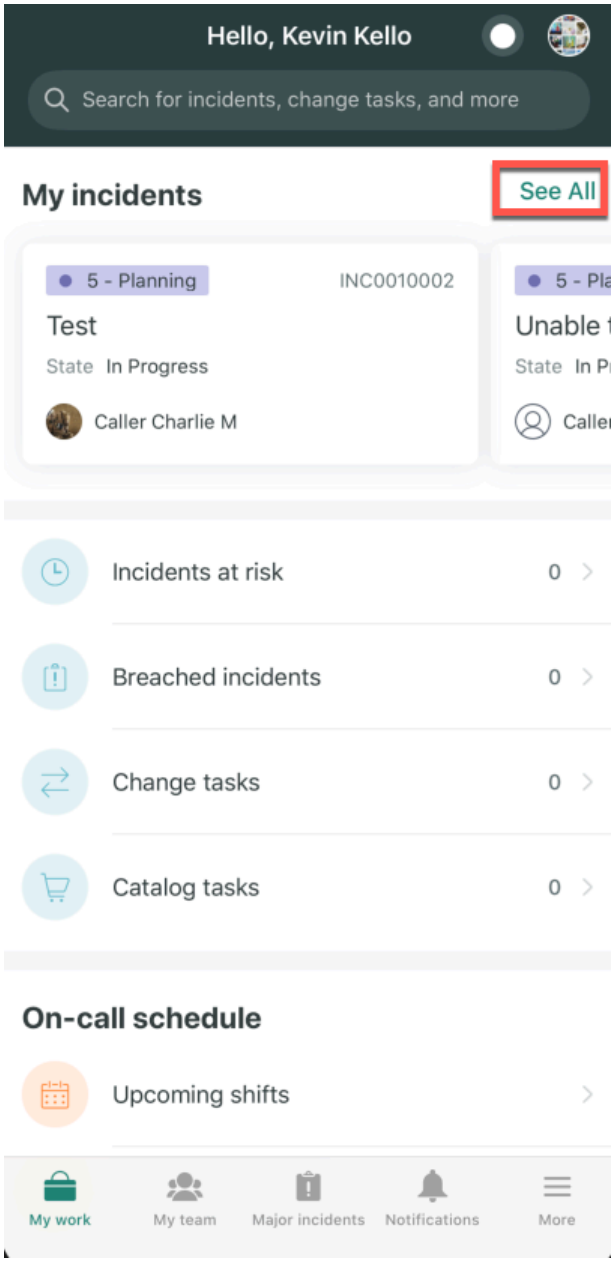


3. Tap the incident record you want to work on.
4. Tap **Related** > **Incident tasks**.

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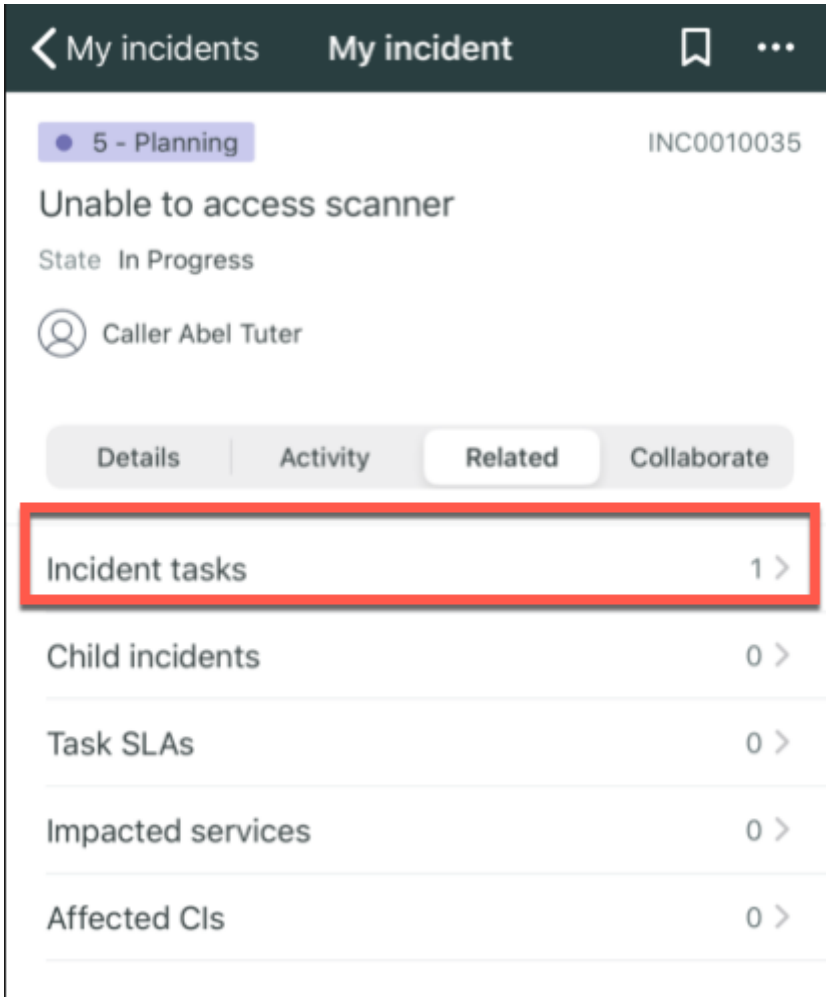


5. Tap on the incident task record.
6. Tap **Collaborate** > **Conference calls** > **Active**.
7. Tap on the conference call.

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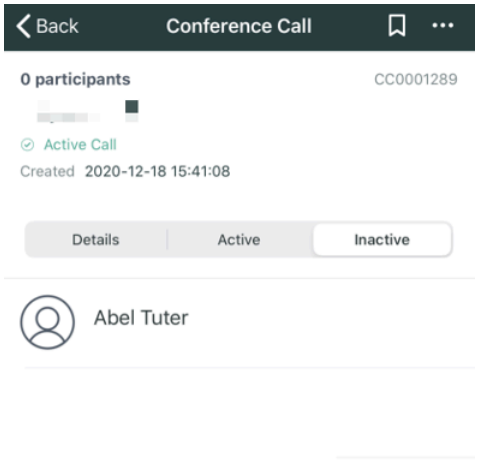


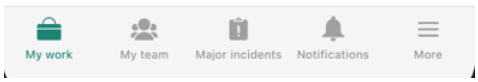


8. Tap ••• .
9. Tap **End call**.

## Incidents at risk

View a list of incidents at risk and work on them from your mobile.

**Related topics**

Process an incident at risk

### Process an incident at risk

Work on an incident at risk from your mobile.

**Before you begin**
Role required: ITIL

**About this task**
Resolve, reassign the incident, or add comments to an incident assigned to you.

**Procedure**

1. On the ITSM mobile agent landing screen, tap the **Incidents at risk** applet.
   The **Incidents at risk** screen opens with a list of incidents.
2. If you want to reduce the number of records on the screen, see Filter records to search for records that match specific search criteria.

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3. On the **Incidents at risk** screen with the list of incidents, swipe left on an incident to open the menu.
4. On the menu, choose one of the actions to process the incident.

| Action | Description |
|---|---|
| Add comments | Add any additional comments or work notes about the incident in this field and tap . |
| Reassign | Use this action to reassign an incident to another agent. On the Reassign incident screen, tap the **Assignment group** field to change the assignment group, select the agent from the list in the **Assigned to** field and add any notes in the **Work notes** and tap to submit. |
| Resolve | On the Resolve incident screen, tap the **Resolution code** field and choose a code for the resolution, add notes in the **Resolution notes field**, and tap . |

5. On the **Incidents at risk** screen, tap a record on the list to open it and view more details.
6. On the **Incidents at risk** screen as shown in the following figure, choose one of the actions in the table as appropriate.

| Option | Description |
|---|---|
| DETAILS tab | Choose one to continue.<br>○ View the fields for details about the incident. The fields with an arrow have additional information.<br>○ At the top right of the screen, tap the menu icon to reassign, edit, or propose the incident as a major incident.<br>○ Add any additional comments using the **Add comments** button.<br>○ Resolve the incident after adding a resolution code and notes using the **Resolve** button. |
| ACTIVITY tab | View the activity on the incident like field changes or assignment changes. Tap the add icon to perform any of the following activities on the incident.<br>**a.** *`Record Video`*: Record a video to be attached to the incident.<br>**b.** *`Open Gallery`*: Open your photo gallery to attach an existing image or a video to the incident.<br>**c.** *`Take Photo`*: Take a picture and attach it to the incident<br>**d.** *`Attach File`*: Attach a file from another application to the incident.<br>**e.** *`Add Additional Comments`*: Add any additional comments to the incident. |

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| Option | Description |
|---|---|
| | **Note:** The comments can be made visible to the customer if you enable them using the toggle bar on the **Additional Comments** field.<br><br>**f.** *`Add Work Notes`*: Add your work notes on the incident. |
| RELATED tab | View the related lists of the incident, such as, child incidents, task SLAs, impacted services, and affected CIs. Tap on the arrow to view more details of these related items. |
| CALLS tab | View the list of all the calls related to an incident. Tap on any of the calls to *`Add participants`* or to *`Join call`*. Tap on the menu on top of the Conference Call page and tap **End call** to end the call. |

## Breached Incidents

View a list of all the breached incidents of your group and take appropriate action on these incidents. Breached incidents are the incident for which the Service Level Agreement (SLA) has exceeded the due date.

### Process a breached incident

View and manage the breached incident from the mobile.

#### Before you begin

Role required: admin

#### Procedure

1. On the ITSM mobile agent landing screen, tap the **Breached incident** applet.
   The **Breached incidents** screen opens with a list of incidents.
2. If you want to reduce the number of records on the screen, see Filter records to search for records that match specific search criteria.
3. On the **Breached incidents** screen with the list of incidents, swipe left on an incident to open the menu.
4. On the menu, choose one of the actions as described in the table.

| Action | Description |
|---|---|
| Add comments | Add any additional comments or work notes about the incident in this field and tap  . |
| Reassign | Use this action to reassign an incident to another agent. On the Reassign incident screen, tap the **Assignment group** field to change the assignment group, select the agent from the list in the **Assigned to** field, and add any notes in the **Work notes**, and tap  to submit. |
| Resolve | On the Resolve incident screen, tap the **Resolution code** field and choose a code for the resolution, add notes in the **Resolution notes** field, and tap  . |

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5. On the **Breached incidents** screen, tap a record on the list to open it and view more details.
6. On the **Breached incidents** screen, as shown in the following figure, choose one of the actions in the table as appropriate.

| Option | Description |
|---|---|
| DETAILS tab | Choose one to continue.<br>○ View the fields for details about the incident. The fields with an arrow have additional information.<br>○ At the top right of the screen, tap the menu icon  to reassign, edit, or propose the incident as a major incident.<br>○ Add any additional comments using the **Add comments** button.<br>○ Resolve the incident after adding a resolution code and notes using the **Resolve** button. |
| ACTIVITY tab | View the activity on the incident like field changes or assignment changes. Tap  to perform any of the following activities on the incident.<br>**a.** *`Record Video`*: Record a video to be attached to the incident.<br>**b.** *`Open Gallery`*: Open your photo gallery to attach an existing image or a video to the incident.<br>**c.** *`Take Photo`*: Take a picture and attach it to the incident<br>**d.** *`Attach File`*: Attach a file from another application to the incident.<br>**e.** *`Add Additional Comments`*: Add any additional comments to the incident.<br>**Note:** The comments can be made visible to the customer if you enable them using the toggle bar on the **Additional Comments** field.<br>**f.** *`Add Work Notes`*: Add your work notes on the incident. |
| RELATED tab | View the related lists of the incident, such as, child incidents, task SLAs, impacted services, and affected CIs. Tap on the arrow to view more details of these related items. |
| CALLS tab | View the list of all the calls related to an incident. Tap on any of the calls to *`Add participants`* or to *`Join call`*. Tap on the menu on top of the Conference Call page and tap *`End call`* to end the call. |

## Change tasks

View and work on the change tasks assigned to you. You can view the details, activities, and other related change tasks by a single tap on the ITSM mobile agent app.

