

Configure Network Models

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Network model creation workflow

The Cisco Crosswork Planning UI provides an easy-to-use interface that hides the complexity of creating a model building chain for a network. It combines the configuration of multiple data collectors under one network (collection) and can produce a single network model that contains the consolidated data. Use the Cisco Crosswork Planning UI for configuring device and network access, creating network models, managing users, and configuring agents.

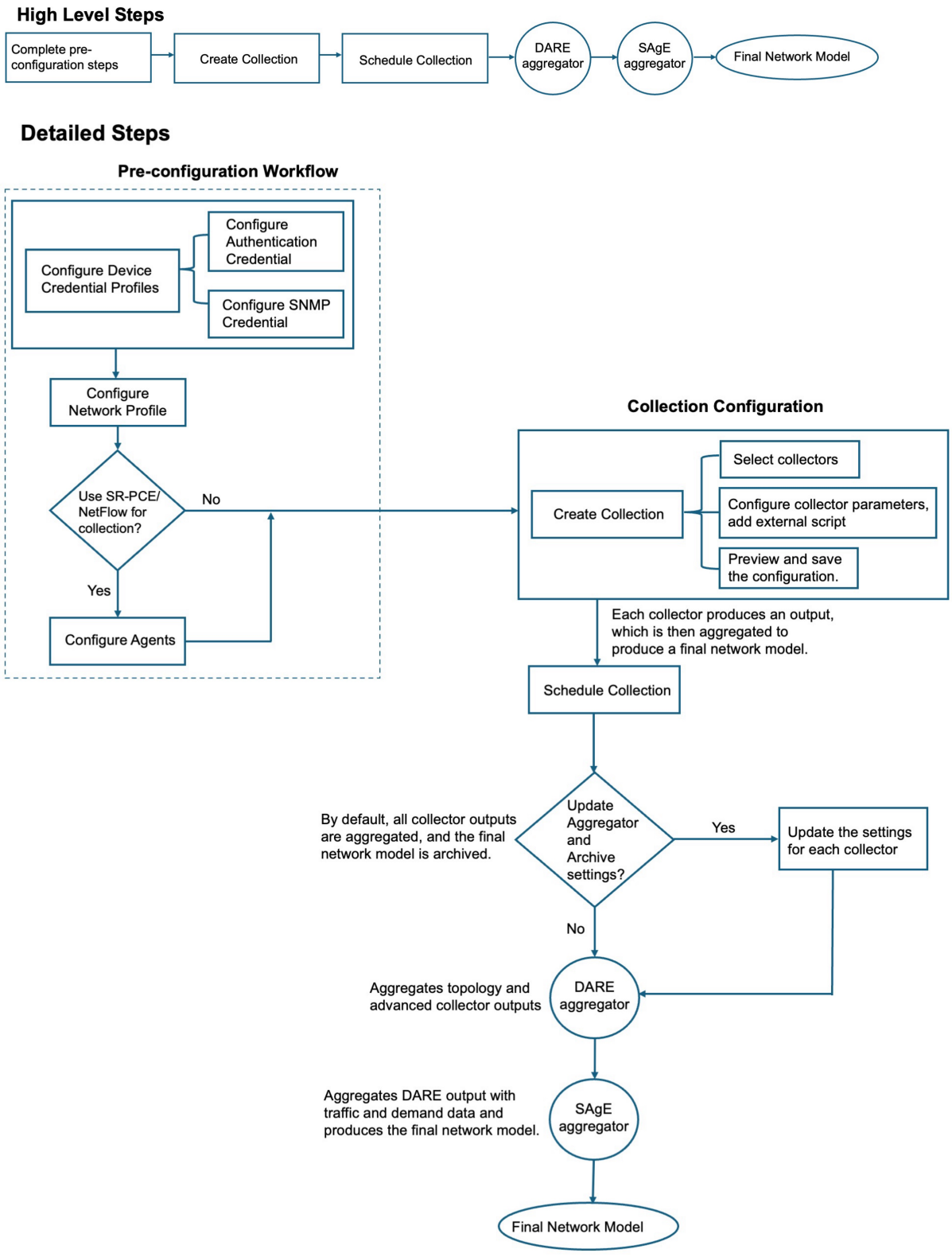
The Table 1: Network model creation workflow, on page 1 and Figure 1: Network model creation workflow, on page 3 illustrate how you can configure individual network models.

Table 1: Network model creation workflow

Step	Action
1. Configure device authgroups, SNMP groups, and network profile access.	See Preconfiguration workflow, on page 4.
2. (Optional) Configure agents only if you need to collect SR-PCE or NetFlow information.	See Configure agents, on page 20.

Step	Action
3. Configure the collections (basic and advanced configurations).	See Collection configuration workflow, on page 4.
4. Schedule when to run the collections.	See Schedule collections, on page 30.
5. (Optional) Manage aggregation and archiving of network model as per your requirement.	See • Aggregate collector outputs, on page 34 • Configure archive, on page 37
6. View or download the plan files in the Cisco Crosswork Planning Design application.	See View or download plan files, on page 38.

Figure 1: Network model creation workflow



Preconfiguration workflow

This workflow describes the steps that you must complete before creating a network model. This preconfiguration workflow involves the creation of credential profiles to access the devices, the device mappings, and the agents.

Step	Action
1. Configure the device credential profiles (Authentication profiles and SNMP profiles).	See Configure credential profiles, on page 10.
2. Configure the network profile access.	See Configure network profiles, on page 14.
3. (Optional) Create agents to collect specific information. This step is required only for collecting SR-PCE or NetFlow information.	See Configure agents, on page 20.

Collection configuration workflow

The initial step in creating a network model is to create a new network (Collection) with topology collection. Use the **Collections** page (from the main menu, choose **Collector** > **Collections**) to configure different collectors. You can choose the network elements that you want to collect. You can also indicate if an SR-PCE is used for collection or not. Based on the selection of collectors, a chain of collectors is derived and displayed. Each collector produces an output, which are aggregated to produce a final network model. The numbered navigation at the top of the page displays where you are in the network model configuration process.

This high-level workflow describes the process involved in collection configuration.

Step	Description
1. Complete all the steps mentioned in the preconfiguration workflow.	See Preconfiguration workflow, on page 4.
2. Select the required collectors.	**1.** As a first step, choose a Basic Topology collector, which will be the source for additional network collections. **2.** Choose the additional collectors, as per your requirement. The collectors are categorized under the **Basic topology**, **Advanced modeling**, and **Traffic and Demands** sections.
3. Configure collection parameters.	Based on the collectors you selected in the previous step, the configuration parameters differ. The left pane displays the selected collectors and the right pane displays the configuration parameters associated with the selected collector. Enter all the required details.

Step	Description
4. (Optional) Run external scripts against a collection model.	If you want specific data from your network that existing Cisco Crosswork Planning collectors do not provide, you can run a customized script against a selected network model. For details, see Run an external script against a network model.
5. Preview the order in which you have configured the collectors.	Preview the order in which you have configured the collectors. If you are satisfied with the configuration, then proceed with the creation of the collection.
6. Schedule the collections.	You can run the collection jobs immediately or you can schedule them to run periodically at a specific time or at intervals. You can also set multiple schedules for a collection. For details, see Schedule collections, on page 30.
7. (Optional) Update the aggregation and archive settings, as required.	See: • Aggregate collector outputs, on page 34 • Configure archive, on page 37

Collector configuration migration

A collector configuration migration is a process that enables you to migrate collector configurations from Cisco WAE 7.5.x/7.6.x or between different Cisco Crosswork Planning instances.

Note When using collectors that have file upload options, ensure to upload the correct files after importing the collector configuration. This is necessary because, after you import the configuration, the server restores only the file name and not the actual file. If you do not use the correct file, the collection will fail.

Migrate collector configurations from Cisco WAE

This section explains how to migrate collector configurations from Cisco WAE 7.5.x/7.6.x to Cisco Crosswork Planning.

Before you begin

- Download the upgrade script from the Cisco Software Download page.

Procedure

Step 1 If you have not backed up the configuration, use these steps to back up and migrate it to a configuration compatible with Cisco Crosswork Planning:

a) Log in to the machine where Cisco WAE 7.x is installed.
b) Enter this command:

```
# ./wae_upgrade --export --install-dir <WAE_7.x_INSTALL_DIR> --cfg-dir
<dir_to_save_exported_config>
Where:
     --install-dir   indicates the directory where 7.x WAE is installed.
     --cfg-dir       indicates the folder where the backup of 7.x configuration
                     must reside. The migrated configurations are saved as
                     wae_networks.cfg in the provided directory.
```

Step 2 If you already have the backed-up configuration, use these steps to convert the file into a format compatible with Cisco Crosswork Planning:

a) Log in to the machine where the Cisco WAE 7.x configuration is backed up.
b) Enter this command:

```
# ./wae_upgrade --migrate --cfg-dir <dir_containing_7.x_config>

Where:
      --cfg-dir   indicates the folder where the 7.x configuation is backed up.
                  This configuration will be migrated to Cisco Crosswork Planning
                  compatible configuration. The migrated configurations are saved as
                  wae_networks.cfg in the provided directory.
```

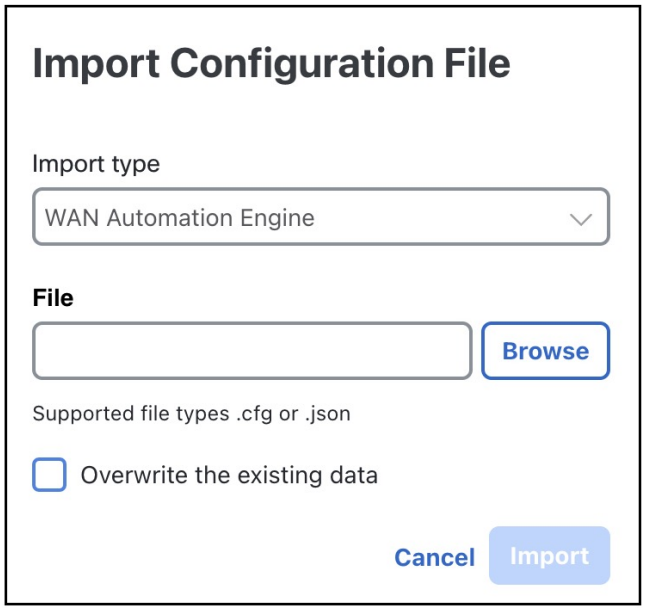
Step 3 Import the migrated configurations (**wae_networks.cfg**) to Cisco Crosswork Planning using these steps:

Note
Before migration, ensure that configurations are backed up using the upgrade scripts. Otherwise, the migration will fail.

a) Log in to the Cisco Crosswork Planning UI.
b) From the main menu, choose **Collector** > **Migration**.
c) Click **Actions** and select **Configuration migration**.

