



CHAPTER 4

Managing VDCs

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

This chapter includes the following sections:

- [Information About Managing VDCs, page 4-1](#)
- [Licensing Requirements for Managing VDCs, page 4-3](#)
- [Prerequisites for Managing VDCs, page 4-4](#)
- [Guidelines and Limitations, page 4-4](#)
- [Managing VDCs, page 4-4](#)
- [Verifying the VDC Configuration, page 4-14](#)
- [Example VDC Management Configuration, page 4-14](#)
- [Additional References, page 4-15](#)
- [Feature History for Managing VDCs, page 4-15](#)

Information About Managing VDCs

After you create a VDC, you can change the interface allocation, VDC resource limits, and the single-supervisor and dual-supervisor high availability (HA) policies. You can also save the running configuration of all VDCs on the physical device to the startup configuration.

This section includes the following topics:

- [Interface Allocation, page 4-2](#)
- [VDC Resource Limits, page 4-3](#)
- [HA Policies, page 4-3](#)
- [Saving All VDC Configurations to the Startup Configuration, page 4-3](#)

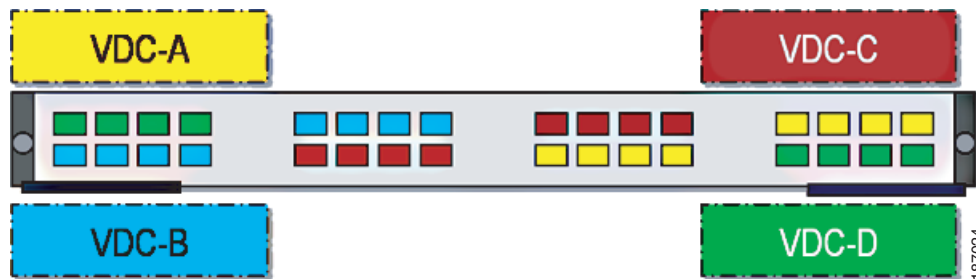
[Send document comments to nexus7k-docfeedback@cisco.com](mailto:nexus7k-docfeedback@cisco.com)

Interface Allocation

When you create a VDC, you can allocate I/O interfaces to the VDC. Later, the deployment of your physical device might change and you can reallocate the interfaces as necessary.

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 (see [Figure 4-1](#)).

Figure 4-1 Example Interface Allocation for Port Groups on a Cisco 7000 Series 10-Gbps Ethernet Module



[Table 4-1](#) shows the port numbering for the port groups.

Table 4-1 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
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*.



Note

When you add or delete interfaces, the NX-OS software removes the configuration and disables the interfaces.

Send document comments to nexus7k-docfeedback@cisco.com

VDC Resource Limits

You can change the resource limits for your VDC individually or by applying a VDC resource template as your needs change. You can change the following limits for the following resources:

- IPv4 route memory
- IPv6 route memory
- Port channels
- Switched Port Analyzer (SPAN) monitor sessions
- VLANs
- Virtual routing and forwarding instances (VRFs)

HA Policies

The HA policy determines the action that the physical device takes when the VDC encounters an unrecoverable field. You can change the HA policy for the VDC that was specified when you created the VDC.



Note

You cannot change the HA policies for the default VDC.

Saving All VDC Configurations to the Startup Configuration

From the VDC, a user with the vdc-admin or network-admin role can save the VDC configuration to the startup configuration. However, you might want to save the configuration of all VDCs to the startup configuration from the default VDC.

Licensing Requirements for Managing VDCs

The following table shows the licensing requirements for this feature:

Product	License Requirement
NX-OS	<p>Managing nondefault VDCs requires an Advanced Services license. Managing the default VDC requires no 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>.</p> <p>Note The NX-OS software allows a grace period of 120 days to use VDCs without an Advanced Services license. If the grace period expires before you obtain a license, all nondefault VDC configuration is removed from the physical device.</p>

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

Prerequisites for Managing VDCs

VDC management has the following prerequisites:

- You must have the network-admin user role.
- You must log in to the default VDC.

Guidelines and Limitations

VDC management has the following guidelines and limitations:

- Only users with the network-admin user role can manage VDCs.
- You can only change VDCs from the default VDC.

Managing VDCs

This section includes the following topics:

- [Allocating Interfaces to a VDC, page 4-4](#)
- [Applying a VDC Resource Template, page 4-6](#)
- [Changing VDC Resource Limits, page 4-7](#)
- [Changing the HA Policies, page 4-10](#)[Saving VDC Configurations, page 4-12](#)
- [Deleting a VDC, page 4-12](#)

Allocating Interfaces to a VDC

You can allocate one or more interfaces to a VDC. When you allocate an interface, you move it from one VDC to another VDC. The interfaces are in the down state after you move them.



