



Cisco DCNM Media Controller Configuration Guide, Release 11.0(1)

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CHAPTER 1

Overview

Cisco Data Center Network Manager (Cisco DCNM) automates the infrastructure of Cisco Nexus 5000, 6000, 7000, and 9000 Series Switches and Cisco MDS 9000 Series switches for data center management. Cisco DCNM enables you to manage many devices while providing ready-to-use control, management, and automation capabilities, along with VXLAN control and automation.

The home page contains a navigation pane to the left, and shortcuts to a few DCNM features in the middle pane.

This guide provides comprehensive information about the UI functionalities for the Media Controller deployment.

The top pane displays the following:

- **Help (?)**: Launches the context-sensitive online help.
- *User Role*: Displays the role of the current logged-in user, for example, admin.
- **Gear** icon: Displays information about Cisco DCNM, enables you to change the DCNM UI password, and allows you to log out from DCNM UI.

For more information about Cisco DCNM, see <https://www.cisco.com/c/en/us/support/cloud-systems-management/data-center-network-manager-11/model.html>.

- [Cisco Data Center Network Manager, on page 1](#)

Cisco Data Center Network Manager

Cisco Data Center Network Manager automates the infrastructure of Cisco Nexus 5000, 6000, 7000, and 9000 Series Switches and Cisco MDS 9000 Series switches. Cisco DCNM enables you to manage multiple devices, while providing ready-to-use control, automation, monitoring, visualization, and troubleshooting capabilities.

The Cisco DCNM home page contains a navigation pane to the left, and shortcuts to a few Cisco DCNM features in the middle pane.

This guide provides comprehensive information about the Media Controller deployment functionalities.

The top pane displays the following UI elements:

- **Help (?)**: Launches the context-sensitive online help.
- *User Role*: Displays the role of the user who is currently logged in, for example, admin.

- **Gear** icon: Displays information about DCNM, enables you to change Cisco DCNM UI password, and allows you to log out from the Cisco DCNM UI.

For more information about Cisco DCNM, see:

<https://www.cisco.com/c/en/us/support/cloud-systems-management/data-center-network-manager-11/model.html>.



CHAPTER 2

Dashboard

This chapter contains the following topics:

- [Dashboard, on page 3](#)

Dashboard

The intent of **Dashboard** is to enable network and storage administrators to focus on particular areas of concern around the health and performance of data center switching. This information is provided as 24-hour snapshots. The functional view of LAN switching consists of six dynamic dashlets that display information in the context of the selected scope by default. The scope can be adjusted in the upper right corner of the window to display focused information that is particular to the managed domain. It offers details of a specific topology or set of topologies that is a part of the data center scope.

The various scopes that are available on the Cisco Data Center Network Manager (DCNM) web interface are:

- **Data Center**
- **Default_LAN**
- Custom scopes that you create

From the left menu bar, choose **Dashboard**. The **Dashboard** window displays the default dashlets.

The following are the default dashlets that appear in the **Dashboard** window:

- Events
- Data Center
- Network Map
- Link Traffic
- Audit Log
- Server Status

From the **Dashlets** drop-down list, you can choose more dashlets so that they are added to the dashboard.

The panels can be added, removed, and dragged around to reorder.

Dashlets

By default, a subset of the available dashlets is automatically displayed in the dashboard. To add a dashlet that is not automatically displayed in a dashboard, from the Cisco DCNM Web UI, perform the following steps:

Procedure

Step 1 Choose **Dashboard**.

Step 2 From the **Dashlets** drop-down list, choose the dashlet that you want to add in the dashboard.

In the **Dashlets** drop-down list, an icon appears before the selected dashlet.

The following table lists the dashlets that you can add on the **Dashboard** window.

| Dashlet | Description |
|--------------|--|
| Events | Displays events with Critical , Error , and Warning severity. In this dashlet, click the Show Acknowledged Events link to go to the Monitor > Switch > Events . |
| Link Traffic | Displays a diagram of Inter-Switch Link (ISL) and saturation link for transmitting and receiving in the data center. |
| Data Center | Displays the number of access, spine and leaf devices, and a generic health score for each switch group in the current scope. Devices are aggregated by type within a switch group. |
| Audit Log | Displays the accounting log table of Cisco DCNM. |
| Network Map | <p>Displays the populated switch groups that are visible in your Role Based Access Control (RBAC) scope on a world map. If you use the scope selector, it limits the set of switch groups displayed. If you use the pop-up option, the map opens in a new tab and can be configured.</p> <ul style="list-style-type: none"> • The network map dialog box has properties that are different from the Summary dashboard view: • You can click and drag nodes to move them around the map. The map saves their new positions. • You can double click a node to trigger a slider that contains the summary inventory information pertaining to a specific switch group. • You can upload an image of your choice as the background to the network map. |

| Dashlet | Description |
|------------------------------|--|
| | <p>Note You will be prompted to upload an image file with recommended dimension, which is the current window size. Reset returns the network map to its default state, resetting the position of the nodes and clearing the custom image.</p> |
| Server Status | Displays the status of DCNM and federation servers, and the health check status for the components. |
| Top ISLs/Trunks | Displays the performance data for the top ten performing ISLs, trunk ports or both. Each entry shows the current average receive and transmit percentage, with a graph depicting the percentage of time each trunk spent exceeding the currently configured thresholds. |
| Top SAN End Ports (SAN only) | <p>Displays the performance data for the top ten performing SAN host and storage ports. Each entry shows the current receive and transmit percentage, with a graph depicting the percentage of time each trunk spent exceeding the currently configured thresholds.</p> <p>Note This dashlet is only for SAN.</p> |
| Top CPU | Displays CPU utilization for the discovered switches over the last 24 hours, with a red bar displaying the high watermark for that 24-hour period. |
| Top Temperature | <p>Displays the module temperature sensor details of switches.</p> <p>Note This dashlet is only for LAN.</p> |
| Health | <p>Displays the health summary that contains two columns displaying the summary of problems and summary of events for the past 24 hours.</p> <p>Click the count adjacent to the warnings pertaining to switches, ISLs, hosts, or storage (other than 0) to view the corresponding inventory for that fabric.</p> <p>Click the count adjacent to the event severity levels (Emergency, Alert, Critical, Error, Warning, Notice, Info, or Debug) to view a summary of the corresponding events and descriptions.</p> |
| Errors | Displays the error packets for the selected interface. This information is retrieved from the Errors > In-Peak and Errors > Out-Peak columns of the Monitor > LAN / Ethernet page. |

| Dashlet | Description |
|---------------------------|---|
| Discards | Displays the error packets that are discarded for the selected interface. Note The Discards dashlet is only for LAN. |
| Inventory (Ports) | Displays the ports inventory summary information. |
| Inventory (Modules) | Displays the switches on which the modules are discovered, the models name and the count. |
| Inventory (ISLs) | Displays the ISLs inventory summary information, such as the category and count of ISLs. |
| Inventory (Logical) | Displays the logical inventory summary information, such as the category and count of logical links. |
| Inventory (Switches) | Displays the switches inventory summary information such as the switch models and the corresponding count. |
| Inventory (Port Capacity) | Displays the port capacity inventory summary information such as the tiers, the number and percentage of the available ports, and the remaining days. |

Note To restore the default dashlets in the dashboard page, click the **Default Set** link in the **Dashlet** drop-down list.



CHAPTER 3

Inventory

This chapter contains the following topics:

- [Viewing Inventory Information, on page 7](#)
- [Discovery, on page 31](#)

Viewing Inventory Information

Beginning with Cisco Prime DCNM release 6.x, you can view the inventory and the performance for both SAN and LAN switches by using the global Scope pane. You can select LAN, SAN, or both to view the inventory information. You can also export and print the inventory information.

You can either Print this information or export to Microsoft Excel.



Note You can use the **Print** icon to print the information that is displayed or you can also use the **Export** icon to export the information that is displayed to a Microsoft Excel spreadsheet. You can also choose the column that you want to display.

The Inventory menu includes the following submenus:

Viewing Inventory Information for Switches

To view the inventory information for switches from the Cisco DCNM Web UI, perform the following steps:

Procedure

- Step 1** Choose **Inventory > View > Switches**.
- The **Switches** window with a list of all the switches for a selected Scope is displayed.
- Step 2** You can also view the following information.
- **Group** column displays the switch group to which the switch belongs.
 - In the **Device Name** column, select a switch to display the Switch Dashboard.

- **IP Address** column displays the IP address of the switch.
- **WWN/Chassis ID** displays the Worldwide Name (WWN) if available or chassis ID.
- **Health** displays the health situation of the switch.

Note To refresh and recalculate the latest health data for all the switches on Cisco DCNM, click the **Recalculate Health** button above the switches table.

- **Status** column displays the status of the switch.
- **# Ports** column displays the number of ports.
- **Model** column displays the model name of the switch.
- **Serial No.** column displays the serial number of the switch.
- **Release** column displays the switch version.
- **License** column displays the DCNM license that is installed on the switch.
- **Up Time** column displays the time period for which the switch is active.

Step 3 In the **Health** column, the switch health is calculated by the capacity manager based on the following formula in the server.properties file.

The function to implement is:

```
# calculate(x, x1, y, y1, z).
```

```
# @param x: Total number of modules.
```

```
# @param x1: Total number of modules in warning.
```

```
# @param y: Total number of switch ports.
```

```
# @param y1: Total number of switch ports in warning.
```

```
# @param z: Total number of events with severity of warning or above.
```

Step 4 The value in the **Health** column is calculated based on the following default equation.

$$((x-x1)*1.0/x) *0.4 + ((y-y1)*1.0/y)*0.3 + ((z*1.0/1000 >= 1) ? 0 : ((1000-z)*1.0/1000)*0.3).$$

In the above formula, the switch health value is calculated based on the following:

- Percentage of Warning Modules (Contributes 40% of the total health).
- Percentage of Warning Ports (Contributes 30% of the total health).
- Percentage of events with severity of Warning or above (Contributes 30% of the total health. If there are more than 1000 warning events, the event health value is 0).

You may also have your own health calculation formula by implementing the common interface class: `com.cisco.dcbu.sm.common.rif.HealthCalculatorRif`. Add the `.jar` file to the DCNM server and modify the `health.calculator` property to point to the class name you have created.

The default Java class is defined as: `health.calculator=com.cisco.dcbu.sm.common.util.HealthCalculator`.

- Capacity Manager calculates health only for the license switches. If the health column does not display a value, the switch either does not have a license or it has missed the capacity manager daily cycle.

- If the switch is unlicensed, click **Unlicensed** in the DCNM License column. The **Administration > License** window appears which allows you to assign a license to the user.
- The capacity manager runs two hours after the DCNM server starts. So, if you discover a device after two hours of the DCNM start time, the health will be calculated 24 hours after this DCNM start time

Viewing System Information

The switch dashboard displays the details of the selected switch.

Procedure

- Step 1** From the Cisco DCNM home page, choose **Inventory > View > Switches**.
- An inventory of all the switches that are discovered by Cisco Prime DCNM Web Client is displayed.
- Step 2** Click a switch in the **Device Name** column.
- The **Switch** dashboard that corresponds to that switch is displayed along with the following information:
- Step 3** Click the **System Information** tab. This tab displays detailed system information such as group name, health, module, time when system is up, serial number, the version number, contact, location, DCNM license, status, system log sending status, CPU and memory utilization, and VTEP IP address are displayed. Click **Health** to access the Health score screen, which includes health score calculation and health trend. The popup contains Overview, Modules, Switch Ports, and Events tabs.
- (Optional) Click **SSH** to access the switch through Secure Shell (SSH).
 - (Optional) Click **Device Manager** to view a graphical representation of a Cisco MDS 9000 Family switch chassis, a Cisco Nexus 5000 Series switch chassis, a Cisco Nexus 7000 Series switch chassis, or a Cisco Nexus 9000 Series switch chassis including the installed switching modules, the supervisor modules, the status of each port within each module, the power supplies, and the fan assemblies.
 - (Optional) Click **HTTP** to access the switch through Hypertext Transfer Protocol (HTTP) for that switch.
 - (Optional) Click **Accounting** to go to the [Viewing Accounting Information , on page 37](#) window pertaining to this switch.
 - (Optional) Click **Backup** to go to the Viewing a Configuration window.
 - (Optional) Click **Events** to go to the [#unique_12](#) window.
 - (Optional) Click **Show Commands** to display the device show commands. The Device Show Commands page helps you to view commands and execute them.
 - (Optional) Click **Copy Running Config to Startup Config** to copy the running configuration to the startup configuration.

Interfaces

The Interfaces option displays all the interfaces that are discovered for the switch, Virtual Port Channels and intended interfaces missing on the device.

Click Port Group to create a new port group or add the interfaces into an existing group.

You can filter and view information for any of the given fields (such as Device Name). The following table describes the buttons that appear on this page. The following table describes the buttons that appear on this page.

| Field | Description |
|-------------------|--|
| Add | Allows you to add a logical interface. |
| Edit | Allows you to edit and change policies that are associated with an interface. |
| Delete | Allows you to delete a logical interface that is created from the Interfaces screen. |
| No Shutdown | Allows you to enable an interface (no shutdown or admin up). |
| Shutdown | Allows you to shut down the interface. |
| Show | Allows you to display the interface show commands. A show command requires show templates in the template library. |
| Rediscover | Allows you to rediscover or recalculate the compliance status on the selected interfaces. |
| Interface History | Allows you to display the interface deployment history details. |

This section contains the following:

Adding Interfaces

To add the interfaces from the Cisco DCNM Web UI, perform the following steps:

Procedure

-
- Step 1** Choose **Inventory > View > Switches**.
You see the **Switches** window displaying a list of all the switches for a selected **Scope**.
 - Step 2** In the **Device Name** column, select a switch to display **Switch Dashboard**.
 - Step 3** Click the **Interfaces** tab.
 - Step 4** Click **Add** to add a logical interface. The **Add Interface** window appears.
If you want to add a sub-interface, you select an interface and click **Add**.
 - Step 5** In the **Type** field, choose the type of the interface. For example, VLAN, loopback, NVE.

- Step 6** In the **Number** field, specify the interface number.
- Step 7** Select the **Admin State ON** check box to specify whether the interface is shut down or not.
-

Editing Interfaces

To edit the interfaces from the Cisco DCNM Web UI, perform the following steps:

Procedure

- Step 1** Choose **Inventory > View > Switches**.
You see the **Switches** window displaying a list of all the switches for a selected Scope.
- Step 2** In the **Device Name** column, select a switch to display **Switch Dashboard**.
- Step 3** Click the **Interfaces** tab.
- Step 4** Click **Edit** to edit an interface. The variables that are shown in the **Edit Configuration** window are based on the template and its policy.
- The **Admin State ON** check box in the **Edit Configuration** window indicates whether the interface is shut down or not.
 - The **Clear Config** before the deployment check box helps you to set a port to its default configuration. When there is a set of configurations already available on the port and these configurations conflict with the configurations that want to place on the port, you may need to clear the configurations before the deployment.
 - In the **Preview** window, the left pane shows the configurations that the template generated based on your input, whereas the right pane shows the configurations that are currently available on the switch.
-

Deleting Interfaces

To delete the interfaces from the Cisco DCNM Web UI, perform the following steps:

Procedure

- Step 1** Choose **Inventory > View > Switches**.
You see the **Switches** window displaying a list of all the switches for a selected Scope.
- Step 2** In the **Device Name** column, select a switch to display **Switch Dashboard**.
- Step 3** Click the **Interfaces** tab.
- Step 4** Click **Delete** to add a logical interface.
-

Shutting Down and Bring Up Interfaces

To shut down and bring up the interfaces from the Cisco DCNM Web UI, perform the following steps:

Procedure

- Step 1** Choose **Inventory > View > Switches**.
The **Switches** window is displayed with a list of all the switches for a selected **Scope**.
- Step 2** In the **Device Name** column, select a switch to display **Switch Dashboard**.
- Step 3** Click the **Interfaces** tab.
- Step 4** Click **Shutdown** to disable an interface. For example, you may want to isolate a host from the network or a host that is not active in the network.
To enable an interface, Click **No Shutdown** button.
-

Displaying Interface Show Commands

To display interface show commands from the Cisco DCNM Web UI, perform the following steps:

Procedure

- Step 1** Choose **Inventory > View > Switches**.
You see the **Switches** window displaying a list of all the switches for a selected **Scope**.
- Step 2** In the **Device Name** column, select a switch to display **Switch Dashboard**.
- Step 3** Click the **Interfaces** tab.
- Step 4** Click **Show** to display the interface show commands.
The **Interface Show Commands** window helps you to view commands and execute them.
-

Rediscovering Interfaces

To rediscover interfaces from the Cisco DCNM Web UI, perform the following steps:

Procedure

- Step 1** Choose **Inventory > View > Switches**.
The **Switches** window is displayed showing a list of all the switches for a selected **Scope**.
- Step 2** In the **Device Name** column, select a switch to display **Switch Dashboard**.
- Step 3** Click the **Interfaces** tab.
- Step 4** Click **Rediscover** to rediscover the selected interfaces. For example, after you edit or enable an interface, you can rediscover the interface.
-

Viewing Interface History

To view the interface history from the Cisco DCNM Web UI, perform the following steps:

Procedure

-
- Step 1** Choose **Inventory > View > Switches**.
You see the Switches window displaying a list of all the switches for a selected Scope.
- Step 2** In the **Device Name** column, select a switch to display **Switch Dashboard**.
- Step 3** Click the **Interfaces** tab.
- Step 4** Click **Interface History** to display the interface history details such as **Policy Name**, **Time of Execution**, and so on.
-

VLAN

You create a VLAN by assigning a number to it; you can delete VLANs and move them from the active operational state to the suspended operational state.

To configure VLANs, choose **Inventory > View > Switches**, and then click a switch in the **Device Name** column.

The following table describes the buttons that appear on this page.

Table 1: VLAN Tab

| Field | Description |
|------------------|---|
| Clear Selections | Allows you to unselect all the VLANs that you selected. |
| Add | Allows you to create Classical Ethernet or Fabric Path VLANs. |
| Edit | Allows you to edit a VLAN. |
| Delete | Allows you to delete a VLAN. |
| No Shutdown | Allows you to enable a VLAN. |
| Shutdown | Allows you to disable a VLAN. |
| Show | Allows you to display the VLAN show commands. |

This section contains the following:

Adding a VLAN

To add a VLAN from the Cisco DCNM Web UI, perform the following steps:

Procedure

-
- Step 1** Choose **Inventory > View > Switches**.
You see the **Switches** window displaying a list of all the switches for a selected **Scope**.

- Step 2** In the **Device Name** column, select a switch to display the **Switch Dashboard**.
- Step 3** Click the **VLAN** tab.
- Step 4** Click **Add** to create Classical Ethernet or Fabric Path VLANs. In the **Add VLAN** window, specify the following fields:
- In the **Vlan Id** field, enter the VLAN ID.
 - In the **Mode** field, specify whether you are adding Classical Ethernet or Fabric Path VLAN.
 - Select the **Admin State ON** check box to specify whether the VLAN is shut down or not.
-

Editing a VLAN

To edit a VLAN from the Cisco DCNM Web UI, perform the following steps:

Procedure

- Step 1** Choose **Inventory > View > Switches**.
- The **Switches** window is displayed with a list of all the switches for a selected **Scope**.
- Step 2** In the **Device Name** column, select a switch to display the **Switch Dashboard**.
- Step 3** Select one or more VLANs, and then click the **Edit**.
-

Deleting a VLAN

To delete a VLAN from the Cisco DCNM Web UI, perform the following steps:

Procedure

- Step 1** Choose **Inventory > View > Switches**.
- You see the **Switches** window displaying a list of all the switches for a selected **Scope**.
- Step 2** In the **Device Name** column, select a switch to display the **Switch Dashboard**.
- Step 3** Click **VLAN** tab.
- Step 4** Select the VLAN that you want to delete, and then click **Delete**.
-

Shutting Down a VLAN

To shut down a VLAN from the Cisco DCNM Web UI, perform the following steps:

Procedure

- Step 1** Choose **Inventory > View > Switches**.
- You see the **Switches** window displaying a list of all the switches for a selected **Scope**.

- Step 2** In the **Device Name** column, select a switch to display **Switch Dashboard**.
- Step 3** Click the **VLAN** tab.
- Step 4** Click **Shutdown** to disable a VLAN.
- To enable a VLAN, click **No Shutdown** button. For example, if you want to start traffic flow on a VLAN you can enable it.
-

Displaying VLAN Show Commands

To display VLAN show commands from the Cisco DCNM Web UI, perform the following steps:

Procedure

- Step 1** Choose **Inventory > View > Switches**.
- The **Switches** window is displayed, showing a list of all the switches for a selected **Scope**.
- Step 2** In the **Device Name** column, select a switch to display **Switch Dashboard**.
- Step 3** Click the **VLAN** tab.
- Step 4** Click **Show** to display the VLAN show commands. Based on the VLAN selection, you can show the VLAN commands. **Interface Show Commands** window displays the commands and allows you to execute them.
-

FEX

The Fabric Extender feature allows you to manage a Cisco Nexus 2000 Series Fabric Extender and its association with the Cisco NX-OS switch that it is attached to. A Fabric Extender is connected to the switch through physical Ethernet interfaces or a Port Channel. By default, the switch does not allow the attached Fabric Extender to connect until it has been assigned a chassis ID and is associated with the connected interface. You can configure a Fabric Extender host interface port as a routed or Layer 3 port. However, no routing protocols can be tied to this routed interface.



Note FEX feature is available on LAN devices only. Therefore, you will see FEX on Cisco DCNM **Inventory Switches**. FEX is also not supported on Cisco Nexus 1000V devices.



Note 4x10G breakout for FEX connectivity is not supported on Cisco Nexus 9500 Switches.



Note The Fabric Extender may connect to the switch through several separate physical Ethernet interfaces or at most one port channel interface.

This section describes how to manage Fabric Extender (FEX) on Cisco Nexus Switches through Cisco DCNM.

You can create and manage FEX from Cisco DCNM **Inventory > Switches**.



Note FEX tab is visible only if you choose a LAN device.

The following table describes the fields that appear on this page.

Table 2: FEX Operations

| Field | Description |
|-------------|---|
| Add | Click to add a new FEX to a Cisco Nexus Switch. |
| Edit | Select any active FEX radio button and click Edit to edit the FEX configuration. You can create an edit template and use it for editing FEX. Select template type as POLICY and sub type as FEX. |
| Delete | Select the FEX radio button, and click Delete icon to delete the FEX associated with the switch. |
| Show | Allows you to view various configuration details for the selected FEX ID. You can select the following from the drop-down list. <ul style="list-style-type: none"> • show_diagnostic • show_fex • show_fex_detail • show_fex_fabric • show_fex_inventory • show_fex_module <p>The variables for respective show commands are displayed in the Variables area. Review the Variables and click Execute. The output appears in the Output area.</p> <p>You can create a show template for FEX. Select template type as SHOW and sub type as FEX.</p> |
| FEX History | Allows you to view the history of the FEX configuration tasks for a particular FEX. You can review the Event Type, Policy Name, Status, Time of Execution, User Name for the selected FEX. |

Table 3: FEX Field and Description

| Field | Description |
|--------|--|
| Fex Id | Uniquely identifies a Fabric Extender that is connected to a Cisco NX-OS device. |

| Field | Description |
|-----------------|--|
| Fex Description | Description that is configured for the Fabric Extender. |
| Fex Version | Specifies the version of the FEX that is associated with the switch. |
| Pinning | An integer value that denotes the maximum pinning uplinks of the Fabric Extender that is active at a time. |
| State | Specifies the status of the FEX as associated with the Cisco Nexus Switch. |
| Model | Specifies the model of the FEX. |
| Serial No. | Specifies the configured serial number. Note If this configured serial number and the serial number of the Fabric Extender are not the same, the Fabric Extender will not be active. |
| Port Channel | Specifies the port channel number to which the FEX is physically connected to the Switch. |
| Ethernet | Refers to the physical interfaces to which the FEX is connected. |
| vPC ID | Specifies the vPC ID configured for FEX. |

This chapter includes the following sections:

Add FEX

To add single-home FEX from the Cisco DCNM Web UI, perform the following steps:

Before you begin

You can add a Fabric Extender (FEX) to the Cisco Nexus Switches through the Cisco DCNM Web Client. If the FEX is physically connected to the switch, FEX will become online after it is added. If the FEX is not physically connected to the switch, the configuration is deployed to the switch, which in turn enables FEX when connected.



Note You can create only single homed FEX through **Inventory > Switches > FEX > Add FEX**. To create a dual-homed FEX, use the vPC wizard through **Configure > Deploy > vPC**.

Ensure that you have successfully discovered LAN devices and configured LAN credentials before you configure FEX.

Procedure

Step 1 Choose **Inventory > Switches > FEX**.

The **FEX** window is displayed.

- Step 2** Click the **Add FEX** icon.
- Step 3** In the General tab, in the **PORTCHANNEL** field, enter the interface port channel number which is connected to the FEX.
- Step 4** In the **INT_RANGE** field, enter the interface range within which the FEX is connected to the switch.
- Note** Do not enter the interface range, if the interfaces are already a part of port channel.
- Step 5** In the **FEX_ID** field, enter the ID for FEX that is connected to a Cisco NX-OS device.
The identifier must be an integer value between 100 to 199.
- Step 6** Click **Add**.
The configured Single-home FEX appears in the list of FEXs associated to the device.
-

Edit FEX

To edit and deploy FEX from the Cisco DCNM Web UI, perform the following steps:

Procedure

- Step 1** Choose **Inventory > Switches > FEX**.
The **FEX** window is displayed.
- Step 2** Select the FEX radio button that you must edit. Click **Edit FEX** icon.
- Step 3** In the Edit Configuration window, from the Policy drop-down list, select **Edit_FEX** to edit the FEX configuration.
- Step 4** Edit the **pinning** and **FEX_DESC** fields, as required.
- Note** If you initially configured port 33 on the parent switch as your only fabric interface, all 48 host interfaces are pinned to this port. If you provision another port, for example 35, then you must perform this procedure to redistribute the host interfaces. All host interfaces are brought down and host interfaces 1 to 24 are pinned to fabric interface 33 and host interfaces 25 to 48 are pinned to fabric interface 35.
- Step 5** Click **Preview**.
You can view the generated configuration for the selected FEX ID. The following is a configuration example for FEX ID 101.
- ```
fex 101
pinning max-links 1
description test
```
- Step 6** After you review the configuration summary on the Preview window, on the Edit Configuration screen, click **Deploy** to deploy the FEX for the switch.
-

## VDCs

This section describes how to manage Virtual Device Contexts (VDCs) on Cisco Nexus 7000 Switches through Cisco DCNM.

Users with the network administrator (network-admin) role can create Virtual Device Contexts (VDCs). VDC resource templates limit the amount of physical device resources available to the VDC. The Cisco NX-OS software provides a default resource template, or you can create resource templates.

You can create and manage VDCs from Cisco DCNM **Inventory > Switches > VDCs**. As Cisco DCNM supports DCNM on Cisco Nexus 7000 Series only, click an active Cisco Nexus 7000 Switch. After you create a VDC, you can change the interface allocation, VDC resource limits, and the high availability (HA) policies.

The following table describes the fields that appear on this page.

**Table 4: Vdc Operations**

| Field      | Description                                                                                                                                                                                                                                                                                                                                                 |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Add        | Click to add a new VDC.                                                                                                                                                                                                                                                                                                                                     |
| Edit       | Select any active VDC radio button and click Edit to edit the VDC configuration.                                                                                                                                                                                                                                                                            |
| Delete     | Allows you to edit the VDC configuration. Select any active VDC radio button and click Edit to edit the VDC configuration.                                                                                                                                                                                                                                  |
| Resume     | Allows you to delete the VDC. Select any active VDC radio button and click Delete to remove the VDC associated with the device.                                                                                                                                                                                                                             |
| Suspend    | <p>Allows you to suspend an active non-default VDC.</p> <p>Save the VDC running configuration to the startup configuration before suspending the VDC. Otherwise, you will lose the changes to the running configuration.</p> <p><b>Note</b> You cannot suspend the default VDC.</p> <p><b>Caution</b> Suspending a VDC disrupts all traffic on the VDC.</p> |
| Rediscover | Allows you to resume a non-default VDC from the suspended state. The VDC resumes with the configuration that is saved in the startup configuration.                                                                                                                                                                                                         |
| Show       | <p>Allows you to view the Interfaces and Resources that are allocated to the selected VDC.</p> <p>In the Interface tab, you can view the mode, admin-status, and operational status for each interface associated with the VDC.</p> <p>In the Resource tab, you can view the allocation of resources and current usage of these resources.</p>              |

Table 5: Vdc Table Field and Description

| Field                                                                                                      | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name                                                                                                       | Displays the unique name for the VDC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Type                                                                                                       | Species the type of VDC. The two types of VDCs are: <ul style="list-style-type: none"> <li>• Ethernet</li> <li>• Storage</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Status                                                                                                     | Specifies the status of the VDC.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Resource Limit-Module Type                                                                                 | Displays the allocated resource limit and module type.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| HA-Policy <ul style="list-style-type: none"> <li>• Single Supervisor</li> <li>• Dual Supervisor</li> </ul> | <p>Specifies the action that the Cisco NX-OS software takes when an unrecoverable VDC fault occurs.</p> <p>You can specify the HA policies for single supervisor module and dual supervisor module configurations when you create the VDC. The HA policy options are as follows:</p> <p><b>Single supervisor module configuration:</b></p> <ul style="list-style-type: none"> <li>• Bringdown—Puts the VDC in the failed state. To recover from the failed state, you must reload the physical device.</li> <li>• Reload—Reloads the supervisor module.</li> <li>• Restart—Takes down the VDC processes and interfaces and restarts it using the startup configuration.</li> </ul> <p><b>Dual supervisor module configuration:</b></p> <ul style="list-style-type: none"> <li>• Bringdown—Puts the VDC in the failed state. To recover from the failed state, you must reload the physical device.</li> <li>• Restart—Takes down the VDC processes and interfaces and restarts it using the startup configuration.</li> <li>• Switchover—Initiates a supervisor module switchover.</li> </ul> <p>The default HA policies for a non-default VDC that you create is restart for a single supervisor module configuration and switchover for a dual supervisor module configuration. The default HA policy for the default VDC is reload for a single supervisor module configuration and switchover for a dual supervisor module configuration.</p> |

| Field                                                                                                        | Description                                                                                              |
|--------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| Mac Address                                                                                                  | Specifies the default VDC management MAC address.                                                        |
| Management Interface <ul style="list-style-type: none"> <li>• IP Address Prefix</li> <li>• Status</li> </ul> | Species the IP Address of the VDC Management interface. The status shows if the interface if up or down. |
| SSH                                                                                                          | Specifies the SSH status                                                                                 |

This chapter includes the following sections:

## Add VDCs

To add VDC from the Cisco DCNM Web UI, perform the following steps:

### Before you begin

Ensure that you have discovered the physical device using a username that has the network-admin role.

Obtain an IPv4 or IPv6 address for the management interface (mgmt 0) if you want to use out-of-band management for the VDC.

Create a storage VDC to run FCoE. The storage VDC cannot be the default VDC and you can have one storage VDC on the device.

### Procedure

- 
- Step 1** Choose **Inventory > Switches > VDC**.  
The **VDC** window is displayed.
- Step 2** Click the **Add VDC** icon.
- Step 3** From the drop-down list, select the VDC type.  
You can configure the VDC in two modes.
- Ethernet VDC
  - Storage VDC
- The default VDC type is Ethernet.
- Step 4** Click **OK**.
- 

### Configuring Ethernet VDCs

To configure VDC in Ethernet mode from the Cisco DCNM Web UI, perform the following steps:

## Procedure

- Step 1** In the General Parameter tab, specify the VDC Name, **Single supervisor HA-policy**, **Dual supervisor HA-policy**, and **Resource Limit - Module Type**.
- Step 2** In the Allocate Interface tab, select the network interfaces (dedicated interfaces membership) to be allocated to the VDC.
- Click **Next**.

- Step 3** In the Allocate Resource tab, specify the resource limits for the VDC.
- Select the radio button and choose **Select a Template from existing Templates** or **Create a New Resource Template**. VDC resource templates describe the minimum and maximum resources that the VDC can use. If you do not specify a VDC resource template when you create a VDC, the Cisco NX-OS software uses the default template, vdc-default.

- If you choose **Select a Template from existing Templates**, from the **Template Name** drop-down list, you can select **None**, **global-default**, or **vdc-default**.

The template resource limits are detailed in the following below:

**Table 6: Template Resource Limits**

| Resource                                    | Minimum | Maximum                            |
|---------------------------------------------|---------|------------------------------------|
| Global Default VDC Template Resource Limits |         |                                    |
| Anycast Bundled                             |         |                                    |
| IPv6 multicast route memory                 | 8       | 8<br>Route memory is in megabytes. |
| IPv4 multicast route memory                 | 48      | 48                                 |
| IPv6 unicast route memory                   | 32      | 32                                 |
| IPv4 unicast route memory                   |         |                                    |
| VDC Default Template Resource Limits        |         |                                    |
| Monitor session extended                    |         |                                    |
| Monitor session mx exception                |         |                                    |
| Monitor SRC INBAND                          |         |                                    |
| Port Channels                               |         |                                    |
| Monitor DST ERSPAN                          |         |                                    |
| SPAN Sessions                               |         |                                    |
| VLAN                                        |         |                                    |
| Anycast Bundled                             |         |                                    |

| Resource                    | Minimum | Maximum |
|-----------------------------|---------|---------|
| IPv6 multicast route memory |         |         |
| IPv4 multicast route memory |         |         |
| IPv6 unicast route memory   |         |         |
| IPv4 unicast route memory   |         |         |
| VRF                         |         |         |

- If you choose Create New Resource Template, enter a unique **Template Name**. In the Resource Limits area, enter the minimum and maximum limits, as required for the resources.

You can edit individual resource limits for a single VDC through the Cisco DCNM **Web Client > Inventory > Switches > VDC**.

Click **Next**.

- Step 4** In the Authenticate tab, you can allow the Admin to configure the password and also authenticate users using AAA Server Groups.

In the Admin User Area:

- Check the **Enable Password Strength Check** checkbox, if necessary.
- In the **Password** field, enter the admin user password.
- In the **Confirm Password** field, reenter the admin user password.
- In the **Expiry Date** field, click the down arrow and choose an expiry date for the admin user from the Expiry Date dialog box. You can also select **Never** radio button not to expire the password.

In the AAA Server Groups area:

- In the **Group Name** field, enter an AAA server group name.
- In the **Servers** field, enter one or more host server IPv4 or IPv6 addresses or names, which are separated by commas.
- In the **Type** field, choose the type of server group from the drop-down list.

Click **Next**.

- Step 5** In the Management Ip tab, enter IPv4 or IPv6 Address information.

Click **Next**.

- Step 6** In the Summary tab, review the VDC configuration.

Click **Previous** to edit any parameters.

Click **Deploy** to configure VDC on the device.

- Step 7** In the Deploy tab, the status of the VDC deployment is displayed.

A confirmation message appears. Click **Know More** to view the commands that are executed to deploy the VDC.

Click **Finish** to close the VDC configuration wizard and revert to view the list of VDCs configured on the device.

---

### Configuring Storage VDCs

To configure VDCs in storage mode from the Cisco DCNM Web UI, perform the following steps:

#### Before you begin

Create a separate storage VDC when you run FCoE on the device. Only one of the VDCs can be a storage VDC, and the default VDC cannot be configured as a storage VDC.

You can configure shared interfaces that carry both Ethernet and Fibre Channel traffic. In this specific case, the same interface belongs to more than one VDC. The shared interface is allocated to both an Ethernet and a storage VDC.

