



Cisco DCNM Classic LAN Configuration Guide, Release 11.1(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. 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 UI functionalities for the Classic LAN deployment functionalities.

The top pane displays the following UI elements:

- **Help (?)**: Launches the context-sensitive online help.
- **Search**: Helps locate records according to the following search criteria:
 - Name
 - IP Address
 - WWN
 - Alias
 - MAC Address
 - Serial Number
- **User Role**: Displays the role of the user who is currently logged in, for example, admin.
- **Gear** icon: Displays information about Cisco DCNM, enables you to change the Cisco DCNM UI password, and allows you to log out from 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_SAN**
- **Default_LAN**
- Each SAN Fabric
- 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.

Dashlet	Description
	<ul style="list-style-type: none"> You can upload an image of your choice as the background to the network map. <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>

Dashlet	Description
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.
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

Topology

- [Topology, on page 7](#)

Topology

The Topology window displays color-encoded nodes and links that correspond to various network elements, including switches, links, fabric extenders, port-channel configurations, virtual port-channels, and more. For information about each of these elements, hover your cursor over the corresponding element. Also, click a node or the line for a link. A slide-in pane appears from the right side of the window. This pane displays detailed information about either the switch or the link.



Note

You can open multiple tabs simultaneously and can function side by side to facilitate comparison and troubleshooting.

Status

The color coding of each node and link corresponds to its state. The colors and what they indicate are described in the following list:

- Green: Indicates that the element is in good health and functioning as intended.
- Yellow: Indicates that the element is in warning state and requires attention to prevent any further problems.
- Red: Indicates that the element is in critical state and requires immediate attention.
- Gray: Indicates lack of information to identify the element or the element has been discovered.



Note

- In the **Topology** window, FEX appears in gray (**Unknown** or **n/a**) because health is not calculated for FEX.

- Black: Indicates that the element is down.

Scope

You can search the topology based on the scope. The default scopes available from the **SCOPE** drop-down list is: **DEFAULT_LAN**

The following search options are available for **DEFAULT_LAN**:

- Quick Search
- Host name (vCenter)
- Host IP
- Host MAC
- Multicast Group
- VXLAN ID (VNI)
- VLAN
- FabricPath
- VXLAN OAM

Searching

When the number of nodes is large, it quickly becomes difficult to locate the intended switches and links. You can quickly find switches and links by performing a search. You are also able to search for VM tracker and generic setups. Searching feature enables you to see which leaf the host is connected to.

The following searches are available:

**Note**

By default, Quick Search is selected.

Quick Search

Quick Search enables you to search for devices by name, IP address, model, serial number, and switch role. As you enter a search parameter in the **Search** field, the corresponding switches are highlighted in the topology. To perform a search for multiple nodes and links, separate multiple keywords using a comma, for example, ABCD12345, N7K, sw-dc4-12345, core, 172.23.45.67. Cisco DCNM supports wildcard searches too. If you know a serial number or switch name partially, you can build a search based on these partial terms that are preceded by an asterisk, for example, ABCD*, sw*12345, core, and so on.

To limit the scope of your search to a parameter, enter the parameter name followed by a space and the parameter in the Search field, for example, name=sw*12345, serialNumber=ABCD12345, and so on.

Host name (vCenter)

The host name search enables you to search for hosts by using vCenter.

Host IP

You can search the topology using host IP addresses. The **Host IP** searches the switches in the scope to locate the hosts that match the IP address that you enter in the **Search** field. The **Host IP** search supports IPv4 and IPv6 addresses. From the Search drop-down list, choose **Host IP** to search the topology using the IP Address of the host device. Enter a host IP address in the **Search** field and press **Enter**. Click **Details** to view the corresponding host details.

Host MAC

You can search a topology using host MAC addresses. The **Host MAC** searches the switches in the scope to locate the hosts that match the MAC address that you enter in the **Search** field. From the Search drop-down list, choose **Host MAC** to search the topology using a host MAC address. Enter a host MAC address in the Search field and press **Enter**. Click **Details** to view the corresponding host details.

Multicast Group

The **Multicast Group** search is limited to the VXLAN context, VXLAN tunnel endpoint or VTEP switches, to get VXLAN IDs (VNIs) associated with this multicast address.

Select the **Multicast Group** search from the drop-down list, enter a multicast address in the search field, and press **Enter**. Click the **Details** link next to the search field to get the detailed multicast address table. The table displays switches, which have the searched multicast address configured on them, along with associated VNI, VNI status, and mapped VLAN.

You can also hover over switches that are highlighted to view details about the search you have performed.

VXLAN ID (VNI)

The VXLAN ID or the VNI search lets you search the topology by VNI. Select the **VXLAN ID (VNI)** search from the drop-down list. Enter a VNI in the search field and press **Enter**. Click the **Details** link next to the search field to view the detailed VNI table. The table displays the switches that have VNI configured on them along with associated multicast address, VNI status, and mapped VLAN.

VLAN

Search by a given VLAN ID. VLAN search provides the search for the VLAN configured on the switch or the links. If STP is enabled, then it provides information that is related to the STP protocol and the STP information for links.

VSAN ID/Name

Search by a given VSAN ID. VSAN search provides the search for VSAN configured on the switch or the links. In order to view the STP details associated with the VSAN, click **STP Details** link.

This shows the STP details, if STP is enabled. If the link is blocked, it is marked as red, green in case of a forwarding link, and orange if the link is blocked for one VSAN range and forwarding for the other VSAN range.

This search is applicable to both the default LAN and SAN scopes.

FabricPath

Search on the FabricPath topology ID, typically 0 or 1. After search, FabricPath topology links are displayed with purple colored links. You can use the **FabricPath Panel** below the search box to fetch various FabricPath graphs.

Click the drop-down arrow next to **FabricPath Panel**, select a below type of graph:

- **Multi destination**—Select the switch from the **Anchor** drop-down list, and select the graph ID from the **Graph ID** drop-down list to get multi destination or broadcast graph.
- **Reachability**—Select the switch in the **From** drop-down list to get the reachable devices in FabricPath topology from the selected switch.
- **Unicast**—Select the switch from the **Source** and **Destination** drop-down list to get equal cost multi paths from a source to destination switch in FabricPath topology.
- **Multicast**—Select from the **Anchor**, **Ftag ID**, and **IGMP Addr** drop-down list to get the FabricPath multicast tree. The selected anchor switch is the root of the tree.

VXLAN OAM

You can track details such as reachability and actual path of the flows in a VXLAN EVPN based-fabric topology by choosing the **VXLAN OAM** option from the **Search** drop-down list or by entering **VXLAN OAM** in the **Search** field. This displays the **Switch to switch** and **Host to host** tabs. DCNM highlights the route on the topology between the source and destination switch for these two options.

The **Switch to switch** option provides the VXLAN OAM ping and traceroute test results for the VTEP-to-VTEP use-case. Provide the following values to enable search by using the **Switch to switch** option:

- From the **Source Switch** drop-down list, choose the source switch.
- From the **Destination Switch** drop-down list, choose the destination switch.
- From the **VRF** drop-down list, choose or enter the VRF details.
- Check the **All Path Included** check box to include all the paths in the search results.

The **Host to host** option provides the VXLAN OAM pathtrace results for the exact path that is taken by a given flow from the VTEP or switch that is connected to the source host to VTEP or switch that is connected to the destination host. For the **Host to host** use-case, there are two suboptions:

- VRF or SVI for a network is instantiated on the switches in the VXLAN EVPN fabric. In such a scenario, the IP address information of the end hosts is required.
- Layer 2 configuration for a given network is instantiated on the switches in the VXLAN EVPN fabric. In such a scenario, both the MAC and IP address information of the end hosts are required.

Provide the following values to enable search using the **Host to host** option:

- In the **Source IP** field, enter the IP address of the source host.
- In the **Destination IP** field, enter the IP address of the destination host.
- In the **VRF** field, choose VRF from the drop-down list or enter the VRF name that is associated with the hosts.

- (Optional) In the **Source Port** field, choose Layer 4 source port number from the drop-down list or enter its value.
- (Optional) In the **Destination Port** field, choose destination port number or enter its value.
- (Optional) In the **Protocol** field, choose the protocol value from the drop-down list or enter its value. This is the Layer 4 protocol, usually TCP or UDP.
- Click the **Interchange/Swap Source and Destination IPs (and MACs if applicable)** icon to interchange the source and destination IP addresses. This interchange allows a quick trace of the reverse path without reentering the host IP addresses or MAC addresses.
- Check the **Layer-2 only** check box to search the VXLAN-EVPN fabric that is deployed in Layer 2 only mode for some networks, that is, Layer 2 VNIs. Note that no SVIs or VRFs should be instantiated in the fabric for these networks when you use this search option.

Enter values for the following additional fields:

Show Panel

You can choose to view your topology based on the following options:

- **Auto Refresh:** Check this check box to automatically refresh the topology.
- **Switch Health:** Check this check box to view the switch's health status.
- **FEX:** Check this check box to view the Fabric Extender.



Note The FEX feature is available only on LAN devices. Therefore, checking this check box displays only the Cisco Nexus switches that support FEX.



Note FEX is also not supported on Cisco Nexus 1000V devices. Therefore, such devices will not be displayed in the topology when you check the **FEX** check box.

- **Links:** Check this check box to view links in the topology. The following options are available:
 - **Errors Only:** Click this radio button to view only links with errors.
 - **All:** Click this radio button to view all the links in the topology.
 - **VPC Only:** Check this check box to view only vPC peer-links and vPCs.
 - **Bandwidth:** Check this check box to view the color coding based on the bandwidth that is consumed by the links.
- **OTV:** Check this check box to show the Overlay Transport Virtualization (OTV) topology with the cloud icon and the dotted links from the OTV edge devices. Hovering the cursor over the cloud and the links shows the relevant information for OTV topology, such as control group, extended VLANs, and so on. The OTV search field appears below the filter field. Use the OTV search field to search the shown OTV topology that is based on **Overlay ID** and **Extended VLAN ID**. The searched virtual links based on the **Overlay ID** and **Extended VLAN ID** are marked green.

A **Details** link appears after you check the **OTV** check box. Clicking the link shows the OTV topology data. The **Overlay Network** column shows whether the particular topology is multicast based or unicast based. The **Edge Device** column displays the edge switches in the particular OTV topology. The other columns display the corresponding overlay interface, extended VLANs, join interface, and data group information.

- **UI controls:** Check the check box to show or hide the various controls on the **Topology** window.
- **Compute:** Check the check box to enable the compute visibility on the **Topology** window.
- **Refresh:** You can also perform a topology refresh by clicking the **Refresh** icon in the upper-right corner of this panel.

Layouts

The topology supports different layouts along with a **Save Layout** option that remembers how you positioned your topology.

- **Hierarchical** and **Hierarchical Left-Right:** Provide an architectural view of your topology. Various switch roles can be defined that will draw the nodes on how you configure your CLOS topology.



Note

When running a large-scale setup, being able to easily view all your switches on a leaf-tier can become difficult. To mitigate this, DCNM splits your leaf-tier every 16 switches.

- **Random:** Nodes are placed randomly on the window. DCNM tries to make a guess and intelligently place nodes that belong together in close proximity.
- **Circular** and **Tiered-Circular:** Draw nodes in a circular or concentric circular pattern.
- **Custom saved layout:** Nodes can be dragged around according to your preference. After you position as required, click **Save** to retain the positions. The next time you come to the topology, DCNM will draw the nodes based on your last saved layout positions.

Before a layout is chosen, DCNM checks if a custom layout is applied. If a custom layout is applied, DCNM uses it. If a custom layout is not applied, DCNM checks if switches exist at different tiers, and chooses the Hierarchical layout or the Hierarchical Left-Right layout. Force-directed layout is chosen if all the other layouts fail.

Zooming, Panning, and Dragging

You can zoom in and zoom out using the controls that are provided at the bottom left of the windows or by using your mouse's wheel.

To pan, click and hold anywhere in the whitespace and drag the cursor up, down, left, or right.

To drag switches, click, hold, and move the cursor around the whitespace region of the topology.

Switch Slide-Out Panel

You can click on the switch to display the configured switch name, IP address, switch model, and other summary information such as status, serial number, health, last-pollled CPU utilization, and last-pollled memory utilization.

Beacon

This button will be shown for switches that support the **beacon** command. After beaconing starts, the button will show a countdown. By default, the beaconing will stop after 60 seconds, but you can stop it immediately by clicking **Stop Beacon**.

**Note**

The default time can be configured in `server.properties` file. Search for **beacon.turnOff.time**. The time value is in milliseconds. Note that this requires a server restart to take effect.

Tagging

Tagging is a powerful yet easy way to organize your switches. Tags can be virtually any string, for example, *building 6, floor 2, rack 7, problem switch, and Justin debugging*.

Use the search functionality to perform searches based on tags.

More Details

Click **Show more details**; detailed information appears in the switch's dashboard.

Link Slide-Out Panel

You can click a link to view the status and the port or switches that describe the link.

24-Hour Traffic

This feature requires **Performance Monitoring** to be turned **ON**. When **Performance Monitoring** is **ON**, traffic information is collected and the aggregate information is displayed along with a graph showing traffic utilization.

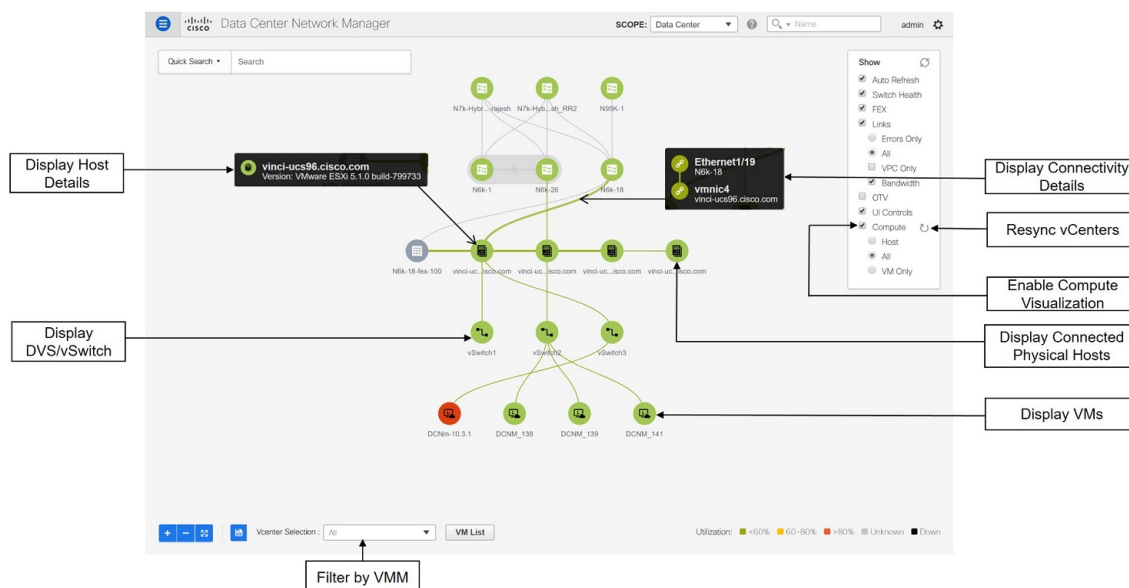
vCenter Compute Visualization

In virtualized environments, any kind of troubleshooting starts with identifying the network attachment point for the virtual machines. This means that a quick determination of the server, virtual switch, port group, VLAN, associated network switch, and physical port is critical. This requires multiple touch points and interactions between the server and the network administrator as well as reference to multiple tools (compute orchestrator, compute manager, network manager, network controller, and so on).

This allows you to visualize the vCenter-managed hosts and their leaf switch connections on the **Topology** window. The visualization options include viewing only the attached physical hosts, only the VMs, or both. When you select both, the topology all the way from the leaf switches to the VMs, including the virtual switches are displayed. The VM Search option highlights the path of the VM. Hover the cursor over a host or a connected uplink to view key information relevant to that entity. Up to four vCenters are supported.

**Note**

- The vCenter Compute Visualization feature is supported on both the LAN Classic and Easy Fabrics installations for the vCenter-managed computes.
- It is not recommended to use special characters in a VM name as vCenter does not escape special characters used in display names. For more information, see <https://vss-wiki.eis.utoronto.ca/display/VSSPublic/Virtual+Machine+Naming>.

Figure 1: vCenter Compute Visualization

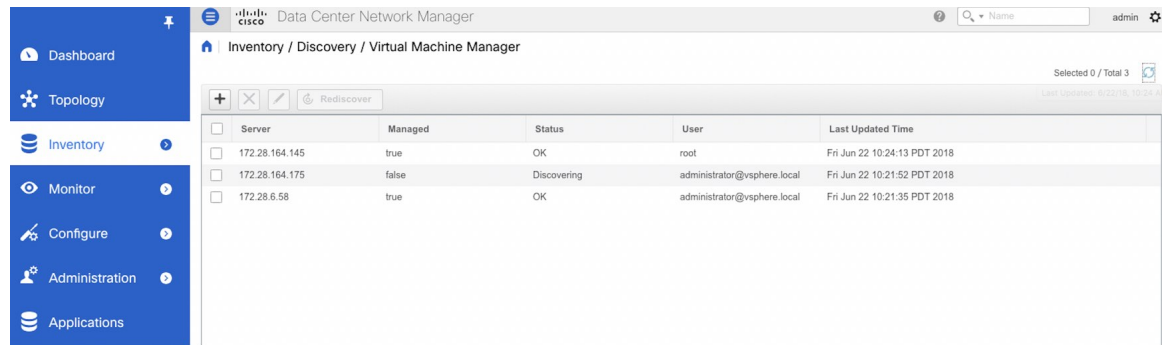
Enabling vCenter Compute Visualization

To enable the vCenter Compute Visualization feature from the Cisco DCNM Web UI, perform the following steps.

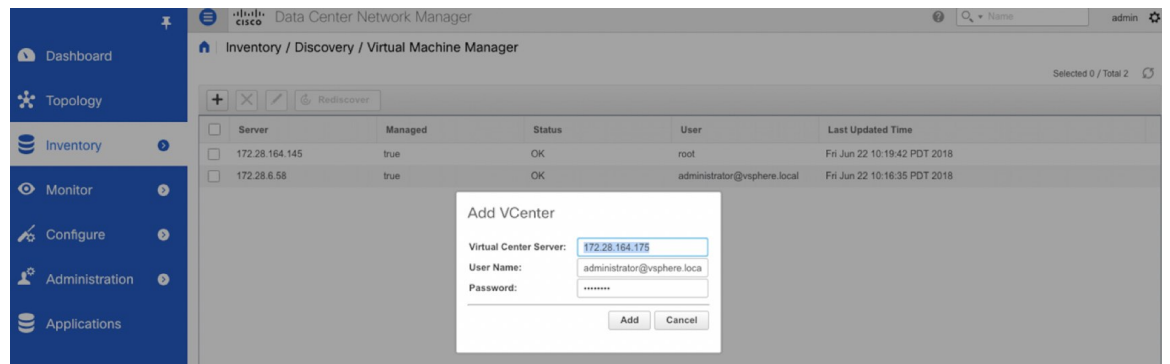
Procedure

Step 1 Choose **Configure > Inventory > Virtual Machine Manager**.

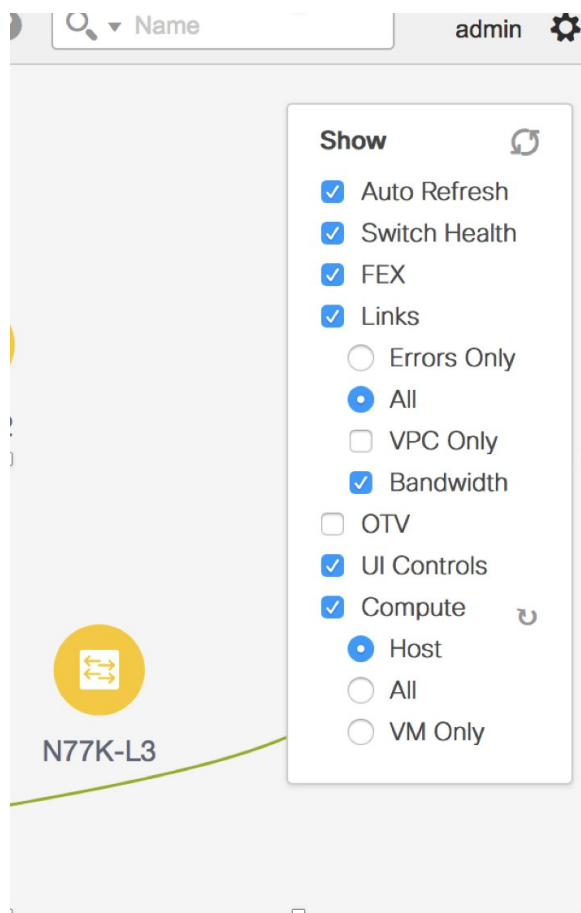
The **Inventory > Discovery > Virtual Machine Manager** window appears.



Step 2 Click the + icon to add a new VMware vSphere vCenter.



Step 3 Enter the server IP address, username, and password to the vCenter. vCenter version 5.5 or later is required. After the initial discovery, the information that is received from the vCenter is appropriately organized and displayed on the main **Topology** window. An extra menu item labeled **Compute** appears on the **Show** pane.



Using vCenter Compute Visualization

To use the vCenter Compute Visualization feature from the Cisco DCNM Web UI, perform the following steps.

Procedure

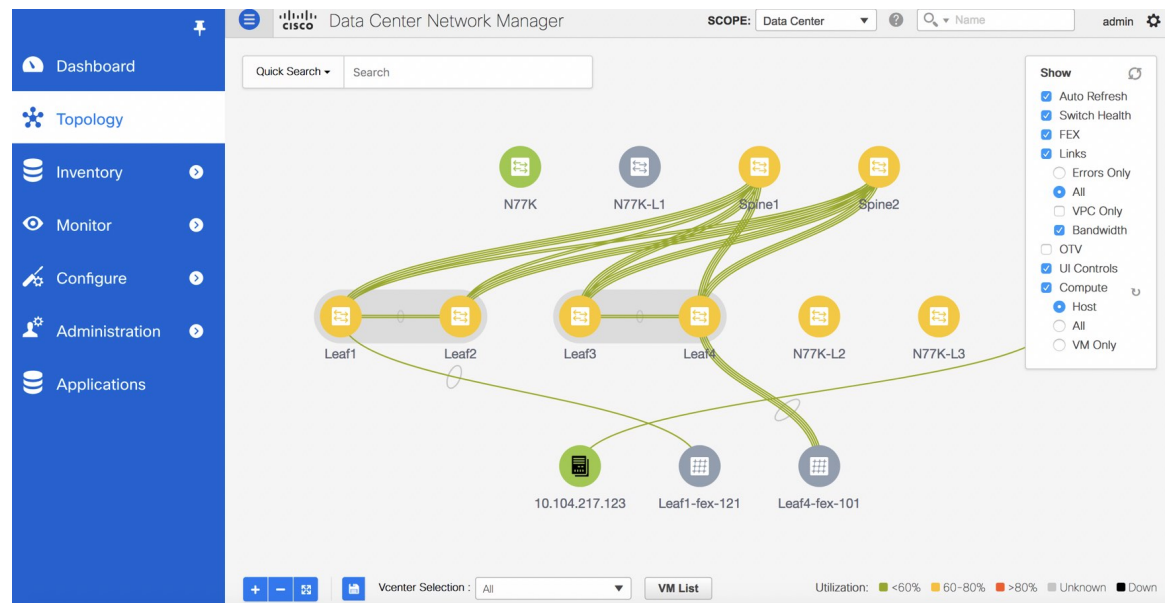
Step 1 Choose **Topology**.

Step 2 In the **Show** list, select **Compute** to enable the compute visibility.

By default, the **Host** check box is selected. This implies that the topology shows the VMWare vSphere ESXi hosts (servers), that are attached to the network switches.

The following options are available in the Compute Visualization feature.

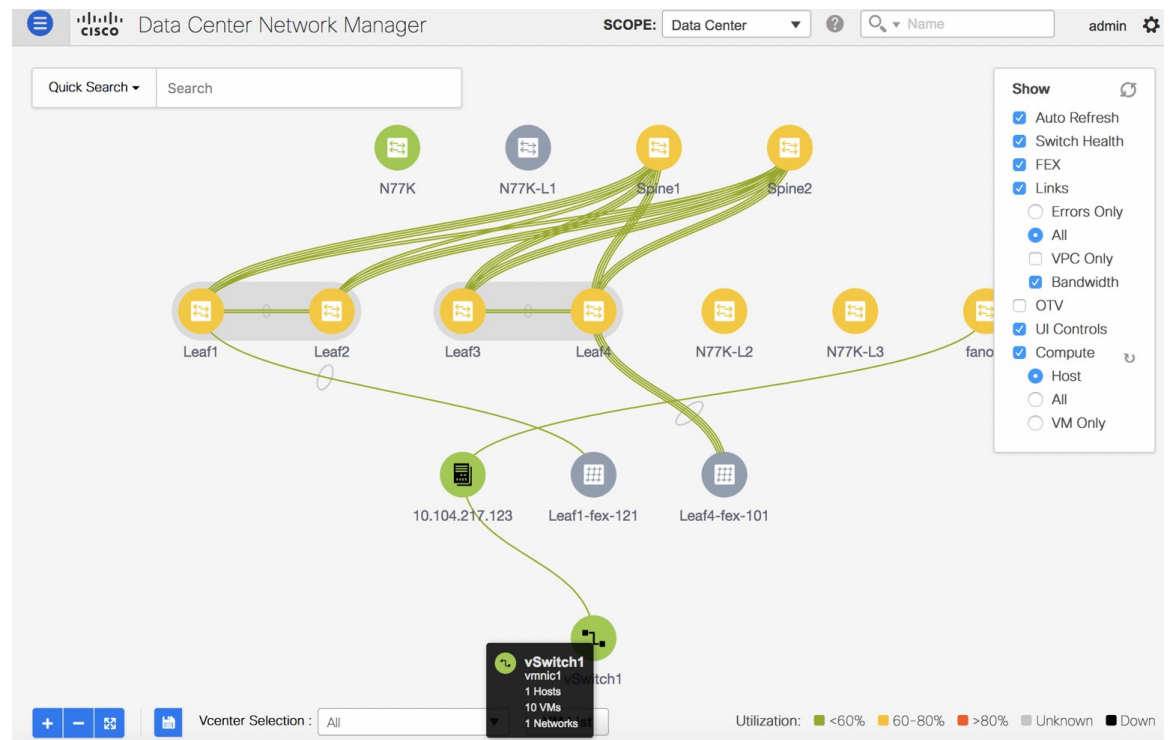
- **Host**
- **All**
- **VM Only**



In the **All** mode, you can see double-arrows that help you to extend a node. If you double-click this node, you can see all the hidden child nodes.

Step 3 Click a specific ESXi host to view additional information.

The expanded topology displayed in the following figure, shows the virtual switches (both vSwitch and Distributed Virtual Switch) that are configured on the specific ESXi host.



Step 4 When changing from the **Host** suboption to the **All** suboption, all the compute resources are expanded.

When **All** is selected, an expanded view of all the hosts, virtual switches, and virtual machines that are part of the topology are displayed. If a VM is powered off, it is shown in red color; otherwise, it is shown in green color.

Note The vCenter search is unavailable when compute visualization is not enabled. Also, this search is available only when you select the **All** option.

Step 5 Instead of browsing through the large set of available information, to focus on a specific VM.

Enter a host name (vCenter) in the **Search** field at the top-left. When you start entering the characters, the topology is instantaneously updated with matching objects.

Using the Virtual Machine List

The **Virtual Machine List** allows you to view the complete list of virtual machines.

Procedure

Step 1 Choose **Topology**.

Step 2 Click **VM List**.

	VM Name	VLAN	Virtual Sw...	Physical ...	Host	Switch	Switch Int...	Connection
1	DCNM_138	0	vSwitch2	vmnic3	vinci-ucs14...	N6k-26	Ethernet1/35	connected
2	DCNM_139	0	vSwitch2	vmnic3	vinci-ucs14...	N6k-26	Ethernet1/35	connected
3	DCNM_141	0	vSwitch2	vmnic3	vinci-ucs14...	N6k-26	Ethernet1/35	connected
4	DCNM-10.3.1	0	vSwitch3	vmnic3	vinci-ucs96...	N6k-18	Ethernet1/18	connected

Click **Export** to export the list of virtual machines into a .csv file.