The Import Configuration File page appears.

Figure 2: Import Configuration File page



d) Select **WAN Automation Engine** from the **Import type** drop-down list.
e) Click **Browse** and select the **wae_networks.cfg** file.
f) (Optional) To overwrite the existing collector configuration, check the **Overwrite the existing data** check box.
g) Click **Import**.

The system proceeds with the import using your configuration. You can monitor the progress on the Migration page (**Collector** > **Migration**). Once the import is successful, the **Import status** column displays **Success**.

What to do next

Note After migrating from Cisco WAE to Cisco Crosswork Planning, the Telnet and SSH settings are not preserved. You need to manually verify and update these settings, if required.

Configurations excluded during migration

The following configurations are NOT migrated while moving from Cisco WAE to Cisco Crosswork Planning:

- HA, LDAP, and User Management configurations
- Smart Licensing configurations
- WMD configurations
- All optical/L1 related configurations, for example, optical agents, optical NIMO, L1-L3 Mapping, Feasibility Limit Margin, Central Frequency Exclude List, and so on. This is because, Cisco Crosswork Planning collection does not support optical features in this release. However, the optical configurations are collected as part of the upgrade script and can be used in future.

- Inter AS NIMO configurations
- Source collector details in the Copy demands step of Demand deduction collector, as these fields are different in Cisco WAE and Cisco Crosswork Planning. You have to manually configure it after migration.
- The networks which are not part of the Composer workflow
- The External executable script configurations, as these scripts may require some changes and testing before deploying to Cisco Crosswork Planning.
- The configured device credentials. A default credential is imported and you must re-enter the credentials.
- Certain resource files, for example, updated network access file, advanced Aggregator configurations such as sql-capabilities, sql-source-capabilities, and so on.
- Nodeflow configuration (BGP details) in case of NetFlow agents. You have to configure it manually post migration.
- Network record plan files

Migrate collector configurations between Cisco Crosswork Planning instances

This section explains how to migrate collector configurations from one Cisco Crosswork Planning instance (source) to the other (target).



Note If using the SR-PCE collector in your configurations, ensure to update the **SR-PCE host** and **Backup SR-PCE host** fields manually after migration. This is necessary because, these fields are not updated while migrating the collector configurations between Cisco Crosswork Planning instances.

Procedure

Step 1 Download the collector configuration file from the source machine.

a) Log in to the Cisco Crosswork Planning instance from which you want to migrate the configuration.
b) From the main menu, choose **Collector** > **Migration**.
c) Click **Actions** and select **Configuration backup**.

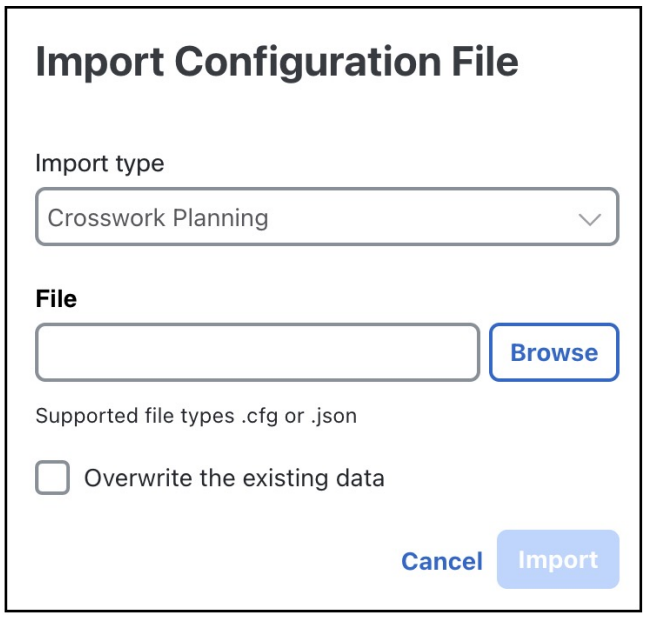
The collector configuration file is downloaded to your local machine.

Step 2 Import the collector configuration file to the target machine.

a) Log in to the Cisco Crosswork Planning instance to which you want to migrate the configuration.
b) From the main menu, choose **Collector** > **Migration**.
c) Click **Actions** and select **Configuration migration**.

The Import Configuration File page appears.

Figure 3: Import Configuration File page



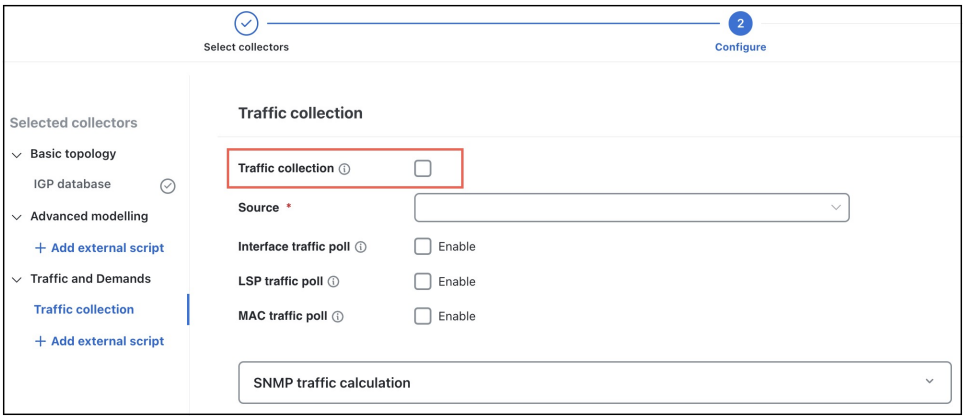
d) Select **Crosswork planning** from the **Import type** drop-down list.
e) Click **Browse** and select the collector configuration file downloaded earlier in the Step 1 (c).
f) (Optional) If you want to overwrite the existing collector configuration, check the **Overwrite the existing data** check box.
g) Click **Import** to import the collector configuration file.

The system proceeds with the import using your configuration. You can monitor the progress on the Migration page (**Collector** > **Migration**). Once the import is successful, the **Import status** column displays **Success**.

What to do next

Note In case of traffic collection, if the traffic poller agent status is displayed as down on the Agent page after migration, even though traffic collection has run successfully, follow these steps:

1. On the Collections page, click **Edit collection** for the collection corresponding to the agent.
2. On the Traffic collection configuration page, uncheck the **Traffic collection** check box and save the configuration.
3. Re-enable the **Traffic collection** check box and save the configuration again.



For details on configuring the **Traffic and Demands** collector, see Collect traffic statistics.

Configure credential profiles

You must define credential profiles to access the devices. Rather than entering credentials each time they are needed, you can instead create credential profiles to securely store this information. The platform supports unique credentials for each type of access protocol, and allows you to bundle multiple protocols and their corresponding credentials in a single profile. Devices that use the same credentials can share a credential profile. For example, if all of your routers in a particular building share a single SSH user ID and password, you can create a single credential profile to allow Cisco Crosswork Planning to access and manage them.

Before creating a credential profile, you must gather access credentials and supported protocols that you will use to monitor and manage your devices. For devices, it includes user IDs, passwords, and connection protocols. You will also need additional data such as the SNMPv2 read and write community strings, and SNMPv3 auth and privilege types.

This workflow describes the steps to create the credential profiles.

Step	Action
1. Set up device authentication credentials to access devices.	See Configure authentication credentials, on page 11.
2. Set up SNMP credentials to access the network server.	See Configure SNMP credentials, on page 12.

Configure authentication credentials

This section explains how to configure authentication credentials for accessing devices using SSH or Telnet.

Configure authentication credentials when setting up device access in the system for the first time or when adding new credentials for future device connections. These credentials enable secure connectivity of network devices via SSH (recommended for security) or Telnet.

You can configure authentication credentials during the initial setup via the **Collector** > **Collections** page or at any time from the **Credentials** page.

Follow these steps to set up authentication credentials from the **Collector** > **Credentials** page.

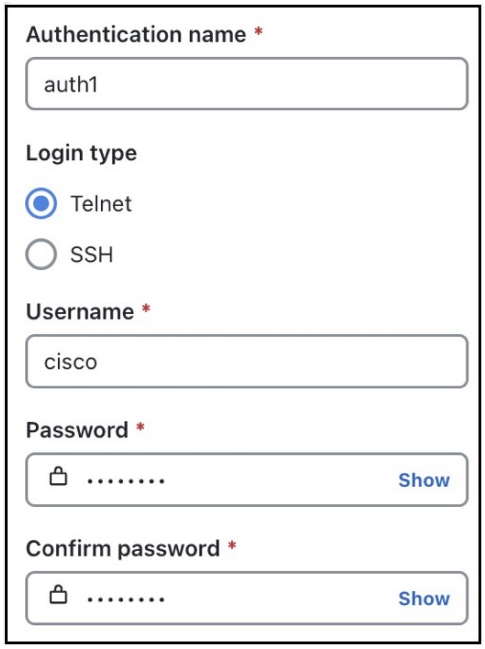
Procedure

Step 1 From the main menu, choose **Collector** > **Credentials**.

Step 2 Click **+ Create new** in the **Authentication** tab.

Note
If you are creating the authentication credentials for the first time, then click **Setup credentials**.

Figure 4: Configure authentication credentials



Step 3 Enter the values in these fields:

- Authentication name: Enter a descriptive name.
- Login type: Select either **SSH** or **Telnet** according to your requirement. The SSH protocol is more secure. The Telnet protocol does not encrypt the username and password.
- Credential fields: Enter the values in the **Username**, **Password**, and **Confirm password** fields.

Step 4 Click **Save**.

The system saves the new authentication credentials, making them available for device access through SSH or Telnet as configured.

Configure SNMP credentials

This section explains how to set up SNMP credentials to enable secure communication between the node and the seed router.

SNMP credentials are required for authenticating and encrypting messages exchanged between the node and the seed router. You can configure SNMP credentials during the initial setup via the **Collector** > **Collections** page or at any time from the **Credentials** page.

Follow these steps to configure SNMP credentials from the **Collector** > **Credentials** page.

Before you begin

Determine in advance whether you require SNMPv2c or SNMPv3, and gather any required authentication or encryption details.

