

Configure Network Models

This section contains the following topics:

- Workflow: Network Model Creation, on page 1
- Workflow: Preconfiguration Steps, on page 4
- Workflow: Collection Configuration, on page 4
- Migrate Collector Configurations, on page 5
- Configure Credential Profiles, on page 10
- Configure Network Profile, on page 14
- Configure Agents, on page 18
- Configure Collections, on page 22
- Schedule Collections, on page 28
- Aggregate Collector Outputs, on page 32
- Configure Archive, on page 34
- View or Download Plan Files, on page 36

Workflow: Network Model Creation

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 device and network access configuration, network model creation, user management, agent configuration, and so on.

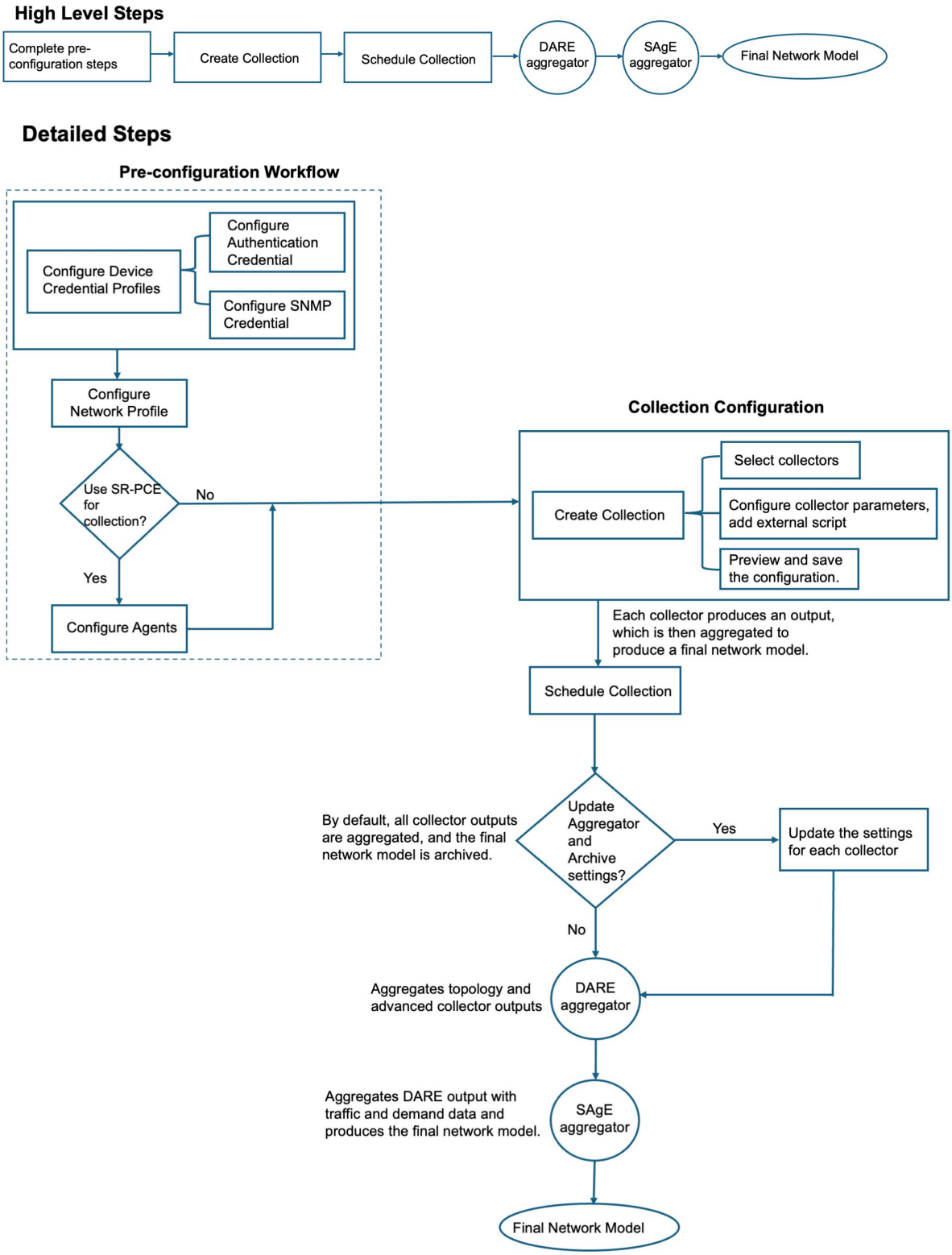
The following table and image show a high-level workflow for configuring individual network models:

Table 1: Network Model Creation Workflow

Step	Action
1. Configure device authgroups, SNMP groups, and network profile access.	See Workflow: Preconfiguration Steps, on page 4.
2. (Optional) Configure agents. This step is required only for collecting SR-PCE or NetFlow information.	See Configure Agents, on page 18.
3. Configure the collections (basic and advanced configurations).	See Workflow: Collection Configuration, on page 4.

Step	Action
4. Schedule when to run the collections.	See Add Schedules, on page 28.
5. (Optional) Manage the aggregation and archive of network model as per your requirement.	See • Aggregate Collector Outputs, on page 32 • Configure Archive, on page 34
6. View or download the plan files in the Cisco Crosswork Planning Design application.	See View or Download Plan Files, on page 36.

Figure 1: Network Model Creation Workflow



Workflow: Preconfiguration Steps

The following 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.

Table 2: Preconfiguration Workflow

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 Profile, 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 18.

Workflow: Collection Configuration

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.

The high-level workflow involved in the collection configuration process is as follows:

Table 3: Collection Configuration Workflow

Step	Description
1. Complete all the steps mentioned in the preconfiguration workflow.	See Workflow: Preconfiguration Steps, 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.

Step	Description
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.
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 External Scripts 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 28.
7. (Optional) Update the aggregation and archive settings, as required.	See: • Aggregate Collector Outputs, on page 32 • Configure Archive, on page 34

Migrate Collector Configurations

In Cisco Crosswork Planning, you can migrate the collector configurations from Cisco WAE 7.5.x/7.6.x, as well as from one Cisco Crosswork Planning instance to the other.

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 importing the configuration, the server restores only the file name and not the actual file. If the correct file is not used, then the collection fails.

Migrate Collector Configuration from Cisco WAE

Follow these steps to migrate the collector configurations from Cisco WAE 7.5.x/7.6.x to Cisco Crosswork Planning.

Before you begin

- Download the upgrade script from Cisco Software Download page.