Click on the name of a VM to view additional information about that virtual machine.

VM List

Total 4

VM Name	VLAN	Virtual Sw...	Physical ...	Host	Switch	Switch Int...	Connection
1 DCNM_138	0	vSwitch2	vmnic3	vinci-ucs14...	N6k-26	Ethernet1/35	connected
	0	vSwitch2	vmnic3	vinci-ucs14...	N6k-26	Ethernet1/35	connected
	0	vSwitch2	vmnic3	vinci-ucs14...	N6k-26	Ethernet1/35	connected
	0	vSwitch3	vmnic3	vinci-ucs96...	N6k-18	Ethernet1/18	connected

DCNM_138
 Network adapter 1 -- 00:50:56:93:6f:dc -- Disconnected
 Network adapter 2 -- 00:50:56:93:57:c2 -- Disconnected
 Network adapter 3 -- 00:50:56:93:32:56 -- Disconnected
 No. of CPUs: 8
 Memory(MB): 24576
 Guest OS: Linux 3.10.0-693.21.1.el7.x86_64 CentOS Linux release 7.4.1708 (Core)
 Guest IP: 172.28.10.138
 PRODUCT INFO:
 * Name: DCNM Virtual Appliance
 * Vendor: Cisco Systems, Inc
 * Version: 11.0.0.700

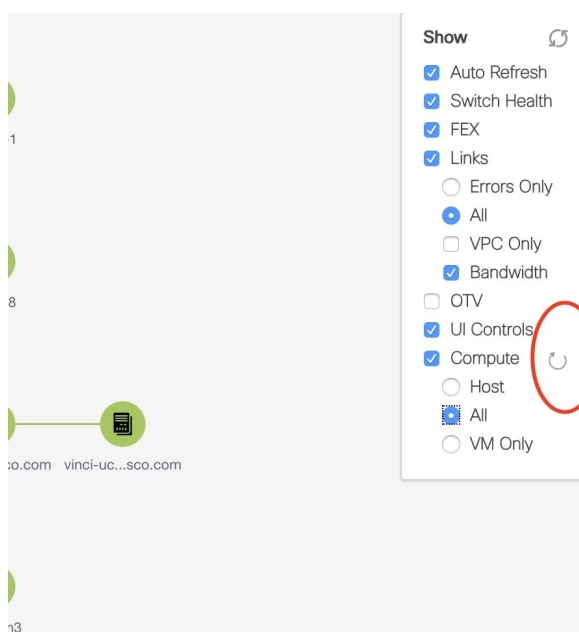
Note When you export the VM List to a .CSV file, the .CSV file may appear correct. However, when the .CSV file is imported into Microsoft Excel, it might get reformatted, for example, the VLAN column 1-1024 could be reformatted to a date 1/1/2019. Therefore ensure that columns are formatted correctly in Microsoft Excel while importing the .CSV file.

Resynchronizing Virtual Machines

Procedure

- Step 1** Choose **Topology**.
- Step 2** Click **Resync vCenters** icon next to **Compute**.

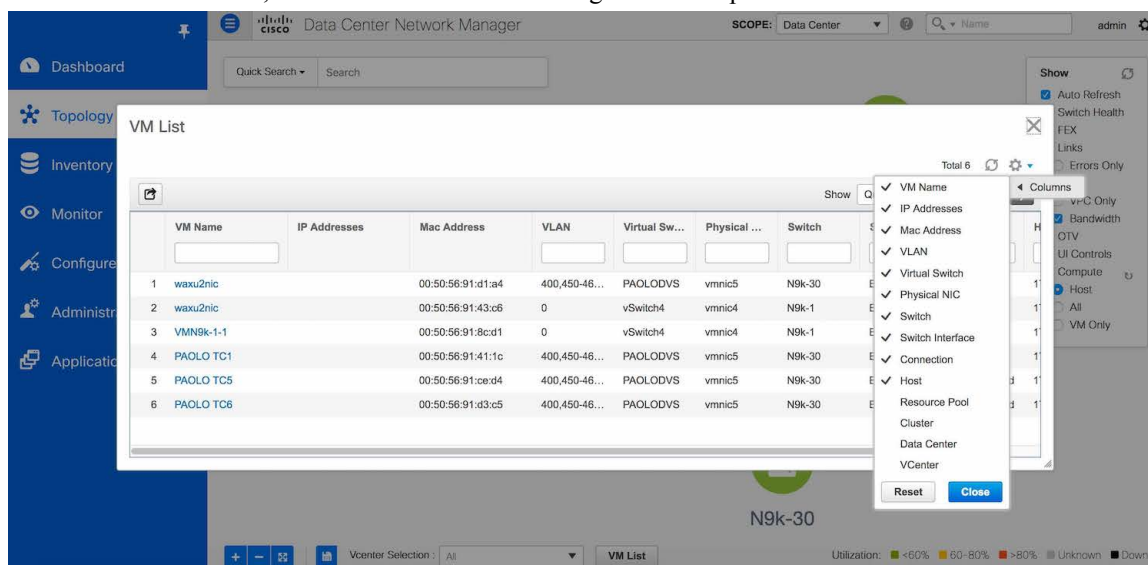
Selecting a Column in the Virtual Machine List



Selecting a Column in the Virtual Machine List

Procedure

Step 1 In the **VM List** window, click the **Columns** under the gear icon drop-down list.

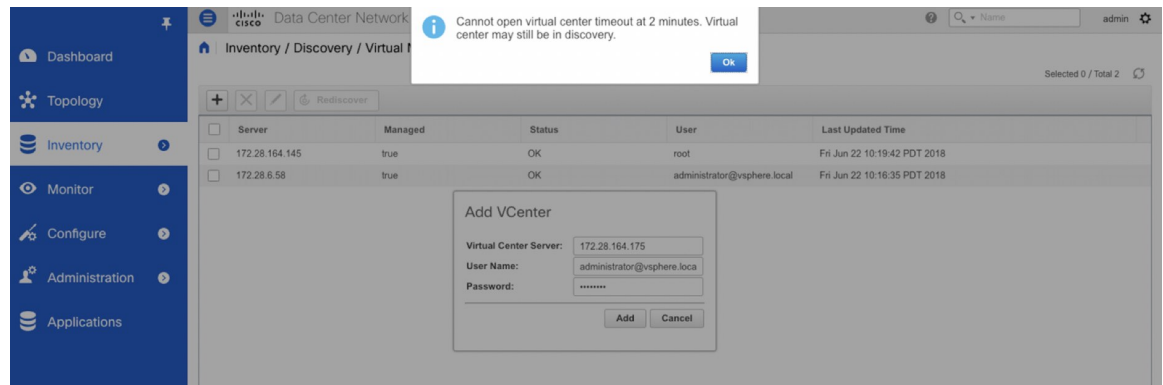


Step 2 Select the columns that you want to display in the VM list table. If you select additional columns, click **Resync vCenters** icon to refresh and view the new columns.

Periodic resynchronization with the vCenter happens in the back-end. To configure the resync timer value, choose **Administration > DCNM Server > Server Properties**. In the **#GENERAL > DATA SOURCES VMWARE** section, specify the timer value in the **vmm.resync.timer** field. The default value is 60 (for 60 minutes), and this value can be increased or decreased. If you enter a value that is less than 60 minutes, the feature is disabled.

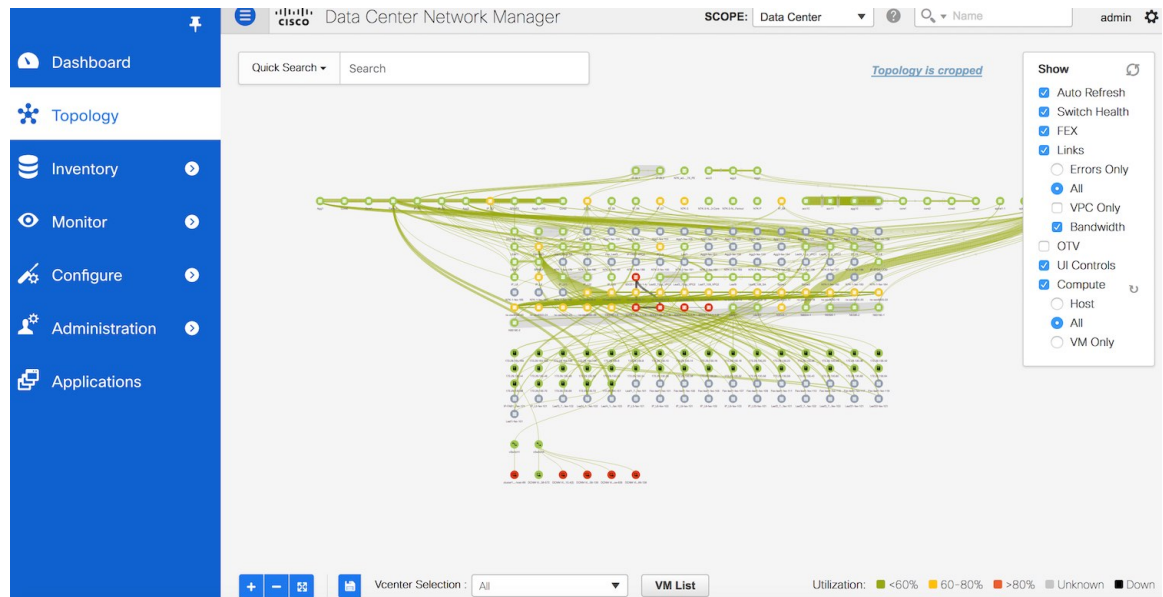
Troubleshooting vCenter Compute Visualization

The following error window appears when the vCenter times out. This error might occur when the discovery of the vCenter is in progress.



Viewing Topology in Scale Mode

The following window shows how the **Topology** window appears after about 200 devices are available in the topology. Note that the topology graph is trimmed down at scale.





CHAPTER 4

Inventory

This chapter contains the following topics:

- [Viewing Inventory Information, on page 23](#)
- [Discovery, on page 47](#)

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.

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

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 54](#) window pertaining to this switch.
 - (Optional) Click **Backup** to go to the Viewing a Configuration window.
 - (Optional) Click **Events** to go to the [Viewing Events Registration, on page 205](#) 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

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.

Field	Description
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.

Field	Description
Show	<p>Allows you to view various configuration details for the selected FEX ID. You can select the following from the drop-down list.</p> <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.
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.	<p>Specifies the configured serial number.</p> <p>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.</p>
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.

Field	Description
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.

Field	Description
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>Note You cannot suspend the default VDC.</p> <p>Caution 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	<p>Species the type of VDC. The two types of VDCs are:</p> <ul style="list-style-type: none"> • Ethernet • Storage
Status	Specifies the status of the VDC.
Resource Limit-Module Type	Displays the allocated resource limit and module type.

Field	Description
HA-Policy <ul style="list-style-type: none"> • Single Supervisor • Dual Supervisor 	<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>Single supervisor module configuration:</p> <ul style="list-style-type: none"> • Bringdown—Puts the VDC in the failed state. To recover from the failed state, you must reload the physical device. • Reload—Reloads the supervisor module. • Restart—Takes down the VDC processes and interfaces and restarts it using the startup configuration. <p>Dual supervisor module configuration:</p> <ul style="list-style-type: none"> • Bringdown—Puts the VDC in the failed state. To recover from the failed state, you must reload the physical device. • Restart—Takes down the VDC processes and interfaces and restarts it using the startup configuration. • Switchover—Initiates a supervisor module switchover. <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>
Mac Address	Specifies the default VDC management MAC address.
Management Interface <ul style="list-style-type: none"> • IP Address Prefix • Status 	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 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		
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

For the selected switch, the **Switch On-Board Analytics** dashboard displays the following charts:



Note The graph data cannot be retrieved if correct certificates are not added to the Switch. Ensure that the certificates are valid for nxapi feature and SAN analytics to function properly.

- 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 as** 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 **Show bandwidth and Size as** 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 **Filter results** check box, and click either the **by fc port** or **by VSAN** radio button and specify the appropriate values to filter the chart results. The FC port value must be in the **fc slot/port** format and the VSAN value must be a digit within the allowed VSAN range.

Click the Filter icon next to the **by fc port** to apply changes.



Note Filtering results by VSAN is not applicable for the **Top 10 Slowest Ports** or **Top 10 Port Traffic** charts.

- 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
- When you add or discover LAN devices in DCNM, ICMP echo packets are sent as part of the discovery process. If you have a firewall that blocks ICMP messages, the discovery process fails. You can skip sending the ICMP echo packets by setting the **cdp.discoverPingDisable** server property to **true**. For more information about how to set a server property, see [Server Properties, on page 186](#).

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.
-

Adding, Editing, Re-Discovering and Removing VMware Servers

This section contains the following:

Adding a Virtual Center Server

You can add a virtual center server from Cisco DCNM.

Procedure

- Step 1** Choose **Inventory > Discovery > Virtual Machine Manager**.
You see the list of VMware servers (if any) that are managed by Cisco DCNM-LAN in the table.
- Step 2** Click **Add**.
You see the **Add VCenter** window.
- Step 3** Enter the **Virtual Center Server** IP address for this VMware server.
- Step 4** Enter the **User Name** and **Password** for this VMware server.
- Step 5** Click **Add** to begin managing this VMware server.
-

Deleting a VMware Server

You can remove a VMware server from the Cisco DCNM.

Procedure

- Step 1** Choose **Inventory > Discovery > Virtual Machine Manager**.

- Step 2** Select the check box next to the VMware server that you want to remove and click **Delete** to discontinue data collection for that VMware server.
-

Editing a VMware Server

You can edit a VMware server from Cisco DCNM Web Client.

Procedure

- Step 1** Choose **Inventory > Discovery > Virtual Machine Manager**.
- Step 2** Check the check box next to the VMware server that you want to edit and click **Edit** virtual center icon.
You see the **Edit VCenter** dialog box.
- Step 3** Enter a the **User Name** and **Password**.
- Step 4** Select managed or unmanaged status.
- Step 5** Click **Apply** to save the changes.
-

Rediscovering a VMware Server

You can rediscover a VMware server from Cisco DCNM.

Procedure

- Step 1** Choose **Inventory > Discovery > Virtual Machine Manager**.
- Step 2** Select the check box next to the VMware that you want to rediscover.
- Step 3** Click **Rediscover**.
A dialog box with warning "Please wait for rediscovery operation to complete." appears.
- Step 4** Click **OK** in the dialog box.
-



CHAPTER 5

Monitor

This chapter contains the following topics:

- [Monitoring Switch, on page 51](#)
- [Monitoring LAN, on page 55](#)
- [Monitoring Report, on page 59](#)
- [LAN Telemetry, on page 61](#)
- [Alarms, on page 90](#)

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 Other Statistics

To view the statistics in user-defined format from the Cisco DCNM Web UI, perform the following steps:

Procedure

Step 1 Choose **Monitor > Switch > User Defined**.

The **Other** window is displayed.

Step 2 You can use the drop-down to filter the view by 24 hours, Week, Month, and Year.

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

- Select the time range, and click **Filter** to filter the display.
- Click the chart icon in the **Switch** column to see a graph of the performance for this user-defined object. You can change the time range for this graph by selecting it from the drop-down list in the upper right corner.
- Use the chart icons to view the traffic chart in varied views.

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 57](#) 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.
Multi Chassis vPC EndPoints	Displays the multi-chassis vPC endpoints for each vPC ID under a vPC domain.
Primary vPC Peer - Device Name	Displays the vPC Primary device name.
Primary vPC Peer - Primary vPC Interface	Displays the primary vPC interface.
Primary vPC Peer - Capacity	Displays the capacity for the primary vPC peer.
Primary vPC Peer - Avg. Rx/sec	Displays the average receiving speed of primary vPC peer.
Primary vPC Peer - Avg. Tx/sec	Displays the average sending speed of primary vPC peer.
Primary vPC Peer - Peak Util%	Displays the peak utilization percentage of primary vPC peer.
Secondary vPC Peer - Device Name	Displays the vPC secondary device name.
Secondary vPC Interface	Displays the secondary vPC interface.
Secondary vPC Peer - Capacity	Displays the capacity for the secondary vPC peer.
Secondary vPC Peer - Avg. Rx/sec	Displays the average receiving speed of secondary vPC peer.
Secondary vPC Peer - Avg. Tx/sec	Displays the average sending speed of secondary vPC peer.
Secondary vPC Peer - Peak Util%	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.

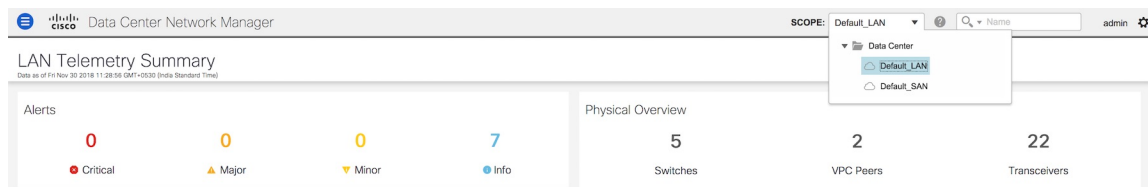
Step 2 Select the checkbox for a specific report and click the **Delete Job** icon to delete a report.

LAN Telemetry

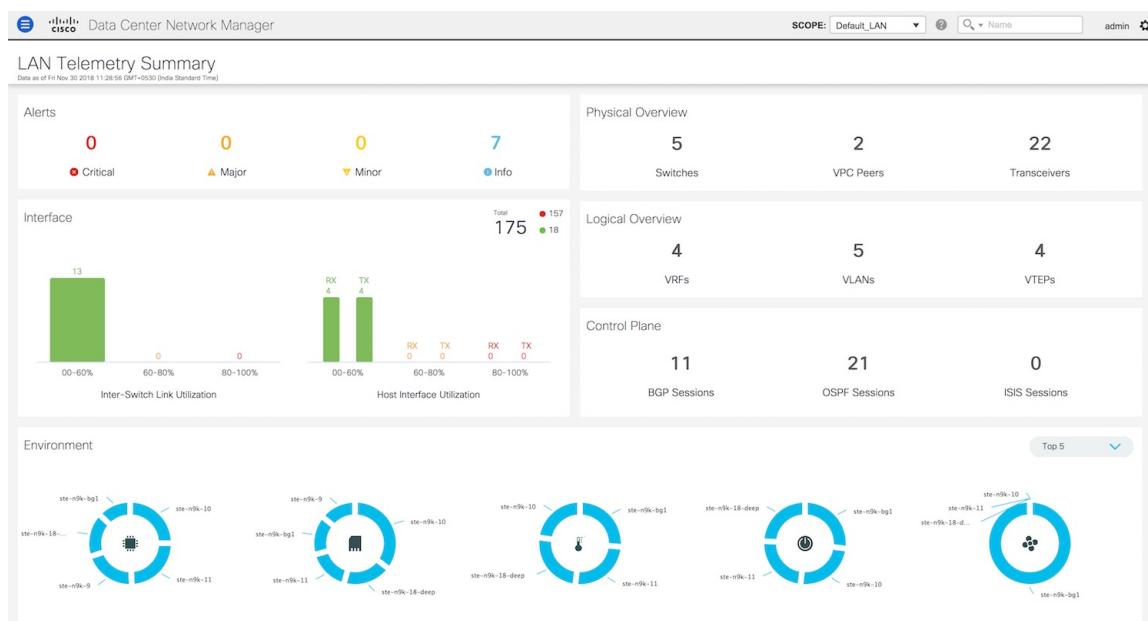
The LAN Telemetry menu includes the following submenus:

Monitoring LAN Telemetry

Once LAN telemetry has been successfully enabled, the LAN Telemetry Summary window is available. You can navigate to the LAN Telemetry Summary window by choosing **Monitor > LAN Telemetry > Explore**. Select the fabric (for example, Default_LAN) for which LAN telemetry has been enabled through the SCOPE at the top.

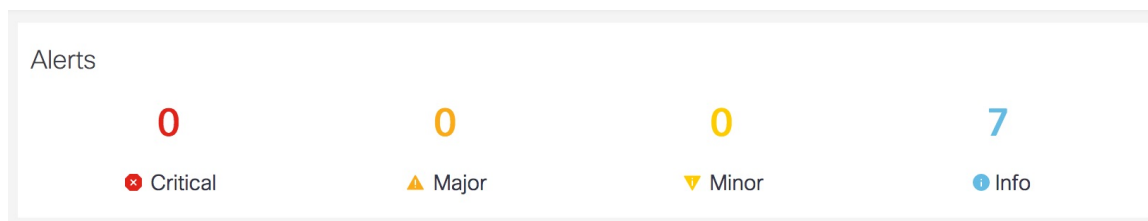


There are six insights (Alerts, Physical Overview, Logical Overview, Control Plane, Interface, and Environment) shown through interactive visualizations depicting different aspects of switch metrics. Click the Alerts, Physical Overview, Logical Overview, Control Plane, and Interface tiles to find more information about the metrics. On the Environment tile, click the donut chart icons to display more information. The Environment tile displays metrics for CPU usage, Memory, Temperature, Power, and Fans.

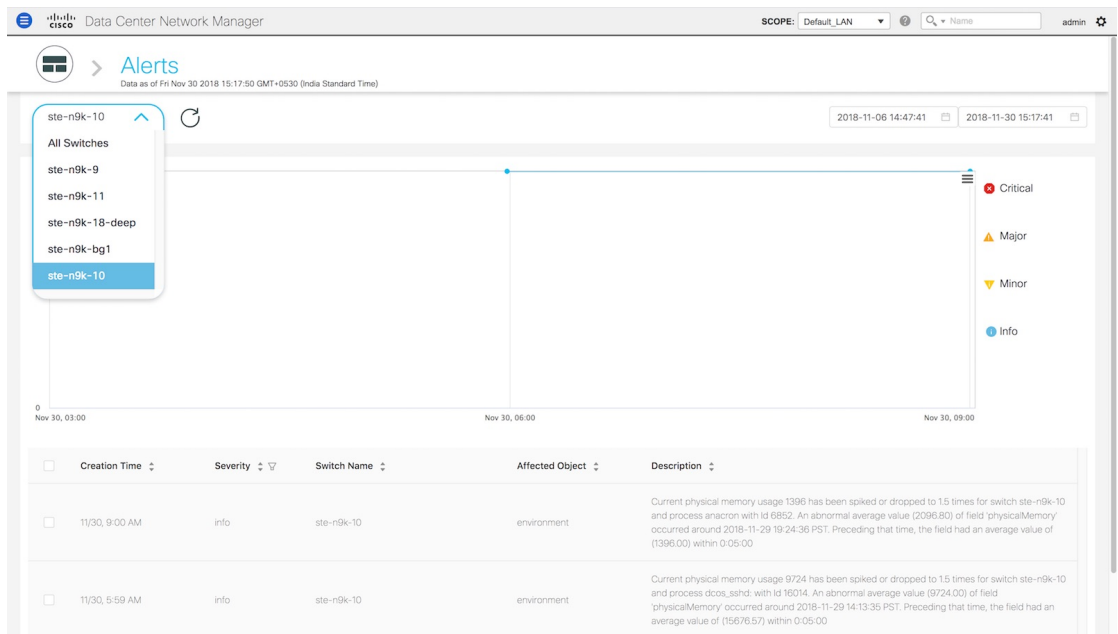


Alerts

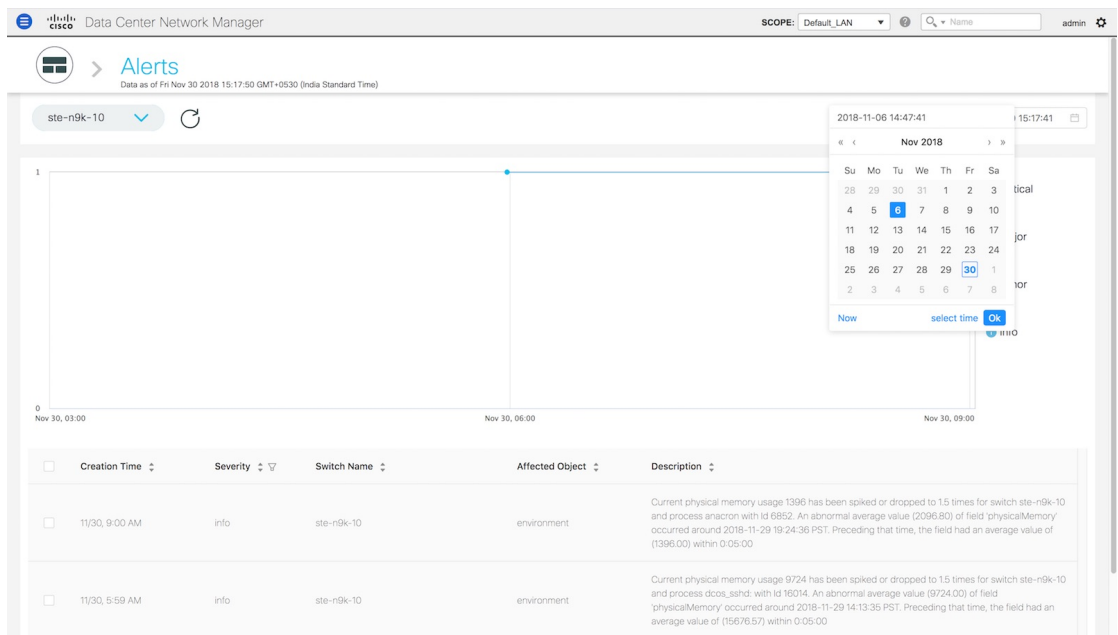
The **Alerts** tile displays the number of alerts that have occurred. The alerts are classified as Critical, Major, Minor, and Info. Each kind of alert is associated with a specific color.



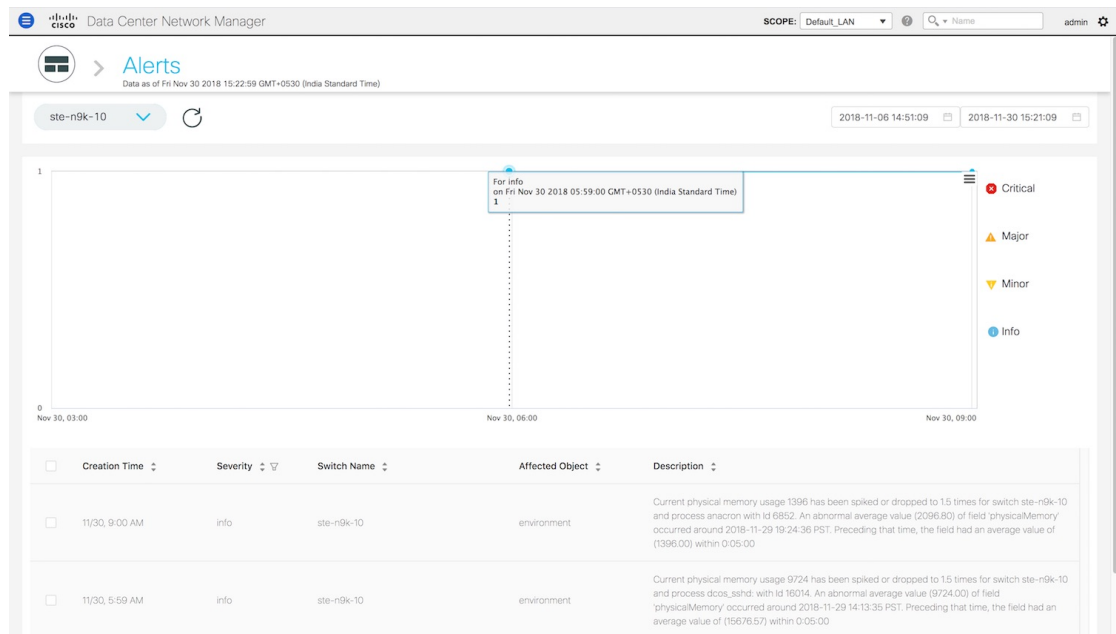
1. Click the **Alerts** tile for more information about the alerts. You can select a specific switch for which you want to display the metrics. You can also select **All Switches** to display metrics for all the switches in the selected fabric.



