



## 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 3-5](#)
- [Prerequisites for Creating VDCs, page 3-5](#)
- [Guidelines and Limitations for Creating VDCs, page 3-5](#)
- [Creating a VDC with the VDC Setup Wizard, page 3-5](#)
- [Additional References for Creating VDCs, page 3-13](#)

## 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 3-3](#)
- [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](#) lists the resource limits for the default VDC template for non-default VDCs.

**Send document comments to [nexus7k-docfeedback@cisco.com](mailto:nexus7k-docfeedback@cisco.com).**

**Table 3-1 Default VDC Template Resource Limits for Non-Default VDCs**

Resource	Minimum	Maximum
Port channels	0	768
SPAN sessions	0	2
IPv4 multicast route memory <sup>1</sup>	8	8
IPv6 multicast route memory <sup>1</sup>	2	2
IPv4 unicast route memory <sup>1</sup>	8	8
IPv6 unicast route memory <sup>1</sup>	4	4
VLANs	16	4096
VRFs <sup>2</sup>	16	8192

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

Table 3-1 lists the resource limits for the global VDC template used for the default VDC.



**Note**

All resources not listed for the global VDC resource template default to the limits in the default VDC template listed in Table 3-1.

**Table 3-2 Global VDC Template Resource Limits for the Default VDC**

Resource	Minimum	Maximum
IPv4 multicast route memory <sup>1</sup>	48	48
IPv6 multicast route memory <sup>1</sup>	8	8
IPv4 unicast route memory <sup>1</sup>	16	16
IPv6 unicast route memory <sup>1</sup>	32	32

1. Route memory is 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.”](#)

***Send document comments to [nexus7k-docfeedback@cisco.com](mailto:nexus7k-docfeedback@cisco.com).***

## 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.

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 processes and interfaces and restarts 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 processes and interfaces and restarts 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 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.

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. the following Cisco Nexus 7000 Series Ethernet modules have four port groups that consist of two, four, eight, or twelve interfaces each, depending on the module:

- N7K-M148GS-11L, N7K-M148GT-11, and N7K-M148GS-11—There are no restrictions on the interface allocation between VDCs, but Cisco recommends that interfaces belonging to the same port group be in a single VDC.

***Send document comments to [nexus7k-docfeedback@cisco.com](mailto:nexus7k-docfeedback@cisco.com).***

- N7K-M132XP-12—Interfaces belonging to the same port group must belong to the same VDC. [Table 3-3](#) shows the port numbering for the port groups on this module.
- N7K-M108X2-12L—There are no restrictions on the interface allocation between VDCs.

**Table 3-3** *Port Numbers for Port Groups on the Cisco Nexus 7000 Series 32-port 10-Gbps Ethernet Module N7K-M132XP-12*

Port Group	Port Numbers
Group 1	1, 3, 5, 7
Group 2	2, 4, 6, 8
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 10-Gbps Ethernet modules, 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.

***Send document comments to [nexus7k-docfeedback@cisco.com](mailto:nexus7k-docfeedback@cisco.com).***

## 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.x</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 Cisco Nexus 7000 Series Switches Licensing Information at the following Cisco site:  <a href="http://www.cisco.com/en/US/products/ps9402/products_licensing_information_listing.html">http://www.cisco.com/en/US/products/ps9402/products_licensing_information_listing.html</a>
<b>Note</b>	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.

## 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 for Creating VDCs

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.

