



## CHAPTER 9

# Working with Topology

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This chapter describes how to use the Topology feature in Cisco Data Center Network Manager (DCNM).

This chapter includes the following sections:

- [Information About Topology, page 9-1](#)
- [Licensing Requirements for Topology, page 9-6](#)
- [Prerequisites for Topology, page 9-6](#)
- [Guidelines and Limitations, page 9-6](#)
- [Using the Topology Feature, page 9-6](#)
- [Related Documents, page 9-16](#)
- [Feature History for Topology, page 9-17](#)

## Information About Topology

The Topology feature provides you with a topology map of supported Cisco NX-OS devices. The topology map also shows switches that run Cisco IOS software, such as the Catalyst 6500 series switches, that are linked by the Cisco Discovery Protocol (CDP). For Nexus 7000 Series devices, the map shows details about virtual device contexts (VDCs).

When Cisco Data Center Network Manager (DCNM) receives new information, the Cisco DCNM client updates the map dynamically. By default, updates occur once a minute. You can see changes occur to the status of links and devices, such as links going down or VDC creation, deletion, or modification.

Because the map is always current, you can use it to troubleshoot ongoing network management issues.

You can modify and save the layout of device icons. The map also provides you quick access to configuring features for a managed device.

This section includes the following topics:

- [Map Views, page 9-2](#)
- [Layouts, page 9-5](#)
- [vPC Support, page 9-5](#)

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## Map Views

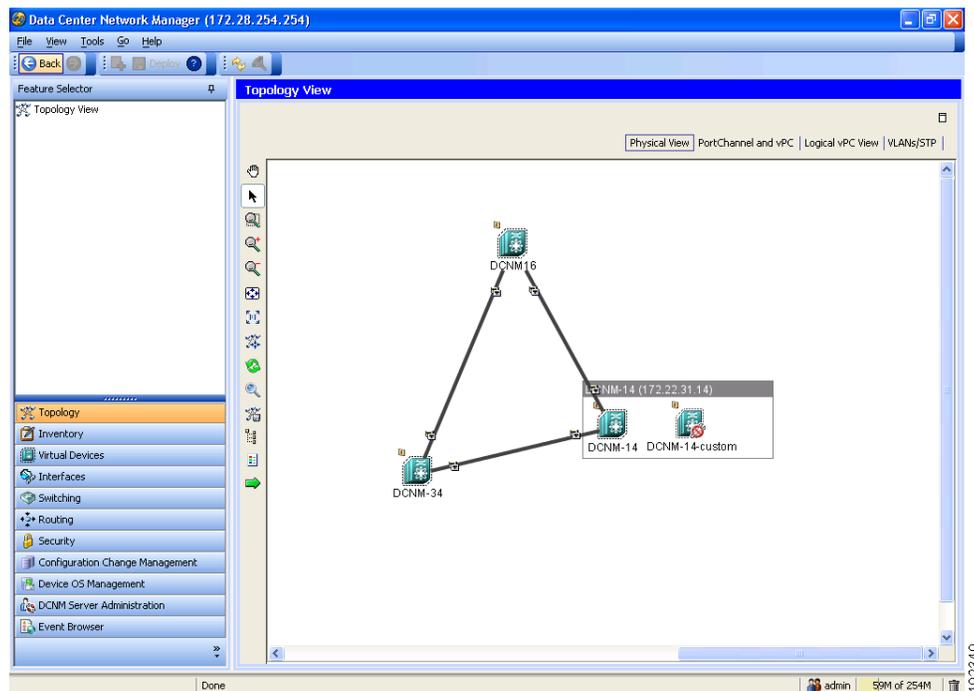
The topology map includes four views of your topology, described in the following topics:

- [Physical View](#), page 9-2
- [PortChannel and vPC](#), page 9-3
- [Logical vPC View](#), page 9-4
- [VLANs/STP](#), page 9-5

## Physical View

The Physical View (see [Figure 9-1](#)) shows the physical connections between discovered devices. This is the default topology view.