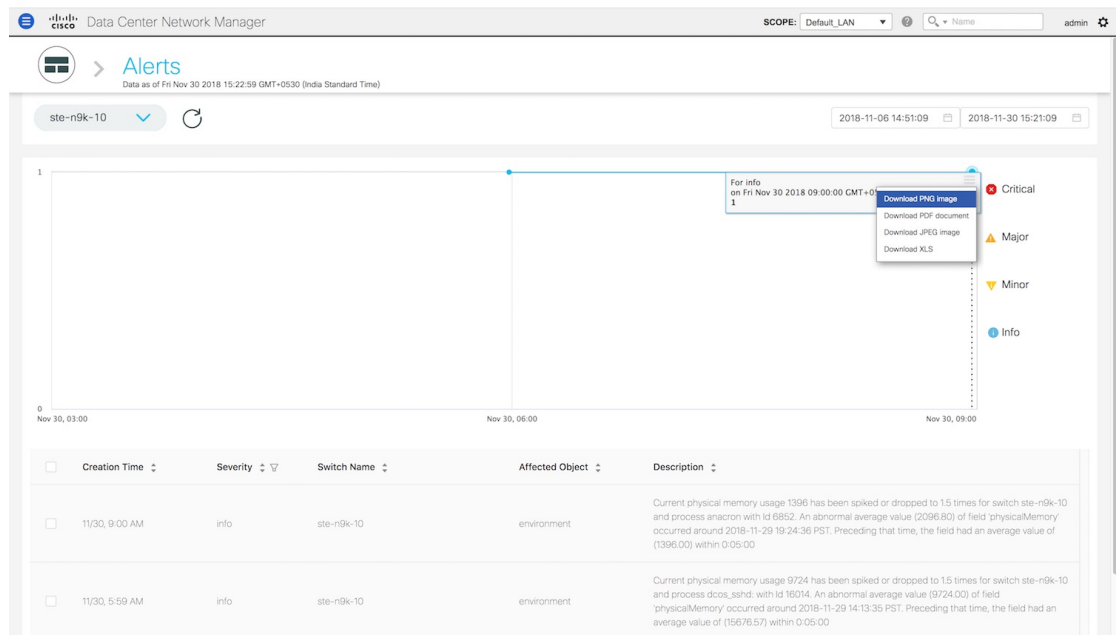
2. You can select a specific time interval to view the alerts that have occurred in that time interval. Click the fields showing the date and time to select the required date and time interval. Click **Now** to display metrics for the current date and time. Click the **Refresh** icon next to the switch selection dropdown to display metrics for the last 30 minutes.



3. Hover over specific points on the graph for the time at which the alert has occurred.



- Click the icon at the top right of the graph to download the graph as a PNG image, PDF document, JPEG image or an XLS file.



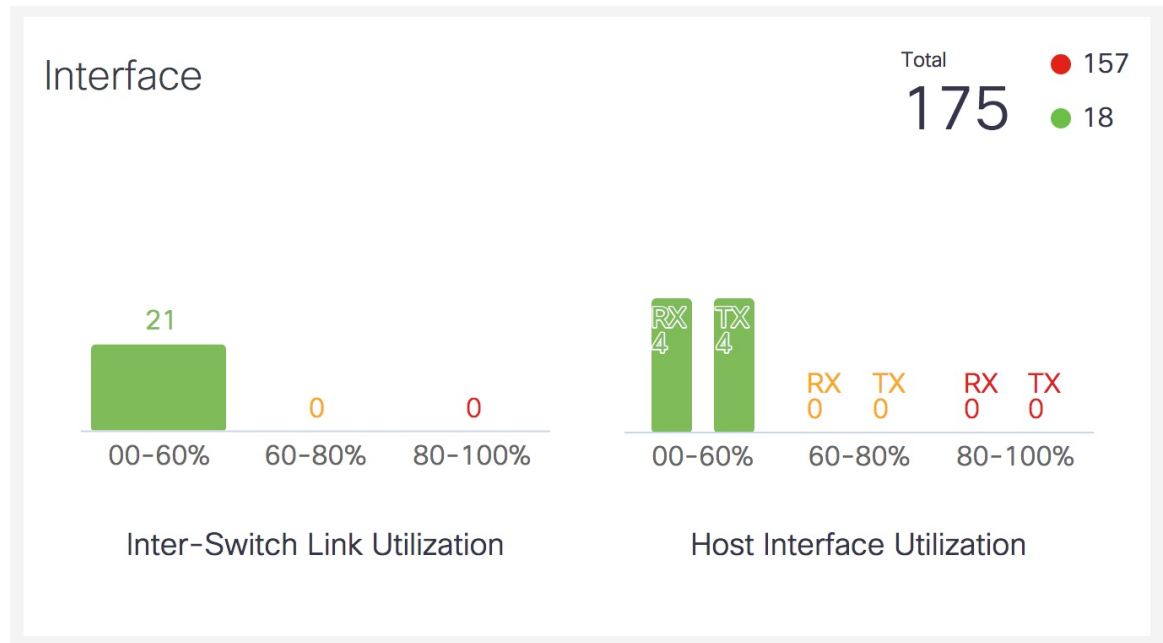
- The bottom of the page has the following fields: **Creation Time**, **Severity**, **Switch Name**, **Affected Object** and **Description**. These fields provide more information about each alert. Click the filter icon next to Severity to filter the alerts based on severity level.

<input type="checkbox"/>	Creation Time	Severity	Switch Name	Affected Object	Description
<input type="checkbox"/>	11/30, 9:00 AM	info	ste-n9k-10	environment	Current physical memory usage 1396 has been spiked or dropped to 1.5 times for switch ste-n9k-10 and process anacron with id 6852. An abnormal average value (2096.80) of field 'physicalMemory' occurred around 2018-11-29 19:24:36 PST. Preceding that time, the field had an average value of (1396.00) within 0:05:00
<input type="checkbox"/>	11/30, 5:59 AM	info	ste-n9k-10	environment	Current physical memory usage 9724 has been spiked or dropped to 1.5 times for switch ste-n9k-10 and process dcos_sshd with id 16014. An abnormal average value (9724.00) of field 'physicalMemory' occurred around 2018-11-29 14:13:35 PST. Preceding that time, the field had an average value of (15676.57) within 0:05:00

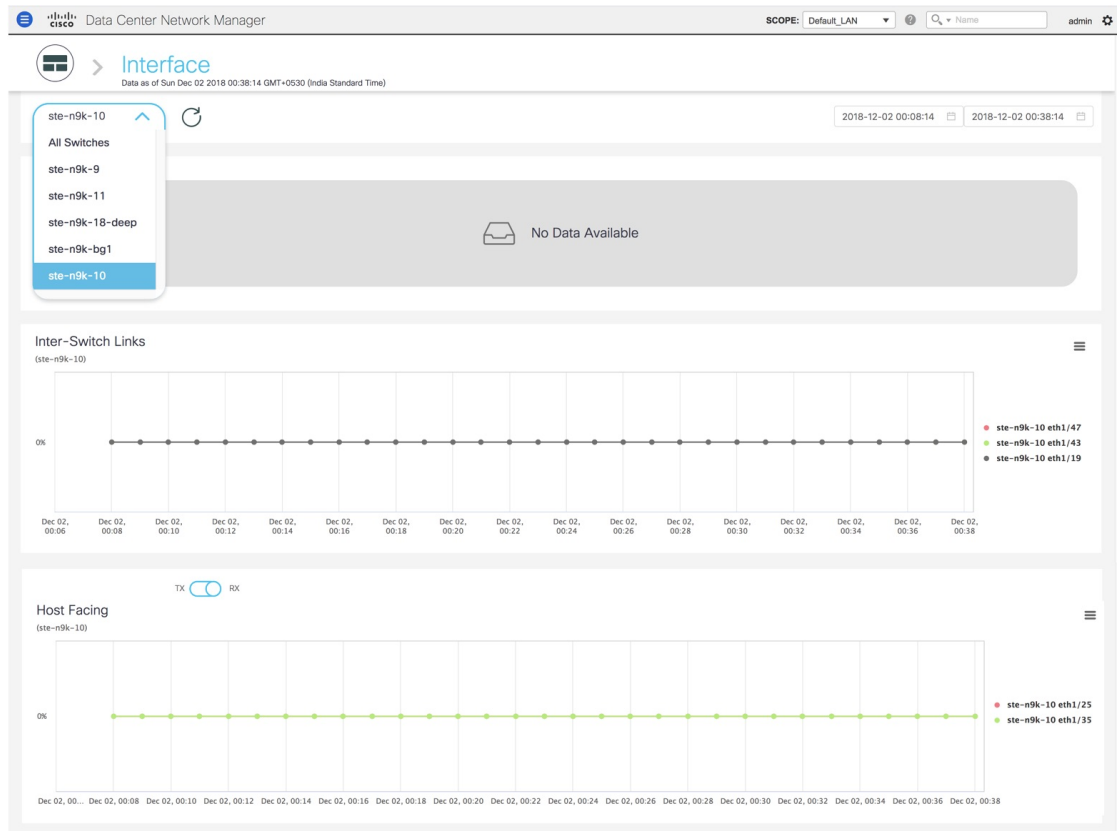
- Click the icon next to **Alerts** at the top of the window to go back to the LAN Telemetry Summary window.

Interface

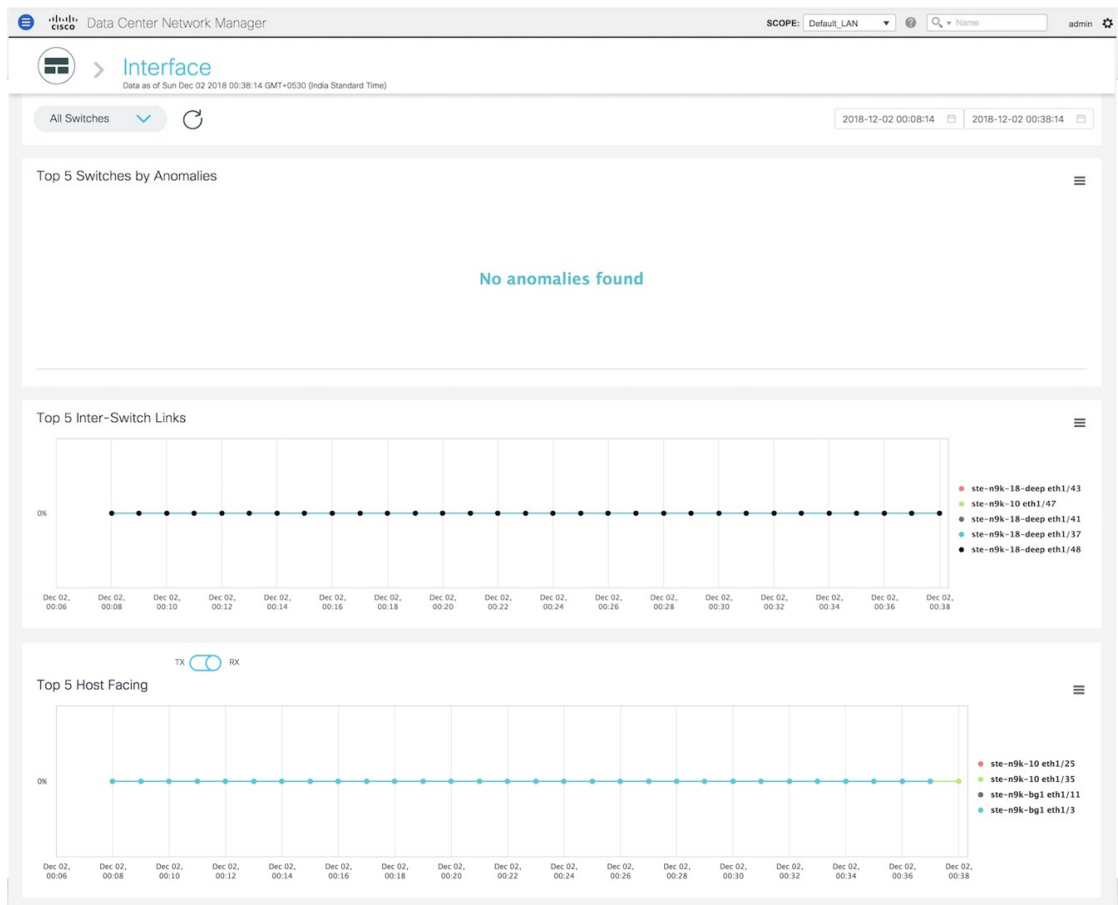
The **Interface** tile displays the Inter-Switch Link Utilization and Host Interface Utilization metrics. It shows the number of Inter-Switch Links in the fabric along with the associated percentage, and the number of host interfaces that are utilized to send and receive data from hosts along with the associated percentage. On the top right of the **Interface** tile, you can see the number of interfaces that are down next to the red dot and the number of interfaces that are up next to the green dot along with the total number of interfaces in the fabric.



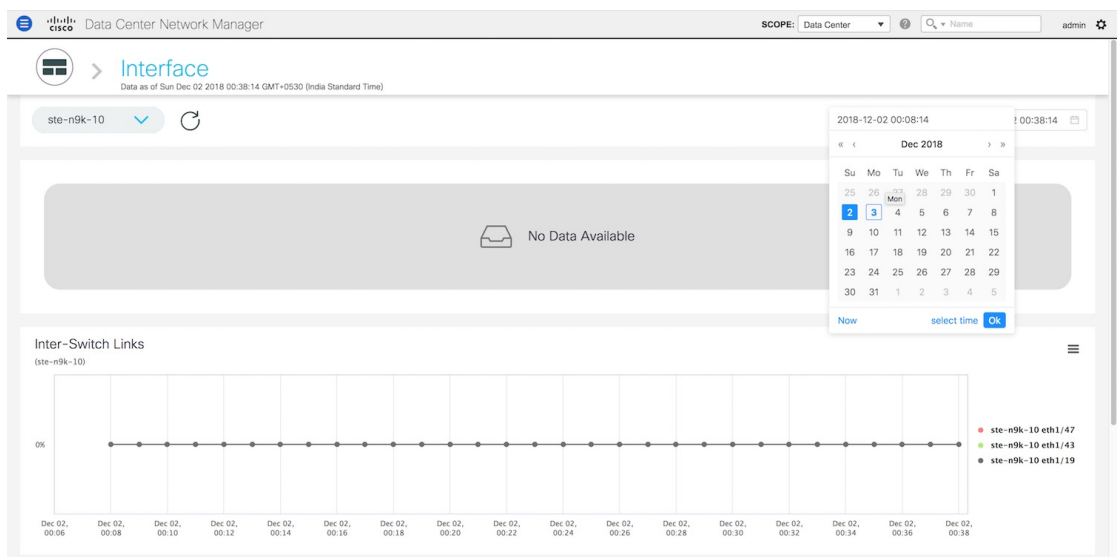
- Click the **Interface** tile to display more information about the ISLs and Host Interfaces. On the **Interface** window, you can select a specific switch for which you want to display the metrics.



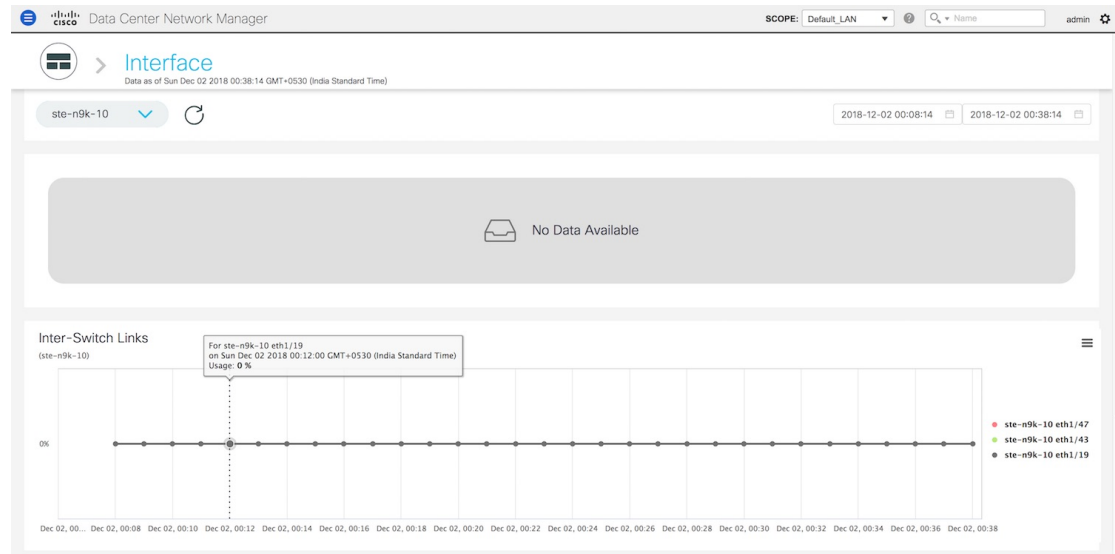
Select **All Switches** to display metrics for all the switches in the selected fabric. This window displays the top five switches based on the number of anomalies, top five ISLs, and the top five host facing links. In the graph displaying the top five switches based on the number of anomalies, each switch has a specific color that is associated with it in the graph. In the graph for the Top 5 Inter-Switch Links and the Top 5 Host Facing links, each switch interface has a specific color that is associated with it in the graph. You can see the colors that are associated with the switches and interfaces on the right of the graphs.



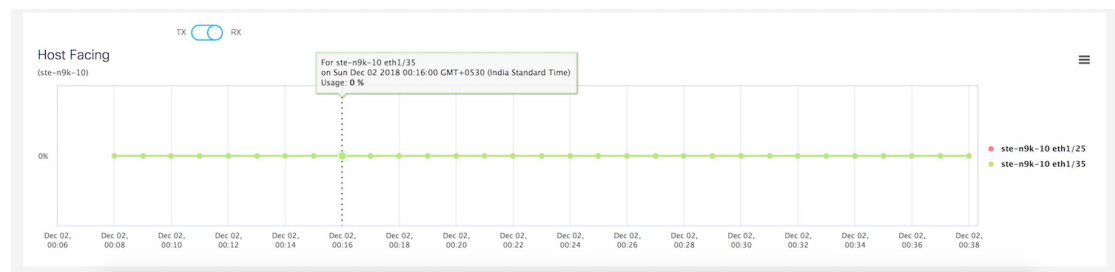
2. You can select a specific time interval to view the metrics during that time interval. Click the fields showing the date and time to select the required date and time interval. Click **Now** to display metrics for the current date and time. Click the **Refresh** icon next to the switch selection dropdown to display metrics for the last 30 minutes.



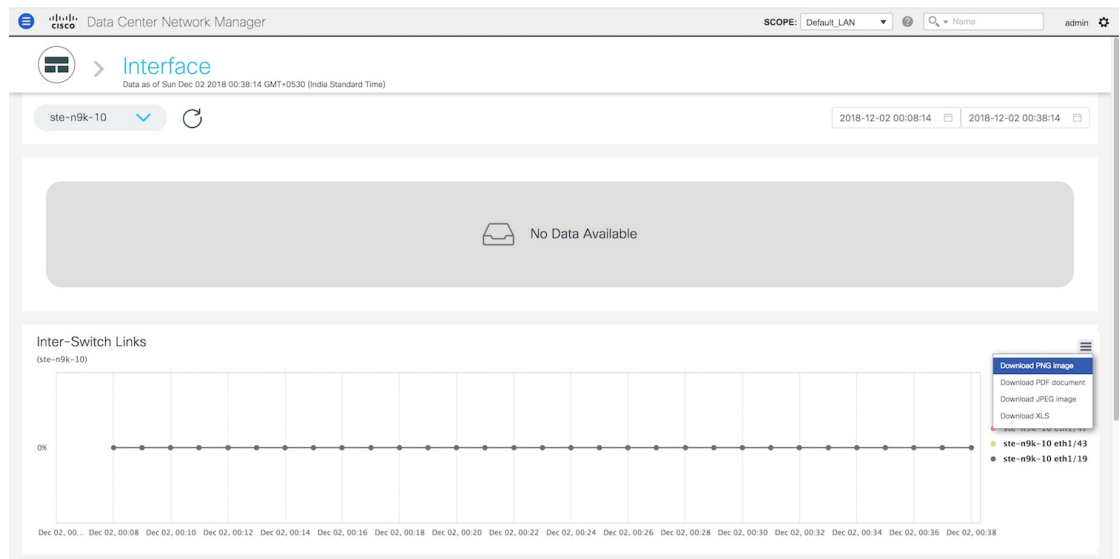
3. Hover over specific points on the respective graphs for more information on the switch anomalies and ISLs at a specific time.



In the graph for Host Facing links, you can toggle between displaying the top five host facing links based on sending traffic (TX) and the top five host facing links based on receiving traffic (RX).



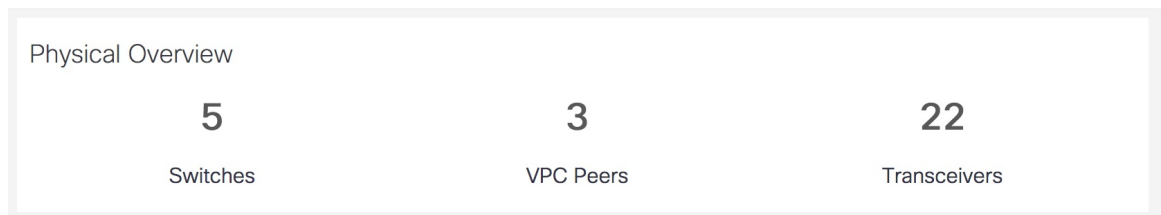
4. Click the icon at the top right of the graph to download the graph as a PNG image, PDF document, JPEG image or an XLS file.



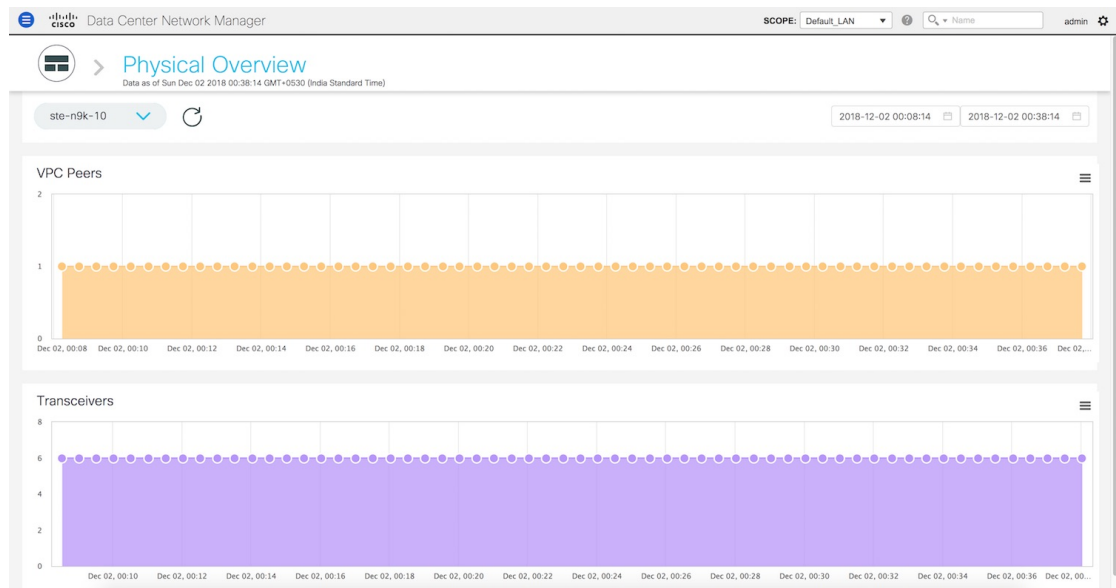
5. Click the icon next to **Interface** at the top of the window to go back to the LAN Telemetry Summary window.

Physical Overview

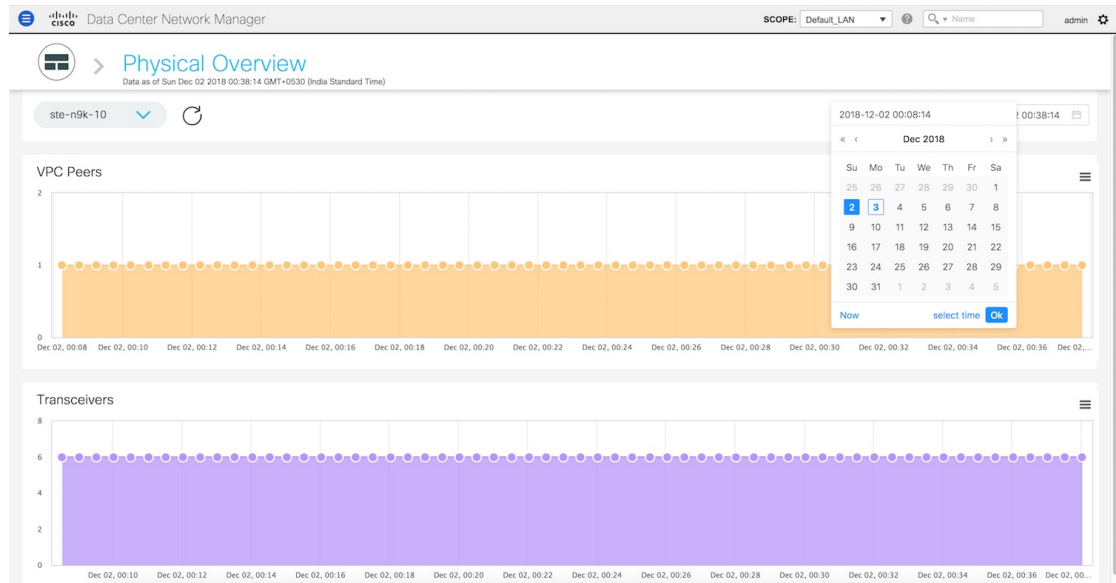
The **Physical Overview** tile displays the number of switches, Virtual Port Channel (VPC) peers, and Transceivers in the specified fabric.



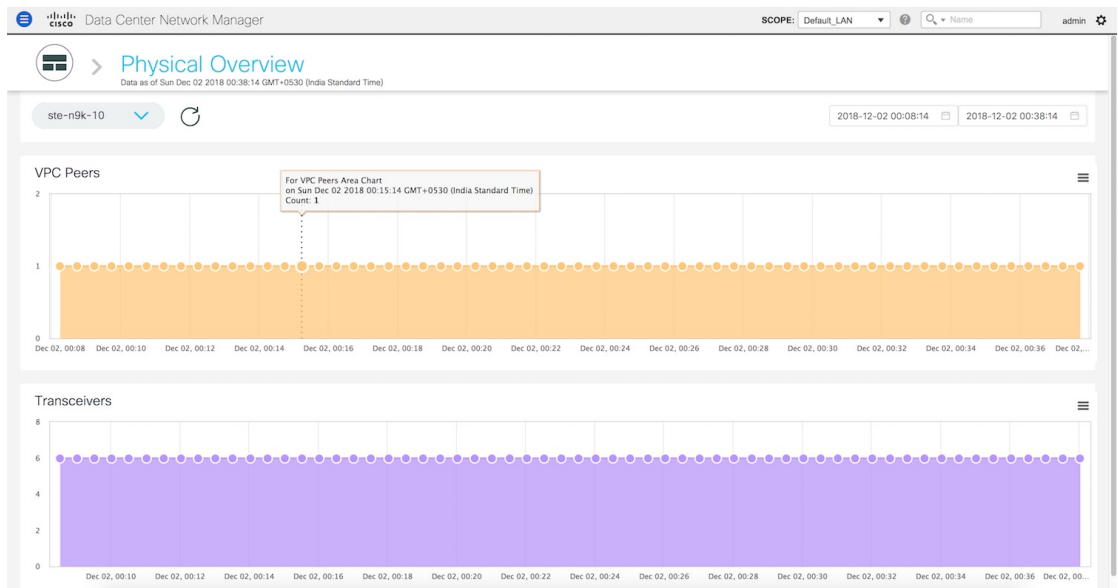
1. Click the **Physical Overview** tile to display more information about the VPC peers and Transceivers. On the **Physical Overview** window, you can select a specific switch from the drop-down list for which you want to display the metrics. You can select **All Switches** to display metrics for all the switches in the selected fabric.