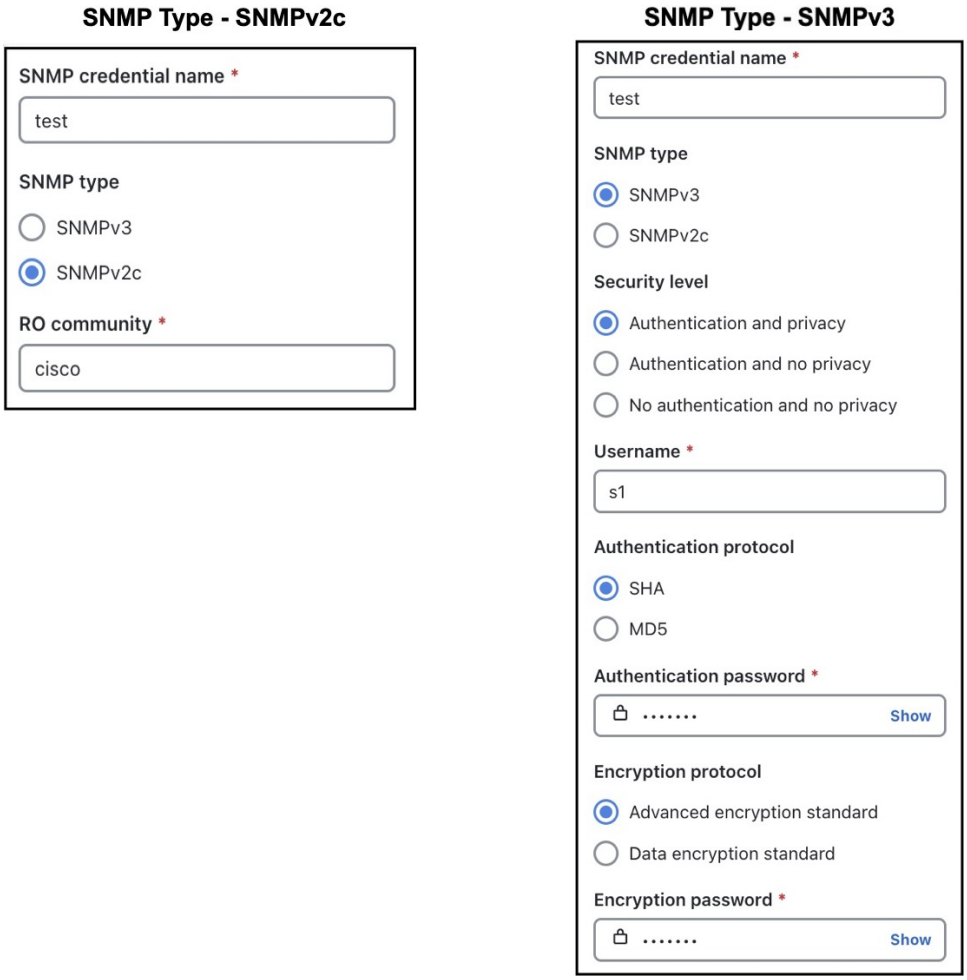
Procedure

Step 1 From the main menu, choose **Collector** > **Credentials**.

Step 2 Click the **SNMP** tab and then click **+ Create new**.

Note
If you are creating the authentication credentials for the first time, then click **Setup credentials**.

Figure 5: Configure SNMP credentials



Step 3 In the **SNMP credential name** field, enter a descriptive name for the SNMP profile.

Step 4 In the **SNMP type** section, select which SNMP protocol to use. The options are **SNMPv3** and **SNMPv2c**.

- SNMPv2c: Enter the SNMP RO community string that acts as a password. It is used to authenticate messages sent between the node and the seed router.
- SNMPv3: Enter the values in the fields mentioned in Table 1: SNMPv3 fields.

Table 2: SNMPv3 fields

Field	Action
Security level	Select one of these options: • Authentication and privacy: security level that provides both authentication and encryption. • Authentication and no privacy: security level that provides authentication but does not provide encryption. • No Authentication and no privacy: security level that does not provide authentication or encryption.
Username	Enter the user name.
Authentication protocol	Select one of these options: • SHA: HMAC-SHA-96 authentication protocol • MD5: HMAC-MD5-96 authentication protocol
Authentication password	Enter the authentication password.
Encryption protocol and Encryption password	The encryption option offers a choice of Data Encryption Standard (DES) or 128-bit Advanced Encryption Standard (AES) encryption for SNMP security encryption. The AES-128 token indicates that this privacy password is for generating a 128-bit AES key #. The AES encryption password can have a minimum of eight characters. If the passphrases are specified in clear text, you can specify a maximum of 64 characters. If you use the localized key, you can specify a maximum of 130 characters.

Step 5 Click **Save**.

The new SNMP credential is saved and available for secure device discovery or communication between your node and the seed router.

Configure network profiles

A network profile is made up of network nodes and their credentials. This section explains how to define a network profile to gather the data from the network.

When accessing the Collections page (**Collector** > **Collections**) for the first time, a Welcome screen appears. Click **Get Started** to see the preconfiguration steps, which are listed in the stepper pane on the left. After you complete the initial two steps, the third one guides you to complete the creation of network profiles.

Alternatively, follow these steps to set up network profiles from the **Collector** > **Network Profiles** page.

Before you begin

Configure device credential profiles (Authentication profiles and SNMP profiles). For details, see Configure authentication credentials, on page 11 and Configure SNMP credentials, on page 12.

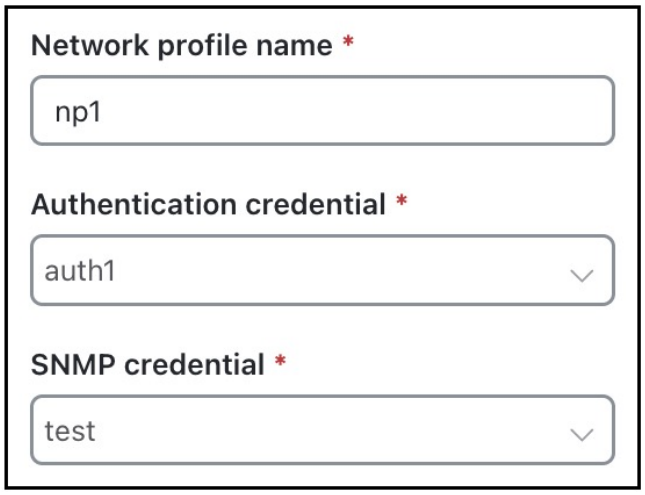
Procedure

Step 1 From the main menu, choose **Collector** > **Network Profiles**.

Step 2 Click the **+ Create new** button.

Note
If you are creating the network profile for the first time, then click **Setup network profile**.

Figure 6: Create network profile



Step 3 Enter the required values in each of these fields.

- Network profile name: Enter a name for the network access profile.
- Authentication credential: Select the applicable authentication credential from the drop-down list. If you don't have any authentication credential created, create one using the steps mentioned in Configure authentication credentials, on page 11.
- SNMP credential: Select the applicable SNMP credential from the drop-down list. If you don't have any SNMP credential created, create one using the steps mentioned in Configure SNMP credentials, on page 12.

Step 4 Click **Create & Proceed**.

Step 5 (Optional) To add or edit nodes associated with these network access credentials, see Add or edit nodes, on page 16.

Step 6 (Optional) To include or exclude individual nodes from the collection, see Configure node filter, on page 17.

Step 7 Click **Save**.

The network profile is created successfully and ready for use in gathering data from the network.

Add or edit nodes

This section explains how to add or edit nodes to update the network profile with correct node details.

Procedure

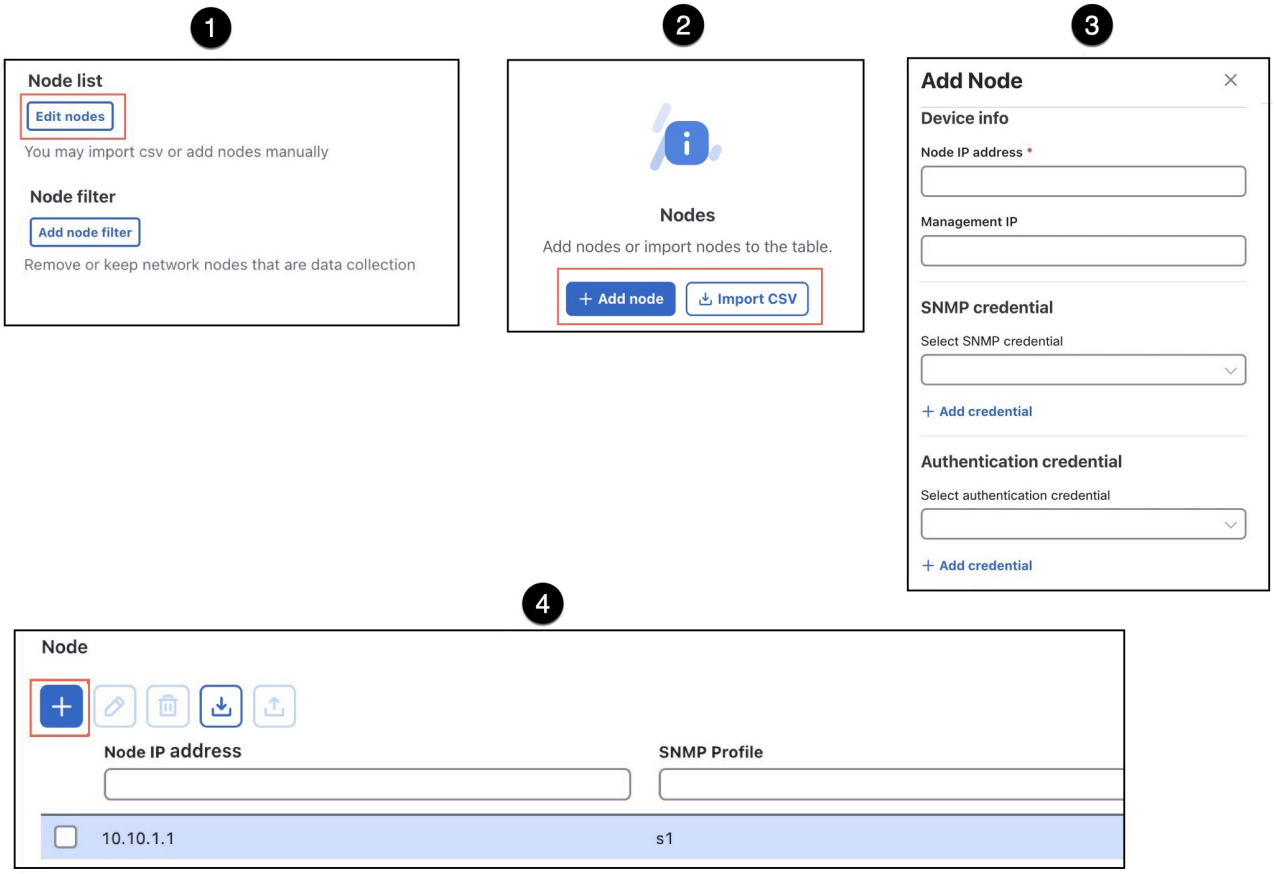
Step 1 From the main menu, choose **Collector** > **Network Profiles**.