**Figure 9-1** Physical View of the Topology Map

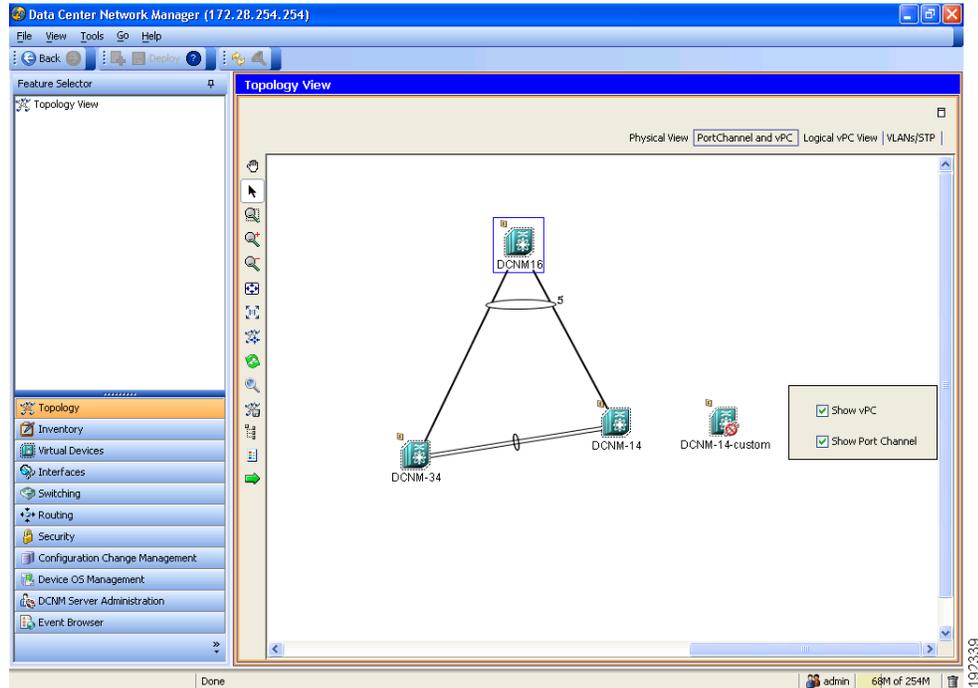


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## PortChannel and vPC

The PortChannel and vPC view (see [Figure 9-2](#)) shows all physical connections and all logical connections among discovered devices, including port channel links, virtual port channel (vPC) links, and vPC peer links. Physical links appear in gray in this view.