Procedure

Step 1 If you have not backed up the configuration, use the following 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 the following 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 the following 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 the following 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) using the following steps:

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

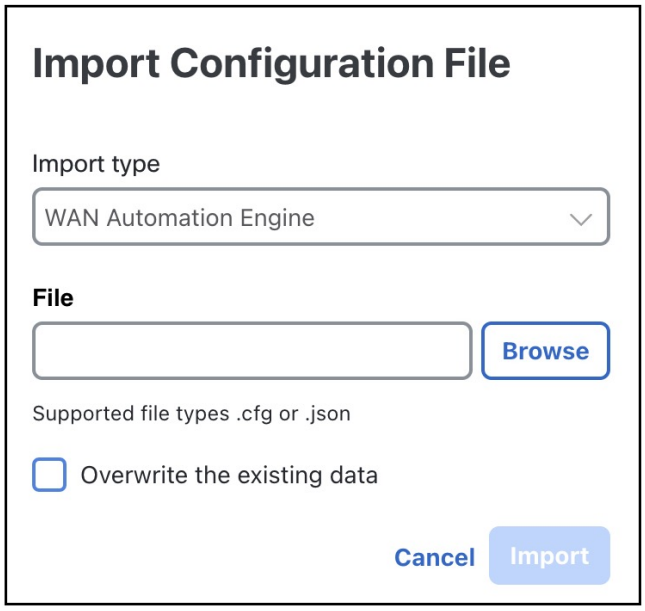
a) Log in to the Cisco Crosswork Planning UI.

b) From the main menu, choose **Collector** > **Migration**.

c) Click **Actions** and choose **Configuration migration**.

The Import configuration file window appears.

Figure 2: Import Configuration File Window



d) From the **Import type** drop-down, choose **WAN Automation Engine**.
e) Click **Browse** and select the **wae_networks.cfg** file.
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.

You can monitor status of the import in the Migration page (**Collector** > **Migration**). Once the import is successful, the **Import status** column displays the status of the task as **Success**.

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 Configuration between Cisco Crosswork Planning Instances



Note If you are 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.

Follow these steps to migrate the collector configuration from one Cisco Crosswork Planning instance (source) to the other (target).

Procedure

Step 1 Download the collector configuration file from the source machine you want to migrate the configuration from:

a) Log into 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 choose **Configuration backup**.

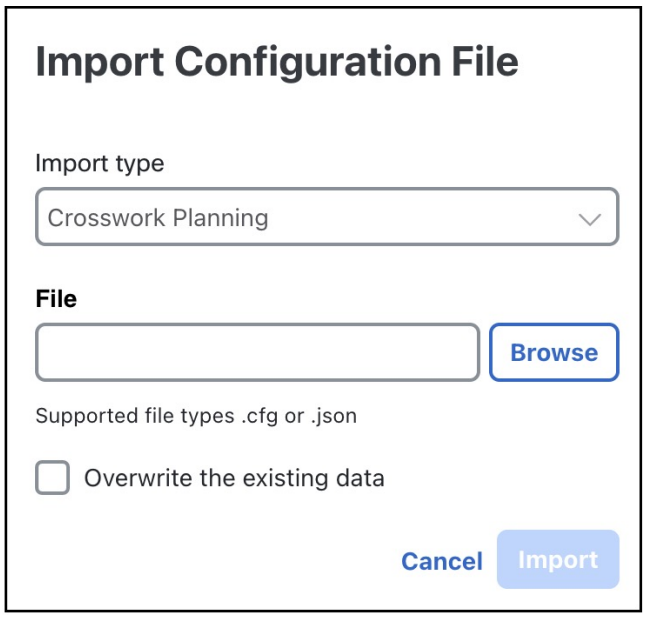
The collector configuration file is downloaded to your local machine.

Step 2 Import the collector configuration file to the target machine where you want to migrate it to:

a) Log into 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 choose **Configuration migration**.

The Import configuration file window appears.

Figure 3: Import Configuration File Window

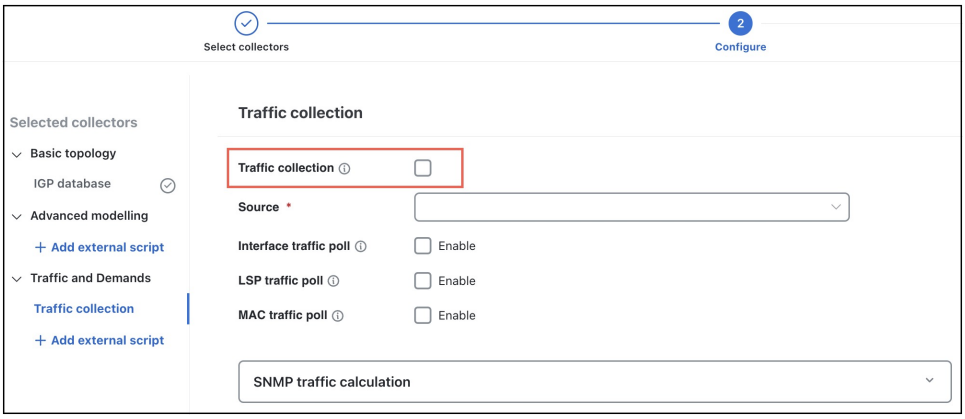


d) From the **Import type** drop-down, choose **Crosswork planning**.
e) Click **Browse** and select the collector configuration file that you downloaded in the Step 1 (c).
f) (Optional) If you want to overwrite the existing collector configuration, check the **Overwrite the existing data** check box.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

You can monitor status of the import in the Migration page (**Collector** > **Migration**). Once the import is successful, the **Import status** column displays the status of the task as **Success**.

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 on the Collections (**Collector** > **Collections**) page:

1. Select **Edit collection** for the collection corresponding to the agent.
2. In the Traffic collection configuration page, uncheck the **Traffic collection** check box and save the configuration.
3. Re-enable the **Traffic collection** checkbox 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.

The following workflow describes the steps to create the credential profiles:

Table 4: Credential Profiles Configuration Workflow

Step	Action
1. Set up device authentication credentials to access devices.	See Configure Authentication Credentials, on page 11.

Step	Action
2. Set up SNMP credentials to access the network server.	See Configure SNMP Credentials, on page 12.

Configure Authentication Credentials

If you are accessing the Collections page (**Collector** > **Collections**) for the first time, then a Welcome screen appears. Click **Get Started** to see the preconfiguration steps, which are listed in the stepper pane on the left. The first step guides you to complete the creation of authentication credentials.

Or

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

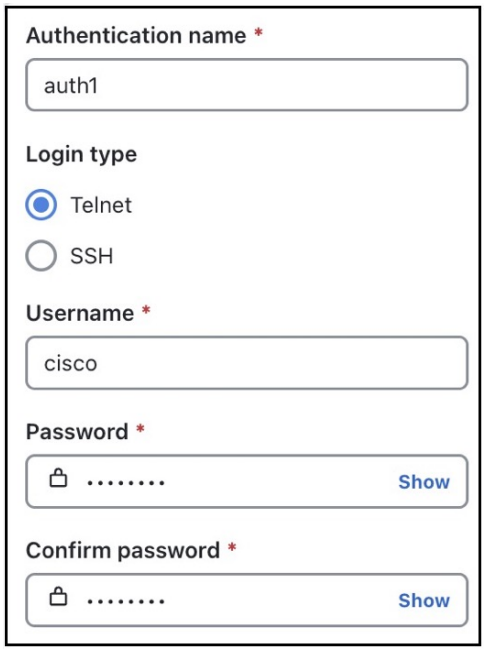
Procedure

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

Step 2 In the **Authentication** tab, click the **+ Create new** button.

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 the following fields:

- **Authentication name**—Enter a descriptive name.
- **Login type**—Choose which login protocol to use: **SSH** or **Telnet**. 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**.

Configure SNMP Credentials

If you are accessing the Collections page (**Collector** > **Collections**) for the first time, then 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 first step, the second one guides you to complete the creation of SNMP credentials.

