



CHAPTER 3

Creating VDCs

This chapter describes how to create virtual device contexts (VDCs) on NX-OS devices.

This chapter includes the following sections:

- [Information About Creating VDCs, page 3-1](#)
- [Licensing Requirements for VDCs, page 3-4](#)
- [Prerequisites for Creating VDCs, page 3-5](#)
- [Guidelines and Limitations, page 3-5](#)
- [Creating a VDC with the VDC Setup Wizard, page 3-5](#)
- [Additional References, page 3-11](#)
- [Feature History for Creating VDCs, page 3-12](#)

Information About Creating VDCs

In Cisco NX-OS, only a user with the network-admin role can create VDCs. You can create up to three VDCs.

This section includes the following topics:

- [VDC Resource Templates, page 3-1](#)
- [High-Availability Policies, page 3-2](#)
- [Allocating Interfaces, page 3-3](#)
- [VDC Management Connections, page 3-4](#)
- [Initializing a New VDC, page 3-4](#)

VDC Resource Templates

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 NX-OS software uses the default template. [Table 3-1](#) and [Table 3-2](#) list the default VDC resource template limits.

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Table 3-1 *Default VDC Resource Template Limits for Cisco NX-OS Release 4.0(1a) and Earlier Releases*

Resource	Minimum	Maximum
IPv4 route memory ¹	8	256
IPv6 route memory ¹	4	256
Port channels	0	256
SPAN sessions	0	2
VLANs	16	4094
VRFs ²	16	8192

1. Route memory limits are in megabytes.
2. VRFs = virtual routing and forwarding instances

Table 3-2 *Default VDC Resource Template Limits for Cisco NX-OS Release 4.0(2) and Later Releases*

Resource	Minimum	Maximum
IPv4 route memory ¹	8	320
IPv6 route memory ¹	4	192
Port channels	0	256
SPAN sessions	0	2
VLANs	16	4094
VRFs	16	8192

1. Route memory limits are in megabytes.



Note

You can have a maximum of two SPAN monitoring sessions on your physical device.

For information about configuring VDC resource templates, see [Chapter 2, “Configuring VDC Resource Templates.”](#)

You can change the individual resource limits after you create the VDC as follows:

- Change an individual resource limit for a single VDC.
- Change the resource limits in a nondefault VDC resource template and apply the template to the VDC.

For information on managing VDC resource limits after you create a VDC, see [Chapter 4, “Managing VDCs.”](#)

High-Availability Policies

The high-availability (HA) policies for a VDC defines the action the NX-OS software takes when an unrecoverable VDC fault occurs.

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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:

- Single supervisor module configuration:
 - 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 and recreates it using the startup configuration.
- Dual supervisor module configuration:
 - 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 and recreates it using the startup configuration.
 - Switchover—Initiates a supervisor module switchover.

The default HA policies for a nondefault VDC that you create is restart for a single supervisor modules 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.

For information on changing the HA policies after you create a VDC, see [Chapter 4, “Managing VDCs.”](#)

Allocating Interfaces

The only physical resources that you can allocate to a VDC are the physical interfaces. You can assign an interface to only one VDC. When you move an interface from one VDC to another VDC, the interface loses all its configuration.

When you first create a VDC, you can specifically allocate interfaces to it. All interfaces initially reside in the default VDC (VDC 1). After you allocate the interfaces to a VDC, you can only view and configure them from that specific VDC. You can also remove interfaces from a VDC by moving them back to the default VDC.



Caution

When you move an interface, all configuration on the interface is lost and the interfaces are in the down state.

You must be aware of the hardware architecture of your platform when allocating interfaces to a VDC. For example, the Cisco Nexus 7000 Series 32-port 10-Gbps Ethernet module (N7K-M132XP-12) requires that you assign all four interfaces in a port group to the same VDC

You can allocate the interfaces on your physical device in any combination, except for the interfaces on the Cisco Nexus 7000 Series 32-port 10-Gbps Ethernet module (N7K-M132XP-12). This module has eight port groups that consist of four interfaces each. You must you assign all four interfaces in a port group to the same VDC. [Table 3-3](#) shows the port numbering for the port groups.