#### Procedure

---

- Step 1** In the General Parameter tab, specify the **VDC Name**, **Single supervisor HA-policy**, **Dual supervisor HA-policy**, and **Resource Limit - Module Type**.
- Step 2** In the Allocate FCoE Vlan tab, select the available **Ethernet Vdc** from the drop-down list.
- The existing Ethernet VLANs range is displayed. Select **None** not to choose any available Ethernet VDCs. You can allocate specified FCoE VLANs to the storage VDC and specified interfaces.
- Click **Next**.
- Step 3** In the Allocate Interface tab, add the dedicated and shared interfaces to the FCoE VDC.
- Note** The dedicated interface carries only FCoE traffic and the shared interface carries both the Ethernet and the FCoE traffic.
- You can configure shared interfaces that carry both Ethernet and Fibre Channel traffic. In this specific case, the same interface belongs to more than one VDC. FCoE VLAN and shared interface can be allocated from same Ethernet VDC.
- Click **Next**.
- Step 4** In the Authenticate tab, you can allow the Admin to configure the password and also authenticate users using AAA Server Groups.
- In the Admin User Area:
- Check the **Enable Password Strength Check** checkbox, if necessary.
  - In the **Password** field, enter the admin user password.
  - In the **Confirm Password** field, reenter the admin user password.
  - In the **Expiry Date** field, click the down arrow and choose an expiry date for the admin user from the Expiry Date dialog box. You can also select **Never** radio button not to expire the password.

In the AAA Server Groups area:

- In the **Group Name** field, enter an AAA server group name.
- In the **Servers** field, enter one or more host server IPv4 or IPv6 addresses or names, which are separated by commas.
- In the **Type** field, choose the type of server group from the drop-down list.

Click **Next**.

**Step 5** In the Management Ip tab, enter IPv4 or IPv6 Address information.

Click **Next**.

**Step 6** In the Summary tab, review the VDC configuration.

Click **Previous** to edit any parameters.

Click **Deploy** to configure VDC on the device.

**Step 7** In the Deploy tab, the status of the VDC deployment is displayed.

A confirmation message appears. Click **Know More** to view the commands that are executed to deploy the VDC.

Click **Finish** to close the VDC configuration wizard and revert to view the list of VDCs configured on the device.

---

## Edit VDC

To edit VDC from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

**Step 1** Choose **Inventory > Switches > VDC**.

The **VDC** window is displayed.

**Step 2** Select the VDC radio button that you must edit. Click the **Edit** VDC icon.

**Step 3** Modify the parameters as required.

**Step 4** After you review the configuration summary on the Summary tab, click **Deploy** the VDC with the new configuration.

---

## Switch On-Board Analytics

The **Switch On-Board Analytics** dashboard displays the following charts:

- Top 10 Slowest Ports
- Top 10 Slowest Target Ports
- Top 10 Slowest Flows
- Top 10 Slowest ITLs

- Top 10 Port Traffic
- Top 10 Target Ports Traffic
- Top 10 Flow Traffic
- Top 10 ITL Traffic

The following metrics are supported by the Switch On-Board Analytics charts:

- Read and Write Completion Time—Time that is taken for an IO to complete successfully, that is, the time gap between IO status from a Target and IO command from an Initiator. The following metrics are supported:
  - Read Completion Time Min
  - Read Completion Time Max
  - Write Completion Time Min
  - Write Completion Time Max

The IO engine tracks the maximum and minimum IO completion time for read and write commands in the context of a switch's port, target port, flows, initiators, and LUNs.

- Read and Write Initiation Time—Time that is taken for an IO to initiate, that is, the time gap between the first response packet from a Target and IO Command from Initiator. The following metrics are supported:
  - Read Initiation Time Min
  - Read Initiation Time Max
  - Write Initiation Time Min
  - Write Initiation Time Max

The IO engine tracks the maximum and minimum IO initiation time for read and write commands in the context of a switch's port, target port, flows, initiators, and LUNs.

- Read and Write IO Bandwidth—Read and write command bandwidth observed in the context of a switch's port traffic, target port traffic, flow traffic, initiators, and LUNs. The IO bandwidth is computed at every four second time interval based on the number of bytes read or written.
- Read and Write IO Rate—Read and write command IO rate observed in the context of a switch's port traffic, target port traffic, flow traffic, initiators, and LUNs. The IO rate is computed at every four second time interval that is based on the number of IO performed.
- Read and Write IO Size—Read and write command IO size observed in the context of a switch's port traffic, target port traffic, flow traffic, initiators, and LUNs. The following metrics are supported:
  - Read IO Size Min
  - Read IO Size Max
  - Write IO Size Min
  - Write IO Size Max

The IO engine tracks the maximum and minimum IO size for read and write commands.

## Viewing Switch On-Board Analytics

You can view the switch on-board analytics information from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

- Step 1** Choose **Inventory > View > Switches**.  
The discovered switches are displayed.
- Step 2** Click a switch name in the **Device Name** column.  
The **Switch** dashboard that corresponds to that switch is displayed.
- Step 3** Click the **Switch On-Board Analytics** tab.  
This tab displays the Switch On-Board Analytics charts.
- 

## Configuring Settings for the Switch On-Board Analytics Charts

Perform the following actions to configure the settings for the switch on-board analytics charts:

- From the **Show Time** drop-down list, choose time to be shown in the charts. You can choose one of the following options:
  - **Microseconds**
  - **Milliseconds**
  - **Seconds**

By default, **Microseconds** is chosen.



---

**Note** The **Show Time** drop-down list is applicable only for the top ten slowest ports, target ports, flows, and ITLs.

---

- From the **Show Flow From** drop-down list, choose whether to show flows from a **Target** or from an **Initiator**. By default, flows from a **Target** are chosen.



---

**Note** The **Show Flow From** drop-down list is applicable only for the charts displaying flows and ITLs.

---

- From the **bandwidth and size** drop-down list, choose the traffic information to be shown in the charts. You can choose one of the following options:
  - **Bytes**

- **KB**
- **MB**

By default, **Bytes** is chosen.

- Check the **Single Column** check box to display the charts in a single column instead of double columns.
- Click the **Refresh** icon in the upper-right corner to refresh the charts.

## Viewing Switch On-Board Analytics Charts

Perform the following actions to view the charts under the **Switch On-Board Analytics** tab:

- View the charts for the top ten slowest ports, target ports, flows, and ITLs by choosing one of the following variables from the drop-down list:
  - **Read Completion Time**—The read command completion time observed in the context of a switch's port.
  - **Write Completion Time**—The write command completion time observed in the context of a switch's port.
  - **Read Initiation Time**—The read command initiation time observed in the context of a switch's port.
  - **Write Initiation Time**—The write command initiation time observed in the context of a switch's port.



### Note

- By default, **Read Completion Time** is selected and all the units for time are in **Microseconds**.
  - Each chart contains a legend that provides information about the variable displayed. Each variable has a check box. Unselecting the check box removes the variable data from the chart or table.
- 
- View the charts for the top ten port traffic, target port traffic, flow traffic, and ITL traffic by choosing one of the following variables from the drop-down list:
    - **Read IO Rate**—The read command data observed in the context of a switch's port.
    - **Write IO Rate**—The write command observed in the context of a switch's port.
    - **Read IO Size**—The read command size observed in the context of a switch's port.
    - **Write IO Size**—The write command size observed in the context of a switch's port.
    - **Read IO Bandwidth**—The read command bandwidth observed in the context of a switch's port.
    - **Write IO Bandwidth**—The write command bandwidth observed in the context of a switch's port.

**Note**

- By default, **Read IO Rate** is selected. The **Read IO Rate** is IO per second. Both **Rate** and **Bandwidth** units are per second over an 8-second range. The **Size** value is for the life of the switch or since the last clear command was run from the CLI.
- The **Read IO Size** and **Read IO Bandwidth** units are in bytes per second. You can change this unit by using the **Show Bandwidth and Size** drop-down list. You can choose from the three options: **Bytes**, **KB**, and **MB**.
- Each chart contains a legend that provides information about the variable displayed. Each variable has a check box. Unselecting the check box removes the variable data from the chart or table.

- Choose the format to display information from the **Show** drop-down list. You can choose one of the following formats:
  - **Chart**
  - **Table**
  - **Chart and Table**

**Note**

- To display information in the **Chart and Table** format, enlarge your browser window or check the **Single Column** check box on the upper right corner.
- The default for Top ten Slowest Ports and Top 10 Port Traffic is **Chart and Table**.

- Use the **Chart Type** drop-down list to display information in the **Bar Chart** or **Stacked Bar Chart**.
- Use the **Actions** drop-down list to export information in a CSV or PDF, or print the required information.
- To view a chart or a table in a new window, click the **Detach** icon on the upper-right corner of a chart or a table. After detaching a chart or table, you can view the top 25 slowest ports, target ports, flows, ITLs, or their traffic.

## Viewing Inventory Information for Modules

To view the inventory information for modules from the Cisco DCNM Web UI, perform the following steps:

### Procedure

- 
- Step 1** Choose **Inventory > View > Modules**.
- The **Modules** window is displayed with a list of all the switches and its details for a selected Scope.
- Step 2** You can view the following information.

- **Group** column displays the group name of the module.
  - **Switch** column displays the switch name on which the module is discovered.
  - **Name** displays the module name.
  - **ModelName** displays the model name.
  - **SerialNum** column displays the serial number.
  - **2nd SerialNum** column displays the second serial number.
  - **Type** column displays the type of the module.
  - **Slot** column displays the slot number.
  - **Hardware Revision** column displays the hardware version of the module.
  - **Software Revision** column displays the software version of the module.
  - **Asset ID** column displays the asset id of the module.
  - **OperStatus** column displays the operation status of the module.
- 

## Viewing Inventory Information for Licenses

To view the inventory information for licenses from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

**Step 1** Choose **Inventory > View > Licenses**.

The **Licenses** window is displayed based on the selected Scope.

**Step 2** You can view the following information.

- **Group** column displays the group name of switches.
  - **Switch** column displays the switch name on which the feature is enabled.
  - **Feature** displays the installed feature.
  - **Status** displays the usage status of the license.
  - **Type** column displays the type of the license.
  - **Warnings** column displays the warning message.
-

# Discovery

Starting from Cisco DCNM release 10.x, Cisco DCNM Web Client allows the **admin** to associate **user** to one or more device scope or group. That means you can only access and configure the associated group or scope devices based on Role Based Access Control (RBAC). Though you might not have the access to other users' associated devices, you can still see all the discovered devices under the **Inventory > Discovery** tab.

From the left menu bar, go to **Administration > Management Users**. You can create users and associate groups, manage remote authentication, and see all the connected clients. For more information about RBAC, navigate to [Managing Local Users](#).

## Adding, Editing, Re-Discovering, Purging and Removing LAN, LAN Tasks and Switch

Cisco DCNM Web Client reports information that is obtained by the Cisco DCNM-LAN devices.



**Tip** If the discovered Device is not in the scope of the current user the check box for the LAN Device in the LAN table grays out.

This section contains the following:

### Adding LAN Switches

To add LAN switches from the Cisco DCNM Web UI, perform the following steps:

#### Procedure

- Step 1** Choose **Inventory > Discovery > LAN Switches**.  
You see the list of LAN devices in the **Switch** column.
- Step 2** Click the **Add** icon to add LAN.  
You see the **Add LAN Devices** dialog box.
- Step 3** Select **Hops from seed Switch** or **Switch List**. The fields vary depending on your selection.
- Step 4** Enter the **Seed Switch** IP address for the fabric.  
For LAN Switches Discovery, DCNM allow both IPv4 and IPv6 address for the Seed Switch.
- Step 5** The options vary depending on the discovery type selected. For example, if you check **Use SNMPv3/SSH**, varied fields are displayed.
- Step 6** Click the drop-down list and choose **Auth-Privacy** security level.
- Step 7** Enter the **Community**, or user credentials.
- Step 8** Select the LAN group from the LAN groups candidates which is in the scope of the current user.

**Note** Select DCNM server and click **Add** to add LAN switches.

- Step 9** Click **Next** to begin the shallow discovery.
- Step 10** In the **LAN Discovery** window, you can select all switches by using the checkbox next to the switch name column or select individual switches. Click **Previous** to go back and edit the parameters.
- Note** In the Status column, if the switch status is **timeout** or **Cannot be contacted**, these switches cannot be added. Only the switches that are reachable and not managed yet are available to select. The checkbox is disabled for the switches that are not available.
- Step 11** Select a switch and click **Add** to add a switch to the switch group.
- If one of more seed switches is not reachable, it is shown as “unknown” on the shallow Discovery window.
- 

## Editing LAN Devices

To edit LAN devices from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

- Step 1** Choose **Inventory > Discovery > LAN Switches**.
- Step 2** Select the check box next to the LAN that you want to edit and click **Edit** icon.  
You see the **Edit LAN** dialog box.
- Step 3** Enter the **Username** and **Password**.
- Note** Select **Credential** or **Management State** to change the Credential or Management state. If **Credential** is selected, you can change the SNMP version and Auth-Privacy if v3, username or password. If **Management State** is selected, you can change the status to managed or unmanaged.
- Step 4** Select the LAN status as **Managed** or **Unmanaged**.
- Step 5** Click **Apply** to save the changes.
- 

## Removing LAN Devices from Cisco DCNM

You can remove a LAN switch from Cisco DCNM.

### Procedure

---

- Step 1** Choose **Inventory > Discovery > LAN Switches**.
- Step 2** Select the check box next to the LAN that you want to remove and click **Delete** to remove the switches and all their data.
- Step 3** Click **Yes** to review the LAN device.
-

## Rediscover LAN Task

### Procedure

---

- Step 1** Choose **Inventory > Discovery > LAN Switches**.
  - Step 2** Click **Rediscover LAN**.
  - Step 3** Click **Yes** in the pop-up window to rediscover the LAN.
-





## CHAPTER 4

# Monitor

---

This chapter contains the following topics:

- [Monitoring Switch, on page 35](#)
- [Monitoring LAN, on page 38](#)
- [Monitoring Report, on page 42](#)
- [Alarms, on page 44](#)

## Monitoring Switch

The Switch menu includes the following submenus:

### Viewing Switch CPU Information

To view the switch CPU information from the Cisco DCNM Web UI, perform the following steps:

#### Procedure

---

**Step 1** Choose **Monitor > Switch > CPU**.

The **CPU** window is displayed. This window displays the CPU information for the switches in that scope.

**Step 2** You can use the drop-down to filter the view by Last 10 Minutes, Last Hour, Last Day, Last Week, Last Month, and Last Year.

**Step 3** In the **Switch** column, click the switch name to view the Switch Dashboard.

**Step 4** Click the chart icon in the **Switch** column to view the CPU utilization.

You can also change the chart timeline to Last 10 Minutes, Last Hour, Last Day, Last Week, Last Month, and Last Year. You can choose the chart type and chart options to show as well.

---

### Viewing Switch Memory Information

To view the switch memory information from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

- Step 1** Choose **Monitor > Switch > Memory**.
- The memory panel is displayed. This panel displays the memory information for the switches in that scope.
- Step 2** Use the drop-down to filter the view by Last 10 Minutes, Last Hour, Last Day, Last Week, Last Month, and Last Year.
- Step 3** Click the chart icon in the **Switch** column to see a graph of the memory usage of the switch.
- Step 4** In the **Switch** column, click the switch name to view the Switch Dashboard.
- Step 5** You can use the drop-down to view the chart in different time lines. Use the chart icons to view the memory utilization chart in varied views.
- 

## Viewing Switch Traffic and Errors Information

To view the switch traffic and errors information from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

- Step 1** Choose **Monitor > Switch > Traffic**.
- The **Switch Traffic** panel is displayed. This panel displays the traffic on that device for the past 24 hours.
- Step 2** Use the drop-down to filter the view by 24 hours, Week, Month, and Year.
- Step 3** Click the **Export** icon in the upper-right corner to export the data into a spreadsheet.
- Step 4** Click **Save**.
- Step 5** Click the switch name to view the Switch Dashboard section.
- 

## Viewing Switch Temperature

Cisco DCNM includes the module temperature sensor monitoring feature, using which you can view the sensor temperature of a switch. You can choose an interval by which to filter the sensor list. The default interval is **Last Day**. Only sensors that have historical temperature data is shown in the list. You can choose between Last ten Minutes, Last Hour, Last Day, Last Week, and Last Month.



**Note** It is not necessary to configure the LAN credentials under the **Configure > Credentials Management > LAN Credentials** screen to fetch the temperature monitoring data from the switches.

---

To view the switch temperature information from the Cisco DCNM Web UI, perform the following steps:

## Procedure

---

**Step 1** Choose **Monitor > Switch > Temperature**.

The **Switch Temperature** window is displayed with the following columns.

- **Scope:** The sensor belongs to a switch, which is part of a fabric. The fabric that it belongs to is shown as its scope. When the scope selector at the top of Cisco DCNM is used, the sensor list is filtered by that scope.
- **Switch:** Name of the switch the sensor belongs to.
- **IP Address:** IP Address of the switch.
- **Temperature Module:** The name of the sensor module.
- **Avg/Range:** The first number is the average temperature over the interval that is specified at the top of the table. The second set of numbers is the range of the temperature over that interval.
- **Peak:** The maximum temperature over the interval

**Step 2** From this list, each row has a chart icon, which you can click. A chart is displayed, which shows historical data for the sensor. The interval for this chart can be changed as well, between 24 hours, 1 week, and 1 month.

---

## Enabling Temperature Monitoring

You can enable the temperature monitoring feature for LAN switches from the LAN Collections screen, and for the SAN switches by setting a few properties under Administration > DCNM Server > Server Properties screens.

### Enabling Temperature Monitoring for LAN Switches

1. From the menu bar, choose **Administration > Performance Setup > LAN Collections**.
2. Select the **Temperature Sensor** check box.
3. Select the type of LAN switches for which you want to collect performance data.
4. Click **Apply** to save the configuration.

## Viewing Accounting Information

To view the accounting information from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

**Step 1** Choose **Monitor > Switch > Accounting**.

The fabric name or the group name along with the accounting information is displayed.

**Step 2** Select **Advanced Filter** beside the filter icon to search the accounting information by **Source**, **Username**, **Time**, and **Description**. Or select **Quick Filter** to search under each column.

**Step 3** You can also select a row and click the **Delete** icon to delete accounting information from the list.

- Step 4** You can use the **Print** icon to print the accounting details and use the **Export** icon to export the data to a Microsoft Excel spreadsheet.
- 

## Viewing Events Information

To view the events and syslog from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

- Step 1** Choose **Monitor > Switch > Events**.
- The fabrics along with the switch name and the events details are displayed.
- The **Count** column displays the number of times the same event has occurred during the time period as shown in the **Last Seen** and **First Seen** columns.
- Click a switch name in the **Switch** column to view the switch dashboard.
- Step 2** Select an event in the table and click the **Add Suppressor** icon to open the shortcut of adding an event suppressor rule.
- Step 3** Select one or more events from the table and click the **Acknowledge** icon to acknowledge the event information for the fabric.
- After you acknowledge the event for a fabric, the acknowledge icon is displayed in the **Ack** column next to the fabric.
- Step 4** Select the fabric and click the **Unacknowledge** icon to cancel an acknowledgment for a fabric.
- Step 5** Select **Advanced Filter** beside the filter icon to search the accounting information by **Source**, **Username**, **Time**, and **Description**. Or select **Quick Filter** to search under each column.
- Step 6** Select a fabric and use the **Delete** icon to delete the fabric and event information from the list.
- Step 7** Click the **Print** icon to print the event details.
- Step 8** Click the **Export to Excel** icon to export the data.
- 

## Monitoring LAN

The LAN menu includes the following submenus:

## Monitoring Performance Information for Ethernet

To monitor the performance information for ethernet from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

**Step 1** Choose **Monitor > LAN > Ethernet**.

The **Ethernet** window is displayed.

**Step 2** You can use the drop-down to filter the view by Last 10 Minutes, Last Hour, Last Day, Last Week, Last Month, and Last Year.

There are variations to this procedure. In addition to these basic steps, you can also perform the following steps:

- Select the name of an Ethernet port from the **Name** column to see a graph of the traffic across that Ethernet port for the past 24 hours. You can change the time range for this graph by selecting it from the drop-down list in the upper-right corner.
- To export the data into a spreadsheet, click the **Export** icon in the upper-right corner and click **Save**.
- Use the chart icons to view the traffic chart in varied views. You can also use the icons to **Append**, **Predict**, and **Interpolate Data**.
- For the Rx/Tx calculation, see the following Rx/Tx calculation.

**Note** The conversion for Fabrics is 10 bit = 1 byte and for LAN traffic, the conversion is 8 bit = 1 byte.

- Average Rx/Tx % = Average Rx/Tx divided by Speed \* 100
- Peak Rx/Tx % = Peak Rx/Tx divided by Speed \* 100

**Note** If the performance tables do not contain any data, see the Thresholds section to turn on performance data collection.

---

## Monitoring ISL Traffic and Errors

To monitor the ISL traffic and errors from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

**Step 1** Choose **Monitor > LAN > Link**.

The **ISL Traffic and Errors** window is displayed. This panel displays the ISL information for the end devices in that scope. You can reduce or expand the scope of what is displayed by using the scope menu.

**Step 2** You can use the drop-down to filter the view by Last 10 Minutes, Last Hour, Last Day, Last Week, Last Month, and Last Year.

**Note** **NaN** (Not a Number) in the data grid means that the data is not available.

There are variations to this procedure. In addition to these basic steps, you can perform the following steps to view detailed information for ISLs:

- To change the time range for this graph, select it from the drop-down list in the upper-right corner.
- To view the detailed information for a specific period, drag the slider control to choose the time interval for which you need the information.
- Use the chart icons to view the traffic chart in varied views. You can also use the icons to **Append**, **Predict**, and **Interpolate Data**. To view real-time information, choose **Real Time** from the drop-down list in the **Chart** menu.
- To export the data into a spreadsheet, choose **Export** from the drop-down list in the **Chart** menu and then click **Save**.
- For the Rx/Tx calculation, see the following Rx/Tx calculation.

**Note** The conversion for Fabrics is 10 bit = 1 byte and for LAN traffic, the conversion is 8 bit = 1 byte.

- Average Rx/Tx % = Average Rx/Tx divided by Speed \* 100
- Peak Rx/Tx % = Peak Rx/Tx divided by Speed \* 100

**Note** If the performance tables do not contain any data, see the Performance Setup Thresholds section to turn on performance.

## Monitoring a vPC

The virtual port channel (vPC) feature enables you to view the links that are physically connected to different devices as a single port channel. A vPC is an extended form of a port channel which allows you to create redundancy and increase bisectional bandwidth by enabling multiple parallel paths between nodes and allowing load balancing traffic. Traffic is distributed among two single device vPC endpoints. If there is an inconsistency in the vPC configurations, the vPC does not function correctly.



**Note** To view the vPC in **vPC Performance**, both primary and secondary device should be designated to the user. If either one kind of switch is not designated, vPC information is isplayed.

Cisco DCNM **Web Client** > **Monitor** > **vPC** displays only consistent vPCs displays both the consistent and inconsistent vPCs.

You can identify the inconsistent vPCs and resolve the inconsistencies in each vPC by using the Cisco DCNM **Web UI** > **Configure** > **Deploy** > **vPC Peer** and **Web Client** > **Configure** > **Deploy** > **vPC**.

[Table 7: vPC Performance, on page 40](#) displays the following vPC configuration details in the data grid view.

**Table 7: vPC Performance**

| Column     | Description                                                        |
|------------|--------------------------------------------------------------------|
| Search box | Enter any string to filter the entries in their respective column. |
| vPC ID     | Displays vPC ID's configured device.                               |
| Domain ID  | Displays the domain ID of the vPC peer switches.                   |

| Column                                          | Description                                                                  |
|-------------------------------------------------|------------------------------------------------------------------------------|
| <b>Multi Chassis vPC EndPoints</b>              | Displays the multi-chassis vPC endpoints for each vPC ID under a vPC domain. |
| <b>Primary vPC Peer - Device Name</b>           | Displays the vPC Primary device name.                                        |
| <b>Primary vPC Peer - Primary vPC Interface</b> | Displays the primary vPC interface.                                          |
| <b>Primary vPC Peer - Capacity</b>              | Displays the capacity for the primary vPC peer.                              |
| <b>Primary vPC Peer - Avg. Rx/sec</b>           | Displays the average receiving speed of primary vPC peer.                    |
| <b>Primary vPC Peer - Avg. Tx/sec</b>           | Displays the average sending speed of primary vPC peer.                      |
| <b>Primary vPC Peer - Peak Util%</b>            | Displays the peak utilization percentage of primary vPC peer.                |
| <b>Secondary vPC Peer - Device Name</b>         | Displays the vPC secondary device name.                                      |
| <b>Secondary vPC Interface</b>                  | Displays the secondary vPC interface.                                        |
| <b>Secondary vPC Peer - Capacity</b>            | Displays the capacity for the secondary vPC peer.                            |
| <b>Secondary vPC Peer - Avg. Rx/sec</b>         | Displays the average receiving speed of secondary vPC peer.                  |
| <b>Secondary vPC Peer - Avg. Tx/sec</b>         | Displays the average sending speed of secondary vPC peer.                    |
| <b>Secondary vPC Peer - Peak Util%</b>          | Displays the peak utilization percentage of secondary vPC peer.              |

You can use this feature as following:

## Monitoring vPC Performance

You can view the relationship among consistent virtual port channels (vPCs). You can view the statistics of all member interfaces and the aggregate of the statistics at the port channel level.



**Note** This tab only displays consistent vPCs.

To view the VPC performance information from the Cisco DCNM Web UI, perform the following steps:

### Procedure

- Step 1** Choose **Monitor > LAN > vPC**.
- The **vPC Performance** statistics is displayed. The aggregated statistics of all vPCs are displayed in a tabular manner.
- Step 2** Click the **vPC ID**.
- The vPC topology, **vPC Details**, **Peer-link Details**, and **Peer-link Status** is displayed.

The **vPC Consistency**, **Peer-link Consistency**, and **vPC Type2 Consistency** for the vPC is displayed.

- Click the **vPC Details** tab, you can view the parameter details of vPC **Basic Setting** and **Layer 2 Settings** for both Primary and Secondary vPC devices.
- Click the **Peer-link Details** tab, to view the parameter details of peer-link **vPC Global Setting** and **STP Global Settings** for both Primary and Secondary vPC devices.
- Click the **Peer-link Status** tab, the **vPC Consistency**, and **Peer-Link Consistency** status is displayed. The parameter details of **Role Status** and **vPC Peer keep-alive Status** for both Primary and Secondary vPC devices is also displayed.

**Step 3** Click the peer-link icon in front of the **Device Name** in the **Primary vPC peer** or **Secondary vPC peer** column to view its member interface.

**Step 4** Click the **Show Chart** icon of the corresponding interface to view its historical statistics.

The traffic distribution statistics appear at the bottom of the vPC window. By default, the Cisco DCNM Web Client displays the historical statistics for 24 hours.

There are variations to this procedure. In addition to these basic steps, you can also perform the following steps to view detailed information for flows:

- To change the time range for this graph, select it from the drop-down list in the upper right corner.
- To view the detailed information for a specific period, drag the slider control to choose the time interval for which you need the information.
- Use the chart icons to view the traffic chart in varied views.
- You can also use the icons to **Append**, **Predict**, and **Interpolate Data**.
- To print the vPC Utilization data, click the **Print** icon in the upper-right corner. The vPC Utilization page appears.
- To export the data into a spreadsheet, click the **Export** icon in the upper-right corner and click **Save File**.

**Note** If the performance tables do not contain any data, see the Thresholds section to turn on performance data collection.

## Monitoring Report

The Report menu includes the following submenus:

### Viewing Reports

You can view the saved reports that are based on the following selection options:

- **By Template**
- **By User**
- From the menu bar, select **Monitor > Report > View**.

To view the reports from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

**Step 1** In the left pane, expand **By Template** or **By User** folder.

**Step 2** Select the report that you wish to view.

You can view the report in the main screen or you can select the report in the **Report** column to view the HTML version of the report in a new browser.

**Step 3** To delete a specific report, select the check box and click the **Delete** icon.

**Step 4** To delete all reports, check the check box in the header, and click the **Delete** icon.

**Note** If you have multiple fabrics, you can select the DCNM-SAN group in the Scope to view Host to Storage connectivity of multiple fabrics in a single report.

The report is divided into two sections:

- A summary report for all the devices that have faulty modules. The table displays information for every device that includes the device hostname, number of faulty modules, and the module number with its PID.
  - The information for the device of the module. The table contains details about the tests failed.
- 

## Generating a Report

You can generate reports that are based on a selected template or you can schedule the report to run at a specified time.

### Procedure

---

**Step 1** From the menu bar, select **Monitor > Report > Generate**.

You see the **Generate Report** window.

**Step 2** In the configuration window, use the drop-down to define the scope for report generation.

In the **Scope** drop-down, you can select a scope group with dual fabrics, the traffic data that is generated by hosts and storage end devices are displayed side by side which enables you to view and compare traffic data that is generated on dual fabrics. To view this report, in the **Other Predefined** folder, select **Traffic by VSAN (Dual Fabrics)**. Click Options to select the **Device Type** and **Fabrics**. Click **Save** to save the configuration.

**Step 3** In the pane on the left, expand the folders and select the report.

**Step 4** (Optional) In the pane on the right, you can edit the **Report Name**.

**Step 5** (Optional) Check the **Export to Csv/Excel** check box to export the report to a Microsoft Excel spreadsheet.

**Step 6** In the **Repeat** radio buttons, if you select:

- **Never** - The report is generated only during the current session.

- **Once** - The report is generated on a specified date and time apart from the current session.
- **Daily** - The report is generated everyday based on the Start and End date at a specified time.
- **Weekly** - The report is generated once a week based on the Start and End date at a specified time.
- **Monthly** - The report is generated once every month based on the Start and End date at a specified time.

When you generate a report for Network Configuration Audit, the daily job generates a report for the selected devices for last one day. Similarly, the weekly job generates a report for the last 7 days, and the monthly job generates a report for the last 30 days.

**Step 7** Click the **Create** button to generate a report that is based on the specifications.

You see the report results in a new browser window.

Alternatively, you can view the report by choosing **Monitor > Report > View** and selecting the report name from the report template that you used in the navigation pane.

**Note** The **Start Date** must be at least five minutes earlier than the **End Date**.

The report is divided into two sections:

- A summary report for all the devices that have faulty modules. The table displays information for every device that includes the device hostname, number of faulty modules and the module number with its PID.
- A detailed information for the device of the module. The table contains details about the tests failed.

---

## Viewing Scheduled Jobs Based on a Report Template

To view the scheduled jobs that are based on a report template from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

**Step 1** Choose **Monitor > Report > Jobs**.

The **Report Jobs** window is displayed with details of the reports that are scheduled for generation along with its status.

**Step 2** Select the checkbox for a specific report and click the **Delete** Job icon to delete a report.

---

## Alarms

The Alarms menu includes the following submenus:

## Monitoring and Adding Alarm Policies

You can add alarm policies for the following:

- **Device Health:** Device health policies enable you to create alarms when Device ICMP Unreachable, Device SNMP Unreachable, or Device SSH Unreachable. Also, these policies enable you to monitor chassis temperature, CPU, and memory usage.
- **Interface Health:** Interface health policies enable you to monitor Up or Down, Packet Discard, Error, Bandwidth details of the interfaces. By default all interfaces are selected for monitoring.
- **Syslog Alarm:** Syslog Alarm Policy defines a pair of Syslog messages formats; one which raises the alarm, and one which clears the alarm.

### Before you begin

If you have created a self-signed certificate or imported an SSL certificate to the keystore, you must copy the new `fmserver.jks` located at `/usr/local/cisco/dcm/wildfly-10.1.0.Final/standalone/configuration` to `/etc/elasticsearch`. If you do not copy the `fmserver.jks` file to the `elasticsearch` directory, you will not be able to get the Alarms and Policies. As the `elasticsearch` database will be stabilizing, you cannot configure any Alarm Policy on the Cisco DCNM Web UI **Monitor > Alarms > Alarm Policies**.

### Procedure

- 
- Step 1** Choose **Monitor > Alarms > Alarm Policies**.
- Step 2** Select the **Enable Alarms** check box to enable alarm policies.
- Step 3** From the **Add** drop-down list, choose any of the following:
- **Device Health Policy:** Select the devices for which you want to create policies. Specify the policy name, description, CPU Utilization parameters, Memory Utilization parameters, Environment Temperature parameters, device availability, and device features.
  - **Interface Health Policy:** Select the devices for which you want to create policies. Specify the policy name, description, link-state, Bandwidth (In/Out), Inbound errors, Outbound errors, Inbound Discards, and Outbound Discards.
  - **Syslog Alarm Policy:** Select the devices for which you want to create policies and then specify the following parameters.
    - **Devices:** Define the scope of this policy. Select individual devices or all devices to apply this policy.
    - **Policy Name:** Specify the name for this policy. It must be unique.
    - **Description:** Specify a brief description for this policy.
    - **Severity:** Define the severity level for this syslog alarm policy. Choices are: Critical, Major, Minor, and Warning.
    - **Identifier:** Specify the identifier portions of the raise & clear messages.
    - **Raise Regex:** Define the format of a syslog raise message.
    - **Clear Regex:** Define the format of a syslog clear message.

Table 8: Example1

| Identifier  | ID1-ID2                                                |
|-------------|--------------------------------------------------------|
| Raise Regex | ETH_PORT_CHANNEL-5-PORT_DOWN: \$(ID1): \$(ID2) is down |
| Clear Regex | ETH_PORT_CHANNEL-5-PORT_UP: \$(ID1): \$(ID2) is up     |

Table 9: Example2

| Identifier  | ID1-ID2                                                                    |
|-------------|----------------------------------------------------------------------------|
| Raise Regex | ETHPORT-5-IF_SFP_WARNING: Interface \$(ID1), High Rx Power Warning         |
| Clear Regex | ETHPORT-5-IF_SFP_WARNING: Interface \$(ID1), High Rx Power Warning cleared |

**Step 4** Click **OK** to add the policy.

---

## Activating Policies

After you create new alarm policies, activate them.

### Procedure

---

**Step 1** Choose **Monitor > Alarms > Policies**.

**Step 2** Select the policies that you want to activate and then click the **Activate** button.

---

## Deactivating Policies

You can deactivate the active alarm policies.

### Procedure

---

**Step 1** Choose **Monitor > Alarms > Policies**.

**Step 2** Select the policies that you want to deactivate and then click the **Deactivate** button.

---

## Importing Policies

You can create alarm policies using the import functionality.

### Procedure

---

- Step 1** Choose **Monitor > Alarms > Policies** and then click the **Import** button.
  - Step 2** Browse and select the policy file saved on your computer.  
You can only import policies in text format.
- 

## Exporting Policies

You can export the alarm policies into a text file.

### Procedure

---

- Step 1** From the menu bar, choose **Monitor > Alarms > Policies**.
  - Step 2** Click the **Export** button and then select a location on your computer to store the exported file.
- 

## Editing Policies

### Procedure

---

- Step 1** From the menu bar, choose **Monitor > Alarms > Policies**.
  - Step 2** Select the policy that you want to edit.
  - Step 3** Click the **Edit** button and then make necessary changes.
  - Step 4** Click the **OK** button.
- 

## Deleting Policies

### Procedure

---

- Step 1** From the menu bar, choose **Monitor > Alarms > Policies**.
  - Step 2** Select the policy that you want to delete.
  - Step 3** Click the **Delete** button. The policy is deleted.
- 

## Viewing Alarms and Events

You can view the alarms, cleared alarms, and events.

## Procedure

---

**Step 1** Choose **Monitor > Alarms > View**.

**Step 2** Choose any of the following tabs.

- **Alarms:** This tab displays the alarms that are generated for various categories. This tab displays information such as ID (optional), Severity, Failure Source, Name, Category, Acknowledged, Creation Time, Last Updated (optional), Policy, and Message. You can specify the **Refresh Interval** in this tab. You can select one or more alarms and then acknowledge or unacknowledge their status using the **Change Status** drop-down list. In addition, you can select one or more alarms and then click the **Delete** button to delete them.
  - **Cleared Alarms:** This tab displays the cleared alarms. This tab displays information such as ID (optional), Severity, Failure Source, Name, Category, Acknowledged, Creation Time, Cleared At (optional), Cleared By, Policy, and Message. You can select one or more alarms and then click the **Delete** button to delete them.
  - **Events:** This tab displays the events that are generated for the switches. This tab displays information such as **Ack**, **Acknowledged user**, **Group**, **Switch**, **Severity**, **Facility**, **Type**, **Count**, **Last Seen**, and **Description**. You can select one or more events and then acknowledge or unacknowledge their status using the **Change Status** drop-down list. In addition, you can select one or more alarms and then click the **Delete** button to delete them. If you want to delete all events, click the **Delete All** button.
-



## CHAPTER 5

# Configure

---

This chapter contains the following topics:

- [Deploy, on page 49](#)
- [Templates, on page 66](#)
- [Backup, on page 89](#)
- [Image Management, on page 101](#)

## Deploy

The Deploy menu includes the following submenus:

## POAP Launchpad



**Note** These features appear on your Cisco DCNM application only if you have deployed the Cisco DCNM installer in the Unified Fabric mode.