Note

When you allocate an interface, all configuration on the interface is lost.

BEFORE YOU BEGIN

Log in to the default VDC with a username that has the network-admin user role.

SUMMARY STEPS

1. `config t`
2. `vdc vdc-name`
3. `show vdc membership`
4. `allocate interface ethernet slot/port`
`allocate interface ethernet slot/port - last-port`
`allocate interface ethernet slot/port, ethernet slot/port, ...`

Send document comments to nexus7k-docfeedback@cisco.com

5. `exit`
6. `show vdc membership [status]`
7. `copy running-config startup-config`

DETAILED STEPS

	Command	Purpose
Step 1	<p><code>config t</code></p> <p>Example: <code>switch# config t</code> <code>switch(config)#</code></p>	Enters configuration mode.
Step 2	<p><code>vdc vdc-name</code></p> <p>Example: <code>switch(config)# vdc Engineering</code> <code>switch(config-vdc)#</code></p>	Specifies a VDC and enters VDC configuration mode.
Step 3	<p><code>show vdc membership</code></p> <p>Example: <code>switch(config-vdc)# show vdc membership</code></p>	(Optional) Displays VDC interface membership information.
Step 4	<p><code>allocate interface ethernet slot/port</code></p> <p>Example: <code>switch(config-vdc)# allocate interface ethernet 2/1</code> Moving ports will cause all config associated to them in source vdc to be removed. Are you sure you want to move the ports? [yes] yes</p>	Allocates one interface to the VDC.
	<p><code>allocate interface ethernet slot/port - last-port</code></p> <p>Example: <code>switch(config-vdc)# allocate interface ethernet 2/1 - 4</code> Moving ports will cause all config associated to them in source vdc to be removed. Are you sure you want to move the ports? [yes] yes</p>	Allocates a range of interfaces on the same module to the VDC.
	<p><code>allocate interface ethernet slot/port, ethernet slot/port, ...</code></p> <p>Example: <code>switch(config-vdc)# allocate interface ethernet 2/1, ethernet 2/3, ethernet 2/5</code> Moving ports will cause all config associated to them in source vdc to be removed. Are you sure you want to move the ports? [yes] yes</p>	Allocates a list of interfaces to the VDC.
Step 5	<p><code>exit</code></p> <p>Example: <code>switch(config-vdc)# exit</code> <code>switch(config)#</code></p>	Exits VDC configuration mode.

Send document comments to nexus7k-docfeedback@cisco.com

	Command	Purpose
Step 6	show vdc membership Example: switch(config)# show vdc membership	(Optional) Displays VDC interface membership information.
Step 7	copy running-config startup-config Example: switch(config)# copy running-config startup-config	Copies the running configuration to the startup configuration. Note After you add an interface to a VDC, you must copy the default VDC running configuration to the startup configuration before users can copy the changed VDC running configuration to the startup configuration.

Applying a VDC Resource Template

You can change the VDC resource limits by applying a new VDC resource template. Changes to the limits take affect immediately except for the IPv4 and IPv6 route memory limits, which take affect after the next VDC reset, physical device reload, or physical device stateful switchover.

BEFORE YOU BEGIN

Log in to the default VDC with a username that has the network-admin user role.

SUMMARY STEPS

1. **config t**
2. **vdc vdc-name**
3. **show vdc resource detail**
4. **template template-name**
5. **exit**
6. **show vdc vdc-name resource**
7. **copy running-config startup-config**

DETAILED STEPS

	Command	Purpose
Step 1	config t Example: switch# config t switch(config)#	Enters configuration mode.
Step 2	show vdc resource detail Example: switch(config)# show vdc resource detail	(Optional) Displays the resource information for all VDCs.

Send document comments to nexus7k-docfeedback@cisco.com

	Command	Purpose
Step 3	vdc <i>vdc-name</i> Example: switch(config)# vdc Engineering switch(config-vdc)#	Specifies a VDC and enters VDC configuration mode.
Step 4	template <i>vdc-template-name</i> Example: switch(config-vdc)# template MyTemplate	Applies a new resource template for the VDC.
Step 5	exit Example: switch(config-vdc)# exit switch(config)#	Exits VDC configuration mode.
Step 6	show vdc <i>vdc-name</i> resource Example: switch(config)# show vdc MyVDC resource	(Optional) Displays the resource information for a specific VDC.
Step 7	copy running-config startup-config Example: switch(config)# copy running-config startup-config	(Optional) Copies the running configuration to the startup configuration.

Changing VDC Resource Limits

You can change the limits on the VDC resources. Changes to the limits take effect immediately except for the IPv4 and IPv6 routing table memory limits, which take effect after the next VDC reset, physical device reload, or physical device stateful switchover.