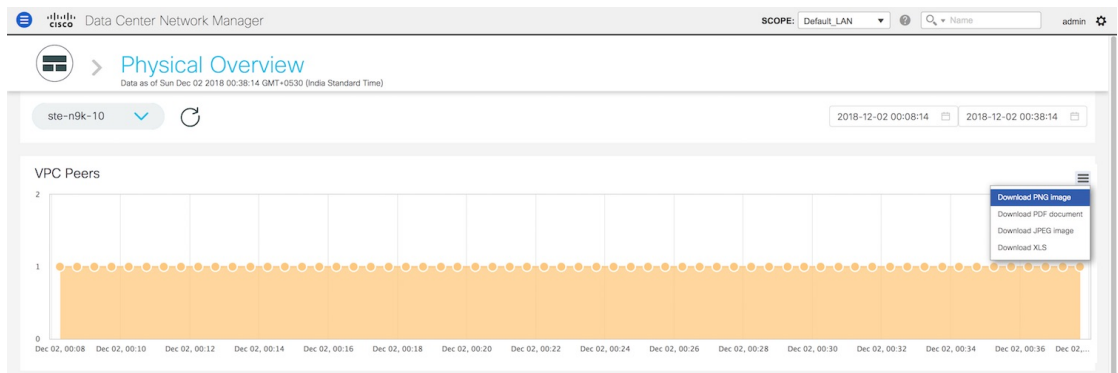
2. You can select a specific time interval to view the metrics during that time interval. Click the fields showing the date and time to select the required date and time interval. Click **Now** to display metrics for the current date and time. Click the **Refresh** icon next to the switch selection dropdown to display metrics for the last 30 minutes.



3. Hover over specific points on the respective graphs to display the number of VPC peers and Transceivers that are associated with a switch at a specific time.



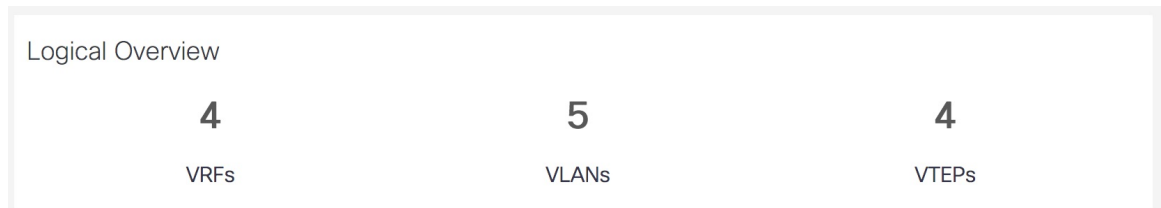
- Click the icon at the top right of the graph to download the graph as a PNG image, PDF document, JPEG image or an XLS file.



- Click the icon next to **Physical Overview** at the top of the window to go back to the LAN Telemetry Summary window.

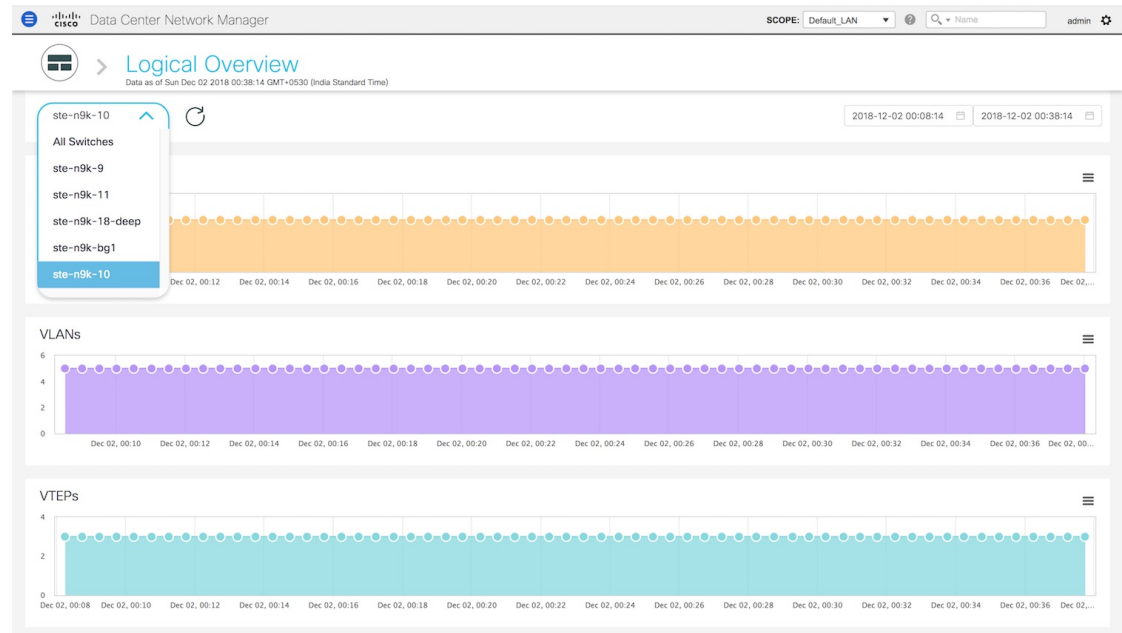
Logical Overview

The **Logical Overview** tile displays the number of Virtual Routing and Forwarding instances (VRFs), VLANs, and VXLAN Tunnel Endpoints (VTEPs) in the specified fabric.

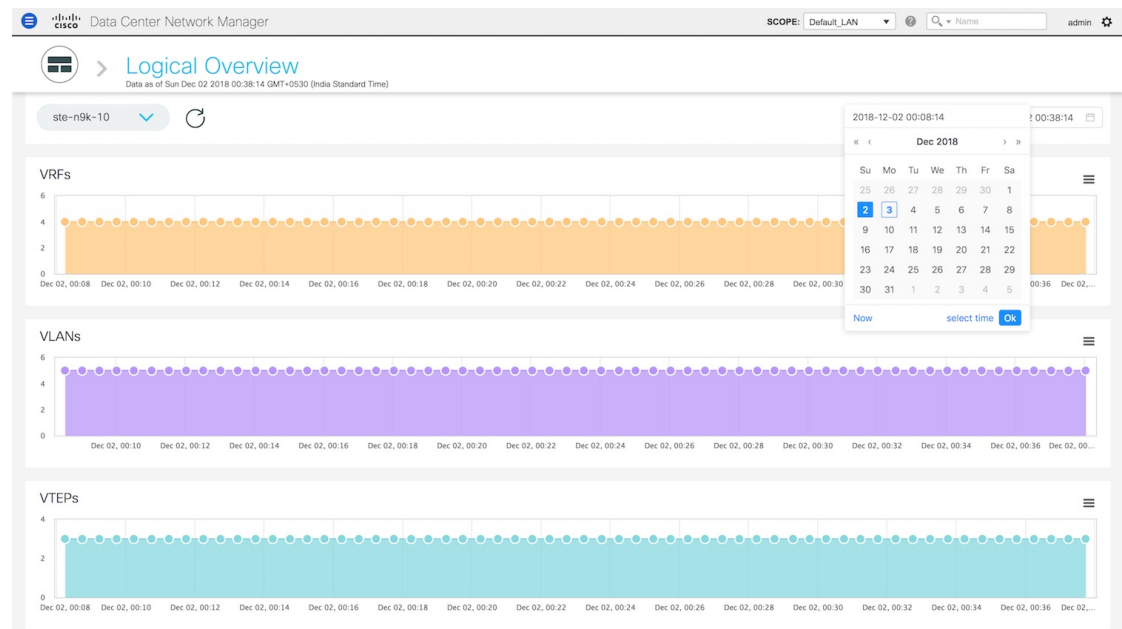


- Click the **Logical Overview** tile to display more information about the VRFs, VLANs, and VTEPs. On the **Logical Overview** window, you can select a specific switch from the drop-down list for which you

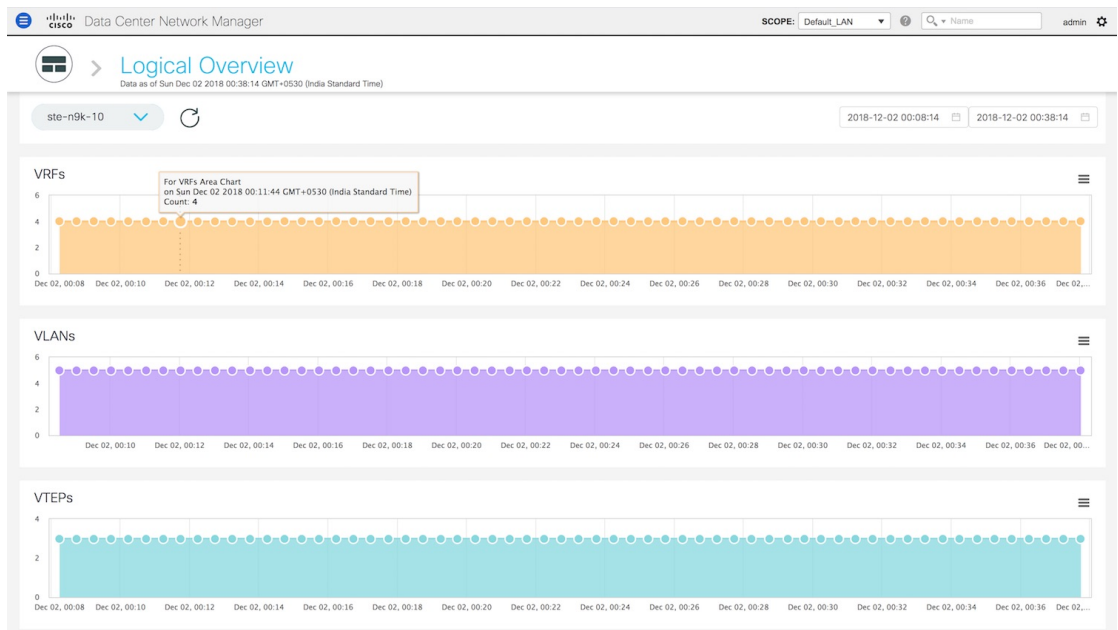
want to display the metrics. You can select **All Switches** to display metrics for all the switches in the selected fabric.



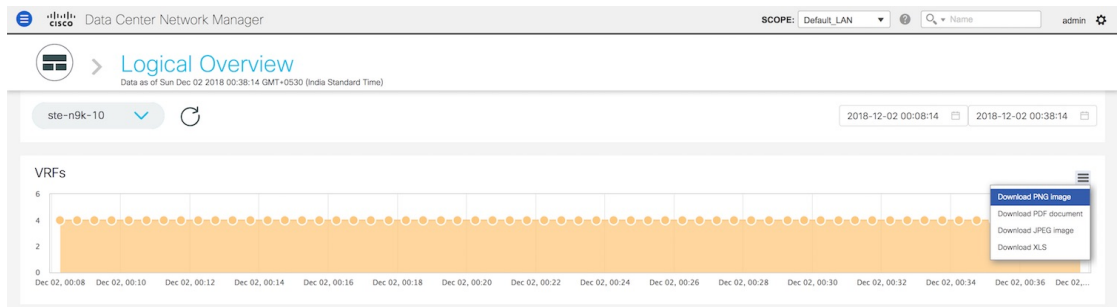
2. You can select a specific time interval to view the metrics during that time interval. Click the fields showing the date and time to select the required date and time interval. Click **Now** to display metrics for the current date and time. Click the **Refresh** icon next to the switch selection dropdown to display metrics for the last 30 minutes.



3. Hover over specific points on the respective graphs to display the number of VRFs, VLANs, and VTEPs associated with a switch at a specific time.



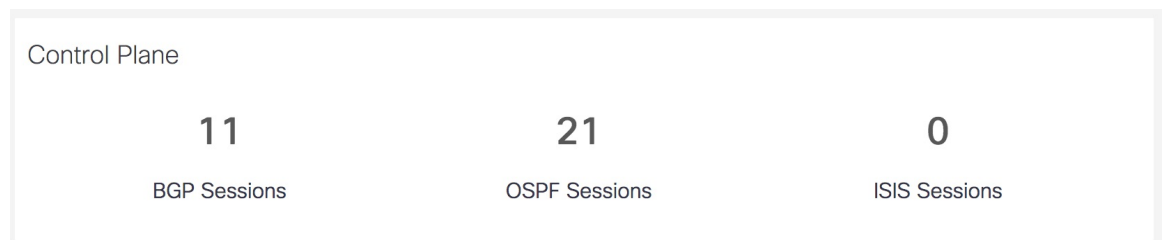
- Click the icon at the top right of the graph to download the graph as a PNG image, PDF document, JPEG image or an XLS file.



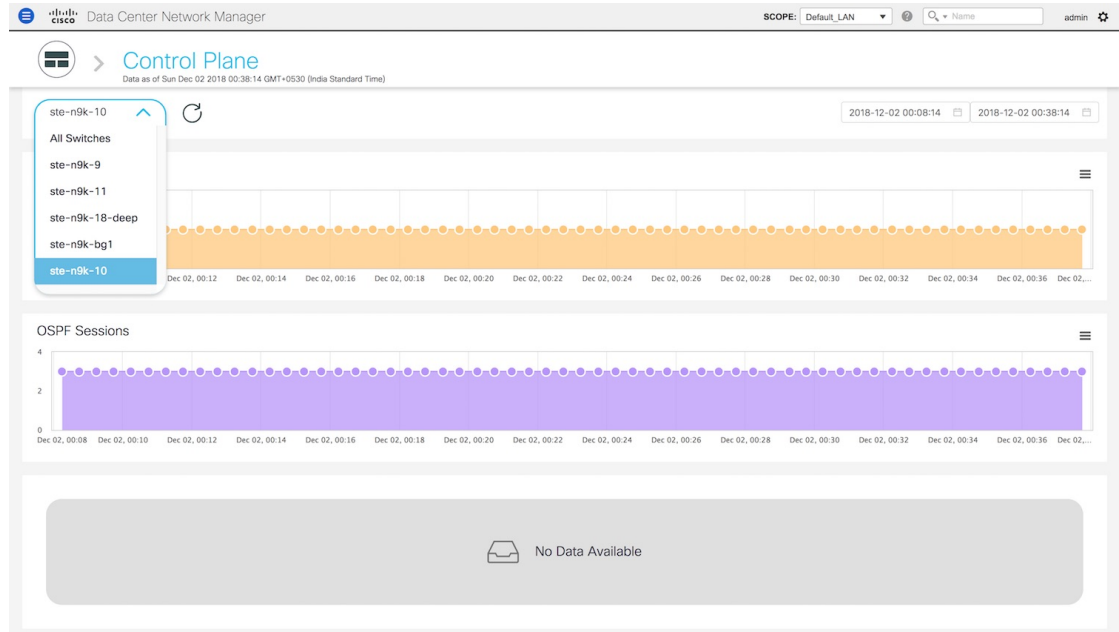
- Click the icon next to **Logical Overview** at the top of the window to go back to the LAN Telemetry Summary window.

Control Plane

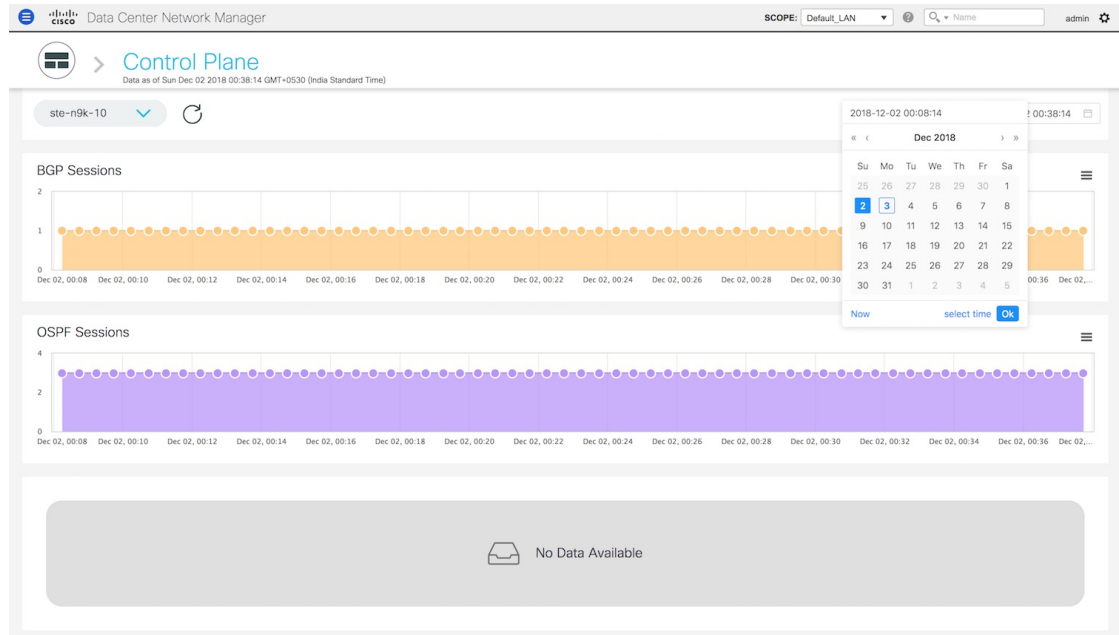
The **Control Plane** tile displays the number of Border Gateway Protocol (BGP) sessions, Open Shortest Path First (OSPF) sessions, and Intermediate System-to-Intermediate System (IS-IS) sessions in the specified fabric.



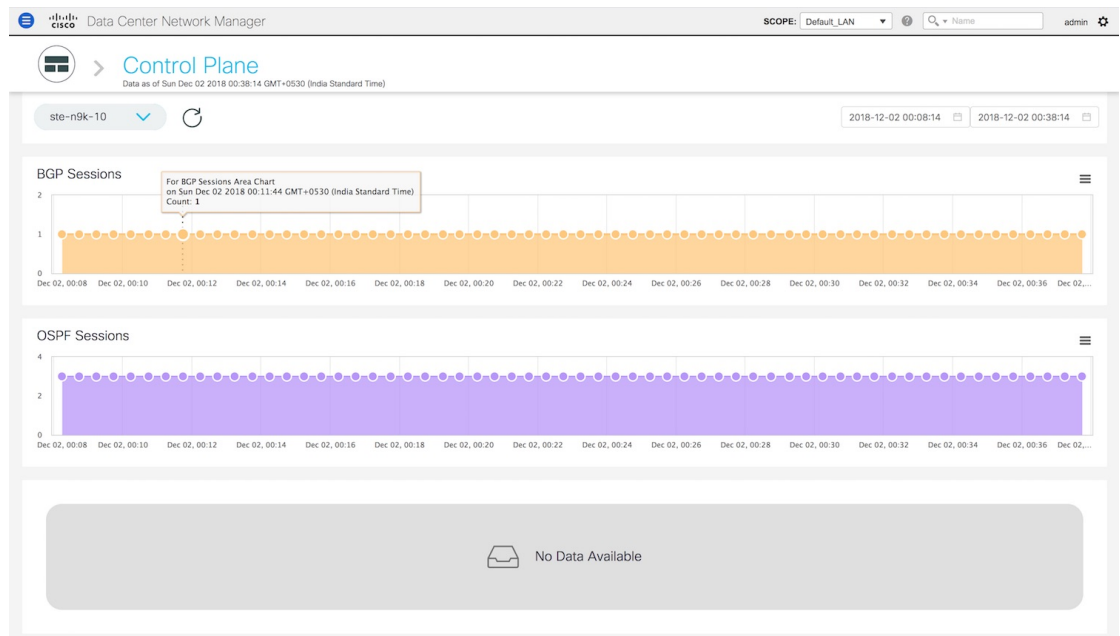
1. Click the **Control Plane** tile to display more information about the BGP sessions, OSPF sessions, and IS-IS sessions. On the **Control Plane** window, you can select a specific switch from the drop-down list for which you want to display the metrics. You can select **All Switches** to display metrics for all the switches in the selected fabric.



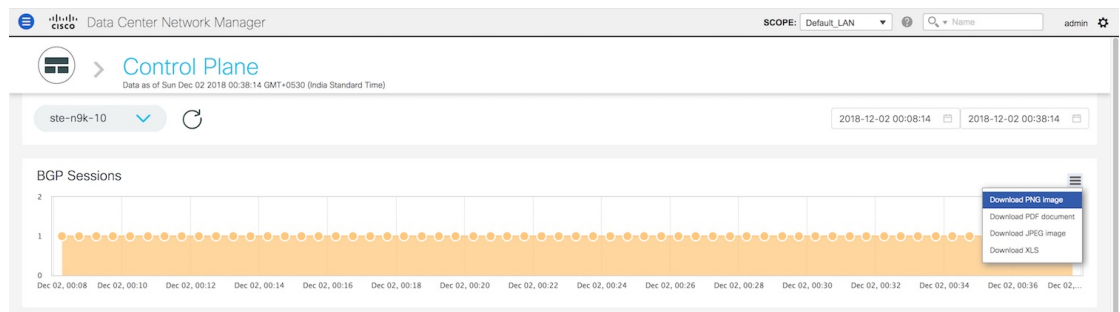
2. You can select a specific time interval to view the metrics during that time interval. Click the fields showing the date and time to select the required date and time interval. Click **Now** to display metrics for the current date and time. Click the **Refresh** icon next to the switch selection dropdown to display metrics for the last 30 minutes.



3. Hover over specific points on the respective graphs to display the number of BGP sessions, OSPF sessions, and IS-IS sessions associated with a switch at a specific time.



- Click the icon at the top right of the graph to download the graph as a PNG image, PDF document, JPEG image or an XLS file.



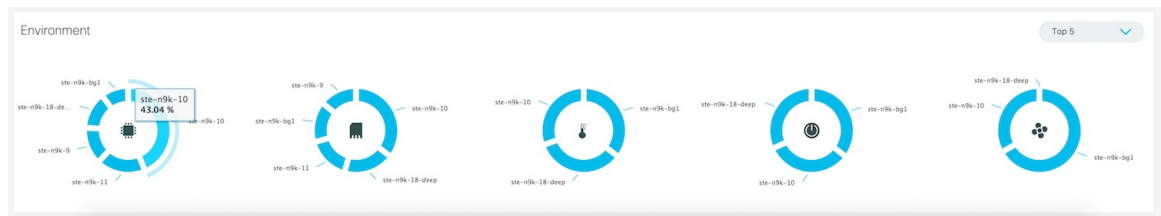
- Click the icon next to **Control Plane** at the top of the window to go back to the LAN Telemetry Summary window.

Environment

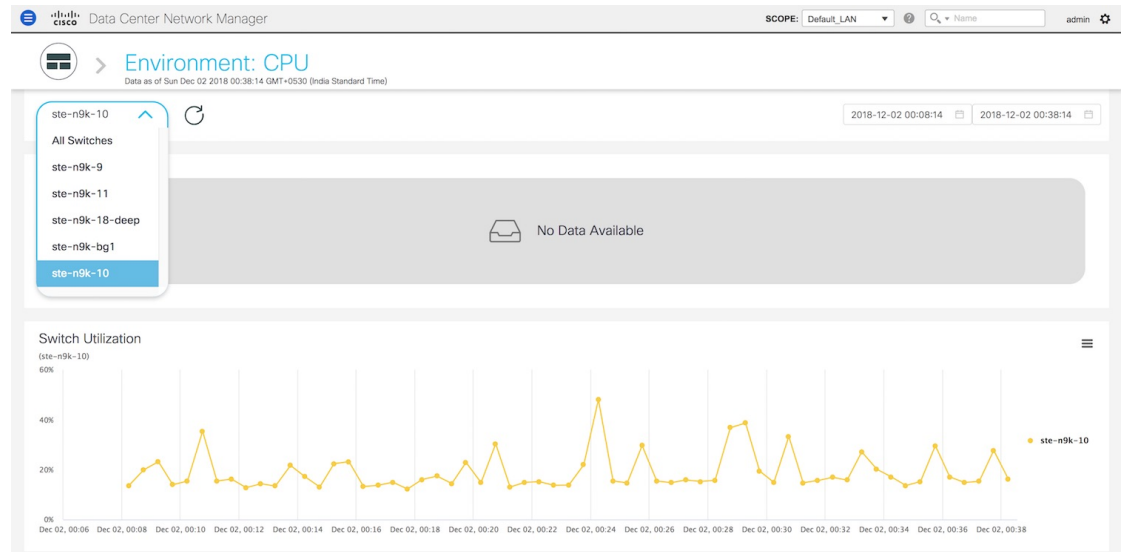
The **Environment** tile displays metrics for CPU usage, Memory, Temperature, Power, and Fans. On the top right of the **Environment** tile, you can select the Top N switches from the dropdown to display metrics for the top N switches. For example, if **Top 5** is selected, donut charts are plotted for the top five switches based on specific metrics.

Environment - CPU

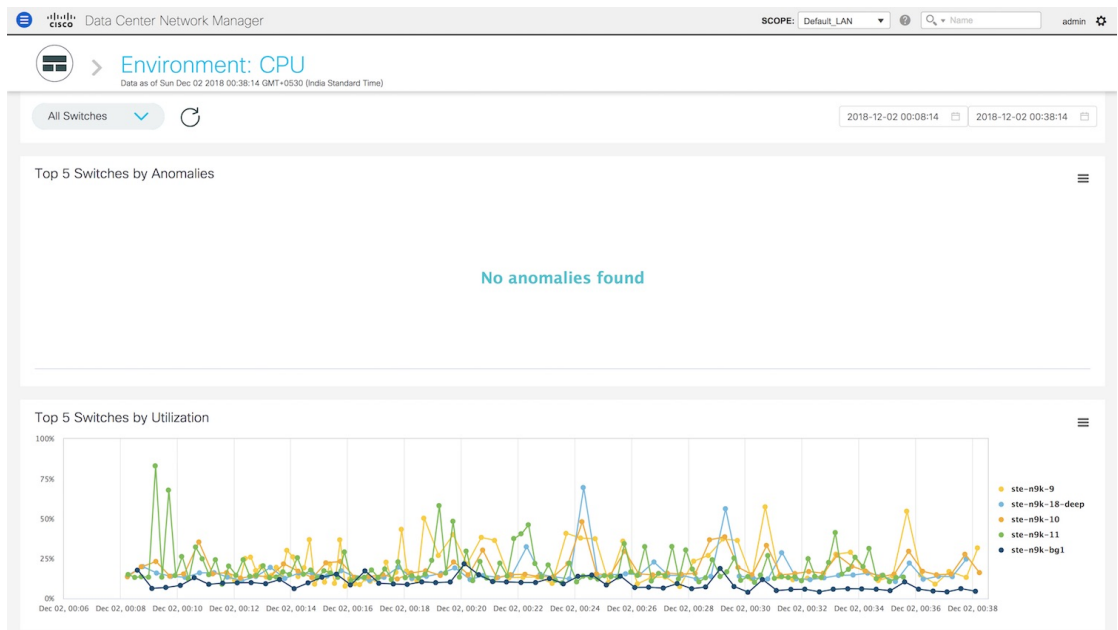
The first donut chart shows the proportion of top five or top ten switches based on CPU usage values. When hovered, it shows the switch name and the corresponding metric value.



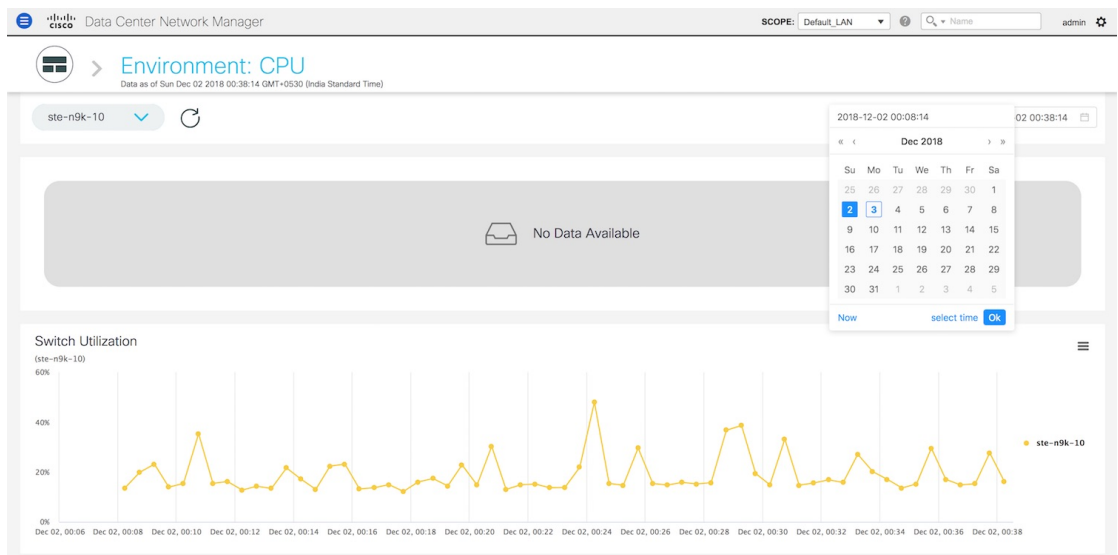
1. Click the CPU usage donut to display more information about CPU usage. On the **Environment: CPU** window, you can select a specific switch from the drop-down list for which you want to display the metrics.



