Configure Cisco Optical Site Manager on NCS 2000 SVO-LC

This chapter describes how to configure Cisco Optical Site Manager on NCS 2000 SVO-LC using the Admin Plane. The Cisco Optical Site Manager Admin Plane provides a dedicated user interface that allows users to add and manage ROADM, DGE, and OLA Cisco Optical Site Manager instances on the server.

Cisco Optical Site Manager Admin Plane Overview

Cisco Optical Site Manager admin plane is responsible for turning up the shelf virtualization orchestration services for the network elements (NE). It is a web user interface that facilitates the installation of the Cisco Optical Site Manager software and configures the NE instances and orchestrates high availability (HA) services.

The admin plane allows you to create, update, manage, and delete Cisco Optical Site Manager NE instances.

In the case of the SVO card, two Cisco Optical Site Manager line cards are installed in two different chassis of the ROADM node. The two SVO cards are connected by two intercommunication links—through the HA network (primary link) and through the devices network (secondary link). Both links are used for the communication between the admin planes. The primary link is also responsible for replicating all the configuration transactions that are performed on each active Cisco Optical Site Manager instance to the related standby Cisco Optical Site Manager instance.

All the networking configuration data required by the admin plane is present in a file shared by both the SVO cards. When creating a new Cisco Optical Site Manager instance, you can configure the management interface

address, while the other parameters are automatically selected by the admin plane based on the constraints defined in the configuration file.

The admin planes coordinate to automatically assign active and standby roles to the Cisco Optical Site Manager instances. The admin planes can also perform an automatic switchover that promotes the standby instance to active when software or hardware faults affect the active instance.

The Cisco Optical Site Manager admin plane allows you to:

- Create the super user for the SVO card model.
- Create, update, or delete Cisco Optical Site Manager instances of type ROADM, OLA, DGE, or TXP. You can also view the details of the Cisco Optical Site Manager instances.
- Control, monitor, and performs health checks of the Cisco Optical Site Manager instances.
- Auto switch Cisco Optical Site Manager instances during a software or hardware fault in the SVO cards or servers.
- Force a manual switch between the active and standby Cisco Optical Site Manager instances.
- View parameters of the network configuration file.
- View a list of allowed and blocked IP addresses
- Troubleshoot using diagnostics. A zip file containing the log files from the admin plane can be downloaded.
- Reset the SVO card to factory defaults. This action erases all containers and configurations on the SVO card.

These are the highlights the SVO Card system installation.

- The super user must be created to log in to the admin plane.

  Only IPv4 addresses can be configured.

  Only one ROADM Cisco Optical Site Manager instance can be created. Subsequent instances must be of type OLA, DGE, or TXP.

  The SVO card can be reset to its default values.

Log into the Cisco Optical Site Manager Admin Plane

Use this task to log in to the Cisco Optical Site Manager admin plane.

Procedure

Step 1 In the browser URL field, enter the IP address of the admin plane (https://*IP_address*/login).

The login page appears.

Step 2 Enter the **Username** and **Password**.

In an SVO card system, only the superuser is allowed to log in to the Cisco Cisco Optical Site Manager admin plane.

Step 3 Click **Login**.

The **COSM Instances** page is displayed.

Admin Plane Home Page

Side Menu Items

In the Cisco Optical Site Manager Admin Plane home page, the menu items are present in the left panel. The menu items allow you to monitor and troubleshoot Cisco Optical Site Manager instances, view certificates, and restart admin plane. The following list describes the menu items.

- **Instances**—Instances menu enables you to create, edit, and monitor Cisco Optical Site Manager instances.
- **Diagnostics**—Diagnostics menu allows you to download log files to troubleshoot Cisco Optical Site Manager instances.
- **Networks**—Networks menu enables you to configure networks and assign IP addresses.
- **Certificates**—Certificates menu enables you to view and renew the self-signed admin plane certificates.
- **Utilities**—Utilities menu allows you to restart the admin plane.

Device Synchronization and Alarm Status Icon

The device synchronization and alarm status are indicated as a summary icon with changing colors close to the bell icon.

Note The icon appears only when you synchronize a device.

The icon indicates the device synchronization and alarm status with respective colors. The icon color changes from lower to a higher priority. The icon statuses are:

- **Green**—All the defined devices are connected and synchronized. The device status is alarm-synchronised.
- **Orange**—One or more devices are disconnected or locked by the user. The device status changes as sync-not-started, sync-configuration, and sync-operational.
- **Red**—One or more devices have sync-error, sync-not-completed, or out-of-sync-alarms.