Tap on the card to access all the change tasks assigned to you.

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1. You can filter the list according to your set criteria.
2. Swipe left to add comments to the task or close the task.
3. On the **Change Tasks** screen, tap on any task to view the details, activity and related change tasks. You can add comments or close a task from this screen.

> **Note:**
> Each change task card shows you the risk value of the task. For example, very high, or moderate.

## View catalog tasks

View a catalog task and add comments to it as part of the catalog item fulfillment.

A catalog task is a task that is associated with the service catalog item. Catalog tasks are used to source items and fulfill requests.

Tap on the card to access all the catalog tasks assigned to you.

1. You can filter the list according to your set criteria.
2. Swipe left to add comments or close the task.
3. On the **Catalog tasks** screen, tap on any task to view the details or activity of the catalog task. You can only add comments from this screen.

## View upcoming shifts with On-Call Scheduling

Use the My work feature in the ITSM Mobile Agent app to view your upcoming shifts and request time off.

### Before you begin

Role required: itil, sn_incident_write

### About this task

Use the On-Call Scheduling applet to view your upcoming shifts and request time off. You can also view the members of your available on-call group.

### Procedure

1. Open the ITSM Mobile Agent app.
2. On the **On-call Schedule** tab, tap **Upcoming shifts**.

   All upcoming shifts for the current month are displayed. The shifts are grouped based on the type of events. One-day events are displayed at the top, followed by multi-day events and short-duration events that are sorted based on the time that the event was created.

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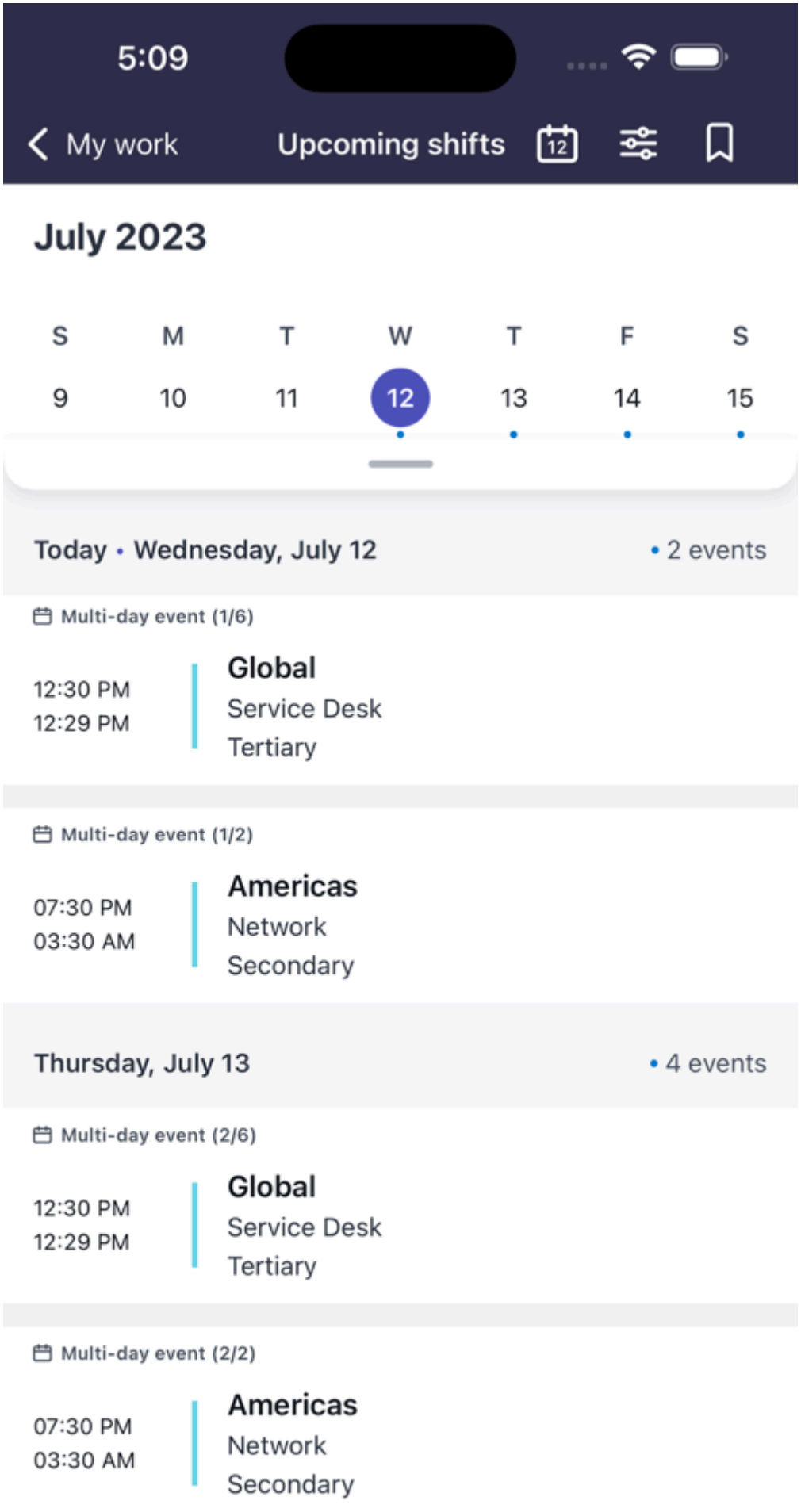


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3. Tap a shift card to view the following shift details:
   - Name
   - Group
   - Roster
   - Start time
   - End time
   - Duration
   - Type
4. Swipe the shift card to the left and tap **Request time-off**.
5. On the Request time-off form, enter the following details and tap **Submit** to complete the time-off request:
   - Group
   - Start date
   - End date
   - Proposed coverage
   - Notes

## Request time off with On-Call Scheduling

Use the **Time-off requests** tab to view a list of time-off requests that are divided into pending and completed requests.

### Before you begin

Role required: itil, sn_incident_write

### Procedure

1. Open the ITSM Mobile Agent app.
2. On the **On-call Schedule** tab, tap **Time-off requests**.
   A list of time-off requests is displayed. The list is divided into pending and completed requests.
3. Tap the filter icon (  ) to view specific time-off requests.
4. Tap the menu icon (  ) and select **Request time-off**.
5. Complete the following fields on the Request time-off form:
   - Group
   - Start date
   - End date
   - Proposed coverage
   - Notes
6. Tap **Submit**.

## View on-call group members

View the members of your group that are available on call.

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### Before you begin

Role required: Itil, sn_incident_write

### Procedure

1. Open the ITSM Mobile Agent app.
2. In the **On-call Schedule** tab, tap **Who is on-call**.
   All the available groups are displayed.
3. Select a group and tap **Submit**.

## Managing teams and incidents using My Team applet

Easily access and get insights into the work of the groups you are managing.

With the My Team applet, as a group manager you can:

- Easily access unassigned incidents from your group and quickly triage work
- Act upon time-off requests submitted by your team
- Review any On-call conflicts or gaps in a schedule and plan for appropriate coverage
- Access dashboards to gain insights like MTTR, CSAT, and so on for your groups.

### My team dashboard

As a group manager, with the My team dashboard, gain insights into the data like incidents at risk, breached incidents or overdue changes.

Tap on the sections to process the incidents.

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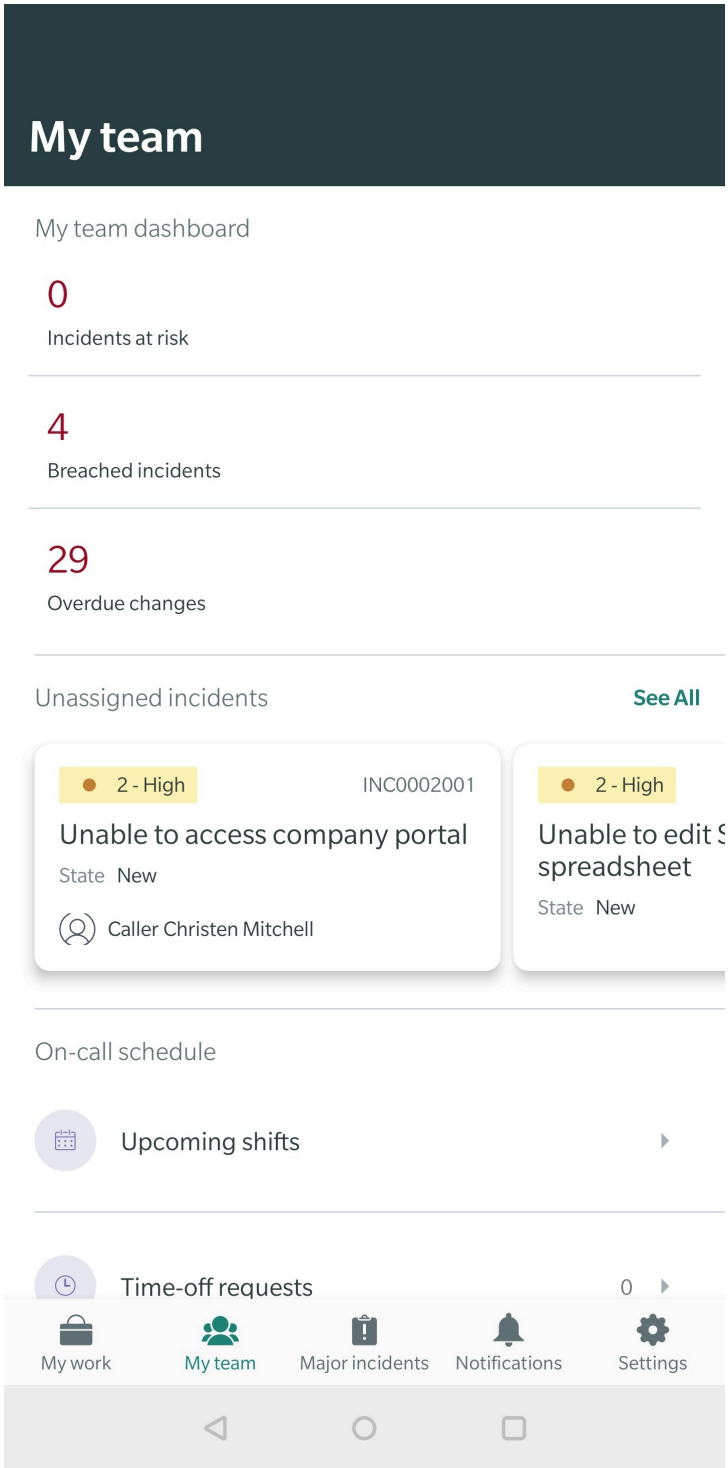


## Related topics

Overdue changes

## Overdue changes

Work on the overdue changes of your team

## Before you begin

Role required: admin

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### Procedure

1. On the My team dashboard, tap on **Overdue changes** on the applet.
2. If you want to reduce the number of records on the screen, see Filter records to search for records that match specific search criteria.
3. On the **Overdue changes** screen with the list of incidents, swipe left on an incident to open the menu.
4. On the menu, choose one of the actions to process the incident.

| Action | Description |
|---|---|
| Add comments | Add work notes about the change in this field and tap . |
| Cancel change | Use this action to cancel the change. Provide a reason on the **Reason** field and tap to submit. |

5. On the **Overdue changes** screen, tap a record on the list to open it and view more details.
6. On the **Change request** screen choose one of the actions in the table as appropriate.

| Option | Description |
|---|---|
| DETAILS tab | Choose one to continue.<br>○ View the fields for details about the incident. The fields with an arrow have additional information.<br>○ Add any additional comments using the **Add comments** button.<br>○ Use this action to cancel the change. Provide a reason on the**Reason** field and tap to submit. |
| PLANNING tab | View all the planning details like the implementation plan, risk and impact analysis and backout plan for the change on this screen |
| Calls | View the list of all the calls related to an incident. Tap on any of the calls to *`Add participants`* or to *`Join call`*. |

## Unassigned incidents

Use the Unassigned incidents applet to assign, reassign, edit or promote to a major incident.