Or

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

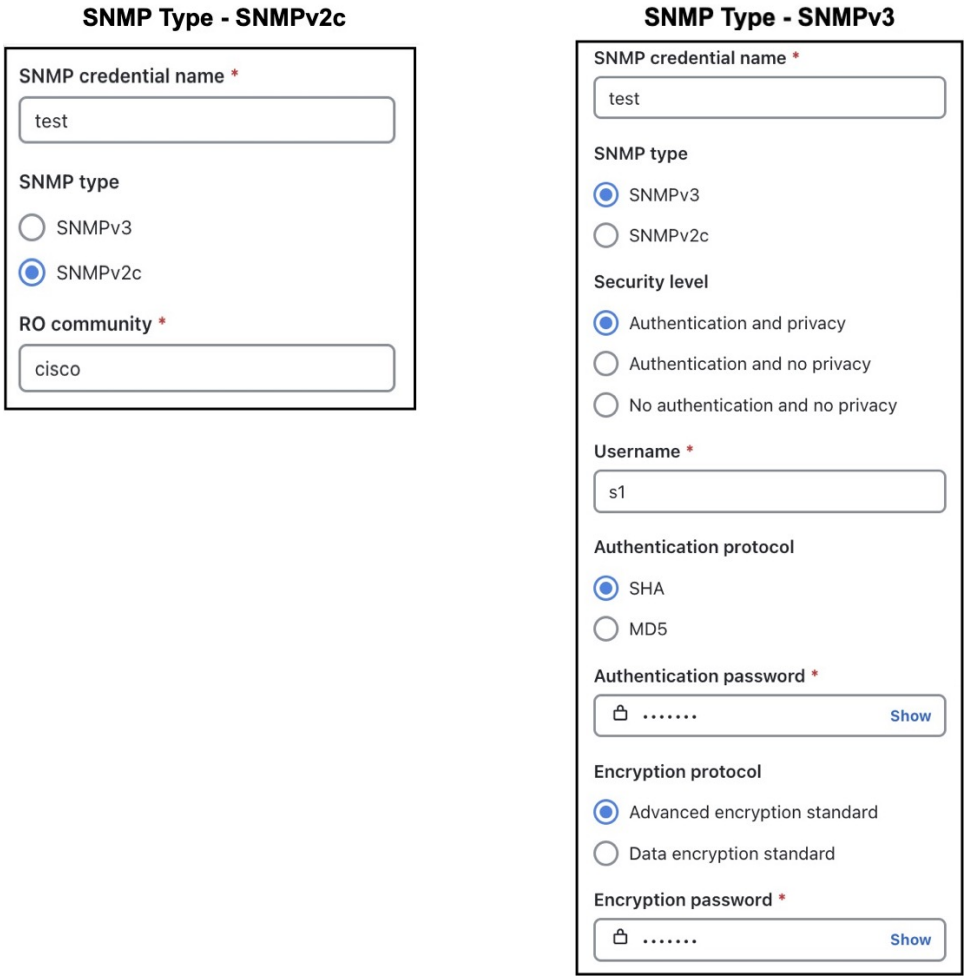
Procedure

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

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

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 Under **SNMP type**, choose which SNMP protocol to use: **SNMPv2c** or **SNMPv3**.

- If you choose **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.
- If you choose **SNMPv3**, enter the following default credentials:
  - **Security level**—Select one of the following:
    - **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 the following:

- **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**.

Configure Network Profile

Define a network profile to gather the data from the network. This network profile is made up of network nodes and their credentials. You can also apply filter criteria to include or exclude a few nodes during discovery.

If you are accessing the Collections page (**Collector** > **Collections**) for the first time, then 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.

Or

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.

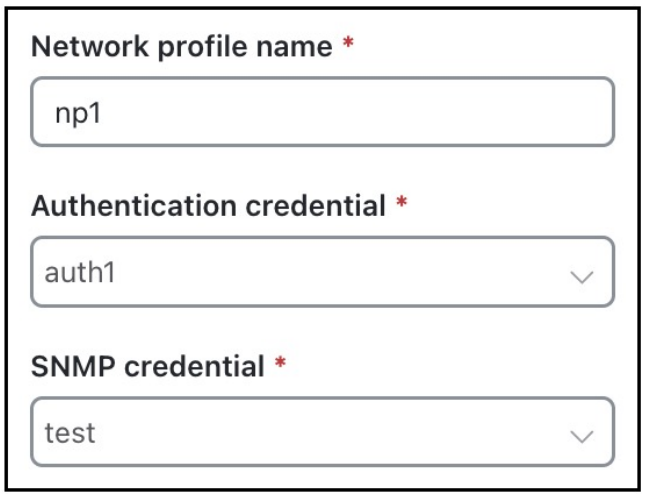
Procedure

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 following information:

- **Network profile name**—Enter a name for the network access profile.
- **Authentication credential**—Choose 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**—Choose 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 15.

Step 6 (Optional) To include or exclude individual nodes from the collection, see Configure the Node Filter, on page 16.

Step 7 Click **Save**.

Add or Edit Nodes

Follow these steps to add or edit nodes associated with network access credentials created in the previous topic.

Procedure

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

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

Step 3 Under **Node list**, click the **Edit nodes** button and do one of the following:

- If you are adding the nodes manually for the first time, then click the **+ Add node** button. Enter the node details in the **Add Node** window and click **Save**. The newly added node appears in the Node List page.