Bell Icon (HA Status)

The icon on the top right of the Cisco Optical Site Manager home page indicates the status of high availability network (primary link) and devices network (secondary link). The icon statuses are:

- **Green**—Both the primary and secondary links are up. High availability is working successfully.
- **Yellow**—A warning that the primary link is up but the secondary link is down.
- **Red**—There are two cases:

- **Small red icon**—The primary link is down but the admin planes are able to communicate because the secondary link is up.
- **Large red icon**—Both the primary and secondary links are down and the server is functioning in standalone mode.

User Profile Icon

The user profile icon displays the username and the log out option for the user to exit the current Cisco Optical Site Manager session.

Cisco Optical Site Manager Instances

A Cisco Optical Site Manager instance is a software virtualization of the physical NCS 2000 node that has been configured to manage.

In a SVO card model, you can configure these Cisco Optical Site Manager instances:

Table 1: Number of Instances Supported

Instance Type	Number of Instances Supported
ROADM and OLA	15

You can create, update and delete Cisco Optical Site Manager instances using the admin plane. Each Cisco Optical Site Manager instance runs as an active instance on one server and as a standby instance on the other server. It is also possible to manually switch the roles of the Cisco Optical Site Manager instance between active and standby.

The peer admin planes that are running on the local and remote server respectively have two intercommunication links, one through the HA network (primary link) and the other through the devices network (secondary link).

The table displays the Cisco Optical Site Manager instances that were created. Each row has two entries relating to the local and remote SVO card or server. In each row, the first entry is the local instance and the second entry is the remote instance. The details are:

- **Name**—Name of the Cisco Optical Site Manager instance.
- **IP Address**—The IP address of the Cisco Optical Site Manager instance. It is IPv4 for the SVO card model.
- **SW version**—SW version on the server.
- **State**—State of the Cisco Optical Site Manager instance.
- **App State**—State of the Cisco Optical Site Manager application that is running on the Cisco Optical Site Manager instance.
  - During a manual switching process, the **App State** field displays different statuses such as SWITCHING, SWITCH_DONE, or UP.
  - The **App State** field displays ACTIVATING or ACTIVATE_RESTART only after the Cisco Optical Site Manager web UI has requested the admin plane to orchestrate the activation process.

- **Role** —Role of the Cisco Optical Site Manager instance. The roles are ACTIVE, STANDBY, NONE, and UNKNOWN. In case of issues or specific Cisco Optical Site Manager states, special tags are displayed such as NOT_RESPONDING, STARTING,STOPPED, or BAD_CLUSTER.

Note The green icon indicates the reachability of the Cisco Optical Site Manager instance to the connected NCS 2000 device. If the active Cisco Optical Site Manager instance is unable to reach the NCS 2000 device due to a network segregation, it performs an auto-switch.

- **Up Time**—Up time of the Cisco Optical Site Manager instance.
- **Type**—Label for the Cisco Optical Site Manager instance.
- **Action**—A set of actions can be performed on the Cisco Optical Site Manager instance:
  - **Details of the Cisco Optical Site Manager instance—**Click this icon to view the summary of the local and remote Cisco Optical Site Manager instance.
  - **Edit Cisco Optical Site Manager Instance**—Click this icon to edit the memory size of the Cisco Optical Site Manager instance.
  - **Switch Cisco Optical Site Manager Instance**—Click this icon to manually switch the Cisco Optical Site Manager instance between servers.

Note A switch operation is possible only if both the Cisco Optical Site Manager instances are up and running and the role of the instances are Active and Standby.

- **Delete Cisco Optical Site Manager Instance**—Click this icon to delete an Cisco Optical Site Manager instance.

Note This icon is disabled when a switch operation is in progress.

Create a Cisco Optical Site Manager Instance

Use this task to configure an Cisco Optical Site Manager instance.

Before you begin

- Log into the Cisco Optical Site Manager Admin Plane, on page 2
- Verify that the High Availability (HA) link between the two Admin planes is operational so that any container memory changes made on the active instance are automatically reflected on the standby instance.

Procedure

Step 1 Click the + button at the top-left of the **COSM Instances** page.

The **COSM Instance Configuration** page appears.

Step 2 In the **General Info** section, perform these steps:

a) Enter the name for the new Cisco Optical Site Manager instance in the **Name** field.