**Figure 9-2** PortChannel and vPC View of the Topology Map

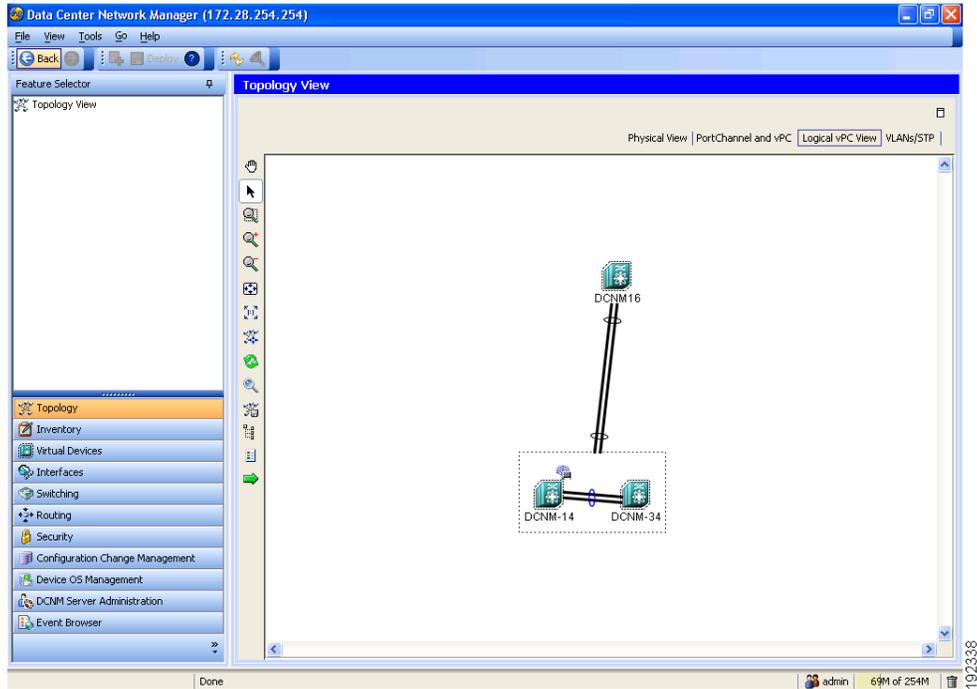


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## Logical vPC View

The Logical vPC View (see [Figure 9-3](#)) shows vPC links and vPC peer links among discovered devices, without showing the physical connections.

**Figure 9-3** Logical vPC View of the Topology Map

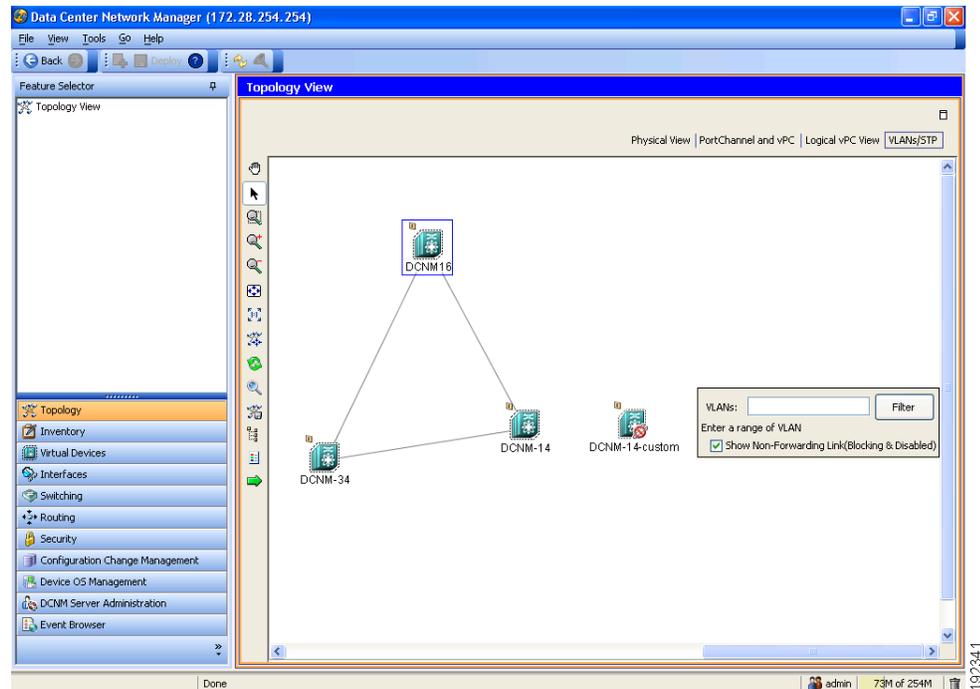


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## VLANs/STP

The VLANs/STP view (see [Figure 9-4](#)) shows VLANs configured among discovered devices.

**Figure 9-4** VLANs/STP View of the Topology Map



## Layouts

The topology map enables you to move devices to where you want them. You can save the layout so that the next time you use the topology map, devices are where you placed them. The Cisco DCNM client saves topology layouts as local user data on the computer that runs the Cisco DCNM client. When you are using the Cisco DCNM client, you do not have access to topology layouts that you saved on other computers or that you saved while logged in to the computer under a different username.

In addition to saved layouts, when you are using the Physical View, you can load one of the following layouts:

- Spring—Devices appear in locations determined by weighting the connections, which often produces a layout with minimal or no crossed connections.
- Tree—Devices appear in a tree unless connections create loops among the devices, in which case devices appear in a spanning tree, that is, a grid in which most of the connections follow the grid layout.