### Before you begin

Role required: group manager

### Procedure

1. On the My team landing screen, tap **See All** on the **Unassigned incidents**applet.
   The **Unassigned Incidents** screen opens with a list of incidents.
2. If you want to reduce the number of records on the screen, see Filter records to search for records that match specific search criteria.
3. On the **Unassigned incidents** screen with the list of incidents, swipe left on an incident to open the menu.

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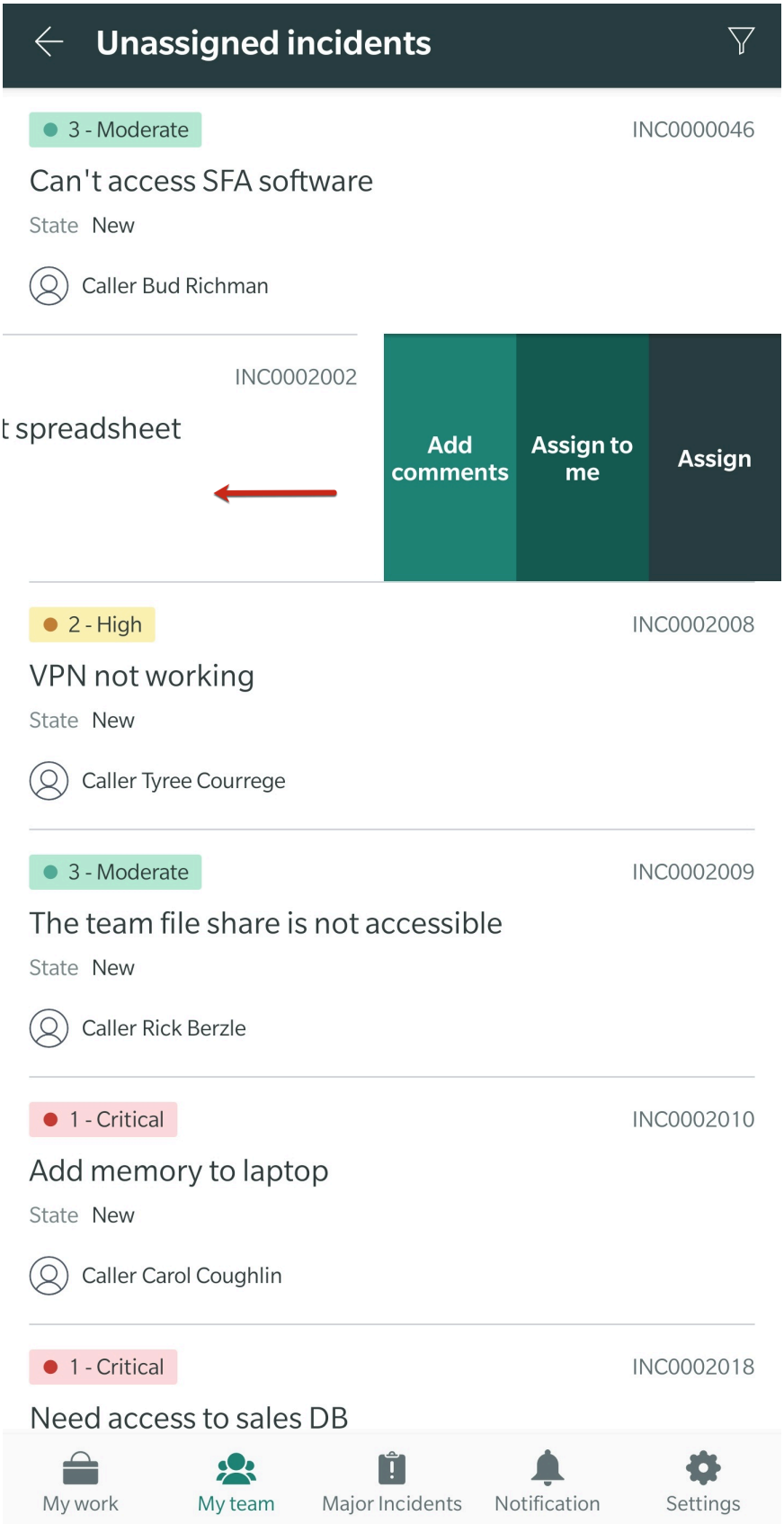


**4.** On the menu, choose one of the actions to process the incident.

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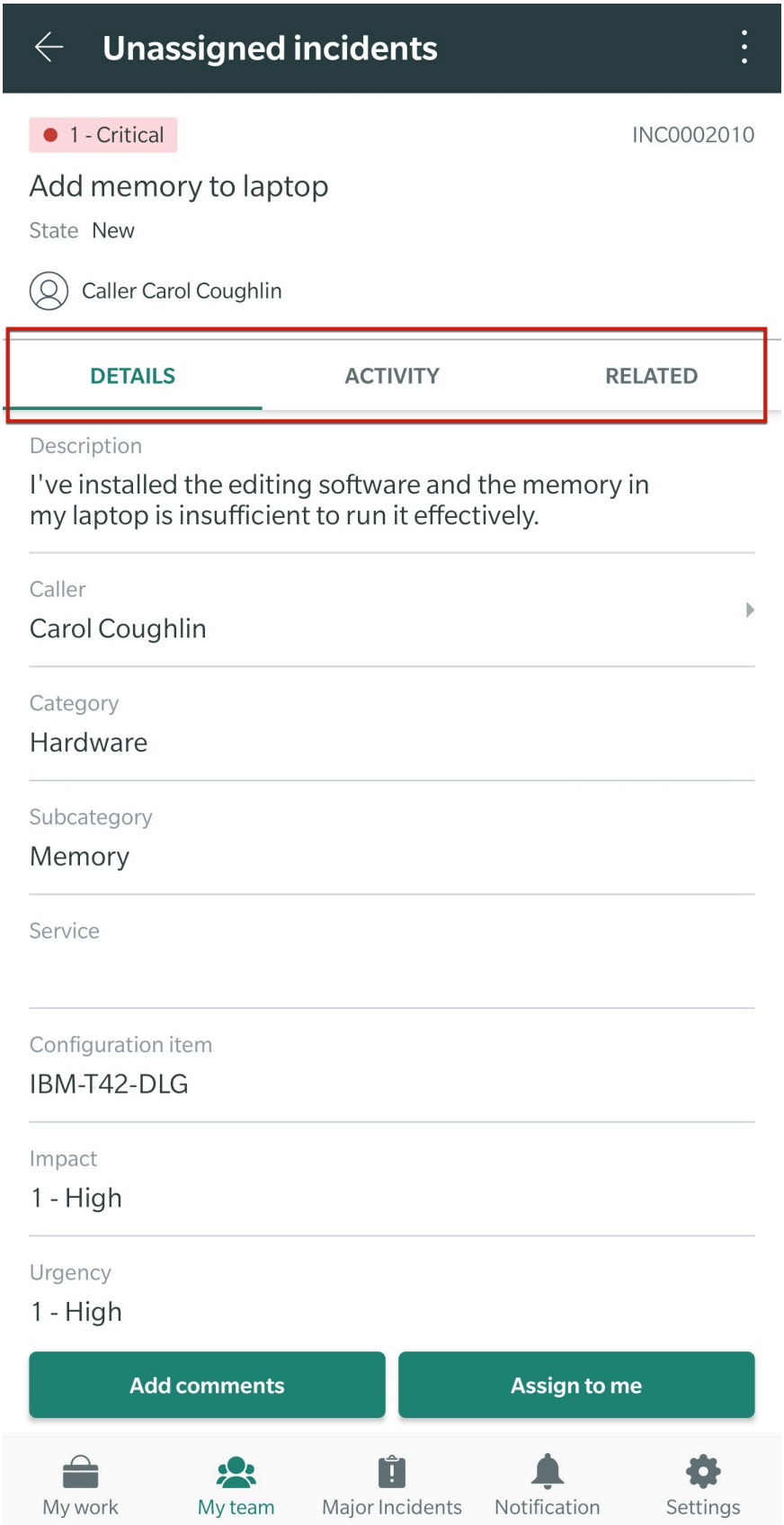
5. On the **Unassigned incidents** screen, tap a record on the list to open it and view more details.
6. On the **Unassigned Incidents** screen as shown in the following figure, choose one of the actions in the table as appropriate.

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## Manage upcoming shifts with On-Call Scheduling

As an On-Call Scheduling manager, view your team's schedule and perform activities like approving time-off requests and providing coverage.

### Before you begin

Role required: rota_manager

### Procedure

1. Open the ITSM Mobile Agent app and tap **My team**.
2. On the **On-call Schedule** tab, tap **Upcoming shifts**.
   All upcoming shifts for the current month are displayed. The shifts are grouped based on the type of events. One-day events are displayed at the top, followed by multi-day events and short-duration events that are sorted based on the time that the event was created.
3. Tap the shift card to view shift details.
4. Tap **Request time-off** and provide the following details:
   - Group
   - Member
   - Start date
   - End date
   - Proposed coverage
   - Notes
5. Tap **Submit**.
6. Tap **Provide Coverage** and provide the following details:
   - Start date
   - End date
   - Coverage
7. Tap **Submit**.
8. In **Upcoming shifts**, swipe the shift card to the left and tap **Request time-off** to go to the Request time-off form.
9. In **Upcoming shifts**, swipe the shift card to the left and tap **Provide Coverage** to go to the Provide Coverage form.

## Manage time-off requests with On-Call Scheduling

Use the **Time-off requests** tab to approve or reject the time-off request that you've received.

### Before you begin

Role required: rota_Manager

### Procedure

1. Open the ITSM Mobile Agent app and tap **My team**.
2. On the **On-call Schedule** tab, tap **Time-off requests**.
   A list of time-off requests is displayed. The list is divided into pending and completed requests.
3. Tap **Approve** or **Reject** the time-off requests that you've received.

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**Note:**
Add a reason for the time-off request rejection.

4. Tap the filter icon ( ) to view specific time-off requests.
5. Tap the menu icon ( ) and select **Request time-off** to go to the Request time-off form.
6. Complete the required fields on the form and tap **Submit**.

## Manage gaps and conflicts with On-Call Scheduling

Resolve all gaps and conflicts for the shifts in your group.

### Before you begin

Role required: rota_manager

### Procedure

1. Open the ITSM Mobile Agent app and tap **My team**.
2. On the **On-call Schedule** tab, tap **Gaps and conflicts**.
   A list of all the gaps and conflicts for the shifts in your group is displayed.
3. Tap any day of the month to view all gaps and conflicts for the shifts on that day.
4. Tap a shift card to view gaps and conflicts for the shift.
5. Swipe a shift card to the left and tap **Provide coverage** to provide or replace coverage, delete coverage, and manage a shift.
6. On the Gaps and conflicts form, tap **Provide coverage** to manage the coverage for a gap in the shift.

## Performance metrics

Access the performance data of your team directly from your mobile with the ITSM Agent mobile app.

As a group manager, with the My team dashboard, gain insights into the work of the groups you are managing by accessing metrics like MTTR (Mean Time To Resolution), CSAT, breached SLAs and so on.

Also view the graphical representation of the incidents raised in a week.

