



## CHAPTER 6

# Administering Device Discovery

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This chapter describes how to administer the Device Discovery feature in the Cisco Data Center Network Manager (DCNM).

This chapter includes the following sections:

- [Information About Device Discovery, page 6-1](#)
- [Licensing Requirements for Device Discovery, page 6-3](#)
- [Prerequisites for Device Discovery, page 6-3](#)
- [Guidelines and Limitations for Device Discovery, page 6-3](#)
- [Performing Device Discovery, page 6-4](#)
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- [Field Descriptions for Device Discovery, page 6-7](#)
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## Information About Device Discovery

This section includes the following topics:

- [Device Discovery, page 6-1](#)
- [Cisco Discovery Protocol, page 6-2](#)
- [Credentials and Discovery, page 6-2](#)
- [Cisco NX-OS Device Preparation, page 6-2](#)
- [Virtualization Support, page 6-2](#)

## Device Discovery

The Device Discovery feature creates devices in Cisco DCNM by connecting to a Cisco NX-OS device and retrieving the running configuration of the device. Cisco DCNM can also discover Cisco NX-OS devices that are neighbors of the first device, which is known as the seed device.

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If the device supports virtual device contexts (VDCs), Cisco DCNM retrieves the running configuration of each virtual device context (VDC) that is configured on the physical device. Cisco DCNM displays each VDC as a device, including the default VDC. If the Cisco NX-OS device has only the default VDC, then device discovery creates only one device in Cisco DCNM.

When Cisco DCNM connects to a device to retrieve its configuration, it uses the XML management interface, which uses the XML-based Network Configuration Protocol (NETCONF) over Secure Shell (SSH). For more information, see the *Cisco NX-OS XML Management Interface User Guide, Release 4.x*.

## Cisco Discovery Protocol

Device discovery uses the Cisco Discovery Protocol (CDP) to find devices that are connected to the initial device in the discovery process. CDP exchanges information between adjacent devices over the data link layer. The exchanged information is helpful in determining the network topology and physical configuration outside of the logical or IP layer.

CDP allows Cisco DCNM to discover devices that are one or more hops beyond the first device (seed device) in the discovery process. When you start the discovery process using the Device Discovery feature, you can limit the number of hops that the discovery process can make.

After Cisco DCNM discovers a Cisco NX-OS device using CDP, it connects to the device and retrieves information, such as the running configuration of the device. The information collected allows Cisco DCNM to manage the device.

Cisco DCNM supports CDP hops on some Cisco switches that run Cisco IOS software. Although Cisco DCNM cannot manage these devices, the Topology feature allows you to see unmanaged devices and the CDP links between unmanaged devices and managed devices.

## Credentials and Discovery

Device discovery requires that you provide a username and password for a user account on the seed device. To successfully complete the discovery of a Cisco NX-OS device, the user account that you specify must be assigned to either the network-admin or the vdc-admin role.

If you want to discover devices that are one or more hops from the seed device, all devices in the chain of hops must be configured with a user account of the same username and password. All Cisco NX-OS devices in the chain of hops must assign the user account to the network-admin or the vdc-admin role.

## Cisco NX-OS Device Preparation

Before you perform device discovery, you should ensure that the Cisco NX-OS device configuration can support a successful discovery. For more information, see the [“Cisco NX-OS Device Configuration Requirements” section on page 1-5](#).

## Virtualization Support

When Cisco DCNM discovers a Cisco NX-OS device that supports VDCs, it determines how many VDC are on the Cisco NX-OS device. In Cisco DCNM, each VDC is treated as a separate device. The status of each VDC is tracked separately and you can configure each VDC independently of other VDCs on a Cisco NX-OS device.

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Before discovering a Cisco Nexus 7000 Series device that has non-default VDCs, ensure that each VDC meets the prerequisites for discovery. For more information, see the [“Prerequisites for Device Discovery”](#) section on page 6-3.