## vPC Support

The topology map provides the following additional vPC-specific features:

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- vPC creation—You can launch the vPC Creation Wizard from the PortChannel and vPC view. See the “[Launching the vPC Wizard](#)” section on page 9-11.
- Quick access to the vPC feature—You can access the configuration for a specific vPC from the PortChannel and vPC view or the Logical vPC View. See the “[Managing a vPC](#)” section on page 9-12.
- vPC configuration inconsistency—You can see vPC links and vPC peer links that have configuration inconsistencies. You can open the Resolve Configuration Consistency dialog box from the topology map. See the “[Finding and Resolving vPC Configuration Inconsistencies](#)” section on page 9-12.

## Licensing Requirements for Topology

The following table shows the licensing requirements for this feature:

Product	License Requirement
Cisco DCNM	The Topology feature requires no license; however, the Logical vPC View of the topology map requires a LAN Enterprise license. Any feature not included in a license package is bundled with the Cisco DCNM and is provided at no charge to you. For information about obtaining and installing a Cisco DCNM LAN Enterprise license, see the “ <a href="#">Installing Licenses</a> ” section on page 2-11.

## Prerequisites for Topology

Topology has the following prerequisites:

- The topology map shows only devices that Cisco DCNM has discovered.
- On devices shown in the topology map, CDP should be enabled both globally and specifically on interfaces used for device discovery.

## Guidelines and Limitations

Topology has the following configuration guidelines and limitations:

- While the Topology feature is an unlicensed feature, you must have a LAN Enterprise license to manage the nondefault VDCs of Nexus 7000 Series devices that appears in the topology.
- The Topology feature displays changes to the topology periodically as determined by the polling frequency for accounting and system logs. By default, the polling frequency is one minute. For more information, see the “[Information About Auto-Synchronization with Devices](#)” section on page 15-1.

## Using the Topology Feature

This section includes the following topics:

- [Opening the Topology Map](#), page 9-7
- [Understanding Device Icons and Links](#), page 9-8
- [Using the Viewing Tools](#), page 9-8

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- [Showing, Hiding, and Using the Details Pane](#), page 9-9
- [Launching the vPC Wizard](#), page 9-11
- [Managing a vPC](#), page 9-12
- [Finding and Resolving vPC Configuration Inconsistencies](#), page 9-12
- [Accessing Other Cisco DCNM Features from the Topology Map](#), page 9-13
- [Moving Devices in the Topology Map](#), page 9-14
- [Loading a Layout](#), page 9-14
- [Reloading the Previously Saved Layout](#), page 9-15
- [Exporting the Topology as a JPG Image](#), page 9-16

## Opening the Topology Map

You can open the topology map to view the topology of discovered devices.

### DETAILED STEPS

To view the topology, follow these steps:

- Step 1** From the Feature Selector pane, choose **Topology > Topology View**.
- The topology map appears in the Contents pane. Buttons for each of the available topology views appear above the topology map.
- Step 2** (Optional) If you want to change topology views, click the topology view name.
- The topology map shows the view of the topology that you selected.
- Step 3** (Optional) If you want to use a view-specific option, see the following table:

View Feature	Available In View	How to Use
Show/hide all VDCs	<ul style="list-style-type: none"> <li>• Physical View</li> <li>• VLANs/STP</li> </ul>	<p>Right-click in a blank space on the map and choose <b>Show All VDCs</b> or <b>Hide All VDCs</b>.</p> <p>When you view all VDCs, Cisco Nexus 7000 Series devices appear as gray boxes that contain device icons for each VDC configured on the Cisco Nexus 7000 Series device.</p>
Filter VLANs	<ul style="list-style-type: none"> <li>• VLANs/STP</li> </ul>	<ol style="list-style-type: none"> <li>1. On the map, find the VLANs box.</li> <li>2. Enter a list of VLAN IDs. You can specify a single VLAN ID, a range of VLAN IDs, or comma-separated IDs and ranges.</li> <li>3. Click <b>Filter</b>.</li> </ol>
Show/hide non-forwarding links	<ul style="list-style-type: none"> <li>• VLANs/STP</li> </ul>	<ol style="list-style-type: none"> <li>1. On the map, find the VLANs box.</li> <li>2. Check or uncheck the <b>Show Non-Forwarding Link (Blocking &amp; Disabled)</b> as needed.</li> </ol>