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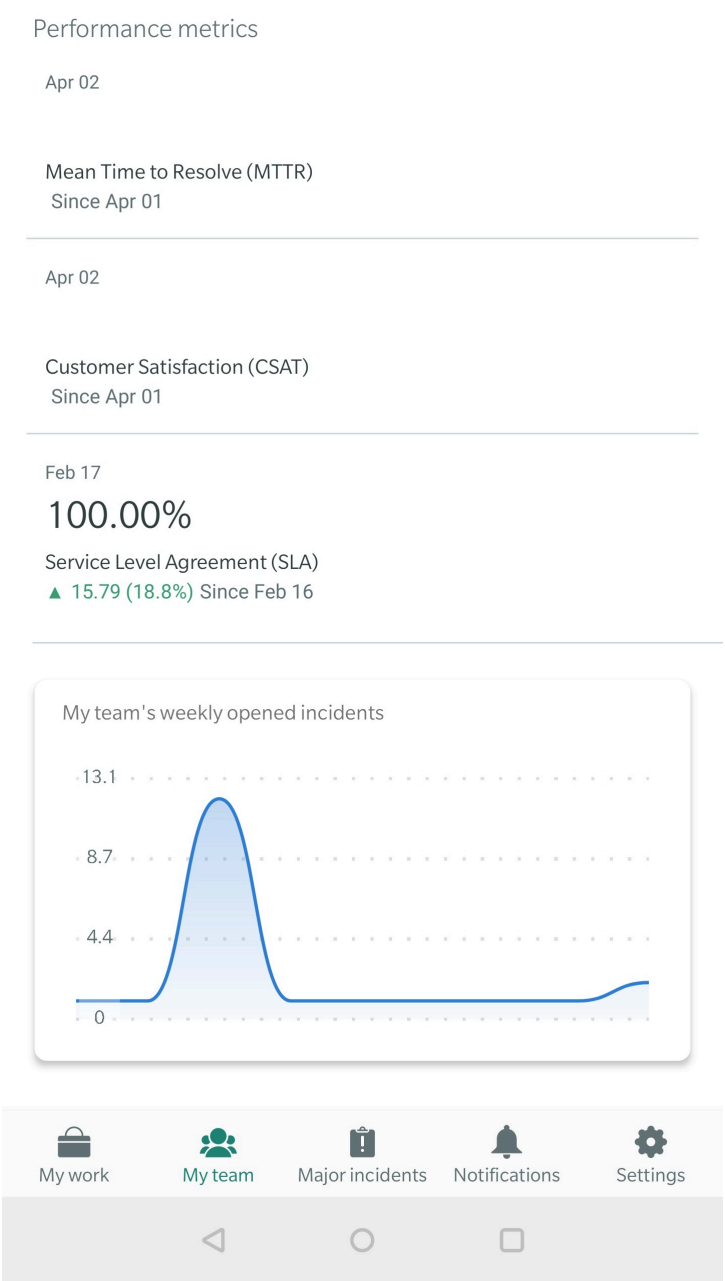


## Managing major incidents using Major Incident applet

As a major incident manager you can quickly review active major incidents or proposed major incidents and act upon them.

As a major incident manager, you can also view and access the ongoing conference calls for current major incidents with the ability to start, join or end conference calls.

The major incident application contains the applets and folders as in the below table.

**Major incident management applets**

| Applet/Folder | Description |
|---|---|
| Active major incidents | View, filter and act upon active major incidents. |

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**Major incident management applets (continued)**

| Applet/Folder | Description |
|---|---|
| Major incident candidates | Review the incidents that are proposed as major incidents and add comments. |
| Resolved major incidents | View resolved major incidents and add comments. |
| Major incident dashboard | Gain insights on the major incidents worked on by your group, like number of major incidents, Mean time to identify, and mean time to resolve. |
| Performance metrics | View a non-interactive graph of major incidents opened per week. |

## Active major incidents

View a list of related incidents, details of a major incident and activities on an incident.

### Before you begin

Role required: major incident manager

### Procedure

1. On the Agent landing screen, tap **See All** on the **Active major incidents** applet.
   The **Active major incidents** screen opens with a list of major incidents.
2. If you want to reduce the number of records on the screen, see Filter records to search for records that match specific search criteria.
3. On the **Active major incidents** screen with the list of incidents, swipe left on an incident to open the menu.
4. Tap **Add comments** to add any additional comments or work notes about the incident in this field and tap the send icon ( ).
5. Tap **Resolve** to resolve the major incident by adding the **Resolution code** and **Resolution notes**.
6. On the **Active major incidents** screen, tap a record on the list to open it and view more details.
7. Use the menu at the top of the screen for quick actions.

   The quick actions available for an active major incident are as follows:

   - Assign to someone: Assign the major incident to someone in an appropriate assignment group.
   - Resolve: Add a resolution code and resolution notes and tap the send icon ( ) to resolve the incident.
   - Add comments: Add any additional comments or work notes for the major incident and tap the send icon ( ) to add these comments to the record.
8. On the **Active major incident** screen, choose one of the actions in the table as appropriate.

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| Option | Description |
|---|---|
| DETAILS tab | View the fields for details about the incident. The fields with an arrow have additional information. |
| ACTIVITY tab | View the activity on the incident like field changes or assignment changes. Tap the add icon ( + ) to perform any of the following activities on the incident.<br>**a.** *Record Video*: Record a video to be attached to the incident.<br>**b.** *Open Gallery*: Open your photo gallery to attach an existing image or a video to the incident.<br>**c.** *Take Photo*: Take a picture and attach it to the incident<br>**d.** *Attach File*: Attach a file from another application to the incident.<br>**e.** *Add Additional Comments*: Add any additional comments to the incident.<br>**Note:** The comments can be made visible to the customer if you enable them using the toggle bar on the **Additional Comments** field.<br>**f.** *Add Work Notes*: Add your work notes on the incident. |
| TASKS tab | View the list of all the tasks associated with the incident. Swipe left on an associated task to **Close task** or **Snooze** for a later time. |
| RELATED tab | View the related lists of the major incident, such as, child incidents, impacted services, outages, and affected CIs. Tap on the arrow to view more details of these related items. |

## Major incident candidate

View a list of major incident candidates and add comments to the incidents proposed as major incidents.

### Before you begin

Role required: major incident manager

### Procedure

1. On the Agent landing screen, tap **See All** on the **Major incident candidates** applet.
   The **Major incident candidates** screen opens with a list of major incident candidates.
2. If you want to reduce the number of records on the screen, see Filter records to search for records that match specific search criteria.
3. On the **Major incident candidates** screen, swipe left on an incident to view the set of quick actions.

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a. Add any additional comments or work notes about the incident in this field.

b. Tap **Reject** to mention the reasons for rejection in the work notes and tap the send icon ) to process the rejection.

c. Tap **Promote** to mention a reason to promote the incident to a major incident, describe the business impact, and tap the send icon ( ).

4. On the **Major incident candidates** screen, tap a record in the list to open it.

5. Use the mobile top menu icon ( ) at the top of the screen for quick actions.

   The quick actions available for an active major incident candidate are as follows:

   - Assign to me: Tap this quick action to assign the major incident candidate to yourself. You can use the **Reject** or **Promote** buttons for an appropriate action.
   - Assign to someone: Assign the major incident to someone in an appropriate assignment group.
   - Resolve: Add a resolution code and resolution notes and tap the send icon ( ) to resolve the incident.
   - Add comments: Add any additional comments or work notes for the major incident and tap the send icon ( ) to add these comments to the record.

6. On the **Major incident candidates** screen, as shown in the following figure, choose one of the actions in the table as appropriate.

**Major incident candidates**

| Option | Description |
|---|---|
| DETAILS tab | View the fields for details about the incident. The fields with an arrow have additional information. |
| ACTIVITY tab | View the activity on the incident like field changes or assignment changes. Tap the add icon ( ) to perform any of the following activities on the incident.<br>**a.** *`Record Video`*: Record a video to be attached to the incident.<br>**b.** *`Open Gallery`*: Open your photo gallery to attach an existing image or a video to the incident.<br>**c.** *`Take Photo`*: Take a picture and attach it to the incident<br>**d.** *`Attach File`*: Attach a file from another application to the incident.<br>**e.** *`Add Additional Comments`*: Add any additional comments to the incident. |

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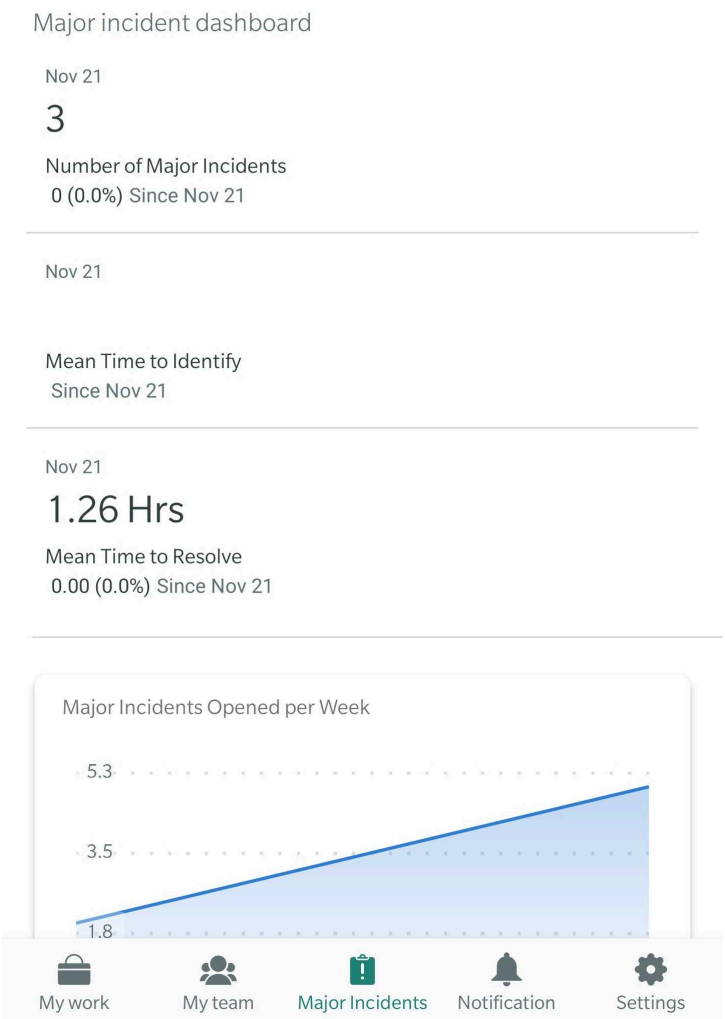
| Option | Description |
| --- | --- |
| | **Note:** The comments can be made visible to the customer if you enable them using the toggle bar on the **Additional Comments** field.<br><br>**f.** *`Add Work Notes`*: Add your work notes on the incident. |
| RELATED LIST tab | View the related lists of the major incident, such as, child incidents, impacted services, outages, and affected CIs. Tap on the arrow to view more details of these related items. |

## Major incident dashboard

Review major incident information at a glance on your mobile.

The dashboard in the Major incidents application provides the information about the count of major incidents, mean time to identify an incident as a major incident and mean time to resolve.




Tap on any of the areas to open a detailed graphical representation of the associated information. You can also scroll left or right on the screen to view information pertaining to a different day or a week.

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## Collaboration with major incidents

Initiate and manage the collaboration for the major incident records from the ITSM Mobile Agent app.