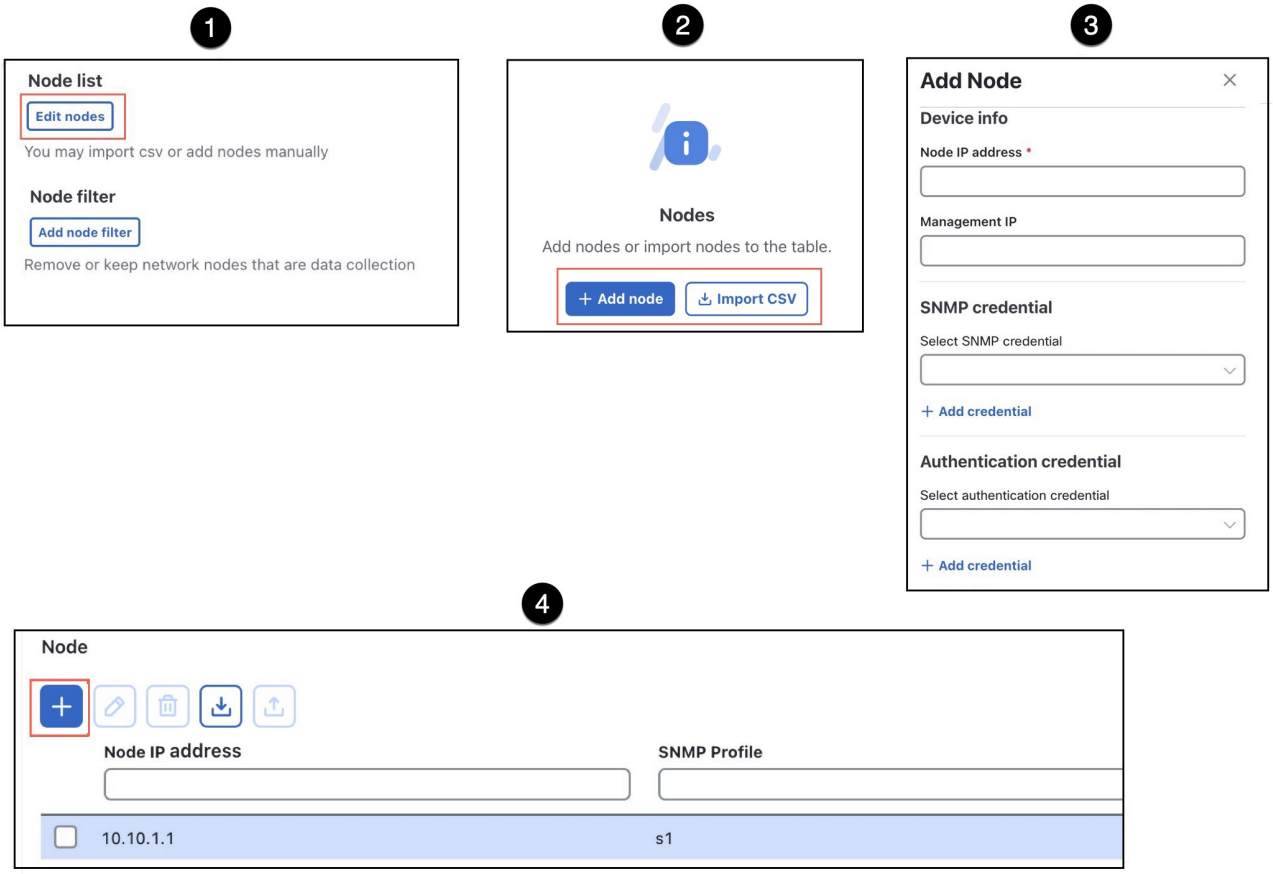
  If you want to add more nodes, then click  and enter the details.

- If there are no nodes added and if you want to import the node list, click the Import CSV button. Click **Browse** and enter the CSV file path, and click **Import**. The newly imported nodes appear in the Node List page.

  If you want to import a different node list, then click and import the CSV file.

  Click the **sample file** link to download a sample file containing node list.

Figure 7: Add Nodes Pages



- To Export a node list, click .
- To edit a node, select the node, click , and enter the node details.
- To delete the nodes, select the nodes and click .

Step 4 Click **Done**.

Configure the Node Filter

Cisco Crosswork Planning enables you to include or exclude individual nodes from the data collection.

Note

- Node/Host name or loopback IP can be added for 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 only by IP address.
- Node filter does not support Segment List hops.

Procedure

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

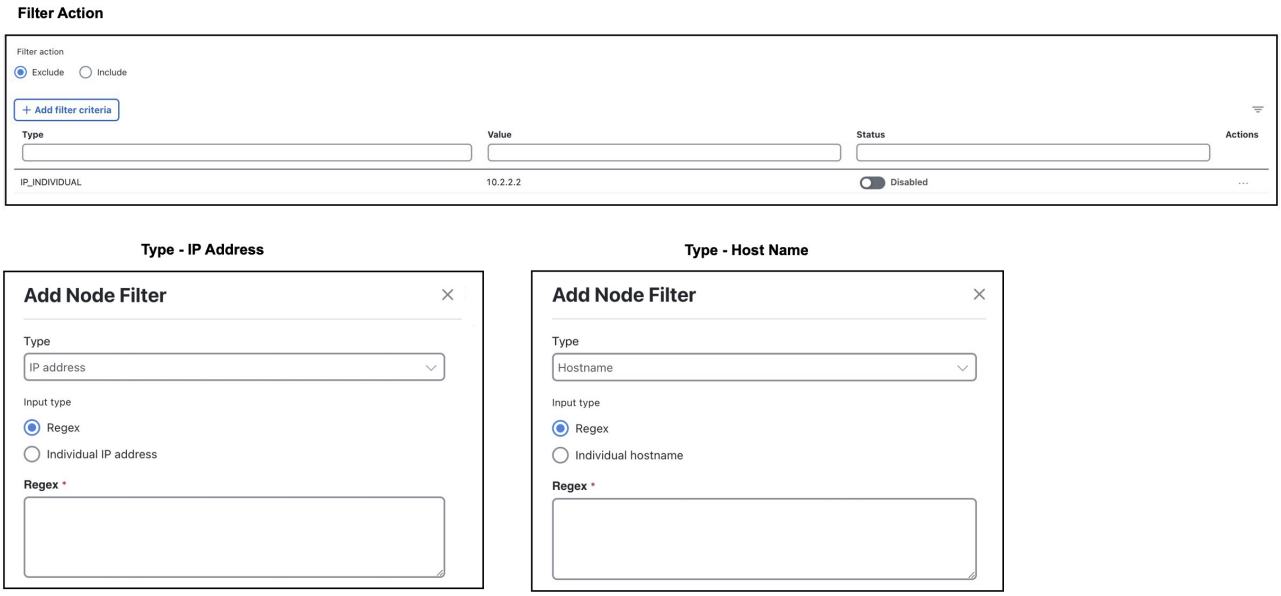
Step 2 Choose the required network profile and click **Save & Proceed**.

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**. Based on the type you selected in the previous step, you get different options.

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

Use the **Regex** option when multiple nodes are to be included/excluded with a single expression. Enter the **Regex** expression in the Regex field.

Use the **Individual IP address** option to add IP address of each node. Enter the IP address in the **IP address** field.

Use the **Individual hostname** option to add hostname of each node. Enter the hostname in the **Hostname** field.

Step 8 Click **Save**.

Step 9 (Optional) Repeat steps 4–8 to add more filter criteria.

Step 10 Slide the toggle in the **Status** column to the Enabled position to consider the entries in the filter.

Step 11 Click **Save**.

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

Configure Agents

Agents perform information-gathering tasks and should be configured before certain network collection operations. This section describes how to configure agents using the Cisco Crosswork Planning UI.



Note This task is required only for collecting SR-PCE or NetFlow information.



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.

If you are accessing the Collections page (**Collector** > **Collections**) for the first time, then 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.

Or

Follow these steps to configure agents from the **Collector** > **Agents** page.

Procedure

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

Step 2 Click **+ Create new**.

Note
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 Choose the required Collector types. The options are **SR-PCE** or **NetFlow**.

- The SR-PCE agent periodically collects information from the SR-PCE server, 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
  SR-PCE agents must be configured for any networks that use SR-PCE before you can perform a network collection.

- The NetFlow collector is 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 types** you choose.

- If you choose **SR-PCE** as the collector type, then enter the applicable configuration details mentioned in Table 5: SR-PCE Agent Configuration Options, on page 19.
- If you choose **NetFlow** as the collector type, then enter the applicable configuration details mentioned in Table 6: NetFlow Agent Configuration Options, on page 21.

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 Create Collections, on page 23.

SR-PCE and NetFlow Agent Configuration Options

This topic describes options available when configuring SR-PCE and NetFlow agents:

Table 5: SR-PCE Agent Configuration Options

Option	Description
Enabled	Enables the SR-PCE agent. Default is enabled.
SR-PCE host IP	Indicates the host IP address of the SR-PCE router.
SR-PCE REST port	Indicates the port number to connect to the SR-PCE host. The default is 8080.