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View Feature	Available In View	How to Use
Show/hide vPCs or port channels	<ul style="list-style-type: none"> <li>PortChannel and vPC</li> </ul>	<ol style="list-style-type: none"> <li>On the map, find the gray box that contains the <b>Show vPC</b> check box and the <b>Show Port Channel</b> check box. You may need to scroll the map or zoom out to locate the gray box.</li> <li>Check or uncheck the check boxes as needed.</li> </ol>

## Understanding Device Icons and Links

To understand the device icons and links shown in the topology map, you can open the legend. The legend presents information about the device icons and links shown in the currently selected topology view.

### DETAILED STEPS

To open the legend, follow these steps:

- 
- Step 1** From the Feature Selector pane, choose **Topology > Topology View**.
- The topology map appears in the Contents pane. Buttons for each of the available topology views appear above the topology map.
- Step 2** (Optional) If you want to change topology views, click the topology view name.
- The topology map shows the view of the topology that you selected. The topology toolbar appears on the left side of the topology map.
- Step 3** From the topology tool bar, click the  icon.
- The Legend dialog box displays information about the device icons and links that may appear in the currently selected topology view.
- 

## Using the Viewing Tools

You can use the pan, select, zoom, and search tools to view the topology map.

The following table describes the viewing tools that are available in the topology toolbar, which is on the left side of the topology map.

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Viewing Tool Icon and Name	How to Use
 Pan	Moves, or pans, the map. <ol style="list-style-type: none"> <li>1. Click the  icon.</li> <li>2. Click anywhere on the topology map, and hold down the mouse button.</li> <li>3. Drag the map in any direction.</li> <li>4. Release the mouse button.</li> </ol>
 Select	Allows you to select a device, link, or port icon. <ol style="list-style-type: none"> <li>1. Click the  icon.</li> <li>2. Click the device, link, or port icon that you want to work with. A balloon displays information about the icon that you clicked.</li> </ol>
 Zoom in Rect	Zooms to a specific portion of the map. <ol style="list-style-type: none"> <li>1. Click the  icon.</li> <li>2. Click on the map and drag a rectangle over the area that you want to see, and release the mouse button.</li> </ol>
 Zoom In	Zooms in. Click the  icon.
 Zoom Out	Zooms out. Click the  icon.
 Fit to View	Fit the entire topology of discovered devices within the topology map. Click the  icon.
 Reset Zoom	Resets the zoom to the default magnification. Click the  icon.
 Search	Allows you to use the device search tool, so that you can search for a device by its name. <ol style="list-style-type: none"> <li>1. To show the Search tool on the map, click the  icon.</li> <li>2. In the Device box, enter all or some of the name of the device that you want to search for, and then click the  icon.</li> <li>3. To hide the Search tool, click the  icon again.</li> </ol> <p><b>Tip</b> You can move the Search tool on the topology map by clicking and dragging it when you have the Select tool enabled.</p>
 Legend	Opens the Legend dialog box. See the <a href="#">“Understanding Device Icons and Links” section on page 9-8</a> .

## Showing, Hiding, and Using the Details Pane

You can show or hide the Details pane within the topology map. When you are showing the Details pane, you can use the sections within the Details pane to learn about the devices and connections in the topology.

### DETAILED STEPS

To show, hide, or use the Details pane, follow these steps:

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**Step 1** From the Feature Selector pane, choose **Topology > Topology View**.

The topology map appears in the Contents pane. The topology toolbar appears on the left side of the topology map.



**Tip** To see the names of topology toolbar icons, move the mouse pointer to the icon and wait briefly for the name of the icon to appear.