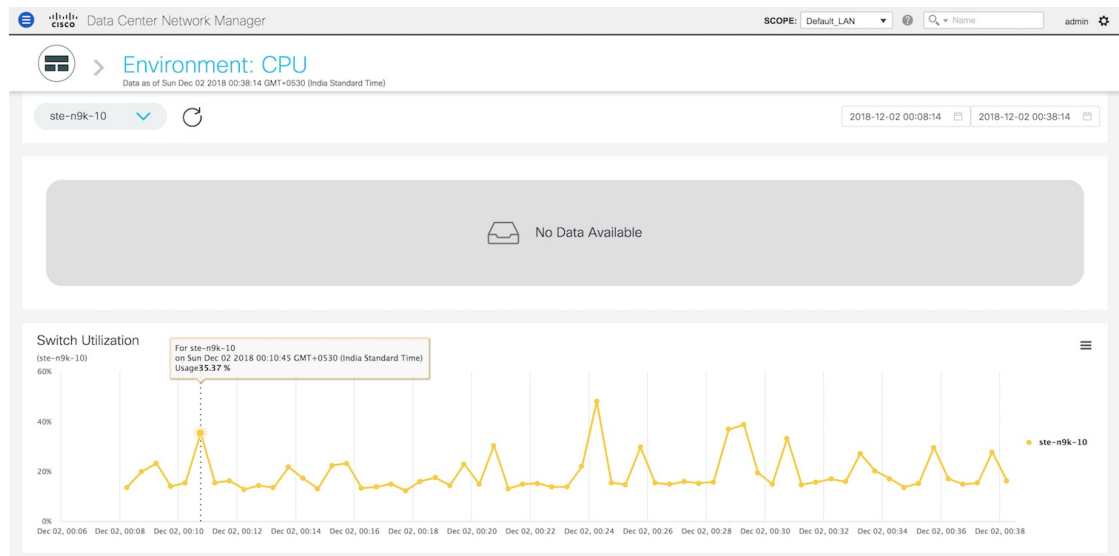
You can select **All Switches** to display metrics for all the switches in the selected fabric. This window displays the top five switches based on the number of anomalies and top five switches based on CPU utilization. Each switch has a specific color that is associated with it in the graph. You can see the colors that are associated with the switches on the right of the graph.



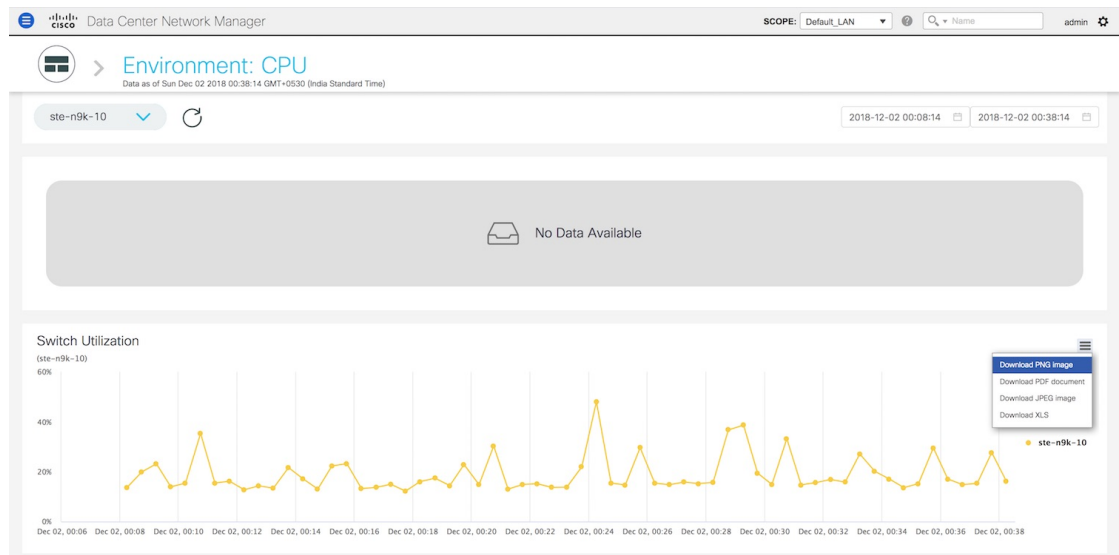
2. You can select a specific time interval to view the metrics during that time interval. Click the fields showing the date and time to select the required date and time interval. Click **Now** to display metrics for the current date and time. Click the **Refresh** icon next to the switch selection dropdown to display metrics for the last 30 minutes.



3. Hover over specific points on the graph for more information on CPU utilization at a specific time.



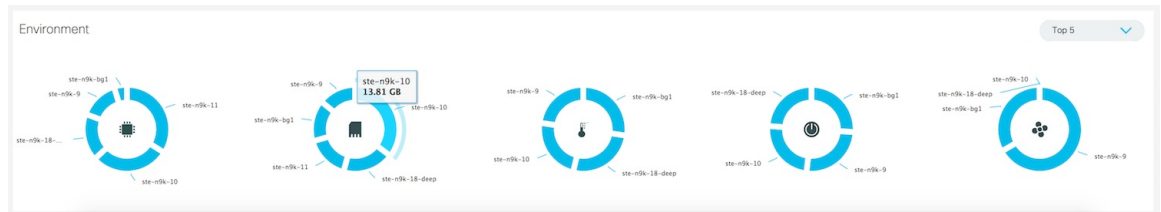
- Click the icon at the top right of the graph to download the graph as a PNG image, PDF document, JPEG image or an XLS file.



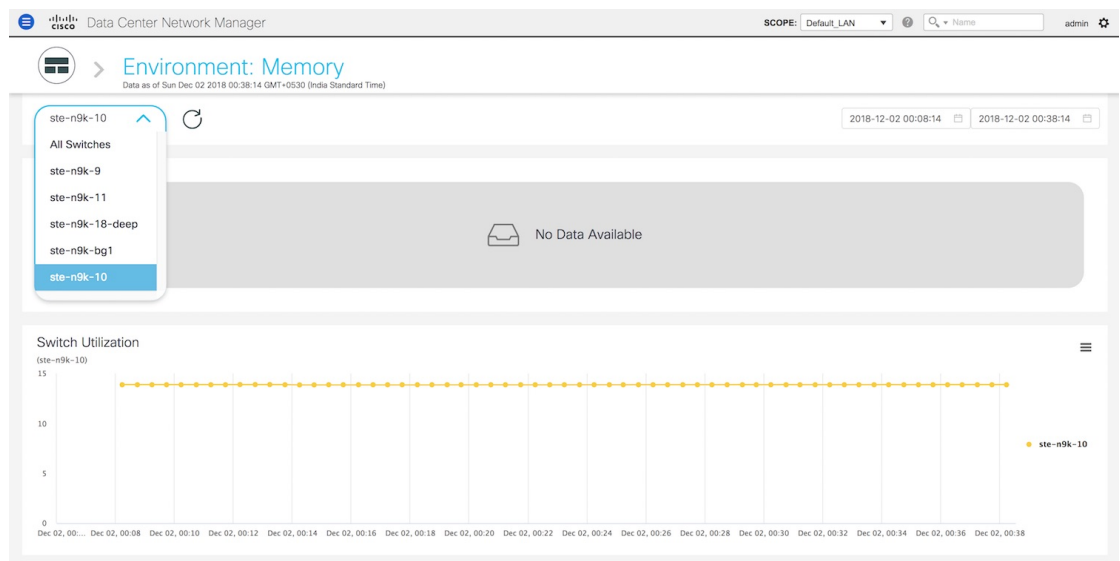
- Click the icon next to **Environment: CPU** at the top of the window to go back to the LAN Telemetry Summary window.

Environment - Memory

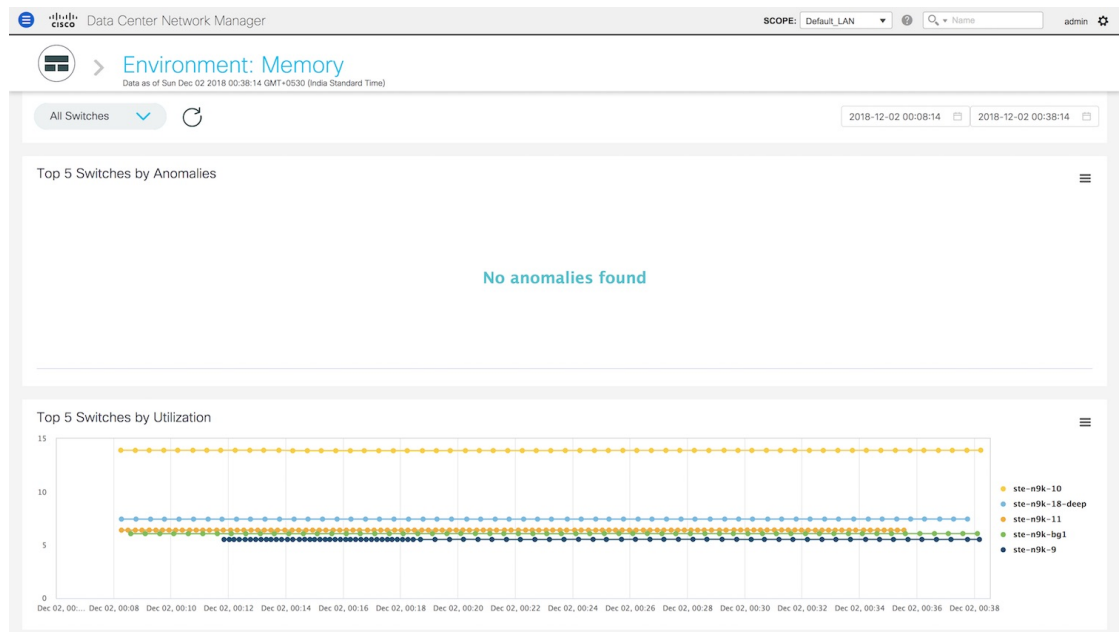
The second donut chart shows the proportion of top five or top ten switches based on memory usage values. When hovered, it shows the switch name and the corresponding metric value.



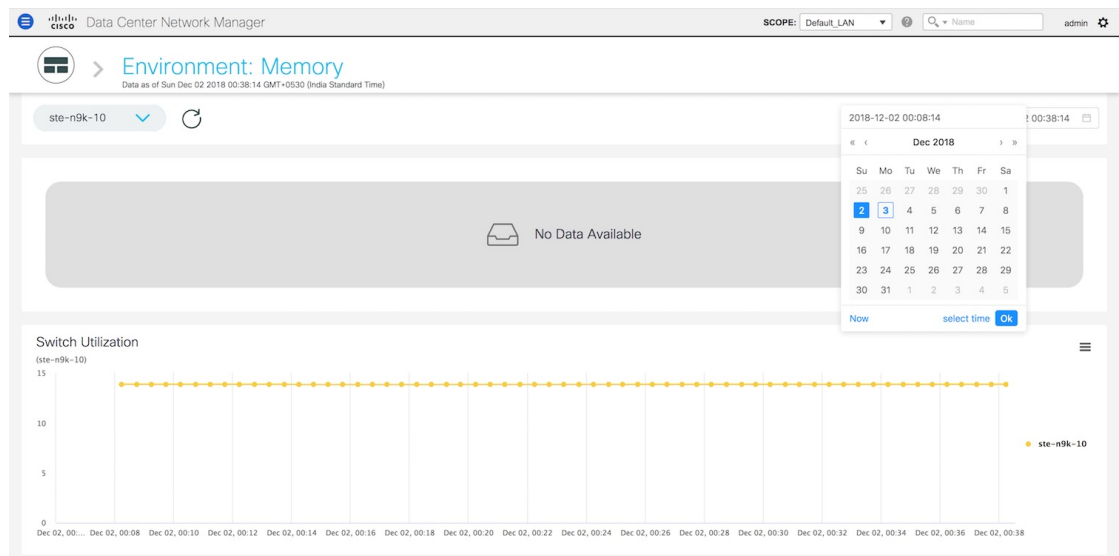
1. Click the memory usage donut to display more information about memory usage. The memory dashboard depicts the actual memory consumption (RAM) on every switch in Gigabytes (GB). On the **Environment: Memory** window, you can select a specific switch from the drop-down list for which you want to display the metrics.



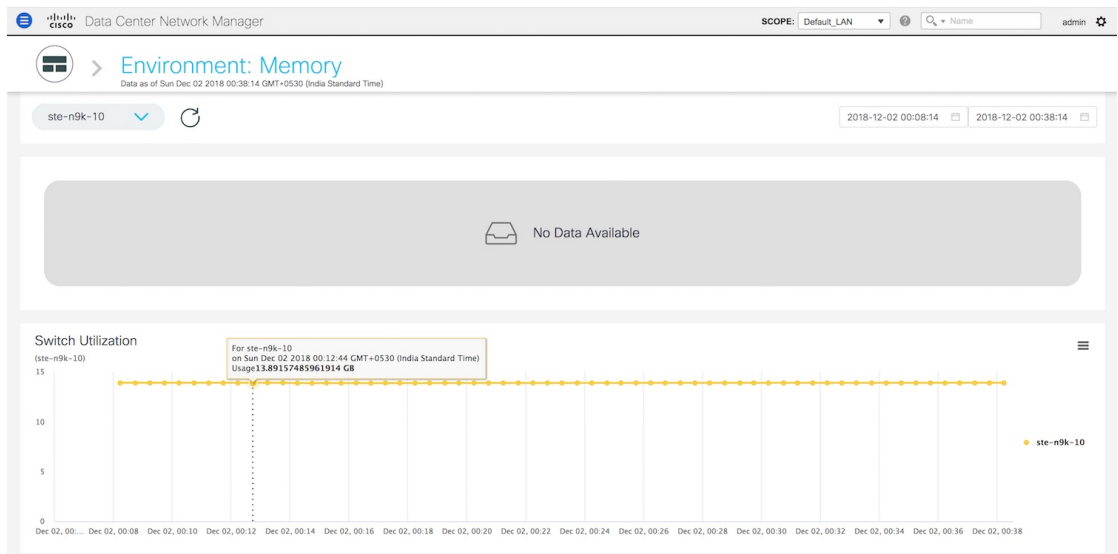
You can select **All Switches** to display metrics for all the switches in the selected fabric. This window displays the top five switches based on the number of anomalies and top five switches based on memory utilization. Each switch has a specific color that is associated with it in the graph. You can see the colors that are associated with the switches on the right of the graph.



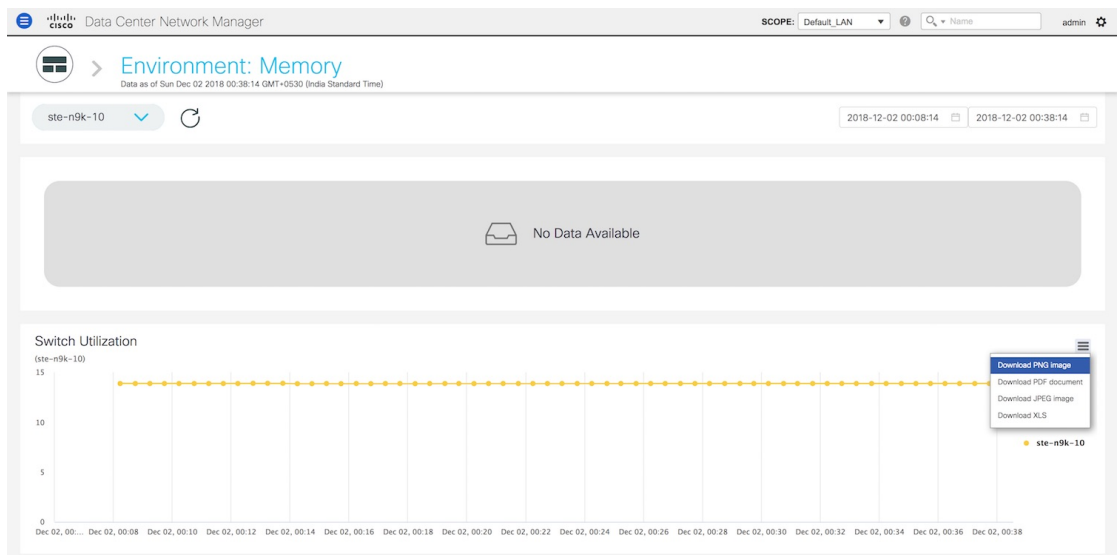
- You can select a specific time interval to view the metrics during that time interval. Click the fields showing the date and time to select the required date and time interval. Click **Now** to display metrics for the current date and time. Click the **Refresh** icon next to the switch selection dropdown to display metrics for the last 30 minutes.



- Hover over specific points on the respective graphs for more information on memory utilization at a specific time.



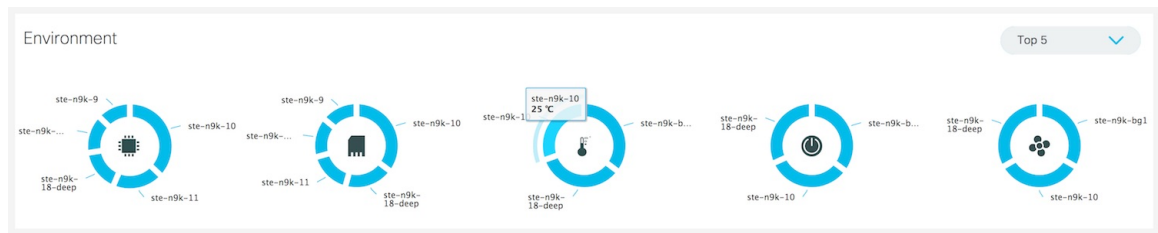
- Click the icon at the top right of the graph to download the graph as a PNG image, PDF document, JPEG image or an XLS file.



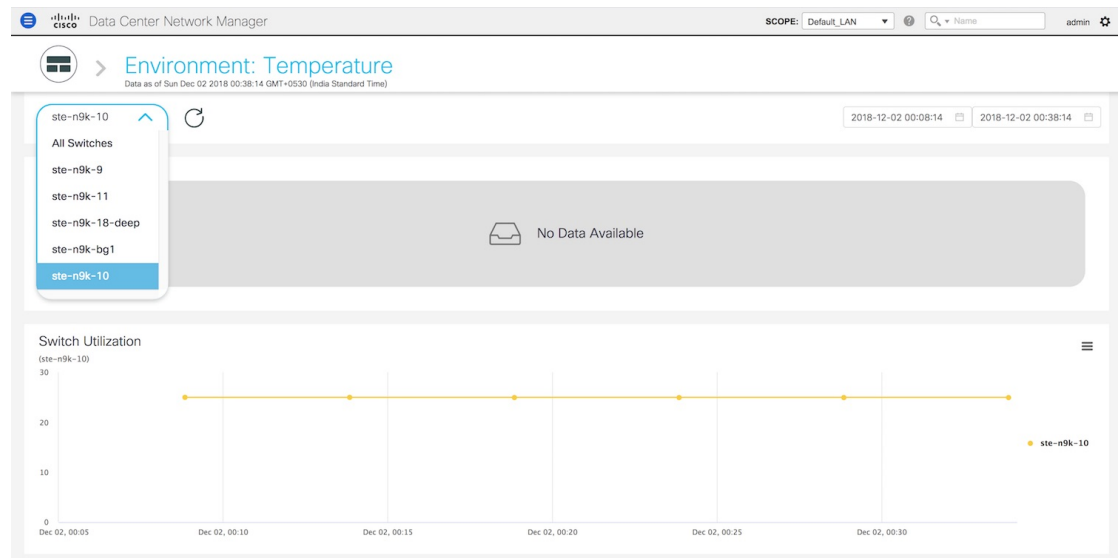
- Click the icon next to **Environment: Memory** at the top of the window to go back to the LAN Telemetry Summary window.

Environment - Temperature

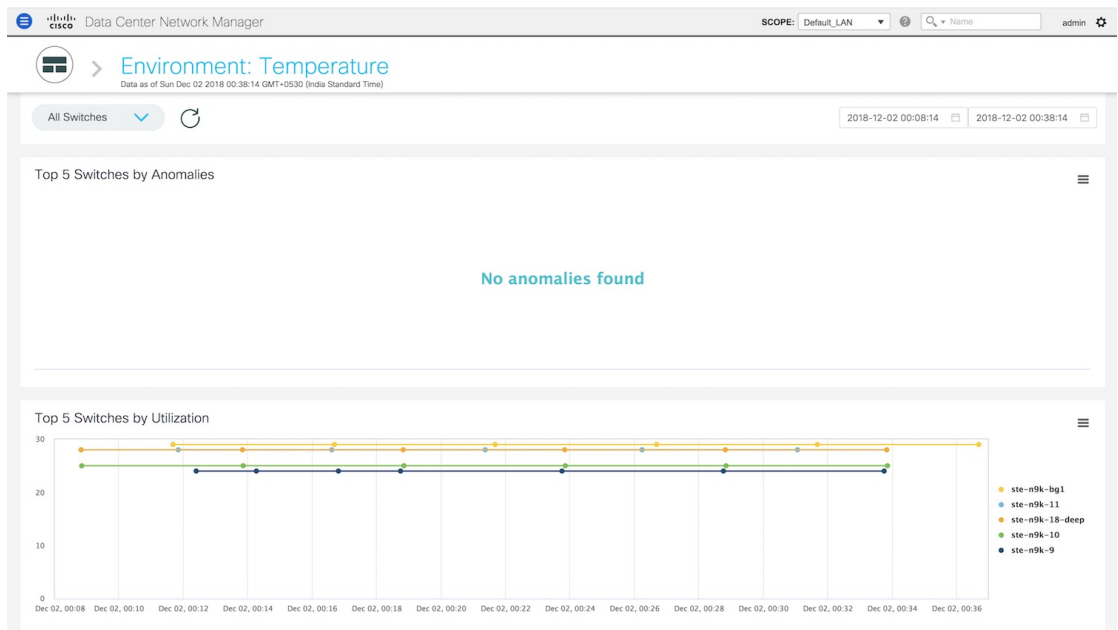
The third donut chart shows the proportion of top five or top ten switches based on temperature levels. When hovered, it shows the switch name and the corresponding metric value.



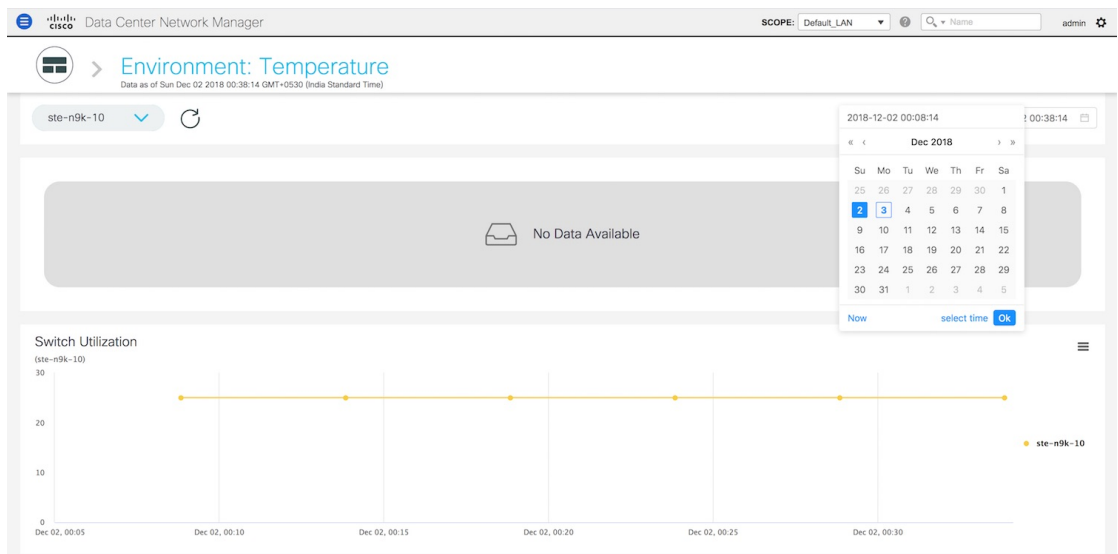
1. Click the temperature levels donut to display more information about temperature levels for the switches in the fabric. On the **Environment: Temperature** window, you can select a specific switch from the drop-down list for which you want to display the metrics.



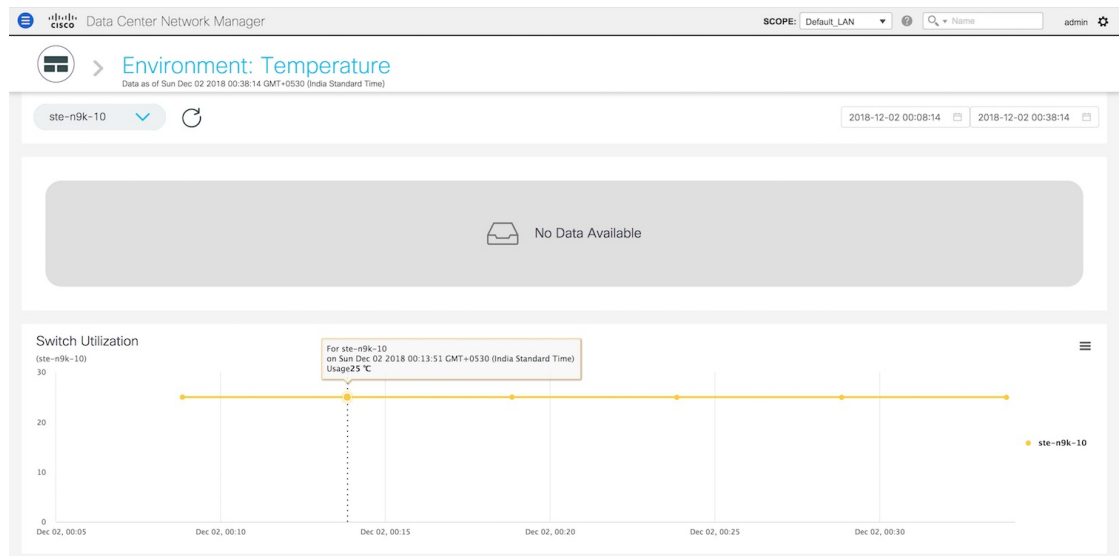
You can select **All Switches** to display metrics for all the switches in the selected fabric. This window displays the top five switches based on the number of anomalies and top five switches based on temperature. Each switch has a specific color that is associated with it in the graph. You can see the colors that are associated with the switches on the right of the graph.



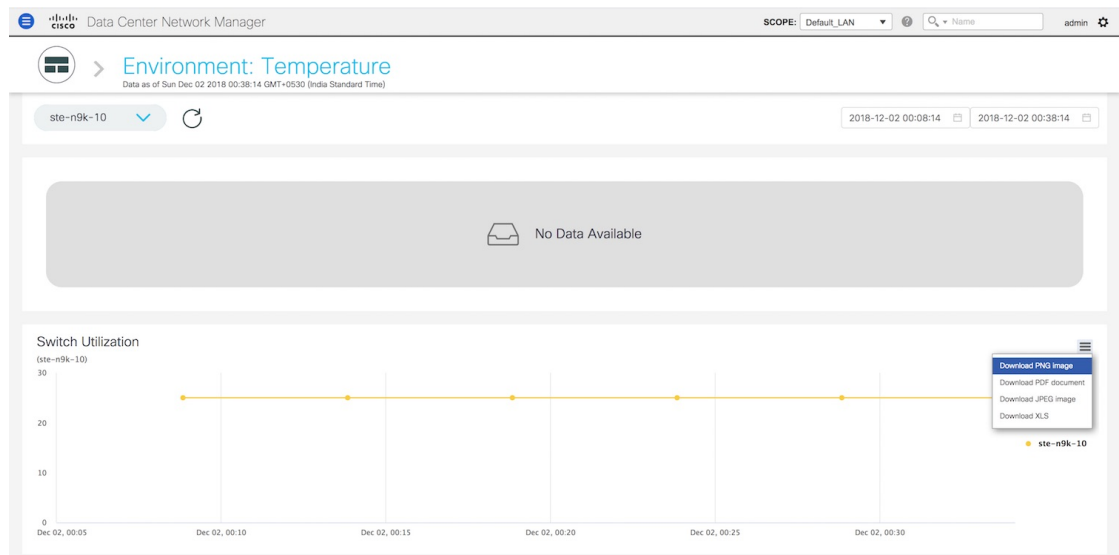
2. You can select a specific time interval to view the metrics during that time interval. Click the fields showing the date and time to select the required date and time interval. Click **Now** to display metrics for the current date and time. Click the **Refresh** icon next to the switch selection dropdown to display metrics for the last 30 minutes.