The name is mandatory and must be unique among the Cisco Optical Site Manager instances managed by the admin plane. It can contain a minimum of two characters and a maximum of 64 characters. It can include numbers, uppercase letters, lowercase letters, dashes (-), or underscores (_).

b) Choose the version from the **Software Version** drop-down list.

c) Choose the type of the Cisco Optical Site Manager instance from the **TDM Terminology** drop-down list.

The two options are ANSI and ETSI.

d) Choose the label of the Cisco Optical Site Manager instance from the **Type** drop-down list.

Note
When **Type** is selected, a default value for memory size is displayed in the **Reserved Memory GB** field.

e) Choose the memory size to be allocated to the Cisco Optical Site Manager instance from the **Profile** drop-down list **Reserved Memory GB** field.

Ensure the High Availability link between the two Adminplanes is properly operating before editing COSM container memory. This guarantees that the configuration change is applied to both containers simultaneously.

Note
In addition to the reserved memory, Cisco Optical Site Manager solution automatically sets the Limit Memory with a threshold value of 2 GB higher than the configured reserved memory. This threshold acts as a buffer to absorb the temporary peak memory requirements. Docker engine kills the operations that cross the Limit Memory threshold due to Out-of-Memory (OOM).

If the reserved memory is alloted more than the server or VM memory, the docker engine fails the allocation. Allocate only up to 80 percent of the server or VM memory for the Reserved Memory.

Step 3 In the **Admin User** section, perform these steps:

a) Enter the username in the **Username** field.

The values "admin," "oper," "private," or, "public" cannot be used as the admin username.

b) Enter the password in the **Password** field.

The password must be a minimum of eight characters. The password must contain at least an uppercase letter a number, and a special character. The special characters supported are ! $ % ^ ( ) [ ] _ - ~ { } . +

c) Enter the password again in the **Retype Password** field.

Step 4 In the **Management Network** section, the system suggests the management subnets to be used in the **IPv4 Address** fields, depending on the type of addressing defined during the installation. The system checks for constraints defined in the network configuration file and ensures that the IP addresses that are assigned are not in use.

a) Enter the IPv4 Address in the **IPv4 Address** field in a SVO card model.

Step 5 Click **Create**.
A message is displayed indicating the creation of the Cisco Optical Site Manager instance.

Step 6 Click **OK**.
The Cisco Optical Site Manager Instances page appears. The table displays the new Cisco Optical Site Manager instance.

The Cisco Optical Site Manager instance can now be accessed through a web browser.

View Details of an Cisco Optical Site Manager Instance

Use this task to view the details of a Cisco Optical Site Manager instance.

Note This feature simplifies troubleshooting and allows extracting detailed information about the runtime environment of both local and remote Cisco Optical Site Manager instances.

Before you begin

Log into the Cisco Optical Site Manager Admin Plane, on page 2

Procedure

Step 1 Click the **Details** icon under the **Actions** column corresponding to the the Cisco Optical Site Manager instance you want to view.
The **COSM Instance Details** page is displayed. See Cisco Optical Site Manager Instance Details, on page 9.

Step 2 Click the heartbeat icon next to the desired instance to view the runtime status of the instance.

The **COSM Runtime Status** page is displayed.

Step 3 Expand the related sections to view the details of the Cisco Optical Site Manager instances.

The sections are **NCS Status**, **HA Agent**, and **NCS Launcher**.

Step 4 Click the hyperlink above the expandable sections to view the details as a plaint text in a new window.

Edit a Cisco Optical Site Manager Instance

Use this task to edit the memory size of the Cisco Optical Site Manager instance.

Before you begin

Log into the Cisco Optical Site Manager Admin Plane, on page 2

Procedure

Step 1 Click the **Edit COSM Instance** icon under the **Actions** column corresponding to the instance you want to edit.
The **COSM Instance Edit** page is displayed.

Step 2 Specify the memory in the **Reserved Memory GB** field.

Step 3 Click **Edit**.

Switch Cisco Optical Site Manager Instances

Use this task to manually switch between active and standby Cisco Optical Site Manager instances.

Before you begin

Log into the Cisco Optical Site Manager Admin Plane, on page 2

Procedure

Step 1 Click the **Switch COSM Instance** icon under the **Actions** column corresponding to the instance you want to switch.
A warning message is displayed prompting you to confirm instance switch.

Step 2 Click **Confirm**.