**Step 2** To show or hide details, click the  icon.

When you choose to show details, the Details pane appears between the topology toolbar and the topology map.



**Tip** Ensure that the Select tool is selected. To select the Select tool, click the  icon.

**Step 3** To use the sections within the Details pane, see the following table:

Section	Available In	How to Use
VDC View	<ul style="list-style-type: none"> <li>Physical View</li> <li>VLANs/STP</li> </ul>	Explore the VDC View tree to see which Nexus 7000 Series devices contain VDCs. To see details about a device, click on it and see the Properties section.
vPC	<ul style="list-style-type: none"> <li>Port Channel and vPC</li> <li>Logical vPC</li> </ul>	Explore the vPC tree to see a categorized listing of all logical connections in the topology map. To see details about a vPC, vPC peer link, or a port channel, click on it and see the Properties section.
Overview	<ul style="list-style-type: none"> <li>All views</li> </ul>	<p><b>Tip</b> To view the Overview section, you may need to click the Overview tab in the Properties section. The Overview and Properties sections share the same section title bar.</p> <p>The Overview section shows a thumbnail view of the whole topology. A blue rectangle indicates the portion of the topology that is currently shown in the map.</p> <ul style="list-style-type: none"> <li>To change which portion of the topology is shown in the map, in the overview, click where you want the map to show.</li> <li>To zoom in or out, click a corner of the blue rectangle and drag it until the map is enlarged or shrunk as you want.</li> </ul>

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Section	Available In	How to Use
Properties	<ul style="list-style-type: none"> <li>All views</li> </ul>	<p><b>Tip</b> To view the Properties section, you may need to click the Properties tab in the Overview section. The Overview and Properties sections share the same section title bar.</p> <ol style="list-style-type: none"> <li>Do one of the following: <ul style="list-style-type: none"> <li>In the VDC View section, click on a physical or virtual device.</li> <li>In the vPC section, click on a logical connection.</li> <li>In the topology map, click on a device, link, or port.</li> </ul> </li> <li>In the Properties section, view the properties of the object that you selected.</li> </ol>

## Launching the vPC Wizard

From the topology map, you can launch the vPC wizard to create a vPC.

### BEFORE YOU BEGIN

Determine which two devices you want to use as the vPC peer switches.

### DETAILED STEPS

To launch the vPC wizard, follow these steps:

**Step 1** From the Feature Selector pane, choose **Topology > Topology View**.

The topology map appears in the Contents pane.

**Step 2** Above the map, click **PortChannel and vPC**.

The map shows the PortChannel and vPC view of the topology.

**Step 3** From the topology toolbar, choose the  icon.

**Step 4** Click one device that you want to use as a vPC peer switch.

**Step 5** Press and hold the **Shift** key.

**Step 6** Click the device that you want to use as a vPC peer switch.

**Step 7** Right-click either device and choose **Launch vPC Wizard**.

The vPC Creation Wizard dialog box appears.

For more information about using this wizard, see the *Cisco DCNM Interfaces Configuration Guide, Release 4.x*.

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## Managing a vPC

From the topology map, you can access the vPC feature for a specific vPC link.

### DETAILED STEPS

To manage a vPC, follow these steps:

- 
- Step 1** From the Feature Selector pane, choose **Topology > Topology View**.  
The topology map appears in the Contents pane.
- Step 2** Above the map, click one of the following views:
- **PortChannel and vPC**
  - **Logical vPC View**
- Step 3** Locate the vPC link for the vPC that you want to manage.
- Step 4** Use the step that applies to the view that you selected:
- PortChannel and vPC—Right-click the ellipse on the vPC link and choose **Manage vPC**.
  - Logical vPC View—Right-click the vPC link and choose **Manage vPC**.

The vPC feature appears. The vPC that you want to manage is selected in the summary table.

For more information about the vPC feature, see the *Cisco DCNM Interfaces Configuration Guide, Release 4.x*.

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## Finding and Resolving vPC Configuration Inconsistencies

You can use the topology map to find vPCs that have configuration inconsistencies and open the Resolve Configuration Inconsistency dialog box.