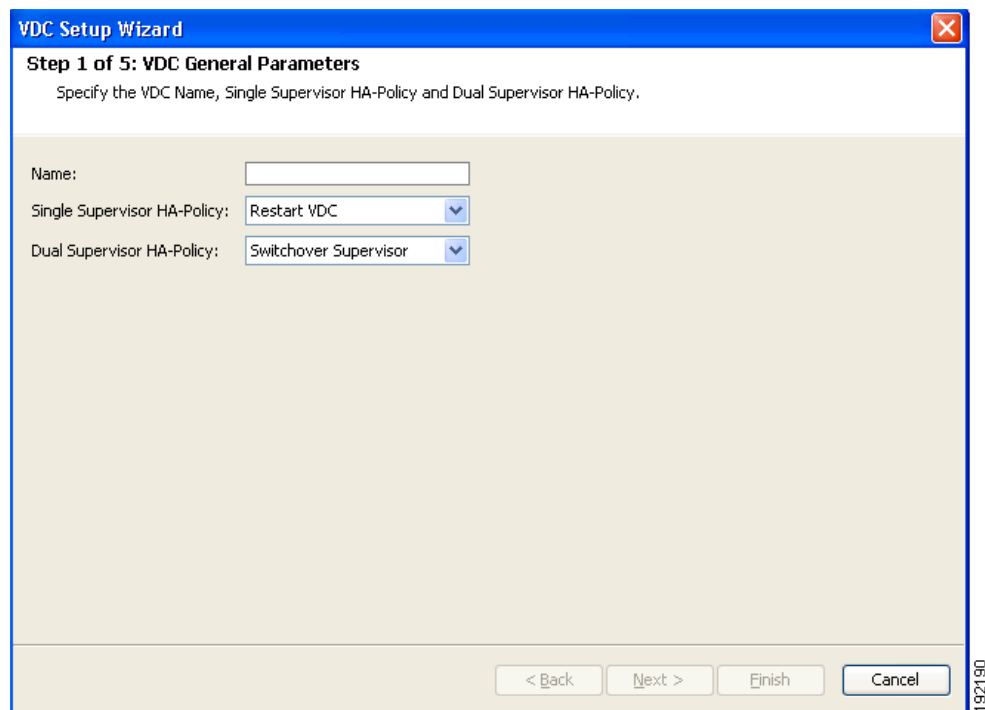
**Send document comments to [nexus7k-docfeedback@cisco.com](mailto:nexus7k-docfeedback@cisco.com).**

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

- 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 **File > New > Create VDC...** to bring up the VDC Setup Wizard and display the VDC General Parameters dialog box (see [Figure 3-1](#)).

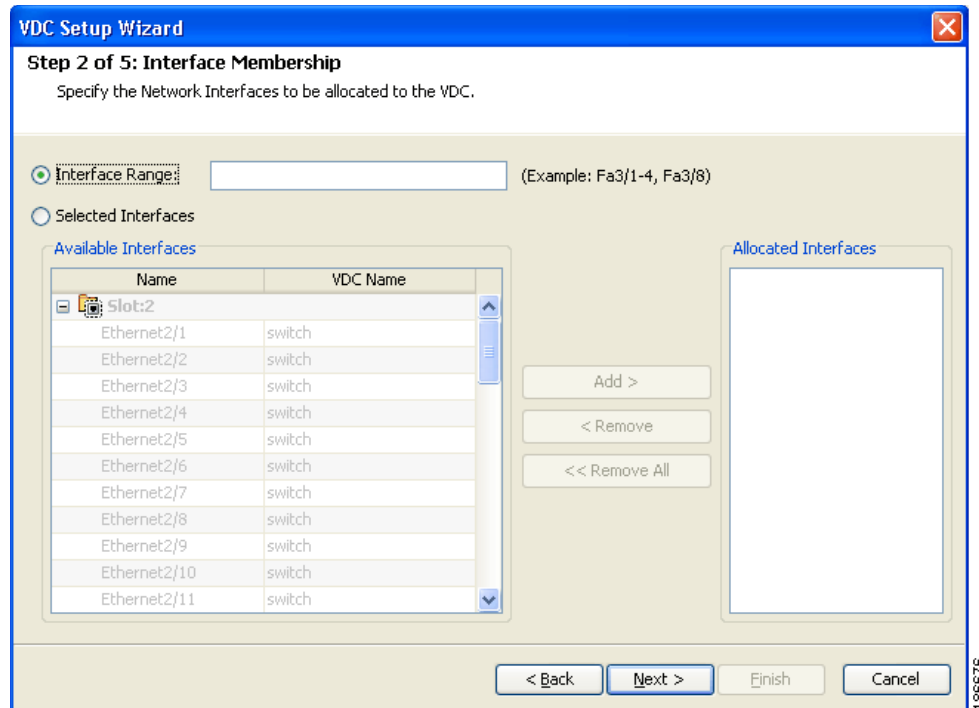
**Figure 3-1 VDC General Parameters Dialog**



- 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](#)).