3. Hover over specific points on the graph for more information on the temperature of the selected switch at a specific time.



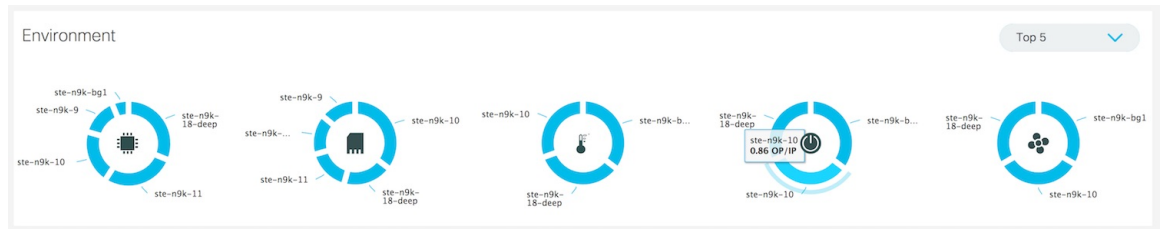
4. Click the icon at the top right of the graph to download the graph as a PNG image, PDF document, JPEG image or an XLS file.



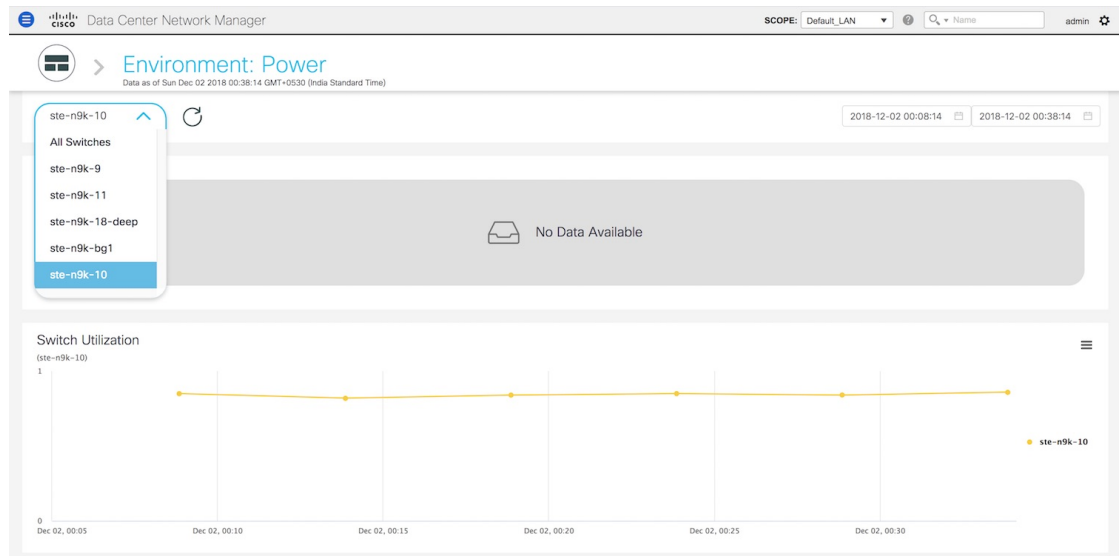
5. Click the icon next to **Environment: Temperature** at the top of the window to go back to the LAN Telemetry Summary window.

Environment - Power

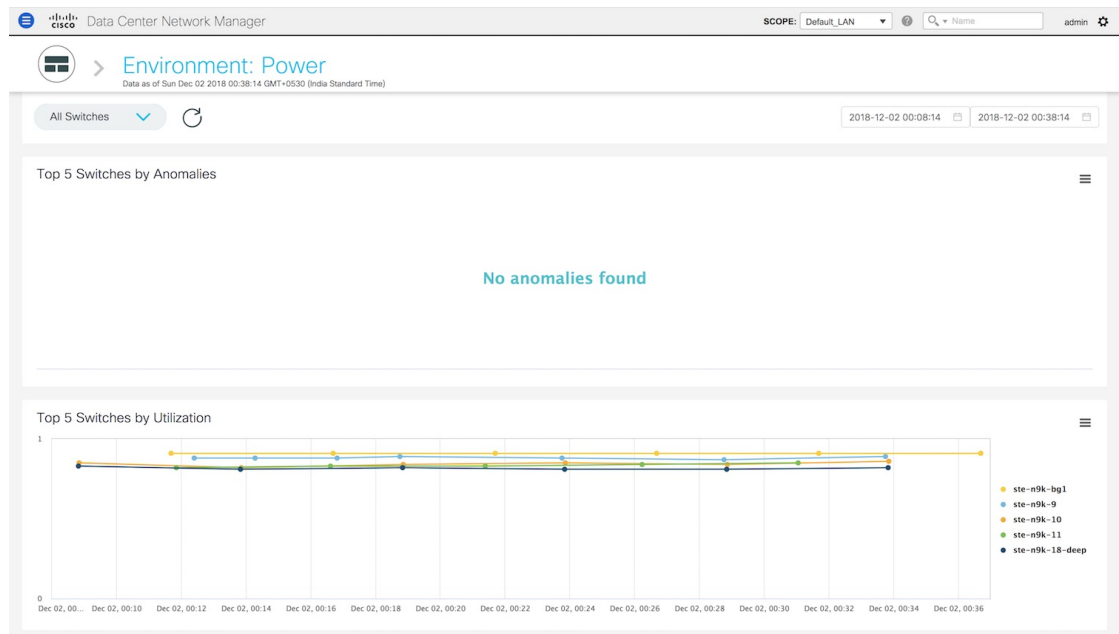
The fourth donut chart shows the proportion of top five or top ten switches based on the power usage or efficiency of the power supplies. When hovered, it shows the switch name and the corresponding metric value.



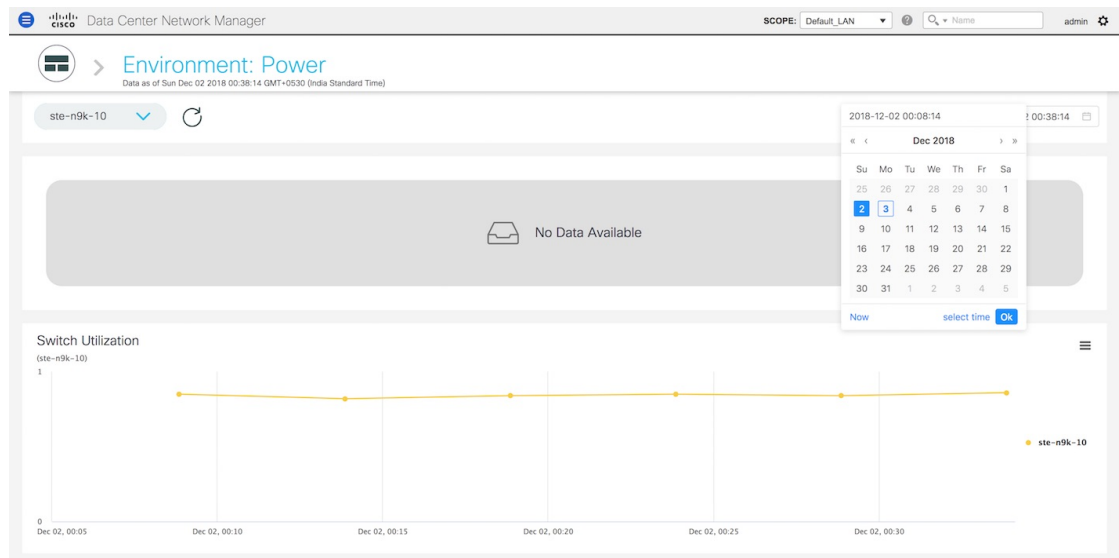
1. Click the Power donut to display more information about the power efficiency metrics for the switches in the fabric. On the **Environment: Power** window, you can select a specific switch from the drop-down list for which you want to display the metrics.



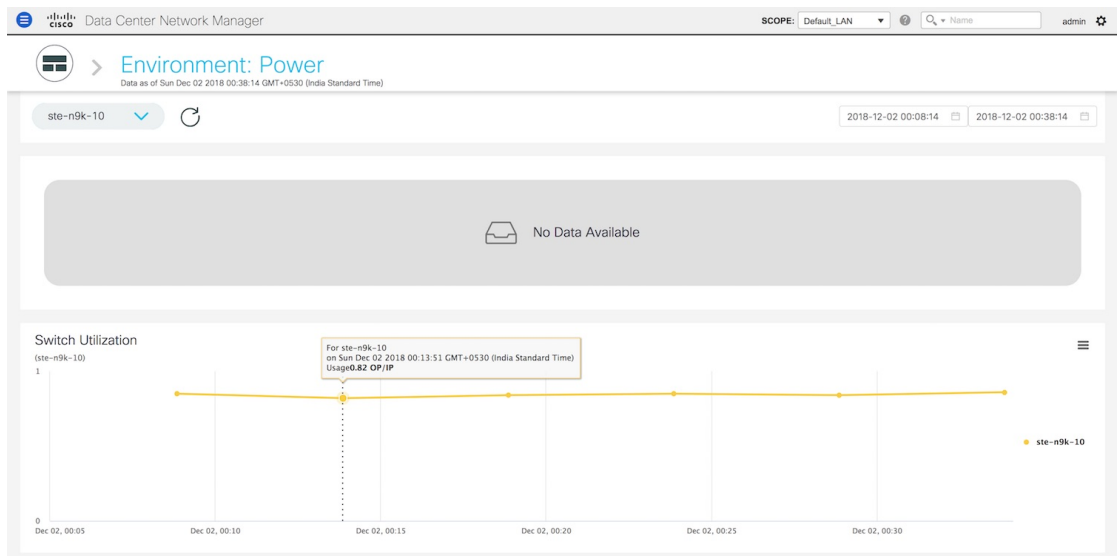
You can select **All Switches** to display metrics for the top five switches based on anomalies and the top five switches based on power usage or efficiency. By definition, efficiency is $\text{Output-Power}/\text{Input-Power}$, which therefore results in a maximum efficiency of 1.0. Each switch has a specific color that is associated with it in the graph. You can see the colors that are associated with the switches on the right of the graph.



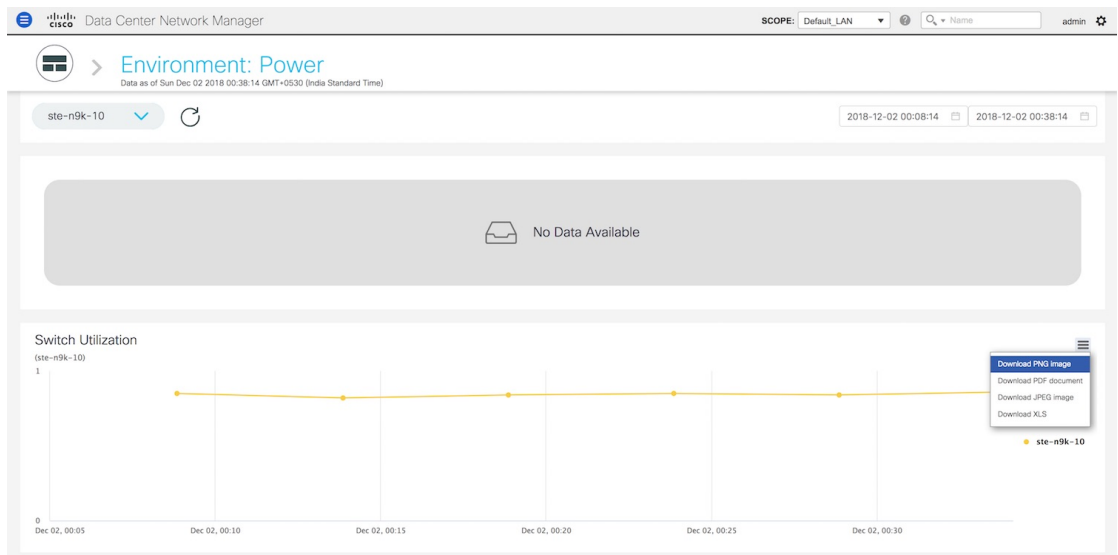
2. You can select a specific time interval to view the metrics during that time interval. Click the fields showing the date and time to select the required date and time interval. Click **Now** to display metrics for the current date and time. Click the **Refresh** icon next to the switch selection dropdown to display metrics for the last 30 minutes.



3. Hover over specific points on the graph for more information on the power efficiency or usage at a specific time.



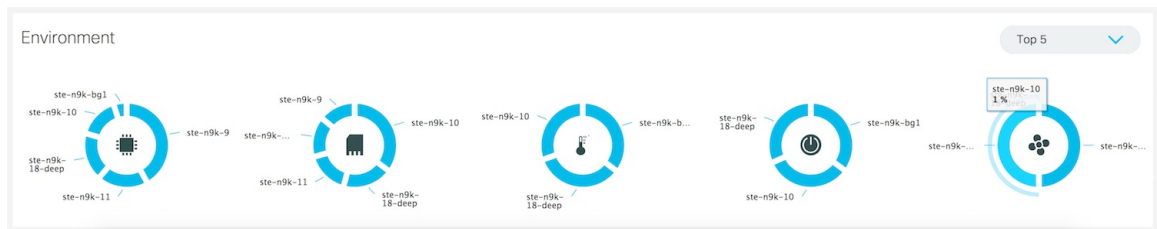
- Click the icon at the top right of the graph to download the graph as a PNG image, PDF document, JPEG image or an XLS file.



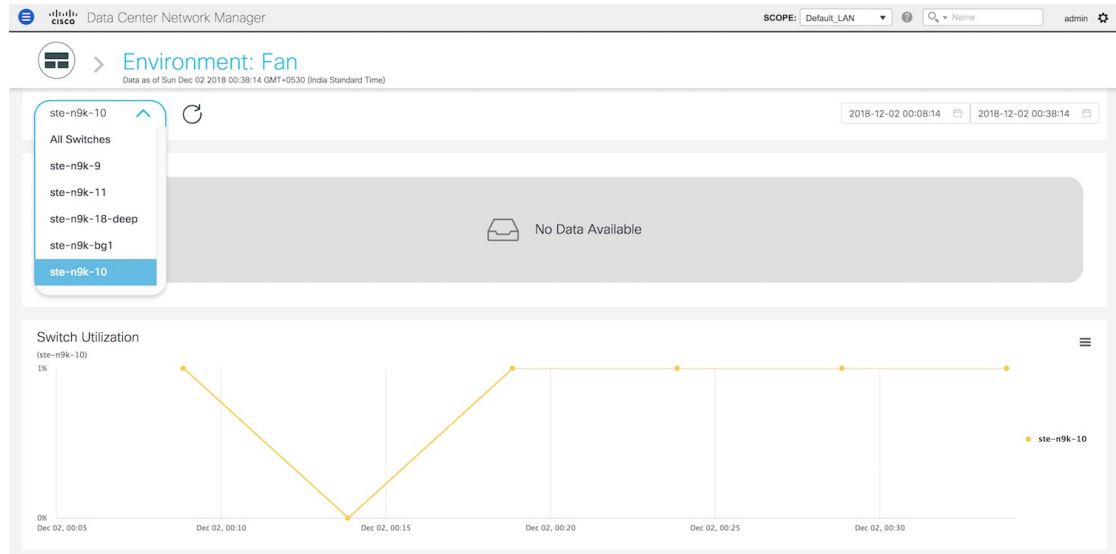
- Click the icon next to **Environment: Power** at the top of the window to go back to the LAN Telemetry Summary window.

Environment - Fan

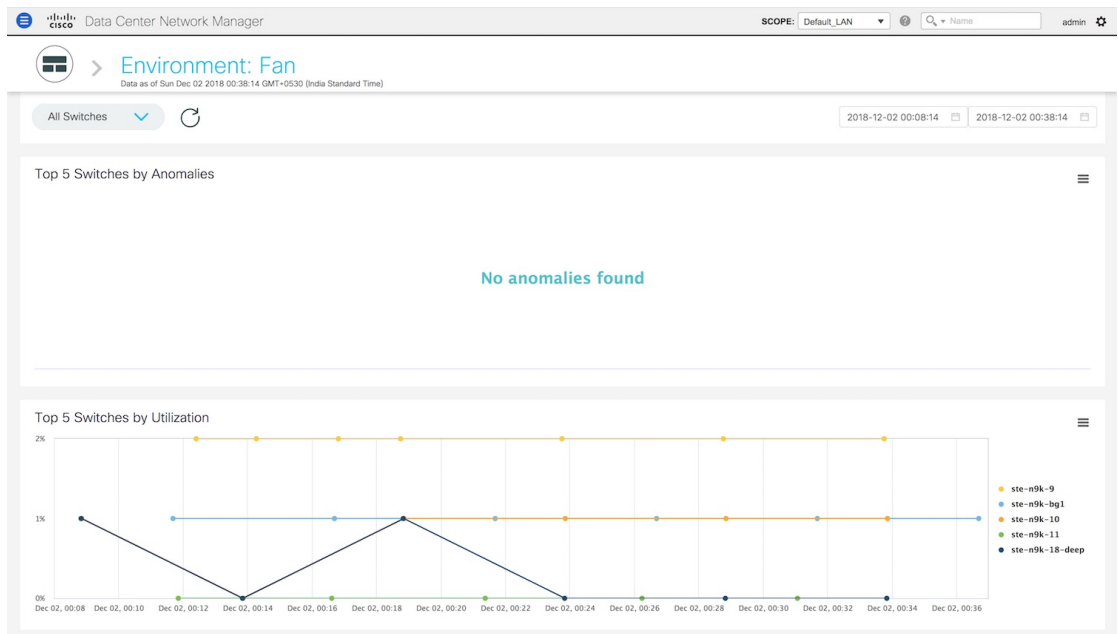
The fifth donut chart shows the proportion of top five or top ten switches based on fan utilization. When hovered, it shows the switch name and the corresponding metric value.



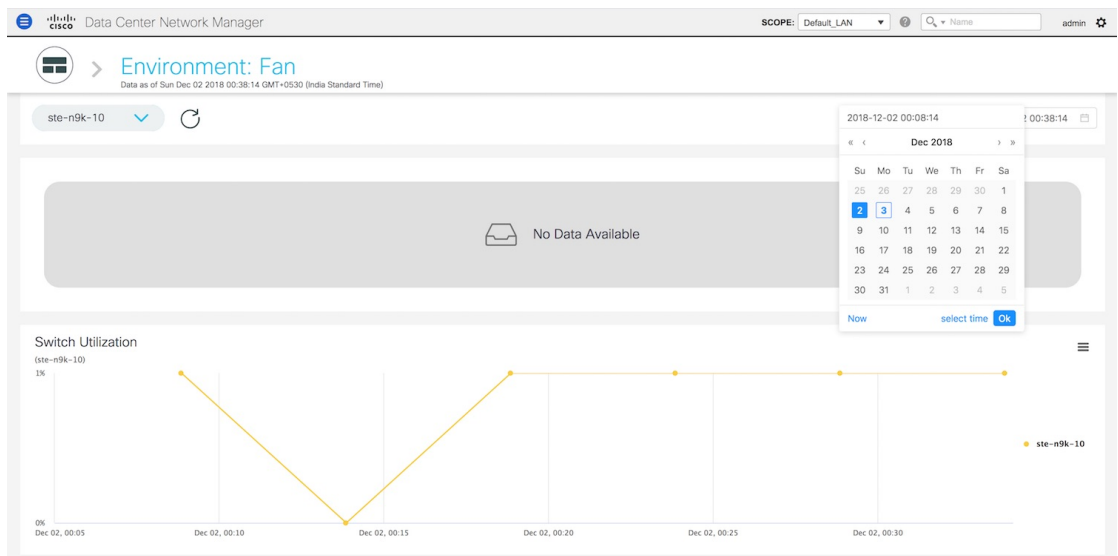
1. Click the Fan donut to display more information about the fan utilization. On the **Environment: Fan** window, you can select a specific switch from the drop-down list for which you want to display the metrics.



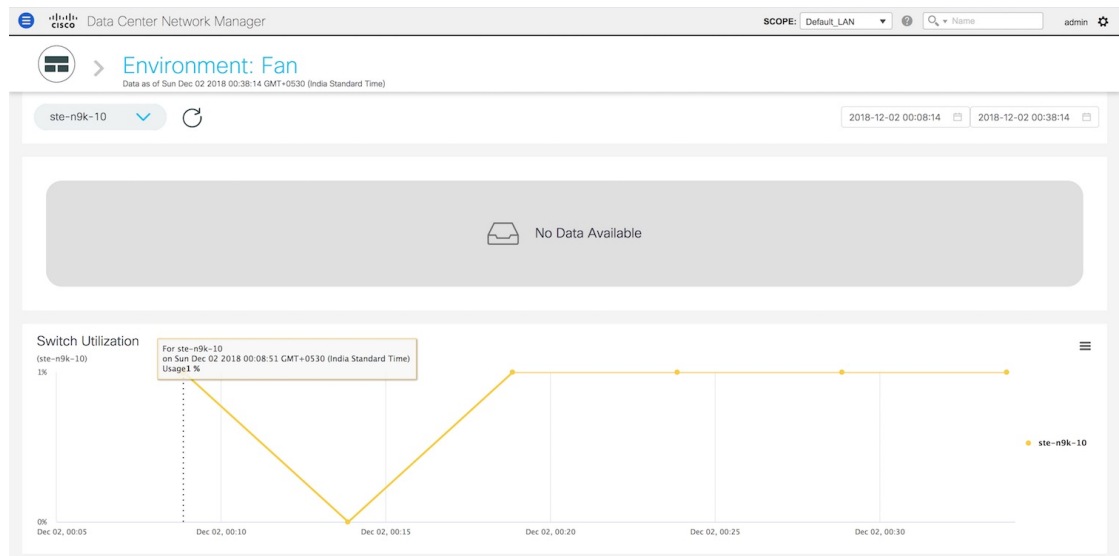
You can select **All Switches** to display metrics for the top five switches based on the number of anomalies and the top five switches based on fan utilization. Each switch has a specific color that is associated with it in the graph. You can see the colors that are associated with the switches on the right of the graph.



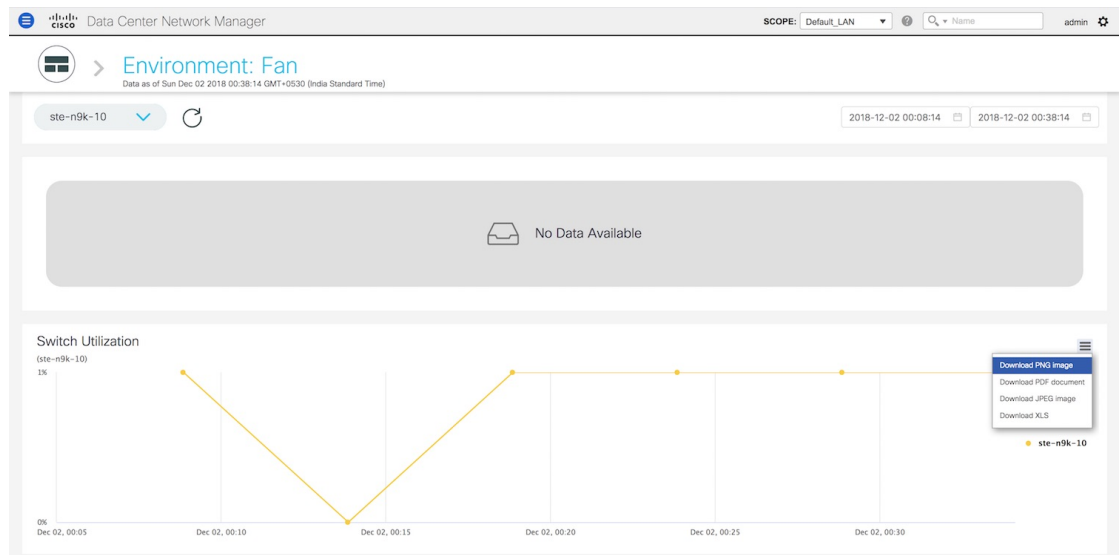
2. You can select a specific time interval to view the metrics during that time interval. Click the fields showing the date and time to select the required date and time interval. Click **Now** to display metrics for the current date and time. Click the **Refresh** icon next to the switch selection dropdown to display metrics for the last 30 minutes.



3. Hover over specific points on the respective graphs for more info on fan utilization at a specific time.



4. Click the icon at the top right of the graph to download the graph as a PNG image, PDF document, JPEG image or an XLS file.



5. Click the icon next to **Environment: Fan** at the top of the window to go back to the LAN Telemetry Summary window.

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: <ul style="list-style-type: none">• 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.<ul style="list-style-type: none">• 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 6

Configure

This chapter contains the following topics:

- [Deploy, on page 95](#)
- [Templates, on page 119](#)
- [Backup, on page 148](#)
- [Image Management, on page 160](#)
- [Streaming Telemetry for LAN Deployments, on page 178](#)

Deploy

The Deploy menu includes the following submenus:

Configuring vPC Peer

A virtual PortChannel (vPC) allows links that are physically connected to two different Cisco Nexus devices to appear as a single PortChannel to a third device. The third device can be a Cisco Nexus 2000 Series Fabric Extender or a switch, server, or any other networking device. A vPC can provide Layer 2 multipathing, which allows you to create redundancy by increasing bandwidth, enabling multiple parallel paths between nodes and load-balancing traffic where alternative paths exist.

After you enable the vPC function, you create a peer keepalive link, which sends heartbeat messages between the two vPC peer devices.

The vPC domain includes both vPC peer devices, the vPC peer keepalive link, the vPC peer link, and all the PortChannels in the vPC domain connected to the downstream device. You can have only one vPC domain ID on each device.

vPC creation is divided into two steps, vPC Peer creation and vPC creation. To configure vPC, you need to configure vPC domain. To create vPC peer, navigate to **Configure > Deploy > vPC Peer**.



Note

After you configure the vPC peer, select vPC peer using the radio button and click **Add vPC**. For information about how to add a vPC to the selected vPC peer, see [Add vPC, on page 101](#).

You can view the history of tasks performed, navigate to **Configure > Deploy > vPC Peer > History** tab. For more information, see [vPC Peer History, on page 96](#).

You can view the list of vPC domains in the **Pre Configured Peers** table.

Table 10: Pre Configured Peers

Column	Description
Search box	Enter any string to filter the entries in their respective column.
Domain ID	Displays the domain ID of the vPC peer switches.
Primary Switch	Displays the vPC Primary device name.
Primary Port Channel ID	Displays the peer-link port channel for vPC primary device.
Secondary Switch	Displays the vPC secondary device name.
Secondary Port Channel ID	Displays the peer-link port channel for vPC secondary device.
Consistency	Displays the vPC Consistency status. Corresponds vPC peer-link configuration and Global Consistency parameters.

This feature supports add, delete, and edit option for Domain. You can also view vPC Peer History.

vPC Peer History

To view the deployed jobs on the vPC peers, navigate to **Configure > Deploy > vPC Peer > History** tab. You can view the list **vPC Peer History** information in the [Table 11: vPC Peer History, on page 96](#).

Table 11: vPC Peer History

Column	Description
Domain Id	Specifies the domain ID for the vPC peer
Primary Switch	Specifies the Primary Switch associated with the vPC Peer.
Secondary Switch	Specifies the Secondary Switch associated with the vPC Peer.
Created By	Specifies the DCNM username, who deployed this task.
Started At	Specifies the time at which the task was performed on the vPC peer. The time is displayed in the format YYYY-MM-DD HH:MM:SS.
Task Performed	Specifies the task that is performed on the vPC peer.

Column	Description
Status	Specifies the status of the task that is performed on the vPC Peer. The status can be Failed, Success, or in_progress.
View Command History	Select an activity, click View Command History . The Command History page displays the commands that are executed, status, and error message on the Primary Switch and Secondary Switch , in their respective tabs.
Delete vPC Peer Job	Select a vPC Peer History entry and click Delete to delete the task history.