### DETAILED STEPS

To find and resolve vPC configuration inconsistencies, follow these steps:

- 
- Step 1** From the Feature Selector pane, choose **Topology > Topology View**.  
The topology map appears in the Contents pane.
- Step 2** Above the map, click one of the following views:
- **PortChannel and vPC**
  - **Logical vPC View**
- Step 3** Locate the vPC for which you want to resolve configuration inconsistencies.  
If a vPC link has configuration inconsistencies, a red ellipse appears over the link. If you use the PortChannel and vPC view, vPC peer links with configuration inconsistencies also show a red ellipse.
- Step 4** (Optional) If you want to resolve configuration inconsistencies now, do one of the following:
- To resolve configuration inconsistencies for the vPC link *and* the vPC peer link, right-click the red ellipse on the vPC link and choose **Launch Configuration Consistency**.

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- To resolve configuration inconsistencies for the vPC peer link only, right-click the red ellipse on the vPC link and choose **Launch Configuration Consistency**.

The Resolve Configuration Inconsistency dialog box opens.

For more information about using the Resolve Configuration Inconsistencies dialog box, see the *Cisco DCNM Interfaces Configuration Guide, Release 4.x*.

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## Accessing Other Cisco DCNM Features from the Topology Map

You can use the topology map to access other features for managed devices. From the topology map, you can access features that are found in the following Feature Selector drawers:

- Inventory
- Virtual Devices
- Interfaces
- Routing
- Switching
- Security

You can also use the topology map to access the Device Discovery feature.

### DETAILED STEPS

To access a feature from the topology map, follow these steps:

---

**Step 1** From the Feature Selector pane, choose **Topology > Topology View**.

The topology map appears in the Contents pane. The topology toolbar appears on the left side of the topology map.



**Note** To see the names of topology toolbar icons, move the mouse pointer to the icon and wait briefly for the name of the icon to appear.

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**Step 2** If you want to access a Cisco DCNM feature for a specific managed device, do the following:

- a. Find the device in the topology map.
- b. Right-click the device and choose the feature that you want to configure.

The feature that you selected appears in the Contents pane. The device that you selected on the topology map is selected in the Summary table for the feature.

**Step 3** If you want to access the Device Discovery feature, right-click a blank area on the map and choose **Discover Devices**.

The Device Discovery feature appears in the Contents pane.

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## Moving Devices in the Topology Map

You can move device icons that are shown in the topology map. The position of devices is shared by all the topology views, that is, if you move a device and then change to another topology view, the device remains where you moved it to.

You can also save the layout, which you can reload later if you make additional changes and want to revert to your last save. For more information, see the [“Reloading the Previously Saved Layout” section on page 9-15](#).

The saved layout becomes the default layout that you see in the topology map when you start the Cisco DCNM client.



### Note

The Cisco DCNM client saves topology layouts as local user data on the computer that runs the Cisco DCNM client. When you are using the Cisco DCNM client, you do not have access to topology layouts that you saved on other computers or that you saved while logged in to the computer under a different username.

### DETAILED STEPS

To move devices in the topology map, follow these steps:

**Step 1** From the Feature Selector pane, choose **Topology > Topology View**.

The topology map appears in the Contents pane. The topology toolbar appears on the left side of the topology map.



**Note** To see the names of topology toolbar icons, move the mouse pointer to the icon and wait briefly for the name of the icon to appear.

**Step 2** From the topology toolbar, choose the  icon.

**Step 3** Find and move device icons as needed. To move an icon, click on the device icon, hold down the mouse button, drag the icon to the new location, and release the mouse button.

You can zoom and pan as needed to find icons. For more information, see the [“Using the Viewing Tools” section on page 9-8](#).

**Step 4** (Optional) If you want to save the changes to the device icon layout, click the  icon.

## Loading a Layout

When you are using the Physical View, you can choose to load a layout. The position of devices is shared by all the topology views. This behavior allows you to use any of the layouts in all views by loading the layout in the Physical View and then choosing another view.