You need to add the deep linking support for ITSM Mobile Agent on the Mobile studio. For more information on adding the deep linking support, refer Add deep linking support to ITSM Mobile Agent

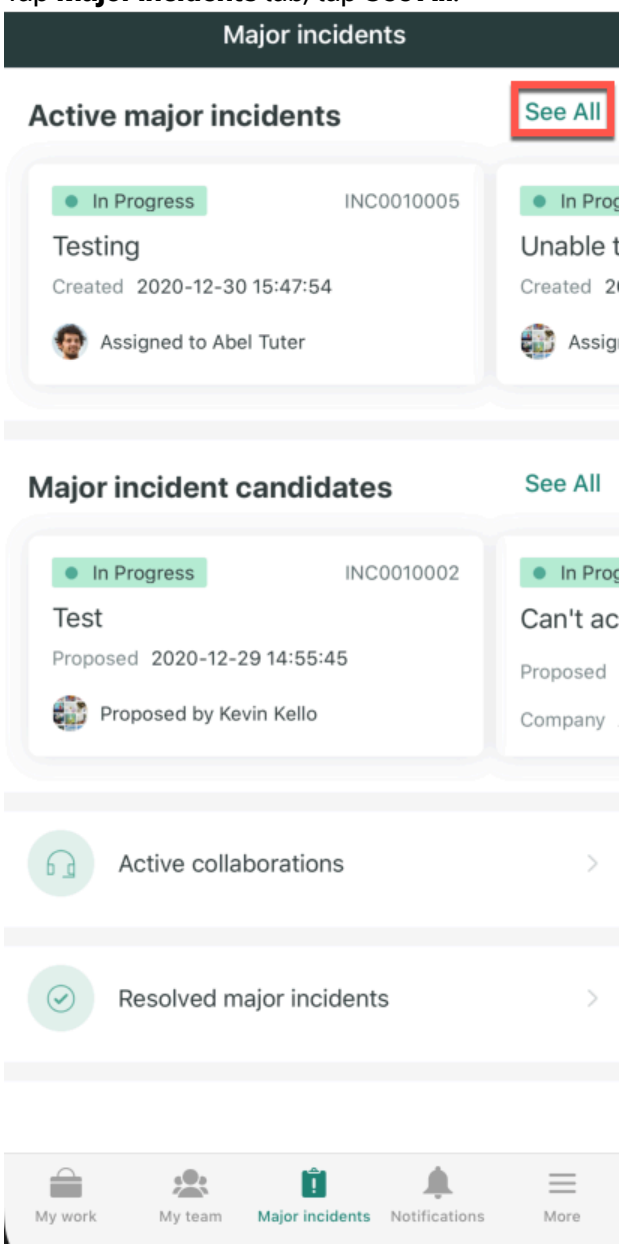
### Initiate a chat with the caller from a major incident

Initiate a chat from a major incident record to discuss about the resolution of the issue.

**Before you begin**
Role required: major_incident_manager, itil, itil_admin, or admin

**Procedure**

1. Open ITSM Mobile Agent app.
2. Tap **Major incidents** tab, tap **See All**.

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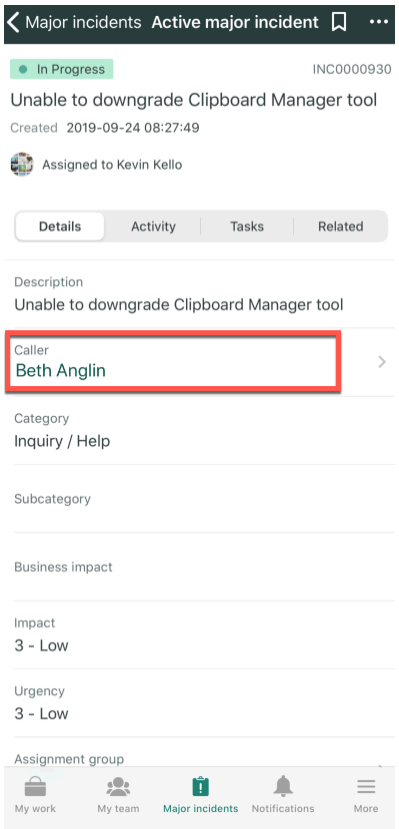
3. Tap the major incident record you want to work on.
4. Tap **Caller**.




5. Do one of the following:

**Major incident**

| Option | Action |
|---|---|
| Initiate chat in Slack | Tap on the Slack contact. |
| Initiate chat in Microsoft Teams | Tap on the Microsoft Teams contact. |

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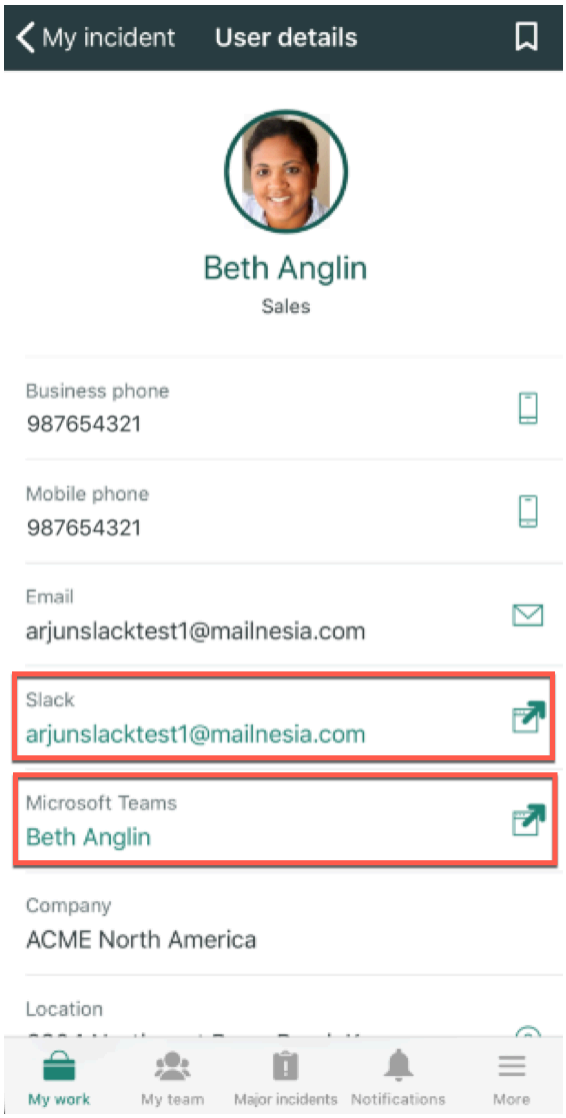


**Note:**
The Slack and the Microsoft Teams contacts will be displayed only if the caller has a valid Slack and Microsoft Teams accounts.

### Initiate a chat with the assignment group from a major incident

Initiate a chat with the assignment group members from a major incident record to discuss about the resolution of the issue.

### Before you begin

Role required: major_incident_manager, itil, itil_admin, or admin

### Procedure

1. Open ITSM Mobile Agent app.
2. Tap **Major incidents** tab, tap **See All**.

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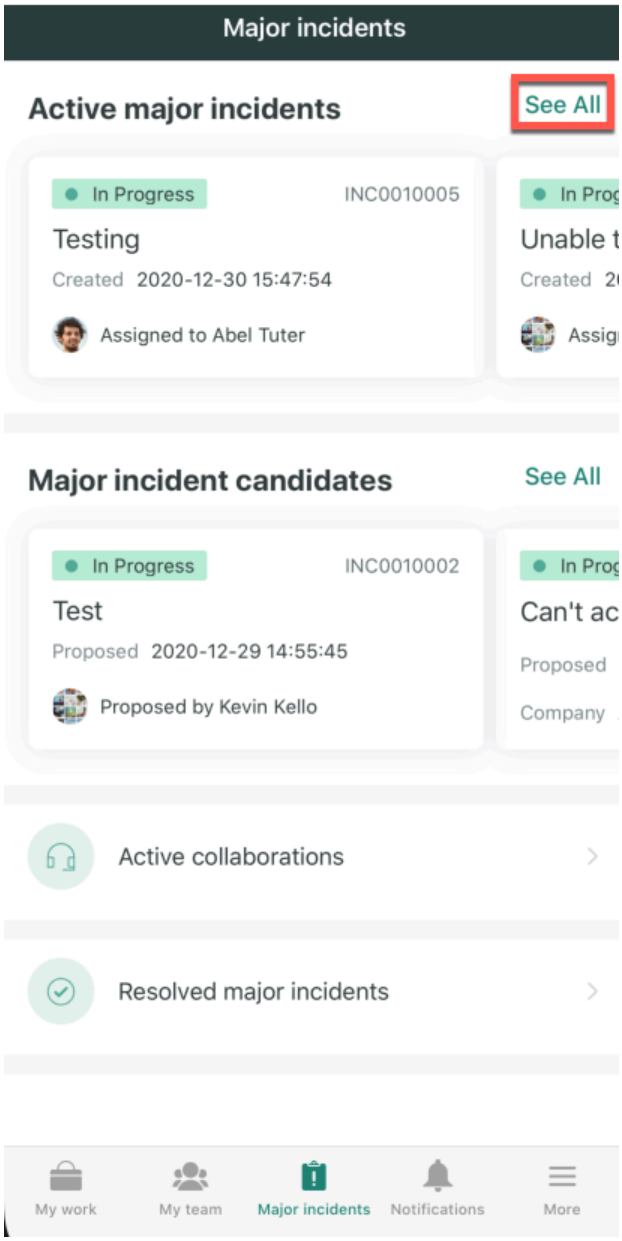


3. Tap the major incident record you want to work on.
4. Tap **Assignment group**.

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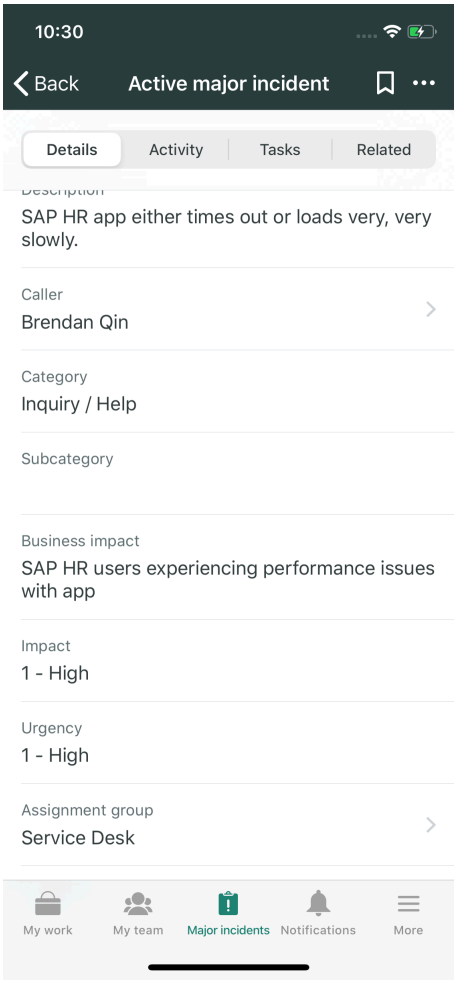


5. Do one of the following:

### Assignment group

| Option | Action |
| --- | --- |
| Initiate chat in Slack | Tap on Slack assignment group. |
| Initiate chat in Microsoft Teams | Tap on the Microsoft Teams assignment group. |

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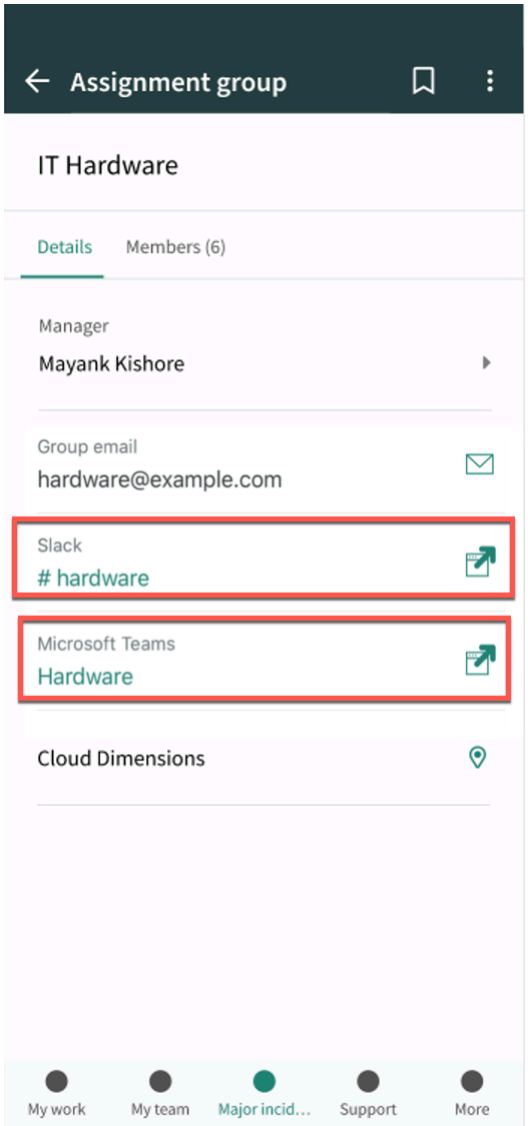


**Note:**
The Slack and the Microsoft Teams assignment group contact will be displayed only if the assignment group has a valid Slack and Microsoft Teams accounts.