## Licensing Requirements for Device Discovery

The following table shows the licensing requirements for this feature:

| Product    | License Requirement   |
|------------|---|
| Cisco DCNM | Device Discovery requires no 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 Device Discovery

Prior to performing device discovery, you should be familiar with the following:

- VDCs
- CDP

Device Discovery has the following prerequisites:

- The Cisco DCNM server must be able to reach to devices that it discovers.
- Cisco NX-OS devices must be running a supported release of Cisco NX-OS. For information about supported releases of Cisco NX-OS, see the *Cisco DCNM Release Notes, Release 4.x*.
- The Cisco NX-OS device must have the minimal configuration that is required to enable device discovery to succeed. For more information, see the [“Cisco NX-OS Device Preparation”](#) section on page 6-2.
- For a Cisco Nexus 7000 Series device, each VDC that you want to discover must have a management interface configured. Cisco DCNM supports discovery of VDCs that are configured with a management interface that is the mgmt0 interface, which is an out-of-band virtual interface, or with an in-band Ethernet interface that is allocated to the VDC.
- To allow Cisco DCNM to discover devices that are CDP neighbors, CDP must be enabled both globally on each device and specifically on the device interfaces used for device discovery. For a Cisco Nexus 7000 Series device, CDP must be enabled globally in each VDC and on the management interface that each VDC is configured to use.

## Guidelines and Limitations for Device Discovery

The Device Discovery feature has the following configuration guidelines and limitations:

- Ensure that Cisco NX-OS devices that you want to discover have been prepared for discovery. For more information, see the [“Cisco NX-OS Device Configuration Requirements”](#) section on page 1-5.
- Cisco DCNM can manage only devices that run Cisco NX-OS. For more information about supported device operating systems and supported device hardware, see the *Cisco DCNM Release Notes, Release 4.x*.

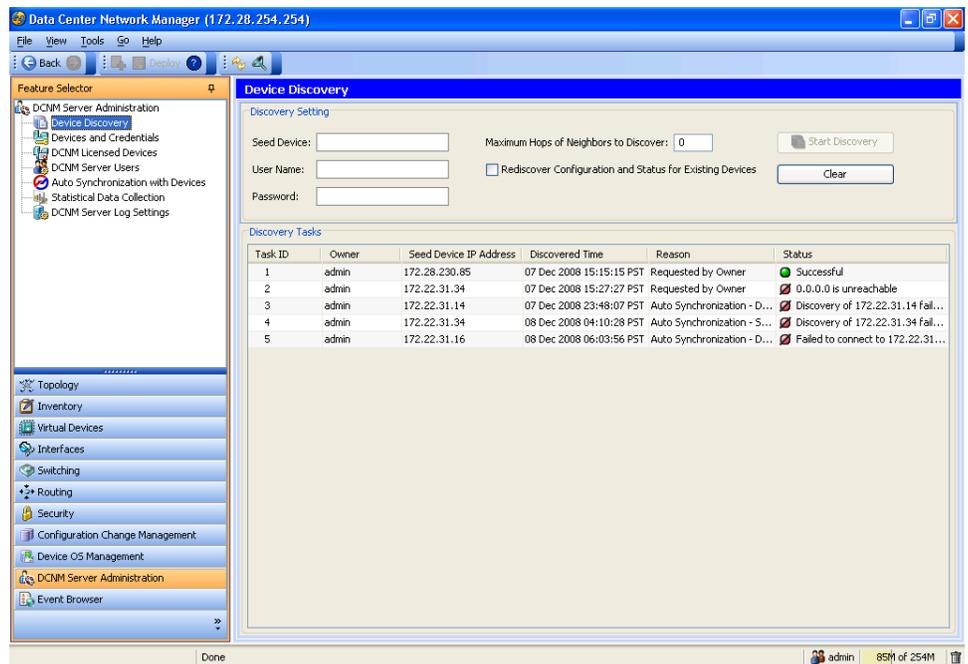
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- CDP-based discovery of devices requires that all devices in the chain of CDP hops use the same username and password specified for the seed device. If your security practices do not allow the same username and password to be used on each device, you can perform device discovery for each device individually.
- Devices that are CDP hops but which are not running Cisco IOS software appear in the Topology feature but cannot be managed by Cisco DCNM.

## Performing Device Discovery

Figure 6-1 shows the Device Discovery content pane.

**Figure 6-1** Device Discovery Content Pane



This section includes the following topics:

- [Discovering Devices, page 6-4](#)
- [Rediscovering Devices, page 6-6](#)

## Discovering Devices

You can discover one or more devices. When a discovery task succeeds, Cisco DCNM retrieves the running configuration and status information of discovered Cisco NX-OS devices.