Step 2 Select the required network profile and click **Save & Proceed**.

Step 3 Under **Node list**, click **Edit nodes** and decide how you want to add nodes.

If you decide to ...	Then ...
When there are no nodes:	
add nodes manually for the first time	**a.** Click + **Add node**. **b.** Enter the node details in the Add Node window. **c.** Click **Save**. The newly added node appears on the Node List page.
import the node list	**a.** Click Import CSV. **b.** Click **Browse** and enter the CSV file path. **c.** Click **Import**. The newly imported nodes appear on the Node List page.
When nodes exist:	
add more nodes	click + and enter the details.
import a different node list	Click and import the CSV file. Click the **sample file** link to download a sample file containing the node list.
export a node list	click .
edit a node	**a.** Select the node you want to edit. **b.** Click . **c.** Enter the node details.
delete nodes	Select the nodes and click .

Figure 7: Edit nodes pages



Step 4 Click **Done**.

Configure node filter

This section explains how to include or exclude individual nodes from the data collection.

Note

- You can add Node/Host name or loopback IP in the node filter list. Management IP must not be added in node filter IPs.
- Node/Host name works with ISIS.
- The OSPF database does not have node names, so filtering works by only IP address.
- Node filter does not support Segment List hops.

Procedure

Step 1 From the main menu, choose **Collector** > **Network Profiles**.

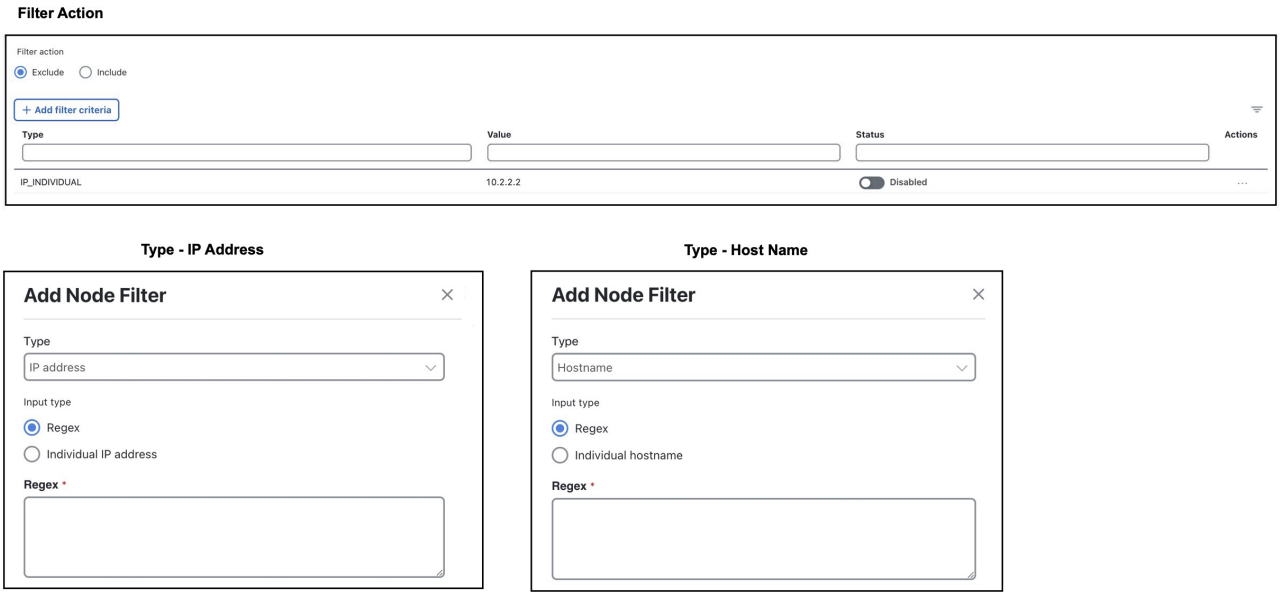
Step 2 Choose the required network profile and click **Save & Proceed**.

Step 3 Click **Add node filter**.

Step 4 Under **Filter action**, choose either **Exclude** or **Include** to exclude or include individual nodes, respectively.

Step 5 Click **+ Add filter criteria**. The Add Node Filter page appears.

Figure 8: Node filter pages



Step 6 From the **Type** drop-down list, choose the type using which you want to filter. The options are: **IP address** and **Hostname**.

Step 7 Select the required option under **Input type** and click **Save**. The options depend on the type you selected in the previous step.

- If you selected **IP address**, the options are: **Regex** and **Individual IP address**.
- If you selected **Hostname**, the options are: **Regex** and **Individual hostname**.

If you decide to ...	Then ...
include or exclude multiple nodes with a regular expression	**a.** Select the **Regex** option. **b.** Enter the Regex expression in the **Regex** field. **Note** If you configure multiple regex filters (for example, one for IP and one for Hostname), the system combines them into a single pattern using the logical OR operator (|). A node is filtered if it matches either the IP pattern or the Hostname pattern. For an example of how regex-based criteria are used to filter nodes, see Regex-based filtering criteria for node selection, on page 19.
add each node's IP address	**a.** Select the **Individual IP address** option. **b.** Enter the IP address in the **IP address** field.
add each node's hostname	**a.** Select the **Individual hostname** option. **b.** Enter the hostname in the **Hostname** field.

Step 8 Optionally, you can repeat steps 4 to 7 to add more filter criteria.

Step 9 Set the toggle in the **Status** column to Enabled to consider the entries in the filter. Then, click **Save**.

What to do next

To edit or delete nodes, use the ••• > **Edit** or ••• > **Delete** options under the **Actions** column.

Regex-based filtering criteria for node selection

When you use regex expressions for IP address and Hostname, the collector service evaluates the patterns against specific fields in the plan database:

- Regex in IP address: Matched against the "Node.IPAddress" field.
- Regex in Hostname: Matched against the "Node.Name" field.

Example

To include nodes from a specific subnet or nodes with a specific pattern, you can add two separate filter criteria:

- **Type**: IP address, **Input type**: Regex, **Value**: 10\.1\..*
- **Type**: Hostname, **Input type**: Regex, **Value**: .*-lab$

The system processes these as a combined expression: **10\.1\..*|.*-lab$**. This will match:

- 10.1.50.1 (matches the IP address pattern)

- router1-lab (matches the hostname pattern)
- 10.1.1.5 (matches the IP address pattern)

Configure agents

This section describes how to configure agents to enable network collection operations in Cisco Crosswork Planning.

Agents perform information-gathering tasks and should be configured before certain network collection operations. This task is required only for collecting SR-PCE or NetFlow information.

When accessing the Collections page (**Collector** > **Collections**) for the first time, a Welcome screen appears. Click **Get Started** to see the preconfiguration steps, which are listed in the stepper pane on the left. After you complete the initial three steps, the fourth one guides you to complete the creation of agents.

Alternatively, follow these steps to configure agents from the **Collector** > **Agents** page.

Procedure

Step 1 From the main menu, choose **Collector** > **Agents**.

Note
If a collection includes the **Traffic collection** collector, the **Collector** > **Agents** page displays the traffic poller agent details as well. The agent's name is the same as that of the collection.

Step 2 Click **+ Create new**.

If you are creating agents for the first time, then click **Setup agent**.

Step 3 Enter a name for the agent in the **Agent name** field.

Step 4 Select the required Collector type.

- SR-PCE: Collects information from the SR-PCE server periodically, and processes the topology and LSP data and notifications sent by SR-PCE. The agent connects to the REST interface of SR-PCE and retrieves the PCE topology.

  Note
  You must configure the SR-PCE agents for any networks that use SR-PCE before you can perform a network collection.

- NetFlow: Responsible for receiving, processing, and storing the flow records. This data helps to analyze and gain insights into the traffic patterns and behavior of the network.

Step 5 The configuration options vary depending on the Collector type you select.

- If you select **SR-PCE**, then enter the applicable configuration details mentioned in SR-PCE agent configuration options, on page 21.
- If you select **NetFlow**, then enter the applicable configuration details mentioned in NetFlow agent configuration options, on page 22.

Step 6 Click **Save**.

The newly created agent appears on the **Collector** > **Agents** page.

- The SR-PCE and NetFlow agents restart when the configuration parameters are edited after saving.
- The SR-PCE agent
  - starts right away after configuration or when Cisco Crosswork Planning starts, as long as the **Enabled** option is selected, and
  - stops when (a) the configuration is removed, (b) Cisco Crosswork Planning has stopped, or (c) the **Enabled** option is deselected.

What to do next

Use the **Collections** page (**Collector** > **Collections**) to configure the collectors to build a network model. For more information, see Configure collections, on page 24.

SR-PCE and NetFlow agent configuration options

This topic describes the options available for configuring SR-PCE and NetFlow agents.

SR-PCE agent configuration options

This table provides the configuration options for SR-PCE agents.

Table 3: SR-PCE agent configuration options

Option	Description
Enabled	Enables the SR-PCE agent. Default is enabled.
SR-PCE host IP	Host IP address of the SR-PCE router.
SR-PCE REST port	Port number to connect to the SR-PCE host. The default is 8080.
Authentication type	Authentication type to be used for connecting to the SR-PCE host. • Basic: Use HTTP Basic authentication (plaintext). • Digest: Use HTTP Digest authentication (MD5). • None: Use no authentication. This is applicable only for old IOS XR versions.
Username	Username for connecting to the SR-PCE host.
Password	Password for connecting to the SR-PCE host.
Connection retry count	Maximum number of retry counts for connecting to the SR-PCE host.

Option	Description
Topology collection	Specifies whether to collect topology data and to have subscription for network changes. These are the options: • Collection only • Collection and Subscription (default) • Off
LSP collection	Specifies whether to collect LSP data and to have subscription for network changes. These are the options: • Collection only • Collection and Subscription (default) • Off
Connection timeout interval	Connection timeout in seconds. Default is 50 seconds.
Pool size	Number of threads processing SR-PCE data in parallel.
Keep alive interval	Interval in seconds to send keep-alive messages. Default is 10.
Batch size	Number of nodes to send in each message. Default is 1000.
Keep alive threshold	Threshold of missed keep-alive messages. Default is 2.
Event buffer enabled	Enables you to add buffer time to process notifications in an SR-PCE agent. The SR-PCE agent processes the notification, and only after the buffered time (specified in the **Events buffer time** field), the consolidated notification is sent to SR-PCE and PCEP LSP collectors. This feature is helpful if there are too many back to back notifications like link flapping, etc. The SR-PCE agent can be configured to collect only Topology information or LSP information using the **Topology collection** and **LSP collection** fields.
Events buffer time	Time to buffer SR-PCE events before sending to collectors, in seconds.
Playback events delay	Delay in SR-PCE events playback to mimic real events, in seconds (0 = no delay).
Max LSP history	Number of LSP entries to send. Default is 0.
Net recorder mode	Records SNMP messages. You can select Off, Record, or Playback. Default is Off.