You can also interact with a user from the assignment group. Tap on the assignment group, and then tap on a user and select either Slack or Microsoft Teams to initiate a conversation.

### View active collaborations

As a major incident manager, you can view all the active collaborations for the major incidents.

**Before you begin**
Role required: major_incident_manager, itil, itil_admin, or admin

**Procedure**

1. Open ITSM Mobile Agent app.
2. Tap **Major incidents** tab.
3. Tap **Active collaborations**.

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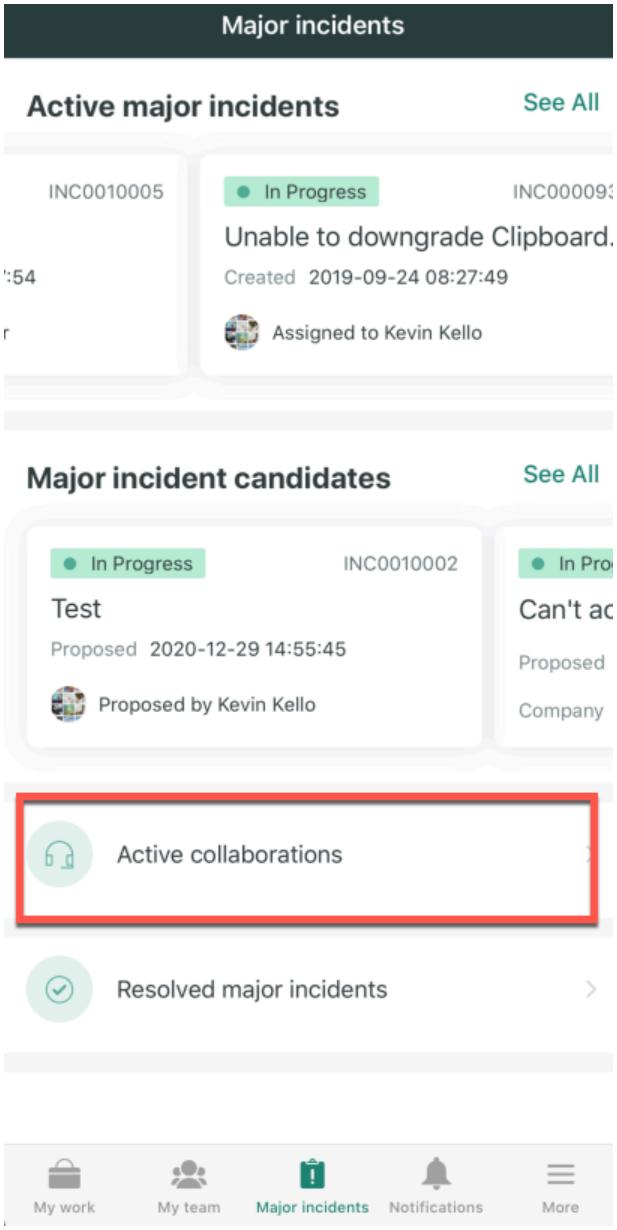


4. Do one of the following:

### View active collaborations

| Option | Action |
| --- | --- |
| **Calls** | View the active calls collaboration. |
| **Chats** | Tap **Chats** to view the active chat collaborations. |

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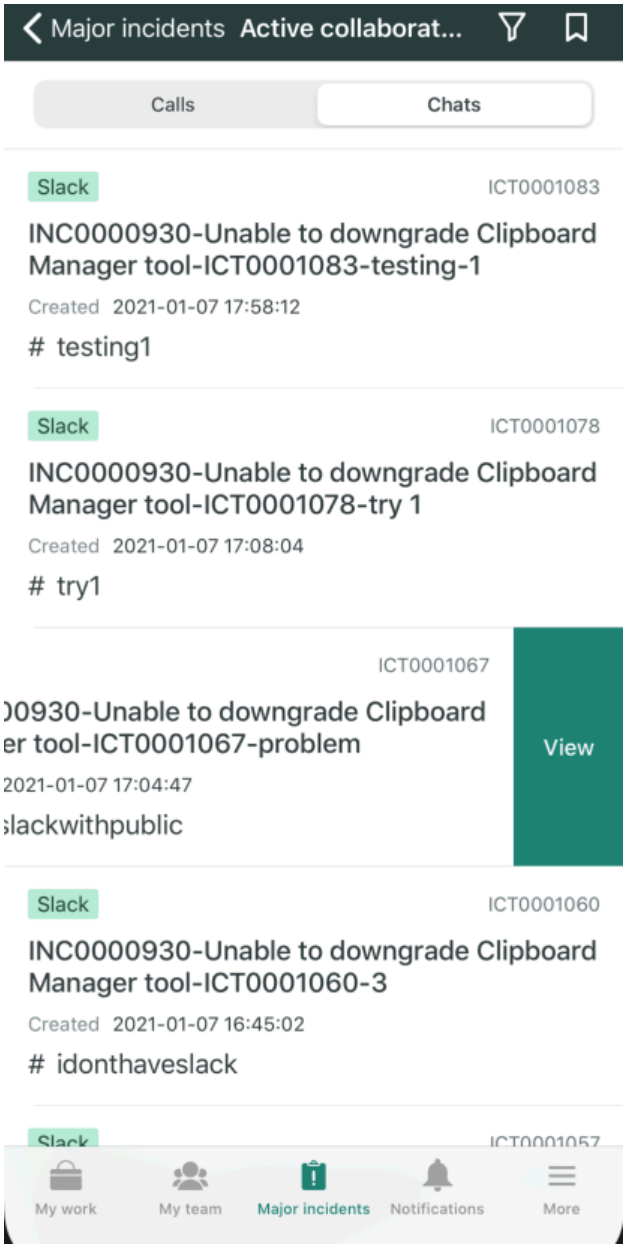


**5.** Swipe and tap **View** to view the conversation in the respective application.

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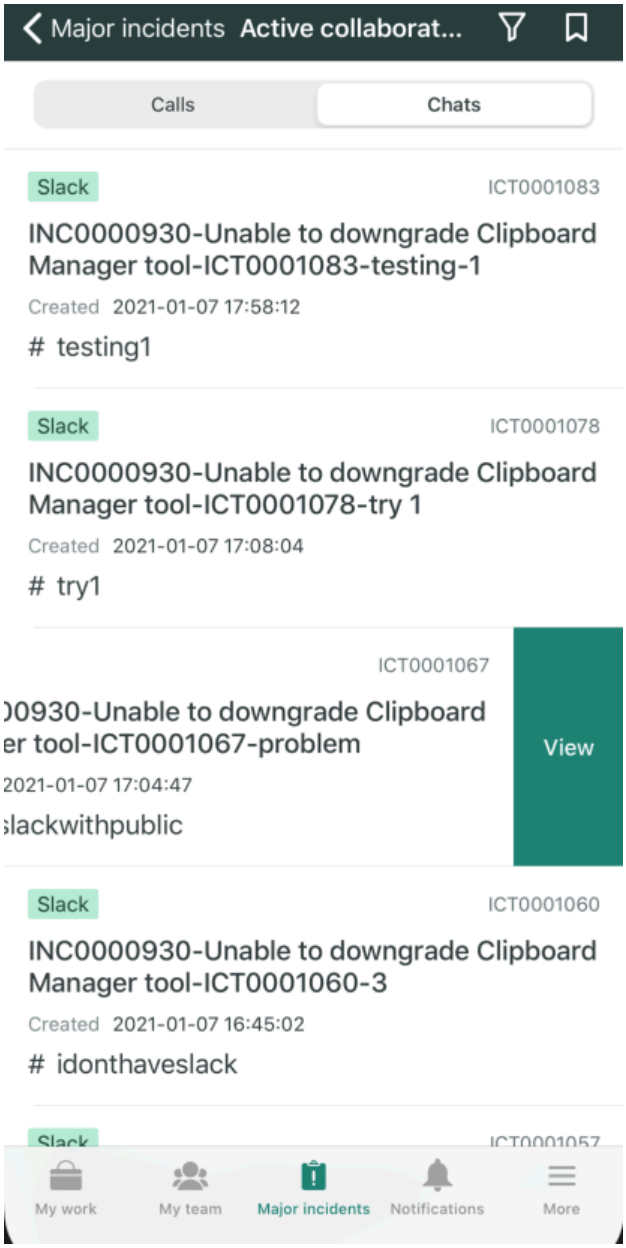


Each collaboration displays:

- Application: Slack / Microsoft Teams
- Collaboration title
- Incident created date and timestamp
- Channel name: Channel marked with “#” is a public channel. Any user can view the conversation. Channel that doesn’t contain a “#” is a private channel, this channel isn’t accessible to public users. Only the collaborators can view the chat conversation.

### Add participants to a conference call from a major incident

Add participants to an active conference call from a major incident record to discuss about the resolution of the major incident.

#### Before you begin

Role required: major_incident_manager, itil, itil_admin, or admin

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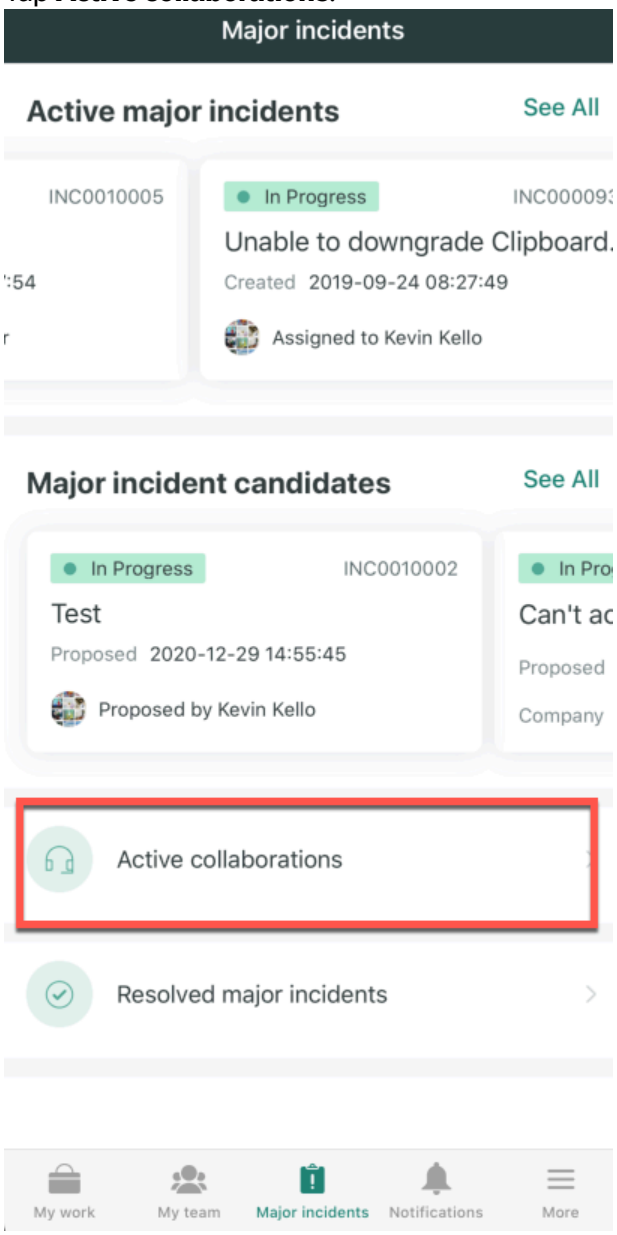
### Procedure