---

The POAP launchpad contains the following configuration steps:

### Procedure

---

- Step 1** Create and manage scopes for POAP creation.
  - Step 2** Set a server for images and configuration files.
  - Step 3** Generate from a template or upload existing configuration.
  - Step 4** Create, Publish, and Deploy Cable Plans.
- 

## Power-On Auto Provisioning (POAP)

Power-On Auto Provisioning (POAP) automates the process of upgrading software images and installing configuration files on Cisco Nexus switches that are being deployed in the network for the first time.

If the AAA authentication is set up before adding switch, "Invalid Credential" error appears during POAP. There is no functional impact. However, it refrains from DCNM receiving accurate POAP. You must update the `poap_dcnm.py` file located in `/var/lib/dcnm/` with the new AAA administrative password, by using the following command:

```
dcnm# python poap_dcnm.py dcnm-info <dcnm-ipaddress> <username> <password>
```

When a Cisco Nexus switch with the POAP feature boots and does not find the startup configuration, the switch enters POAP mode, locates a DHCP server and bootstraps itself with its interface IP address, gateway, and DNS server IP addresses. It also obtains the URL of an SCP server and downloads a configuration script that is run on the switch to download and install the appropriate software image and configuration file.

If the POAP does not complete any configurations, you can refresh the configurations on the device. SSH to Cisco DCNM server and logon. Navigate to the DCNM directory by using the following command:

```
dcnm# cd /var/lib/dcnm/<switch_serial_number>
```

Locate the switch configuration file in the above directory. Refresh the configuration by using the following command:

```
dcnm# sed -i 's/\r//g' <config_file_for_switch>
```


**Note**

When you move the mouse cursor over an error that is identified in a specific parameter in any window, it will display the exact error message before you move to the next screen.

## DHCP Scopes

DHCP scope is a well-defined term in DHCP arena. It is used to define a policy for giving out IP addresses and other options to host on a specific IP subnet. In DCNM, we use the DHCP scope to distribute IPv4 address, PYTHON bootscript, (or other supported protocol + access credential + server) which stores the bootscript.

Choose **Configure > Deploy > POAP**.

The following table details the columns in the display.

**Table 10: DHCP Scopes display fields**

| DHCP Scopes         | Comment                                                                                                                       |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------|
| Scope Name          | The DHCP scope name must be unique among the switch scopes. This name is not used by ISC DHCP but used to identify the scope. |
| Scope Subnet        | The IPv4 subnet used by the DHCP servers.                                                                                     |
| IP Address Range    | The IP address ranges allocated to the POAP switches. Multiple IP addresses can be used, separated by comma.                  |
| Lease Time          | Maximum lease time for the DHCP lease.                                                                                        |
| Default Gateway     | The default gateway for the DHCP scope. Enter a valid IP as the default gateway.                                              |
| Domain Name Servers | The domain name server for the DHCP scope.                                                                                    |
| Bootscript Name     | The Python Bootup script.                                                                                                     |

| DHCP Scopes           | Comment                              |
|-----------------------|--------------------------------------|
| TFTP/Bootsript Server | The server that holds the bootsript. |

### Adding a DHCP Scope

To add a DHCP scope from the Cisco DCNM Web UI, perform the following steps:

#### Procedure

- 
- Step 1** Choose **Configure > Deploy > POAP > DHCP Scopes**.  
The **DCHP Scopes** window is displayed.
  - Step 2** Click **Add** scope icon.
  - Step 3** In the **Add DHCP Scope** window, specify values in the fields according to the information in [Table 10: DCHP Scopes display fields, on page 50](#).
  - Step 4** Click **OK** to add a DHCP scope.
- 

### Editing an existing DHCP Scope



- 
- Note** Once the DCNM is accessed for the first time, you must edit the default scope named **enhanced\_fab\_mgmt** and add free IP address ranges.
- 

To edit an existing DHCP scope from the Cisco DCNM Web UI, perform the following steps:

#### Procedure

- 
- Step 1** Choose **Configure > Deploy > POAP > DHCP Scopes**.
  - Step 2** Use the checkbox to select the DHCP scope.
  - Step 3** Click **Edit** scope icon.
  - Step 4** In the Edit DHCP Scope window, edit the DHCP scopes.
  - Step 5** Click **Apply** to save the changes.
- 

### Deleting a DHCP Scope

To delete a DHCP scope from the Cisco DCNM Web UI, perform the following steps:

#### Procedure

- 
- Step 1** Choose **Configure > Deploy > POAP > DHCP Scopes**.
  - Step 2** Use the checkbox to select the DHCP scope.

**Step 3** Click Delete scope icon.

**Step 4** In the delete notification, click **Yes** to delete the DHCP scope.

**Note** You may click the Refresh icon to refresh the DHCP Scopes list.

## Image and Configuration Servers

The Image and Configuration Servers page allows you to specify the servers and credentials used to access the device images and the uploaded or Cisco DCNM generated or published device configuration. The server that is serving the images could be different from the one serving the configurations. If the same server is serving both images and configurations, you need to specify the server IP address and credentials twice for each server because the root directory holding the images or configuration files could be different. By default, the Cisco DCNM server will be the default image and configuration server. There will be two Cisco DCNM server addresses, one for configuration, one for image.

From the menu bar, choose **Configure > Deploy > POAP**. The Power-On Auto Provisioning (POAP) page appears. Click **Images and Configuration**.

The following table details the columns in the display.

*Table 11: DHCP Scopes display fields*

| Image and Configuration Servers | Description                                  |
|---------------------------------|----------------------------------------------|
| Name                            | Name of the image and configuration server.  |
| URL                             | URL shows where images and files are stored. |
| Username                        | Indicates the username.                      |
| Last Modified                   | Indicates the last modified date.            |

You can add your own image and configuration servers if they are different from the default.

### Add Image or Configuration Server URL

To add an image or a configuration server URL from the Cisco DCNM Web UI, perform the following steps:

#### Procedure

**Step 1** On the Image and Configuration Servers page, click the **Add** icon.

**Step 2** In the **Add Image or Configuration Servers URL** window, specify a name for the image.

**Step 3** Select the **scp** radio button to select the SCP protocol for POAP and Image Management.

**Step 4** Enter Hostname/Ipaddress and Path.

**Step 5** Specify the Username and Password.

**Step 6** Click **OK** to save.

### Editing an Image or Configuration Server URL

To edit an image or a configuration server URL to the repository from the Cisco DCNM Web UI, perform the following steps:

#### Procedure

---

- Step 1** On the Image and Configuration Servers page, select an existing Image and Configuration Server from the list, and click the **Edit** icon.
  - Step 2** In the **Edit Image or Configuration Servers URL** window, edit the required fields.  
The Default\_SCP\_Repository cannot be edited.
  - Step 3** Click **OK** to save or click **Cancel** to discard the changes.
- 

### Deleting an Image or Configuration Server URL

To delete an image or a configuration server URL to the repository from the Cisco DCNM Web UI, perform the following steps:

#### Procedure

---

- Step 1** On the Image and Configuration Servers page, select an existing Image and Configuration Server from the list, and click the **Delete** icon.
- Step 2** In the delete notification, click **Yes** to delete the image and configuration server.

**Note** The default SCP Repository cannot be deleted.

---

### Using the File Browser

The file browser feature enables you to browse through the repository.

To view the files using file browser from the Cisco DCNM Web UI, perform the following steps:

#### Procedure

---

- Step 1** On the Image and Configuration Servers page, select an existing Image and Configuration Server from the list.
  - Step 2** Click the **File Browser** button to see the file in the directory. The File browser pop-up dialog appears.
- 

### Uploading an Image File

To upload an image file from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

- Step 1** On the **Image and Configuration Servers** window, select an existing **Image and Configuration Server** from the list.
  - Step 2** Click the **Image Upload** button.
  - Step 3** Click the **Choose File** button to choose an image file.
  - Step 4** In the **Platform** drop-down list, choose the hardware model name of the managed device. For example, N7K, N9K.
  - Step 5** In the **Type** drop-down list, choose the image type. For example, kickstart, system.
- 

## POAP Templates

Templates can be created or imported into the template builder of DCNM. There are some predefined Fabric specific POAP templates bundled with DCNM. The template builder can be invoked from the GUI, **Configure > Templates > Deploy**. The templates dedicated to POAP will be used to generate many different POAP device configurations

The following icons are listed at the menu bar of the window to customize the view of the information in the window:

- Use the Show Filter icon to filter the templates.
- Use the Print icon to print the list of templates and their details.
- Use the Export icon to export the list of templates to a Microsoft Excel spreadsheet.

This section contains the following:

### Add POAP Template

To add POAP templates from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

- Step 1** Choose **Configure > Deploy > POAP > POAP Definitions**.  
The **POAP Definitions** window is displayed.
- Step 2** In the **Configuration Steps**, click the template hyperlink in the POAP Definitions section.
- Step 3** Click the **Add template** icon.
- Step 4** Specify the **Template Name**, **Template Description**, and **Tags**.
- Step 5** Use the checkbox to specify the Supported Platforms.
- Step 6** Select the template type from the drop-down list.  
By default, CLI template type is selected.
- Step 7** Select the **Published** checkbox if you want the template to have 'Read Only' access.
- Step 8** In the **Template Content** pane, specify the content of the template.

For help on creating the template content, click the **Help** icon next to the Template Content header. For information about POAP template annotations, see the [POAP Template Annotation, on page 56](#) section.

- Step 9** Click **Validate Template Syntax** to validate syntax errors.
  - Step 10** Click **Save** to save the template.
  - Step 11** Click **Save and Exit** to save the template and exit the window.
  - Step 12** Click **Cancel** to discard the template.
- 

## Editing a Template

To edit a template from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

- Step 1** Choose **Configure > Deploy > POAP > POAP Definitions**.
  - Step 2** In the Configuration Steps, click the template hyperlink in the POAP Definitions section.
  - Step 3** Select a template from the list and click the **Modify or View** template icon.
  - Step 4** Edit the template content and click **Save** to save the template or **Save and Exit** to save and exit the screen.
- 

## Cloning a Template

To clone a template from an existing template, from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

- Step 1** Choose **Configure > Deploy > POAP > POAP Definitions**.
  - Step 2** In the Configuration Steps, click the template hyperlink in the POAP Definitions section.
  - Step 3** Select a template from the list and click **Save Template As** icon.
  - Step 4** Edit the template and click **Save** to save the template or **Save and Exit** to save and exit the screen.
- 

## Importing a Template

To import a template from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

- Step 1** Choose **Configure > Deploy > POAP**.
  - Step 2** Under **Configuration Steps**, click the template hyperlink in the **POAP Definitions** section.
  - Step 3** Select a template from the list and click **Import Template**.
  - Step 4** Select the template file and upload.
-

## Exporting a Template

To export a template from the Cisco DCNM Web UI, perform the following steps:

### Procedure

- 
- Step 1** Choose **Configure > Deploy > POAP > POAP Definitions**.
  - Step 2** In the Configuration Steps, click the template hyperlink in the POAP Definitions section.
  - Step 3** Select a template from the list and click **Export** template icon.
  - Step 4** Select a location for the file download.
- 

## Deleting a Template



**Note** Only user-defined templates can be deleted.

To delete a template from the Cisco DCNM Web UI, perform the following steps:

### Procedure

- 
- Step 1** Choose **Configure > Deploy > POAP > POAP Definitions**.
  - Step 2** In the Configuration Steps, click the template hyperlink in the POAP Definitions section.
  - Step 3** Select a template from the list and click **Remove template** icon.
  - Step 4** Click **Yes** to confirm.
- 

## POAP Template Annotation

Annotation is used to add semantic, validation logic and description to the template variable.

The Annotation for a given template variable is required to precede the given template variable. Only one annotation statement is required for each template variable. When a template variable has an associated annotation statement, the template variable has to be declared on a single line, Multiple variables cannot be declared under the same annotation statement.

Format of an annotation statement is as follows:

```
@(<key1>=<value1>,<key2>=<value2>, ..., <keyN>=<valueN>)
```



**Note** Each annotation statement is composed of one or more key-values pair.

- The value can be true, false, or a string.
- If the value is a string, it should be double quoted.

The following is a sample template variable, “hostname”, with annotation statement with the keys “DisplayName”, and “Description”:

```
@(DisplayName="Host Name", Description = "Description of the host")
```

String hostname;

The table displays the supported keys in the annotation statement:

**Table 12: Annotation Keys**

| Key Name                 | Default Value | Description                                                                                                                                                                                                                                |
|--------------------------|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DisplayName              | Empty String  | The value is displayed as a variable label in the template form GUI, on POAP definition screen.                                                                                                                                            |
| Description              | Empty String  | Displays the description next or below the template variable field in the template form GUI.                                                                                                                                               |
| IsManagement             | false         | The associated variable is of IP Address type. This will be used as the management IP address. DCNM used this IP address to manage the devices.                                                                                            |
| IsMultiplicity           | false         | If true, this single value can take multiple values. For example; when it is used with IsManagement annotation, it allows you to type in multiple IP addresses and assign each IP address to a device.                                     |
| IsSwitchName             | false         | The associated variable value is used as the device host name.                                                                                                                                                                             |
| IsMandatory              | true          | It marks the field as mandatory if the value is set as ‘true’.                                                                                                                                                                             |
| UseDNSReverseLookup      | false         | This annotation compliments the IsSwitchName annotation. Once they are associated with a variable. The variable is populated with the reverse DNS name, if available during the creation time of the corresponding POAP definition record. |
| IsFabricPort             | false         | The associated variable value contains a list of the ports used as fabric ports. The variable value will be used by the cable plan generation from POAP                                                                                    |
| IsHostPort               | false         | Trunk ports connected to host/servers.                                                                                                                                                                                                     |
| IsVPCDomainID            | false         | Used as the vPC Domain ID.                                                                                                                                                                                                                 |
| IsVPCPeerLinkSrc         | false         | Used as the VPC IPv4 source address.                                                                                                                                                                                                       |
| IsVPCPeerLinkDst         | false         | Used as the VPC IPv4 peer address.                                                                                                                                                                                                         |
| IsVPCPeerLinkPortChannel | false         | Used for VPC port channel.                                                                                                                                                                                                                 |
| IsVPCLinkPort            | false         | Used for VPC interface.                                                                                                                                                                                                                    |
| IsVPC                    | false         | Used as a VPC record.                                                                                                                                                                                                                      |
| IsVPCID                  | false         | Individual VPC ID.                                                                                                                                                                                                                         |

| Key Name         | Default Value | Description                  |
|------------------|---------------|------------------------------|
| IsVPCPortChannel | false         | Individual VPC port channel. |
| IsVPCPort        | false         | VPC Interface.               |

## POAP Definitions

The POAP switch definition has two major functions:

- Monitoring switch POAP process
- Managing POAP switch configuration

You must copy the Cisco DCNM license files to the `/var/lib/dcnm/license` directory to install as part of the POAP process.

You must also copy the device licenses to the `/var/lib/dcnm/licenses` folder.



**Note** The device licenses refers to the devices monitored by the Cisco DCNM.

The following fields and icons are listed at the menu bar of the window to customize the view of the information in the window:

| Fields and Icons | Description                                                                                                   |
|------------------|---------------------------------------------------------------------------------------------------------------|
| Serial Number    | Specifies the serial number for the switch.                                                                   |
| Switch ID        | Specifies the ID defined for the switch                                                                       |
| Management IP    | Specifies the Management IP for the switch.                                                                   |
| Status           |                                                                                                               |
| Switch Status    | Indicates if the switch is published or not.                                                                  |
| Publish Status   | Indicates if this POAP template has been published successfully to the TFTP site.                             |
| Bootscrip Status | Indicates the Bootscrip execution state when the device executed POAP. For details, view the “Boot Log” file. |

| Fields and Icons            | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Diff State                  | <p>Specifies if the configuration defined in POAP is different from the running configuration on the device. If a difference is detected, the user has an option to make changes to the device configuration, thereby ensuring that the configuration on the device is sync with the POAP configuration. The different states are:</p> <ul style="list-style-type: none"> <li>• NA—Specifies that no POAP definition is configured on DCNM for the particular device; therefore, no difference computation can be made.</li> <li>• Diff Detected—Specifies that few configuration differences are detected between POAP definition in DCNM and the running configuration on the switch. You can review the difference statements and choose the commands to deploy to the device, and synchronize the running configuration with the POAP definition.</li> <li>• No Diff Detected—Specifies that there was no configuration diff perceived between POAP definition and the running configuration on the switch.</li> <li>• Error—Specifies that an error has occurred during diff computation. Refer to the logs to troubleshoot the issue.</li> </ul> |
| Model                       | Specifies the model of the switch.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Template Config File Name   | <p>Specifies the template used for creating the POAP definition. Fabric and IPFabric POAP templates are available.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Bootscrip Last Updated Time | Specifies the last updated time for bootscrip.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Last Published              | Specifies the last published time for the POAP definition.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| POAP Creation Time          | Specifies the time when the POAP definition was created.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| System Image                | Specifies the System Image used while creating the POAP definition.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Kickstart Image             | Specifies the kickstart image used the POAP definition.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Icons                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Add                         | Allows you to add a POAP definition. For more information, see <a href="#">Creating a POAP Definition, on page 60</a> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

| Fields and Icons       | Description                                                                                                                                                    |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Edit                   | Allows you to edit a POAP definition. For more information, see <a href="#">Editing a POAP Definition, on page 62</a> .                                        |
| Delete                 | Allows you to delete a POAP definition. For more information, see <a href="#">Deleting POAP Definitions, on page 62</a> .                                      |
| Write Erase and Reload | Allows you to reboot and reload a POAP definition. For more information, see <a href="#">Write, Erase, and Reload the POAP Switch Definition, on page 63</a> . |
| Change Image           | Allows you to change the image for the defined POAP definition. For more information, see <a href="#">Change Image, on page 63</a> .                           |
| Boot Log               | Display the list and view log files from the device bootflash.                                                                                                 |
| Update Serial Number   | Allows the user to modify the serial number of the POAP definition.                                                                                            |
| Refresh Switch         | Refreshes the list of switches.                                                                                                                                |
| Refresh Diff State     | Refreshes the Diff state.                                                                                                                                      |
| Show Filter            | Filters list of switches based on the defined value for each column.                                                                                           |
| Print                  | Prints the list of devices and their details.                                                                                                                  |
| Export                 | Exports the list of devices and their details to a Microsoft Excel spreadsheet.                                                                                |
| Select Columns         | Displays the columns to be displayed. You can choose to show/hide a column.                                                                                    |



**Note** Each annotation statement is composed of one or more key-values pair. The value can be true, false or a string. If the value is a string, it should be mentioned in double-quotes.

This section contains the following:

### Creating a POAP Definition

To create a POAP definition from the Cisco DCNM Web UI, perform the following steps:

#### Procedure

**Step 1** Choose **Configure > Deploy > POAP > POAP Definitions**.

- Step 2** From the **Scope** drop-down list, select the scope for POAP definition.
- Step 3** Click **Add** to add a new POAP definition.
- Step 4** Click **Generate Definition** radio button to generate POAP definition from a template, and click **Next** to specify the switch details.
- Step 5** Enter the serial number of switches that are separated by comma. Alternatively, you can click **Import from CSV File** to import the list of switches.
- Note** The serial number cannot be changed after you create the POAP definition. Verify that the serial numbers do not contain spaces, the POAP will not work otherwise.
- Step 6** Use the drop-down list to select the Switch Type.
- Step 7** Use the drop-down list to select the Image Server.
- Step 8** Use the drop-down list to select the System Image and Kickstart image.
- Step 9** Specify the Switch Username and Switch Password.
- Step 10** Click **Next** to Select the Switch Config Template.
- Step 11** Use the drop-down to select the Template and click View to specify the Template Parameters.
- Step 12** Enter Template Parameters.
- Step 13** From the **Settings File** drop-down list to select the file. If the settings file is unavailable, click **Save Parameter** as New Settings File button to specify a name for the settings file.
- Step 14** Select the variables and click **Manage**.
- Step 15** Click **Add** to see the variables to be saved.  
Specify a name for the settings file and click **Save**.
- Step 16** Click **Manage** to modify the settings file parameters.
- Step 17** Click **Preview CLI** to view the generated configuration.
- Step 18** Click **Finish** to publish the POAP definition.
- Step 19** Click **Next** to generate the configuration.
- 

## Uploading a POAP Definition

To upload a POAP definition from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

- Step 1** Choose **Configure > Deploy > POAP > POAP Definitions**.
- Step 2** Click **Upload Startup Config** radio button to upload startup configuration to the POAP repository Server, and click **Next** to enter the switch details.
- Step 3** Enter the serial number of switches separated by comma.
- Step 4** Use the drop-down to select the Switch Type.
- Step 5** Use the drop-down to select the Image Server.
- Step 6** Use the drop-down to select the System Image and Kickstart Image.
- Step 7** Specify the Switch User Name and Password.
- Step 8** Click **Browse** to select the upload configuration file.

**Step 9** Click **Finish** to publish the POAP definition.

---

## Editing a POAP Definition

To edit a POAP definition from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

**Step 1** Choose **Configure > Deploy > POAP > POAP Definitions**.

**Step 2** Select the POAP switch definitions from the list and click the **Edit** icon.

**Step 3** Follow the steps listed in [Creating a POAP Definition, on page 60](#) and [Uploading a POAP Definition, on page 61](#) sections.

**Note** You can select multiple POAP definitions with similar parameters to edit POAP definition.

---

## Deleting POAP Definitions

To delete POAP definitions from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

**Step 1** Choose **Configure > Deploy > POAP > POAP Definitions**.

**Step 2** Select the POAP switch definitions from the list and click **Delete** icon.

**Step 3** Click **Yes** to delete the switch definitions.

A prompt appears to delete the device from the data source. Check or uncheck the checkbox based if you want to delete the switches associated with the POAP Definition.

**Step 4** Click **OK** to confirm to delete the device. Based on the check box, the device will be deleted from the data source also.

---

## Publishing POAP Definitions

### Procedure

---

**Step 1** Choose **Configure > Deploy > POAP > POAP Definitions**.

**Step 2** Select the POAP switch definitions from the list and click **Publish**.

**Step 3** Click **Yes** to publish the switch definitions.

---

## Write, Erase, and Reload the POAP Switch Definition

To write, erase, and reload the POAP switch definition from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

- Step 1** Choose **Configure > Deploy > POAP > POAP Definitions**.
- Step 2** Select the POAP switch definitions from the list and click the **Edit** icon.
- Step 3** Click **Write Erase and Reload**.

The **Write, Erase, and Reload** works only when the selected switches are listed in the **Inventory > Discovery > LAN Switches** window. Also, valid credentials must be specified in the **Configure > Credentials Management > LAN Credentials** window.

- Step 4** Click **Continue** to reboot and reload the switch definitions.
- 

## Change Image

To change image from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

- Step 1** Choose **Configure > Deploy > POAP > POAP Definitions**.
- Step 2** Select the POAP switch definitions from the list and click the **Edit** icon.
- Step 3** Select the switch for which you must change the image. Click **Change Image**.

**Note** You can select multiple POAP definitions with similar parameters to change the image for booting the device.

The **Multi Device Image Change** window is displayed.

- Step 4** From the **Image Server** drop-down list, select the server where the new image is stored.
  - Step 5** From the **System Image** drop-down list, select the new system image.
  - Step 6** From the **Kickstart Image** drop-down list, select the new image which replaces the old image.
  - Step 7** Click **OK** to apply and change the image.
- 

## Updating the Serial Number of a Switch for an Existing POAP Definition

To update the serial number of a switch when performing an RMA from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

- Step 1** Ensure that the old switch is in place with POAP definition and discovered.
- Step 2** Manually update the serial number in Cisco DCNM on the POAP screen.

**Note** This button may be hidden underneath a >> button.

Now, two devices in Cisco DCNM have the same IP address.

**Step 3** Physically remove the old switch from the network.

**Step 4** Place the new switch in the rack and connect network cables and power. Bring up the new switch. The new switch reboots several times so that it comes up with necessary configurations.

**Step 5** Manually rediscover the switches in Cisco DCNM.

There is one device in Cisco DCNM with the same IP address.

## Cable Plan



**Note** If you are generating POAP definitions from the uploaded configuration, then generation of cable plan using the option of “Generate Cable Plan from POAP definition” will not work as the POAP definitions that are generated from the uploaded configuration will not have the required meta-data to generate the cable plans. You must select either “Capture from Existing Deployment” or “Import Cable plan file” to create a cable plan.

The Cable plan configuration screen has the following options:

### Create a Cable Plan

To create a cable plan from the Cisco DCNM Web UI, perform the following steps:

#### Procedure

**Step 1** Choose **Configure > Deploy > POAP > Cable Plan**.

**Step 2** Click **Create Cable Plan**.

In the Create Cable Plan pop-up, use the radio button to select the options.

**Step 3** If you select:

- a) **Capture from existing deployment:** You can ascertain the Inter-Switch Links between existing switches that are managed by DCNM and “lock down” the cable plan based on the existing wiring.
- b) **Import Cable Plan File:** You decide how to wire the switches (or how they are already wired) and select an XML file for import into DCNM.

### Viewing an Existing Cable Plan Deployment

To view the existing cable plan deployment from the Cisco DCNM Web UI, perform the following steps:

#### Procedure

**Step 1** Choose **Configure > Deploy > POAP > Cable Plan**.

- Step 2** Click **View**.
  - Step 3** In the **Cable Plan – Existing\_Deployment** window, you can view the existing cable plan deployments.
  - Step 4** You can use the **Table View** and **XML View** icons to change the view of the cable plan deployments table.
- 

### Deleting a Cable Plan

To delete a cable plan from the Cisco DCNM Web UI, perform the following steps:

#### Procedure

---

- Step 1** Choose **Configure > Deploy > POAP > Cable Plan**.
  - Step 2** Click **Delete** icon.
  - Step 3** Click **Yes** to confirm deletion.
- 

### Deploying a Cable Plan

To deploy a cable plan from the Cisco DCNM Web UI, perform the following steps:

#### Procedure

---

- Step 1** Choose **Configure > Deploy > POAP > Cable Plan**.
  - Step 2** In the Switches table, use the checkbox to select the cable plan and click **Deploy a Cable Plan**.
  - Step 3** Click **Yes** to confirm deployment.
- 

### Revoking a Cable Plan

#### Procedure

---

- Step 1** Choose **Configure > Deploy > POAP > Cable Plan**.
  - Step 2** In the Switches table, use the check box to select cable plans, and click **Revoke a Cable Plan**.
  - Step 3** Click **Yes** to confirm.
- 

### Viewing a Deployed Cable Plan from Device

To view the deployed cable plan from a device from the Cisco DCNM Web UI, perform the following steps:

#### Procedure

---

- Step 1** Choose **Configure > Deploy > POAP > Cable Plan**.

- Step 2** In the Switches table, click **In Sync** or **Out of Sync** hyperlink in the cable plan status column.
- Step 3** You can use the **Table View** and **XML View** icons to change the view of the cable plan table.

## Templates

The **Templates** menu includes the following option:

### Template Library

**Template Library** includes the following tabs:

### Template Library

You can add, edit, or delete templates that are configured across different Cisco Nexus and Cisco MDS platforms using Cisco DCNM Web client. From Cisco DCNM Web client home page, choose **Configure > Templates > Template Library > Templates**. The following parameters are displayed for each template that is configured on Cisco DCNM Web client. Templates support JavaScript. You can use the JavaScript function in a template to perform arithmetic operations and string manipulations in the template syntax.

The following table describes the fields that appear on this page.

**Table 13: Templates Operations**

| Field                      | Description                                                                                                                                                                                                   |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Add Template               | Allows you to add a new template.                                                                                                                                                                             |
| Launch job creation wizard | Allows you to create jobs.                                                                                                                                                                                    |
| Modify/View Template       | Allows you to view the template definition and modify as required.                                                                                                                                            |
| Save Template As           | Allows you to save the selected template in a different name. You can edit the template as required.                                                                                                          |
| Delete Template            | Allows you to delete a template                                                                                                                                                                               |
| Import Template            | Allows you to import a template from your local directory, one at a time.                                                                                                                                     |
| Export template            | Allows you to export the template configuration to a local directory location.                                                                                                                                |
| Import Template Zip File   | Allows you to import .zip file, that contains more than one template that is bundled in a .zip format<br><br>All the templates in the ZIP file are extracted and listed in the table as individual templates. |

Table 14: Template Properties

| Field                 | Description                                                                                                                                                                                         |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Template Name         | Displays the name of the configured template.                                                                                                                                                       |
| Template Description  | Displays the description that is provided while configuring templates.                                                                                                                              |
| Tags                  | Displays the tag that is assigned for the template and aids to filter templates based on the tags.                                                                                                  |
| Implements            | Displays the abstract template to be implemented.                                                                                                                                                   |
| Dependencies          | Specifies the specific feature of a switch.                                                                                                                                                         |
| Supported Platforms   | Displays the supported Cisco Nexus platforms compatible with the template. Check the check box of platforms that are supported with the template.<br><b>Note</b> You can select multiple platforms. |
| Template Type         | Displays the type of the template.                                                                                                                                                                  |
| Template Sub Type     | Specifies the sub type that is associated with the template.                                                                                                                                        |
| Template Content Type | Specifies if it is Jython or Template CLI.                                                                                                                                                          |
| Published             | Specifies if the template is published or not.                                                                                                                                                      |
| Imports               | Specifies the base template for importing.                                                                                                                                                          |

In addition, from the menu bar, choose **Configure > Templates > Template Library > Templates** and you can also:

- Click **Show Filter** to filter the templates that is based on the headers.
- Click **Print** to print the list of templates.
- Click **Export to Excel** to export the list of template to a Microsoft Excel spreadsheet.

This section contains the following:

## Template Structure

The configuration template content mainly consists of four parts. Click the **Help** icon next to the **Template Content** for information about editing the content of the template.

This section contains the following:

### Template Format

This section describes the basic information of the template. The possible fields are as detailed in the table below.

| Property Name      | Description                                                                                            | Valid Values                                                                                                                                                       | Optional? |
|--------------------|--------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| name               | The name of the template                                                                               | Text                                                                                                                                                               | No        |
| description        | Brief description about the template                                                                   | Text                                                                                                                                                               | Yes       |
| userDefined        | Indicates whether the user created the template. Value is 'true' if user created.                      | "true" or "false"                                                                                                                                                  | Yes       |
| supportedPlatforms | List of device platforms supports this configuration template. Specify 'All' to support all platforms. | N1K, N3K, N3500, N4K, N5K, N5500, N5600, N6K, N7K, N9K, MDS, VDC, N9K-9000v, All list separated by comma.                                                          | No        |
| templateType       | Specifies the type of Template used.                                                                   | <ul style="list-style-type: none"> <li>• CLI</li> <li>• POAP</li> <li>• POLICY</li> <li>• SHOW</li> <li>• PROFILE</li> <li>• FABRIC</li> <li>• ABSTRACT</li> </ul> | Yes       |

| Property Name   | Description                                          | Valid Values | Optional? |
|-----------------|------------------------------------------------------|--------------|-----------|
| templateSubType | Specifies the sub type associated with the template. |              |           |

| Property Name | Description | Valid Values                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Optional? |
|---------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|               |             | <ul style="list-style-type: none"> <li>• CLI               <ul style="list-style-type: none"> <li>• N/A</li> </ul> </li> <li>• POAP               <ul style="list-style-type: none"> <li>• N/A</li> <li>• VXLAN</li> <li>• FABRICPATH</li> <li>• VLAN</li> <li>• PMN</li> </ul> </li> <li>• POLICY               <ul style="list-style-type: none"> <li>• VLAN</li> <li>• INTERFACE_VLAN</li> <li>• INTERFACE_ETHERNET</li> <li>• INTERFACE_BD</li> <li>• INTERFACE_PORT_CHANNEL</li> <li>• INTERFACE_FC</li> <li>• INTERFACE_MGMT</li> <li>• INTERFACE_LOOPBACK</li> <li>• INTERFACE_NVE</li> <li>• INTERFACE_VFC</li> <li>• INTERFACE_SANPORT_CHANNEL</li> <li>• DEVICE</li> <li>• FEX</li> <li>• INTERFACE</li> </ul> </li> <li>• SHOW               <ul style="list-style-type: none"> <li>• VLAN</li> <li>• INTERFACE_VLAN</li> <li>• INTERFACE_VPC</li> <li>• INTERFACE_ETHERNET</li> <li>• INTERFACE_BD</li> <li>• INTERFACE_PORT_CHANNEL</li> </ul> </li> </ul> |           |

| Property Name | Description | Valid Values                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Optional? |
|---------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|               |             | <ul style="list-style-type: none"> <li>• INTERFACE_FC</li> <li>• INTERFACE_MGMT</li> <li>• INTERFACE_LOOPBACK</li> <li>• INTERFACE_NVE</li> <li>• INTERFACE_VFC</li> <li>• INTERFACE_PORT_CHANNEL</li> <li>• DEVICE</li> <li>• FEX</li> <li>• INTERFACE</li> <br/> <li>• PROFILE                             <ul style="list-style-type: none"> <li>• VXLAN</li> </ul> </li> <br/> <li>• FABRIC                             <ul style="list-style-type: none"> <li>• NA</li> </ul> </li> <br/> <li>• ABSTRACT                             <ul style="list-style-type: none"> <li>• VLAN</li> <li>• INTERFACE_VLAN</li> <li>• INTERFACE_VPC</li> <li>• INTERFACE_ETHERNET</li> <li>• INTERFACE_BD</li> <li>• INTERFACE_PORT_CHANNEL</li> <li>• INTERFACE_FC</li> <li>• INTERFACE_MGMT</li> <li>• INTERFACE_LOOPBACK</li> <li>• INTERFACE_NVE</li> <li>• INTERFACE_VFC</li> <li>• INTERFACE_PORT_CHANNEL</li> <li>• DEVICE</li> <li>• FEX</li> <li>• INTERFACE</li> </ul> </li> </ul> |           |

| Property Name | Description                                                      | Valid Values                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Optional? |
|---------------|------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| contentType   |                                                                  | <ul style="list-style-type: none"> <li>• CLI               <ul style="list-style-type: none"> <li>• TEMPLATE_CLI</li> </ul> </li> <li>• POAP               <ul style="list-style-type: none"> <li>• TEMPLATE_CLI</li> </ul> </li> <li>• POLICY               <ul style="list-style-type: none"> <li>• TEMPLATE_CLI</li> </ul> </li> <li>• PYTHON</li> <li>• SHOW               <ul style="list-style-type: none"> <li>• TEMPLATE_CLI</li> </ul> </li> <li>• PROFILE               <ul style="list-style-type: none"> <li>• TEMPLATE_CLI</li> <li>• PYTHON</li> </ul> </li> <li>• FABRIC               <ul style="list-style-type: none"> <li>• PYTHON</li> </ul> </li> <li>• ABSTRACT               <ul style="list-style-type: none"> <li>• TEMPLATE_CLI</li> <li>• PYTHON</li> </ul> </li> </ul> | Yes       |
| implements    | Used to implement the abstract template.                         | Text                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Yes       |
| dependencies  | Used to select the specific feature of a switch.                 | Text                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Yes       |
| published     | Used to Mark the template as read only and avoids changes to it. | “true” or “false”                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Yes       |
| timestamp     | Shows the template modified time                                 | Modified date and time in the format YYYY-MM-DD HH:MM:SS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Yes       |

### Template Variables

This section contains declared variables, the data type, default values, and valid values conditions for the parameters that are used in the template. These declared variables are used for value substitution in the template content section during the dynamic command generation process. Also these variables are used in decision

making and in iteration blocks in the template content section. Variables have predefined data types. You can also add a description about the variable. The following table describes the syntax and usage for the available datatypes.

| Variable Type          | Valid Value                                                                                            | Iterative? |
|------------------------|--------------------------------------------------------------------------------------------------------|------------|
| boolean                | true false                                                                                             | No         |
| enum                   | Example: running-config, startup-config                                                                | No         |
| float                  | Floating number format                                                                                 | No         |
| floatRange             | Example: 10.1,50.01                                                                                    | Yes        |
| Integer                | Any number                                                                                             | No         |
| integerRange           | Contiguous numbers separated by “-”<br>Discrete numbers separated by “,”<br><br>Example: 1-10,15,18,20 | Yes        |
| interface              | Format: <if type><slot>[/<sub slot>]/<port><br><br>Example: eth1/1, fa10/1/2 etc.                      | No         |
| interfaceRange         | Example: eth10/1/20-25, eth11/1-5                                                                      | Yes        |
| ipAddress              | IPv4 OR IPv6 address                                                                                   | No         |
| ipAddressList          | Example: 172.22.31.97, 172.22.31.99,<br>172.22.31.105, 172.22.31.109                                   | Yes        |
| ipAddressWithoutPrefix | Example: 192.168.1.1<br><br>or<br><br>Example: 1:2:3:4:5:6:7:8                                         | No         |
| ipAddress[]            | Example: {192.168.1.1, 192.168.1.2, 10.1.1.1}                                                          | Yes        |
| ipV4Address            | IPv4 address                                                                                           | No         |
| ipV4AddressWithSubnet  | Example: 192.168.1.1/24                                                                                | No         |
| ipV6Address            | IPv6 address                                                                                           | No         |
| ipV6AddressWithPrefix  | Example: 1:2:3:4:5:6:7:8<br><br>22                                                                     | No         |
| ipV6AddressWithSubnet  | IPv6 Address with Subnet                                                                               | No         |
| ISISNetAddress         | Example: 49.0001.00a0.c96b.c490.00                                                                     | No         |

| Variable Type                                    | Valid Value                                            | Iterative? |
|--------------------------------------------------|--------------------------------------------------------|------------|
| macAddress                                       | 14 or 17 character length MAC address format           | No         |
| string                                           | Free text<br><br>Example: Description for the variable | No         |
| string[]                                         | Example: {a,b,c,str1,str2}                             | Yes        |
| wwn<br>(Available only in Cisco DCNM Web Client) | Example: 20:01:00:08:02:11:05:03                       | No         |

### Variable Meta Property

Each variable that is defined in the template variable section has a set of meta properties. The meta properties are mainly the validation rules that are defined for the variable.