During the switching process, the **App State** field displays different statuses such as SWITCHING, SWITCH_DONE, and UP. The **Role** field displays NONE, ACTIVE, and STANDBY.

Delete an Cisco Optical Site Manager Instance

Use this task to delete an Cisco Optical Site Manager instance.

Before you begin

Log into the Cisco Optical Site Manager Admin Plane, on page 2

Procedure

Step 1 Click the **Delete** button under the **Actions** column corresponding to the Cisco Optical Site Manager instance you want to delete.
A confirmation message is displayed.

Step 2 Click **Confirm**.

The Cisco Optical Site Manager instance is deleted.

Cisco Optical Site Manager Instance Details

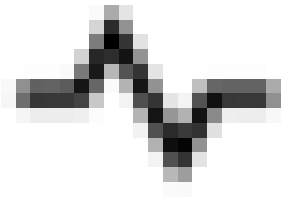
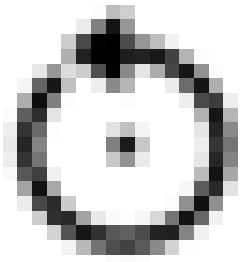
The Cisco Optical Site Manager Instance Details page is a user interface that displays the property information of both local and remote Cisco Optical Site Manager instances.

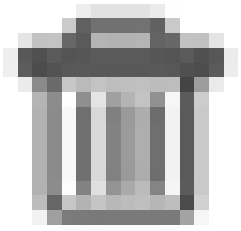
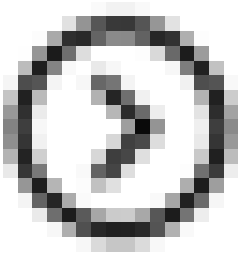
- Shows properties for both local and remote Cisco Optical Site Manager instances.
- Includes an Admin & Troubleshooting property with action icons for both instances.
- Action icons enable troubleshooting and management of Cisco Optical Site Manager instances.

Admin & Troubleshooting Actions

The Admin & Troubleshooting property provides a set of action icons for both Cisco Optical Site Manager instances. These icons allow you to perform troubleshooting and management actions.

Table 2: Action Icons for Cisco Optical Site Manager Instances

Icon	Icon Name	Description
	**Get local COSM runtime status**	Click this icon to extract detailed information about the runtime status of both local and remote Cisco Optical Site Manager applications.
	**Restart local COSM container**	Click this icon to restart the target Cisco Optical Site Manager container.

Icon	Icon Name	Description
	**Delete local COSM container**	Click this icon to delete the target Cisco Optical Site Manager container.
	**Force active local COSM container**	Click this icon to force the local Cisco Optical Site Manager container to become the active instance if high availability is not working.

Retrieve runtime status of an instance

You can extract detailed information about the runtime environment of a local or remote Cisco Optical Site Manager instance.

Use this task to retrieve the runtime information of local or remote Cisco Optical Site Manager container.

Note

Procedure

Step 1 Click the heartbeat icon next to the required instance.

The **Cisco Optical Site Manager Runtime Status** page is displayed.

Step 2 Expand the related sections to view the details of the Cisco Optical Site Manager instances.

These sections are dispalyed:

- NCS Status
- HA Agent
- NCS Launcher

Step 3 Click the hyperlink above the expandable sections to view the details in a separate window as plain text.

Restart an instance

Use this task to restart a a local or remote Cisco Optical Site Manager instance.

Procedure

Click the **Restart local COSM container** (reload) icon.

You are redirected to the Cisco Optical Site Manager Instances page.

The Cisco Optical Site Manager instance reloads.

You are redirected to the **COSM Instances** page. The COSM instance restarts.

Delete an instance

Use this task to delete a Cisco Optical Site Manager instance.

Procedure

Step 1 Click the **Delete local COSM container** (trashcan) icon.

A warning message is displayed.

Step 2 Click **Confirm**.

A success message is displayed.

Step 3 Click **OK**.

You are redirected to the **COSM Instances** page.

Force activate a local instance

Use this task to forcefully activate a local Cisco Optical Site Manager instance.

Important This task must be performed only when the admin plane fails to assign a role to the local instance.

Procedure

Click the **Force active local COSM container** icon.

You are redirected to the **COSM Instances** page. The status of the local instance changes from NONE to ACTIVE.

Reset the SVO Card or Restart Admin Plane

Use this task to reset the SVO card to factory defaults or restart the Cisco Optical Site Manager admin plane.