### Note

If you are using a different view than the Physical View, the  icon on the topology toolbar acts the same as the  icon. For information about using the  icon, see the [“Reloading the Previously Saved Layout” section on page 9-15](#).

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## BEFORE YOU BEGIN

Determine which physical devices, if any, that you want to specify as core switches. When you load a layout other than a saved layout, core switches appear at the top of the topology map, and devices that are one CDP hop from the core switches appear just below them.

## DETAILED STEPS

To load a topology layout in Physical View, follow these steps:

---

**Step 1** From the Feature Selector pane, choose **Topology > Topology View**.

The topology map appears in the Contents pane. The topology toolbar appears on the left side of the topology map.



**Note** To see the names of topology toolbar icons, move the mouse pointer to the icon and wait briefly for the name of the icon to appear.

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**Step 2** (Optional) For each physical device that you want to appear at the top of the layout, right-click on the device icon and choose **Make as Core Switch**.

**Step 3** From the topology toolbar, click the  icon.

The Layout drop-down list appears.

**Step 4** From the **Layout** drop-down list, select the layout that you want to load.

The Physical View of the topology map changes to the layout that you selected. Any devices that you specified as core switches appear at the top of the map, with devices that are one CDP hop away from the core switches appearing just below them.

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## Reloading the Previously Saved Layout

You can load the most recently saved layout. This feature allows you to undo changes to device placement that you have made since you last saved the layout.



**Note** The Cisco DCNM client saves topology layouts as local user data on the computer that runs the Cisco DCNM client. When you are using the Cisco DCNM client, you do not have access to topology layouts that you saved on other computers or that you saved while logged in to the computer under a different username.

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## DETAILED STEPS

To reload the most recent saved topology layout, follow these steps:

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**Step 1** From the Feature Selector pane, choose **Topology > Topology View**.

The topology map appears in the Contents pane. The topology toolbar appears on the left side of the topology map.

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**Note** To see the names of topology toolbar icons, move the mouse pointer to the icon and wait briefly for the name of the icon to appear.

- Step 2** From the topology toolbar, choose the  icon.  
The topology map changes to the most recent layout that you saved.

## Exporting the Topology as a JPG Image

You can export, or save, a JPG image of the topology map. The JPG image created shows only the portion of the topology that appears in the Cisco DCNM client at the moment that you save the JPG file.

### DETAILED STEPS

To export the visible portion of the topology map as a JPG image, follow these steps:

- Step 1** From the Feature Selector pane, choose **Topology > Topology View**.  
The topology map appears in the Contents pane. The topology toolbar appears on the left side of the topology map.
-  **Note** To see the names of topology toolbar icons, move the mouse pointer to the icon and wait briefly for the name of the icon to appear.
- Step 2** View the portion of the topology map that you want to save. For more information, see the [“Using the Viewing Tools” section on page 9-8](#).
- Step 3** Arrange the device icons as desired. For more information, see the [“Moving Devices in the Topology Map” section on page 9-14](#).
- Step 4** From the topology toolbar, click the  icon.  
A dialog box appears.
- Step 5** Specify the location and filename of the JPG image and click **Save**.  
The JPG image of the visible portion of the topology map is saved.

## Related Documents

For additional information related to implementing Topology, see the following sections:

Related Topic	Document Title
VDCs	<i>Cisco DCNM Virtual Device Context Configuration Guide, Release 4.x</i>

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Related Topic	Document Title
vPCs	<i>Cisco DCNM Interfaces Configuration Guide, Release 4.x</i>
Device discovery	<a href="#">Administering Device Discovery, page 6-1</a>

## Feature History for Topology

Table 9-1 lists the release history for this feature.

**Table 9-1** Feature History for Topology

Feature Name	Releases	Feature Information
Topology	4.2(1)	Support for hierarchical and grid layouts was removed.
vPC support	4.1(2)	This feature was added to the topology map.
Multiple views	4.1(2)	This feature was added to the topology map.
Topology	4.1(2)	This feature was preexisting.

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