Option	Description
Authentication type	Indicates the authentication type to be used for connecting to the SR-PCE host. The available options are: • 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	Indicates the username for connecting to the SR-PCE host.
Password	Indicates the password for connecting to the SR-PCE host.
Connection retry count	Indicates the maximum number of retry counts for connecting to the SR-PCE host.
Topology collection	Specifies whether to collect topology data and to have subscription for network changes. The options are: Collection only, Collection and Subscription, and Off. Default is Collection and Subscription.
LSP collection	Specifies whether to collect LSP data and to have subscription for network changes. The options are: Collection only, Collection and Subscription, and Off. Default is Collection and Subscription.
Connection timeout interval	Specifies the connection timeout in seconds. Default is 50 seconds.
Pool size	Indicates the number of threads processing SR-PCE data in parallel.
Keep alive interval	Indicates the interval in seconds to send keep-alive messages. Default is 10.
Batch size	Indicates the number of nodes to send in each message. Default is 1000.
Keep alive threshold	Specifies 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	Indicates the time to buffer SR-PCE events before sending to collectors, in seconds.
Playback events delay	Indicates the delay in SR-PCE events playback to mimic real events, in seconds (0 = no delay).

Option	Description
Max LSP history	Indicates the 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.

Table 6: 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	Indicates the node name.
Sampling rate	Indicates the 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	Indicates the IPv4 source address of flow export packets.
BGP source IP	Indicates the IPv4 or IPv6 source address of iBGP update messages.
BGP password	Indicates the BGP peering password for MD5 authentication.
Interval	Indicates the interval time for writing the output file, in seconds. Enter the value that is greater than zero and multiple of 60. Default is 900 seconds.
Flow size	Indicates the flow collection deployment size, based on network-wide aggregated flow export traffic rate. The values are: • 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	Allows you to choose the 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.

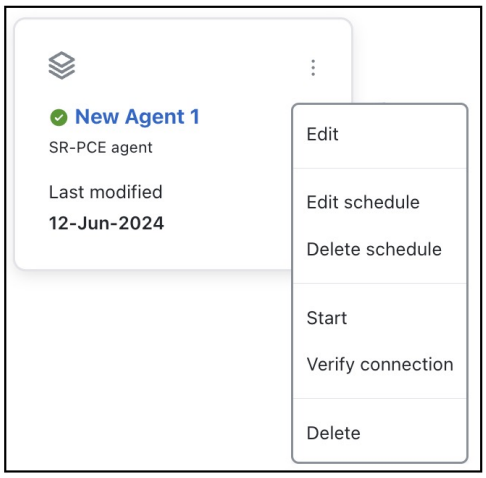
- **Delete schedule**—Use this option to delete the data refresh frequency set for the agents.

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 and modify collections using the Cisco Crosswork Planning UI.

Create Collections

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.

Before you begin

Ensure that you have completed the steps mentioned in Workflow: Preconfiguration Steps, on page 4.

Follow these steps to create collections.

Procedure

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

Step 2 Click **Add collection** at the top-right corner. The Add Collection modal window appears.

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

Step 3 In the **Collection name** field, enter the name of the collection.

Step 4 From the **Node profile** drop-down list, choose the required node profile. If you want to create any new node profile, then click **+ Add new profile**.

Step 5 Click **Continue**.

The collection configuration page appears with a numbered navigation bar at the top.

Step 6 Verify that the **Collectors** radio button is clicked at the top. This option is selected by default.

Step 7 Select the required collectors. You must choose one of the Basic topology collectors to start the network collection. Then, select the collectors from the other sections.

Figure 10: Select Collectors Page



The collectors are categorized under the following sections. Choose the collectors from all these sections as per your requirement. For descriptions of all the collectors, see Collector Descriptions.

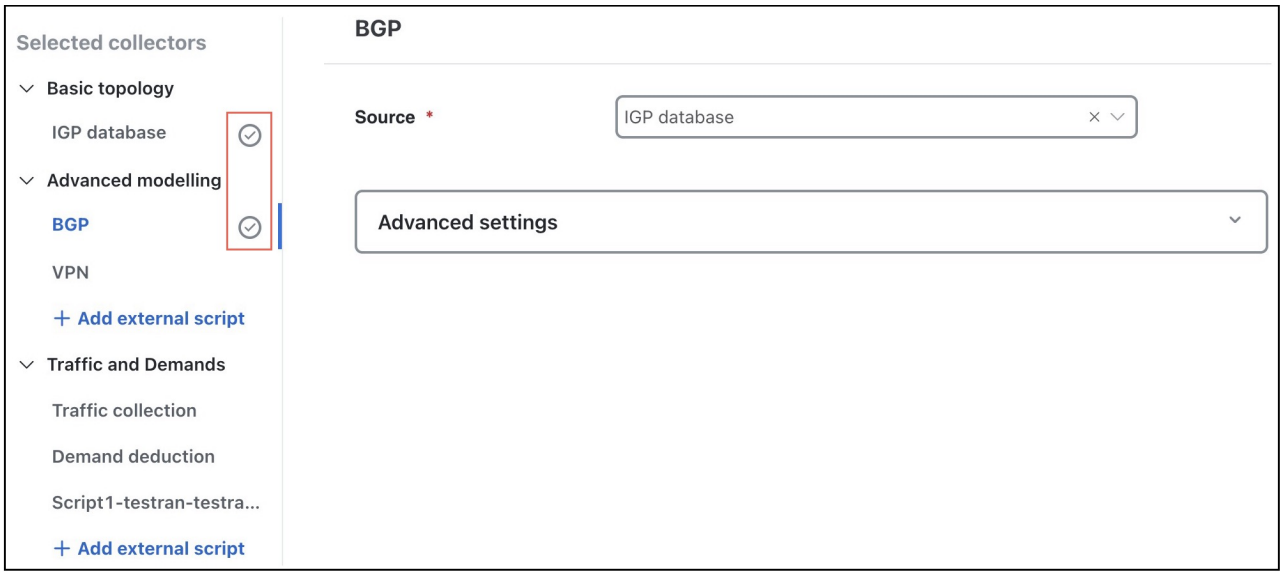
- **Basic topology**—Choose the required basic topology collector. The supported basic topology collectors are: IGP database and SR-PCE. You can choose only one topology collector.
- **Advanced modeling**—Choose the required advanced network data collectors to configure additional data collections. The supported advanced modeling collectors are: LSP, BGP, VPN, and Config parsing. You can choose multiple advanced collectors.
- **Traffic and Demands**—Choose the required collectors for traffic collection. The supported traffic and demands collectors are: Inventory, Multicast, Layout, Traffic collection, Demand deduction, and NetFlow. You can choose multiple traffic and demand collectors.

Step 8 In the second step of configuration, enter the configuration parameters for the selected collectors. Note the following:

- 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, choose 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 each collector that you selected. Otherwise, the **Next** button is not enabled and you will not be able to proceed further.

Figure 11: Configure Collection Parameters



Step 9 (Optional) If you want to use a customized script against a collection model, use the **+ Add external script** link. For details, see Run External Scripts Against a Network Model.

Step 10 Once the configuration parameters are entered for all the collectors, click **Next**.