Table 3-3 Port Numbers for Port Groups on the Cisco Nexus 7000 Series 32-port 10-Gbps Ethernet Module

Port Group	Port Numbers
Group 1	1, 3, 5, 7
Group 2	2, 4, 6, 8

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Table 3-3 Port Numbers for Port Groups on the Cisco Nexus 7000 Series 32-port 10-Gbps Ethernet Module

Port Group	Port Numbers
Group 3	9, 11, 13, 15
Group 4	10, 12, 14, 16
Group 5	17, 19, 21, 23
Group 6	18, 20, 22, 24
Group 7	25, 27, 29, 31
Group 8	26, 28, 30, 32

For more information on port groups on the Cisco Nexus 7000 Series 32-port 10-Gbps Ethernet module, see the *Cisco Nexus 7000 Series Hardware Installation and Reference Guide*.

For information changing the interface allocation after you create a VDC, see [Chapter 4, “Managing VDCs.”](#)

VDC Management Connections

The NX-OS software provides a virtual management (mgmt 0) interface for out-of-band management of each VDC. You can configure this interface with a separate IP address that is accessed through the physical mgmt 0 interface. You also use one of the Ethernet interfaces on the physical device for in-band management. For more information on management connections, see the [“VDC Management Connections” section on page 1-8.](#)

Initializing a New VDC

A new VDC is similar to a new physical device. You must set the VDC admin user account password and perform the basic configuration to establish connectivity to the VDC.

Licensing Requirements for VDCs

The following table shows the licensing requirements for this feature:

Product	License Requirement
DCNM	Creating nondefault VDCs requires an Advanced Services license. For a complete explanation of the DCNM licensing scheme, see the <i>Cisco DCNM Fundamentals Configuration Guide, Release 4.1</i> .
NX-OS	Creating nondefault VDCs requires an Advanced Services license. For a complete explanation of the NX-OS licensing scheme and how to obtain and apply licenses, see the <i>Cisco Nexus 7000 Series NX-OS Licensing Guide, Release 4.1</i> .
Note	The DCNM and NX-OS software allow a grace period to create and use nondefault VDCs without an Advanced Services license. If the grace period expires before you obtain a license, all VDC configuration is removed from the physical device.

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Prerequisites for Creating VDCs

VDC creation has the following prerequisites:

- You have discovered the physical device using a username that has the network-admin user role.
- The Advance Services license is installed.
- You have a name for the VDC.
- You have resources available on the physical device to allocate to the VDCs.
- You have an IPv4 or IPv6 address to use for configuring connectivity to the VDC.

Guidelines and Limitations

VDCs have the following guidelines and limitations:

- VDCs cannot share interfaces, VLANs, VRFs, or port channels.
- You can create a maximum of three VDCs on a physical device.
- Only users with the network-admin role can create VDCs.
- You can create VDCs only from the default VDC.

Creating a VDC with the VDC Setup Wizard

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 NX-OS software provides a default resource template or you can create resource templates.

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.

DETAILED STEPS

To create a VDC using the VDC Setup Wizard, follow these steps:

-
- Step 1** From the Feature Selector pane, choose **Virtual Devices**.
 - Step 2** From the Summary pane, click a physical device.
 - Step 3** From the menu bar, choose **Files > New > Create VDC...** to bring up the VDC Setup Wizard and display the VDC General Parameters dialog box (see [Figure 3-1](#)).

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Figure 3-1 VDC General Parameters Dialog

VDC Setup Wizard

Step 1 of 5: VDC General Parameters

Specify the VDC Name, Single Supervisor HA-Policy and Dual Supervisor HA-Policy.