1. Open ITSM Mobile Agent app.
2. In **Major incidents** tab.
3. Tap **Active collaborations**.




4. Tap on the active conference call.

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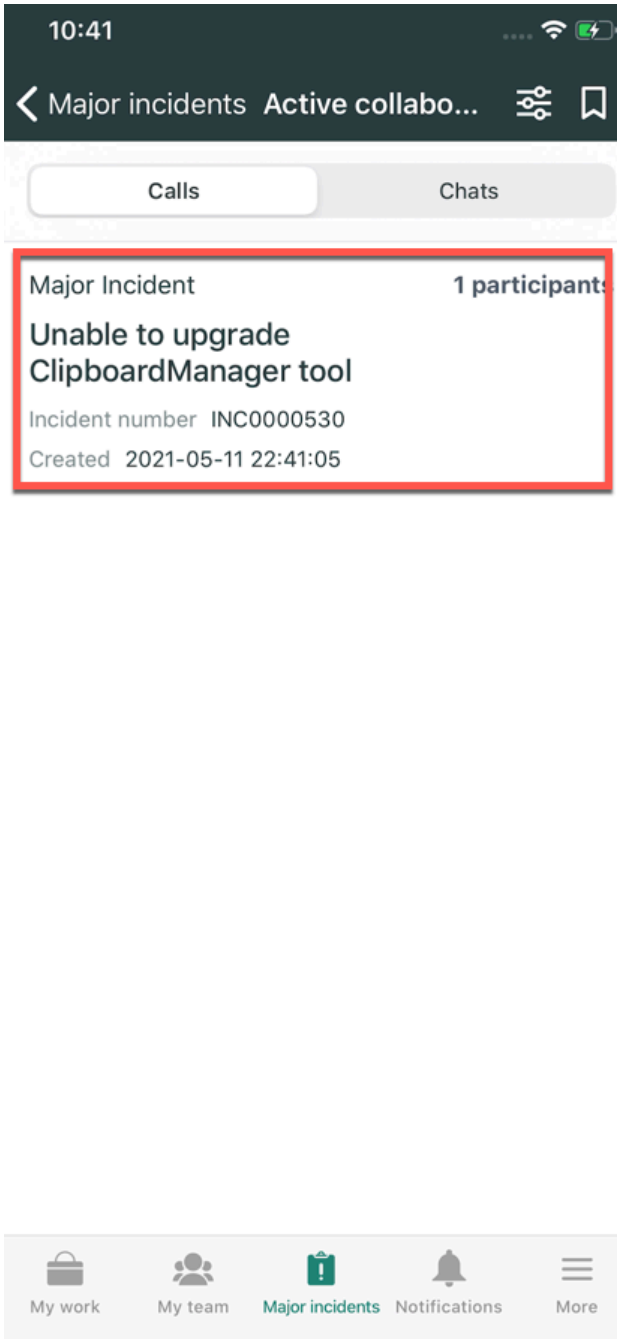


**5.** Tap **Add participants**

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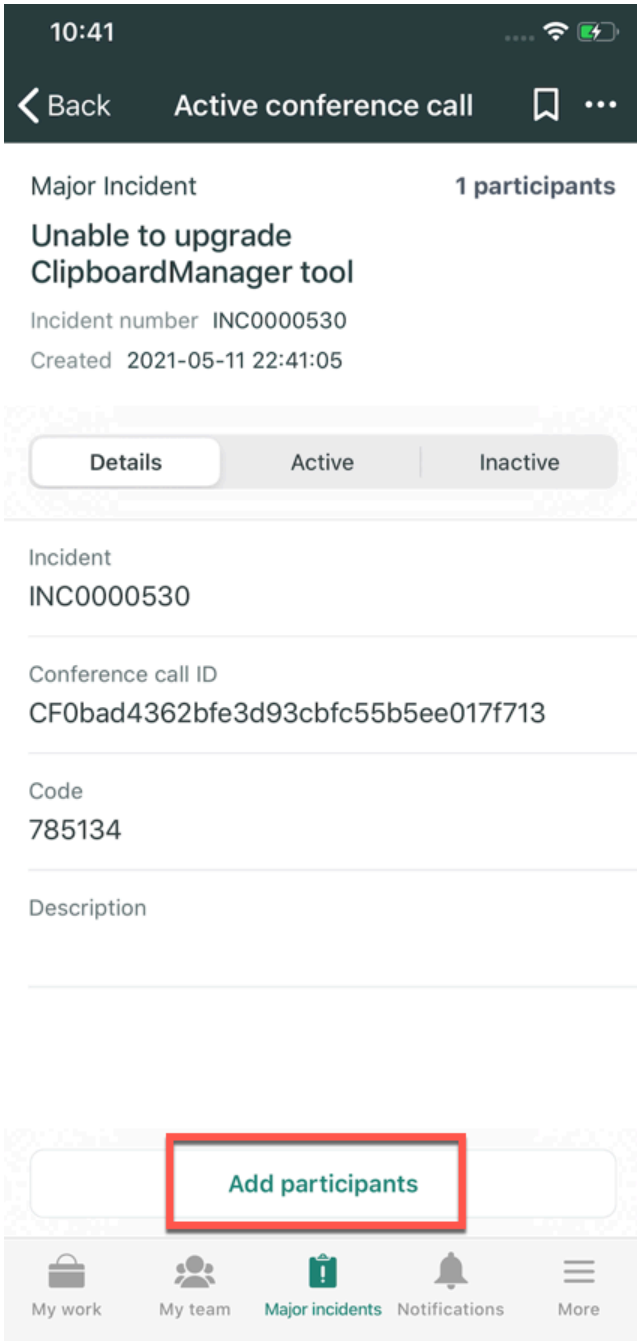


6. Provide the following details:
   a. **Recommended participants**: The list of participants associated with the incident will be displayed. Select the required users, and tap **Submit**.
   b. **Users**: Select the required users, and tap **Submit**.
   c. **Groups**: Select the required group, and tap **Submit**.

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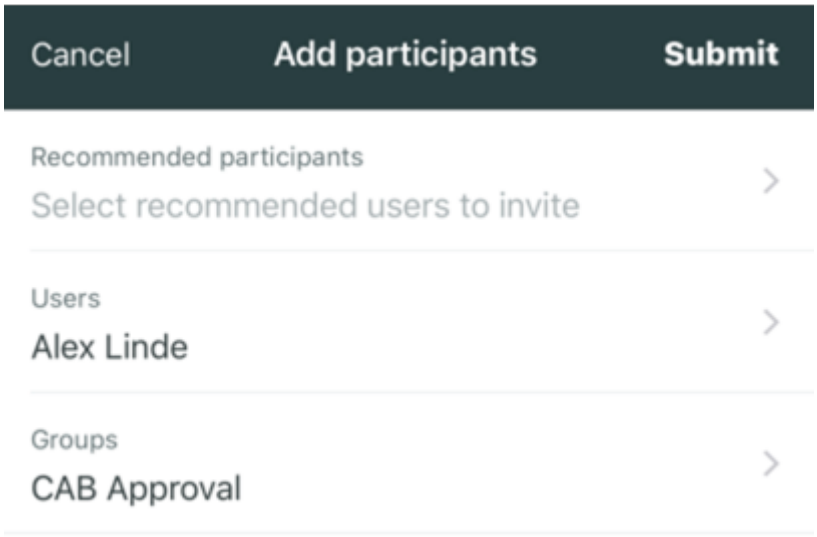


7. In the **Add participants** screen, click **Submit**.

### Join an active conference call from a major incident

You can join an active conference call from a major incident record to discuss about the resolution of the issue.

#### Before you begin

Role required: major_incident_manager, itil, itil_admin, or admin

#### Procedure

1. Open ITSM Mobile Agent app.
2. In **Major incidents** tab.
3. Tap **Active collaborations**.

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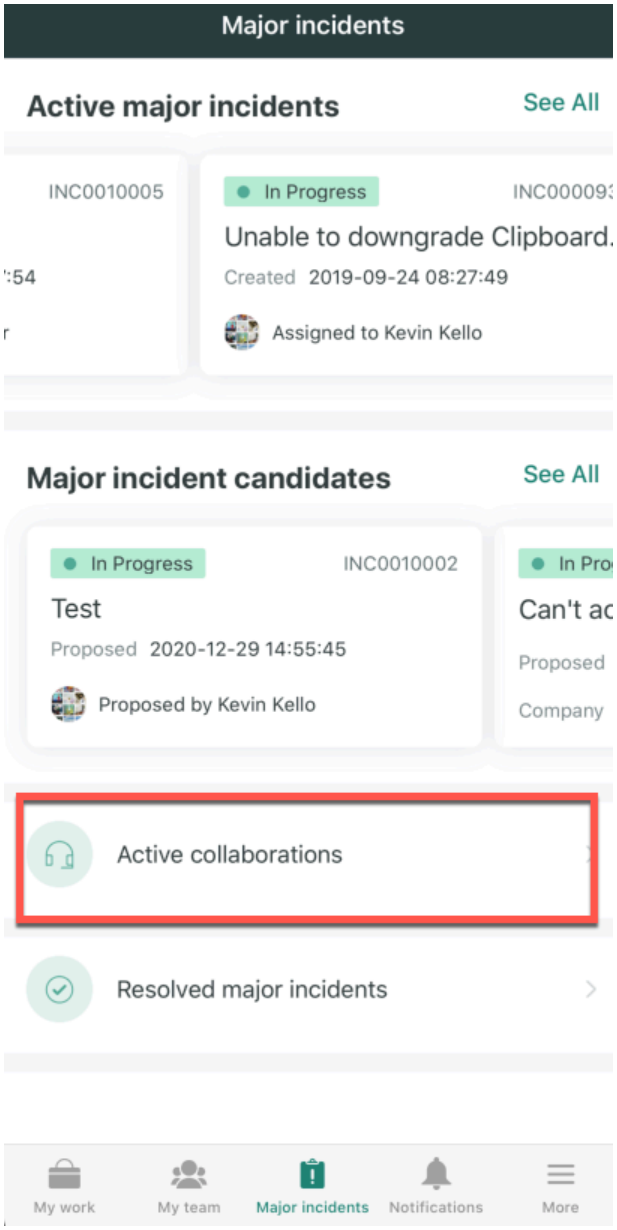


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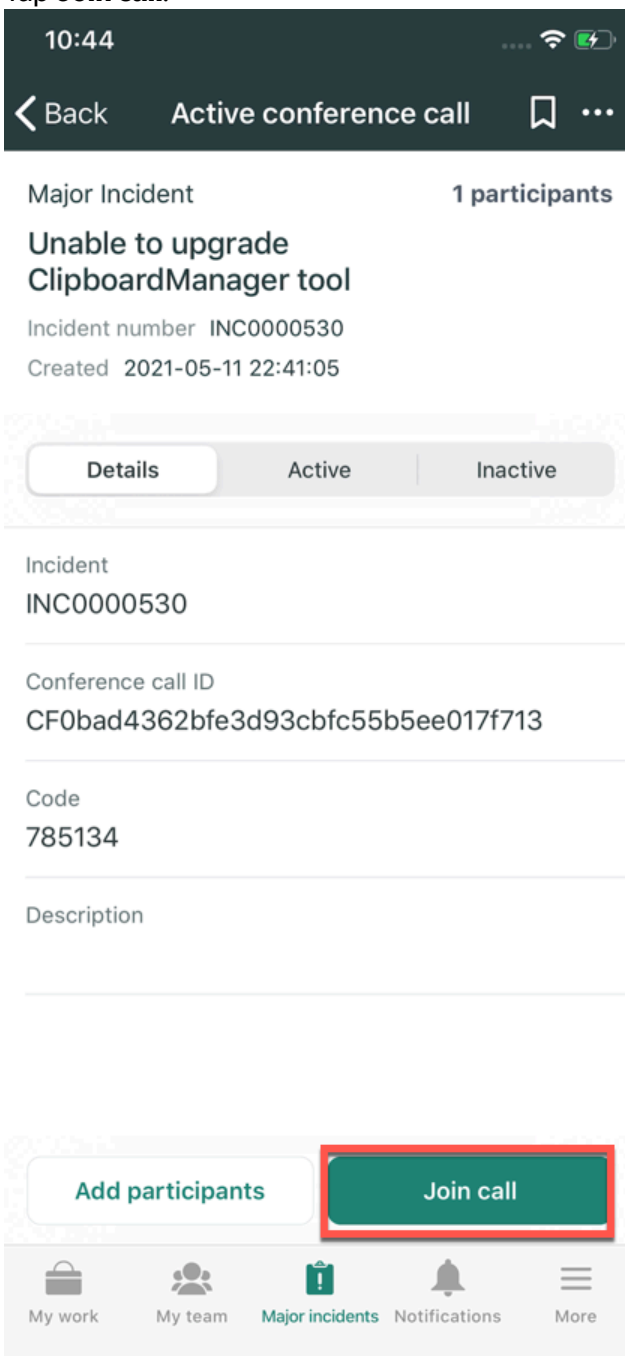
4. Tap **Join call**.