The following table describes the various meta properties applicable for the available variable types.

| Variable Type | Description                                               | Variable Meta Property |              |                |     |     |          |          |          |          |            |            |              |
|---------------|-----------------------------------------------------------|------------------------|--------------|----------------|-----|-----|----------|----------|----------|----------|------------|------------|--------------|
|               |                                                           | default Value          | valid Values | decimal Length | min | max | min Slot | max Slot | min Port | max Port | min Length | max Length | regular Expr |
| boolean       | A boolean value.<br><br>Example: true                     | Yes                    |              |                |     |     |          |          |          |          |            |            |              |
| enum          |                                                           |                        | Yes          |                |     |     |          |          |          |          |            |            |              |
| float         | signed real number.<br><br>Example: 75.56, -8.5           | Yes                    | Yes          | Yes            | Yes | Yes |          |          |          |          |            |            |              |
| intRange      | range of signed real numbers<br><br>Example: 50.5 - 54.75 | Yes                    | Yes          | Yes            | Yes | Yes |          |          |          |          |            |            |              |

| Variable Type | Description                                                                                                                  | Variable Meta Property |              |                |     |     |          |          |          |          |            |            |              |
|---------------|------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------|----------------|-----|-----|----------|----------|----------|----------|------------|------------|--------------|
|               |                                                                                                                              | default Value          | valid Values | decimal Length | min | max | min Slot | max Slot | min Port | max Port | min Length | max Length | regular Expr |
| integer       | signed number<br><br>Example:<br>50,<br>-75                                                                                  | Yes                    | Yes          |                | Yes | Yes |          |          |          |          |            |            |              |
| intRange      | Range of signed numbers<br><br>Example:<br>50-65                                                                             | Yes                    | Yes          |                | Yes | Yes |          |          |          |          |            |            |              |
| interface     | specifies interface<br><br>Example:<br>Ethernet<br>5/10                                                                      | Yes                    | Yes          |                |     |     | Yes      | Yes      | Yes      | Yes      |            |            |              |
| intRange      |                                                                                                                              | Yes                    | Yes          |                |     |     | Yes      | Yes      | Yes      | Yes      |            |            |              |
| ipAdRes       | IP address in IPv4 or IPv6 format                                                                                            | Yes                    |              |                |     |     |          |          |          |          |            |            |              |
| ipAdList      | Example:<br>192.102.1,<br>172.16.10.1<br><br><b>Note</b><br>Separate the addresses in the list using commas and not hyphens. | Yes                    |              |                |     |     |          |          |          |          |            |            |              |

| Variable Type      | Description                                    | Variable Meta Property |              |                |     |     |          |          |          |          |            |            |              |
|--------------------|------------------------------------------------|------------------------|--------------|----------------|-----|-----|----------|----------|----------|----------|------------|------------|--------------|
|                    |                                                | default Value          | valid Values | decimal Length | min | max | min Slot | max Slot | min Port | max Port | min Length | max Length | regular Expr |
| <del>ipAd</del>    | IPv4 or IPv6 Address (does not require prefix) |                        |              |                |     |     |          |          |          |          |            |            |              |
| <del>ipAdes]</del> | List of IP addresses separated by a comma (,)  | Yes                    |              |                |     |     |          |          |          |          |            |            |              |
| <del>ip4Adis</del> | IPv4 address                                   | Yes                    |              |                |     |     |          |          |          |          |            |            |              |
| <del>ip4Adis</del> | IPv4 Address with Subnet                       | Yes                    |              |                |     |     |          |          |          |          |            |            |              |
| <del>ip6Adis</del> | IPv6 address                                   | Yes                    |              |                |     |     |          |          |          |          |            |            |              |
| <del>ip6Adis</del> | IPv6 Address with prefix                       | Yes                    |              |                |     |     |          |          |          |          |            |            |              |
| <del>ip6Adis</del> | IPv6 Address with Subnet                       | Yes                    |              |                |     |     |          |          |          |          |            |            |              |
| <del>ip6Adis</del> | Example:<br>4008:6600                          |                        |              |                |     |     |          |          |          |          |            |            |              |
| long               | Example:<br>100                                | Yes                    |              |                | Yes | Yes |          |          |          |          |            |            |              |
| <del>macAdis</del> | MAC address                                    |                        |              |                |     |     |          |          |          |          |            |            |              |

| Variable Type | Description                                                                                                                                                                                                                                                                     | Variable Meta Property |              |                |     |     |          |          |          |          |            |            |              |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------|----------------|-----|-----|----------|----------|----------|----------|------------|------------|--------------|
|               |                                                                                                                                                                                                                                                                                 | default Value          | valid Values | decimal Length | min | max | min Slot | max Slot | min Port | max Port | min Length | max Length | regular Expr |
| string        | literal string                                                                                                                                                                                                                                                                  | Yes                    |              |                |     |     |          |          |          |          | Yes        | Yes        | Yes          |
| string[]      | string literals that are separated by a comma (,) Example: (string1, string2)                                                                                                                                                                                                   | Yes                    |              |                |     |     |          |          |          |          |            |            |              |
| struct        | Set of parameters that are bundled under a single variable.<br><br>struct<br><br><structure name declaration<br>> {<br><parameter type><br><br><parameter 1>;<br><parameter type><br><br><parameter 2>;<br>...<br>}<br>{<struct1><br>[,<br><struct2><br>[,<br><struct3><br>[]>; |                        |              |                |     |     |          |          |          |          |            |            |              |

| Variable Type | Description | Variable Meta Property |              |                |     |     |          |          |          |          |            |            |              |
|---------------|-------------|------------------------|--------------|----------------|-----|-----|----------|----------|----------|----------|------------|------------|--------------|
|               |             | default Value          | valid Values | decimal Length | min | max | min Slot | max Slot | min Port | max Port | min Length | max Length | regular Expr |
| wwn           | WWN address |                        |              |                |     |     |          |          |          |          |            |            |              |

### Example: Meta Property Usage

```

##template variables

integer VLAN_ID {
 min = 100;
 max= 200;
};

string USER_NAME {
 defaultValue = admin123;
 minLength = 5;
};

struct interface_a{
 string inf_name;
 string inf_description;
 ipAddress inf_host;
 enum duplex {
 validValues = auto, full, half;
 };
}myInterface;

##

```

### Variable Annotation

You can configure the variable properties marking the variables using annotations.



**Note** Variable Annotations are available for POAP only. However, the annotations do not impact on the template type 'CLI'.

The following annotations can be used in the template variable section.

| Annotation Key | Valid Values                                                         |
|----------------|----------------------------------------------------------------------|
| DataDepend     | Text                                                                 |
| Description    | Text                                                                 |
| DisplayName    | Text<br><b>Note</b> Enclose the text with quotes, if there is space. |
| IsAlphaNumeric | "true" or "false"                                                    |
| IsDeviceID     | "true" or "false"                                                    |

| Annotation Key | Valid Values                                                                                   |
|----------------|------------------------------------------------------------------------------------------------|
| IsGateway      | “true” or “false”                                                                              |
| IsInternal     | “true” or “false”                                                                              |
| IsManagementIP | “true” or “false”<br><b>Note</b> This annotation must be marked only for variable “ipAddress”. |
| IsMandatory    | “true” or “false”                                                                              |
| IsMultiplicity | “true” or “false”                                                                              |
| IsPositive     | “true” or “false”                                                                              |
| Password       | Text                                                                                           |
| UsePool        | “true” or “false”                                                                              |
| Username       | Text                                                                                           |

### Example: Variable Annotation

```
##template variables
@(DisplayName="Host Name", Description = "Description of the host")
String hostname;
@(DisplayName="Host Address", Description = " test description" IsManagementIP=true)
IPAddress hostAddress;
##
```

### Example: IsMandatory Annotation

```
##template variables
@(IsMandatory="ipv6!=null")
ipV4Address ipv4;
@(IsMandatory="ipv4!=null")
ipV6Address ipv6;
##
```

### IsShowAnnotation

```
##template variables
boolean isVlan;
@(IsShow="isVlan==true")
integer vlanNo;
##
```

## Templates Content

This section includes the configuration commands and any parameters that you want to include in the template. These commands can include the variables declared in the template variables section. During the command generation process the variable values are substituted appropriately in the template content.



**Note** You must specify the commands that you include as if you were entering them in the global configuration command mode on any device. You must consider the command mode when you include commands.

Template content is governed by the usage of variables.

- **Scalar variables**—does not take a range or array of values which cannot be used for iteration (In the variable types table those marked iterate-able as 'No'). Scalar variables must be defined inside the template content.

Syntax: \$\$<variable name>\$\$

Example: \$\$USER\_NAME\$\$

- **Iterative variables**—used for block iteration. These loop variable must be accessed as shown below inside the iteration block.

Syntax:@<loop variable>

Example:

```
foreach val in $$INTEGER_RANGE_VALUE$$ {
@val
}
```

- **Scalar Structure Variable**—Structure member variables can be accessed inside the template content.

Syntax: \$\$<structure instance name>.<member variable name>\$\$

Example: \$\$myInterface.inf\_name\$\$

- **Array Structure Variable**—Structure member variables can be accessed inside the template content.

Syntax: \$\$<structure instance name>.<member variable name>\$\$

Example: \$\$myInterface.inf\_name\$\$

In addition to the template variables, you can use the conditional and iterative command generation using the following statements:

- **if-else if-else Statement**—makes a logical decision in inclusion/exclusion of set of configuration command based on the value assigned for the variable in it.

```
Syntax: if(<operand 1> <logical operator> <operand 2>){
command1 ..
command2..
..
}
else if (<operand 3> <logical operator> <operand 4>)
{
Command3 ..
Command4..
..
}
else
{
Command5 ..
Command6..
..
}
}
```

Example: if-else if-else statement

```
if($$USER_NAME$$ == 'admin'){
```

```

Interface2/10
no shut
}
else {
Interface2/10
shut
}

```

- **foreach Statement**—used for iterating a block of commands. The iteration is performed based on the assigned loop variable value.

```

Syntax:
foreach <loop index variable> in $$<loop variable>$$ {
@<loop index variable> ..
}
Example: foreach Statement
foreach ports in $$MY_INF_RANGE$$ {
interface @ports
no shut
}

```

- **Optional parameters**—By default all parameters are mandatory. To make a parameter optional, you must annotate the parameter.

In the variable section, you can include the following command:

- **@(IsMandatory=false)**
- **Integer frequency;**

In the template content section, a command can be excluded or included without using “if” condition check, by assigning a value to the parameter. The optional command can be framed as below:

- **probe icmp [frequency frequency-value] [timeout seconds] [retry-count retry-count-value]**

## Advanced Features

The following are the advanced features available to configure templates.

- **Assignment Operation**

Config template supports assignment of variable values inside the template content section. The values are validated for the declared data type of the variable. If there is a mismatch, the value is not assigned.

Assignment operation can be used under the following guidelines:

- The operator on the left must be any of the template parameters or a for loop parameter.
- The operator on the right values can be any of the values from template parameters, for loop parameters, literal string values surrounded by quotes or simple string values.

If a statement does not follow these guidelines, or if it does not suit this format, it will not be considered as assignment operation. It is substituted during command generation like other normal lines.

```

Example: Template with assignment operation
##template properties
name =vlan creation;
userDefined= true;
supportedPlatforms = All;
templateType = CLI;

```

```

published = false;
##
##template variables
integerRange vlan_range;
@(internal=true)
integer vlanName;
##
##template content
foreach vlanID in $$vlan_range$$ {
vlan @vlanID
$$vlanName$$=@vlanID
name myvlan$$vlanName$$
}
##

```

- Evaluate methods

Config template uses the Java runtime provided Java script environment to perform arithmetic operations (such as ADD, SUBTRACT, and so on), string manipulations, and so on.

Locate the javascript file in the template repository path. This file contains primary set of arithmetic, string functions. You can also add custom Javascript methods.

These methods can be called from config template content section in below format:

```

Example1:
$$somevar$$ = evalscript(add, "100", $$anothervar$$)

```

Also the *evalscript* can be called inside if conditions as below:

```

if($$range$$ > evalscript(sum, $$vlan_id$$, -10)){
do something...
}

```

You can call a method that is located at the backend of the Java script file.

- Dynamic decision

Config template provides a special internal variable “LAST\_CMD\_RESPONSE”. This variable stores the last command response from the device during the execution of the command. This can be used in the config template content to make dynamic decisions to deliver the commands that are based on the device condition.




---

**Note** The if block must be followed by an else block in a new line, which can be empty.

---

An example use case to create a VLAN, if it does not exist on the device.

```

Example: Create VLAN
##template content
show vlan id $$vlan_id$$
if($$LAST_CMD_RESPONSE$$ contains "not found"){
vlan $$vlan_id$$
}
else{
}
##

```

This special implicit variable can be used only in the “IF” blocks.

- Template referencing

You can have a base template with all the variables defined. This base template can be imported to multiple templates. The base template content is substituted in the appropriate place of the extending template. The imported template parameters and the contents can be accessed inside the extending template.

```
Example: Template Referencing
Base template:
##template properties
 name =a vlan base;
 userDefined= true;
 supportedPlatforms = All;
 templateType = CLI;
 published = false;
 timestamp = 2015-07-14 16:07:52;
 imports = ;
##
##template variables
 integer vlan_id;
##
##template content
 vlan $$vlan_id$$
##

Derived Template:
##template properties
 name =a vlan extended;
 userDefined= true;
 supportedPlatforms = All;
 templateType = CLI;
 published = false;
 timestamp = 2015-07-14 16:07:52;
 imports = a vlan base,template2;
##
##template variables
 interface vlanInterface;
##
##template content
 <substitute a vlan base>
 interface $$vlanInterface$$
 <substitute a vlan base>
##
```

When you launch the extended template, the parameter inputs for the base template are also obtained. In addition, the substituted content is used for complete CLI command generation.

- Solution POAP Templates for VXLAN and FabricPath

From Cisco DCNM Release 10.0(1), Cisco provides you a set of defined templates to aid in POAP operations. You can download Cisco-defined templates from <https://software.cisco.com/download/release.html>.

For instructions on how to download and install POAP templates, see *Cisco DCNM Installation Guide, Release 10.0(x)*.

## Adding a Template

To add user-defined templates and schedule jobs from the Cisco DCNM Web UI, perform the following steps:

## Procedure

---

- Step 1** Choose **Configure > Templates > Template Library > Templates**.
- The **Templates** window is displayed with the name of the template along with its description, supported platforms, and tags.
- Step 2** Click **Add** to add a new template.
- Step 3** Specify a **Template Name**, **Template Description**, **Tags**, **Implements**, and **Dependencies** for the new template. Specify a template name, description, tags, and supported platforms for the new template.
- Step 4** Select the supported platforms that the template must support.
- Step 5** Specify a **Template Type** for the template. Select **POAP** to make this template available when you power on the application.
- Note** The template is considered as a CLI template if **POAP** is not selected.
- Step 6** Select a **Template Sub Type** and **Template Content Type** for the template. Select **Published** to make the template read-only. You cannot edit a published template.
- Step 7** Click **Template Content** to edit the template syntax. For information about the structure of the Configuration Template, see the *Template Structure* section.
- Step 8** From the **Imports > Template Name** list, check the template check box.
- The base template content is displayed in the **Template Content** window. The base template displays the template properties, template variables, and template content. This template can be imported in to another template and the base template content is substituted in the appropriate place of the extending template. When you launch the extended template, the parameter inputs for the base template are also obtained. Also, the substituted content is used for complete CLI command generation.
- Note** The base templates are CLI templates.
- Step 9** Click **Validate Template Syntax** to validate the template values.
- If an error or a warning message appears, you can check the validation details in **Validation Table**.
- Note** You can continue to save the template if there are warnings only. However, if there is an error, you must edit the templates to fix the errors before you proceed.
- Step 10** Click **Save** to save the template.
- Step 11** Click **Save and Exit** to save the configuration and go back to the configuring templates screen.
- 

## Configuring Template Job

To configure and schedule jobs for individual templates from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

- Step 1** Choose **Configure > Templates > Template Library > Templates**.
- Step 2** Select a template.

**Note** Config Job wizard is applicable only for CLI templates.

**Step 3** Click **Launch job creation wizard** icon and click **Next**.

**Step 4** Use the drop-down to select **Device Scope**.

The devices that are configured under the selected **Device Scope** are displayed.

**Note** If no devices are displayed, check if the device LAN credentials are configured by choosing **Administration > Credentials Management > LAN Credentials**.

**Step 5** Use the arrows to move the devices to the right column for job creation and click **Next**.

**Step 6** In the **Define Variable** section, specify the VSAN\_ID, VLAN\_ID, ETH\_SLOT\_NUMBER, VFC\_SLOT\_NUMBER, SWITCH\_PORT\_MODE, ETH\_PORT\_RANGE and ALLOWED\_VLANS values.

**Note** Based on the selected template, variables vary.

**Step 7** In the **Edit Variable Per Device** section, double click the fields to edit the variables for specific devices and click **Next**.

**Step 8** If you have selected multiple devices, use the drop-down to select a specific device and preview its configuration. Click **Back** to edit the configuration or click **Next**.

**Step 9** Specify a job name and description.

The Device Credentials are populated from **Administration > Credentials Management > LAN Credentials**.

**Step 10** Use the radio button to select **Instant Job** or **Schedule Job**.

If you select **Schedule Job**, specify the date and time for the job delivery.

**Step 11** Use the check box to select **Copy Run to Start**.

**Step 12** If you want to configure more transaction and delivery options, use the check box to select **Show more options**.

**Step 13** Under **Transaction Options(Optional)**, if you have a device with rollback feature support, select **Enable Rollback** check box and select the appropriate radio button.

You can choose one of the following options by selecting the appropriate radio button:

- **Rollback the configuration on a device if there is any failure on that device**
- **Rollback the configuration on all the devices if there is any failure on any device**
- **Rollback the configuration on a device if there is any failure on any device and stop further configuration delivery to remaining devices**

**Step 14** Under **Delivery Options (Optional)**, specify the command response timeout in seconds and use the radio button to select a delivery order. The value of command response timeout ranges from 1 to 180.

You can choose one of the following options by selecting the appropriate radio button:

- **Deliver configuration one device at a time in sequential**
- **Delivery configuration in parallel to all devices at the same time**

**Step 15** Click **Finish** to create the job.

A confirmation message is displayed that the job has been successfully created.

---

## Modifying a Template

You can edit the user-defined templates. However, the predefined templates and templates that are already published cannot be edited.

### Procedure

---

- Step 1** From **Configure > Templates > Template Library > Templates**, select a template.
  - Step 2** Click **Modify/View template**.
  - Step 3** Edit the template description and tags.  
The edited template content is displayed in a pane on the right.
  - Step 4** From the **Imports > Template Name** list, check the template check box.  
The base template content is displayed in the **Template Content** window. You can edit the template content based on your requirement in the **Template Content** window. Click the help icon next to the **Template Content** window for information about editing the content of the template.
  - Step 5** Edit the supported platforms for the template.
  - Step 6** Click **Validate Template Syntax** to validate the template values.
  - Step 7** Click **Save** to save the template.
  - Step 8** Click **Save and Exit** to save the configuration and go back to the configuring templates screen.
- 

## Copying a Template

To copy a template from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

- Step 1** Choose **Configure > Templates > Template Library > Templates**, and select a template.
- Step 2** Click **Save Template As**.
- Step 3** Edit the template name, description, tags, and other parameters.  
The edited template content is displayed in the right-hand pane.
- Step 4** From the **Imports > Template Name** list, check the template check box.  
The base template content is displayed in the **Template Content** window. You can edit the template content that is based on your requirement in the **Template Content** window. Click the help icon next to the **Template Content** window for information about editing the content of the template.
- Step 5** Edit the supported platforms for the template.
- Step 6** Click **Validate Template Syntax** to validate the template values.
- Step 7** Click **Save** to save the template.

- Step 8** Click **Save and Exit** to save the configuration and go back to the configuring templates screen.
- 

## Deleting a Template

You can delete the user-defined templates. However, you cannot delete the predefined templates. From Cisco DCNM Release 11.0(1), you can delete multiple templates at once.

To delete a template from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

- Step 1** Choose **Configure > Templates > Template Library > Templates**.
- Step 2** Use the check box to select a template and click **Remove template** icon.
- The template is deleted without any warning message.
- 

### What to do next

The template is deleted from the list of templates on the DCNM Web UI. When you restart the DCNM services, the deleted templates are displayed on the **Configure > Templates > Template Library > Templates** page.

To delete the template permanently, delete the template that is located in your local directory: `Cisco Systems\dcm\dcnm\data\templates\`.

## Importing a Template

To import a template from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

- Step 1** Choose **Configure > Templates > Template Library > Templates** and click **Import Template**.
- Step 2** Browse and select the template that is saved on your computer.
- You can edit the template parameters, if necessary. For information, see [Modifying a Template, on page 86](#).
- Note** The “\n” in the template is considered as a new line character when imported and edited, but it works fine when imported as a ZIP file.
- Step 3** Click **Validate Template Syntax** to validate the template.
- Step 4** Click **Save** to save the template or **Save and Exit** to save the template and exit.
- Note** You can import Cisco-defined FabricPath and IP VXLAN Programmable Fabric POAP Templates to the Cisco DCNM Web Client. For more information, see [Installing POAP Templates, on page 88](#).
-

## Exporting a Template

To export a template from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

**Step 1** Choose **Configure > Templates > Template Library > Templates**.

**Step 2** Use the check box to select a template and click **Export Template**.

The browser requests you to open or save the template to your directory.

---

## Installing POAP Templates

Cisco DCNM allows you to add, edit, or delete user-defined templates that are configured across different Cisco Nexus platforms. From Cisco DCNM Release 10.0(x), Cisco-defined FabricPath and IP VXLAN Programmable Fabric POAP Templates are provided as a separate download on the official Cisco website. These templates are compatible for use with the DCNM Virtual Appliance (OVA or ISO) for use with Nexus 2000, Nexus 5000, Nexus 6000, Nexus 7000, and Nexus 9000 Series switches.

You can download the Cisco-defined templates from <https://software.cisco.com/download/release.html>.

Perform the following task to install the POAP templates from the Cisco DCNM.

### Procedure

---

**Step 1** Navigate to [www.cisco.com/go/dcnm](http://www.cisco.com/go/dcnm), and download the latest file.

You can choose one of the following:

- `dcnm_ip_vxlan_fabric_templates.10.0.1a.zip`
- `dcnm_fabricpath_fabric_templates.10.0.1a.zip` file

**Step 2** Unzip and extract the files to the local directory on your computer.

**Step 3** Choose **Configure > Templates > Template Library > Templates**.

**Step 4** Click **Import Template**.

**Step 5** Browse and select the template that is saved on your computer. You can edit the template parameters, if necessary.

**Step 6** Check **POAP** and **Publish** check box to designate these templates as POAP templates.

**Step 7** Click **Validate Template Syntax** to validate the template.

**Step 8** Click **Save** to save the template or **Save and Exit** to save the template and exit.

---

## Configuring Jobs

To configure jobs from the Cisco DCNM Web UI, perform the following steps:

## Procedure

- 
- Step 1** Choose **Configure > Templates > Templates Library > Jobs**.  
The jobs are listed along with the Job ID, description and status.
- Step 2** Click **Show Filter** to filter the list.  
In the **Status** column, use the drop-down to select the job status.
- Step 3** Select a job and click the **Delete** icon to delete the job.
- Step 4** To view the status of a job, click the **Job ID** radio button and click **Status**.
- Step 5** To view the command execution status for a device, click the radio button of a device name from the **Devices** table in the **Job Execution Status** window.

**Note** You can delete multiple jobs at once, but you cannot view the status of multiple jobs at once.

---

# Backup

The **Backup** menu includes the following submenus:

## Switch Configuration

This feature allows you to backup device configurations from running configuration as a regular text file in the file system. However, you can also perform operations on startup configuration. The backup files can be stored in the DCNM server host or on a file server.

You can also configure the archive system to support scheduling of jobs for the selected list of devices. You can configure only one job for a switch.

The following tables describe the icons and fields that appear on **Configure > Backup > Switch Configuration**.

**Table 15: Switch Configuration Operations**

| Icon                            | Description                                                                                                |
|---------------------------------|------------------------------------------------------------------------------------------------------------|
| Copy Configuration to bootflash | Allows you to copy a configuration file of a switch to the bootflash of the selected destination switches. |
| View Configuration              | Allows you to view the configuration file.                                                                 |
| Delete Configuration            | Allows you to delete the configuration file.                                                               |
| Compare Configuration           | Allows you to compare two configuration files, from different devices or on the same device.               |
| Export Configuration            | Allows you to export a configuration file from the DCNM server.                                            |

| Icon                              | Description                                                                |
|-----------------------------------|----------------------------------------------------------------------------|
| Import User-Defined Configuration | Allows you to import a user-defined configuration file to the DCNM server. |
| Restore Configuration to devices  | Allows you to restore configuration from the selected devices.             |
| Archive Jobs                      | Allows you to add, delete, view, or modify the jobs.                       |

**Table 16: Switch Configuration Field and Description**

| Field         | Description                                                                                                     |
|---------------|-----------------------------------------------------------------------------------------------------------------|
| Device Name   | Displays the device name<br>Click the arrow next to the device to view the configuration files.                 |
| IP Address    | Displays the IP address of the device.                                                                          |
| Group         | Displays the group of the device.                                                                               |
| Configuration | Displays the configuration files that are archived for that device.                                             |
| Archive Time  | Displays the time when the device configuration files were archived.<br>The format is Day:Mon:DD:YYYY HH:MM:SS. |
| Size          | Displays the size of the archived file.                                                                         |

This section contains the following:

## Copy Configuration

You can copy the configuration files to the same device, to another device, or multiple devices concurrently.

Perform the following task to view the status of tasks.

### Procedure

- 
- Step 1** From Cisco DCNM home page, choose **Configure > Backup > Switch Configuration**. Select any startup/running/archive configuration of the device that you must copy.
- Step 2** Click **Copy Configuration to bootflash**.  
**Copy Configuration to bootflash** page appears, displaying the **Source Configuration Preview** and **Selected Devices** area.  
**Source Configuration Preview** area shows the contents of running/startup/version configuration file which is copied to the devices.
- Step 3** In the **Selected Devices** area, check the device name check box to copy the configuration to the device.

**Note** You can select multiple destination devices to copy the configuration.

The selected devices area shows the following fields:

- Device Name—Specifies the target device name to which the source configuration is copied.
- IP Address—Specifies the IP Address of the destination device.
- Group—Specifies the group to which the device belongs.
- Status—Specifies the status of the device.

**Step 4** Click **Copy**.

A confirmation window appears.

**Step 5** Click **Yes** to copy the configuration to the destination device configuration.

---

## View Configuration

You can view or edit the configuration file on the device.

Perform the following task to view or edit the configuration file for the devices.

### Procedure

---

**Step 1** From Cisco DCNM home page, choose **Configure > Backup > Switch Configuration**. Click the arrow next to the device name to view the configuration files on the device. Select the configuration file radio button to view the configuration file.

**Step 2** Click the View Configuration.

The View Configuration window appears showing the configuration file content.

---

## Delete Configuration

Perform the following task to delete the configuration file from the device.



**Note** Ensure that you take a backup of the configuration file before you delete.

---

### Procedure

---

**Step 1** From Cisco DCNM home page, choose **Configure > Backup > Switch Configuration**. Click the arrow next to the device name to view the configuration files on the device.

**Step 2** Click the configuration file radio button to be deleted.

**Note** You can delete multiple configuration files. However, you cannot delete startup, or running configuration files.

**Step 3** Click **Yes** to delete the configuration file.

---

## Compare Configuration Files

This feature allows you to compare the configuration file with another version of the same device or with the configuration file of another device.

Perform the following task to compare the configuration files.

### Procedure

---

**Step 1** Navigate to **Configure > Backup > Switch Configuration**. Click the arrow next to the device name to view the configuration files on the device.

**Step 2** Check the check box and select two configuration files to compare.

The first file that you selected is designated as Source and the second configuration file is designated as the Target file.

**Step 3** Click **Compare Configuration**.

**View Config Diff** page appears, displaying the difference between the two configuration files.

The Source and Target configuration files content is displayed in two columns. From the drop-down list in the right-top corner, choose **All** to view the entire configuration. You can also choose **Changed** to view the configuration differences of the configuration files.

The differences in the configuration file are show in the table, with legends.

- **Red**: Deleted configuration details.
- **Green**: New added configuration.
- **Blue**: Modified configuration details.

**Step 4** Click **Copy to Target** to copy the source configuration to the target configuration file. Click **Cancel** to revert to the configuration details page.

The Copy Configuration window displays the source configuration preview and the target device of the destination configuration. The selected devices area shows the following fields:

- Device Name—Specifies the target device name to which the source configuration is copied.
- IP Address—Specifies the IP Address of the destination device.
- Group—Specifies the group to which the device belongs.
- Status—Specifies the status of the device.

**Step 5** Click **Yes** to copy the configuration to the destination device configuration.

---

## Export Configuration

You can export a configuration file from the Cisco DCNM server. Perform the following task to export a configuration file.

### Procedure

---

- Step 1** From Cisco DCNM home page, choose **Configure > Backup**, select a configuration to export.
- Step 2** Click **Export Configuration**.
- The files are downloaded.
- 

## Import Configuration File

You can import the configuration file from the file server to the Cisco DCNM. Perform the following task to import a single or multiple configuration files.

### Procedure

---

- Step 1** From Cisco DCNM home page, choose **Configure > Backup > Switch Configuration** and click **Import User-Defined Configuration**.
- The file server directory opens.
- Step 2** Browse the directory and select the configuration file that you want to import. Click **Open**.
- A confirmation screen appears.
- Step 3** Click **Yes** to import the selected file.
- The imported configuration file appears as a User Imported file.
- 

## Restore Configuration

You can restore the configuration file from the selected switches. From Cisco DCNM Release 11.0(1), you can restore configuration based on the selected date as well.



---

**Note** You cannot restore the configuration for SAN switches and FCoE-enabled switches.

---

Perform the following task to restore the configuration from the selected devices.

### Procedure

---

- Step 1** From Cisco DCNM home page, choose **Configure > Backup > Switch Configuration**, and click **Restore**.

**Step 2** Select the type of restore from the drop-down list. You can choose **Version-based** or **Date-based**.

- Note**
- If you choose date-based restore, you have to select the date and time. The configuration available before the mentioned time is restored.
  - If you choose version-based restore, you have to choose a configuration from the **Configuration** column. You can view the configuration details in the **View** column.

**Step 3** Check the **Device Name** check box from which you want to restore the configuration. Click **Restore**.

The **Devices** area shows the following fields:

- Device Name—Specifies the device name from which the configuration file is restored.
- IP Address—Specifies the IP Address of the device.
- Group—Specifies the group to which the device belongs.
- Status—Specifies the status of the device.

**Note** You can restore the configuration only from the same device. If you select user-imported configuration files, you can restore configuration for any number of devices.

## Archive Jobs

This section contains context-sensitive online help content under Cisco DCNM **Configure > Backup > Switch Configuration > Archive Jobs**.

The following table describes the fields that appear on the **Archive Jobs** window.

| Field          | Description                                                                                                                                                                                       |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| User           | Specifies the who created this job.                                                                                                                                                               |
| Group          | Specifies the group to which this job belongs.                                                                                                                                                    |
| Group Job      |                                                                                                                                                                                                   |
| Schedule       | Specifies the schedule of the job. Also show the recurrence information.                                                                                                                          |
| Last Execution | Specifies the date and time at which this job was last executed.                                                                                                                                  |
| Job Status     | Specifies if the job was successful, scheduled, running, or failure.<br><br><b>Note</b> <b>Running</b> and <b>Scheduled</b> status is not applicable for existing jobs in an upgraded Cisco DCNM. |

## Archive Jobs

To add, delete or view the job from the Cisco DCNM Web UI, perform the following steps:



**Note** You must set the SFTP/TFTP/SCP credentials before you configure jobs. On the DCNM Web Client, navigate to **Administration > DCNM Server > Archive FTP Credentials** to set the credentials.

### Procedure

**Step 1** Choose **Configure > Backup > Switch Configuration > Archive Jobs > Archive Jobs** tab, and click **Add Job**.

The Create Job screen displays the Schedule, Device Selection and Selected Devices.

A backup is scheduled as defined.

a) In the **Schedule** area, configure the start time, repeat interval and repeat days.

- **Start At:** Configure the start time using the hour:minutes:second drop-down lists.
  - **Once:** Configure the job to be executed once, on the particular day. The time at which this job will be executed is determined by the **Start At** field.
  - **Now**—Configure the job to be executed immediately. Cisco DCNM will consider the default date and time as configured on the server.

**Note** You can schedule a job to run **Now** even if a job is already scheduled.
  - **Daily:** Check the check box on the days you want this job to be executed. The time at which this job will be executed is determined by the **Start At** field.
  - **Real Time:** Configure the job to be executed if there is any configuration changes in the device. The device must be quiet for 5 minutes, after which the DCNM Sever will execute this job.
- **Repeat Interval:** Check the Repeat Interval check box to repeat the job at scheduled intervals. Configure the intervals using either days or hours drop-down list.
- **Comments:** Enter your comments, if any.

b) In the **Device Selection** area, use the radio button to choose one of the following:

- **Device Group:** Click the Device Group radio button to select the entire group of devices for this job.

Select the Device Group from the drop-down list.