Add vPC Peer Wizard

To add a VPC peer using the wizard from the Cisco DCNM Web UI, perform the following steps:

Procedure

Step 1 Choose **Configure > Deploy > vPC Peer** tab.

Step 2 Click **Add vPC Peer** icon in the toolbar.

You are directed to the vPC Peer creation wizard. There are five steps to complete the vPC Peer creation.

Step 3 On the **Select Devices** screen:

Click to choose the device that you want to be the primary and device secondary device on the vPC peer link. You can also filter the devices using the **Scope** drop-down list.

Note The licensed devices with configured LAN credentials are displayed.

Note If vPC is already configured on the device that you chose as primary, the secondary device information and the domain ID are populated automatically. You can also modify, as required.

In the **Domain ID** field, enter the vPC domain ID.

To enable LACP on the peer link, check **Enable lacp on peer link** checkbox.

For the VXLAN VTEP device, **Loopback Interface** and **Loopback Secondary IP** address can be specified in the Domain Setting table.

Click **Next** to configure peer link.

Step 4 On the Configure Peer-Link screen:

For configuring the peer-link, you have two options. You can either select an existing port-channel or create a new port-channel. If Peer link is already configured on device, on selection of peer link port-channel automatically populates secondary peer-link port-channel.

Perform the following steps on both the primary and the secondary devices.

1. Click **Existing Port Channel** or **Create New port Channel** radio button to configure port channel.

A port channel bundles physical links into a channel group to create a single logical link that provides the aggregate bandwidth of up to 8 physical links on the M series module. If a member port within a port channel fails, the traffic previously carried over the failed link switches to the remaining member ports within the port channel.

2. If you choose **Existing Port Channel**:

- Click the search icon next to the **Port Channel Id** field to select the Port channel ID for the device peer link.
- From the list of port channels for the device, check the **Port Channel ID** check box.
- Click **OK**.

The Port channels selected for the device are displayed in the below area. The interfaces and the port channel to which they are connected to are displayed in the **Existing Port Channel** under the **Configure Secondary Device Peer Link** area.

3. If you choose **Create New Port Channel**:

- In the **Port Channel Id** field, enter the port channel number for each device that you want to use as the vPC peer link.

You can use different numbers for the two port channels on the two vPC devices that you are designating as the vPC peer link.

- In the interface table below, choose the interfaces that you want to use for the vPC peer link.

Click **Next** to configure peer link port-channel setting.

Step 5 On the **Configure Peer-Link Port Channel Settings** screen:

Edit the Description, Port Mode and Native VLAN for the primary and the secondary devices. We recommend that you configure the Layer 2 port channels that you are designating as the vPC peer link in trunk mode and use two ports on separate modules on each vPC peer device for redundancy.

If you did not check the **Enable lacp on peer link** in the Select Devices screen, the Protocol field will display NONE.

If you want to create VLANs, the **Allowed VLANs** value must be a valid VLAN ID or range.

Click **Next** to view the summary information.

Step 6 On the **Summary** screen:

You can view the CLI configuration for the Primary Switch and Secondary Switch.

You can copy and save the configuration this configuration to your local directory.

Step 7 Click **Previous** to change any configurations.

Step 8 Click **Deploy** to configure vPC Peers.

After the deployment is complete, a status message shows whether the deployment is successful or a failure. Click **Know More** to view the status of each command deployed.

Delete vPC Peer

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

Procedure

-
- Step 1** Choose **Configure > Deploy > vPC Peer** tab.
- Step 2** Select the vPC domain which you want to delete, and click the **Delete vPC Peer** icon in the toolbar. Click **Yes** when the confirmation window pops out.
-

Edit vPC Peer Configuration

To edit the VPC peer configuration from the Cisco DCNM Web UI, perform the following steps:

Procedure

-
- Step 1** Choose **Configure > Deploy > vPC Peer** tab.
- Step 2** Select the vPC domain which you want to edit, and click the **Edit vPC Peer** icon in the toolbar. You can edit the vPC Peer configuration by following the wizard as [Add vPC Peer Wizard, on page 97](#).
-

Configuring vPC

After you finish configuring the vPC Peers, navigate to **Configure > Deploy > vPC** to configure the vPC.

You can view the history of tasks that are performed, navigate to **Configure > Deploy > vPC > History**. For more information, see [vPC History, on page 100](#).

You can view the list of virtual port-channels (vPC) in the **Virtual Port-Channel(vPC)** table.

Table 12: Virtual Port-Channel(vPC)

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.
Primary vPC Peer-Device Name	Displays the vPC Primary device name.
Primary vPC Peer - Port Channel	Displays the vPC port channel for the primary vPC device that is connected to the multi-chassis endpoint or access switch.
Primary vPC Peer - Peer Port Channel	Displays the peer-link port channel for the vPC primary device.

Column	Description
Primary vPC Peer - Operational Mode	Displays the operational mode of the primary vPC endpoints.
Secondary vPC Peer - Device Name	Displays the vPC secondary device name.
Secondary vPC Peer - Port Channel	Displays the vPC port channel for the secondary device that is connected to the multi-chassis endpoint or access switch.
Secondary vPC Peer - Peer Port Channel	Displays the peer-link port channel for the vPC secondary device.
Secondary vPC Peer - Operational Mode	Displays the operational mode of the secondary vPC endpoints.
Multi Chassis vPC EndPoints - Device Name	Displays the multi-chassis vPC endpoints for each vPC ID under a vPC domain.
Multi Chassis vPC EndPoints - Port Channel ID	Displays the port channel on multi chassis vPC devices or access devices connected to the vPC peer switches.
vPC Consistency	Displays the vPC Consistency status. Corresponds vPC port channel and vPC.

This feature supports add, delete, and edit option for vPC.

vPC History

To view the deployed jobs on the created vPC peers, navigate to **Configure > Deploy > vPC > History** tab. You can view the list **vPC Peer History** information in the table.

Table 13: vPC Peer History

Column	Description
vPC Id	Specifies the domain ID for the vPC peer.
Primary Switch	Specifies the Primary Switch associated with the vPC.
Secondary Switch	Specifies the Secondary Switch associated with the vPC.
Access Switch	Specifies the Access Switch associated with the vPC.
Created By	Specifies the DCNM username who deployed this task.
Started At	Specifies the time at which the task was performed on the vPC peer. The time is displayed in the format YYYY-MM-DD HH:MM:SS.
Task Performed	Specifies the task that is performed on the vPC.
Status	Species the status of the task that is performed on the vPC.
View Command History	Select an activity, click View Command History . The Command History page displays the commands that are executed, status and error message for every command on the Primary Switch , Secondary Switch , and Access Switch , in their respective tabs.

Column	Description
Delete vPC Job	Select a vPC history and click Delete to delete the task history.

Add vPC

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

Procedure

-
- Step 1** Choose **Configure > Deploy > vPC** tab.
- Step 2** Click the **Add vPC** icon in the toolbar.
- The vPC creation screen appears. There are five steps to complete the vPC creation.
- Note** Configure the vPC domain before configuring the vPC. After configuring the domain, choose the vPC peer to create vPCs.
- Step 3** On the Select Devices page, click **Search** button next to the Primary Switch text box to open a list of vPC peers.
- After selection, click **OK**. After you choose the domain, the vPC domain window is prepopulated with the vPC domain information.
- Note** You cannot choose a peer link if a switch associated is not a licensed switch with configured LAN credentials.
- Click **Ok**.
- Step 4** In the **vPC ID** field, enter the value for this vPC.
- By default, this field is autopopulated when you choose the primary and secondary switches.
- Choose the option to **Configure Access Switch/Fex**, **Configure New Fex**, or **Configure Host** and specify the **Access Switch/Fex**.
- A dual-home FEX is created after you successfully deploy the vPC.
- Step 5** To enable LACP on VPC port-channels, check **Create LACP-based Port Channels For Setting Up vPC** checkbox.
- Note** LACP-based port channel is created. By default, LACP is not enabled on the vPC port channel. We recommend that you create and use LACP for all these port channels. If you do not want to use LACP, deselect the option. Ensure that the LACP is configured with active mode on the interfaces on each port channel on the vPC peer devices. This configuration allows you to more easily detect compatibility between devices, unidirectional links, and multihop connection, and provides dynamic reaction to run-time changes and link failures.
- Step 6** In the Configure links with vPC Primary and vPC Secondary page, configure the port channel for the Primary and Secondary vPC.
- Step 7** Select or create the port-channel to configure the vPC. Select **Existing Port Channel** or **Create New port Channel** radio button to configure port channels.

A port channel bundles physical links into a channel group to create a single logical link that provides the aggregate bandwidth of up to 8 physical links on the M series module. If a member port within a port channel fails, the traffic previously carried over the failed link switches to the remaining member ports within the port channel.

- If you choose **Existing Port Channel**:

1. Click the search icon next to the **Port Channel Id** field to select the Port channel ID for the device peer link.

All the discovered port channels are displayed. The non-LACP port channel is disabled and you cannot select only LACP enabled Port-channels.

2. From the list of port channels for the device, check the **Port Channel ID** check box.
3. Click **OK**.

The Port channels that are selected for the device are displayed in the below area. The interfaces and the port channel to which they are connected to are displayed in the **Existing Port Channel** under the **Configure Secondary Device Peer Link** area.

- If you choose **Create New Port Channel**:

1. In the **Port Channel Id** field, enter the port channel number for each device that you want to use as the vPC peer link.

This field is autopopulated by default.

You can use different numbers for the two port channels on the two vPC devices that you are designating as the vPC peer link.

2. In the interface table below, choose the interfaces that you want to use for the vPC peer link.

Click **Next** to review and modify other vPC port channel settings.

Step 8

In the Configure vPC Port Channel Settings, review and configure parameters for the port channel for both Primary and Secondary switches.

Edit the Description, Port Mode, Native VLAN, and Protocol for the port channels of the primary and the secondary devices.

If you did not check the **Create LACP-based Port Channels for setting up vPC** in the Select Devices screen, the Protocol field displays NONE.

If you want to create VLANs, the **Allowed VLANs** value must be a valid VLAN ID or range.

Click **Next**.

Step 9

On the **Summary** page, you can view the summary of your configuration for the Primary Switch, Secondary Switch, and Access Switch.

You can copy and save the configuration this configuration to your local directory.

Step 10

Click **Previous** to change any configurations.

Step 11

Click **Deploy** to configure vPC on the devices.

After the deployment is complete, a status message shows whether the deployment is successful or a failure. Click **Know More** to view the status of each command deployed.

Delete vPC

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

Procedure

- Step 1** Choose **Configure > Deploy > vPC**.
 - Step 2** Select the vPC which you want to delete, and click the **Delete vPC** icon in the toolbar.
Click **Yes** when the confirmation window pops out.
-

Edit vPC Configuration

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

Procedure

- Step 1** Choose **Configure > Deploy > vPC** tab.
 - Step 2** Select the vPC which you want to edit, and click the **Edit vPC** icon in the toolbar.
You can edit the selected vPC configuration by following the steps mentioned in the [Add vPC, on page 101](#) section.
-

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 14: 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.

DHCP Scopes	Comment
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.
TFTP/Bootscript Server	The server that holds the bootscript.

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 14: DCHP Scopes display fields, on page 104](#).
 - 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 15: 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 110](#) 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 16: 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.

Key Name	Default Value	Description
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.
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.

Fields and Icons	Description
Bootscript Status	Indicates the Bootsript execution state when the device executed POAP. For details, view the “Boot Log” file.
Model	Specifies the model of the switch.
Template Config File Name	Specifies the template used for creating the POAP definition. Fabric and IPFabric POAP templates are available.
Bootscript Last Updated Time	Specifies the last updated time for bootsript.
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 Creating a POAP Definition, on page 114 .
Edit	Allows you to edit a POAP definition. For more information, see Editing a POAP Definition, on page 115 .
Delete	Allows you to delete a POAP definition. For more information, see Deleting POAP Definitions, on page 116 .
Write Erase and Reload	Allows you to reboot and reload a POAP definition. For more information, see Write, Erase, and Reload the POAP Switch Definition, on page 116 .
Change Image	Allows you to change the image for the defined POAP definition. For more information, see Change Image, on page 116 .
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.

Fields and Icons	Description
Refresh Switch	Refreshes the list of switches.
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 114](#) and [Uploading a POAP Definition, on page 115](#) 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.
-

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 17: 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.

Field	Description
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 All the templates in the ZIP file are extracted and listed in the table as individual templates.

**Note**

Notifications appear next to **Import Template Zip File** if there are issues while loading templates after restarting the server. Click the notifications to see the errors in the **Issues in loading Template** window. Templates with errors are not listed in the **Templates** window. To import these templates, correct the errors, and import them.

Table 18: 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.
Supported Platforms	Displays the supported Cisco Nexus platforms compatible with the template. Check the check box of platforms that are supported with the template. Note 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.

Table 19: Advanced Template Properties

Field	Description
Implements	Displays the abstract template to be implemented.
Dependencies	Specifies the specific feature of a switch.
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

Property Name	Description	Valid Values	Optional?
templateType	Specifies the type of Template used.	<ul style="list-style-type: none">• CLI• POAP• POLICY• SHOW• PROFILE• FABRIC• ABSTRACT	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"> • CLI <ul style="list-style-type: none"> • N/A • POAP <ul style="list-style-type: none"> • N/A • VXLAN • FABRICPATH • VLAN • PMN • POLICY <ul style="list-style-type: none"> • VLAN • INTERFACE_VLAN • INTERFACE_VPC • INTERFACE_ETHERNET • INTERFACE_BD • INTERFACE_PORT_CHANNEL • INTERFACE_FC • INTERFACE_MGMT • INTERFACE_LOOPBACK • INTERFACE_NVE • INTERFACE_VFC • INTERFACE_SAN_PORT_CHANNEL • DEVICE • FEX • INTRA_FABRIC_LINK • INTER_FABRIC_LINK • INTERFACE • SHOW <ul style="list-style-type: none"> • VLAN • INTERFACE_VLAN • INTERFACE_VPC 	

Property Name	Description	Valid Values	Optional?
		<ul style="list-style-type: none">• INTERFACE_ETHERNET• INTERFACE_BD• NIERFACE_PORT_CHANNEL• INTERFACE_FC• INTERFACE_MGMT• INTERFACE_LOOPBACK• INTERFACE_NVE• INTERFACE_VFC• NIERFACE_SAN_PORT_CHANNEL• DEVICE• FEX• INTRA_FABRIC_LINK• INTER_FABRIC_LINK• INTERFACE <ul style="list-style-type: none">• PROFILE<ul style="list-style-type: none">• VXLAN• FABRIC<ul style="list-style-type: none">• NA	

Property Name	Description	Valid Values	Optional?
		<ul style="list-style-type: none"> • ABSTRACT • VLAN • INTERFACE_VLAN • INTERFACE_VPC • INTERFACE_ETHERNET • INTERFACE_BD • INTERFACE_PORT_CHANNEL • INTERFACE_FC • INTERFACE_MGMT • INTERFACE_LOOPBACK • INTERFACE_NVE • INTERFACE_VFC • INTERFACE_SAN_PORT_CHANNEL • DEVICE • FEX • INTRA_FABRIC_LINK • INTER_FABRIC_LINK • INTERFACE 	

Property Name	Description	Valid Values	Optional?
contentType		<ul style="list-style-type: none"> • CLI <ul style="list-style-type: none"> • TEMPLATE_CLI • POAP <ul style="list-style-type: none"> • TEMPLATE_CLI • POLICY <ul style="list-style-type: none"> • TEMPLATE_CLI • PYTHON • SHOW <ul style="list-style-type: none"> • TEMPLATE_CLI • PROFILE <ul style="list-style-type: none"> • TEMPLATE_CLI • PYTHON • FABRIC <ul style="list-style-type: none"> • PYTHON • ABSTRACT <ul style="list-style-type: none"> • TEMPLATE_CLI • PYTHON 	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

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 “-“ Discrete numbers separated by “,” Example: 1-10,15,18,20	Yes
interface	Format: <if type><slot>[/<sub slot>]/<port> 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, 172.22.31.105, 172.22.31.109	Yes
ipAddressWithoutPrefix	Example: 192.168.1.1 or Example: 1:2:3:4:5:6:7:8	No
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 22	No
ipV6AddressWithSubnet	IPv6 Address with Subnet	No
ISISNetAddress	Example: 49.0001.00a0.c96b.c490.00	No
long	Example: 100	No
macAddress	14 or 17 character length MAC address format	No

Variable Type	Valid Value	Iterative?
string	Free text, for example, used for the description of a variable Example: string scheduledTime { regularExpr=^([01]\d 2[0-3]):([0-5]\d)\$; }	No
string[]	Example: {a,b,c,str1,str2}	Yes
struct	Set of parameters that are bundled under a single variable. struct <structure name declaration > { <parameter type> <parameter 1>; <parameter type> <parameter 2>; } [<structure_inst1> [, <structure_inst2>] [, <structure_array_inst3 []>]; struct interface_detail { string inf_name; string inf_description; ipAddress inf_host; enum duplex { validValues = auto, full, half; }; }myInterface, myInterfaceArray[];	No Note If the struct variable is declared as an array, the variable is iterative.
wwn (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. Example: true	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
enum			Yes										
float	signed real number Example: 75.56, -8.5	Yes	Yes	Yes	Yes	Yes							
floatRange	range of signed real numbers Example: 50.5 - 54.75	Yes	Yes	Yes	Yes	Yes							
integer	signed number Example: 50, -75	Yes	Yes		Yes	Yes							
integerRange	Range of signed numbers Example: 50-65	Yes	Yes		Yes	Yes							
interface	specifies interface Example: Ethernet 5/10	Yes	Yes				Yes	Yes	Yes	Yes			
interfaceRange		Yes	Yes				Yes	Yes	Yes	Yes			
ipAddress	IP address in IPv4 or IPv6 format	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
ipAddList	Example: 19.102.10. 172.6.10.1 Note Separate the addresses in the list using commas and not hyphens.	Yes											
ipAddMask	IPv4 or IPv6 Address (does not require prefix)												
ipV4Add	IPv4 address	Yes											
ipV4Subnet	IPv4 Address with Subnet	Yes											
ipV6Add	IPv6 address	Yes											
ipV6Prefix	IPv6 Address with prefix	Yes											
ipV6Subnet	IPv6 Address with Subnet	Yes											
ipV4V6Add	Example: 4008:6:40												

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
long	Example: 100	Yes			Yes	Yes							
mac	MAC address												
string	literal string Example for string Regular expression string string definition { 0-9999 }	Yes									Yes	Yes	Yes
string[]	string literals that are separated by a comma (,) Example: {string1, string2}	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
struct	Set of parameters that are bundled under a single variable. struct <structure name declaration> { <parameter type> <parameter 1>; <parameter type> <parameter 2>; } [,<struct1>] [,<struct2>] [,<struct3>] []>;												
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	Description
DataDepend	Text	
Description	Text	Description of the field appearing in the window
DisplayName	Text Note Enclose the text with quotes, if there is space.	Display name of the field appearing in the window
Enum	Text1, Text2, Text3, and so on	Lists the text or numeric values to select from
IsAlphaNumeric	"true" or "false"	Validates if the string is alphanumeric
IsAsn	"true" or "false"	
IsDestinationDevice	"true" or "false"	
IsDestinationFabric	"true" or "false"	
IsDestinationInterface	"true" or "false"	
IsDestinationSwitchName	"true" or "false"	
IsDeviceID	"true" or "false"	
IsDot1qId	"true" or "false"	
IsFEXID	"true" or "false"	

Annotation Key	Valid Values	Description
IsGateway	“true” or “false”	Validates if the IP address is a gateway
IsInternal	“true” or “false”	Makes the fields internal and does not display them on the window Note Use this annotation only for the ipAddress variable.
IsManagementIP	“true” or “false” Note This annotation must be marked only for variable “ipAddress”.	
IsMandatory	“true” or “false”	Validates if a value should be passed to the field mandatorily
IsMTU	“true” or “false”	
IsMultiCastGroupAddress	“true” or “false”	
IsMultiLineString	“true” or “false”	Converts a string field to multiline string text area
IsMultiplicity	“true” or “false”	
IsPassword	“true” or “false”	
IsPositive	“true” or “false”	Checks if the value is positive
IsReplicationMode	“true” or “false”	
IsShow	“true” or “false”	Displays or hides a field on the window
IsSiteId	“true” or “false”	
IsSourceDevice	“true” or “false”	
IsSourceFabric	“true” or “false”	
IsSourceInterface	“true” or “false”	
IsSourceSwitchName	“true” or “false”	

Annotation Key	Valid Values	Description
IsSwitchName	“true” or “false”	
IsRMID	“true” or “false”	
IsVPCDomainID	“true” or “false”	
IsVPCID	“true” or “false”	
IsVPCPeerLinkPort	“true” or “false”	
IsVPCPeerLinkPortChannel	“true” or “false”	
IsVPCPortChannel	“true” or “false”	
Password	Text	Validates the password field
UsePool	“true” or “false”	
UseDNSReverseLookup		
Username	Text	Displays the username field on the window

Example: DisplayName 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;
##
```

Example: IsMultiLineString Annotation

```
##template variables
@(IsMultiLineString=true)
string EXTRA_CONF_SPINE;
##
```

IsShow Annotation

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

```
##

##template variables
boolean enableScheduledBackup;
@(IsShow="enableScheduledBackup==true",Description="Server time")
string scheduledTime;
##
The condition "enableScheduledBackup==true" evaluates to true/false

##template variables
@(Enum="Manual,Back2BackOnly,ToExternalOnly,Both")
string VRF_LITE_AUTOCONFIG;
@(IsShow="VRF_LITE_AUTOCONFIG!=Manual", Description="Target Mask")
integer DCI_SUBNET_TARGET_MASK
##
The condition "VRF_LITE_AUTOCONFIG!=Manual" matches string comparison to evaluate to true
or false
```

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.
- **Interactive command handling:** Include prompt and response as part of the template content for handling interactive commands.

Example:

```
##template variables
string srcFile;
string srcDir;
string password;
string vrf;
##

##template content
copy scp://root@10.127.117.65/$$srcFile$$ bootflash: vrf $$vrf$$ <prompt:'(yes/no)?',
response:'yes'> <prompt:'(y/n)?[n] ',
```