**Send document comments to [nexus7k-docfeedback@cisco.com](mailto:nexus7k-docfeedback@cisco.com).**

**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.

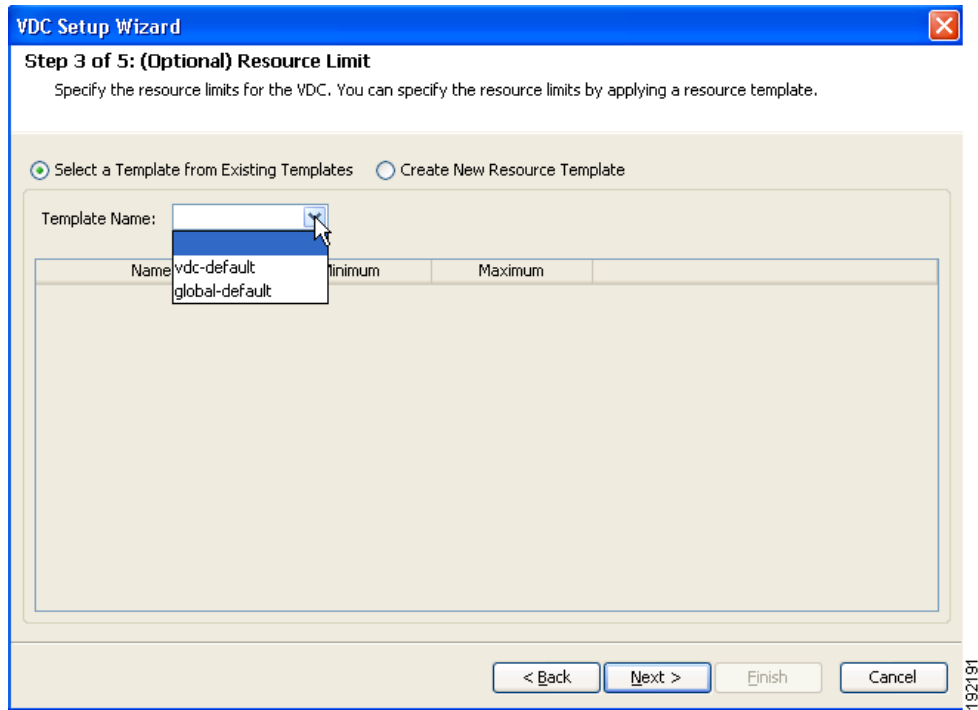
**Step 9** Click **Next**.

The Resource Limit dialog box appears.

**Step 10** (Optional) To use an existing resource templates, from the Template Name field, click on the down arrow and choose a resource template from the drop-down list (see [Figure 3-3](#)).