NetFlow agent configuration options

This table provides the configuration options for NetFlow agents.

Table 4: NetFlow agent configuration options

Option	Description
BGP	Enables passive BGP peering. Cisco Crosswork Planning tries to set up a BGP session with the router. Enter the BGP details in the table listed below the BGP check box.
Name	Node name.
Sampling rate	Sampling rate of the packets in exported flows from the node. For example, if the value is 1,024, then one packet out of 1,024 is selected in a deterministic or random manner.
Flow source IP	IPv4 source address of flow export packets.
BGP source IP	IPv4 or IPv6 source address of iBGP update messages.
BGP password	BGP peering password for MD5 authentication.
Interval	Interval in seconds for writing the output file. Enter the value that is greater than zero and multiple of 60. Default is 900 seconds.
Flow size	Flow collection deployment size, based on network-wide aggregated flow export traffic rate. • Small: Recommended when flow traffic rate is less than 10 Mbps. • Medium: Recommended when flow traffic rate is between 10 Mbps and 50 Mbps. • Large: Recommended when flow traffic rate is more than 50 Mbps. • Lab: Not for customer use. Default is Medium.
Extra aggregation	Choose aggregation keys from the list.

Agent operations

There are several operations you can perform on the agents created:

- **Edit**—Use this option to edit the agent parameters.
- **Start**, **Restart**, and **Stop**—Use these options to start, restart, and stop the agents, respectively.
- **Verify connection**—Use this option to check the status of the agents.
- **Delete**—Use this option to delete the agents.
- **Add schedule** and **Edit schedule**—Use these options to set up and edit the data refresh frequency for the agents, respectively. Enter the schedule using a cron expression.

Note This option is available only for SR-PCE agents. You can only add or edit schedules, but you cannot view the schedule details such as Status, Duration, and so on.

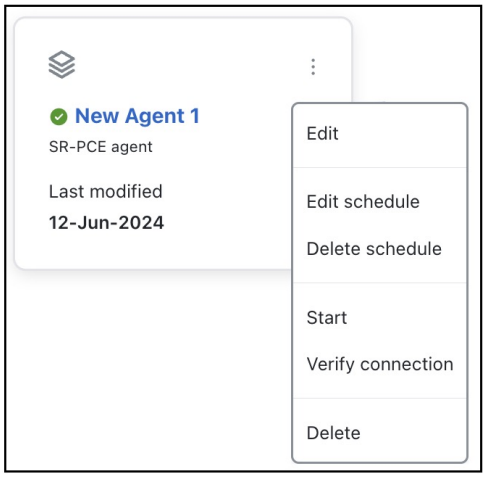
- **Delete schedule**—Use this option to delete the data refresh frequency set for the agents.

Note This option is available only for SR-PCE agents.

Follow these steps to access these options.

1. From the main menu, choose **Collector** > **Agents**. The list of already created agents appears.
2. Click ⋮ in the agent that you want to edit and choose the relevant option. Note that the options differ based on the type of agent.

Figure 9: Agent operations - example



Configure collections

This topic describes how to create collections using the Cisco Crosswork Planning UI.

The Collections page provides a visual workflow to guide you from creating a network model using various collectors to setting up a schedule to run collections and archiving the network models.



Important When configuring collections in Cisco Crosswork Planning, it is important to understand how collections and network devices impact the system's capacity. The scale numbers (for example, 6,000 or 3,000 nodes) represent the total capacity across all collections combined. For example, you can create a 6,000-node configuration using either a single collection containing all nodes or multiple collections, such as six collections with 1,000 nodes each. However, exceeding the system's defined scale limits can result in performance issues. These include collectors and aggregators running out of memory. Ensure the total number of devices or interfaces across all collections remains within the defined scale limits to maintain optimal system performance. For details on scale numbers, see the *"Profile specifications"* section in the *Cisco Crosswork Planning 7.1 Installation Guide*.

Before you begin

Ensure that you have completed the steps mentioned in Preconfiguration workflow, on page 4.

Procedure

Step 1 From the main menu, choose **Collector** > **Collections**. The list of already created collections appears.

Step 2 Begin the process of creating collections.

a) Click **Add collection** at the top right corner. The Add Collection page appears.

If you are creating the collection for the first time, then click **Add collection** in the Create collection page.

b) In the **Collection name** field, enter the name of the collection.

c) From the **Node profile** drop-down list, select the required node profile.

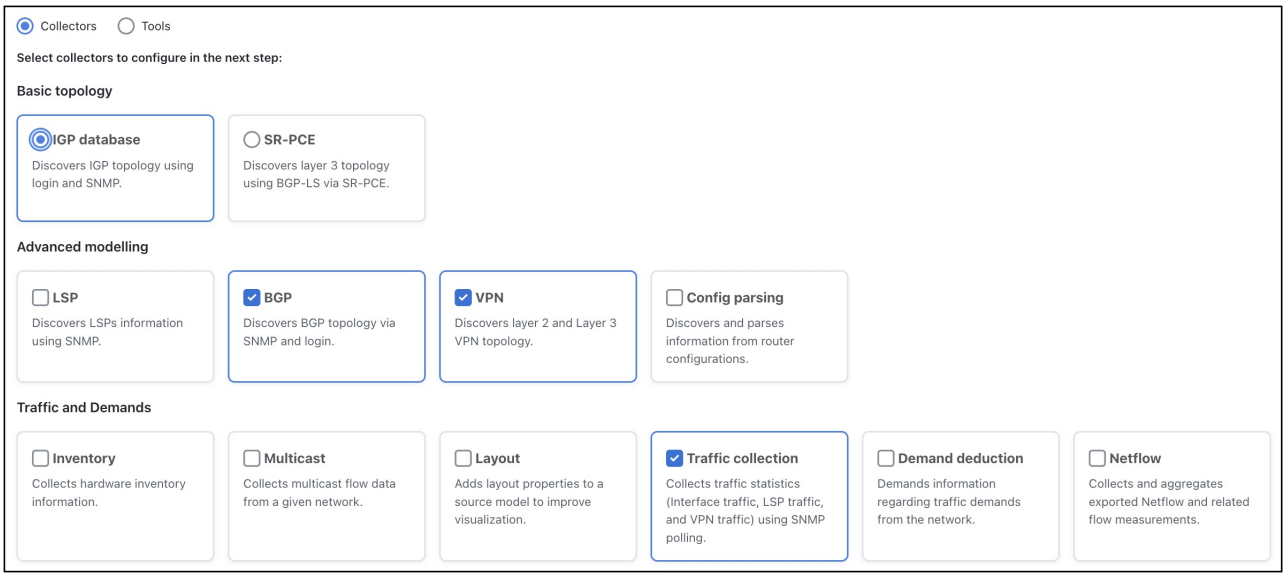
To create a new node profile, click **+ Add new profile**.

d) Click **Continue** to proceed to the collection configuration page.

Step 3 Select the required collectors. For descriptions of all the collectors, see Collector descriptions.

a) Verify that **Collectors** is selected at the top. This option is selected by default.

Figure 10: Select collectors page



b) Select one of the Basic topology collectors to initiate the network collection. Supported collectors include: IGP database and SR-PCE.

Note that you can select only one topology collector.

c) Select additional collectors as needed from these sections.

- Advanced modeling: Select the required advanced network data collectors to configure additional data collections. The supported advanced modeling collectors are: LSP, BGP, VPN, and Config parsing. You can select multiple advanced collectors.
- Traffic and Demands: Select the required collectors for traffic collection. The supported traffic and demands collectors are: Inventory, Multicast, Layout, Traffic collection, Demand deduction, and NetFlow. You can select multiple traffic and demand collectors.

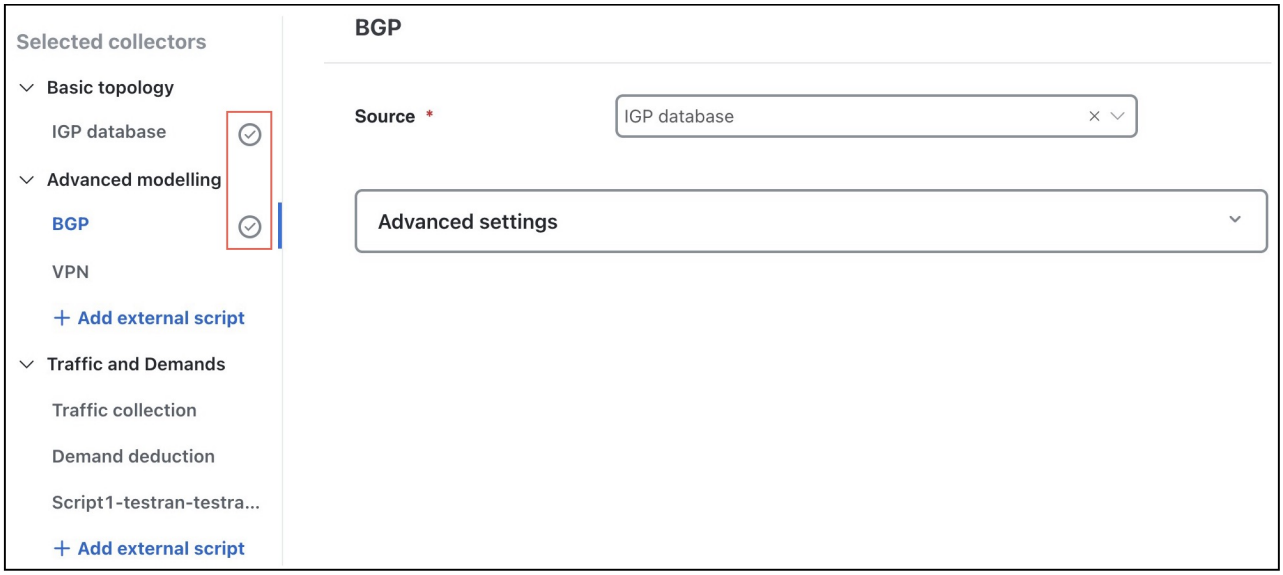
Step 4 Configure collectors.

a) Enter the configuration parameters for the selected collectors.

- The **Selected collectors** pane on the left displays the collectors that you selected in the previous step. Click the collector name in this pane to enter the configuration details.
- From the **Source** drop-down, select the collector whose output will serve as the source (input) for the currently selected collector.
- A tick mark appears next to the collector name once you enter all the required configuration parameters for that specific collector.
- To exclude a selected collector during the configuration process, click Remove.

Note
You must enter the configuration details for all selected collectors. Otherwise, the **Next** button is not enabled and you will not be able to proceed further.