```
response:'y'> <prompt:'password:',
response:'$$password$$'>
```

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]**

Template Content Editor

The template content editor has the following features:

- **Syntax highlighting:** The editor highlights the syntax, like different types of statements, keywords, and so on, for Python scripting.
- **Autocompletion:** The editor suggests the template datatypes, annotations, or metaproperties when you start typing.
- **Go to line:** You can navigate to the exact line in the template content editor instead of scrolling. Press **Command-L** in Mac or **Ctrl-L** in Windows, and enter the line number to which you want to navigate to in the pop-up window.

If you enter a value greater than the number of lines in the editor, you will be navigated to the last line in the editor window.

- **Template search and replace:** Press **Command-F** in Mac or **Ctrl-F** in Windows, enter the search term in the **Search for** field, and select the type of search in the search window. You can perform the following searches in the editor:
 - **RegExp Search:** You can perform the regular expression search in the editor.
 - **CaseSensitive Search:** You can perform a case-sensitive search in the editor.
 - **Whole Word Search:** You can perform a whole word search to find the exact words in the editor. For example, a regular search for the word "play" returns results where it is part of words like "display," but the whole word search returns results only when there is an exact match for the word "play".
 - **Search In Selection:** You can perform a search in the selected content. Select the content to which you want to limit the search and enter the search term.

Choose the + icon in the search window to use the replace option. Enter the replacing word in the **Replace with** field. You can replace the selected word once by selecting **Replace**. To replace all the occurrences of the selected word, select **All**.

- **Code folding:** You can expand or group code blocks in the editor by clicking the arrow next to their line numbers.
- **Other features:** The editor automatically indents the code, the closing braces, and highlights the matching parenthesis.

Template Editor Settings

You can edit the following features of a template editor by clicking **Template Editor Settings**.

- **Theme:** Select the required theme for the editor from the drop-down list.
- **KeyBinding:** Select the editor mode from the **KeyBinding** drop-down list to customize the editor. **Vim** and **Ace** modes are supported. The default is **Ace**.
- **Font Size:** Select the required font size for the editor.

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 is 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.
- The Template Properties window appears.
- Step 3** Specify a template name, description, tags, and supported platforms for the new template.
- Step 4** 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 5** Select a **Template Sub Type** and **Template Content Type** for the template.
- Step 6** Click the **Advanced** tab to edit other properties like **Implements**, **Dependencies**, **Published**, and **Imports**. Select **Published** to make the template read-only. You cannot edit a published template.
- Step 7** 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 8 Click **OK** to save the template properties, or click the cancel icon at the top-right corner of the window to revert the changes.

Note You can edit the template properties by clicking **Template Property**.

Step 9 Click **Template Content** to edit the template syntax. For information about the structure of the Configuration Template, see the *Template Structure* section.

Step 10 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** by clicking the error and warnings field.

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. Click the line number under the Start Line column to locate the error in the template content. You will get an error if you validate a template that does not have a template name.

Step 11 Click **Save** to save the template.

Step 12 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 144](#).

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 146](#).

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, 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 20: 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.
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 21: Switch Configuration Field and Description

Field	Description
Device Name	Displays the device name 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.

Field	Description
Configuration	Displays the configuration files that are archived for that device.
Archive Time	Displays the time when the device configuration files were archived. 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 in your local system. You can use the third-party file transfer tools to transfer these files to an external server.
-

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**.



Note The configuration files from the archived jobs are located in the DCNM Server directory: `\dcm\dcnm\data\archive\<dcnm-ip-address>\`. You can use the third-party file transfer tools or file transfer commands to transfer these files to an external server.

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

Field	Description
User	Specifies who created this job.
Group	Specifies the group to which this job belongs.
Group Job	Specifies whether it is a group job or a per-device job. The values are true or false .
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. Note Running and Scheduled status is not applicable for existing jobs in an upgraded Cisco DCNM.
User Comments	Specifies the comments or description provided by the user.

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.

From Cisco DCNM Release 11.2(1), you can apply VRF for all the selected devices simultaneously. You can either apply Management VRFs or Default VRFs.

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.

Select a VRF type to modify the existing VRF type to the specified device. You can either apply Management VRFs or Default VRFs.

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**.
 - You cannot modify the repeat interval duration for an archive job. When you try to modify, the operation fails and the job is deleted. You must delete existing repeat interval archive job and create a new job.

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"> • Skipped • Failed • Successful
Error Cause	Specifies the error if the job has failed. The categories are as follows: <ul style="list-style-type: none"> • No change in the configuration. • Switch is not managed by this server. <p>Note 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 22: Archive Operations

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

Table 23: Archive Field and Description

Field Name	Description
Device Name	Displays the device name 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. 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 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.
	Note If Failover is triggered in Native HA, the Task Id sequence number is incremented by 32.

Field	Description
Task Type	Specifies the type of task. <ul style="list-style-type: none"> • Compatibility • Upgrade
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.
Job Status	Specifies the status of the job. <ul style="list-style-type: none"> • Planned • In Progress • Completed • Completed with Exceptions
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 image 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 image is stored.
The servers at **Configure > Image Management > Repositories** are displayed in the drop-down list.
- From the **Select Image** list, choose the appropriate 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.

Note Only files with BIN extension are listed if you select **File Server**. To view other files, choose **Administration > DCNM Server > Server Properties**, set **FILE_SELECTION_FILTER** to **false**, and restart the server. It is set to **true** by default.

- 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.

Note Only files with BIN extension are listed if you select **Switch File System**. To view other files, choose **Administration > DCNM Server > Server Properties**, set **FILE_SELECTION_FILTER** to **false**, and restart the server. It is set to **true** by default.

- 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).

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**, **Upgrade Option 2** is disabled.

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.

What to do next

After you complete the ISSU on the switch, ensure that you wait for 20 minutes to allow the switch to reboot, and stabilize the SNMP agent. Cisco DCNM will discovery polling cycles in order to display the new version of the switch on the Cisco DCNM Web UI.

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. <ol style="list-style-type: none">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. <ol style="list-style-type: none">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"> • Planned • In Progress • Completed
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.
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. 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.

Field	Description
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.
- Only files with BIN extension are listed if you select **File Server**. To view other files, choose **Administration > DCNM Server > Server Properties**, set **FILE_SELECTION_FILTER** to **false**, and restart the server. It is set to **true** by default.

- c) 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.

- d) Click **OK** to choose the patch image or **Cancel** to revert to the SMU installation wizard.

If you choose **Switch File System**:

- a) 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.

Only files with BIN extension are listed if you select **Switch File System**. To view other files, choose **Administration > DCNM Server > Server Properties**, set **FILE_SELECTION_FILTER** to **false**, and restart the server. It is set to **true** by default.

- b) 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. 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.
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**:

- a) 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.

- b) From the **Select Image** list, choose the appropriate package that must be installed on the device.

You can select more than one package file to be installed on the device.

Only files with RPM extension are listed if you select **File Server**. To view other files, choose **Administration > DCNM Server > Server Properties**, set **FILE_SELECTION_FILTER** to **false**, and restart the server. It is set to **true** by default.

Check the check box to use the same package for all other selected devices of the same platform.

- c) Click **OK** to choose the patch image or **Cancel** to revert to the RPM Installation Wizard.

If you choose **Switch File System**:

- a) From the **Select Image** list, choose the appropriate package file image that is located on the flash memory of the device.

You can select more than one package file to be installed on the device.

Only files with RPM extension are listed if you select **Switch File System**. To view other files, choose **Administration > DCNM Server > Server Properties**, set **FILE_SELECTION_FILTER** to **false**, and restart the server. It is set to **true** by default.

- b) 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.

Field	Description
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 and the type of package. The installed packages can be base packages or non-base packages.

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">• Planned• In Progress• Completed
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.
-

Streaming Telemetry for LAN Deployments

In today's data center environments, granular visibility and tracking of network events has become critical. The traditional polling-based methods that pull the network state in predefined intervals need a fork-lift upgrade. More advanced streaming approaches are required that provide network event visibility in closer to real time through a push method. Streaming telemetry not only allows data to be pushed out at a much finer granularity with a lower cadence (shorter interval) but it also enables event-based notifications. While getting relevant data in a timely fashion is highly desirable, the data needs to be analyzed and converted into actionable insights.

As a first step toward LAN analytics, DCNM 11.0(1) enables subscriptions for environmental metrics through streaming telemetry for consumption and analysis. The environmental metrics that are streamed include CPU, Memory, Power, Temperature, and Fan Speed; all these are enabled with a single click. DCNM allows you to configure the streaming interval for these metrics. The default streaming interval for CPU, Memory is set to 30 seconds, and those for Power, Temperature, and Fan Speed is set to 300 seconds (5 minutes).

Starting from DCNM 11.1(1), subscriptions are enabled for Interface, Transceivers, Control Plane, and Resource summary metrics through streaming telemetry for consumption and analysis. DCNM allows you to configure the streaming interval for these metrics. The default streaming interval for Interface, Transceivers, Control Plane, and Resource summary metrics is set to 30 seconds.

The per-metric real-time streaming dashboards allow filtering on a per fabric and per switch level including a per-switch drill-down where applicable. Streaming telemetry is currently supported on the Nexus 9000 platforms.

Guidelines and Recommendations

- **Cisco DCNM LAN Telemetry is a preview-only feature. Do not enable this feature in the production environments.**
- In a cluster mode, a minimum of three compute nodes have to be up for LAN Telemetry to start properly. However, LAN Telemetry functions properly if any one of the three compute nodes is intermittently down.
- If two compute nodes go down, both nodes have to be restored for Zoo Keeper and Kafka Connect to bootstrap correctly and resume data transmission.
- We recommend using the LAN Telemetry feature for up to 30 switches.
- The LAN Telemetry feature is not supported on switches with the Cisco NX-OS Release 7.0(3)I4(8b) and 7.0(4)I4(x) images.

Pre-Requisites for Enabling the LAN Telemetry Feature

- The Cisco Nexus 9000 switches and Cisco DCNM need to be time synchronized (NTP is recommended).
- Minimum software version on the Nexus 9000 switches must be 7.0(3)I6(1) or higher.
- In the LAN Classic mode, you need to manually enable the following configurations on all the switches before enabling telemetry:

- **feature nxapi**

- `nxapi http port 80`

**Note**

If the preceding configurations are unavailable on the switches, the telemetry health on Cisco DCNM does not show the configurations and the connection status for the telemetry-enabled switches. The preceding commands can be manually defined in a new template, and then pushed to all the switches in the fabric from Cisco DCNM. Use an unused port (for example, port 80) configure `nxapi`.

Enabling the Streaming Telemetry Feature

Procedure

Step 1

Choose **Configure > LAN Telemetry > Configure**. Select the fabric for which LAN Telemetry has to be enabled. Then press the **Enable** button.

LAN Telemetry

Select a Fabric

Default_LAN

This will enable real-time collection of data from the fabric via streaming telemetry.

Data for the following features will be periodically collected:

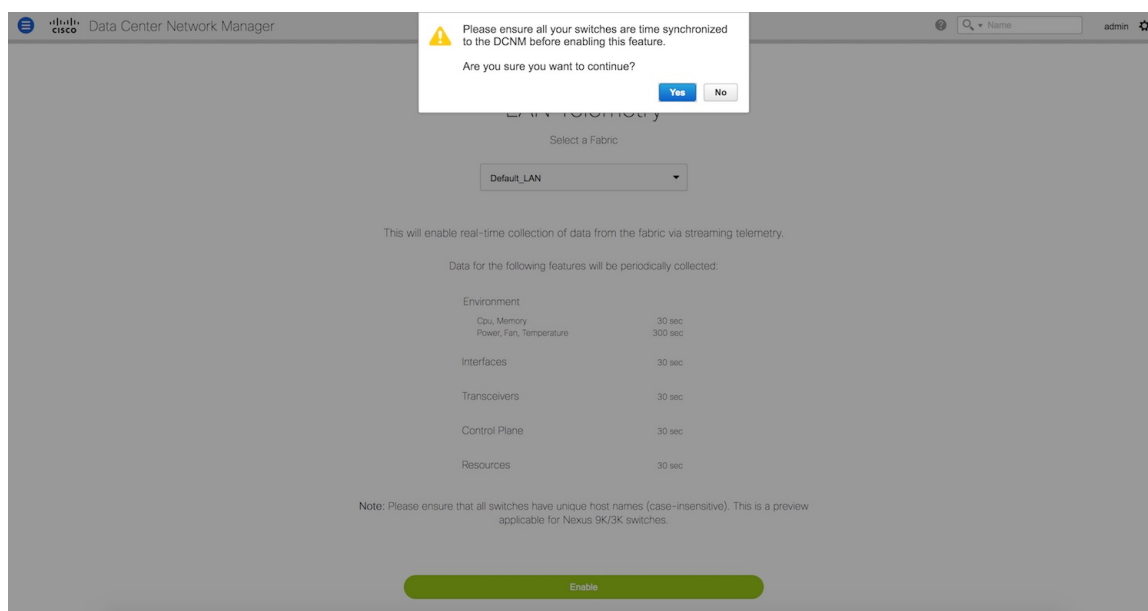
Environment		
Cpu, Memory	30 sec	
Power, Fan, Temperature	300 sec	
Interfaces	30 sec	
Transceivers	30 sec	
Control Plane	30 sec	
Resources	30 sec	

Note: Please ensure that all switches have unique host names (case-insensitive). This is a preview applicable for Nexus 9K/3K switches.

Enable

A warning message appears to indicate that the Cisco DCNM and switches need to be time-synchronized before this feature is enabled. Recall, that this is a prerequisite for this feature. If the prerequisite is met, acknowledge by clicking **Yes**.

Note When Telemetry is enabled, the NTP configuration is done on the switches for LAN Classic deployment, wherein the NTP server address is set to DCNM's out-of-band interface's IPv4 address. In case of HA setups, the NTP server address is set to the VIP address of the out-of-band interface. Ensure that the NTP configurations are not removed/modified from the switches.



Step 2 Once this feature is enabled, a message appears indicating the initialization process has begun, which takes a couple of minutes. This time is needed for the streaming configuration to be pushed to the switches. The initial data to be streamed out from the switches, which are consumed by DCNM, and depicted on the LAN telemetry dashboard.

Once the LAN telemetry preview feature is enabled, DCNM updates the switch telemetry configuration for the environmental metrics. Every switch that does not conform to the telemetry requirements (must be Cisco Nexus 9000) is excluded from the configuration update. The status of the switch configuration can be monitored by choosing **Configure > LAN Telemetry > Health**.

Once the jobs are successfully executed, the required telemetry configuration has been applied to the switches and the streaming data appears once received and processed.

LAN Telemetry Health

The LAN Telemetry Health window provides a detailed break-down of how much data is streamed out by each switch per feature for the last 24 hours. This window shows the status of the configuration for every switch, apart from showing the statistics of the received data for every metric from every switch. The Connection Status indicates the status of the connection used to transport telemetry data between the switch and DCNM.

When the connection status is shown as **Disconnected** the port configuration may not be accepted by the switch correctly. On the switch image 7.0(3)I7(6), if a switch already had **nxapi** configuration, and later it was managed by DCNM and telemetry was enabled on that fabric, DCNM pushes **http port 80** configuration so that it could query some NXAPI commands such as **show telemetry transport** and **show telemetry data collector details**, to monitor telemetry connection statistics. In this case, the switch does not update **http port**

80 in its configuration even though the command was executed correctly. In such a scenario, issue the following commands on the switch:

```
switch# configure
switch(config)# no feature nxapi
switch(config)# feature nxapi
switch(config)# http port 80
```



Note You cannot configure ICAM on the Cisco Nexus 9000 Series Switches Release 7.0(3)I7(6), and therefore, the telemetry will fail until the switch issue is resolved.

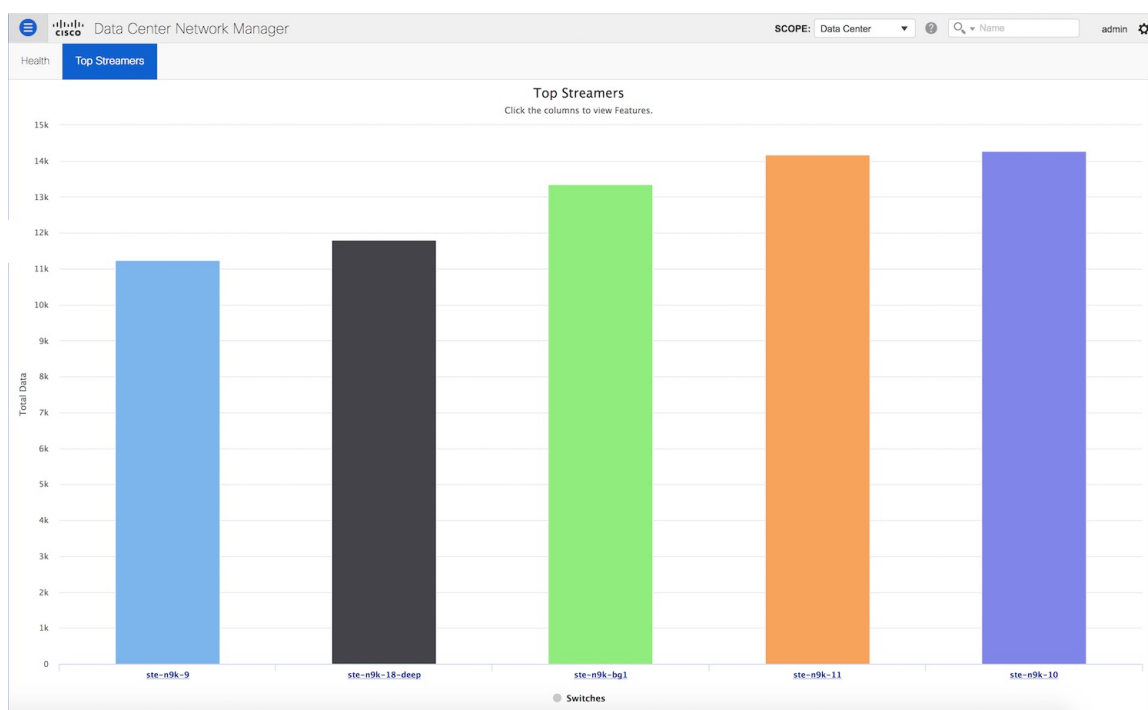
To view the LAN Telemetry Health, perform the following steps:

Procedure

Step 1 Choose **Configure > LAN Telemetry > Health**.

Name	Description	Additional Information	Update Period (seconds)	Packets Sent	Configuration Status	Connection Status
ste-n9k-10	N9K-C9396PX NXOS 9.2(1)	SAL18422FXL Default_LAN...		121744	✓ SUCCESS	✓ Connected
ste-n9k-11	N9K-C9396PX NXOS 9.2(1)	SAL18432P11 Default_LAN...		121375	✓ SUCCESS	✓ Connected
ste-n9k-18-deep	N9K-C9396PX NXOS 9.2(2)	SAL18432P61 Default_LAN...		100718	✓ SUCCESS	✓ Connected
ste-n9k-9	N9K-C9396PX NXOS 7.0(3)...	SAL1833YM60 Default_LA...		92293	✓ SUCCESS	✓ Connected
ste-n9k-bg1	N9K-C93180YC-EX NXOS ...	FDO21061Q4W Default_LA...		0	✓ SUCCESS	✓ Connected

Step 2 Click the **Top Streamers** tab to view the graphs that depicts the top five streaming switches and has a drill-down capability for a feature-wise break-down.

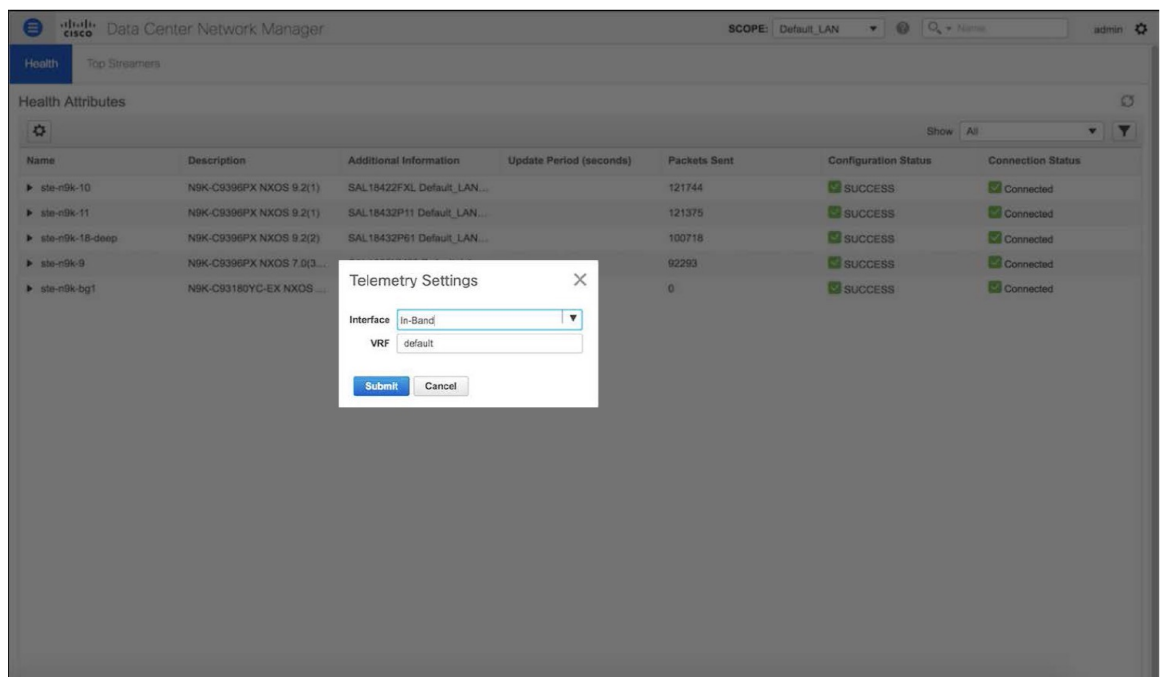
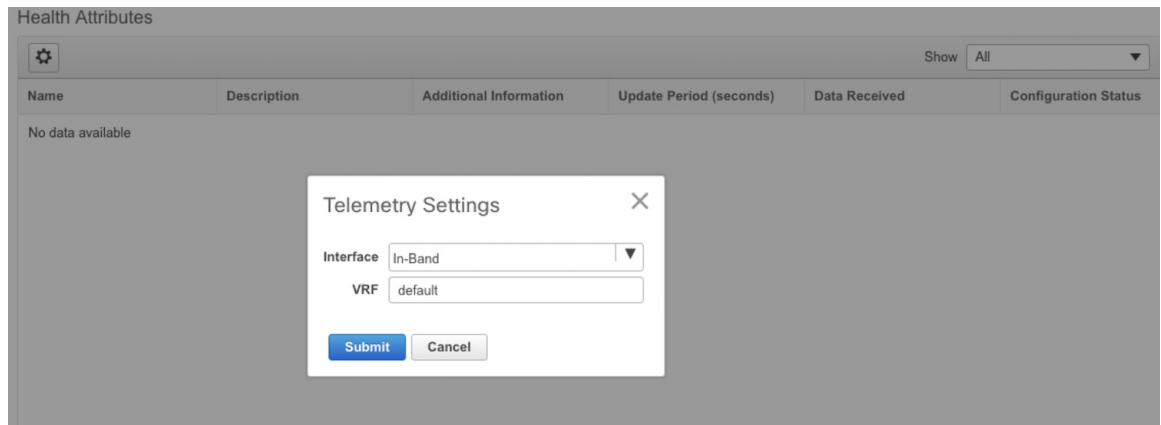


Telemetry Streaming Interface

Telemetry data, by default is streamed through the management interface of the switches to the Cisco DCNM. This is the Out-of-Band network. This is a global configuration for all fabrics or switch-groups in DCNM. The switches can also stream the Telemetry data through their front panel ports to DCNM assuming there's connectivity from the switches to the DCNM. This is the In-band network. To use the in-band network, do the following:

Procedure

- Step 1** Disable Telemetry on all the Enabled fabrics.
- Step 2** Go to the Health window and change the settings by clicking on the gear icon on the Health window. In the Telemetry Settings window that comes up, select **In-Band** from the Interface drop-down list. The VRF option is set to default. Click Submit.



The VRF option is set to default. You can also change this to any other VRF assuming that the switches are configured with the VRF and there is availability to the in-band interface of the DCNM through that VRF.

Note If Telemetry is already enabled for some fabrics, you should first disable Telemetry on all the enabled fabrics and only then modify the Telemetry network setting. After modifying the Telemetry network settings, you can enable Telemetry on the fabrics. Now, Telemetry data start coming through the in-band interface.



CHAPTER 7

Administration

This chapter contains the following topics:

- [DCNM Server, on page 185](#)
- [Management Users, on page 199](#)
- [Performance Setup, on page 203](#)
- [Event Setup, on page 205](#)
- [Credentials Management, on page 209](#)

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 **Re(start)** icon to start or restart services, and click the **Stop** icon to 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**
- **Smart License**
- **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"> • Permanent • Eval • Unlicensed • Not Applicable • Expired • Invalid
License Type	Displays if the license is a switch-based embedded license or a server-based license.
Expiration Date	Displays the expiry date of the license. Note Text under the Expiration Date 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.

Field	Description
Assign All	Click this option on the toolbar to refresh the table and assign the licenses for all the items in the table.
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.

After you register smart license, if you click **Assign License** for a switch that does not have a permanent license, a smart license is assigned to the switch. The priority of licenses that are assigned are in the following order:

1. **Permanent**
2. **Smart**
3. **Eval**

Disabling smart licensing unassigns licenses of switches that were smart-licensed.

The evaluation license is assigned for switches that do not support smart licensing. The license state is **Eval** and the license type is **DCNM-Server**. See *Cisco DCNM Licensing Guide, Release 11.x* to view the list of switches that support smart licensing.

Smart License

From Cisco DCNM Release 11.1(1), you can use the smart licensing feature to manage licenses at device-level and renew them if required. From Cisco DCNM Web UI, choose **Administration > DCNM Server > License > Smart License**. You will see a brief introduction on Cisco smart licensing, a menu bar, and the **Switch Licenses** area.

In the introduction, click **Click Here** to view the information on smart software licensing.

The menu bar has the following icons:

- **Registration Status:** Displays details of the current registration in a pop-up window when clicked. The value is **UNCONFIGURED** if the smart licensing is not enabled. After you enable the smart licensing without registering, the value is set to **DEREGISTERED**. The value is set to **REGISTERED** after you register. Click the registration status to view the last action, account details, and other registration details in the **Registration Details** pop-up window.
- **License Status:** Specifies the status of the license. The value is **UNCONFIGURED** if the smart licensing is not enabled. After you enable the smart licensing without registering, the value is set to **NO LICENSES IN USE**. The value is set to **AUTHORIZED** or **OUT-OF-COMPLIANCE** after registering and assigning licenses. Click the license status to view the last action, last authorization attempt, next authorization attempt, and the authorization expiry in the **License Authorization Details** pop-up window.

- **Control:** Allows you to enable or disable smart licensing, register tokens, and renew the authorization.

The following table describes the fields that appear in the **Switch Licenses** section.

Field	Description
Name	Specifies the license name.
Count	Specifies the number of licenses used.
Status	Specifies the status of the licenses used. Valid values are Authorized and Out of Compliance .
Description	Specifies the type and details of the license.
Last Updated	Specifies the timestamp when switch licenses were last updated.
Print	Allows you to print the details of switch licenses.
Export	Allows you to export the license details.

After you remove a product license from your account in Cisco Smart Software Manager, disable the smart licensing and register it again.

Enabling Smart Licensing

To enable smart licensing from Cisco DCNM Web UI, perform the following steps:

Procedure

Step 1 Choose **Administration > DCNM Server > License > Smart License**.

Step 2 Click **Control** and choose **Enable** in the drop-down list to enable the smart licensing.

A confirmation window appears.

Step 3 Click **Yes**.

Instructions to register the DCNM instance appear.

The registration status changes from **UNCONFIGURED** to **DEREGISTERED**, and the license status changes from **UNCONFIGURED** to **No Licenses in Use**.

Registering a Cisco DCNM Instance

Before you begin

Create a token in Cisco Smart Software Manager.

Procedure

Step 1 Choose **Administration > DCNM Server > License > Smart License**.

Step 2 Click **Control** and choose **Register** in the drop-down list.

The **Register** window appears.

Step 3 Select the transport option to register the smart licensing agent.

The options are:

- **Default - DCNM communicates directly with Cisco's licensing servers**

This option uses the following URL: <https://tools.cisco.com/its/service/oddce/services/DDCEService>

- **Transport Gateway - Proxy via Gateway or Satellite**

Enter the URL if you select this option.

- **Proxy - Proxy via intermediate HTTP or HTTPS proxy**

Enter the URL and the port if you select this option.

Step 4 Enter the registration token in the **Token** field.

Step 5 Click **Submit** to register the license.

The registration status changes from **DEREGISTERED** to **REGISTERED**. The name, count, and status of switch licenses appear.

Click **Registration Status: REGISTERED** to see the details of the registered token.

The switch details are updated under the **Switches/VDCs** section of the **License Assignments** tab. The license type and the license state of switches that are licensed using the smart license option are **Smart**.

What to do next

Troubleshoot communication errors, if any, that you encounter after the registration.

Renew Authorization

You can manually renew the authorization only if you have registered. Automatic reauthorization happens periodically. Click **License Status** to view details about the next automatic reauthorization. To renew authorization from Cisco DCNM Web UI, perform the following steps:

Procedure

Step 1 Choose **Administration > DCNM Server > License > Smart License**.

Step 2 Click **Control** and choose **Renew Authorization** in the drop-down list to renew any licensing authorizations.

A request is sent to Cisco Smart Software Manager to fetch updates, if any. The **Smart Licenses** window is refreshed after the update.

Disabling Smart Licensing

To disable smart licensing from Cisco DCNM Web UI, perform the following steps:

Procedure

-
- Step 1** Select **Control** and select **Disable** to disable smart licensing.
A confirmation window appears.
- Step 2** Click **Yes**.
The license status of the switches using this token, under the **License Assignments** tab, changes to **Unlicensed**. This token is removed from the list under the **Product Instances** tab in the Cisco Smart Software Manager.
If a smart license is not available and you disable smart licensing, release the license manually from the **License Assignments** tab.
-

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.
Expiration Date	Displays the expiry date of the license. Note Text in the Expiration Date 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/ postgresql-standby-backup.tgz. If the file exists, restore database data files:

```
rm -rf      data/*
tar -zxvf   replication/ postgresql-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.
-

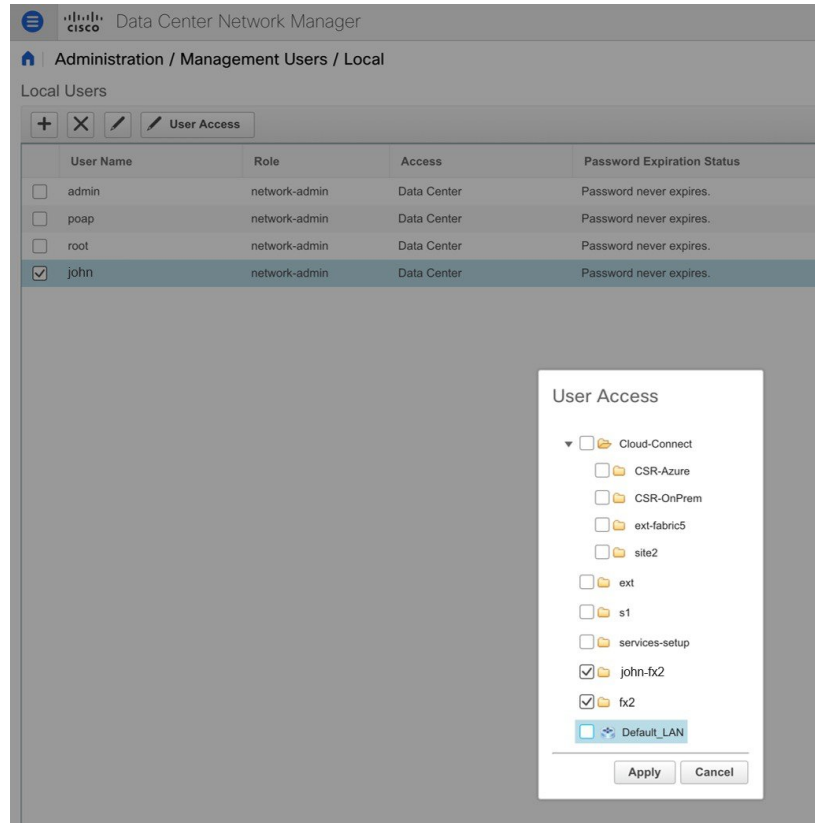
User Access

You can select specific groups or fabrics that local users can access. This restricts local users from accessing specific groups or fabrics for which they have not been provided access. To do this, 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 specific groups or fabrics that the user can access 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 keep 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**.
-

Configuring User-Defined Statistics

To configure user-defined statistics from the Cisco DCNM Web UI, perform the following steps:

Procedure

- Step 1** Choose **Administration > Performance Setup > User Defined**.
The User-Defined statistics window is displayed.

- Step 2** Click **Add** icon.
- The **Add SNMP Statistic to Performance Collection** window is displayed.
- Step 3** From the **Switch** table, select the switch for which you want to add other statistics.
- Step 4** From the **SNMP OID** drop-down list, select the OID.
- Note** For SNMP OID ModuleX_Temp,IFHCInOctets.IFINDEX,IFHCOctets.IFINDEX, selected from drop-down list, you must replace 'X' with correct module number or the corresponding IFINDEX.
- Step 5** In the **Display Name** box, enter a new name.
- Step 6** From the **SNMP Type** drop-down list, select the type.
- Step 7** Click **Add** to add this statistic.
-

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.

You can either enter an IPv4 or IPv6 addresses or DNS server name in the **Address** field.

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:

- a) From the **Type** drop-down list, choose an event type.
- b) Check the **Storage Ports Only** check box to select only the storage ports.
- c) From the **Minimum Severity** drop-down list, select the severity level of the messages to receive.
- d) Click **Add** to add the notification.

If you select **Syslog**, then:

- a) 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.

- [Edit Credentials, on page 211](#)
- [Validate Credentials, on page 211](#)
- [Clear Switch Credentials, on page 211](#)

The LAN Credentials for the DCNM User table has the following fields.

Field	Description
Switch	Displays the LAN switch name.

Field	Description
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.