Use this procedure for the following purposes:

- To discover devices that are not currently managed by Cisco DCNM. For example, you should use this procedure when Cisco DCNM has not yet discovered any devices, such as after a new installation.

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- To discover devices that you have added to your network without rediscovering devices that Cisco DCNM already has discovered.
- To rediscover the topology when CDP links have changed, without rediscovering devices that Cisco DCNM has already discovered.

**Note**

You must successfully discover a Cisco NX-OS device before you can use Cisco DCNM to configure the device.

### BEFORE YOU BEGIN

Ensure that you have configured the Cisco NX-OS device so that the Cisco DCNM server can connect to it. For more information, see the [“Cisco NX-OS Device Configuration Requirements” section on page 1-5](#).

Determine the IPv4 address of the device that you want Cisco DCNM to connect to when it starts the discovery task. This is the seed device for the discovery.

Determine whether you want to discover devices that are CDP neighbors of the seed device. If so, determine the maximum number of hops from the seed device that the discovery process can make.

**Note**

The discovery process can perform complete discovery of neighbors only if the neighboring devices are configured with the same credentials as the seed device.

### DETAILED STEPS

To discover one or more Cisco NX-OS devices, follow these steps:

- Step 1** From the Feature Selector pane, choose **DCNM Server Administration > Device Discovery**.  
The discovery tasks appear in the Discovery Tasks area of the Contents pane.
- Step 2** In the Seed Device field, enter the IPv4 address of the device that you want Cisco DCNM to connect to when it starts the discovery task. Valid entries are in dotted decimal format.
- Step 3** In the User Name field, enter the username of a user account on the device. The user account must have a network-admin or vdc-admin role.
- Step 4** In the Password field, enter the password for the user account that you entered in the User Name field.
- Step 5** (Optional) If you want Cisco DCNM to discover devices that are CDP neighbors of the seed device, in the Maximum Hops of Neighbors to Discover field, enter the desired maximum number of hops. By default, the maximum hops is 0 (zero).
- Step 6** Ensure that **Rediscover Configuration and Status for Existing Devices** is unchecked. By default, this check box is unchecked.  
By leaving this check box unchecked, you enable Cisco DCNM to use previously discovered devices as CDP hops without retrieving their running configuration and status information.
- Step 7** Click **Start Discovery**.  
After a short delay, the discovery task appears at the bottom of the list of tasks in the Discovery Tasks area. Cisco DCNM updates the task status periodically.
- Step 8** Wait until the status for the task is Successful. This step may take several minutes.

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After the status is Successful, you can use Cisco DCNM to configure and monitor the discovered devices.

You do not need to save your changes.

## Rediscovering Devices

You can rediscover one or more devices.



### Note

Rediscovery replaces any configuration data that Cisco DCNM has for a Cisco NX-OS device with the configuration data retrieved during the rediscovery. If you need to discover one or more devices without retrieving configuration and status information for already discovered devices, see the [“Discovering Devices” section on page 6-4](#).

You must successfully discover a Cisco NX-OS device before you can use Cisco DCNM to configure the device.

### BEFORE YOU BEGIN

Ensure that you have configured the Cisco NX-OS device so that the Cisco DCNM server can connect to it. For more information, see the [“Cisco NX-OS Device Preparation” section on page 6-2](#).

### DETAILED STEPS

To rediscover one or more Cisco NX-OS devices, follow these steps:

- Step 1** From the Feature Selector pane, choose **DCNM Server Administration > Device Discovery**.  
The discovery tasks and their status appear in the Discovery Tasks area of the Contents pane.
- Step 2** In the Seed Device field, enter the IPv4 address of the device that you want Cisco DCNM to connect to when it starts the discovery task. Valid entries are in dotted decimal format.
- Step 3** In the User Name field, enter the username of a user account on the device. The user account must have a network-admin or vdc-admin role.
- Step 4** In the Password field, enter the password for the user account that you entered in the User Name field.
- Step 5** (Optional) If you want Cisco DCNM to rediscover devices that are CDP neighbors of the seed device, in the Maximum Hops of Neighbors to Discover field, enter the desired maximum number of hops. By default, the maximum hops is 0 (zero).
- Step 6** Check **Rediscover Configuration and Status for Existing Devices**. By default, this check box is unchecked.  
  