Figure 11: Configure collection parameters



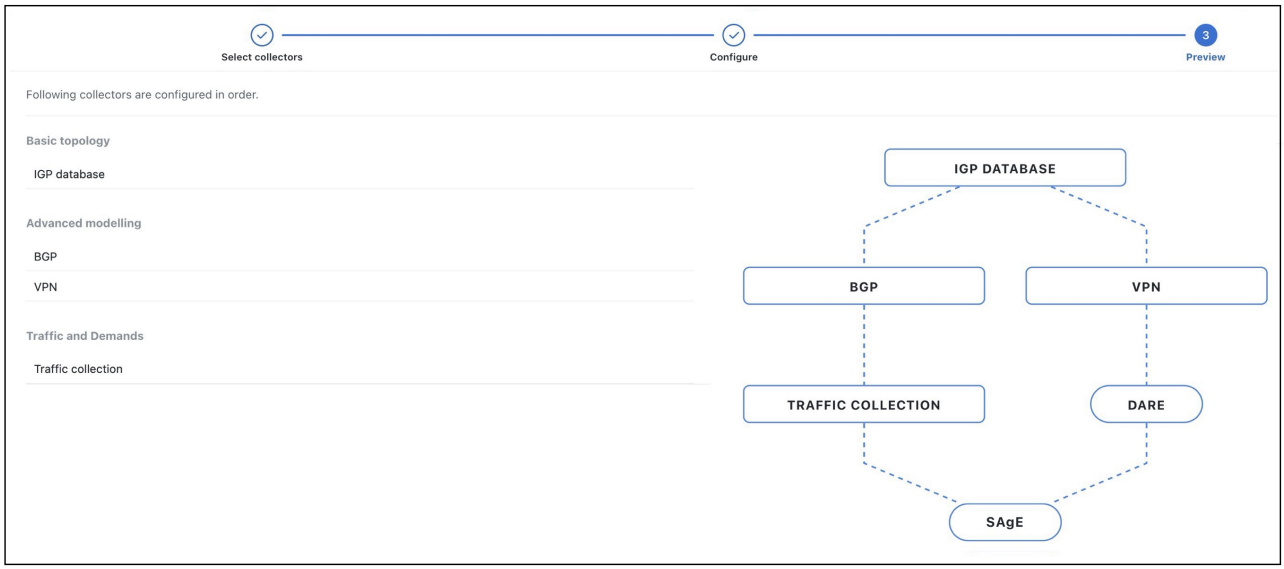
b) (Optional) To use a customized script against a collection model, click the **+ Add external script** link. For details, see Run an external script against a network model.

c) Once the configuration parameters are entered for all the collectors, click **Next**.

Step 5 Preview the order in which the collectors are added and complete collection creation.

a) Review the preview diagram to verify the order in which collectors are added. You can observe which collector output is being used as the input for the other collector.

Figure 12: Preview page



b) If you are satisfied with the configuration, click **Create** to proceed with the creation of the collection.

- A confirmation message appears indicating that the collection has been successfully created.

- To make any changes to the configuration, click **Back** to go back to the previous page. You can also click the step numbers at the top to navigate to the required configuration step.

Note

- By default, all changes are auto saved as you make them. Until you click the **Create** button, these changes are saved as **Draft**.
- Auto-saving is enabled only when creating a new collection or if the collection is in the Draft state. If you are editing an existing collection, the changes are not auto-saved.

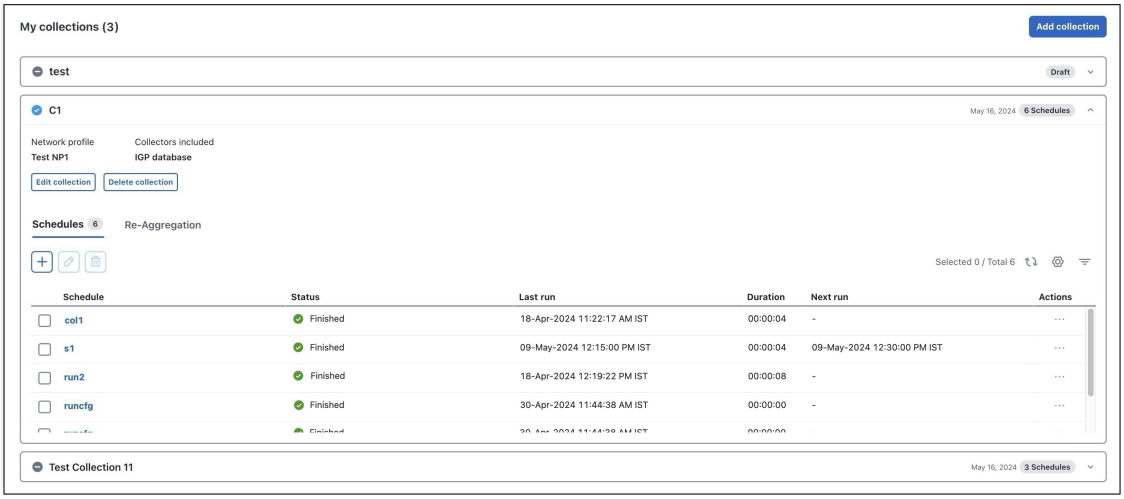
Step 6 (Optional) If you want to configure the schedules immediately, click **Add schedule** in the dialog box and proceed with the schedule configuration. For details, see Schedule collections, on page 30.

Step 7 Click **Done** in the successful message box to complete the collection creation process.

The newly added collection appears in the **Collector** > **Collections** page. Expand each collection panel to view its details.

This image shows a sample Collections page with three collections.

Figure 13: List of available collections



What to do next

Schedule collection job to run immediately or schedule it to run at specific intervals. For details, see Schedule collections, on page 30.

Edit collections

This topic describes how to edit existing collections.

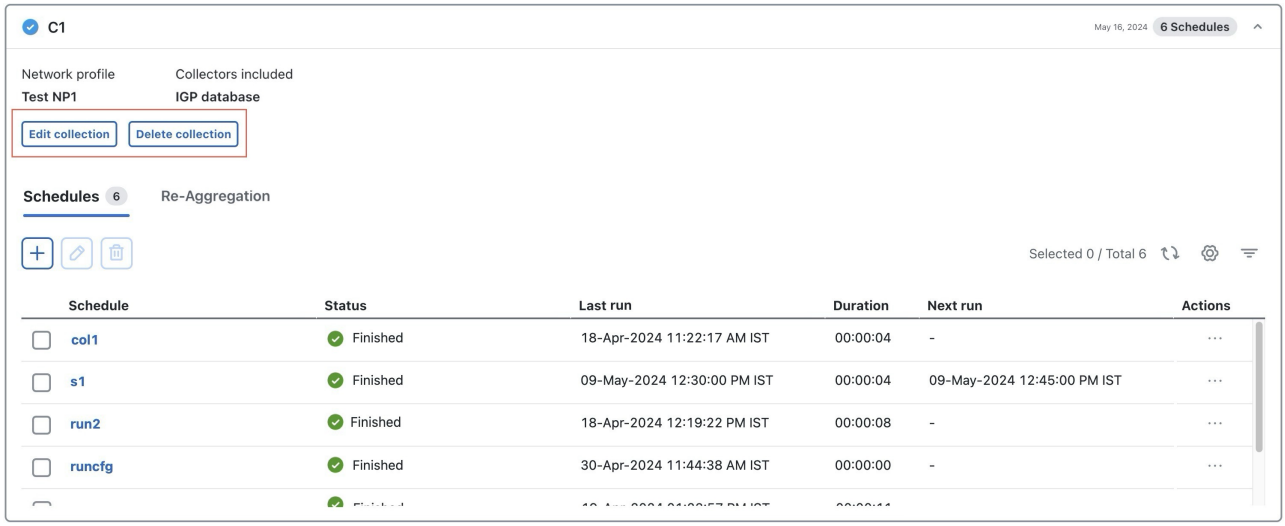
Procedure

Step 1 From the main menu, choose **Collector** > **Collections**. The list of existing collections appears.

Step 2 Expand the Collection area you want to edit.

Step 3 Click **Edit collection**.

Figure 14: Collection actions



Step 4 Make the required changes in the **Select collectors** and **Configure** pages. Preview the changes and ensure that the updated configuration meets your requirements. For more information, see Configure collections, on page 24.

Step 5 Click **Save**.

What to do next

Configure schedules for the collection job. You can schedule the collection job to run immediately or schedule it to run at specific intervals. For details, see Schedule collections, on page 30.

Delete collections

This topic describes how to delete existing collections.

Procedure

Step 1 From the main menu, choose **Collector** > **Collections**. The list of existing collections appears.

Step 2 Expand the Collection area you want to delete.

Step 3 Click **Delete collection** (for reference, see Figure 14: Collection actions, on page 29).

Step 4 Click **Yes** in the confirmation dialog box.

A message confirming the successful deletion of the collection appears.

Schedule collections

This topic describes how to schedule different network collections to run using the Cisco Crosswork Planning UI.

You can schedule jobs to run at a specific date and time, or at regular intervals. You can also create multiple schedules for the same collection with different time intervals and collector settings.

Before you begin

- Ensure that you have created the required collections. For details, see Configure collections, on page 24.
- Be familiar with using cron expressions.