Step 11 The final step of collection configuration is to preview the order in which the collectors are added. In the preview diagram, you can observe which collector output is being used as the input for the other collector.

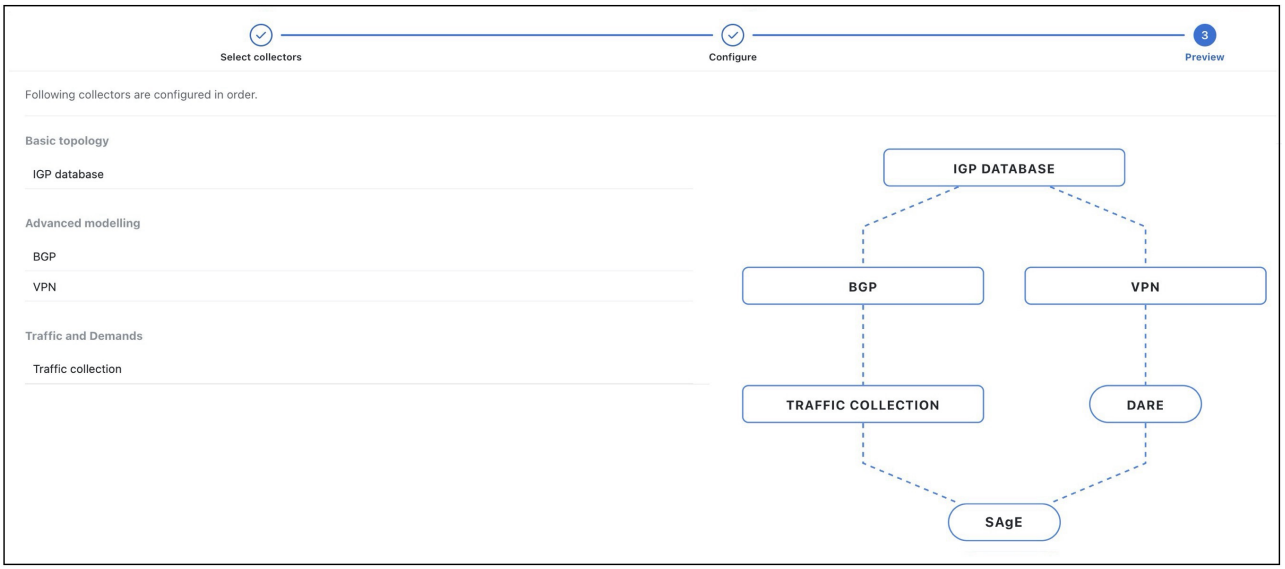
If you are satisfied with the configuration, then click **Create** to proceed with the creation of the collection. The Collection creation successful message appears.

If you want to make any changes to the configuration, then 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.

Figure 12: Preview Page



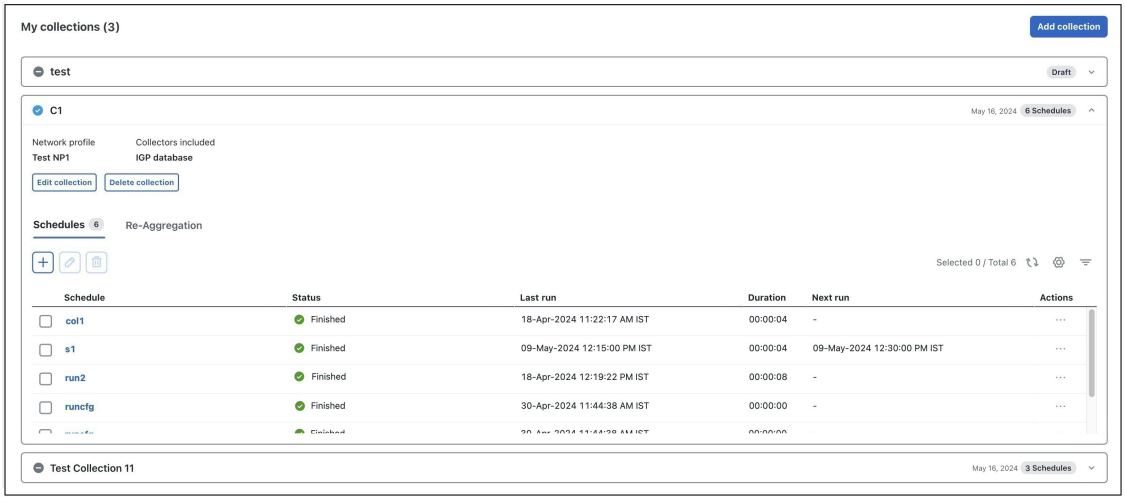
Step 12 (Optional) If you want to configure the schedules immediately, click **Add schedule** in the dialog box and proceed with the schedule configuration. For details, see Add Schedules, on page 28.

Step 13 Click **Done** in the successful message box to complete the collection creation process.

The newly added collection appears in the **Collector** > **Collections** page.

The following image shows a sample Collections page with three collections. Expand each collection panel to view its details.

Figure 13: List of Available Collections



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 28.

Edit Collections

Follow these steps to edit collections.

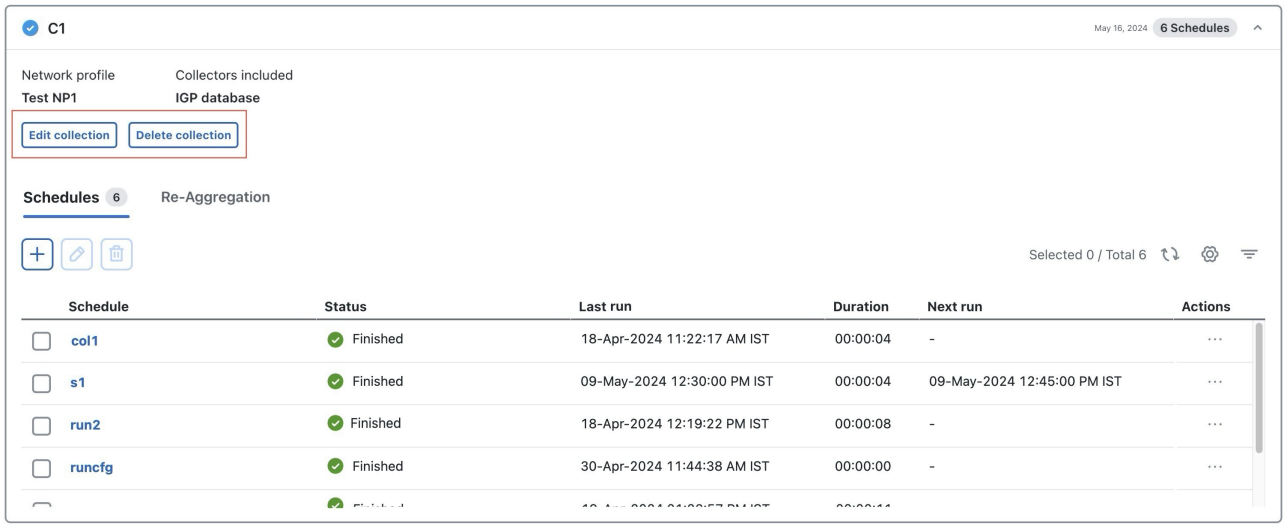
Procedure

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 26).