Name:

Single Supervisor HA-Policy:

Dual Supervisor HA-Policy:

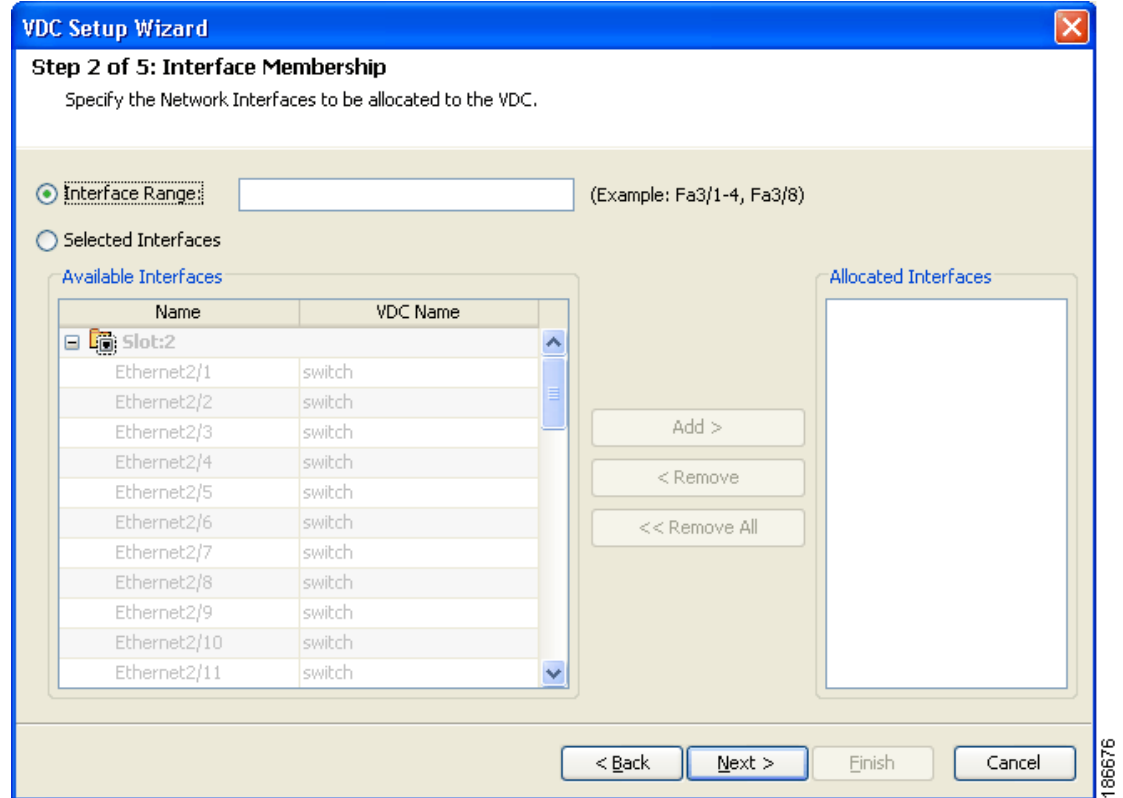
< Back Next > Finish Cancel

186675

- Step 4** In the Name field, enter the VDC name.
- Step 5** (Optional) In the Single Supervisor HA-Policy field, click the down arrow and choose the HA policy for the VDC when the physical device has a single supervisor module.
- Step 6** (Optional) In the Dual Supervisor HA-Policy field, click the down arrow and choose the HA policy for the VDC when the physical device has dual supervisor modules.
- Step 7** Click **Next**.
- The Interface Membership dialog box appears (see [Figure 3-2](#)).

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Figure 3-2 Interface Membership Dialog



Step 8 Choose the interfaces that you want to allocate to the VDC.