**Send document comments to [nexus7k-docfeedback@cisco.com](mailto:nexus7k-docfeedback@cisco.com).**

**Figure 3-3 Resource Limit Dialog Box Using an Existing Resource Template**



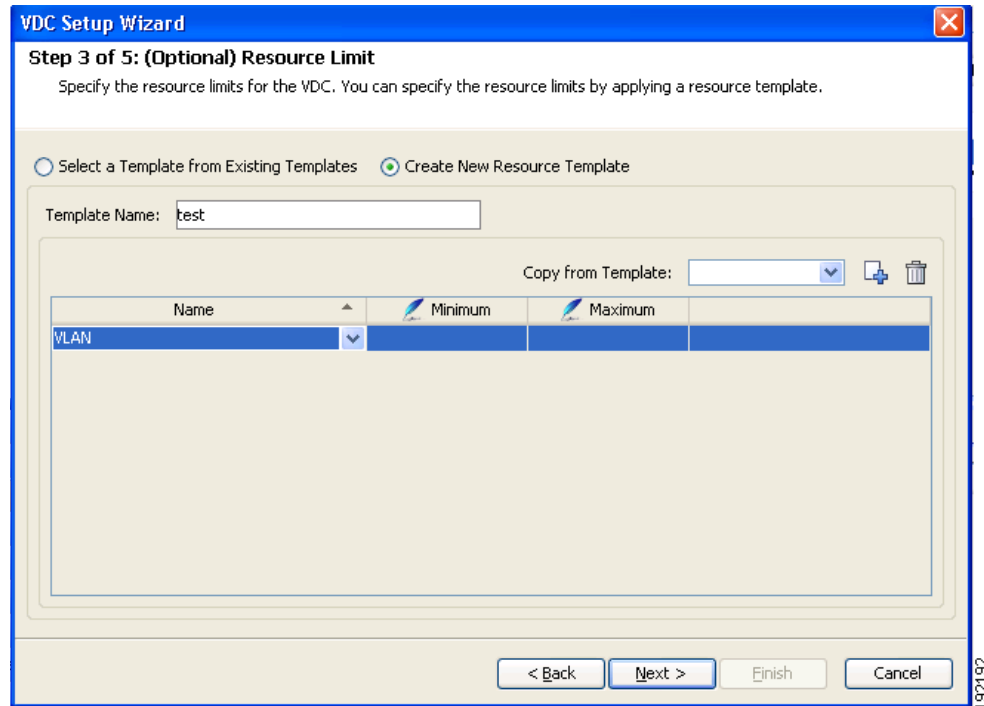
**Note** If you do not select a resource template, DCNM uses the vdc-default template.



- Step 11** (Optional) To create a new resource template, follow these steps:
- a. Click the **Create New Resource Template** radio button (see [Figure 3-4](#)).



**Send document comments to [nexus7k-docfeedback@cisco.com](mailto:nexus7k-docfeedback@cisco.com).**

**Figure 3-4 Resource Limit Dialog Box Creating a New Resource Template**



- b. From the Template Name field, enter the resource template name.
- c. Click the  icon to add a new resource row.  
A new resource limit row appears.
- d. From the cell under Name, click the down arrow and choose a resource from the drop-down list.
- e. Click the cell under Minimum and enter the minimum limit.
- f. Click the cell under Maximum and enter the maximum limit.
- g. To set additional resource limits, repeat Step c through Step f.
- h. (Optional) To delete a row, click the row to delete and click the  icon.  
The resource limit row disappears.