By checking this check box, you enable Cisco DCNM to replace any configuration and status information that it has about a previously discovered device with the running configuration and status information retrieved from the device.
- Step 7** Click **Start Discovery**.  
  
After a short delay, the discovery task appears at the bottom of the list of tasks in the Discovery Tasks area. Cisco DCNM updates the task status periodically.
- Step 8** Wait until the status for the task is Successful. This step may take several minutes.

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After the status is Successful, you can use Cisco DCNM to configure and monitor the discovered devices.

You do not need to save your changes.

## Viewing the Status of Device Discovery Tasks

To view the status of device discovery tasks, from the Feature Selector pane, choose **DCNM Server Administration > Device Discovery**.

The tasks, including the task status, appear in the Discovery Tasks area in the Contents pane. For information about the fields that appear, see the “[Field Descriptions for Device Discovery](#)” section on page 6-7.

## Where to Go Next

View the discovered devices and configure unique device credentials, as needed. For more information, see the “[Administering Devices and Credentials](#)” section on page 7-1.

## Field Descriptions for Device Discovery

This section includes the following field descriptions for the Device Discovery feature:

- [Device Discovery Content Pane, page 6-7](#)
- [Related Fields, page 6-8](#)

## Device Discovery Content Pane

**Table 6-1**      *Device Discovery Content Pane*

| Field                                 | Description   |
|---------------------------------------|---|
| <b>Discovery Setting</b>              |   |
| Seed Device                           | IPv4 address of the first device that you want to discover. Valid entries are in dotted decimal format. By default, this field is blank.  |
| User Name                             | Name of the device user account that the Cisco DCNM server uses to access the device. The user account must have network-admin or vdc-admin privileges on the device. By default, this field is blank.  |
| Password                              | Password for the device user account specified in the User Name field. By default, this field is blank.   |
| Maximum Hops of Neighbors to Discover | Largest permissible number of CDP hops between the Cisco DCNM server and the device. If the server connects to the device but exceeds this number of hops, the discovery fails. The default setting is 0 (zero), which disables the discovery of neighboring devices. |

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**Table 6-1** Device Discovery Content Pane (continued)

| Field  | Description  |
|--|--|
| Rediscover Configuration and Status for Existing Devices | Whether the discovery task you are configuring is to replace an existing device discovery that has already completed. By default, this check box is unchecked.   |
| <b>Discovery Tasks</b>                                   |  |
| Task ID  | <i>Display only.</i> Number assigned to the discovery task. The task ID indicates the order in which discovery tasks occurred.   |
| Owner  | <i>Display only.</i> Cisco DCNM server user account used to start the discovery task.  |
| Seed Device IP Address                                   | <i>Display only.</i> IPv4 address of the seed device.  |
| Discovered Time  | <i>Display only.</i> Date and time of the most recent update to the Status field.  |
| Status   | <i>Display only.</i> State of the discovery task. Valid values are as follows: <ul style="list-style-type: none"> <li>• In progress—The discovery tasks are ongoing.</li> <li>• Successful—The discovery task completed without errors.</li> <li>• Failed—The discovery task completed with errors.</li> </ul> |

## Related Fields

For information about fields that configure devices, see the “[Administering Devices and Credentials](#)” section on page 7-1.

## Additional References for Device Discovery

For additional information related to device discovery, see the following sections:

- [Related Documents, page 6-8](#)
- [Standards, page 6-8](#)

## Related Documents

| Related Topic                        | Document Title  |
|--------------------------------------|---|
| Cisco NX-OS XML management interface | <i>Cisco NX-OS XML Management Interface User Guide, Release 4.x</i> |

## Standards

| Standards                                    | Title                    |
|--|--------------------------|
| NETCONF protocol over the Secure Shell (SSH) | <a href="#">RFC 4742</a> |

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## Feature History for Device Discovery

Table 6-2 lists the release history for this feature.

**Table 6-2** *Feature History for Device Discovery*

| <b>Feature Name</b> | <b>Releases</b> | <b>Feature Information</b> |
|---------------------|-----------------|----------------------------|
| Device Discovery    | 4.2(1)          | No change from Release 4.1 |
| Device Discovery    | 4.1(2)          | No change from Release 4.0 |

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