Procedure

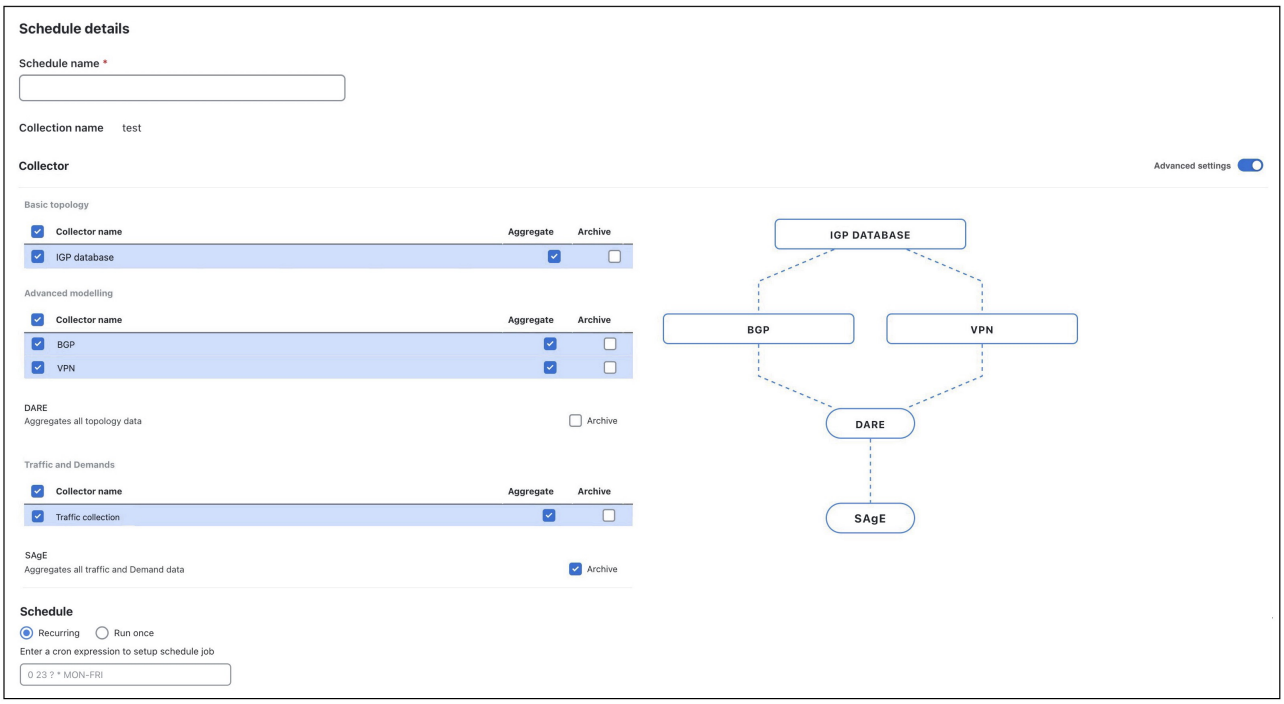
Step 1 From the main menu, choose **Collector** > **Collections**. The list of already created collections appears (for reference, see Figure 13: List of available collections, on page 28).

Step 2 Expand the collection panel for which you want to add the schedule. Use one of these options to create the schedule:

- If this is the first time you are creating the schedule, then click the **Add schedule** button while creating the collection or in the collection panel.
- If there are already other schedules available, click the ⊕ icon under the **Schedule** tab to create additional schedules (see Figure 16: Schedule actions, on page 32).

The Schedule details page appears.

Figure 15: Schedule details



Step 3 In the **Schedule name** field, enter the name for the schedule.

Step 4 In the **Collector** section:

- If you want to exclude any collector from data collection, uncheck the check box next to the collector name.
- If you want to exclude any collector from aggregation, uncheck the check box under the **Aggregate** column of the corresponding collector. For details, see Aggregate collector outputs, on page 34.
- If you want to archive any collection, check the check box under the **Archive** column of the corresponding collector. For details, see Configure archive, on page 37.

Step 5 In the **Schedule** section, specify whether you want to run this collection once or as a recurring job.

- If you select the **Run once** option, the collection runs immediately and only once. After selecting this option, the **Schedule** button at the bottom changes to **Run now**. Click it to run the collection immediately.
- If you select the **Recurring** option, specify the time interval using a cron expression. The **Recurring** option is selected by default. After entering the cron expression, click **Schedule** to run the job at the time interval you specified.

Step 6 (Optional) Repeat steps 2 through 5 if you want to create more schedules.

The configured schedule appears in the corresponding Collection panel in the **Collector** > **Collections** page. Click the schedule name under the **Schedule name** column to view its details.

Edit schedules

This topic describes how to change the execution timing or parameters of existing schedules within a collection..

Use this task to update the schedule associated with a collection in the system. Editing a schedule lets you control when collections run, ensuring alignment with operational requirements or maintenance windows.

Procedure

Step 1 From the main menu, choose **Collector** > **Collections**. The list of existing collections appears.

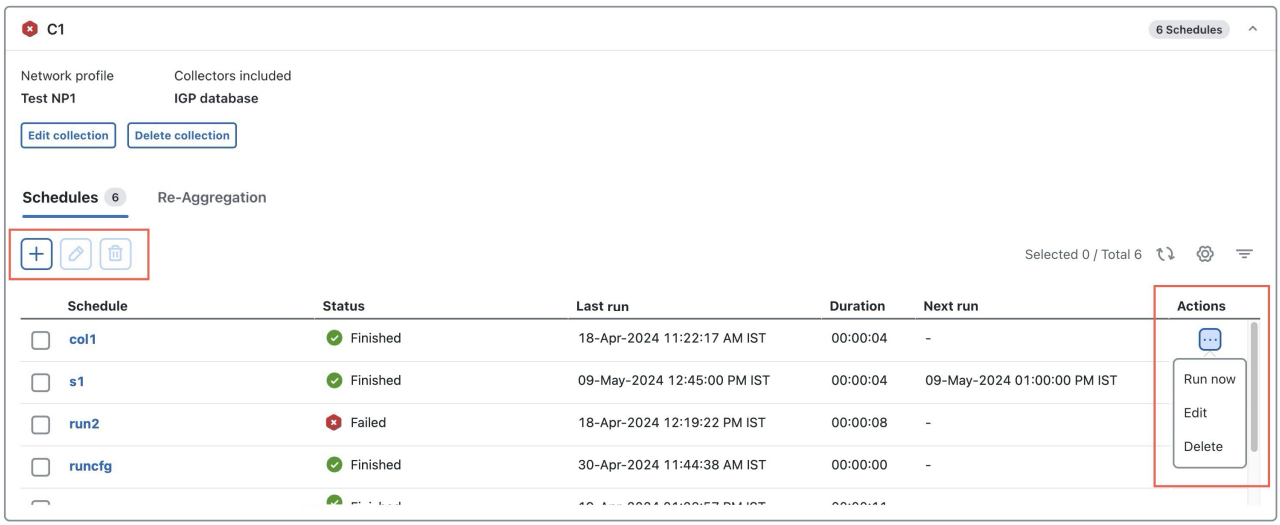
Step 2 Expand the collection panel that contains the schedule you want to edit.

Step 3 Under the **Schedules** tab, edit the schedules using any of these options:

- Select the schedule you want to edit and click .
- In the **Actions** column, click ••• > **Edit** for the schedule you want to edit.
- Click the schedule name (under the **Schedule** column) and then click **Edit**.

Note
You can edit only one schedule at a time.

Figure 16: Schedule actions



Step 4 In the **Edit Schedule** page, make the required changes.

Step 5 Click **Run now** to execute the job immediately, or click **Schedule** to set the job to run at a specified interval. For details, see Schedule collections, on page 30.

The selected schedule is updated. The collection will run immediately or at the newly specified intervals, depending on the option you chose.

Delete schedules

This topic describes how to remove unwanted collection schedules from the system.

Use this task when you need to clean up scheduled data collection activities to ensure only relevant schedules are active in your environment.

Procedure

Step 1 From the main menu, choose **Collector** > **Collections**. The list of existing collections appears.

Step 2 Expand the collection panel that contains the schedule you want to delete.

Step 3 Under the **Schedules** tab, delete the schedules using any of these options:

- Select the schedule you want to delete and click .
- In the **Actions** column, click ••• > **Delete** for the schedule you want to delete.

Note
You can delete only one schedule at a time.

Step 4 Click **Yes** in the confirmation dialog box.

The selected schedule is removed from the collection, and a confirmation message appears indicating successful deletion.

View scheduled task status and history

This topic describes how to view the statuses and recent histories of scheduled tasks for a collection.

After a schedule is configured for a collection, you can view the current task status and last 10 statuses of the tasks involved. This helps you track execution outcomes, troubleshoot failures, and download collected data when needed.

Follow these steps to view scheduled task statuses and histories.

Before you begin

Confirm that a schedule has been configured for the collection.

Procedure

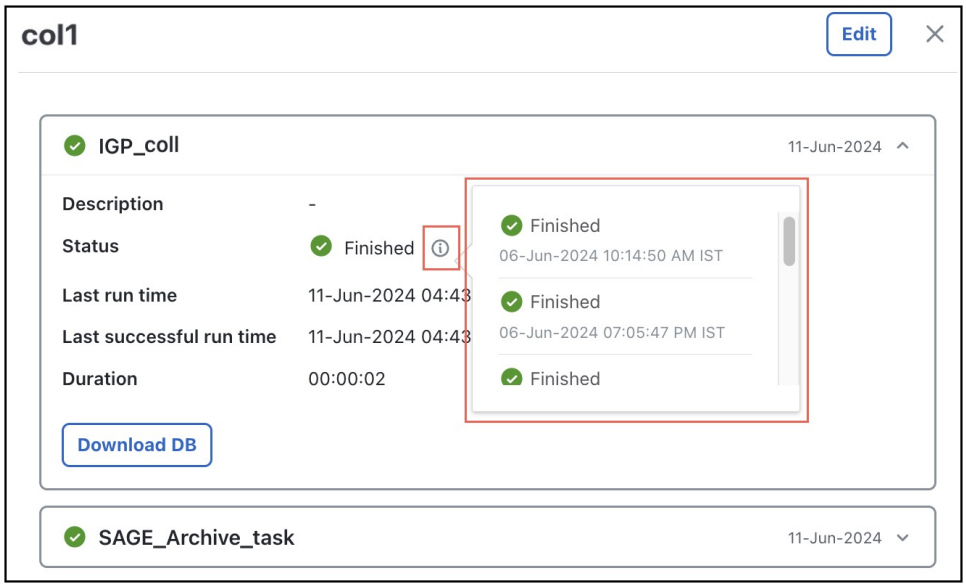
Step 1 Expand the desired collection panel.

Step 2 In the **Schedules** tab, click the name of the schedule.

The page that opens displays the statuses of all the tasks involved in the scheduled collection, including:

- timestamps of the recent task execution

- duration of each task, and
- description if the task has failed.



Step 3 Click the ⓘ icon in the **Status** field to display the last 10 task statuses.

Step 4 To download the collected data from the collector, click **Download DB**.

What to do next

If you identify any failed tasks, review the descriptions provided and take further troubleshooting or corrective action as needed.

Aggregate collector outputs

This topic describes how to exclude specific collector outputs from the network model aggregation process.

Each collector produces an output, which is aggregated (consolidated) to build a complete network model. Cisco Crosswork Planning uses the Delta Aggregation Rules Engine (DARE) to aggregate basic and advanced topology collector outputs. Simple Aggregation Engine (SAgE) consolidates all traffic and demand data, along with the topology changes from DARE, to create a final network model.

By default, all the selected collectors are included in the aggregation during collection configuration. You can choose to exclude any collector from aggregation while scheduling the collection. By doing so, even though the data is collected from the excluded collector, it will not be aggregated.

Note It is assumed that you are in the middle of creating a network model when performing the steps described in this topic. For more information, see Configure collections, on page 24.

Follow these steps to exclude a collector output from aggregation.

Procedure

Step 1 Open the Add or Edit Schedule page for the collection you want to edit. For more information, see Schedule collections, on page 30 or Edit schedules, on page 32.