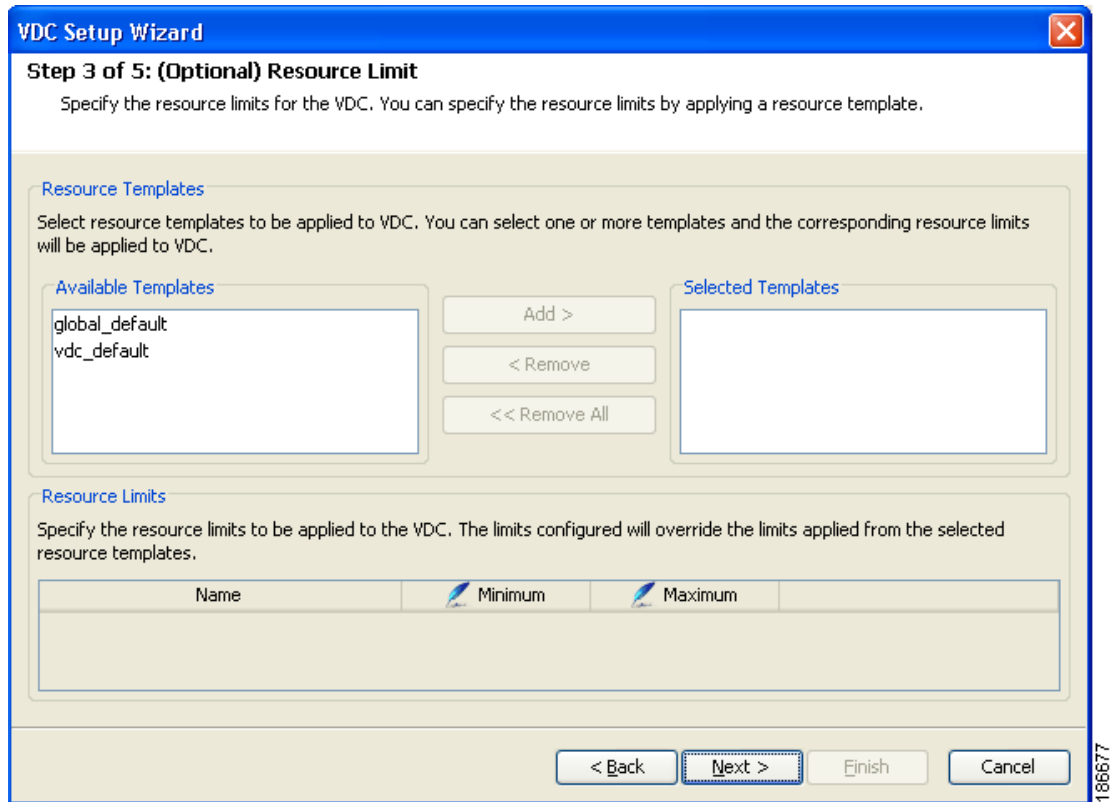
Note When you allocate an interface to a VDC, the interface configuration is lost.

Step 9 Click Next.

The Resource Limit dialog box appears (see [Figure 3-3](#)).

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Figure 3-3 Resource Limit Dialog Box



- Step 10** (Optional) To use one or more resource templates, follow these steps:
- To use a resource template, click a resource template name in the Available Templates list and click **Add**.
 - To remove a resource template, click a resource template name in the Selected Templates list and click **Remove**.
 - To remove all selected resource templates, click **Remove All**.



Note If you do not select a resource template, DCNM uses the default template.

- Step 11** (Optional) To set an individual resource limit, following these steps:
- Right-click in the Resource Limits area and choose **Add Resource Limit** from the pop-up menu. A new resource limit row appears in the Resource Limits area.
 - From the cell under Name, click the down arrow and choose a resource from the drop-down list.
 - Click the cell under Minimum and enter the minimum limit.
 - Click the cell under Maximum and enter the maximum limit.
 - To set additional resource limits, repeat Step a through Step d.
 - To remove a resource limit, right-click on the resource limit and choose **Delete Resource Limit** from the pop-up menu. The resource limit row disappears from the Resource Limits pane.

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Note If you do not set up resource limits, DCNM uses the default template resource limits.

Step 12 Click Next.