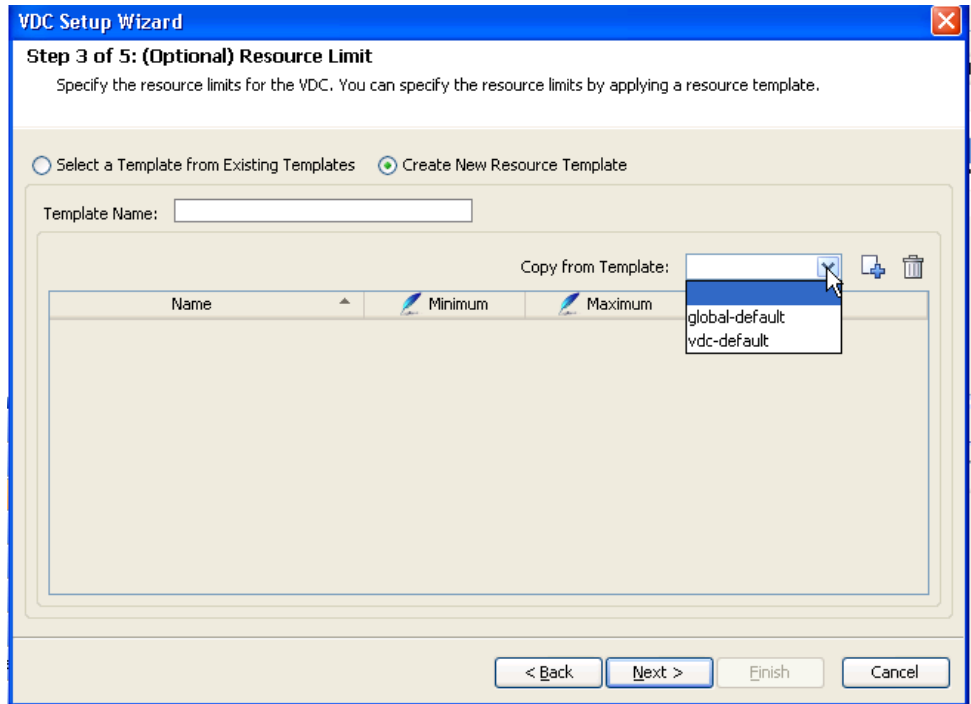



**Note** If you do not select a resource template, DCNM uses the vdc-default template.

- Step 12** (Optional) To create a new resource template from an existing resource template, follow these steps:
- a. Click the **Create New Resource Template** radio button.
  - b. From the Copy from Template field, click the down arrow and click a resource template (see [Figure 3-5](#)).

**Send document comments to [nexus7k-docfeedback@cisco.com](mailto:nexus7k-docfeedback@cisco.com).**

**Figure 3-5 Resource Limit Dialog Box Copying a Resource Template**





- c. (Optional) Modify the resource fields as needed.
- d. (Optional) To add a row, follow the procedure described in [Step 11](#).
- e. (Optional) To delete a row, click the row to delete and click the  icon.  
The resource limit row disappears.



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

**Step 13** (Optional) To change the resource limits, follow these steps:

- a. Click the  icon to add a new resource row.  
A new resource limit row appears.
- b. From the cell under Name, click the down arrow and choose a resource from the drop-down list.
- c. Click the cell under Minimum and enter the minimum limit.
- d. Click the cell under Maximum and enter the maximum limit.
- e. To change additional resource limits, repeat [Step a](#) through [Step f](#).
- f. (Optional) To delete a row, click the row to delete and click the  icon.  
The resource limit row disappears.



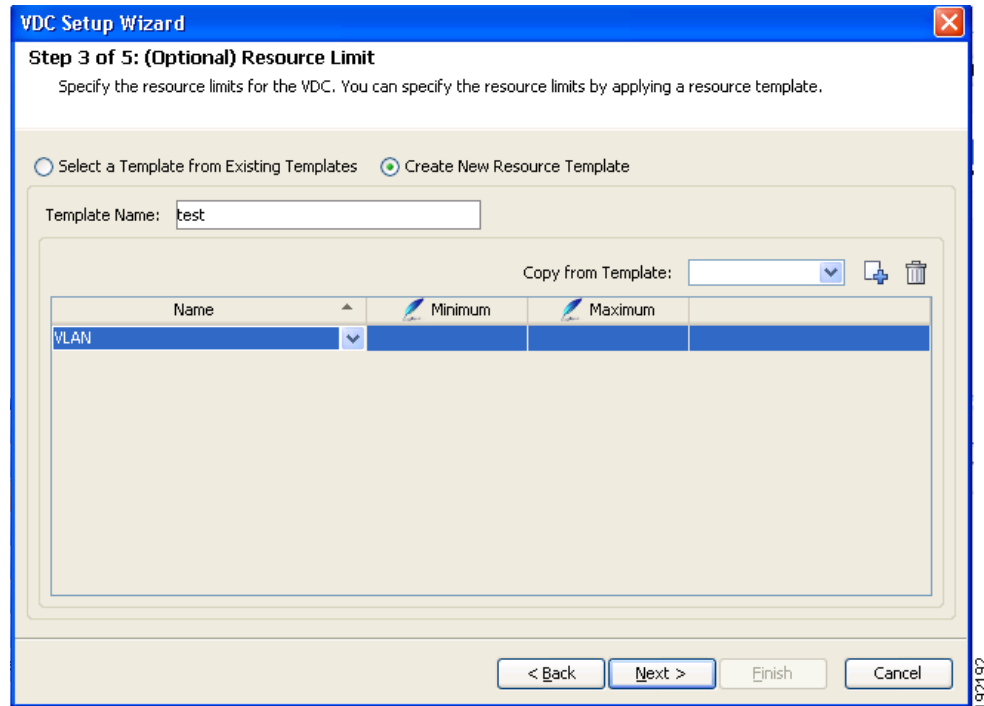
**Note** If you do not set up resource limits, DCNM uses the vdc-default template resource limits.