Before you begin

Log into the Cisco Optical Site Manager Admin Plane, on page 2

Procedure

Step 1 Click **Tools** in the left panel and select **Utilities**.

The **Utilities** page appears.

Step 2 Perform one of the following steps:

- Click **Reset to Factory Default** to reset the SVO card to the fautory defaults.

  Caution
  All the instances and configurations available on the SVO card are erased.

- Click **Restart Admin Plane** to restart the admin plane.

  Caution
  Restarting admin plane may interrupt any running procedure.

A **Warning!** dialog box appears.

Step 3 Click **Confirm**.

View and Renew Certificate

Use this task to view and renew the certificates of the admin plane.

Lifetime of self-signed admin plane certificates can be extended by five years. In HA networks, the renewal must be run individually for each admin plane application.

Note The admin plane container must be restarted to renew the certificate. The operation is blocked if any orchestrated operation is running on the admin plane such as SW download.

Before you begin

Log into the Cisco Optical Site Manager Admin Plane, on page 2.

Procedure

Step 1 Click **Certificates** in the left panel.

The **Certificates** page displays the certificate details.

Step 2 In case of renewal, click **Renew Certificate**.

Generate and apply certificates

Certificates are required to enable security protocols for Cisco Optical Site Manager. Use this task to generate a self-signed certificate or upload your own certificate.

Before you begin

Log into Cisco Optical Site Manager .

Procedure

Step 1 Click **Users & Access** in the left panel.

The **Users & Access** page is displayed.

Step 2 Click the **x509 Certificates** tab.

Step 3 Click to expand the **Certificates Configuration** section.

Step 4 To automatically generate and apply certificate, click **Auto Generate & Apply Certificate** .

Step 5 To manually generate and apply certificates, perform these steps:

a) In the **Certificate file** field, click the **Select Files** to select a certificate file in *.crt* , *.cert* , or *.cer* formats.

b) In the **Key file** field, click the **Select Files** to select a key file in *.key* format.

c) Click **Apply** to upload and apply the certificate.

Cisco Optical Site Manager Instances Statistics

Cisco Optical Site Manager instances statistics table is a collection of memory resource details for each Cisco Optical Site Manager instance. The table periodically collects details such as allocation and consumption of memory for each Cisco Optical Site Manager instance. The statistics table is similar to the Cisco Optical Site Manager instances table with a **Memory** column.

You can view and download the statistical data of the Cisco Optical Site Manager instances using the icons in the **Actions** column. Each Cisco Optical Site Manager instance runs as an active instance on one server and as a standby instance on the other server.

The table displays the created Cisco Optical Site Manager instances and the associated memory details. Each row has two entries relating to the local and remote SVO card or server. In each row, the first entry is the local instance and the second entry is the remote instance. The details are:

- **Name**—Name of the Cisco Optical Site Manager instance.
- **IP Address**—The IP address of the Cisco Optical Site Manager instance. It is IPv4 for the SVO card model, and IPv4 for the external server model.
- **SW version**—SW version on the server.
- **Role**—Role of the Cisco Optical Site Manager instance.

Note The green icon indicates the reachability of the Cisco Optical Site Manager instance to the connected NCS 2000 device. If the active Cisco Optical Site Manager instance is unable to reach the NCS 2000 device due to a network segregation, it performs an auto-switch.

- **Type**—Label for the Cisco Optical Site Manager instance.
- **Memory (GB) Min/Max/Actual**—Minimum and maximum memory allocated for each instance and actual memory utilized by each instance.
- **Actions**—A set of actions performed on the Cisco Optical Site Manager instance. The actions are:
  - **Memory Statistics Graph**—Click this icon to view the summary of the local and remote Cisco Optical Site Manager instance.
  - **Download Local Statistics File**—Click this icon to download all the statistics files of the local Cisco Optical Site Manager instance as a zip package.

View Memory Statistics Graphical Summary

Use this task to view the memory details of local and remote Cisco Optical Site Manager instances in graphical format.

Before you begin

Log into the Cisco Optical Site Manager Admin Plane, on page 2

Procedure

Step 1 Click **Statistics** in the left panel.

The **Statistics** page appears.

Step 2 Click **Memory Statistics Graph** for an Cisco Optical Site Manager instance.

The **Cisco Optical Site Manager Instance Memory Statistics** page appears displaying memory statistics for both local and remote instances.