**Note** When the devices are not licensed, they will not be shown under the group on the Cisco DCNM **Configure > Backup > Switch Configuration > Archive Jobs**. When none of the devices under a group is licensed, the group alone will be shown with no devices, until a device under that group is licensed.

- **Selected Devices:** Click the **Selected Devices** radio button to select one of multiple devices from various groups for this job.

Select the devices from the drop-down list.

**Note** When the SAN and LAN credentials are not configured for a switch, it will not be listed in the Selected Devices drop-down list. To configure, navigate to **Administration > Credentials Management > SAN Credentials** and **Administration > Credentials Management > LAN Credentials**.

c) In the **Selected Devices** area, the following fields are shown:

- **Name:** Specifies the name of the device on which the job is scheduled.
- **IP Address:** Specifies the IP Address of the device.
- **Group:** Specifies the group to which the device belongs.
- **VRF:** Specifies the virtual routing and forwarding (VRF) instance.

**Note** If a job for a device exists under device level, you can create a group level job which includes this switch as part of that group. However, this switch will be excluded during the execution of the job.

d) Click **Create** to add a new job.

**Step 2** To delete a job, from the Cisco DCNM home page, choose **Configure > Backup > Switch Configuration > Archive Jobs > Archive Jobs**, and select a job.

a) Click **Delete Job**.

The Schedule, Device Selection and the Selected devices for this job is displayed.

b) Click **Delete**.

**Step 3** To view the details of the job, from the Cisco DCNM home page, choose **Configure > Backup > Switch Configuration > Archive Jobs > Archive Jobs**, and check the job check box.

a) Click **View/Modify Job**.

The Schedule, Device Selection and the Selected devices for this job is displayed.

b) Modify the required details. Click **OK** to revert to view the list of jobs.

**Note** You cannot modify a job that is scheduled to be run **Now** to one that is scheduled to be run **Daily**.

---

### What to do next

You can also configure the Cisco DCNM to retain the number of archived files per device. Choose **Administration > DCNM Server > Server Properties**, and update the **archived.versions.limit** field.

### Job Execution Details

The Cisco DCNM **Web Client > Configure > Backup > Switch Configuration > Archive Jobs > Archive Jobs > Job Execution Details** tab shows the following tabs in the Job Execution History table.

| Field          | Description                                                                                                                                                                                                                                                                                                              |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Job Name       | Displays the system-generated job name.                                                                                                                                                                                                                                                                                  |
| User           | Specifies the persona of the person who created the job.                                                                                                                                                                                                                                                                 |
| Device Group   | Specifies fabric or the LAN group under which the job was created.                                                                                                                                                                                                                                                       |
| Device         | Specifies the IP Address of the Device.                                                                                                                                                                                                                                                                                  |
| Server         | Specifies the IP Address of the DCNM Server to which the device is associated with.                                                                                                                                                                                                                                      |
| Protocol       | Specifies if the SFTP, TFTP, or SCP protocol is applied.                                                                                                                                                                                                                                                                 |
| Execution time | Specifies the time at which the job was last executed.                                                                                                                                                                                                                                                                   |
| Status         | Specifies the status of the job. <ul style="list-style-type: none"> <li>• Skipped</li> <li>• Failed</li> <li>• Successful</li> </ul>                                                                                                                                                                                     |
| Error Cause    | Specifies the error if the job has failed. The categories are as follows: <ul style="list-style-type: none"> <li>• No change in the configuration.</li> <li>• Switch is not managed by this server.</li> </ul> <p><b>Note</b> If the error cause column is empty, it implies that the job was executed successfully.</p> |

## Archives

A user with network operator role can view configuration archives for a switch and their details in the **Archives** window.

The following tables describe the icons and fields that are displayed in this window.

**Table 17: Archive Operations**

| Icon           | Description                                                                                        |
|----------------|----------------------------------------------------------------------------------------------------|
| <b>Compare</b> | Allows you to compare two configuration files either from different devices or on the same device. |
| <b>View</b>    | Allows you to view a configuration file.                                                           |

Table 18: Archive Field and Description

| Field Name    | Description                                                                                                         |
|---------------|---------------------------------------------------------------------------------------------------------------------|
| Device Name   | Displays the device name<br>Click on the arrow next to the device to view the configuration files.                  |
| IP Address    | Displays the IP address of the device.                                                                              |
| Group         | Displays the group of the device.                                                                                   |
| Configuration | Displays the configuration files that are archived for that device.                                                 |
| Archive Time  | Displays the time at which the device configuration files were archived.<br>The format is Day:Mon:DD:YYYY HH:MM:SS. |
| Size          | Displays the size of the archived file.                                                                             |

This section contains the following:

## Compare Configuration Files

You can compare one version of a configuration file with another version of the same configuration file in the same device, or the configuration files of two different devices.

To compare the configuration files from the Cisco DCNM Web UI, perform the following steps:

### Procedure

**Step 1** Choose **Configure > Backup > Archives**.

**Step 2** In the **Archives** area, click the arrow that is adjacent the name of the device whose configuration files you want to view. The list of configuration files is displayed.

**Step 3** Check the check box next to configuration files and select two configuration files to compare.

The first file that you select is designated as the source and the second configuration file is designated as the target file.

**Step 4** Click **Compare**.

The **View Config Diff** page displays the difference between the two configuration files.

The Source and Target configuration files content are displayed in two columns. Choose **All** from the drop-down list in the right-top corner to view the entire configuration. Choose **Changed** to view the configuration differences between the configuration files.

The differences in the configuration files are shown in a table, with legends.

**Red**—Deleted configuration details.

**Green**—Newly added configuration.

**Blue**—Modified configuration details.

---

## View Configuration

You can view an archived configuration file.

To view or edit the configuration file for the devices from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

- Step 1** Choose **Configure > Backup > Archives**.  
The **Archives** window is displayed.
  - Step 2** Click the arrow that is next to the name of the device whose configuration files you want to view.  
The list of configuration files are displayed.
  - Step 3** Select the radio button that is next to the corresponding file you want to view.
  - Step 4** Click the **View** configuration icon.  
The **View** configuration window appears showing the configuration file content in the right column.
- 

## Network Config Audit

Cisco DCNM provides auditing for the configuration changes across the network switches. The Network Audit Reporting feature enables you to generate an audit report so that you can track the added, deleted, or modified configurations. You will be able to generate the network audit reports only when you have existing archival jobs. Using the generated reports, you can view the config differences on a device for a specified period.

This section contains the following:

### Generating Network Config Audit Reports

To generate the network config audit reports from the Cisco DCNM Web UI, perform the following steps:

#### Procedure

---

- Step 1** Choose **Configure > Backup > Network Config Audit**.  
The **Network Audit Report** window is displayed.
- Step 2** In the **Devices** drop-down list, choose the devices to generate a report.
- Step 3** Specify the **Start Date** and the **End Date**.
- Step 4** Click **Generate Report** to view the configuration differences. The configuration differences are color-coded.

- Red: Deleted Configuration
- Green: Newly Added Configuration
- Blue: Changed configuration
- Strikethrough: Old configuration

After you generate a report, you can export the configuration reports into an HTML file.

---

## Creating a Network Config Audit Report

To create a network config audit job and view the configuration differences between the devices from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

**Step 1** Choose **Monitor > Report > Generate**.

The left pane shows various reports that you can create.

**Step 2** Choose **Common > Network Config Audit**.

**Step 3** In the **Report Name** field, enter the name of the report.

**Step 4** In the **Repeat** field, choose the appropriate repeat interval, that is, Daily, Weekly, or Monthly.

Daily job generates a report of configuration differences for all the selected devices for last 1 day. Weekly job generates a report for the last 7 days, and the monthly job generates a report for the last 30 days.

**Step 5** In the **Start** and **End** date fields, specify the start and end date for the report.

**Step 6** In the **Email Report** field, specify the email delivery options.

- No: Select this option if you do not want to send the report through email.
- Link Only: Select this option if you want to send the link to the report.
- Contents: Select this option if you want to send the report content.

If you select Link Only or the Contents option, enter the email address and subject in the **To** and **Subject** fields.

---

## Monitoring Network Config Audit Report

To monitor the network config audit report from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

**Step 1** Choose **Monitor > Report > View**.

**Step 2** Choose **Common > Network Config Audit** in the left pane to the network config audit reports.

---

## Deleting a Network Config Audit Report

To delete a network config audit report from the Cisco DCNM Web UI, perform the following steps:

### Procedure

- 
- Step 1** Choose **Monitor > Report > View**.
- Step 2** Choose **Common > Network Config Audit**.
- The **View Reports** window is displayed with the reports that you have created.
- Step 3** Select the reports that you want to delete, and click the **Delete** icon.
- 

## Image Management

The **Image Management** menu includes the following options:

### Upgrade [ISSU]

The **Upgrade [ISSU]** menu includes the following submenus:

#### Upgrade History [ISSU]

This feature enables you to upgrade the Cisco Nexus Platform Switches using In-Service Software Upgrade (ISSU). This upgrade procedure may be disruptive or non-disruptive based on the device configuration. You can select the Kickstart, System, or SSI images required for the upgrade from a remote server using SFTP, SCP, TFTP, FTP or from image repository or the file system on the device. Image repository can use SCP, SFTP, FTP, or TFTP as file transfer protocol. To select the images from the repository, the same needs to be uploaded from **Configure > Image Management > Repositories** tab.

The following table describes the fields that appear on **Configure > Image Management > Upgrade [ISSU] > Upgrade History**.

| Field     | Description                                                                                                                                                                                     |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Task Id   | Specifies the serial number of the task. The latest task will be listed in the top.<br><br><b>Note</b> If Failover is triggered in Native HA, the Task Id sequence number is incremented by 32. |
| Task Type | Specifies the type of task.<br><br><ul style="list-style-type: none"> <li>• Compatibility</li> <li>• Upgrade</li> </ul>                                                                         |
| Owner     | Based on the Role-Based Authentication Control (RBAC), specifies the owner who initiated this task.                                                                                             |
| Devices   | Displays all the devices that were selected for this task.                                                                                                                                      |

| Field        | Description                                                                                                                                                                   |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Job Status   | Specifies the status of the job. <ul style="list-style-type: none"> <li>• Planned</li> <li>• In Progress</li> <li>• Completed</li> <li>• Completed with Exceptions</li> </ul> |
| Created Time | Specifies the time when the task was created.                                                                                                                                 |
| Scheduled At | Specifies the time when the task is specified to be executed. You can also choose to schedule a task to be executed at a later time.                                          |
| Comment      | Shows any comments that the Owner has added while performing the task.                                                                                                        |



**Note** After a fresh Cisco DCNM installation, this page will have no entries.

You can perform the following:

## New Installation

To upgrade the devices that are discovered from the Cisco DCNM, perform the following steps:

### Procedure

- 
- Step 1** Choose **Configure > Image Management > Upgrade [ISSU] > Upgrade History**, click **New Installation** to install, or upgrade the kickstart and the system images on the devices.
- The devices with default VDCs are displayed in the **Select Switches** window.
- Step 2** Select the check box to the left of the switch name.
- You can select more than one device and move the devices to the right column.
- Step 3** Click **Add** or **Remove** icons to include the appropriate switches for upgrade.
- The selected switches appear in a column on the right.
- Step 4** Click **Next** to navigate to the **Specify Software Images** window. This tab displays the switches that you selected in the previous screen and allows you to choose the images for upgrade.
- The **Auto File Selection** check box enables you to specify a file server, an image version, and a path where you can apply the upgraded image to the selected devices.
  - In the **Select File Server** drop-down list, select the one of the file servers that is created in the Cisco DCNM repositories.

- In the **Image Version** field, specify the image version. For example, enter 7.3.9.D1.1 in the **Image Version** field if you have selected m9700-sf3ek9-kickstart-mz.7.3.0.D1.1.bin as the image version.
- In the **Path** field, specify the image path. Specify an absolute path if you choose SCP or SFTP. For example, `//root/images/`. Specify a relative path to the FTP or TFTP home directory if you choose FTP or TFTP. Specify the absolute path of the image if you are using TFTP server that is provided by Cisco DCNM, local DCNM TFTP. You cannot use the same DCNM TFTP server for creating another job when the current job is in progress.

**Step 5** Click **Select Image** in the **Kickstart image** column.

The **Software Image Browser** dialog box appears.

- Note**
- Cisco Nexus 3000 Series and 9000 Series Switches require only the system image to load the Cisco NX-OS operating system. Therefore, the option to select kickstart images for these devices is disabled.
  - If there is an issue in viewing the **Software Image Browser** dialog box, reduce the font size of your browser and retry.

**Step 6** Click **Select Image** in the **System Image** column.

The **Software Image Browser** dialog box appears.

**Step 7** On the **Software Image Browser** dialog box, you can choose the kickstart image from **File Server** or **Switch File System**.

If you choose **File Server**:

- a) From the **Select the File server** list, choose the appropriate file server on which the kickstart image is stored.

The servers at **Configure > Image Management > Repositories** are displayed in the drop-down list.

- b) From the **Select Image** list, choose the appropriate kickstart image. Check the check box to use the same image for all other selected devices of the same platform.

Example: For platform types N7K-C7009 and N7K-C7010, logic matches platform (N7K) and three characters (C70) from subplatform. The same logic is used across all platform switches.

- c) Click **OK** to choose the kickstart image or **Cancel** to revert to the **Specify Software Images** window.

If the file server selected is either `ftp` or `tftp`, in the text box, enter the relative path of the file from the home directory.

If you choose **Switch File System**:

- a) From the **Select Image** list, choose the appropriate image that is located on the flash memory of the device.
- b) Click **OK** to choose the kickstart image or **Cancel** to revert to the **Specify Software Images** dialog box.

**Step 8** The **Vrf** column indicates the name of the virtual routing and forwarding (VRF).

VRF is not applicable for Cisco MDS devices.

**Step 9** In the **Available Space** column, specify the available space for the **Primary Supervisor** and **Secondary Supervisor** modules of the switch.

**Available Space** column shows the available memory in MB on the switch (for less than 1 MB, it is shown and marked as KB).

Bootflash browser shows the filename, size, and last modified date for all the files and directories on the switch bootflash. You can delete files by selecting them and clicking **Delete** to increase the available space on the switch.

- Step 10** **Selected Files Size** column shows the size of images that are selected from the SCP or SFTP server. If the total size of selected images is greater than available space on a switch, the file size is marked in red. We recommend that you create more space on the switch to copy images to it and install.
- Step 11** Drag and drop the switches to reorder the upgrade task sequence.
- Step 12** Select **Skip Version Compatibility** if you are sure that the version of the Cisco NX-OS software on your device is compatible with the upgraded images that you have selected.
- Step 13** Select **Select Parallel Line Card upgrade** to upgrade all the line cards at the same time. Upgrading a parallel line card is not applicable for Cisco MDS devices.
- Step 14** Select **Options** under the **Upgrade Options** column to choose the type of upgrade. **Upgrade Options** window appears with two upgrade options. The drop-down list for **Upgrade Option 1** has the following options:
- NA
  - **bios-force**
  - **non-disruptive**
- NA is the default value.
- The drop-down list for **Upgrade Option 2** has the following options:
- NA
  - **bios-force**
- When NA is selected under **Upgrade Option 1**, **Upgrade Option 2** is disabled.
- When **bios-force** is selected under **Upgrade Option 1**, NA is the only option under **Upgrade Option 2**
- When **non-disruptive** is selected under **Upgrade Option 1**, you can choose NA or **bios-force** under **Upgrade Option 2**.
- Check the **Use this Option for all other selected devices** check box to use the selected option for all the selected devices and click **OK**.
- Note**
- The upgrade options are applicable only for Cisco Nexus 3000 Series and 9000 Series switches.
  - Selecting the non-disruptive option for upgrading does not ensure a non-disruptive upgrade. Perform a compatibility check to ensure that the device supports non-disruptive upgrade.
- Step 15** Click **Next**.
- If you did not select **Skip Version Compatibility**, the Cisco DCNM performs a compatibility check. You can choose to wait until the check is complete or click **Finish Installation Later**.
- The installation wizard is closed and a compatibility task is created in **Configure > Image Management > Upgrade [ISSU] > Upgrade History** tasks.

The time that is taken to check the image compatibility depends on the configuration and the load on the device.

The **Version Compatibility Verification** status column displays the status of verification.

If you skip the version compatibility check by choosing **Skip Version Compatibility**, Cisco DCNM displays only the name of the device, the **Current Action** column displays **Completed**, and the **Version Compatibility Verification** column displays **Skipped**.

- Step 16** Click **Finish Installation Later** to perform the upgrade later.
- Step 17** Click **Next**.
- Step 18** Check the **Next** check box to put a device in maintenance mode before upgrade.
- Step 19** Check the check box to save the running configuration to the startup configuration before upgrading the device.
- Step 20** You can schedule the upgrade process to occur immediately or later.
1. Select **Deploy Now** to upgrade the device immediately.
  2. Select **Choose time to Deploy** and specify the time in MMM/DD/YYYY HH:MM:SS format to perform the upgrade later.  
  
This value is relative to the server time. If the selected time to deploy is in the past, the job is executed immediately.
- Step 21** You can choose the execution mode based on the devices and the line cards you have chosen to upgrade.
1. Select **Sequential** to upgrade the devices in the order in which they were chosen.
  2. Select **Concurrent** to upgrade all the devices at the same time.
- Step 22** Click **Finish** to begin the upgrade process.
- The Installation wizard closes and a task to Upgrade is created on the **Configure > Image Management > Upgrade [ISSU] > Upgrade History** page.

---

## Finish Installation

You can choose to complete the installation for tasks which was completed on the **Compatibility Check** page. Perform the following task to complete the upgrade process on the devices.

### Procedure

---

- Step 1** Choose **Configure > Image Management > Upgrade [ISSU] > Upgrade History**, select a task for which the compatibility check is complete.
- Select only one task at a time.
- Step 2** Click **Finish Installation**.
- Software Installation Wizard** appears.

- Step 3** Check the check box to save the running configuration to the startup configuration before upgrading the device.
- Step 4** Check the check box to put a device in maintenance mode before upgrade. This option is valid only for the devices that support maintenance mode.
- Step 5** You can schedule the upgrade process to occur immediately or later.
1. Select **Deploy Now** to upgrade the device immediately.
  2. Select **Choose time to Deploy** and specify the time in DD/MM/YYYY HH:MM:SS format to perform the upgrade later.
- Step 6** You can choose the execution mode that is based on the devices and the line cards that you have chosen to upgrade.
1. Select **Sequential** to upgrade the devices in the order in which they were chosen.
  2. Select **Concurrent** to upgrade the devices at the same time.
- Step 7** Click **Finish** to complete the upgrade process.
- 

## View

To view the image upgrade history from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

- Step 1** Choose **Configure > Image Management > Upgrade [ISSU] > Upgrade History**, check the task ID check box.
- Select only one task at a time.
- Step 2** Click **View**.
- The **Installation Task Details** window is displayed.
- Step 3** Click **Settings**. Select **Columns** and choose the column details options.
- This window displays the location of the kickstart and system images, compatibility check status, installation status, descriptions, and logs.
- Step 4** Select the device.
- The detailed status of the task is displayed. For the completed tasks, the response from the device is displayed. If the upgrade task is in progress, a live log of the installation process appears.

**Note** This table is refreshed every 30 secs for jobs in progress, when you are on this window.

The switch-level status for an ongoing upgrade on a Cisco MDS switch is not displayed for other users without SAN credentials applied. To apply SAN Credentials, choose **Administration > Credentials Management > SAN Credentials**.

---

## Delete

To delete a task from the Cisco DCNM Web UI, perform the following steps:

### Procedure

- 
- Step 1** Choose **Configure > Image Management > Upgrade [ISSU] > Upgrade History**, and check the **Task ID** check box.
  - Step 2** Click **Delete**.
  - Step 3** Click **OK** to confirm deletion of the job.
- 

## Switch Level History

You can view the history of the upgrade process at a switch level. You can view the current version of the switch and other details.

The following table describes the fields that appear on **Configure > Image Management > Upgrade [ISSU] > Switch Level History**.

| Field           | Description                                          |
|-----------------|------------------------------------------------------|
| Switch Name     | Specifies the name of the switch                     |
| IP Address      | Specifies the IP Address of the switch               |
| Platform        | Specifies the Cisco Nexus switch platform            |
| Current Version | Specifies the current version on the switch software |

Click the radio button next to a switch name to select the switch and view its upgrade history. Click **View** to view the upgrade task history for the selected switch.

The following table describes the fields that appear on **Configure > Image Management > Upgrade [ISSU] > Switch Level History > View Device Upgrade Tasks**:

| Field           | Description                                                                                                                              |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Owner           | Specifies the owner who initiated the upgrade.                                                                                           |
| Job Status      | Specifies the status of the job. <ul style="list-style-type: none"> <li>• Planned</li> <li>• In Progress</li> <li>• Completed</li> </ul> |
| KickStart Image | Specifies the kickStart image that is used to upgrade the Switch.                                                                        |
| System Image    | Specifies the system image that is used to upgrade the switch.                                                                           |

| Field              | Description                                                                  |
|--------------------|------------------------------------------------------------------------------|
| Completed Time     | Specifies the date and time at which the upgrade was successfully completed. |
| Status Description | Specifies the installation log information of the job.                       |

## Patch [SMU]

The Patch [SMU] menu includes the following submenus:

### Installation History

This feature allows you to activate or deactivate packages using Software Maintenance Update (SMU). Personnel with Admin privileges can perform this operation.

The following table describes the fields that appear on **Configure > Image Management > Patch [SMU] > Installation History**.

| Field              | Description                                                                                                                            |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Task Id            | Specifies the serial number of the task. The latest task is listed at the top.<br><br>The tasks are performed in the sequential order. |
| Switch Name        | Specifies the name of the switch for which the patch file is installed.                                                                |
| IP Address         | Specifies the IP Address of the device.                                                                                                |
| Task               | Specifies if the patch is installed or uninstalled on this device.                                                                     |
| Package            | Specifies the name of the patch file.                                                                                                  |
| Status             | Specifies the status of installation or uninstallation of the patch files.                                                             |
| Status Description | Describes the status of installation or uninstallation of the patch files.                                                             |

This section contains the following:

### Install Patch

To install the patch on your devices from Cisco DCNM Web Client, perform the following steps:

#### Procedure

- 
- Step 1** Choose **Configure > Image Management > Patch [SMU] > Installation History**, click **Install**.

The **Select Switches** window appears. All the Cisco Nexus switches that are discovered by Cisco DCNM are displayed.

- Step 2** Select the check box to the left of a switch name.  
You can select more than one device.
- Step 3** Click **Add** or **Remove** icons to include the appropriate switches for installing the patch.  
The selected switches appear in the right column.
- Step 4** Click **Next**.
- Step 5** Click **Select Packages** in the **Packages** column.  
The **SMU Package Browser** dialog box appears.
- Step 6** In the **SMU Package Browser** dialog box, you can choose the patch file from **File Server** or **Switch File System**.
- If you choose **File Server**:
- From the **Select the file server** list, choose the appropriate file server on which the patch is stored.  
The servers, which are listed in the **Repositories** window, are displayed in the drop-down list. Choose **Configure > Image Management > Repositories** to view the **Repositories** window.
  - From the **Select Image** list, choose the appropriate patch that must be installed on the device.  
You can select more than one patch file to be installed on the device.  
**Note** If the patch installation results in the restart of the device, select only one patch file.  
Check the check box to use the same patch for all other selected devices of the same platform.
  - From the **Select Vrf** list, choose the appropriate virtual routing and forwarding (VRF).  
The two options in the drop-down list are **management** and **default**.  
Check the check box to use the same VRF for all other selected devices.
  - Click **OK** to choose the patch image or **Cancel** to revert to the SMU installation wizard.
- If you choose **Switch File System**:
- From the **Select Image** list, choose the appropriate patch file image that is located on the flash memory of the device.  
You can select more than one patch file to be installed on the device.
  - Click **OK** to choose the image, **Clear Selections** to uncheck all the check boxes, or **Cancel** to revert to the **SMU Package Browser** dialog box.
- Step 7** Click **Finish**.  
You will get a confirmation window. Click **OK**.  
**Note** SMU installation may reload the switch if the SMU is reloaded.
- You can view the list of patches that are installed on the switch in the **Switches** window by choosing **DCNM > Inventory > Switches**.
-

## Uninstall Patch

To uninstall the patch on your devices from Cisco DCNM Web Client, perform the following steps:

### Procedure

---

- Step 1** Choose **Configure > Image Management > Patch [SMU] > Installation History**, click **Uninstall**.  
The **Select Switches** page appears. The discovered Cisco Nexus switches are displayed.
- Step 2** Check the check box on the left of the switch name.  
You can select more than one image device.
- Step 3** Click **Add** or **Remove** icons to include the appropriate switches for installing the patch.  
The selected switches appear in a column on the right.
- Step 4** Click **Next**.  
The **Active Packages** page appears.
- Step 5** Click **Select Packages** under the **Installed Packages** column.  
The **Packages Installed** window appears, which lists the patches that are applied to the switch.
- Step 6** Select the patches that you want to uninstall from this device.  
You can select more than one patch that is applied on the device.
- Note** If the patch uninstallation results in the restart of the device, select only one patch.
- Step 7** Click **Finish** to uninstall the patch from the device.  
You will get a confirmation window. Click **OK**.  
You can uninstall more than one patch at a time.
- Note** SMU uninstallation may reload the switch if the SMU is reloaded.
- 

## Delete Patch Installation Tasks

To delete the patch installation tasks from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

- Step 1** Choose **Configure > Image Management > Patch [SMU] > Installation History**, check the task ID check box.
- Step 2** Click **Delete**.
- Step 3** Click **OK** to confirm deletion of the patch installation task.
-

## Switch Installed Patches

You can view the patches that are installed on all the switches in the network. You can refresh the view to see the latest installed patches.

The following table describes the fields that appear on **Configure > Image Management > Patch [SMU] > Switch Installed Patches**.

| Field             | Description                                            |
|-------------------|--------------------------------------------------------|
| Switch Name       | Specifies the name of the switch.                      |
| IP Address        | Specifies the IP address of the switch.                |
| Platform          | Specifies the Cisco Nexus switch platform.             |
| Installed Patches | Specifies the currently installed patches on switches. |

Click **Refresh** to refresh the table.

## Package [RPM]

The Package [RPM] menu includes the following submenus:

### Package Installation [RPM]

The package [RPM] feature allows you to install RPM packages. This feature is available for the Cisco Nexus 9000 Series and 3000 Series Switches.

The following table describes the fields that appear on **Configure > Image Management > Package [RPM] > Installation History**.

| Field          | Description                                                                                                                            |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Task Id        | Specifies the serial number of the task. The latest task is listed in the top.<br><br>The tasks are performed in the sequential order. |
| Switch Name    | Specifies the name of the switch for which the package file is installed.                                                              |
| IPAddress      | Specifies the IP address of the device.                                                                                                |
| Task           | Specifies if the package is installed or uninstalled on this device.                                                                   |
| Package        | Specifies the name of the package file.                                                                                                |
| Status         | Specifies the status of installation or uninstallation of the package files.                                                           |
| Completed Time | Specifies the time at which the installation or uninstallation task completed.                                                         |

| Field              | Description                                                                  |
|--------------------|------------------------------------------------------------------------------|
| Status Description | Describes the status of installation or uninstallation of the package files. |

This section contains the following:

## Install Package [RPM]

Perform the following task to install the package on your devices using Cisco DCNM Web client.

### Procedure

- 
- Step 1** Choose **Configure > Image Management > Package [RPM] > Installation History**, click **Install**.  
The **Select Switches** page appears.
- Step 2** Check the check box on the left of the switch name.  
You can select more than one device.
- Step 3** Click **Add** or **Remove** to include appropriate switches for installing packaging.  
The selected switches appear in a column on the right.
- Step 4** Click **Next**.
- Step 5** Click **Select Packages** in the **Packages** column.  
The **RPM Package Browser** screen appears.
- Step 6** Choose the package file from **File Server** or **Switch File System**.  
If you choose **File Server**:
- From the **Select the file server** list, choose the appropriate file server on which the package is stored.  
The servers at **Configure > Image Management > Repositories** are displayed in the drop-down list.
  - From the **Select Image** list, choose the appropriate package that must be installed on the device.  
You can select only one package file to be installed on the device.  
Check the check box to use the same package for all other selected devices of the same platform.
  - Click **OK** to choose the patch image or **Cancel** to revert to the RPM Installation Wizard.
- If you choose **Switch File System**:
- From the **Select Image** list, choose the appropriate package file image that is located on the flash memory of the device.  
You can select only one package file to be installed on the device.
  - Click **OK**.
- Step 7** In the **Installation Type** column, choose one of the installation types:
- **Normal**—Fresh installation
  - **Upgrade**—Upgrading the existing RPM

- **Downgrade**—Downgrading the existing RPM

**Step 8** Click **Finish**.

You can view the list of packages that are installed on the switch, on the **Web Client > Inventory > Switches** page.

**Note** If you are using Cisco DCNM Release 10.1(2), in case of installation of reload RPMs, perform a manual install commit on the switch after it switch reloads.

---

## Uninstall Package [RPM]

To uninstall the RPM on your devices from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

**Step 1** Choose **Configure > Image Management > Package [RPM] > Installation History**, click **Uninstall**.

The **Select Switches** window appears.

**Step 2** Check the check box on the left of the switch name.

You can select more than one switch.

**Step 3** Click the **Add** or **Remove** icons to include the appropriate switches for uninstalling the package.

The selected switches appear in a column on the right.

**Step 4** Click **Next**.

The **Active Packages** page appears.

**Step 5** Click **Select Packages** under the **Installed Packages** column.

The **Packages Installed** window appears, which lists the packages that are installed in the switch.

**Step 6** Click **Finish** to uninstall the package from the device.

You will get a confirmation window. Click **OK**.

You can uninstall more than one package at a time.

**Note**

- If you are using Cisco DCNM Release 10.1(2), in case of uninstallation of reload RPMs, a manual install commit needs to be performed on the switch once the switch is reloaded.
- RPM uninstallation may reload the switch if the RPM is reload RPM.

---

## Delete Package Installation Tasks

To delete the package installation tasks from the history view from the Cisco DCNM Web UI, perform the following steps:

### Procedure

- 
- Step 1** Choose **Configure > Image Management > Package [RPM] > Installation History**, select the task ID check box.
  - Step 2** Click **Delete**.
  - Step 3** Click **OK** to confirm deletion of the task.
- 

## Switch Installed Packages

You can view the RPM packages that are installed on all Switches in the network. You can refresh the view to see the latest installed packages.

The following table describes the fields that appear on **Configure > Image Management > Packages [RPM] > Switch Installed Packages**.

| Field              | Description                                                                                                                                                                         |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Switch Name        | Specifies the name of the switch.                                                                                                                                                   |
| IP Address         | Specifies the IP address of the switch.                                                                                                                                             |
| Platform           | Specifies the Cisco Nexus switch platform.                                                                                                                                          |
| Installed Packages | Specifies the currently installed packages on the switches. If there are multiple RPM packages that are installed on the switch, the names of the packages are separated by commas. |

Click **Refresh** to refresh the table.

## Maintenance Mode [GIR]

The Maintenance Mode [GIR] menu includes the following submenus:

### Maintenance Mode

The maintenance mode allows you to isolate the Cisco Nexus Switch from the network to perform an upgrade or debug, using Graceful Insertion and Removal (GIR). When the switch maintenance is complete, you can return the switch to normal mode. When the switch is in the maintenance mode, all protocols are gracefully brought down and all physical ports are shut down. When the normal mode is restored, all the protocols and ports are initiated again.

Perform the following to change the system mode of the devices.

### Procedure

- 
- Step 1** Choose **Configure > Image Management > Maintenance Mode [GIR] > Maintenance Mode**, check the switch name check box.

You can select multiple switches.

**Step 2** Choose one of the following options under the **Mode Selection** column:

- Shutdown
- Isolate

**Note** Click the appropriate option before you change the mode.

**Step 3** Click **Change System Mode**.

A confirmation message appears.

**Step 4** Click **OK** to confirm to change the maintenance mode of the device.

The status of operation can be viewed in the **System Mode** and the **Maintenance Status**.

## Switch Maintenance History

You can view the history of the maintenance mode changes executed from the Cisco DCNM.

The following table describes the fields that appear on **Configure > Image Management > Maintenance Mode [GIR] > Switch Maintenance History**.

| Field              | Description                                                                           |
|--------------------|---------------------------------------------------------------------------------------|
| Task Id            | Specifies the serial number of the task. The latest tasks that are listed in the top. |
| Switch Name        | Specifies the name of the switch for which the maintenance mode was changed.          |
| IP Address         | Specifies the IP address of the switch.                                               |
| User               | Specifies the name of the user who initiated the maintenance.                         |
| System Mode        | Specifies the mode of the system.                                                     |
| Maintenance Status | Specifies the mode of the maintenance process.                                        |
| Status             | Specifies the status of the mode change.                                              |
| Completed Time     | Specifies the time at which the maintenance mode activity was completed.              |

Click the radio button next to the switch name to select the switch for which you need to view the upgrade history. Click **View** to view the upgrade task history for the selected switch.

The following table describes the fields that appear on **Configure > Image Management > Upgrade [ISSU] > Switch Level History > View > Upgrade Tasks History**

| Field           | Description                                                                                                                              |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Owner           | Specifies the owner who initiated the upgrade.                                                                                           |
| Job Status      | Specifies the status of the job. <ul style="list-style-type: none"> <li>• Planned</li> <li>• In Progress</li> <li>• Completed</li> </ul> |
| KickStart Image | Specifies the kickstart image that is used to upgrade the Switch.                                                                        |
| System Image    | Specifies the system image that is used to upgrade the switch.                                                                           |
| Completed Time  | Specifies the date and time at which the upgrade was successfully completed.                                                             |

## Repositories

This feature allows you to add image servers and configuration servers information to fetch images for Upgrade, Patch, and POAP mode operations.

You can specify valid servers for SCP/SFTP/FTP/TFTP. DCNM does not perform the validation for SCP/SFTP/FTP/TFTP servers while creating or updating the servers. DCNM performs validation only for the SCP servers.



### Note

The SCP repositories use SSH protocol for the directory listing and therefore you need to enable SSH on the SCP repository server. The SFTP repository uses SFTP protocol for directory listing. The TFTP and FTP repositories do not support directory listing. You need to specify the file path manually.

## Add Image or Configuration Server URL

To add an image or a configuration server URL to the repository from the Cisco DCNM Web UI, perform the following steps:

### Procedure

**Step 1** On the **Image and Configuration Servers** window, click the **Add** icon.

The **Add Image or Configuration Server URL** window is displayed.

**Step 2** Specify a name for the image.

**Step 3** Click the radio button to select the protocol.

The available protocols are **SCP**, **FTP**, **SFTP**, and **TFTP**. Use the SCP protocol for POAP and Image Management.

You can use IPv4 and IPv6 addresses with these protocols.

- Step 4** Enter the hostname or IP address and the path to download or upload files.
  - Step 5** Specify the username and password.
  - Step 6** Click **OK** to save.
- 

## Deleting an Image or Configuration Server URL

To delete an image from the repository from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

- Step 1** On the **Image and Configuration Servers** window, select an existing image from the list, and click **Delete**.
- Step 2** In the delete notification, click **Yes** to delete the image and configuration server.

**Note** The default SCP Repository cannot be deleted.

---

## Editing an Image or Configuration Server URL

To edit an image or a configuration server URL to the repository from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

- Step 1** On the **Image and Configuration Servers** window, select an existing image and configuration server from the list, and click **Edit**.
  - Step 2** In the **Edit Image or Configuration Server URL** window, edit the required fields.
  - Step 3** Click **OK** to save or click **Cancel** to discard the changes.
- 

## File Browser

You can view the contents of the server on the **Image and Configuration Servers** page.

1. In the **Image and Configurations** page, check the **Server Name** check box to view the content.
2. Click **File Browser** to view the contents of this server.

## Image Upload

To upload different types of images to the server from the Cisco DCNM Web UI, perform the following steps:



---

**Note** Devices use these images during POAP.

---

### Procedure

---

**Step 1** On the **Image and Configuration Servers** window, check the server name check box to select the server for uploading images.