**Step 14** Click **Next**.

The Authentication dialog box appears (see [Figure 3-6](#)).

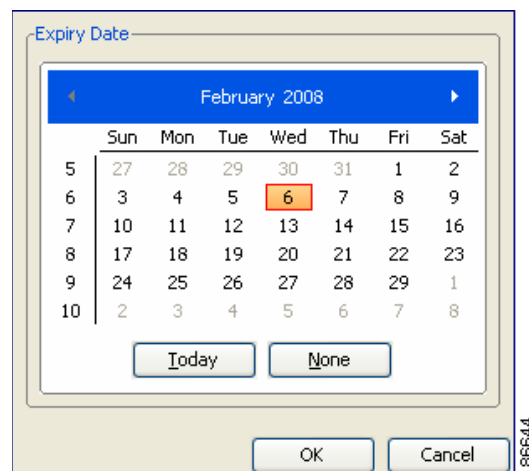
**Send document comments to [nexus7k-docfeedback@cisco.com](mailto:nexus7k-docfeedback@cisco.com).**

**Figure 3-6 Authentication Dialog**



- Step 15** In the Password field, enter the admin user password.
- Step 16** In the Confirm Password field, reenter the admin user password.
- Step 17** (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 3-7](#)).

**Figure 3-7 Expiry Date Dialog Box**



- Step 18** (Optional) In the Password Type field, click the down arrow and choose from the drop-down menu.
- Step 19** (Optional) Check the **Authenticate users using AAA Servers** check box and enter the AAA server information as follows:
  - a. In the Group Name field, enter an AAA server group name.

**Send document comments to [nexus7k-docfeedback@cisco.com](mailto:nexus7k-docfeedback@cisco.com).**

- b. In the Type field, click the down arrow and choose the type of server group.
- c. In the Servers field, enter one or more host server IPv4 or IPv6 addresses or names, separated by commas.

**Step 20** Click **Next**.

The Management of VDC dialog box appears (see [Figure 3-8](#)).

**Figure 3-8 Management of VDC Dialog**

**Step 21** In the Management Interface area, enter the IPv4 or IPv6 address information.

**Step 22** In the SSH area, click the down arrows and choose the SSH key type and SSS key length.

**Step 23** In the Default Gateway area, enter the default IPv4 or IPv6 gateway address.

**Step 24** In the Discover the VDC area, uncheck the **Discover the VDC** check box to prevent automatic discovery.

**Step 25** 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 26** Manually discover the VDC as described in the [“Discovering VDCs”](#) section on page 4-7.

**Step 27** From the menu bar, choose **File > Deploy** to apply your changes to the device.

***Send document comments to [nexus7k-docfeedback@cisco.com](mailto:nexus7k-docfeedback@cisco.com).***

## Additional References for Creating VDCs

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

- [Related Documents for Creating VDCs, page 3-13](#)

### Related Documents for Creating VDCs

Related Topic	Document Title
DCNM Licensing	<i>Cisco NX-OS Licensing Guide</i>
NX-OS Licensing	<i>Cisco DCNM Fundamentals Configuration Guide, Release 4.x</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</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
Creating VDCs	4.2(1)	No change from Release 4.1(2).
IPv4 unicast route memory resource	4.1(2)	Changed the default maximum value from 256 to 8.
IPv6 unicast route memory resource	4.1(2)	Changed the default maximum value from 256 to 4.
Multicast route memory resources	4.1(2)	Added IPv4 and IPv6 multicast route memory resources.
Port channel resources	4.1(2)	Changed the default maximum value from 256 to 768.
VDC setup wizard	4.1(2)	Added the ability to create VDC resource templates in the VDC setup wizard.
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.

***Send document comments to [nexus7k-docfeedback@cisco.com](mailto:nexus7k-docfeedback@cisco.com).***