Step 2 (Optional) Notice that the **Advanced Settings** toggle button is turned on by default. If it is off, turn it on.

Step 3 Under the **Collector** section, uncheck the **Aggregate** check box for the collector you want to exclude from aggregation.

Figure 17: Aggregation settings



Step 4 (Optional) Update the schedule settings. For more information, see Schedule collections, on page 30.

Step 5 If you select **Run once** in the previous step, click **Run now** to run the job immediately. If you select **Recurring**, click **Schedule** to run the job at the specified time interval.

After you uncheck the **Aggregate** check box for a collector, the subsequent data collected from that collector will not be aggregated. However, the data previously collected from the unchecked collector will still be available in the aggregator output.

Data from excluded collectors is no longer included in aggregation, ensuring only selected collector outputs contribute to the final network model.

Reaggregate collector outputs

This topic describes how to reaggregate collector outputs.

At any point during the collection process, you can perform reaggregation of all the collectors and populate the DARE and SAgE network afresh. This process does not trigger new data collection, but removes the previous aggregation results and starts a new aggregation.

Note In a collection

- only one scheduler can be used for reaggregation and
- only those collectors which are part of aggregation are considered for reaggregation.

Procedure

Step 1 From the main menu, choose **Collector** > **Collections**. The list of existing collections appears.

Step 2 Expand the collection panel in which you want to reaggregate the collector outputs.

Step 3 Click the **Re-Aggregation** tab.

Step 4 If re-aggregating for the first time, click **Schedule** or **Run once**.

- If you click **Run once**, the reaggregation happens immediately and only once.
- If you click **Schedule**, enter the data refresh frequency using a cron expression and click **Save**. The data resync occurs at the specified interval.

The **Network ReAggregation** entry appears in the table providing status and details of the job.

Figure 18: Reaggregation of collection



Step 5 To update the schedule or perform reaggregation again, click ••• under the **Actions** column. Based on the option you selected in the previous step, the options displayed under this button differ slightly.

- If you selected **Schedule**, these options appear: Run now, Edit schedule, Pause, and Delete.
- If you selected **Run once**, these options appear: Run now, Add schedule, and Delete.

Step 6 (Optional) Click the **Netwok ReAggregation** link in the table to view the details of aggregation.

The system discards the previous aggregation and initiates a new aggregation process for the selected collectors.

Configure archive

This topic describes how to configure archive settings in a collection.

After creating a network model and running collections, you can retrieve and view the plan files. Plan files capture all relevant information about a network at a given time, and can include topology, traffic, routing, and related information. The archive is a repository for plan files.

By default, the final network model is archived after running the collection. However, from the Add or Edit Schedules page, you can

- choose not to archive a final network model
- choose to archive models at a collection level, and
- schedule the archiving of network models.

Before you begin

It is assumed that you are in the middle of creating a network model when performing the steps described in this topic. For more information, see Configure collections, on page 24.

Procedure

Step 1 Open the Add or Edit Schedule page for the collection that you want to edit. For more information, see Schedule collections, on page 30 or Edit schedules, on page 32.

Step 2 (Optional) Check that the **Advanced settings** toggle button is turned on by default. If it is enabled, turn it on.

Step 3 Under the **Collector** section:

- To archive network models at a collection level, check the box under the **Archive** column for the corresponding collection.
- To prevent archiving of a final network model, uncheck the **Archive** check box next to SAgE.

Figure 19: Archive settings



Step 4 (Optional) Update the schedule settings. For more information, see Schedule collections, on page 30.

Step 5 If you select **Run once** in the previous step, click **Run now** to run the job immediately. If you select **Recurring**, click **Schedule** to run the job at the specified time interval.

In the final network model, the data collected from the unchecked collector will not be available.

The archived network model is saved in a plan file format (.pln) in the Archive section of the **Network Models** page.

What to do next

Access the plan files from the Cisco Crosswork Planning Design application. For more information, see View or download plan files, on page 38.

View or download plan files

The archived network model is saved in a plan file format (.pln), which can be downloaded or viewed from the **Network Models** page of the Cisco Crosswork Planning Design application. The archive locations vary based on whether the Cisco Crosswork Planning Design and Collector applications are installed on the same machine or on different machines. For more details, see the following sections.

Scenario 1: When the Cisco Crosswork Planning Design and Collector applications are installed on the same machine

If the Cisco Crosswork Planning Design and Collector applications are installed on the same machine, the archived network models appear under **Network Models** > **Local archive**.

Follow these steps to view or download the plan files from the Local archive.

Before you begin

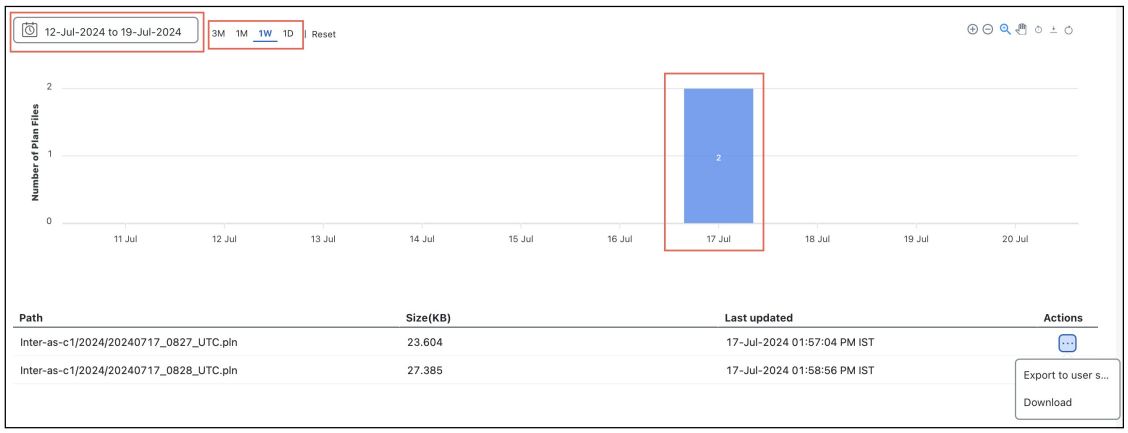
- Make sure that the network model has been archived. For details, see Configure archive, on page 37.

Procedure

Step 1 From the main menu, choose **Network Models**.

Step 2 On the left pane, under **Local archive**, a list of archived collections are displayed. Select the required collection name from the list. The right panel displays the list of plan files created under this collection at various scheduled times. The **Last updated** column displays the time at which the plan file was created.

Figure 20: Archived plan files



You can filter the plan files in several ways:

- Use the date range selection field at the top to select the required start and end dates. The plan files generated during the selected date range is displayed at the bottom.
- Use the links next to the date range selection field to view the plan files generated during last three months (3M), last one month (1M), last one week (1W), or last day (1D).
- Click the bars in the graph to view the plan files generated during a specific date or time. Continue clicking the relevant bar segment to drill down to the exact timestamp.

Step 3 Select the required plan file from the right panel and click ••• > **Export to user space** under the **Actions** column.

The Export plan to User Space window appears.

Note

To download the plan file to your local machine, click ••• > **Download** under the **Actions** column.

Step 4 (Optional) In the **Save as** field, enter a new name for the plan file.

Step 5 (Optional) Select the required tags from the list (if available) or create new tags.

To create new tags, click **Add new tag**, enter the tag name, and then click the + icon next to the field.

Step 6 Click **Save**.

The plan file is imported into the **User space** > **My network models** page.

Step 7 In the **User space** > **My network models** page, click the name of the file to visualize the network model in the **Network Design** page. For more information, see *Cisco Crosswork Planning Design 7.1 User Guide*.

Scenario 2: When the Cisco Crosswork Planning Design and Collector applications are installed on different machines

If the Cisco Crosswork Planning Design and Collector applications are installed on different machines, the archived network models appear under **Network Models** > **Remote archive** of the Cisco Crosswork Planning Design application.

This high-level workflow describes how to access the network models from the external collector.

Step	Action
1. Make sure that the network model has been archived in the machine where the Cisco Crosswork Planning Collector application is installed.	See Configure archive, on page 37.
2. Connect to the machine where Cisco Crosswork Planning Collector application is installed (external collector).	See Connect to the external collector, on page 40.
3. Access the network models from the Remote archive.	See View or download plan files from remote archive, on page 41.

Connect to the external collector

This topic describes how to connect to the Cisco Crosswork Planning Collector instance (external collector) on a different machine.

Procedure

Step 1 Log in to the machine where the Cisco Crosswork Planning Design application is installed.

Step 2 From the main menu, choose **Administration** > **Settings** > **Design settings** > **External collector collection**.

Step 3 In the **Host name/IP address** field, enter the host name or IP address of the machine where the Cisco Crosswork Planning Collector application is installed (external collector).

Step 4 Enter the port, username, and password for the external collector machine.

Step 5 Click **Save**.

Step 6 From the main menu, choose **Network Models** and verify that the **Remote archive** option appears in the left pane.

The Cisco Crosswork Planning Design application is now connected to the external collector.

What to do next

View or download the archived network models from the Remote archive. For details, see View or download plan files from remote archive, on page 41.

View or download plan files from remote archive

Follow these steps to view or download the plan files from the Remote archive.

Procedure

Step 1 Log in to the machine where the Cisco Crosswork Planning Design application is installed.

Step 2 From the main menu, choose **Network Models**.

Step 3 On the left pane, under **Remote archive**, list of collections archived in the external collector are displayed. Select the required collection name from the list. The right panel displays the list of plan files created under this collection at various scheduled times. Use the **Last updated** column to know the time at which the plan file was created.

You can filter the plan files in several ways (see Figure 20: Archived plan files, on page 39):

- Use the date range selection field at the top to select the required start and end dates. The plan files generated during the selected date range is displayed at the bottom.
- Use the links next to the date range selection field to view the plan files generated during last three months (3M), last one month (1M), last one week (1W), or last day (1D).
- Click the bars in the graph to view the plan files generated during a specific date or time. Continue clicking the relevant bar segment to drill down to the exact timestamp.

Step 4 Select the required plan file from the right panel and click ••• > **Export to user space** under the **Actions** column.

The Export Plan to User Space window appears.

Note
To download the plan file to your local machine, click ••• > **Download** under the **Actions** column.

Step 5 (Optional) In the **Save as** field, enter a new name for the plan file.

Step 6 (Optional) Select the required tags from the list (if available) or create new tags.

To create new tags, click **Add new tag**, enter the tag name, and then click the + icon next to the field.

Step 7 Click **Save**.

The plan file is imported into the **User space** > **My network models** page.

Step 8 In the **User space** > **My network models** page, click the name of the file to visualize the network model in the **Network Design** page. For more information, see *Cisco Crosswork Planning Design 7.1 User Guide*.