The Authentication dialog box appears (see [Figure 3-4](#)).

Figure 3-4 Authentication Dialog

VDC Setup Wizard

Step 4 of 5: Authentication
Specify the authentication method for login.

Authenticate users using local user database on VDC

User Name:

Password: Password Type:

Confirm Password:

Expiry Date:

Authenticate users using AAA Server Groups

Group Name:

Type:

Servers:

< Back Next > Finish Cancel

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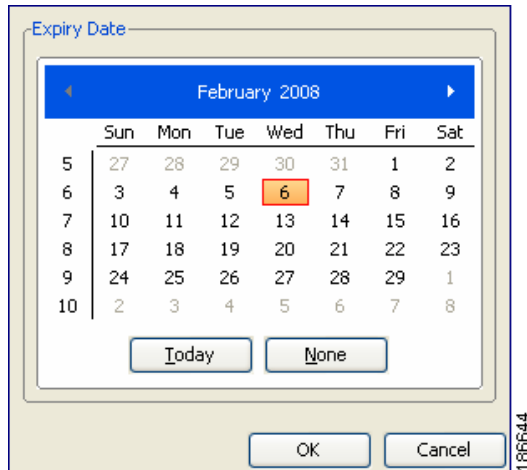
Step 13 In the Password field, enter the admin user password.

Step 14 In the Confirm Password field, reenter the admin user password.

Step 15 (Optional) In the Expiry Date field, click the down arrow and choose an expiry date for the admin user from the Expiry Date dialog box (see [Figure 3-5](#)).

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Figure 3-5 Expiry Date Dialog Box



- Step 16** (Optional) In the Password Type field, click the down arrow and choose from the drop-down menu.
- Step 17** (Optional) Check the **Authenticate users using AAA Servers** check box and enter the AAA server information as follows:
- In the Group Name field, enter an AAA server group name.
 - In the Type field, click the down arrow and choose the type of server group.
 - In the Servers field, enter one or more host server IPv4 or IPv6 addresses or names, separated by commas.
- Step 18** Click **Next**.

The Management of VDC dialog box appears (see [Figure 3-6](#)).

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Figure 3-6 Management of VDC Dialog

- Step 19** In the Management Interface area, enter the IPv4 or IPv6 address information.
- Step 20** In the SSH area, click the down arrows and choose the SSH key type and SSS key length.
- Step 21** In the Default Gateway area, enter the default IPv4 or IPv6 gateway address.
- Step 22** In the Discover the VDC area, uncheck the **Discover the VDC** check box to prevent automatic discovery.
- Step 23** Click **Finish**.



Note Creating a VDC can take a few minutes depending on the amount of resources that the device must reserve for the VDC.

- Step 24** Manually discover the VDC as described in the “[Discovering VDCs](#)” section on page 4-7.
- Step 25** From the menu bar, choose **File > Deploy** to apply your changes to the device.

Additional References

For additional information related to creating VDC, see the following sections:

- [Related Documents, page 3-12](#)

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Related Documents

Related Topic	Document Title
DCNM Licensing	<i>Cisco Nexus 7000 Series NX-OS Licensing Guide, Release 4.1</i>
NX-OS Licensing	<i>Cisco DCNM Fundamentals Configuration Guide, Release 4.1</i>
Cisco Nexus 7000 Series 32-port 10-Gbps Ethernet module	<i>Cisco Nexus 7000 Series Hardware Installation and Reference Guide</i>
Command reference	<i>Cisco Nexus 7000 Series NX-OS Virtual Device Context Command Reference, Release 4.1</i>

Feature History for Creating VDCs

[Table 3-4](#) lists the release history for this feature.

Table 3-4 Feature History for Creating VDCs

Feature Name	Releases	Feature Information
IPv4 unicast route memory resource	4.0(2)	Changed the default maximum value from 256 to 320.
IPv6 unicast route memory resource	4.0(2)	Changed the default maximum value from 256 to 192.