The **Select Image File** window appears.

**Step 2** Click **Browse** to select the image file from the directory.

**Step 3** From the **Platform** drop-down list, select the device to which you must upload this image.

**Step 4** From the **Type** drop-down list, select the type of the image you are uploading to the device.

**Step 5** Click **OK**.

The image is uploaded to the repository.

---



## CHAPTER 6

# Media Controller

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- [Topology, on page 119](#)
- [Host, on page 120](#)
- [Flow, on page 132](#)
- [Global, on page 146](#)
- [Config, on page 147](#)

## Topology

You can view the Media Controller topology on the **Web UI > Media Controller > Topology** page. This topology is specific to the operations performed by DCNM as a Media Controller.



---

**Note** If you remove a device from the Inventory, the Policy deployment status for that switch is removed. However, you must clear the policy configuration on the switch also.

---

### Quick Search

Enter the search string to highlight relevant devices.

The following fields are available to search on: **switch or hostname, switch or host IP address, switch MAC, and switch serial number.**

### Multicast Group

Right-click (or press Return Key) in the field. A list of Multicast Addresses are displayed. You can choose the multicast IP address for which you need to view the topology.

The devices under this multicast IP address, and links to spine and leaf are highlighted. The dotted moving lines depict the flow of traffic in the Media Controller topology.

You can search or filter based on flow alias name in the Topology. When you search for Multicast Group, you can search using the IP address or flow alias name.

# Host

The Host menu includes the following submenus:

## Discovered Host

You can view all the hosts that are populated through telemetry on this screen. After the switches are discovered, all the switches in the fabric will push data to the DCNM server at regular intervals using telemetry. Cisco DCNM server displays the received Events and Flow statistics for each active flow.

The following table describes the fields that appear on this page. Click the table header to sort the entries in alphabetical order of that parameter.

**Table 19: Discovered Host Table Fields and Description**

| Field                | Description                                                                                                                                                                                                                                                        |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Host Name            | Specifies the configured Host Alias for the host IP address.<br><br>The Host IP is displayed if the Host Alias is not configured.                                                                                                                                  |
| Role                 | Specifies the role of the host device. The role of the host can be one of the following: <ul style="list-style-type: none"> <li>• Sender</li> <li>• External Sender</li> <li>• Dynamic Receiver</li> <li>• External Receiver</li> <li>• Static Receiver</li> </ul> |
| Multicast Group      | Specifies the multicast address of the flow in which the host participates.                                                                                                                                                                                        |
| Source               | Specifies the source of the flow which the discovered host participates in.                                                                                                                                                                                        |
| Switch               | Specifies the name of the switch.                                                                                                                                                                                                                                  |
| Interface            | Specifies the interface to which host is connected on the sender or receiver leaf.                                                                                                                                                                                 |
| MAC Address          | Specifies the MAC address of a physical host, if the switch has ARP entry for that host).                                                                                                                                                                          |
| Host Discovered Time | Specifies the date and time at which the switch discovered the host.                                                                                                                                                                                               |

| Field        | Description                                                                             |
|--------------|-----------------------------------------------------------------------------------------|
| Fault Reason | Specifies the failure reason for the flow that the discovered host has participates in. |

## Host Alias

Cisco DCNM allows you to create host aliases for Media Controller sender and receiver hosts. The active multicast traffic transmitting and receiving devices are termed as hosts. Beginning with Cisco DCNM Release 11.0(1), you can add a host-alias name to your sender and receiver hosts, to help you to identify the hosts by a name. You can also import a large number of Host Alias to Cisco DCNM Media Controller.

The following table describes the fields that appear on this page.

*Table 20: Host Alias Table Field and Description*

| Field           | Description                                                                                                |
|-----------------|------------------------------------------------------------------------------------------------------------|
| Host Alias      | Specifies the host name that is configured to identify the host.                                           |
| IP Address      | Specifies the IP address of the host connecting to the switch, which you want to refer with an alias name. |
| Last Updated At | Specifies the date and time at which the host alias was last updated.                                      |

This section contains the following:

## Add Host Alias

Perform the following task to add new host aliases to devices in the fabric discovered by Cisco DCNM.

### Procedure

- 
- Step 1** Choose **Media Controller > Host > Host Alias**, click **Add**.
- Step 2** In the Add/Edit Host Alias window, enter the following:
- **Host Name**—Enter a fully qualified unified hostname for the identification.
  - **IP Address**—Enter the IP address of the host that is the part of a flow.
- Note** You can also create host alias before a host sends any data to its directly connected sender or receiver leaf .
- Step 3** Click **Save** to apply the changes.
- Click **Cancel** to discard the host alias.
- The new host alias is shown in the table on the **Host Alias** window.
-

## Edit Host Alias

Perform the following task to edit the host alias.

### Procedure

---

- Step 1** Choose **Media Controller > Host > Host Alias**, select the check box next to the Host Alias that you need to modify.
- Step 2** In the **Add/Edit Host Alias** window, enter the following:
- **Host Name**—Enter a fully qualified unified hostname for the identification.
  - **IP Address**—Enter the IP address of the host that is the part of a flow.
- Step 3** Click **Save** to apply the changes.  
Click **Cancel** to discard the host alias.  
The modified host alias is shown in the table on the **Host Alias** window.
- 

## Delete Host Alias

Perform the following task to delete the host alias.

### Procedure

---

- Step 1** Choose **Media Controller > Host > Host Alias**, select the check box next to the Host Alias that you want to delete.  
You can select multiple Host Alias entries to be deleted at the same instance.
- Step 2** Click **Delete**.
- Step 3** On the confirmation window, click **OK** to delete the Host Alias.  
Click **Cancel** to retain the host alias.
- 

## Import Host Alias

Perform the following task to import host aliases for devices in the fabric.

### Procedure

---

- Step 1** Choose **Media Controller > Host > Host Alias**, click **Import** icon.
- Step 2** Browse the directory and select the CSV file, which contains the Host IP address and corresponding unique hostname information.
- Step 3** Click **Open**.

The host aliases are imported and displayed on the Host Alias table.

## Export Host Alias

Perform the following task to export host aliases for devices in the fabric.

### Procedure

- Step 1** Choose **Media Controller > Host > Host Alias**, click **Export** icon.  
A notification window appears.
- Step 2** Select a location on your local system directory to store the Host Aliases configuration from DCNM and click **OK**.  
The host alias configuration file is exported to your local directory. The filename is appended with the date and time at which the file was exported. The format of the exported file is `.csv`.

## Host Policies

You can add policies to the host devices. Navigate to **Media Controller > Host > Host Policies** to configure the host policies.



- Note** Switches must be deployed with default host policies. You can edit the default host policies to permit or deny. From the Deployment drop-down list, select **Deploy Selected Policies** to deploy the default policies to the switches. You can also deploy all the default policies to all the managed switches by selecting **Deploy All Default Policies** even without selecting any default policies.

By default, the sequence numbers for policies are auto-generated by DCNM and Multicast mask/prefix is taken as /32. The server property `pmn.hostpolicy.multicast-ranges.enabled` under **Administration > DCNM Server > Server Properties** must be set to 'true' for the user to be able to provide sequence numbers and multicast mask/prefix. When the server property is set to **True**, the fields to enter the sequence number and the multicast mask/prefix is available in the **Media Controller > Host > Host Policies > Add** and **Media Controller > Host > Host Policies > Edit** pages.

The default host policies must be deployed successfully to the switch before you deploy the custom host policies on that switch. Otherwise, the custom policies will fail to deploy. Ensure that you deploy all default policies successfully to all the switches before you add, edit, import, or deploy custom policies.

The following table describes the fields that appear on this page.

**Table 21: Host Policies Operations**

| Field | Description                          |
|-------|--------------------------------------|
| Add   | Allows you to add a new host policy. |

| Field      | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Edit       | Allows you to view or edit the selected host policy parameters.                                                                                                                                                                                                                                                                                                                                                                                                                |
| Delete     | <p>Allows you to delete the user-defined host policy.</p> <p><b>Note</b></p> <ul style="list-style-type: none"> <li>• Undeploy policies from all switches before deleting them from DCNM.</li> <li>• You can undeploy the default policy, but you cannot delete the default policy. You can delete and undeploy only the custom policies.</li> <li>• When you undeploy the default policies, All Default Policies will be reset to have default permission (Allow).</li> </ul> |
| Delete All | <p>Allows you to delete all custom policies without selecting any policy check box.</p> <p><b>Note</b></p> <ul style="list-style-type: none"> <li>• Undeploy policies from all switches before deleting them from DCNM.</li> <li>• You can undeploy the default policy, but you cannot delete the default policy. You can delete and undeploy only the custom policies.</li> </ul>                                                                                             |
| Import     | <p>Allows you to import host policies from a CSV file to DCNM.</p> <p><b>Note</b> After import, all policies imported from a CSV file are applied to all managed switches automatically.</p>                                                                                                                                                                                                                                                                                   |
| Export     | Allows you to export host policies from DCNM to a CSV file.                                                                                                                                                                                                                                                                                                                                                                                                                    |

| Field      | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Deployment | <p>From the Deployment drop-down list, select an appropriate value.</p> <ul style="list-style-type: none"> <li>• <b>Deploy Selected Policies</b>—Select one or more check boxes next to the policy name. Select this option to deploy selected policies to the switch.</li> <li>• <b>Deploy All Custom Policies</b>—Select this option to deploy all the user-defined policies at a single instance.</li> <li>• <b>Undeploy Selected Custom Policies</b>—Select one or more check boxes next to the policy name. Select this option from the drop-down list to undeploy the selected policies.</li> <li>• <b>Undeploy All Custom Policies</b>—Select this option to undeploy all the user-defined policies for a single instance.</li> <li>• <b>Redo all Failed Custom Policies</b>—Select this option to deploy all failed user-defined policies.</li> <li>• <b>Deployment History</b>—Select one policy from the drop-down list. Select this option to view the deployment history of the selected policy.</li> </ul> <p>Deployment History shows the following fields.</p> <ul style="list-style-type: none"> <li>• <b>Policy Name</b>—Displays the selected policy name.</li> <li>• <b>Switch Name</b>—Specifies the name of the switch that the policy was deployed to.</li> <li>• <b>Deployment Status</b>—Displays the status of deployment. It shows if the deployment was Success or Failed.</li> <li>• Specifies the action that is performed on the switch for that flow policy. <ul style="list-style-type: none"> <li>• <b>Create</b>—Implies that the policy has been deployed on the switch.</li> <li>• <b>Delete</b>—Implies that the policy has been undeployed from the switch.</li> </ul> </li> <li>• <b>Deployment Date/Time</b>—Specifies the date and time at which the host policy was last updated. The format is <i>Day MMM DD YYYY HH:MM:SS Timezone</i>.</li> <li>• <b>Failed Reason</b>—Species why the policy was not successfully deployed.</li> </ul> |

Table 22: Host Policies Table Field and Description

| Field       | Description                                                     |
|-------------|-----------------------------------------------------------------|
| Policy Name | Specifies the policy name for the host, as defined by the user. |

| Field             | Description                                                                                                                                                                                                                                   |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Host Name         | Specifies the host ID.                                                                                                                                                                                                                        |
| Receiver IP       | Specifies the IP address of the receiving device.                                                                                                                                                                                             |
| Sender IP         | Specifies the IP Address of the transmitting device.                                                                                                                                                                                          |
| Multicast IP      | Specifies the multicast IP address for the host.                                                                                                                                                                                              |
| Sender IP         | Specifies the IP Address of the sender.                                                                                                                                                                                                       |
| Host Role         | Specifies the host device role. The host device role is either one of the following: <ul style="list-style-type: none"> <li>• Sender</li> <li>• Receiver-External</li> <li>• Receiver-Local</li> </ul>                                        |
| Operation         | Specifies if the operation of the host policy. The policy has the following operations: <ul style="list-style-type: none"> <li>• Permit</li> <li>• Deny</li> </ul>                                                                            |
| Sequence #        | Specifies the sequence number of the custom policy when the multicast range is selected.                                                                                                                                                      |
| Deployment Action | Specifies the action performed on the switch for that host policy. <ul style="list-style-type: none"> <li>• <b>Create</b>—The policy is deployed on the switch.</li> <li>• <b>Delete</b>—The policy is undeployed from the switch.</li> </ul> |
| Deployment Status | Specifies if the deployment is successful, failed or the policy is not deployed.                                                                                                                                                              |
| Last Updated      | Specifies the date and time at which the host policy was last updated.<br>The format is <i>Day MMM DD YYYY HH:MM:SS Timezone</i> .                                                                                                            |

This section contains the following:

## Add Host Policy

By default, the sequence number for policies is auto-generated by DCNM, and Multicast mask/prefix is /32 by default. The server property **pmn.hostpolicy.multicast-ranges.enabled** under **Administration > DCNM Server > Server Properties** must be set to 'true' for the user to be able to provide sequence numbers and multicast mask/prefix. When the server property is set to **true**, the fields to enter the sequence number and the multicast mask/prefix are available in the **Media Controller > Host > Host Policies > Add** and **Media Controller > Host > Host Policies > Edit** windows.

The default host policies must be deployed successfully to the switch before you deploy the custom host policies on that switch. Otherwise, the custom policies will fail to deploy. Ensure that you deploy all default policies successfully to all the switches before you add custom policies.

To add Host policy from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

- Step 1** Choose **Media Controller > Host > Host Policies**.  
The **Host Policies** window is displayed.
- Step 2** Click the **Add** icon.
- Step 3** In the Add Host Policy window, specify the parameters in the following fields.
- **Policy Name:** Specifies a unique policy name for the host policy.
  - **Host Role:** Specifies the host as a multicast sender or receiver. Select one of the following:
    - Sender
    - Receiver-Local
    - Receiver-External
  - **Host Name:** Specifies the host to which the policy is applied. If a destination host is detected, you can choose the hostname from the drop-down list.

**Note** Do not select hosts that are discovered as remote receivers to create receiver or sender host policies. However, hosts that are discovered as remote senders can be used for creating sender host policies.
  - **Sender IP:** Specifies the IP address of the Sender host.
  - **Receiver IP:** Specifies the IP address of the receiver host. This field is visible and is applicable only if the Host Role is set to **Receiver-Local**.
  - **Multicast:** Specifies the multicast IP Address for the host policy.
  - **Allow/Deny:** Click the radio button to choose, if the policy must **Allow** or **Deny** the traffic flow.
- Step 4** Click **Save & Deploy** to configure and deploy the Policy.  
Click **Cancel** to discard the new policy.
- 

## Edit Host Policy

The default host policies must be deployed successfully to the switch before you deploy the custom host policies on that switch. Otherwise, the custom policies will fail to deploy. Ensure that you deploy all default policies successfully to all the switches before you edit custom policies.

To edit host policy from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

- Step 1** Choose **Media Controller > Host > Host Policies**.  
The **Host Policies** window is displayed.
- Step 2** Check the check box next to the host policy name, that you need to edit.
- Step 3** Click **Edit** Host policy icon.
- Step 4** In the Edit Host Policy window, edit to specify if the policy will **Allow** or **Deny** traffic.
- Note** The changes made to Host Policy are applied immediately. If the policy is already applied to any device, the changes may impact the existing flows.
- Step 5** Click **Save & Deploy** to configure and deploy the Policy.  
Click **Cancel** to discard the changes.
- 

## Delete Host Policy

To delete host policy from the Cisco DCNM Web UI, perform the following steps:



- Note** You can delete only user-defined Host Policies.
- 

### Procedure

---

- Step 1** Choose **Media Controller > Host > Host Policies**.  
The **Host Policies** window is displayed.
- Step 2** Check the check box next to the host policy name, that you need to delete.  
You can select more than one host policy to delete.
- Step 3** Click **Delete** Host policy icon.  
Click **Delete All** to delete all the policies at a single instance.
- Step 4** In the delete notification, click **OK** to delete the host policy. Click **Cancel** to return to the Host Policies page.
- Note** Deleting a host policy from DCNM does not undeploy the policy from the switches on which it is deployed. It is highly recommended to undeploy the policy on the switches before deleting it from DCNM.
- A Delete Host policy successful message appears at the bottom of the page.
-

## Import Host Policy

The default host policies must be deployed successfully to the switch before you deploy the custom host policies on that switch. Otherwise, the custom policies will fail to deploy. Ensure that you deploy all default policies successfully to all the switches before you import custom policies.

To import host policies from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

- Step 1** Choose **Media Controller > Host > Host Policies**.  
The **Host Policies** window is displayed.
- Step 2** Click the **Import** host policy icon.
- Step 3** Browse the directory and select the `.csv` format file which contains the Host Policy configuration information.  
The policy will not be imported if the format in the `.csv` file is incorrect.
- Step 4** Click **Open**.  
The imported policies are automatically deployed to all the switches in the fabric.
- 

## Export Host Policy

To export host policies from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

- Step 1** Choose **Media Controller > Host > Host Policies**.  
The **Host Policies** window is displayed.
- Step 2** Click the **Export** host policy icon.  
A notification window appears.
- Step 3** Select a location on your directory to store the Host Policy details file.
- Step 4** Click **OK**.  
The host policy file is exported to your local directory. The filename is appended with the date on which the file is exported. The format of the exported file is `.csv`.
- 

## Policy Deployment

Policies are automatically deployed to switches whenever they are added, edited, or imported. You can choose to undeploy or redeploy the policies, by choosing the appropriate actions in the **Deployment** drop-down list. The policies will not be deployed correctly if the device is rebooting while the policy was deployed. In such case, the Failed message appears in the Status column in the table below.

The default policies must be deployed successfully to the switch before you deploy the custom policies on that switch. Otherwise, the custom policies will fail to deploy. Ensure that you deploy all default policies successfully to all the switches before you deploy custom policies.

### Deploy Selected Policies

This option allows you to deploy only selected policies to the devices. You can deploy other policies when required.

Select one or more check boxes next to the policy name. Select this option to deploy selected policies to the switch.

### Deploy All Custom Policies

This option allows you to deploy all the custom or user-defined policies to the switch. The policies are deployed even if the switch is rebooting. In such case, the deployment fails and a status message Failed appears in the table below.

Select this option to deploy all the user-defined policies at a single instance.

### Undeploy Selected Custom Policies

Select one or more check boxes next to the policy name. Select this option from the drop-down list to undeploy the selected policies.

### Undeploy All Custom Policies

This option allows you to undeploy all the custom or user-defined policies in a single instance.




---

**Note** You cannot undeploy the default configured policies.

---

### Redo All Failed Custom Policies

The deployment of policies may fail due to various reasons. This option allows you to deploy all failed user-defined policies.

All the deployments that failed previously are deployed again only to those switches. All the undeployments failed previously are redeployed from only those switches.

### Deployment History

This option allows you to view the deployment history of the policy.

The policy name is shown in the Policy Name field. From the drop-down list, choose the switch on which this policy was deployed.

The deployment history of the selected policy for the switch appears in the table below.

Deployment History table shows the following fields.

**Table 23: Policy Deployment History Table Field and Descriptions**

| Field                | Description                                                                                                                                                                               |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Deployment Status    | Displays the deployment status of the policy.<br>It shows if the deployment was Success or Failed.                                                                                        |
| Deployment Action    | Specifies the action that is performed on the switch for that policy.<br><b>Create:</b> The policy is deployed on the switch.<br><b>Delete:</b> The policy is undeployed from the switch. |
| Deployment Date/Time | Specifies the date and time at which the host policy was last updated. The format is <i>Day MMM DD YYYY HH:MM:SS Timezone</i> .                                                           |
| Failed Reason        | Species why the policy was not successfully deployed.                                                                                                                                     |

## Applied Host Policies

Beginning from Cisco DCNM Release 11, you can view the policies that you have applied in the entire network. On the Cisco DCNM Web UI, navigate to **Media Controller > Host > Applied Host Policies** to view the various policies.

The table displays default PIM policy, local receiver policy, and sender policy. Media Controller will not display user-defined PIM Policies or Receiver External Policies.

The following table describes the fields that appear on this page.

**Table 24: Field and Description on the Applied Host Policies**

| Column Name | Description                                                                                                                                                                           |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Policy Name | Specifies the name of the policy applied.                                                                                                                                             |
| Host Role   | Specifies the role of the host.<br>The host device role is either one of the following: <ul style="list-style-type: none"> <li>• PIM</li> <li>• Sender</li> <li>• Receiver</li> </ul> |
| Switch      | Specifies the name of the switch to which the policy is applied.                                                                                                                      |
| Interface   | Specifies the interface to which the policy is applied.                                                                                                                               |
| Active      | Specifies if the policy is active or not.                                                                                                                                             |

| Column Name | Description                                                                                                                      |
|-------------|----------------------------------------------------------------------------------------------------------------------------------|
| Time Stamp  | Specifies the date and time at which the policy was created\deployed.<br><br>The format is Day, MMM DD YYYY HH:MM:SS (Timezone). |

## Flow

The Flow menu includes the following submenus:

### Flow Status

Cisco DCNM allows you to view the flow status pictorially and statistically. The flow status is available on **Media Controller > Flow > Flow Status**.

The following table describes the fields that appear on the Active tab.

*Table 25: Active Tab*

| Field        | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Show Chart   | <p>Click Show Chart icon to view the graphical representation of the Flow Status.</p> <p><b>Note</b> The data refers to the sender leaf when the sender starts broadcasting. Please see the receiver start time in the flow status table to find when the receiver started getting data.</p> <p>Click the <b>Show</b> drop-down list to view the flow status information in one of the following formats—Chart, Table, or Chart and Table.</p> <p>Click <b>Chart Type</b> icon to view the various chart types. Select a chart type to view the flow status information that is depicted in that chart format. You can choose a chart option to see filled patterns or data markers.</p> <p>Click <b>Actions</b> icon to print the report or excel chart information to your local directory.</p> |
| Multicast IP | <p>Specifies the multicast IP address for the flow.</p> <p><b>Note</b> You can click the wave link next to the Multicast IP address to view the pictorial representation of flow statistics.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Flow Alias   | Specifies the name of the Flow Alias.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

| Field              | Description                                                                                                                                                                                                                                                                                                                               |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sender             | Specifies the IP Address or the Host alias of the sender for the multicast group.                                                                                                                                                                                                                                                         |
| Receiver           | Specifies the IP Address or the Host alias of the receiver joining the group.                                                                                                                                                                                                                                                             |
| Bandwidth          | Specifies the bandwidth that is allotted for the traffic.                                                                                                                                                                                                                                                                                 |
| Sender Switch      | Specifies if the Sender switch is a leaf or spine.                                                                                                                                                                                                                                                                                        |
| Sender Interface   | Specifies the interface to which the sender is connected to.                                                                                                                                                                                                                                                                              |
| Receiver Switch    | Specifies if the Receiver switch is a leaf or spine.                                                                                                                                                                                                                                                                                      |
| Receiver Interface | Specifies the interface to which the receiver is connected to.                                                                                                                                                                                                                                                                            |
| QOS/DSCP           | Specifies the Switch-defined QoS Policy.                                                                                                                                                                                                                                                                                                  |
| Flow Link State    | <p>Specifies the state of the flow link.</p> <p>Click <b>active</b> link to view the network diagram of the Sender and Receiver.</p> <p>The dotted line displays the direction of the flow of traffic. You can hover over the nodes to view information. The table on the right side shows information about the Sender and Receiver.</p> |
| Policy ID          | Specifies the policy ID applied to the multicast IP.                                                                                                                                                                                                                                                                                      |
| Sender Start Time  | Displays the time from when the sender joined.                                                                                                                                                                                                                                                                                            |
| Receiver Join Time | Specifies the time at which the receiver joined.                                                                                                                                                                                                                                                                                          |

The following table describes the fields that appear on the Inactive tab.

Table 26: Inactive Tab

| Field              | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Show Chart         | <p>Click Show Chart icon to view the graphical representation of the Flow Status.</p> <p><b>Note</b> The data refers to the sender leaf when the sender starts broadcasting. Please see the receiver start time in the flow status table to find when the receiver started getting data.</p> <p>Click the <b>Show</b> drop-down list to view the flow status information in one of the following formats—Chart, Table, or Chart and Table.</p> <p>Click <b>Chart Type</b> icon to view the various chart types. Select a chart type to view the flow status information that is depicted in that chart format. You can choose a chart option to see filled patterns or data markers.</p> <p>Click icon to print the report or excel chart information to your local directory.</p> |
| Multicast IP       | Specifies the multicast IP address of the flow.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Flow Alias         | Specifies the name of the Flow Alias.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Sender             | Specifies the IP Address or the Host alias of the sender for the multicast groups.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Receiver           | Specifies the IP Address or the Host alias of the receiver.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Bandwidth          | Specifies the bandwidth that is allotted for the traffic.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| QoS/DSCP           | Specifies the Switch-defined QoS Policy.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Policy ID          | Specifies the policy ID applied to the multicast IP.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Sender Start Time  | Specifies the time at which the sender joined.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Receiver Join Time | Specifies the time at which the receiver joined.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

| Field        | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Fault Reason | <p>Specifies reason for the inactive flow.</p> <p>Cisco DCNM determines the inactive flow if both the sender and receiver mroute exists with any of the following combinations.</p> <ul style="list-style-type: none"> <li>• Receiver IIF is null</li> <li>• Receiver OIF is null</li> <li>• Sender IIF is null</li> <li>• Sender OIF is null</li> </ul> <p>In this scenario, the switch will not have any fault reason. Therefore, there is no fault reason for such inactive flows.</p> |

The following table describes the fields that appear on the Sender Only tab.

**Table 27: Sender Only Tab**

| Field                    | Description                                                                |
|--------------------------|----------------------------------------------------------------------------|
| Multicast IP             | Specifies the multicast IP address for the flow.                           |
| Flow Alias               | Specifies the name of the Flow Alias.                                      |
| Sender                   | Specifies the name of the sender.                                          |
| Sender Switch            | Specifies the IP address of the sender switch.                             |
| Sender Ingress Interface | Specifies the name of the sender ingress interface.                        |
| Flow Link State          | Specifies the flow link state, if it is allow or deny.                     |
| Policy ID                | Specifies the policy ID applied to the multicast IP.                       |
| Bandwidth                | Specifies the bandwidth that is allotted for the traffic.                  |
| Sender Start Time        | Displays the time from when the sender switch is transmitting information. |

The following table describes the fields that appear on the Receiver Only tab.

**Table 28: Receiver Only Tab**

| Field        | Description                                      |
|--------------|--------------------------------------------------|
| Multicast IP | Specifies the multicast IP address for the flow. |
| Flow Alias   | Specifies the name of the Flow Alias.            |

| Field                  | Description                                                                                                           |
|------------------------|-----------------------------------------------------------------------------------------------------------------------|
| Name                   | Specifies the receiver ID. If the multicast receiver is remote, the <b>Remote</b> label can be seen next to its name. |
| Receiver Interface     | Specifies the name of the destination switch interface.                                                               |
| Receiver Switch        | Specifies the IP address of the receiver switch.                                                                      |
| Source Specific Sender | Specifies the IP address of the multicast sender.                                                                     |
| Flow Link State        | Specifies the flow link state, if it is allow or deny.                                                                |
| Policy ID              | Specifies the policy ID applied to the multicast IP.                                                                  |
| Bandwidth              | Specifies the bandwidth that is allotted for the traffic.                                                             |
| Receiver Join Time     | Specifies the time at which the receiver joined.                                                                      |

Click the **Show** drop-down list in the statistical representation area to display the statistical data in various formats.

Click the arrow to export the statistical data. You can export it in `.csv` or `.pdf` formats.



**Note**

Cisco DCNM holds the Flow statistics values in the DCNM server internal memory. Therefore, after a DCNM Restart or HA switch over, the Flow statistics will not show previously collected values. However, you can see the Flow statistics that are collected after the server Restart or HA switch over.

If the new flow joins before the uplinks between the switches that are detected in DCNM, a message `BW_UNAVAIL` appears. This is resolved after the uplinks between the switches are detected by DCNM after discovery of the devices.

## Flow Alias

Using the Flow Alias feature, you can specify names for multicast groups. The multicast IP addresses are difficult to remember, thus by assigning a name to the multicast IP address, you can search and add policies based on the name.

You can configure a flow alias on **Media Controller > Flow > Flow Alias**.

The following table describes the fields that appear on this page.

**Table 29: Flow Alias Table Field and Description**

| Field                | Description                                         |
|----------------------|-----------------------------------------------------|
| Flow Alias           | Specifies the name of the Flow Alias.               |
| Multicast IP Address | Specifies the multicast IP address for the traffic. |
| Description          | Description added to the Flow Alias.                |

| Field           | Description                                                  |
|-----------------|--------------------------------------------------------------|
| Last Updated at | Specifies the date on which the flow alias was last updated. |

This section contains the following:

## Add Flow Alias

To add flow alias from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

- Step 1** Choose **Media Controller > Flow > Flow Alias**.  
The **Flow Alias** window is displayed.
- Step 2** Click the **Add Flow Alias** icon.
- Step 3** In the **Add Flow Alias** window, specify the parameters in the following fields.
- **Flow Name**: Specifies a unique flow alias name.
  - **Multicast IP Address**: Specifies the multicast IP Address for the flow alias.
  - **Description**: Specifies the description that you add for the flow alias.
- Step 4** Click **Save** to save the flow alias.  
Click **Cancel** to discard.
- 

## Edit Flow Alias

To edit a flow alias from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

- Step 1** Choose **Media Controller > Flow > Flow Alias**.  
The **Flow Alias** window is displayed.
- Step 2** Check the check box next to the flow alias name, that you need to edit.
- Step 3** Click **Edit Flow Alias** icon.
- Step 4** In the Edit Flow Alias window, edit the **Name**, **Multicast IP**, **Description** fields.
- Step 5** Click **Save** to save the new configuration.  
Click **Cancel** to discard the changes.
-

## Delete Flow Alias

To delete flow alias from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

- Step 1** Choose **Media Controller > Flow > Flow Alias**.  
The **Flow Alias** window is displayed.
- Step 2** Check the check box next to the flow alias, that you need to delete.  
You can select more than one flow alias to delete.
- Step 3** Click **Delete** Flow Alias icon.  
The flow alias is deleted.
- 

## Export Flow Alias

To export host alias from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

- Step 1** Choose **Media Controller > Flow > Flow Alias**.  
The **Flow Alias** window is displayed.
- Step 2** Click **Export** flow alias icon.  
A notification window appears.
- Step 3** Select a location on your directory to store the Alias details file.
- Step 4** Click **OK**.  
The flow alias file is exported to your local directory. The filename is appended with the date on which the file is exported. The format of the exported file is `.csv`.
- 

## Import Flow Alias

To import flow alias from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

- Step 1** Choose **Media Controller > Flow > Flow Alias**.  
The **Flow Alias** window is displayed.

- Step 2** Click **Import** flow alias icon.
- Step 3** Browse the directory and select the file which contains the Flow Alias configuration information.
- Step 4** Click **Open**.

The flow alias configuration is imported and displayed on the **Media Controller > Flow > Flow Alias** window, on the Cisco DCNM Web Client.

## Flow Policies

You can configure the flow policies on **Media Controller > Flow > Flow Policies**.

The default policies are displayed on the Flow policy page. By default, the bandwidth of these policies is 0. You can configure the bandwidth such that any flow that matches the default flow policy will accordingly use the bandwidth and QOS/DSCP parameters. The policy is deployed to all the devices when you save the configuration.

The default flow policies must be deployed successfully to the switch before you deploy the custom flow policies on that switch. Otherwise, the custom policies will fail to deploy. Ensure that you deploy all default policies successfully to all the switches before you add, edit, import, or deploy custom policies.



**Note** When you undeploy a default policy, it will be reset to default values, that is, Bandwidth:0gbps, DSCP:Best Effort, and Policer:Enabled.

The following table describes the fields that appear on this page.

**Table 30: Flow Policies Operations**

| Field      | Description                                                                                                                                                                                                                                       |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Add        | Allows you to add a new flow policy.                                                                                                                                                                                                              |
| Edit       | Allows you to view or edit the selected flow policy parameters.                                                                                                                                                                                   |
| Delete     | Allows you to delete the user-defined flow policy.<br><b>Note</b> <ul style="list-style-type: none"> <li>• You cannot delete the default flow policies.</li> <li>• Undeploy policies from all switches before deleting them from DCNM.</li> </ul> |
| Delete All | Allows you to delete all the flow policies at a single instance.<br><b>Note</b> Undeploy policies from all switches before deleting them from DCNM.                                                                                               |

| Field  | Description                                                                                                                                                               |
|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Import | Allows you to import flow policies from a CSV file.<br><b>Note</b> After import, all policies imported from a CSV file are applied to all managed switches automatically. |
| Export | Allows you to export flow policies to a CSV file.                                                                                                                         |

| Field      | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Deployment | <p>From the Deployment drop-down list, select an appropriate value.</p> <ul style="list-style-type: none"> <li>• <b>Deploy Selected Policies</b>—Select one or more check boxes next to the policy name. Select this option to deploy selected policies to the switch.</li> <li>• <b>Deploy All Custom Policies</b>—Select this option to deploy all the user-defined policies at a single instance.</li> <li>• <b>Undeploy Selected Custom Policies</b>—Select one or more check boxes next to the policy name. Select this option from the drop-down list to undeploy the selected policies.</li> <li>• <b>Undeploy All Custom Policies</b>—Select this option to undeploy all the user-defined policies for a single instance.</li> <li>• <b>Redo all Failed Custom Policies</b>—Select this option to deploy all failed user-defined policies.</li> <li>• <b>Deployment History</b>—Select one policy from the drop-down list. Select this option to view the deployment history of the selected policy.</li> </ul> <p>Deployment History shows the following fields.</p> <ul style="list-style-type: none"> <li>• <b>Policy Name</b>—Displays the selected policy name.</li> <li>• <b>Switch Name</b>—Specifies the name of the switch that the policy was deployed to.</li> <li>• <b>Deployment Status</b>—Displays the status of deployment. It shows if the deployment was Success or Failed.</li> <li>• Specifies the action that is performed on the switch for that flow policy. <ul style="list-style-type: none"> <li>• <b>Create</b>—Implies that the policy has been deployed on the switch.</li> <li>• <b>Delete</b>—Implies that the policy has been undeployed from the switch.</li> </ul> </li> <li>• <b>Deployment Date/Time</b>—Specifies the date and time at which the host policy was last updated. The format is <i>Day MMM DD YYYY HH:MM:SS Timezone</i>.</li> <li>• <b>Failed Reason</b>—Species why the policy was not successfully deployed.</li> </ul> |

Table 31: Flow Policies Table Field and Description

| Field              | Description                                                                                                                                                                                                                                           |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Policy Name        | Specifies the flow policy name.                                                                                                                                                                                                                       |
| Multicast IP Range | Specifies the multicast IP address for the traffic.                                                                                                                                                                                                   |
| Bandwidth          | Specifies the bandwidth that is allotted for the traffic.                                                                                                                                                                                             |
| QoS/DSCP           | Specifies the Switch-defined QoS Policy.                                                                                                                                                                                                              |
| Deployment Status  | Specified if the flow policy is deployed successfully or failed.                                                                                                                                                                                      |
| Deployment Action  | Specifies the action that is performed on the switch for that host policy. <ul style="list-style-type: none"> <li>• <b>Create</b>—The policy is deployed on the switch.</li> <li>• <b>Delete</b>—The policy is undeployed from the switch.</li> </ul> |
| In Use             | Specifies if the flow policy is in use or not.                                                                                                                                                                                                        |
| Last Updated       | Specifies the date and time at which the flow policy was last updated.<br><br>The format is <i>Day MMM DD YYYY HH:MM:SS Timezone</i> .                                                                                                                |



- Note** A new flow policy or an edited flow policy is effective only under the following circumstances.
- If the new flow matches the existing flow policy.
  - If the flow expires and reforms, while the new policy is already added or edited, that matches with the flow policy.

This section contains the following:

## Add Flow Policy

The default flow policies must be deployed successfully to the switch before you deploy the custom flow policies on that switch. Otherwise, the custom policies will fail to deploy. Ensure that you deploy all default policies successfully to all the switches before you add custom policies.