Step 2 Expand the Collection panel 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 as required. For reference, see Create Collections, on page 23. Preview the changes and ensure that the updated configuration meets your requirements.

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 Add Schedules, on page 28.

Delete Collections

Follow these steps to delete collections.

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 26).

Step 2 Expand the Collection panel you want to delete.

Step 3 Click **Delete collection** (for reference, see Figure 14: Collection Actions, on page 27).

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

The collection deletion successful message 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. Also, you can create multiple schedules for the same collection with different time intervals and different collector settings.

Add Schedules

Before you begin

- Ensure that you have created the required collections. For details, see Create Collections, on page 23.
- Be familiar with using cron expressions.

Follow these steps to add schedules.

Procedure

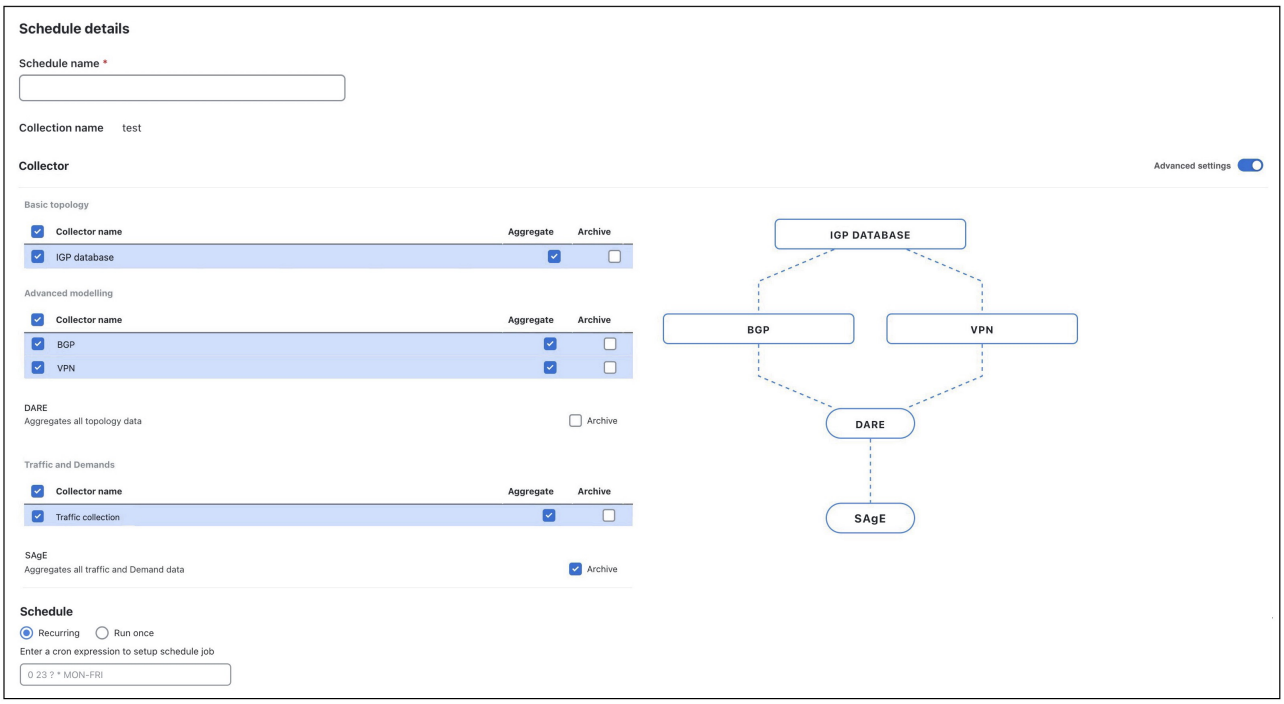
Step 1 From the main menu, choose **Collector** > **Collections**. The list of already created collections appears (for reference, see Figure 13: List of Available Collections, on page 26).

Step 2 Expand the collection panel for which you want to add the schedule and use any of the following 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 30).

The Schedule details page appears.

Figure 15: Schedule Details



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

Step 4 In the **Collector** section:

- If you want to exclude any collector from 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 32.
- 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 34.

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

- If you choose 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 choose the **Recurring** option, enter 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.

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

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

Edit Schedules

Follow these steps to edit schedules.

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 26).

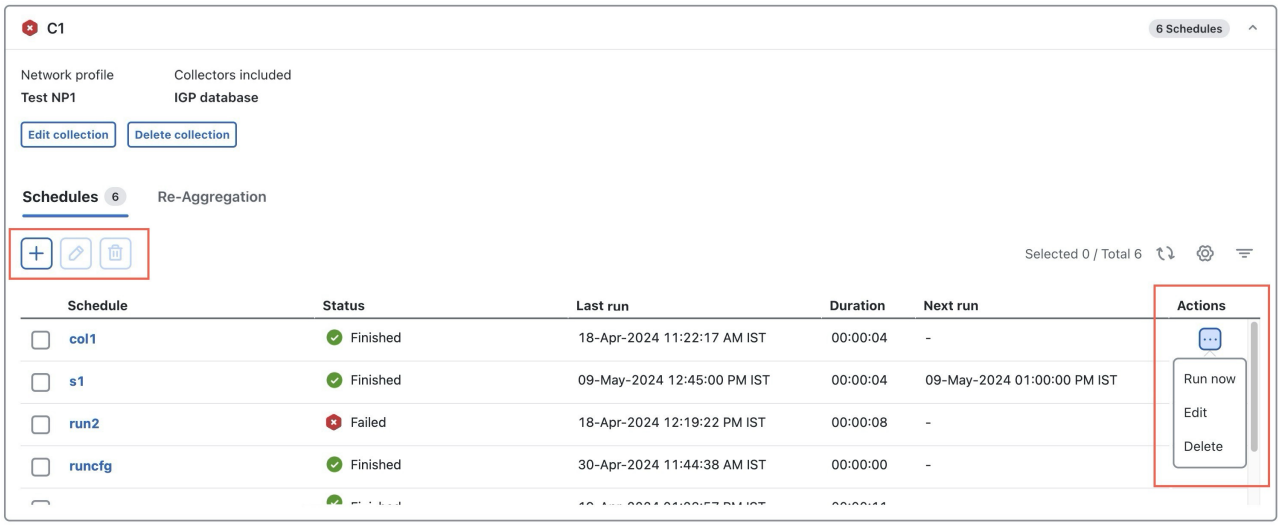
Step 2 Expand the collection panel for which you want to edit the schedule.

Step 3 Under the **Schedules** tab, edit the schedules in any of the following ways:

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

Note
You can edit only one schedule at a time.

Figure 16: Schedule Actions



Step 4 Make the required changes in the **Edit Schedule** page. Then, click **Run now** to run the job immediately or **Schedule** to run the job at the specified interval. For details, see Add Schedules, on page 28.

Delete Schedules

Follow these steps to delete schedules.

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 26).

Step 2 Expand the collection panel for which you want to delete the schedule.

Step 3 Under the **Schedules** tab, delete the schedules in any of the following ways (see Figure 16: Schedule Actions, on page 30):

- Select the schedule that you want to delete and click .
- From 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 schedule deletion successful message appears.