### End a conference call from major incident

A host or a user with the major incident manager role can end the conference call.

### Before you begin

Role required: major_incident_manager, itil, itil_admin, or admin

### Procedure

1. Open ITSM Mobile Agent app.
2. In **Major incidents** tab.
3. Tap **Active collaborations**.

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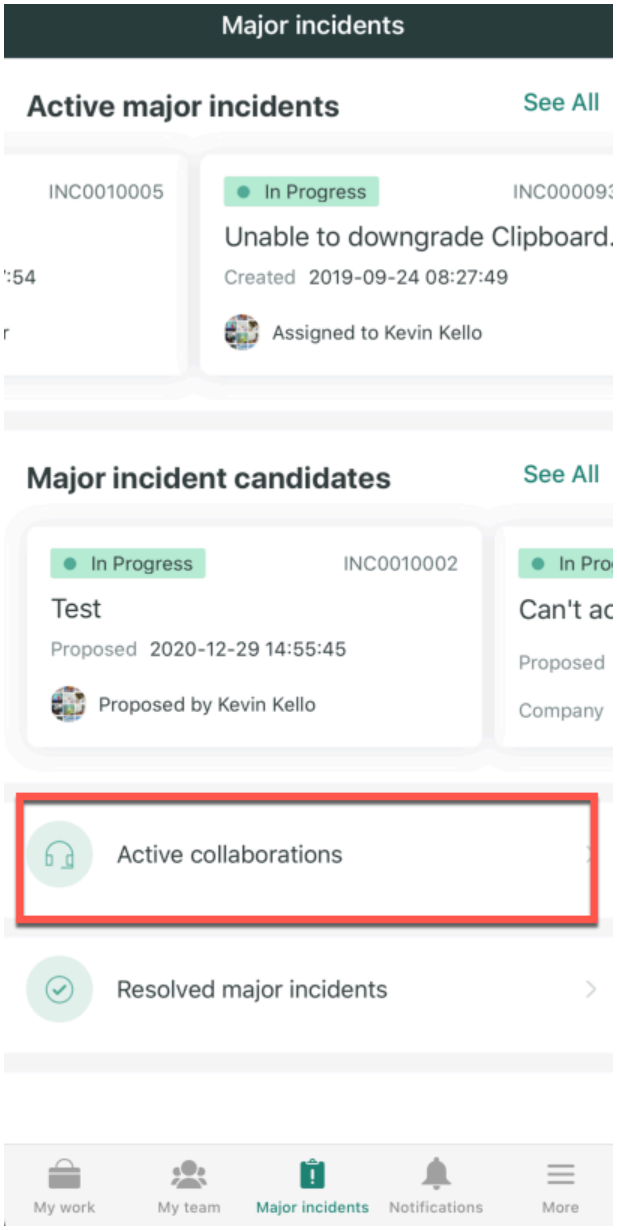


**4.** Tap ••• .

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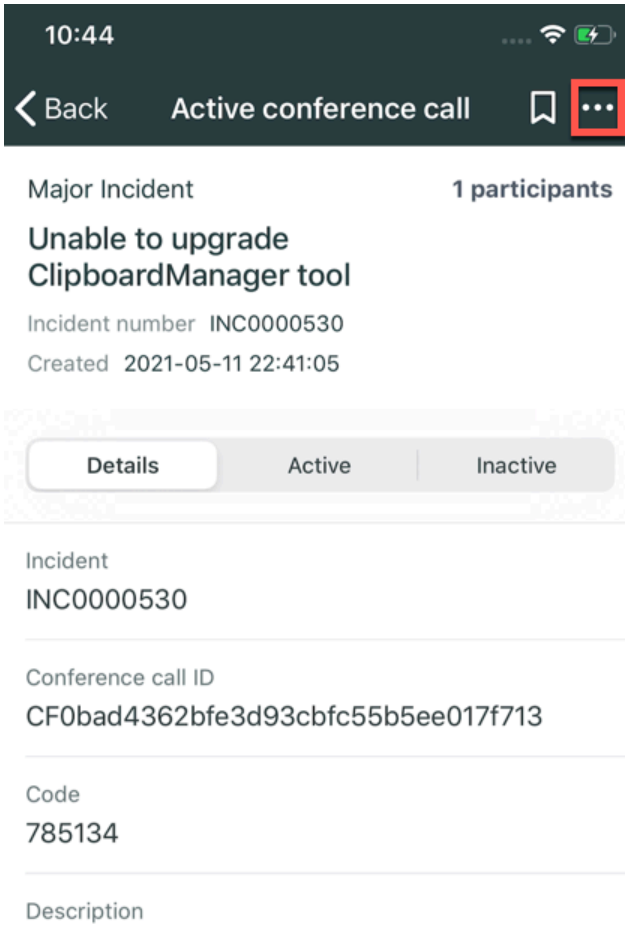


**5.** To end the call tap **End call** button.

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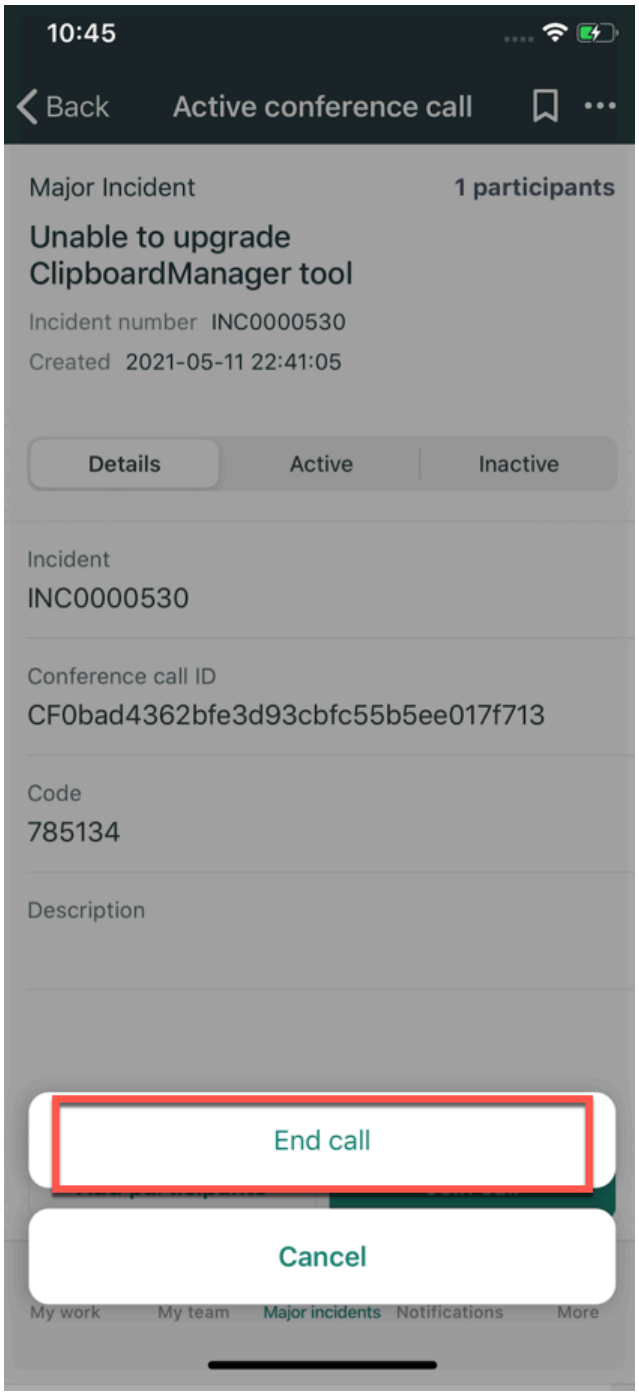
Tap **Cancel** to resume the conference call.




## Reference

Reference section provides additional information about components installed with Mobile Agent

### Domain Separation for ITSM Mobile Agent

This is an overview of domain separation and ITSM Mobile Agent. Domain separation enables you to separate data, processes, and administrative tasks into logical groupings called domains. You can then control several aspects of this separation, including which users can see and access data.

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### Support level - Basic

- Business logic: Ensure that data goes into the proper domain for the application's service provider use cases.
- The application supports domain separation at run time. This includes domain separation from the user interface, cache keys, reporting, rollups, and aggregations.
- The owner of the instance must set up the application to function across multiple tenants.

Use case: When a service provider (SP) uses chat to respond to a tenant-customer's message, the client must be able to see the SP's response.

### ITSM Mobile Agent overview

The mobile platform supports domain separation for all native clients. The mobile UI design clearly indicates the domain that a record is associated with.

Before extending the domain separation functionality to mobile, the feature must be enabled on the platform web-based interface. For further information on configuration, see Domain separation setup and administration.

### How domain separation works in mobile

You can use the company or account fields to display appropriate records by domain. These fields are available in tables when the domain separation plugin is enabled. Because each company or account is linked to a single domain, when you create a record, you can use these fields to specify the domain in which you want to create the record.

After the feature has been set up through the platform web-based interface, a two-part process is required to further extend the domain separation functionality on mobile. For additional information about configuring domain separation on mobile devices, contact Customer Service and Support.

### ITSM Mobile Agent domain separated tables

- Incident [incident]
- Incident Task [incident_task]

### ITSM Mobile Agent use cases

- An ESS user belonging to "Initech" domain, creates an incident. Only those ITIL users belonging to "Initech" domain or global domain can see this incident.
- An ITIL user belonging to a parent domain can see incidents of all its child domains as well.
- An ITIL user belonging to a specific domain can create incidents only on behalf of the domains that they have access to.
- An ITIL user can associate child incidents only of those domains that they have access to.
- If a user has access to multiple domains, the domain specified on the current record drives the functionality of that record and reference fields.

### Settings

View the information related to the settings of your ITSM Agent mobile app.

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You can adjust the settings of the ITSM Agent mobile app. The following information is available in the Settings screen of your app.

| Setting | Description |
| --- | --- |
| Instance | Name of the app version |
| Version | Version of the app |
| Security | If the administrator has set authentication requirements, enter the secure credentials in the field. |
| Analytics | Enable the analytics of the app usage |
| Legal | Read the privacy policies, Open source licence information and End user licence agreement |
| Logout | Logout from the instance |

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