To add flow policy from the Cisco DCNM Web UI, perform the following steps:

### Procedure

- Step 1** Choose **Media Controller > Flow > Flow Policies**.

The **Flow Policies** window is displayed.

**Step 2** Click the **Add** Flow policy icon.

**Step 3** In the Add Flow Policy window, specify the parameters in the following fields.

- **Policy Name:** Specifies a unique policy name for the flow policy.
- **Bandwidth:** Specifies the bandwidth that is allocated for the flow policy. Select of the radio buttons to choose **Gbps** or **Mbps**.

**Step 4** From the **QoS/DSCP** drop-down list, choose an appropriate ENUM value.

**Step 5** In the Multicast IP Range, enter the beginning IP and ending IP Address for the multicast range.

Click **Plus (+)** icon to add the multicast range to the policy.

**Step 6** Click **Deploy** to deploy the new policy.

Click **Cancel** to discard the changes.

---

## Edit Flow Policy

The default flow policies must be deployed successfully to the switch before you deploy the custom flow policies on that switch. Otherwise, the custom policies will fail to deploy. Ensure that you deploy all default policies successfully to all the switches before you edit custom policies.

To add flow policy from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

**Step 1** Choose **Media Controller > Flow > Flow Policies**.

The **Flow Policies** window is displayed.

**Step 2** Check the check box next to the flow policy name, that you need to edit.

**Step 3** Click **Edit** Flow policy icon.

**Step 4** In the Edit Flow Policy window, edit the **Multicast IP**, **Bandwidth**, **QoS/DSCP** fields.

**Step 5** Click **Deploy** to deploy the new policy.

Click **Cancel** to discard the changes.

---

## Delete Flow Policy

To delete flow policy from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

**Step 1** Choose **Media Controller > Flow > Flow Policies**.

The **Flow Policies** window is displayed.

**Step 2** Check the check box next to the flow policy name, that you need to delete.

You can select more than one flow policy to delete.

**Note** You cannot delete the default policies.

**Step 3** Click **Delete** icon to delete the selected flow policy.

Click **Delete All** icon to delete all the flow policies at a single instance.

---

## Import Flow Policy

The default flow policies must be deployed successfully to the switch before you deploy the custom flow policies on that switch. Otherwise, the custom policies will fail to deploy. Ensure that you deploy all default policies successfully to all the switches before you import custom policies.

To import flow policies from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

**Step 1** Choose **Media Controller > Flow > Flow Policies**.

The **Flow Policies** window is displayed.

**Step 2** Click the **Import** flow policy icon.

**Step 3** Browse the directory and select the file which contains the Flow Policy configuration information.

**Step 4** Click **Open**.

The flow policy configuration is imported and displayed on the **Media Controller > Flow > Flow Policies** window, on the Cisco DCNM Web Client.

The imported policies are automatically deployed to all the switches in the fabric.

---

## Export Flow Policy

To export host policies from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

**Step 1** Choose **Media Controller > Flow > Flow Policies**.

The **Flow Policies** window is displayed.

**Step 2** Click the **Export** flow policy icon.

A notification window appears.

**Step 3** Select a location on your directory to store the Flow Policy details file.

**Step 4** Click **OK**.

The flow policy file is exported to your local directory. The filename is appended with the date on which the file is exported. The format of the exported file is `.csv`.

---

## Policy Deployment

Policies are automatically deployed to switches whenever they are added, edited, or imported. You can choose to undeploy or redeploy the policies, by choosing the appropriate actions in the **Deployment** drop-down list. The policies will not be deployed correctly if the device is rebooting while the policy was deployed. In such case, the Failed message appears in the Status column in the table below.

The default policies must be deployed successfully to the switch before you deploy the custom policies on that switch. Otherwise, the custom policies will fail to deploy. Ensure that you deploy all default policies successfully to all the switches before you deploy custom policies.

### Deploy Selected Policies

This option allows you to deploy only selected policies to the devices. You can deploy other policies when required.

Select one or more check boxes next to the policy name. Select this option to deploy selected policies to the switch.

### Deploy All Custom Policies

This option allows you to deploy all the custom or user-defined policies to the switch. The policies are deployed even if the switch is rebooting. In such case, the deployment fails and a status message Failed appears in the table below.

Select this option to deploy all the user-defined policies at a single instance.

### Undeploy Selected Custom Policies

Select one or more check boxes next to the policy name. Select this option from the drop-down list to undeploy the selected policies.

### Undeploy All Custom Policies

This option allows you to undeploy all the custom or user-defined policies in a single instance.



---

**Note** You cannot undeploy the default configured policies.

---

### Redo All Failed Custom Policies

The deployment of policies may fail due to various reasons. This option allows you to deploy all failed user-defined policies.

All the deployments that failed previously are deployed again only to those switches. All the undeployments failed previously are redeployed from only those switches.

## Deployment History

This option allows you to view the deployment history of the policy.

The policy name is shown in the Policy Name field. From the drop-down list, choose the switch on which this policy was deployed.

The deployment history of the selected policy for the switch appears in the table below.

Deployment History table shows the following fields.

**Table 32: Policy Deployment History Table Field and Descriptions**

| Field                | Description                                                                                                                                                                               |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Deployment Status    | Displays the deployment status of the policy.<br>It shows if the deployment was Success or Failed.                                                                                        |
| Deployment Action    | Specifies the action that is performed on the switch for that policy.<br><b>Create:</b> The policy is deployed on the switch.<br><b>Delete:</b> The policy is undeployed from the switch. |
| Deployment Date/Time | Specifies the date and time at which the host policy was last updated. The format is <i>Day MMM DD YYYY HH:MM:SS Timezone</i> .                                                           |
| Failed Reason        | Species why the policy was not successfully deployed.                                                                                                                                     |

## Global

The Global menu includes the following submenus:

## Events

Cisco DCNM allows you to view and purge the various events between the Host and Flow. The Events are recorded on **Media Controller > Events**.

The PMN Events table is updated real-time.

The maximum stored PMN events and cleanup frequency can be specified via **pmn.rows.limit** and **pmn.delete.interval** respectively in the **Administration > DCNM Server > Server Properties** page.

The following table describes the fields that appear on this page.

| Field            | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Purge            | <p>Click to remove the old/unwanted events.</p> <p><b>Note</b> If the DCNM server restarts, by default a maximum of 5000 event entries are retained for 6 hours.</p> <p>Click one of the radio buttons to choose the Purge options.</p> <ul style="list-style-type: none"> <li>• <b>Max # of Records</b>—Enter the maximum number of records to delete.</li> <li>• <b># of Days</b>—Enter the number of days for which you need to delete the events.</li> <li>• <b>Delete all data from the previous date</b>—Specifies a date before which all the data is deleted.</li> </ul> <p>Click <b>Purge</b> to delete/retain PMN events information.</p> |
| Category         | Specifies if the event category.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Severity         | Specifies the severity of the event.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Description      | <p>Specifies the description of the event.</p> <p>The sample description appears as:</p> <pre>Creating flow for FlowRequest:The flowRequest is for hostId:&lt;&lt;IP_Address&gt;&gt; hostInterface:&lt;&lt;Host_Int_ID&gt;&gt; mcastIp:&lt;&lt;Multicast IP&gt;&gt; Is sender role:false originating from switch:&lt;&lt;Host IP Address&gt;&gt;</pre>                                                                                                                                                                                                                                                                                              |
| Impacted Flows   | Specifies the impacted flows due to this event.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Last Update Time | <p>Specifies the date and time at which the event was last modified.</p> <p>The format is <i>Day MMM DD YYYY HH:MM:SS Timezone</i>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Export           | <p>Allows you to download the events to a local directory path.</p> <p>The filename is appended with the date on which the file is exported. The format of the exported file is <i>.xls</i>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

## Config

The Config menu includes the following submenus:

### Setting Up the SNMP Server for DCNM

When you add a switch to the DCNM inventory, DCNM automatically configures the switch with the following configuration so that the switch knows where to send SNMP traps: `snmp-server host dcnm-host-IP traps version 2c public UDP port - 2162`

Follow these steps to establish switch-to-DCNM connectivity if you are planning to use a controller deployment.

### Procedure

- 
- Step 1** To ensure that DCNM receives SNMP traps from the switches, specify the IP address (or VIP address for native HA) to which the switches send the SNMP traps by configuring DCNM server property `trap.registaddress=dcnm-ip` under **Administrator > Server Properties**.
- Step 2** For an Inband environment, use the `pmn_telemetry_snmp` CLI template that is packaged along with the Cisco DCNM Application, to configure more SNMP settings on the switch. For more information, see [Switch Global Config, on page 150](#).
- 

## AMQP Notifications

For all DCNM operations (such as Host Alias, Host Policy, and so on), AMQP notifications are sent. For operations triggered by the switch and received through telemetry (such as Flow Status), Cisco DCNM periodically checks for new events and generate appropriate notifications. This time period can be configured by setting the "AMQP\_POLL\_TIME" value in the `server.properties`.

To update the `server.properties` file and change AMQP poll interval, perform the following:

1. Locate the `server.properties` file that is located at the following location:

```
/usr/local/cisco/dcm/fm/conf/
```

2. Edit the line `AMQP_POLL_TIME` based on the required poll interval. Poll interval value is in minutes.

```
AMQP_POLL_TIME=5
```

The poll interval is set to 5 minutes. By default, the poll interval is set to 2 minutes.

3. Restart the DCNM server to apply the changes that are made in the `server.properties` file, using the command:

```
appmgr restart dcnm—for Standalone deployment
```

```
appmgr restart ha-apps—for Native HA deployment
```

### AMQP Notification Components

#### • Routing Key

The routing key is an address that the exchange may use to decide how to route the message. This is similar to a URL in HTTP. Most exchange types use the routing key to implement routing logic, but user may choose to ignore it and filter on some other criteria such as message contents. DCNM PMN additionally includes routing key criteria in message header properties.

#### • Routing Key Format

The routing key of DCNM PMN AMQP for object notification has following format:

```
Severity.Operation.ObjectType
```

Example: `info.com.cisco.dcnm.event.pmn.create.host`

| Key Identifier | Details                                                                                                  |
|----------------|----------------------------------------------------------------------------------------------------------|
| Severity       | Message Severity (Info/Warning/Error)                                                                    |
| Operation      | Create/Update/Delete/Discover/Apply/<br>Establish/Deploy/SwitchReload/DCNM                               |
| Object Type    | Object involved in notification includes Host Alias, Host, Host Policy, Flow Policy, Flow, Switch, DCNM. |

#### • Message Properties

Message includes following properties and header which can be used for content parsing.

| Property         | Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| priority         | Message priority. Its default value is 0.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| delivery_mode    | Delivery mode used for the message. Its default value is 2 (persistent), which means the message is stored both in-memory and on disk.                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| content_encoding | UTF-8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| content_type     | MIME type of message content. The default value is application/json.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| headers          | List of name-value pairs about the message. <ul style="list-style-type: none"> <li>• Severity—Message Severity (Info/Warning/Error).</li> <li>• Operation Status—Success/Failure.</li> <li>• Operation—<br/>Create/Update/Delete/Discover/Apply/<br/>Establish/Deploy/SwitchReload/DCNM.</li> <li>• Bulk—True/False indicates bulk operation.</li> <li>• Type—Object involved in notification such as Host Alias, Host, Host Policy, Flow Policy, Flow, Switch, DCNM.</li> <li>• User—Logged-in user who performed the action.</li> <li>• Event—Message sent (for backwards compatibility).</li> </ul> |
| message_id       | Message ID                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

#### • Notification Body

DCNM notification payload contains necessary information to identify the resources that trigger the notification, as well as link for detailed information retrieval. In case of operation failure, the notification includes the error message with detailed reason.

## Switch Global Config

Prior to Release 11, Cisco DCNM Media Controller performed operations such as managing the bandwidth, stitching the flows, host link bandwidth, and so on. Beginning with Release 11, DCNM allows two major operations.

- Monitor the Network
- Configure Host and Flow policies

DCNM monitors the Flow Status, Discovered Host, Applied Host Policies and other operations using Telemetry. For any operations triggered by the switch and received through telemetry (e.g. Flow Established), DCNM periodically checks for new events and generate appropriate notification.

If `pmn.deploy-on-import-reload.enabled` server property is set to true, during a switch reload, when DCNM receives switch `coldStartSNMPtrap`, it will push Global Config, and Host and Flow policies that are showing 'Deployment Status=Successes' to the switch automatically. The switch telemetry and SNMP configuration can be deployed on demand by using DCNM packaged `pmn_telemetry_snmp` CLI template via **Configure > Templates > Template Library**.

Navigate to **Cisco DCNM Web UI > Media Controller > Global > Config** to set or modify Switch Global configuration and WAN links.

When Cisco DCNM is installed in Media Controller Deployment mode, you can deploy policies the unicast bandwidth, ASM range, and WAN links through **Web UI > Media Controller > Global > Config**.

After you deploy the DCNM in Media Controller mode, you must configure the bandwidth and ASM. The remaining percentage of the bandwidth is utilized by the multicast traffic. DCNM acts like a Master Controller, and deploy the bandwidth and ASM configurations to all the switches in the fabric.

Navigate to **Cisco DCNM Web UI > Media Controller > Global > Config > Switch Global Config** to configure the global parameters.

### AMQP Notifications

As Cisco DCNM uses Telemetry to fetch data from the Fabric, the flow status and AMQP notifications may not reflect the current state in real time. It periodically checks new events and generate appropriate notification. Also, flows are no longer limited to a single spine and may take N or W or M shape. Host policies are applied based on the switch interface configuration and not just-in-time (JIT). All these architecture changes influence current AMQP messages and trigger time. By default, poll interval is set to 2 minutes. For more information, see [AMQP Notifications, on page 148](#).

### Unicast Bandwidth Reservation

You can configure the server to allot a dedicated percentage of bandwidth to unicast traffic. The remaining percentage is automatically reserved for multicast traffic.

In the Unicast Bandwidth Reservation (%) field, enter a numeric value to configure the bandwidth.

## ASM Range

Any Source Multicast (ASM) is a PIM tree building mode that uses shared trees to discover new sources and receivers as well as source trees to form shortest paths from receivers to sources. ASM provides discovery of multicast sources.

You can configure the ASM range by specifying the IP address and the subnet mask.

In the ASM/Mask field, enter the IP address and subnet mask defining the multicast source. Click **Add** icon to add the multicast address to the ASM range. You can add multiple ASM ranges. To delete an ASM range, select the check box next to the ASM/Mask in the table and click **Delete** icon.

After you configure the Unicast Bandwidth Reservation and ASM range, you can perform the following operations to deploy this to the switches.

**Table 33: Operations on the Global Config screen**

| Icon     | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Save     | Click <b>Save</b> to save the configurations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Deploy   | <p>After configuring the Unicast Bandwidth and ASM range, you can choose to deploy the configuration. You can choose one of the following from the drop-down list:</p> <ul style="list-style-type: none"> <li>• <b>All</b>—Deploys both ASM and Bandwidth configuration to all switches.</li> <li>• <b>Bandwidth</b>—Deploys only the bandwidth configuration.</li> <li>• <b>ASM</b>—Deploys only the ASM configuration.</li> <li>• <b>All Failed</b>—Deploys all failed deployments.</li> </ul> <p>Success or Failed message appears next to each of the ASM range in the table.</p> |
| Undeploy | <p>You can undeploy the Unicast Bandwidth and ASM range. From the drop-down list, choose one of the following:</p> <ul style="list-style-type: none"> <li>• <b>All</b>—Undeploys both ASM and Bandwidth configuration to all switches.</li> <li>• <b>Bandwidth</b>—Undeploys only the bandwidth configuration from the switches.</li> <li>• <b>ASM</b>—Undeploys only the ASM configuration.</li> </ul>                                                                                                                                                                               |

| Icon    | Description                                                                                                                                                                                                                                                                   |
|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Status  | <p>Unicast Bandwidth Reservation Status specifies if the bandwidth deployment was success, or failed or not deployed.</p> <p>ASM/Mask Status field displays if the ASM and Mask configuration was deployed successfully, or failed or not deployed.</p>                       |
| History | <p>Click the respective History link to view the deployment history for Unicast Bandwidth and ASM deployments.</p> <p>For a description about the fields that appear on the History link, see <a href="#">#unique_219 unique_219_Connect_42_deployment_history_table</a>.</p> |

The following table describes the fields that appear on the Deployment History.

**Table 34: Deployment History Field and Description**

| Field                | Description                                                                               |
|----------------------|-------------------------------------------------------------------------------------------|
| Switch Name          | Specifies the switch name in the fabric on which the configuration was deployed.          |
| Action               | Specifies the action that is performed on the switch - <b>Deploy</b> or <b>Undeploy</b> . |
| Deployment Status    | Displays the status of deployment. It shows if the deployment was Success or Failed.      |
| Deployment Date/Time | Displays the date and time when the deployment was initialized.                           |
| Failed Reason        | Specifies the reason why the deployment failed.                                           |

| Field | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Show  | <p>From the drop-down list, choose an appropriate filter.</p> <ul style="list-style-type: none"> <li>• Quick Filter - A search field appears in every column. You can enter a search string to filter.</li> <li>• Advanced Filter - In the Advanced Filter screen, select the All or Any radio button in the Match field. In the Select Filter field, select the category from the drop-down list. Select an appropriate condition from the drop-down field in the next field. Enter a search string in the next field.</li> </ul> <p>Click <b>Add</b> icon to add another filter. Click <b>Remove</b> icon to delete the filter. Click <b>Clear</b> to clear all the filters. Click <b>Apply</b> to activate the filters, and view the filtered events. Click <b>Save</b> to save the applied filter. Click <b>Cancel</b> to discard the advanced filters.</p> <ul style="list-style-type: none"> <li>• All - This removes all the filters and displays the complete deployment history.</li> <li>• Manage Preset Filters - Select an appropriate filter from the drop-down list.</li> </ul> <p>Click Edit to modify the filter parameters. Click <b>Remove</b> to delete the filter. Click <b>Cancel</b> to discard the changes and revert to Deployment History.</p> |
| Total | Displays the total number of events on the Deployment History page.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

After deploying the global configurations, configure the WAN for each switch in your network.

## WAN Links

Beginning with Release 11, Cisco DCNM Web UI allows you to configure WAN links for each switch in your fabric.

The external end devices can connect to the network through a Border Leaf and PIM router. The interface that connects the PIM router to the Border Leaf is called WAN Link.

1. From the Select a Switch drop-down list, choose a switch in the fabric for which you want to establish WAN links.

The list of interfaces on the switch is populated in the following table.



**Note** The switches that are a part of the fabric appear in the drop-down list.

2. In the WAN Links column, from the drop-down list, choose **Yes** or **No** to designate the interface as a WAN link.
3. Click **View All Deployed WAN Links** to view the Switch Name, Switch IP Address, and Interface Name which is configured as a WAN link. You can choose an appropriate filter to view the WAN links.
4. Click **Save** to save the selection on interfaces as WAN links and other configuration changes.
5. Click **Deploy** to configure the interfaces as WAN links.
6. Click **Undeploy** to remove the WAN links from the switch.

The following table describes the fields that appear on this page.

**Table 35: WAN Links Table Field and Description**

| Field             | Description                                                                                                                                                                                                                                                           |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Status            | Specifies if the WAN links are deployed or undeployed on the selected switch.                                                                                                                                                                                         |
| History           | Click this link to view the deployment history.<br>For description about the fields that appear on this page, see the table below.                                                                                                                                    |
| Interface Name    | Specifies the interface which is connected as a WAN link to the end device.                                                                                                                                                                                           |
| Admin Status      | An up arrow depicts that the status is up. A down arrow implies that the status is down.                                                                                                                                                                              |
| Oper Status       | An up arrow depicts that the operational state of the interface is up. A down arrow implies that the status is down.                                                                                                                                                  |
| WAN Links         | From the drop-down, list you can choose to designate this interface as a WAN link. <ul style="list-style-type: none"> <li>• Select <b>Yes</b> to configure the interface as a WAN link.</li> <li>• Select <b>No</b> to remove the interface as a WAN link.</li> </ul> |
| Deployment Status | Specifies if the interface is deployed as a WAN link or not.                                                                                                                                                                                                          |

The following table describes the fields that appear on the Deployment History.

**Table 36: Deployment History Field and Description**

| Field       | Description                                                                      |
|-------------|----------------------------------------------------------------------------------|
| Switch Name | Specifies the switch name in the fabric on which the configuration was deployed. |

| Field                | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Action               | Specifies the action that is performed on the switch - <b>Deploy</b> or <b>Undeploy</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Deployment Status    | Displays the status of deployment. It shows if the deployment was Success or Failed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Deployment Date/Time | Displays the date and time when the deployment was initialized.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Failed Reason        | Specifies the reason why the deployment failed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Show                 | <p>From the drop-down list, choose an appropriate filter.</p> <ul style="list-style-type: none"> <li>• Quick Filter - A search field appears in every column. You can enter a search string to filter.</li> <li>• Advanced Filter - In the Advanced Filter screen, select the All or Any radio button in the Match field. In the Select Filter field, select the category from the drop-down list. Select an appropriate condition from the drop-down field in the next field. Enter a search string in the next field.</li> </ul> <p>Click <b>Add</b> icon to add another filter. Click <b>Remove</b> icon to delete the filter. Click <b>Clear</b> to clear all the filters. Click <b>Apply</b> to activate the filters, and view the filtered events. Click <b>Save</b> to save the applied filter. Click <b>Cancel</b> to discard the advanced filters.</p> <ul style="list-style-type: none"> <li>• All - This removes all the filters and displays the complete deployment history.</li> <li>• Manage Preset Filters - Select an appropriate filter from the drop-down list.</li> </ul> <p>Click Edit to modify the filter parameters. Click <b>Remove</b> to delete the filter. Click <b>Cancel</b> to discard the changes and revert to Deployment History.</p> |
| Total                | Displays the total number of events on the Deployment History page.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |





## CHAPTER 7

# Administration

---

This chapter contains the following topics:

- [DCNM Server, on page 157](#)
- [Management Users, on page 168](#)
- [Performance Setup, on page 172](#)
- [Event Setup, on page 173](#)
- [Credentials Management, on page 177](#)

## DCNM Server

The DCNM Server menu includes the following submenus:

### Starting, Restarting, and Stopping Services

To clean up the performance manager database (PM DB) stale entries, start, restart, or stop a service, from the Cisco DCNM Web UI, perform the following steps:

#### Procedure

---

- Step 1** Choose **Administration > DCNM Server > Server Status**.
- The **Status** window appears that displays the server details.
- Step 2** In the **Actions** column, click the **Start** or **Stop** icons to start or stop services.
- Step 3** In the **Actions** column, click the **Delete** icon to clean up PM DB stale entries.
- Step 4** You can see the latest status in the **Status** column.
- 

#### What to do next

See the latest status in the **Status** column.

#### Using the Commands Table

The commands table contains links to commands that launch new dialog boxes to provide information about the server status and server administrative utility scripts. These commands can be directly executed on the server CLI as well.

- **ifconfig**: click this link to view information about interface parameters, IP address, and netmask used on the Cisco DCNM server.
- **appmgr status all**: click this link to view the DCNM server administrative utility script that checks the status of different services currently running.
- **clock**: click this link to view information about the server clock details such as time, zone information.




---

**Note** The commands section is applicable only for the OVA or ISO installations.

---

## Viewing Log Information

You can view the logs for performance manager, SAN management server, SME server, web reports, web server, and web services. These processes have no corresponding GUI that allows you to view information about these log files. If you see errors, preserve these files for viewing.




---

**Note** Logs cannot be viewed from a remote server in a federation.

---

To view the logs from the Cisco DCNM Web UI, perform the following steps:

### Procedure

- 
- Step 1** Choose **Administration > DCNM Server > Logs**.
- You see a tree-based list of logs in the left column. Under the tree, there is a node for every server in the federation. The log files are under the corresponding server node.
- Step 2** Click a log file under each node of the tree to view it on the right.
- Step 3** Double-click the tree node for each server to download a ZIP file containing log files from that server.
- Step 4** Click the **Print** icon on the upper right corner to print the logs.
- 

## Server Properties

You can set the parameters that are populated as default values in the DCNM server.

To set the parameters of the DCNM server from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

- Step 1** Choose **Administration > DCNM Server > Server Properties**.
- Step 2** Click **Apply Changes** to save the server settings.
- 

## Configuring SFTP/TFTP/SCP Credentials

A file server is required to collect device configuration and restoring configurations to the device.

To configure the SFTP/TFTP/SCP credentials for a file store from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

- Step 1** Choose **Administration > DCNM Server > Archive FTP Credentials**.

The **Archive FTP Credentials** window is displayed.

**Note** The credentials are autopopulated for fresh OVA and ISO installations.

- Step 2** In the **Server Type** field, use the radio button to select **SFTP**.

**Note**

- You must have an SFTP server to perform backup operation. The SFTP server can be an external server. The SFTP directory must be an absolute Linux/SSH path format and must have read/write access to the SFTP User.
- If you are using an external server, enter its IP address in the **server.FileServerAddress** field in **Administration > DCNM Server > Server Properties**.
- If the **nat.enabled** field under **Administration > DCNM Server > Server Properties** is true, you must enter the NAT device IP in the **server.FileServerAddress** field and the SFTP server must be local.

- a) Enter the **User Name** and **Password**.
- b) Enter the **Directory** path.

The path must be in absolute Linux path format.

If SFTP is unavailable on your device, you can use third-party SFTP applications, such as, mini-SFTP, Solarwinds, and so on. When you use an external SFTP, you must provide the relative path in the SFTP Directory Path. For example, consider the use cases at the end of this procedure.

- c) From the **Verification Switches** drop-down list, select a switch.
- d) Click **Apply** to save the credentials.
- e) Click **Verify & Apply** to verify if SFTP and switch have connectivity and save the configuration.

If there are any failures during the verification, the new changes will not be stored.

- f) Click **Clear SSH Hosts** to clear SSH hosts for all switches or selected switches.

If there is a failure in any of the switches, an error message appears. Navigate to **Configure > Backup > Switch Configuration > Archive Jobs > Job Execution Details** to view the number of successful and unsuccessful switches.

**Step 3** In the **Server Type** field, use the radio button to select **TFTP**.

Cisco DCNM uses a local TFTP server for data transfer. Ensure that there is no external TFTP server running on the DCNM server.

**Note** Ensure that your switch user role includes the copy command. Operator roles receive a *permission denied* error. You can change your credentials in the **Discovery** window. Navigate to **Inventory > Discovery**.

- a) From the **Verification Switch** drop-down list, select a switch.
- b) Click **Apply** to save the credentials everywhere.
- c) Click **Verify & Apply** to verify if TFTP and switch have connectivity and save the configuration.

If there are any failures during the verification, the new changes are not stored.

**Step 4** In the **Server Type** field, use the radio button to select **SCP**.

**Note**

- You must have an SCP server to perform backup operation. The SCP server can be an external server. The SCP directory must be an absolute Linux/SSH path format and must have read/write access to the SCP User.
- If you are using an external server, enter its IP address in the **server.FileServerAddress** field under **Administration > DCNM Server > Server Properties**.
- If the **nat.enabled** field under **Administration > DCNM Server > Server Properties** is true, you must enter the NAT device IP in the **server.FileServerAddress** field and the server must be local.

- a) Enter the **User Name** and **Password**.
- b) Enter the **Directory** path.

The path must be in absolute Linux path format.

If SCP is unavailable on your device, use external SCP applications, such as, mini-SCP, Solarwinds, and so on. When you use an external SCP, you must provide the relative path in the SCP Directory Path. For example, consider the use cases at the end of this procedure.

- c) From the **Verification Switches** drop-down, select the switch.
- d) Click **Apply** to save the credentials everywhere.
- e) Click **Verify & Apply** to verify if SCP and switch have connectivity and save the configuration. If there are any failures during the verification, the new changes will not be stored.
- f) Click **Clear SSH Hosts** to clear SSH hosts for all switches or selected switches.

If there is a failure in any of the switches, an error message is displayed. To view the number of successful and unsuccessful switches, go to **Configure > Backup > Switch Configuration > Archive Jobs > Job Execution Details**.

**Step 5** Choose **Configuration > Templates > Templates Library > Jobs** to view individual device verification status.

The configurations that are backed up are removed from the file server and are stored in the file system.

---

### SFTP Directory Path

#### Use Case 1:

If Cisco DCNM is installed on Linux platforms, like OVA, ISO, or Linux, and the test folder is located at `/test/sftp/`, you must provide the entire path of the SFTP directory. In the SFTP Directory field, enter `/test/sftp`.

#### Use Case 2:

If Cisco DCNM is installed on the Windows platform, and the test folder is located at `C://Users/test/sftp/`, you must provide the relative path of the SFTP directory. In the SFTP Directory field, enter `/`.

For Example:

- If the path in the external SFTP is `C://Users/test/sftp/`, then the Cisco DCNM SFTP Directory path must be `/`.
- If the path in the external SFTP is `C://Users/test`, then the Cisco DCNM SFTP Directory path must be `/sftp/`.

### Examples for SCP Directory Path

#### Use Case 1:

If Cisco DCNM is installed on Linux platforms, like OVA, ISO, or Linux, and the test folder is located at `/test/scp/`, you must provide the entire path of the SCP directory. In the **SCP Directory** field, enter `/test/scp`.

#### Use Case 2:

If Cisco DCNM is installed on the Windows platform, and the test folder is located at `C://Users/test/scp/`, you must provide the relative path of the SCP directory. In the **SCP Directory** field, enter `/`.

For Example:

- If the path in the external SCP is `C://Users/test/scp/`, then the Cisco DCNM SCP directory path must be `/`.
- If the path in the external SCP is `C://Users/test`, then the Cisco DCNM SCP directory path must be `/scp/`.

## Modular Device Support

To support any new hardware that does not require many major changes, a patch can be delivered instead of waiting for the next DCNM release. **Modular Device Support** helps to deliver and apply the DCNM patch releases. An authorized DCNM administrator can apply the patch to the production setup. Patch releases are applicable for the following scenarios:

- Support any new hardware, like chassis or line cards

- Support latest NX-OS versions
- Support critical fixes as patches

To view the patch details from Cisco DCNM Web UI, perform the following steps:

### Procedure

---

**Step 1** Choose **Administration > DCNM Server > Modular Device Support**.

You see the **DCNM Servers** column on the left in the window and **Modular Device support information** window on the right.

**Step 2** Expand **DCNM Servers** to view all the DCNM servers.

It includes the list of patches installed along with the version number, corresponding platforms supported, chassis supported, NX-OS version supported, PID supported, backup directory and the last patch deployment time in the **Modular Device support information** table.

---

### What to do next

For more details about how to apply and rollback a patch, go to <http://www.cisco.com/go/dcnm> for more information.

## Managing Switch Groups

From Cisco NX-OS Release 6x, you can configure switch groups by using Cisco DCNM Web UI. You can add, delete, rename, or move a switch to a group or move a group of switches to another group.

This section contains the following:

### Adding Switch Groups

To add switch groups from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

**Step 1** Choose **Administration > DCNM Server > Switch Groups**.

**Step 2** Click the **Add** icon.

The **Add Group** window is displayed, that allows you to enter the name for the switch group.

**Step 3** Enter the name of the switch group and click **Add** to complete adding the switch group.

The switch group name validation, and the maximum tree depth is 10. If you do not choose a parent group before adding a new switch group, the new group is added on the top of the hierarchy

---

## Deleting a Group or a Member of a Group

You can delete a group or a member of the group from the Cisco DCNM Web UI. When you delete a group, the associated groups are deleted. The fabrics or ethernet switches of the deleted groups are moved to the default SAN or LAN.

To delete a group or a member of a group from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

- Step 1** Choose the switch group or members of a group that you want to remove.
- Step 2** Click the **Remove** icon or press the **Delete** key on your keyboard.
- A dialog box prompts you to confirm the deletion of the switch group or the member of the group.
- Step 3** Click **Yes** to delete or **No** to cancel the action.
- 

## Moving a Switch Group to Another Group

To move a switch group to another group from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

- Step 1** Select a switch or switch group.
- Step 2** Drag the highlighted switch or switch group to another group.
- To move multiple switches across different switch groups, use **Ctrl** key or **Shift** key.
- You can see the switch or switch group. Users are not allowed to move multiple switches in the group level under the new group now.
- Note** It is not allowed to move multiple switches in the group level. You may not mix a group with switches.
- 

## Managing Licenses

You can view the existing Cisco DCNM licenses by choosing **Administration > DCNM Server > License**. You can view and assign licenses in the following tabs:

- **License Assignments**
- **Server License Files**



---

**Note** By default, the **License Assignments** tab appears.

---

The following table displays the SAN and LAN license information.

| Field                            | Description                                                                                      |
|----------------------------------|--------------------------------------------------------------------------------------------------|
| License                          | Specifies SAN or LAN.                                                                            |
| Free/Total Server-based Licenses | Specifies the number of free licenses that are purchased out of the total number of licenses.    |
| Unlicensed/Total (Switches/VDCs) | Specifies the number of unlicensed switches or VDCs out of the total number of switches or VDCs. |
| Need to Purchase                 | Specifies the number of licenses to be purchased.                                                |

This section includes the following topics:

## License Assignments

The following table displays the license assignment details for every switch or VDC.

| Field            | Description                                                                                                                                                                                                                                    |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Group            | Displays if the group is fabric or LAN.                                                                                                                                                                                                        |
| Switch Name      | Displays the name of the switch.                                                                                                                                                                                                               |
| WWN/Chassis ID   | Displays the world wide name or Chassis ID.                                                                                                                                                                                                    |
| Model            | Displays the model of the device. For example, DS-C9124 or N5K-C5020P-BF.                                                                                                                                                                      |
| License State    | Displays the license state of the switch that can be one of the following: <ul style="list-style-type: none"> <li>• Permanent</li> <li>• Eval</li> <li>• Unlicensed</li> <li>• Not Applicable</li> <li>• Expired</li> <li>• Invalid</li> </ul> |
| License Type     | Displays if the license is a switch-based embedded license or a server-based license.                                                                                                                                                          |
| Eval Expiration  | Displays the expiry date of the license.<br><b>Note</b> Text under the <b>Eval Expiration</b> column is in red for licenses, which expire in seven days.                                                                                       |
| Assign License   | Select a row and click this option on the toolbar to assign the license.                                                                                                                                                                       |
| Unassign License | Select a row and click this option on the toolbar to unassign the license.                                                                                                                                                                     |
| Assign All       | Click this option on the toolbar to refresh the table and assign the licenses for all the items in the table.                                                                                                                                  |

| Field        | Description                                                                          |
|--------------|--------------------------------------------------------------------------------------|
| Unassign All | Click this option on the toolbar to refresh the table and unassign all the licenses. |



**Note** You must have network administrator privileges to assign or unassign licenses.

When the fabric is first discovered and if the switch does not have a valid switch-based license, a license is automatically assigned to the fabric from the file license pool until no more licenses are left in the pool. If you have an existing fabric and a new switch is added to the fabric, the new switch is assigned a license if one is available in the file license pool and if it does not already have a switch-based license.

## Server License Files

### Server License Files

The following table displays the Cisco DCNM server license fields.

| Field            | Description                                                                                                                                         |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Filename         | Specifies the license file name.                                                                                                                    |
| Feature          | Specifies the licensed feature.                                                                                                                     |
| PID              | Specifies the product ID.                                                                                                                           |
| LAN (Free/Total) | Displays the number of free versus total licenses for LAN.                                                                                          |
| Eval Expiration  | Displays the expiry date of the license.<br><b>Note</b> Text in the <b>Eval Expiration</b> field is in Red for licenses that expires in seven days. |

### Adding Cisco DCNM Licenses

To add Cisco DCNM licenses from Cisco DCNM, perform the following steps:

#### Before you begin

You must have network administrator privileges to complete the following procedure.

#### Procedure

- 
- Step 1** Choose **Administration > DCNM Server > License** to start the license wizard.
- Step 2** Choose the **Server License Files** tab.
- The valid Cisco DCNM-LAN license files are displayed.
- Ensure that the security agent is disabled when you load licenses.