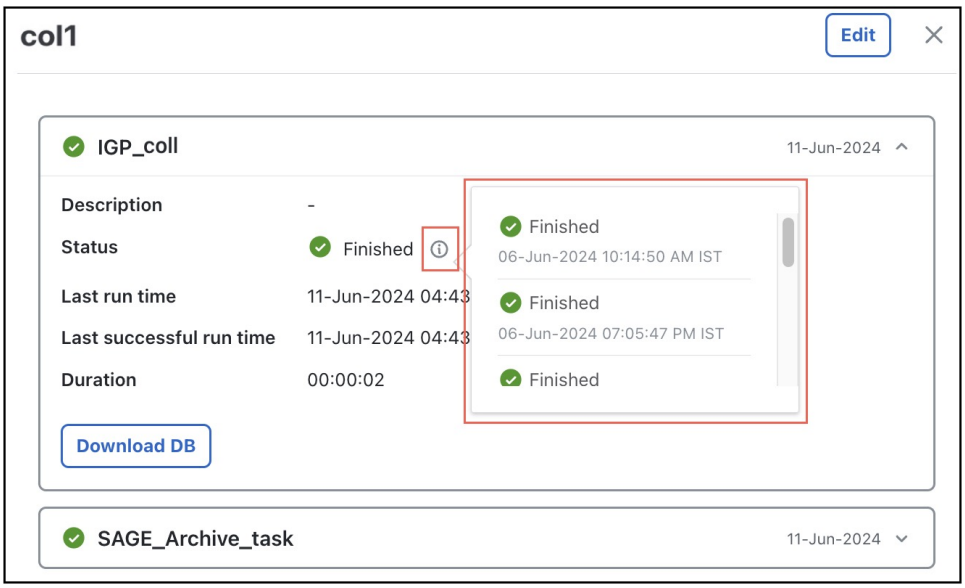
View Schedule Task Status and History

After a schedule is configured for a collection, you can view the current status and last 10 statuses of the tasks involved.

To do this:

1. Expand the collection panel.
2. Click the name of the schedule in the **Schedules** tab.

   The page that opens displays the statuses of all the tasks involved in the scheduled collection, along with timestamps of the recent task execution, the duration of the task, and the description (if there is a task failure).



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

Click **Download DB** to download the collected data from the collector.

Aggregate Collector Outputs

Each collector produces an output, which are 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, and helps 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 Create Collections, on page 23.

Follow these steps to exclude any collector output from aggregation.

Procedure

Step 1 Open the Add or Edit Schedule page for the collection you want to edit. For details, see Add Schedules, on page 28 or Edit Schedules, on page 30.

Step 2 (Optional) Notice that the **Advanced Settings** toggle button is turned on by default. If it is not, then 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 details, see Add Schedules, on page 28.

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

Once you uncheck the **Aggregate** check box for any 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.

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. When you use this option, the data collection will not occur, but the aggregated model created so far will be discarded and a fresh aggregation process will begin.

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.

Follow these steps to reaggregate collector outputs.

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 26).

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 you are performing the reaggregation for the first time, click the **Schedule** or **Run once** button. If this is not the first time, then update the schedule or re run the aggregation using the options mentioned in the next step.

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

Figure 18: Reaggregation of Collection



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

Step 5 Update the schedule or run the reaggregation once more using ••• under the **Actions** column, if required. Based on the option you selected in the previous step, the options displayed under this button differ slightly.

If you have selected the **Schedule** option in the previous step, then this button displays: Run now, Edit schedule, Pause, and Delete. If you have selected the **Run once** option, then it displays: Run now, Add schedule, and Delete.

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

Configure Archive

The Archive is a repository for plan files. 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.

If you have the Cisco Crosswork Planning Design application installed on the same machine, the archived network models appear under **Network Models** > **Local archive**.

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.

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 Create Collections, on page 23.

Procedure

Step 1 Open the Add or Edit Schedule page for the collection that you want to edit. For details, see Add Schedules, on page 28 or Edit Schedules, on page 30.

Step 2 (Optional) Notice that the **Advanced settings** toggle button is turned on by default. If it is not, then turn it on.

Step 3 Under the **Collector** section:

- If you want to archive network models at a collection level, check the check box under the **Archive** column of the corresponding collection.
- If you do not want to archive a final network model, uncheck the **Archive** check box next to SAgE.

Figure 19: Archive Settings



Step 4 (Optional) Update the schedule settings. For details, see Add Schedules, on page 28.

Step 5 If you selected **Run once** in the previous step, click **Run now** to run the job immediately. If you selected **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 sections of the **Network Models** page.

What to do next

Access the plan files from the Cisco Crosswork Planning Design application. For more details, see View or Download Plan Files, on page 36.

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

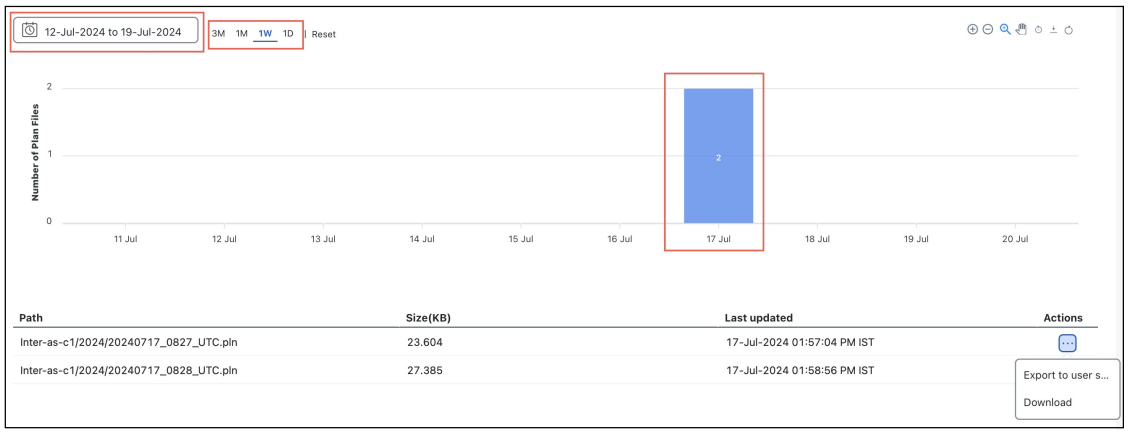
- Make sure that the network model has been archived. For details, see Configure Archive, on page 34.

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 7.0 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.

The following high-level workflow describes how to access the network models from the external collector:

Table 7: Workflow: Access 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 34.
2. Connect to the machine where Cisco Crosswork Planning Collector application is installed (external collector).	See Connect to the External Collector, on page 38.
3. Access the network models from the Remote archive.	See View or Download Plan Files from Remote Archive, on page 39.

Connect to the External Collector

Follow these steps 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 the IP address of the machine where the Cisco Crosswork Planning Collector application is installed (external collector).

Step 4 Enter the Port, Username, and Password details of the machine.

Step 5 Click **Save**.

Step 6 From the main menu, choose **Network Models** and verify that the **Remote archive** option is displayed in the left pane. Notice that the collections archived in the external collector are displayed here.

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 39.

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 37):

- 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 7.0 User Guide*.