Note
The **Memory Statistics** graph displays a fine-grained collection of memory usage of the Cisco Optical Site Manager instance in the last few days. Memory limits defined at creation time are also displayed for reference. The **Historical Daily Statistics** graph displays the daily memory details such as average memory usage and maximum memory usage of the Cisco Optical Site Manager instances since creation.

Step 3 (Optional) Click the calender icon to view the statistics for the required period.

Step 4 Click the table icon to export the data as plain text in a new window.

Download Local Cisco Optical Site Manager Instances Memory Files

Use this task to download the local Cisco Optical Site Manager instances memory files.

Before you begin

Log into the Cisco Optical Site Manager Admin Plane, on page 2

Procedure

Step 1 Click **Statistics** in the left panel.

The **Statistics** page appears.

Step 2 Click **Download Local Statistics File** for an Cisco Optical Site Manager instance.

A confirmation message appears.

Step 3 Click **OK**.

The statistics files for the local Cisco Optical Site Manager instance downloads as a zip package.

Download Diagnostic Log Files

Use this task to download the Cisco Optical Site Manager admin plane diagnostic log files.

Before you begin

Log into the Cisco Optical Site Manager Admin Plane, on page 2

Procedure

Step 1 Click **Diagnostics** in the left panel.

The **Diagnostics** page appears.

Step 2 Click the **Download Log Files** button.

A zip file that contains the admin plane logs is downloaded.

Custom Scripts

Custom scripts are quick solutions that are specific to each feature. The scripts provide access to the full application object model to extend the capabilities of the admin plane at runtime

The custom scripts let you do the following actions and more:

- Add UI- and REST-based custom actions
- Define in a declarative way web input forms for action parameters
- Export data in different text formats
- Add custom validation logic, for example, when creating a new Cisco Optical Site Manager instance
- Perform custom tasks on application events, for example, when the HA role changes
- Define scripted HA services that can communicate through the Admin Plane GRPC channels

The scripts table displays the added scripts and the relevant script details. The following list describes the table items.

- **Name**—Name of the custom script
- **Type**—Type of the custom script
- **Target**—Target GUI of the Cisco Optical Site Manager admin plane
- **Status**—Status of the custom script
- **Version**—Version of the custom script added
- **Lifetime**—Duration of the script in the admin plane in **dd:hh:mm:ss** format
- **Action**—Action to delete the added script

Add Custom Scripts

Use this task to add custom scripts to the Cisco Optical Site Manager admin plane, for example, **importInstancesCSV** file.

Before you begin

Log into the Cisco Optical Site Manager Admin Plane, on page 2

Procedure

Step 1 Click **Scripts** in the left panel.

The Scripts page appears.

Step 2 Click **Add new Cisco Optical Site Manager script**.

An explorer window opens.

Step 3 Select a custom script and click **Open**, for example, **importInstancesCSV** file.

A Success message appears.

Step 4 Click **OK**.

The **importInstancesCSV** script is added to the scripts table.

Step 5 Check the Cisco Optical Site Manager Instances table in the admin plane for the **Import CSV** button.

The **Import CSV** button allows you to import the Cisco Optical Site Manager instances using a CSV file.

Modify Admin Plane Properties

Admin plane is customizable through several configuration properties. A few of the admin plane properties are useful in particular contexts or for troubleshooting. You can modify some “expert only” settings from the Admin Plane web UI.

Use this task to modify the admin plane properties.

Before you begin

Log into the Cisco Optical Site Manager Admin Plane, on page 2

Procedure

Step 1 Click **Tools** in the left panel and choose **Properties**.

The **Properties** page appears to display the admin plane properties, current values, and edited values.

Table 3: Properties Table

Label	Description
Property	Displays the customizable admin plane properties
Current Value	Displays the current values of each admin plane property
Edited Value	This field is editable. Enter the values for the admin plane properties.

Step 2 To modify the values for the admin plane properties, perform one of the following actions:

Tip
When you hover over a property, a tooltip appears to explain the property purpose.

- In **Edited Value**, enter the needed values for the properties that you want to customize.
- Click **Reset to default** to restore the default settings for all the properties.

Step 3 Click **Apply** to apply the modified values.

A **Warning!** message appears.

Step 4 Click **Continue**.

A **Success!** message appears.

Step 5 Click **OK**.

Step 6 Restart the admin plane to commit the modified values in the properties files. See Reset the SVO Card or Restart Admin Plane, on page 12.

Remember
Modified properties are not automatically propagated to the peer server. Make the same changes on the peer server to align the properties files with the host server.