**Step 3** Download the license pack file that you received from Cisco into a directory on the local system.

**Step 4** Click **Add License File** and select the license pack file that you saved on the local machine.

The file is uploaded to the server machine, which is saved into the server license directory, and then loaded on to the server.

**Note** Ensure that you do not edit the contents of the .lic file or the Cisco DCNM software ignores any features that are associated with that license file. The contents of the file are signed and must remain intact. When you accidentally copy, rename, or insert the license file multiple times, the duplicate files are ignored, but the original is counted.

## Native HA

### Procedure

**Step 1** By default, DCNM is bundled with an embedded database engine PostgreSQL. The native DCNM HA is achieved by two DCNMs running as **Active / Warm Standby**, with their embedded databases synchronized in real time. So once the active DCNM is down, the standby takes over with the same database data and resume the operation. The *standby host database down* scenario is documented after this procedure.

**Step 2** From the menu bar, choose **Administration > DCNM Server > Native HA**.

You see the **Native HA** window.

**Step 3** You can allow manual failover of DCNM to the standby host by clicking the **Failover** button, and then click **OK**.

- Alternatively, you can initiate this action from the Linux console.

1. SSH into the DCNM active host.
2. Enter "`"/usr/share/heartbeat/hb_standby"`

**Step 4** You can allow manual syncing database and disk files to standby host by clicking **Force Sync**, and then click **OK**.

**Step 5** You can test or validate the HA setup by clicking **Test** and then click **OK**.

### What to do next

Some HA troubleshooting scenarios are noted in this sub section.

**The standby host database is down:** Typically, the DCNM database (PostgreSQL) is up on the active and standby hosts. In DCNM 10.1 and earlier versions, the standby database can be down due to a database synchronization failure.

- Enter "`ps -ef | grep post`". You should see multiple postgres processes running. If not, it indicates that the database is down.
- Restore database data from a backup file that is created at the beginning of database synchronization. Change directory to "`/usr/local/cisco/dcm/db`"

- Check existence of file replication/ pgsq-standby-backup.tgz. If the file exists, restore database data files:

```
rm -rf data/*
tar -zxf replication/ pgsq-standby-backup.tgz data
/etc/init.d/postgresql-9.4 start
ps -ef | grep post
```

The active DCNM host will synchronize the two databases.

**The TFTP server is not bound to the eth1 VIP address on the active host:** The TFTP server should run on the active host (not on the standby host), and it should be bound to the eth1 VIP address. In some setups, the bind address is not the VIP address, as per the TFTP configuration file, and this could cause issues when switches try to use TFTP.

- Enter “grep bind /etc/xinetd.d/tftp” to check if the TFTP configuration file has the right bind address. If the displayed IP address is not the eth1 VIP address, then change the bind address to the VIP address. Repeat the procedure for the standby host. Update the bind address to the VIP address.
- Enter “ /etc/init.d/xinetd restart” on the active host to restart TFTP.




---

**Note** The TFTP server can be started or stopped with the “appmgr start/stop ha-apps” command.

---

## Multi Site Manager

### Procedure

- 
- Step 1** Multi-Site-Manager (MsM) provides a single pane for users to search for switches that are managed by DCNM globally. MSM can do realtime search to find out which switch globally handles the traffic for a given virtual machine based on IP address, name or mac address, and supporting VXLAN basing on segment ID as well. It provides hyperlink to launch the switch only. This window also plays the role of remote site registration. The registration only allows the current DCNM server to access the remote DCNM server or site. For the remote site to access the current DCNM server, registration is required on the remote site as well.
  - Step 2** Choose **Administration > DCNM Server > Multi Site Manager**.  
The MsM window displays the overall health or status of the remote site and the application health.
  - Step 3** You can search by **Switch, VM IP, VM Name, MAC, and Segment ID**.
  - Step 4** You can add a new DCNM server by clicking **+Add DCNM Server**. The **Enter Remote DCNM Server Information** window opens. Fill in the information that is required and click **OK** to save.
  - Step 5** Click **Refresh All Sites** to display the updated information.
-

# Management Users

The Management Users menu includes the following submenus:

## Remote AAA

To configure remote AAA from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

**Step 1** Choose **Administration > Management Users > Remote AAA Properties**.

The AAA properties configuration window appears.

**Step 2** Use the radio button to select one of the following authentication modes:

- **Local**: In this mode the authentication authenticates with the local server.
- **Radius**: In this mode the authentication authenticates against the RADIUS servers specified.
- **TACACS+**: In this mode the authentication authenticates against the TACAS servers specified.
- **Switch**: In this mode the authentication authenticates against the switches specified.
- **LDAP**: In this mode the authentication authenticates against the LDAP server specified.

**Step 3** Click **Apply**.

**Note** Restart the Cisco DCNM LAN services if you update the Remote AAA properties.

---

## Local

### Procedure

---

**Step 1** Use the radio button and select **Local** as the authentication mode.

**Step 2** Click **Apply** to confirm the authentication mode.

---

## Radius

### Procedure

---

**Step 1** Use the radio button and select **Radius** as the authentication mode.

**Step 2** Specify the Primary server details and click **Test** to test the server.

- Step 3** (Optional) Specify the Secondary and Tertiary server details and click **Test** to test the server.
- Step 4** Click **Apply** to confirm the authentication mode.
- 

## TACACS+

### Procedure

---

- Step 1** Use the radio button and select **TACACS+** as the authentication mode.
- Step 2** Specify the Primary server details and click **Test** to test the server.
- Step 3** (Optional) Specify the Secondary and Tertiary server details and click **Test** to test the server.
- Step 4** Click **Apply** to confirm the authentication mode.
- 

## Switch

### Procedure

---

- Step 1** Use the radio button to select **Switch** as the authentication mode.  
DCNM also supports LAN switches with the IPv6 management interface.
- Step 2** Specify the Primary Switch name and click **Apply** to confirm the authentication mode.
- Step 3** (Optional) Specify the names for Secondary and Tertiary Switches.
- Step 4** Click **Apply** to confirm the authentication mode.
- 

## LDAP

### Procedure

---

- Step 1** Use the radio button and select **LDAP** as the authentication mode.
- Step 2** In the **Host** field, enter DNS address of the host.
- Step 3** Click **Test** to test the AAA server. The **Test AAA Server** window pops out.
- Step 4** Enter a valid **Username** and **Password** in the **Test AAA Server** window.  
A dialog box appears confirming the status of the AAA server test. If the test has failed, the **LDAP Authentication Failed** dialog box appears.
- Step 5** In the **Port** field, enter a port number.
- Step 6** (Optional) Select the **SSL Enabled** check box, if SSL is enabled on the AAA server.
- Step 7** In the **Base DN** field, enter the base domain name.
- Step 8** In the **Filter** field, specify the filter parameters.

- Step 9** Choose an option to determine a role by either **Attribute** or **Admin Group Map**.
  - Step 10** In the **Role Admin Group** field, enter the name of the role.
  - Step 11** In the **Map to DCNM Role** field, enter the name of the role to be mapped.
  - Step 12** In the **Access Map** field, enter the Role Based Access Control (RBAC) group to be mapped.
  - Step 13** Click Apply Changes icon on the upper right corner to apply the LDAP configuration.
- 

## Managing Local Users

As an admin user, you can use Cisco DCNM Web UI to create a new user, assign the role and associate one or more groups or scope for the user.

This section contains the following:

### Adding Local Users

#### Procedure

---

- Step 1** From the menu bar, choose **Administration > Management Users > Local**. You see the **Local Users** page.
  - Step 2** Click **Add User**.  
You see the **Add User** dialog box.
  - Step 3** Enter the username in the **User name** field.  
**Note** The username is case sensitive, but the username guest is a reserved name, which is not case sensitive. The guest user can only view reports. The guest user cannot change the guest password, or access the Admin options in DCNM Web Client.
  - Step 4** From the **Role** drop-down list, select a role for the user.
  - Step 5** In the **Password** field, enter the password.
  - Step 6** In the **Confirm Password** field, enter the password again.
  - Step 7** Click **Add** to add the user to the database.
  - Step 8** Repeat Steps 2 through 7 to continue adding users.
- 

### Deleting Local Users

To delete local users from the Cisco DCNM Web UI, perform the following steps:

#### Procedure

---

- Step 1** Choose **Administration > Management Users > Local**.  
The **Local Users** page is displayed.
- Step 2** Select one or more users from the **Local Users** table and click the **Delete User** button.

- Step 3** Click **Yes** on the warning window to delete the local user. Click **No** to cancel deletion.
- 

## Editing a User

To edit a user from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

- Step 1** Choose **Administration > Management Users > Local**.
- Step 2** Use the checkbox to select a user and click the **Edit User** icon.
- Step 3** In the **Edit User** window, the **Username** and **Role** are mentioned by default. Specify the **Password** and **Confirm Password**.
- Step 4** Click **Apply** to save the changes.
- 

## User Access

To control the local users to access the specific groups from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

- Step 1** Choose **Administration > Management Users > Local**.  
The **Local Users** window is displayed.
- Step 2** Select one user from the **Local Users** table. Click **User Access**.  
The **User Access** selection window is displayed.
- Step 3** Select the groups allowed to access for the user and click **Apply**.
- 

## Managing Clients

You can use Cisco DCNM to disconnect DCNM Client Servers.

### Procedure

---

- Step 1** Choose **Administration > Management Users > Clients**.  
A list of DCNM Servers are displayed.
- Step 2** Use the check box to select a DCNM server and click **Disconnect Client** to disconnect the DCNM server.

**Note** You cannot disconnect a current client session.

---

## Performance Setup

The Performance Setup menu includes the following submenus:

### Performance Setup LAN Collections

If you are managing your switches with the Performance Manager, you must set up an initial set of flows and collections on the switch. You can use Cisco DCNM to add and remove performance collections. License the switch and kept it in the **Managed Continuously** state before creating a collection for the switch.

To add a collection, follow these steps:

#### Procedure

---

- Step 1** Choose **Administration > Performance Setup > LAN Collections**.
  - Step 2** For all the licensed LAN switches, use the check boxes to enable performance data collection for **Trunks**, **Access**, **Errors & Discards**, and **Temperature Sensor**.
  - Step 3** Use the check boxes to select the types of LAN switches for which you want to collect performance data.
  - Step 4** Click **Apply** to save the configuration.
  - Step 5** In the confirmation dialog box, click **Yes** to restart the performance collector.
- 

### Performance Setup Thresholds

If you are managing your switches with the Performance Manager, you must set up an initial set of flows and collections on the switch. You can use Cisco DCNM to add and remove performance collections. License the switch and keep it in the **Managed Continuously** state before creating a collection for the switch.

#### Procedure

---

- Step 1** Choose **Administration > Performance Setup > Thresholds**.
  - Step 2** Under **Generate a threshold event when traffic exceeds % of capacity**, use the check box to specify the **Critical at** and **Warning at** values. The range for **Critical at** is from 5 to 95, and the default is 80. The range for **Warning at** is from 5 to 95, and the default is 60.
  - Step 3** Select a value for **Performance Polling Interval** from the drop-down list. Valid values are **5 min** and **10 min**, and the default is **5 min**.
  - Step 4** Click **Apply**.
-

# Event Setup

The Event Setup menu includes the following submenus:

## Viewing Events Registration

To enable **Send Syslog**, **Send Traps** and **Delayed Traps** you must configure the following in the DCNM SAN client:

- Enabling **Send Syslog**: Choose **Physical Attributes > Events > Syslog > Servers**. Click **Create Row**, provide the required details, and click **Create**.
- Enabling **Send Traps**: Choose **Physical Attributes > Events > SNMP Traps > Destination**. Click **Create Row**, provide the required details, and click **Create**.
- Enabling **Delayed Traps**: Choose **Physical Attributes > Events > SNMP Traps > Delayed Traps**. In the **Feature Enable** column, use the check boxes to enable delayed traps for the switch and specify the delay in minutes.

### Procedure

---

- Step 1** Choose **Administration > Event Setup > Registration**.  
The SNMP and Syslog receivers along with the statistics information are displayed.
- Step 2** Check the **Enable Syslog Receiver** check box and click **Apply**, to enable the syslog receiver if it is disabled in the server property.  
To configure event registration or syslog properties, choose **Administration > DCNM Server > Server Properties** and follow the on-screen instructions.
- Step 3** Select **Copy Syslog Messages to DB** and click **Apply** to copy the syslog messages to the database.  
If this option is not selected, the events will not be displayed in the events page of the Web client.  
The columns in the second table display the following:
- Switches sending traps
  - Switches sending syslog
  - Switches sending syslog accounting
  - Switches sending delayed traps
- 

## Notification Forwarding

You can use Cisco DCNM Web UI to add and remove notification forwarding for system messages.

This section contains the following:

## Adding Notification Forwarding

Cisco DCNM Web UI forwards fabric events through email or SNMPv1 traps.

To add and remove notification forwarding for system messages from the Cisco DCNM Web UI, perform the following steps:




---

**Note** Test forwarding works only for the licensed fabrics.

---

### Procedure

---

- Step 1** Choose **Administration > Event Setup > Forwarding**.
- The events forwarding scope, the recipient email address, severity of the event and type of the event is displayed. The description Regex field is applicable only when the forwarding source is selected as Syslog while adding the events forwarder.
- Step 2** Check the **Enable** checkbox to enable events forwarding.
- Step 3** Specify the **SMTP Server** details and the **From** email address.
- Step 4** Click **Apply** to save the configuration, or in the **Apply and Test** icon, use the drop-down to select the fabric. Click **Apply and Test** to save and test the configuration.
- Step 5** In the **Event Count Filter**, add a filter for the event count to the event forwarder.
- The forwarding stops forwarding an event if the event count exceeds the limit as specified in the event count filter. In this field, you can specify a count limit. Before an event can be forwarded, the Cisco DCNM checks if its occurrence exceeds the count limit. If it does, the event will not be forwarded.
- Step 6** Select the **Snooze** checkbox and specify the **Start** date and time and the **End** date and time. Click **Apply** to save the configuration.
- Step 7** Under the **Event Forwarder Rules** table, click the + icon to add an event forwarder rule.
- You see the **Add Event Forwarder Rule** dialog box.
- Step 8** In the **Forwarding Method**, choose either **E-mail** or **Trap**. If you choose **Trap**, a **Port** field is added to the dialog box.
- Step 9** If you choose the **E-mail** forwarding method, enter the IP address in the **Email Address** field. If you choose the **Trap** method, enter the trap receiver IP address in the **Address** field and specify the port number.
- Step 10** For **Forwarding Scope**, choose the **Fabric/LAN** or **Port Groups** for notification.
- Step 11** In the **Source** field, select **DCNM** or **Syslog**.
- If you select **DCNM**, then:
- From the **Type** drop-down list, choose an event type.
  - Check the **Storage Ports Only** check box to select only the storage ports.
  - From the **Minimum Severity** drop-down list, select the severity level of the messages to receive.
  - Click **Add** to add the notification.
- If you select **Syslog**, then:
- In the **Facility** list, select the syslog facility.

- b) Specify the syslog **Type**.
- c) In the **Description Regex** field, specify a description that matches with the event description.
- d) From the **Minimum Severity** drop-down list, select the severity level of the messages to receive.
- e) Click **Add** to add the notification.

**Note** The **Minimum Severity** option is available only if the **Event Type** is set to All.

The traps that are transmitted by Cisco DCNM correspond to the severity type. A text description is also provided with the severity type.

```
trap type(s) = 40990 (emergency)
40991 (alert)
40992 (critical)
40993 (error)
40994 (warning)
40995 (notice)
40996 (info)
40997 (debug)
textDescriptionOid = 1, 3, 6, 1, 4, 1, 9, 9, 40999, 1, 1, 3, 0
```

---

## Removing Notification Forwarding

You can remove notification forwarding.

### Procedure

- 
- Step 1** Choose **Administration > Event Setup > Forwarding**.
  - Step 2** Select the check box in front of the notification that you want to remove and click **Delete**.
- 

## Event Suppression

Cisco DCNM allows you to suppress the specified events that are based on the user-specified suppressor rules. Such events will not be displayed on the Cisco DCNM Web UI. The events will neither be persisted to DCNM database, nor forwarded via email or SNMP trap.

You can view, add, modify, and delete suppressor rules from the table. You can create a suppressor rule from the existing event table. Select a given event as the template, and invoke the rule dialog window. Event details are automatically ported from the selected event in the event table to the input fields of the rule creation dialog window.

This section includes the following:

### Add Event Suppression Rules

To add rules to the Event Suppression from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

- Step 1** Choose **Administration > Event Setup > Suppression**.  
The **Suppression** window is displayed.
- Step 2** Click the **Add** icon above the **Event Suppressors** table.  
The **Add Event Suppressor Rule** window is displayed.
- Step 3** In the **Add Event Suppressor Rule** window, specify the **Name** for the rule.
- Step 4** Select the required **Scope** for the rule that is based on the event source.  
In the Scope drop-down list, the LAN groups and the port groups are listed separately. You can choose **LAN**, **Port Groups** or **Any**. For **LAN**, select the scope of the event at the Fabric or Group or Switch level. You can only select groups for **Port Group** scope. If use selects **Any** as the scope, the suppressor rule is applied globally.
- Step 5** Enter the **Facility** name or choose from the **LAN Switch Event Facility** List.  
If you do not specify a facility, wildcard is applied.
- Step 6** From the drop-down list, select the Event **Type**.  
If you do not specify the event type, wildcard is applied.
- Step 7** In the **Description Matching** field, specify a matching string or regular expression.  
The rule matching engine uses regular expression that is supported by Java Pattern class to find a match against an event description text.
- Step 8** Check the **Active Between** box and select a valid time range during which the event is suppressed.  
By default, the time range is not enabled, i.e., the rule is always active.
- Note** In general, you must not suppress accounting events. Suppressor rule for Accounting events can be created only for certain rare situations where Accounting events are generated by actions of DCNM or switch software. For example, lots of '*sync-snmp-password*' AAA syslog events are automatically generated during the password synchronization between DCNM and managed switches. To suppress Accounting events, navigate to the **Suppressor table** and invoke the **Add Event Suppressor Rule** dialog window.
- Note** Choose **Monitor > Switch > Events** to create a suppressor rule for a known event. There is no such shortcut to create suppressor rules for Accounting events.

## Delete Event Suppression Rule

To delete event suppressor rules from the Cisco DCNM Web UI, perform the following steps:

### Procedure

---

- Step 1** Choose **Administration > Event Setup > Suppression** .
- Step 2** Select the rule from the list and click **Delete** icon.

- Step 3** Click **Yes** to confirm.
- 

## Modify Event Suppression Rule

To modify the event suppressor rules, do the following tasks:

### Procedure

---

- Step 1** Choose **Administration > Event Setup > Suppression**.
- Step 2** Select the rule from the list and click **Edit**.  
You can edit **Facility**, **Type**, **Description Matching** string, and **Valid time range**.
- Step 3** Click **Apply** to save the changes,
- 

## Credentials Management

The Credential Management menu includes the following submenus:

### LAN Credentials

While changing the device configuration, Cisco DCNM uses the device credentials provided by you. However, if the LAN Switch credentials are not provided, Cisco DCNM prompts you to open the **Administration > Credentials Management > LAN Credentials** page to configure LAN credentials.

Cisco DCNM uses two sets of credentials to connect to the LAN devices:

- **Discovery Credentials**—Cisco DCNM uses these credentials during discovery and periodic polling of the devices.
- **Configuration Change Credentials**—Cisco DCNM uses these credentials when user tries to use the features that change the device configuration.

LAN Credentials Management allows you to specify configuration change credentials. Before changing any LAN switch configuration, you must furnish *Configuration Change* SSH credentials for the switch. If you do not provide the credentials, the configuration change action will be rejected.

These features get the device write credentials from LAN Credentials feature.

- Upgrade (ISSU)
- Maintenance Mode (GIR)
- Patch (SMU)
- Template Deployment
- POAP-Write erase reload, Rollback
- Interface Creation/Deletion/Configuration

- VLAN Creation/Deletion/Configuration
- VPC Wizard

You must specify the configuration change credentials irrespective of whether the devices were discovered initially or not. This is a one-time operation. Once the credentials are set, that will be used for any configuration change operation.

### Default Credentials

Default credentials is used to connect all the devices that the user has access to. You can override the default credentials by specifying credentials for each of the devices in the Switch Table below.

Cisco DCNM tries to use individual switch credentials in the Switch Table, to begin with. If the credentials (username/password) columns are empty in the Switch Table, the default credentials will be used.

### Switch Table

Switch table lists all the LAN switches that user has access. You can specify the switch credentials individually, that will override the default credentials. In most cases, you need to provide only the default credentials.

You can perform the following operations on this screen.

- [#unique\\_264 unique\\_264\\_Connect\\_42\\_section\\_xnr\\_slb\\_nx](#)
- [#unique\\_264 unique\\_264\\_Connect\\_42\\_section\\_njy\\_pmb\\_nx](#)
- [#unique\\_264 unique\\_264\\_Connect\\_42\\_section\\_o1f\\_5mb\\_nx](#)

The LAN Credentials for the DCNM User table has the following fields.

| Field      | Description                                      |
|------------|--------------------------------------------------|
| Switch     | Displays the LAN switch name.                    |
| IP Address | Specifies the IP Address of the switch.          |
| User Name  | Specifies the username of the switch DCNM user.  |
| Password   | Displays the encrypted form of the SSH password. |
| Group      | Displays the group to which the switch belongs.  |

### Edit Credentials

Perform the following task to edit the credentials.

1. From the Cisco DCNM home page, choose **Administration > Credentials Management > LAN Credentials**, check the **Switch** check box for which you need to edit the credentials.
2. Click Edit icon.
3. Specify **User Name** and **Password** for the switch.

### Validate Credentials

Perform the following task to validate the credentials.

1. From the **Administration > Credentials Management > LAN Credentials**, check the **Switch** check box for which you need to validate the credentials.
2. Click **Validate**.

A confirmation message appears, stating if the operation was successful or a failure.

### Clear Switch Credentials

Perform the following task to clear the switch credentials.

1. From the **Administration > Credentials Management > LAN Credentials**, check the **Switch** check box for which you need to clear the credentials.
2. Click **Clear**.
3. Click **Yes** to clear the switch credentials from the DCNM server.





## CHAPTER 8

# Applications

Cisco DCNM uses the Applications Framework to build and deploy its various functions.

The applications framework provides the following features:

- An infrastructure for hosting applications that require more system resources as the network scale increases.
- An independent application development, deployment, and management lifecycle for applications.

In this release, Cisco DCNM uses the following applications:

- **Compliance(0.1)**: This application helps in fabric building for the Easy Fabric installation. The Compliance application runs as one instance per fabric. It is enabled when a fabric is created. Similarly, it is disabled when a fabric is deleted.
- **ElasticCluster(5.6)**: This application is used for storing various database information.
- **Kibana(1.0)**: Kibana is an open source data visualization plug-in for Elasticsearch, which provides visualization capabilities. Cisco DCNM uses the Kibana application for the media controller functionality. Kibana is used for Endpoint Locator (EPL) and Telemetry.
- **UTR(1.0)**: The Universal Telemetry Receiver (UTR) receives and decodes the streaming data from the switches, and feeds the data to a Kafka storage. The UTR can dynamically scale and instantiate multiple instances of UTR. It is a containerized application, which is instantiated using the Application Hosting Framework of Cisco DCNM.
- **vmmplugin(2.0)**: The VMM plug-in stores all the Computes and the virtual machine information that is connected to the fabric or the switch groups that are loaded into Cisco DCNM.



**Note** In this release, the applications are view-only in the Cisco DCNM Web UI. You cannot control these applications from the user interface. For example, you cannot start or stop these applications from the **Catalog** tab of the **Applications** window.

- [Using the Applications Framework, on page 182](#)
- [Enabling the Cisco DCNM Cluster, on page 182](#)
- [Adding Computes into the Cluster Mode, on page 183](#)
- [Installing a DCNM Compute, on page 185](#)
- [Disaster Recovery, on page 185](#)

- [Converting from Un-Cluster to Cluster Mode with Existing Elasticsearch Data, on page 186](#)

## Using the Applications Framework

To use the Applications Framework feature, from the left pane, click **Applications**.

The Applications window displays the following tabs:

- **Catalog:** This tab lists the applications that are used by Cisco DCNM. These applications are used for performing various functions within Cisco DCNM. For example, the Elasticsearch application is used as a database by the Telemetry feature. In this release, you will not be able to add new third-party applications, and hence the Add applications button is disabled.




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**Note** The green icon on top of the application page indicates that the application is deployed in Cisco DCNM. If you see an amber icon within an application icon, it indicates a problem. If you see an amber icon within the Compliance application icon, it indicates that one of the deployed fabrics has some issues.

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- **Compute:** This tab displays the existing compute nodes. The tab shows nodes that are part of the hosting infrastructure. The uptime indicates how long they have been part of the infrastructure. In a High Availability setup, both the active and the standby nodes appear as Joined. In a cluster mode, the compute nodes are also displayed indicating if they are joined or discovered.




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**Note** In cluster mode, the Cisco DCNM servers will not appear in the computes tab.

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- **Health:** This tab displays all the instances of an application; certain applications may have multiple instances to extend scale. The health parameter indicates how much memory is available to applications. The uptime indicates how long the instances have been up for.
- **Preferences:** This tab is relevant to the cluster mode of deployment, where the application instances are placed. In this tab, you can enable compute cluster connectivity and configure the preferences.

## Enabling the Cisco DCNM Cluster

The Compute cluster feature provides scale mechanism to serve larger fabric, more advanced features (Telemetry, Advisories, and so on). The default status of the Cisco DCNM in any of the install modes does not support having computes as a cluster.




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**Note** **Compute cluster is supported only on the LAN Fabric mode. The Classic LAN and the IP Fabric for Media (IPFM) installations will not support the Compute cluster functionality.**

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The values you specify in the preferences tab are not actually subnets with their gateway, rather they are IP prefix pools of addresses that can be used within the services that run inside a container. Hovering your mouse over the “?” button explains what is an acceptable input. Cisco DCNM Computes constantly communicates

with DCNM Controllers; this ensures that the required applications are properly running on only the computes that are properly functioning. In a Native-HA environment only the active DCNM initiates the compute cluster, and standby DCNM is ready to take over in case the active fails. In Cisco DCNM 11.1(1) a maximum of three computes are supported per DCNM Servers installation.

To enable the Compute Cluster Connectivity, perform the following steps:

### Procedure

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- Step 1** In the left pane, click **Applications**.
- Step 2** Click the **Preferences** tab.
- Step 3** In the **InBand Fabric** field, specify the IP prefix pool to connect applications through the inband path.  
InBand Fabric is required for applications that connect with switches over the Underlay or Front Panel network. For example, EPL and Telemetry over In-Band. These IP addresses are visible outside of the compute. The InBand subnet mask should be /24 to /28.
- Step 4** In the **Out-Of-Band** field, specify the IP prefix pool to connect applications with the fabric management network.  
Out-Of-Band is required for applications that connect with switches over the Management network of the switches, e.g, Telemetry. These IP addresses are visible outside of the compute. The Out-Of-Band subnet mask should be /24 to /28.
- Step 5** In the **Inter Application** field, specify the IP prefix pool for inter-application communication.  
You can specify a pool that does not fall in either of the above subnets. Inter Application Network is not visible outside of the DCNM cluster, it is an internal network for communication between multiple services. But, the network should not conflict with the endpoints that the services try to reach. The Inter-Application subnet mask should be /20 to /24.
- Step 6** Click **Enable**.
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## Adding Computes into the Cluster Mode

Compute is an additional installation mode with Cisco DCNM 11.1(1). It is supported with both small and large installations. Cisco DCNM supports a maximum of three Computes.

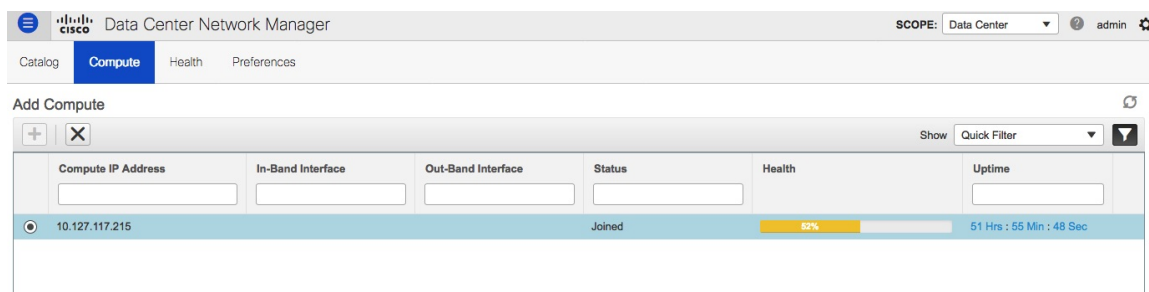
When a Compute is installed with correct parameters, it appears as Discovered.

To add computes into the cluster mode, perform the following steps:

### Procedure

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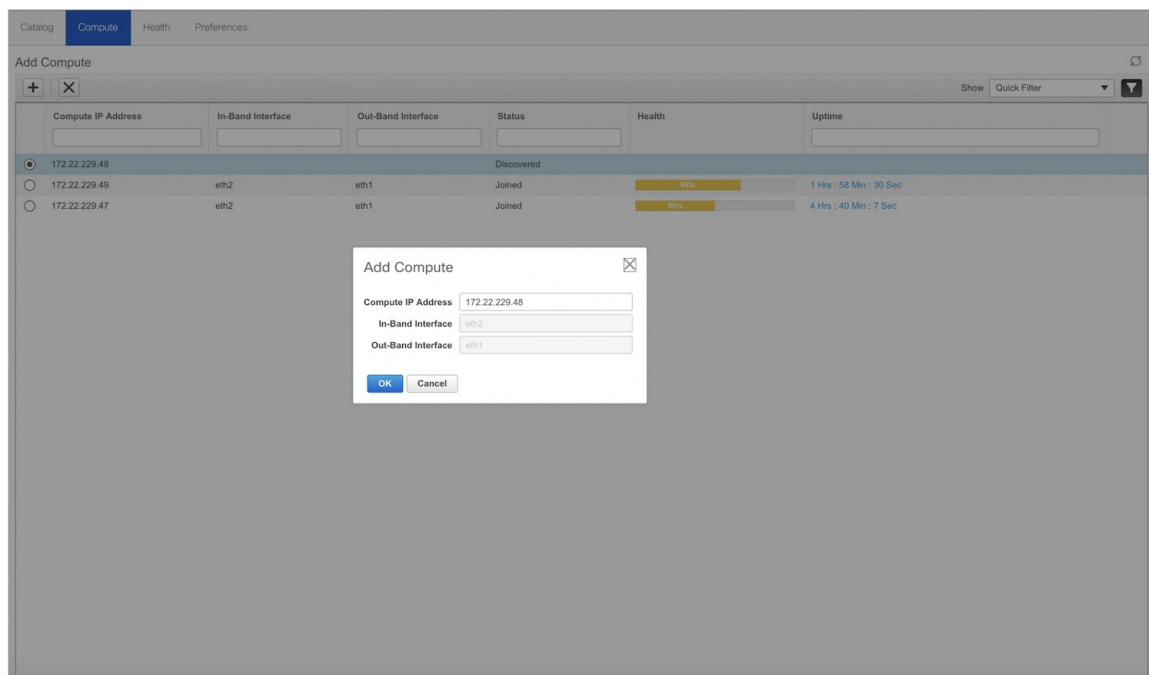
- Step 1** In the left pane, click **Applications**.
- Step 2** Click the **Compute** tab.
- Step 3** Click the **Add Compute (+)** button.



- While using Compute, ensure that Cisco DCNM GUI shows nodes as Joined.
- Offline indicates that some connectivity issues between Nodes (on Eth0).
- Health only indicates the amount of Memory left (Just like UnClustered mode).

The Compute window can also be used to monitor the health of computes. In Cisco DCNM 11.1(1), the health essentially indicates the amount of memory left in the compute, this is based on applications that are enabled. If a Compute is not properly communicating with the DCNM Server, the status of the Compute appears as Offline, and no applications will be running on Offline Computes. Most applications do not function properly if there are less than three computes, while a short loss of a single Compute node is mostly fine. In such cases, refer to the requirements of the individual applications.

**Step 4** In the **Add Compute** dialog box, verify the **Compute IP Address**, **In-Band Interface**, and the **Out-Band Interface** fields.



**Step 5** Click **OK**.

## Deleting a Compute

To delete a compute, perform the following steps:

### Procedure

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- Step 1** In the left pane, click **Applications**.
- Step 2** Click the **Compute** tab.
- Step 3** Click the **Remove (X)** button.

**Caution** When you delete a Compute, you will lose all the data that is stored in the Compute. You need to be cautious while deleting a Compute, since it can cause a cluster failure, for any data stored on Elasticsearch. If you are trying to restore a Compute, follow disaster recovery methods.

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## Installing a DCNM Compute



**Note** With Native HA installations, the HA status s be **Ok** before DCNM can be converted to cluster mode.

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A Cisco DCNM Compute can be installed using an ISO or OVA of a regular Cisco DCNM image. It can be deployed directly on a bare metal using an ISO or a VM using the OVA. After you deploy Cisco DCNM, using the DCNM web installer, choose **Compute** as the install mode for Cisco DCNM. On a Compute VM, you will not find DCNM processes or postgres database; it runs a minimum set of services required to provision and monitor applications.

Follow the instructions on the Web installer to install the compute. After the compute installation is complete, it appears as **Discovered** in the **Applications > Compute** tab. Compute will not join the cluster unless a user with admin privileges logs into the DCNM, and adds the compute to the cluster. After it is added, the status of the compute changes to **Joined**.

## Disaster Recovery

The **appmgr backup** operation on a compute gathers all the data that is required to re-install the compute. Also, this operation preserves all the application data. Using the tar ball generated by the backup command, the **appmgr restore** command restores all the data into the compute. This is similar to how you restore Cisco DCNM from a backup data.

When a compute needs to be reinstalled in a disaster recovery mode, you need to restore the application data into a new installation. It is also possible that the Cisco DCNM servers need to be restored into a new server. You may find the following scenarios:

- Cisco DCNM Controllers need to be recovered
- Cisco DCNM Computes need to be recovered
- Cisco DCNM Controllers and Computes need to be recovered

**Scenario 1**

You can use SSH to access the computes as root, and enter the **appmgr stop afw** command on each of the compute nodes. Now, the DCNM controllers can be powered off and restored onto a new DCNM Installation.

After the restore of the DCNM controllers is complete, verify that DCNM controller is completely up and the Applications screen is loading. Verify that all computes are showing up as offline. Now, enter the **appmgr start afw** command on each of the computes. After a while ensure all the applications are running and Computes are showing as “Joined”.

**Scenario 2**

In this case, enter the **appmgr stop afw** command on the compute that is being restored, after the compute shows offline in the Compute tab. Restore the compute on a new installation.

Perform one restore after the other.

**Scenario 3**

In this case, first perform scenario 1, and then perform scenario 2.

## Converting from Un-Cluster to Cluster Mode with Existing Elasticsearch Data

**Note**

Every time Cisco DCNM is converted from un-clustered to clustered, run the steps mentioned below to rebuild the database schema and preserve the Elasticsearch data.

Read through the complete procedure before proceeding with the Cluster mode conversion.

To convert from un-cluster to cluster mode, perform the following steps.

**Procedure**

- 
- Step 1** From the left pane, choose **Preferences**, and then click the **Preferences** tab.
- Step 2** Take backup of the Elasticsearch data by executing the **appmgr afw backup-es** command.
- If the setup is HA, repeat the step on DCNM Standby.
- Step 3** Copy the tarball file produced from Step 2 to Compute 1.
- If the setup is HA, copy the tarball file on DCNM Standby to Compute 2.
- Step 4** Restore the Elasticsearch data by executing the **appmgr afw restore-es \$tarball** command on the Compute node, where \$tarball is the location of the tarball file copied in Step 3.
- If the setup is HA, repeat the step on Compute 2.
- Step 5** Proceed with adding the Compute nodes. Ensure that Compute 1 is added before Compute 2.

- If the setup is HA, ensure that Compute 2 is added before the rest of the computes (except for Compute 1).
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