Note

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

BEFORE YOU BEGIN

Log in to the default VDC with a username that has the network-admin user role.

SUMMARY STEPS

1. **config t**
2. **vdc** *vdc-name*
3. **limit-resource monitor-session minimum** *min-value* **maximum** {*max-value* | **equal-to-min**}
limit-resource port-channel minimum *min-value* **maximum** {*max-value* | **equal-to-min**}
limit-resource u4route-mem minimum *min-value* **maximum** *max-value*
limit-resource u6route-mem minimum *min-value* **maximum** *max-value*
limit-resource vlan minimum *min-value* **maximum** {*max-value* | **equal-to-min**}
limit-resource vrf minimum *min-value* **maximum** {*max-value* | **equal-to-min**}
4. **exit**

Send document comments to nexus7k-docfeedback@cisco.com

5. `show vdc vdc-name resource`
6. `copy running-config startup-config`

DETAILED STEPS

	Command	Purpose
Step 1	<code>config t</code> Example: <code>switch# config t</code> <code>switch(config)#</code>	Enters configuration mode.
Step 2	<code>show vdc resource detail</code> Example: <code>switch(config)# show vdc resource detail</code>	(Optional) Displays the resource information for all VDCs.
Step 3	<code>vdc vdc-name</code> Example: <code>switch(config)# vdc Engineering</code> <code>switch(config-vdc)#</code>	Specifies a VDC and enters VDC configuration mode.

Send document comments to nexus7k-docfeedback@cisco.com

	Command	Purpose
Step 4	<p>limit-resource monitor-session minimum <i>min-value maximum {max-value equal-to-min}</i></p> <p>Example: switch(config-vdc)# limit-resource monitor-session minimum 0 maximum 1</p>	<p>Configures the SPAN monitor session resource limits. The range is from 0 to 2. The equal-to-min keyword automatically sets the maximum limit equal to the minimum limit.</p> <p>Note You can have a maximum of two SPAN monitoring sessions on your physical device.</p>
	<p>limit-resource port-channel minimum <i>min-value maximum {max-value equal-to-min}</i></p> <p>Example: switch(config-vdc)# limit-resource port-channel minimum 0 maximum 128</p>	<p>Configures the port-channel resource limits. The range is from 0 to 256. The equal-to-min keyword automatically sets the maximum limit equal to the minimum limit.</p>
	<p>limit-resource u4route-mem minimum <i>min-value maximum max-value</i></p> <p>Example: switch(config-vdc)# limit-resource u4route-mem minimum 16 maximum 40</p>	<p>Configures the limits for IPv4 route memory in megabytes. The default minimum value is 8.</p> <p>In Cisco NX-OS Release 4.0(1a) and earlier releases, the default maximum value is 256 and the range for both values is from 1 to 256. In Cisco NX-OS Release 4.0(2) and later releases, the default maximum value is 320 and the range for both values is from 1 to 320.</p>
	<p>limit-resource u6route-mem minimum <i>min-value maximum max-value</i></p> <p>Example: switch(config-vdc)# limit-resource u6route-mem minimum 16 maximum 32</p>	<p>Configures the limits for IPv6 route memory in megabytes. The default minimum value is 4.</p> <p>In Cisco NX-OS Release 4.0(1a) and earlier releases, the default maximum value is 256. In Cisco NX-OS Release 4.0(2) and later releases, the default maximum value is 192. The range for both values is from 1 to 256.</p>
	<p>limit-resource vlan minimum <i>min-value maximum {max-value equal-to-min}</i></p> <p>Example: switch(config-vdc)# limit-resource vlan minimum 24 maximum 2056</p>	<p>Configures the VLAN resource limits. The range is from 16 to 4094. The equal-to-min keyword automatically sets the maximum limit equal to the minimum limit.</p>
	<p>limit-resource vrf minimum <i>min-value maximum {max-value equal-to-min}</i></p> <p>Example: switch(config-vdc)# limit-resource vrf minimum 32 maximum 4196</p>	<p>Configures the VRF resource limits. The range is from 16 to 8192. The equal-to-min keyword automatically sets the maximum limit equal to the minimum limit.</p>
Step 5	<p>exit</p> <p>Example: switch(config-vdc)# exit switch(config)#</p>	<p>Exits VDC configuration mode.</p>

Send document comments to nexus7k-docfeedback@cisco.com

	Command	Purpose
Step 6	show vdc vdc-name resource Example: switch(config)# show vdc MyVDC resource	(Optional) Displays the VDC resource information.
Step 7	copy running-config startup-config Example: switch(config)# copy running-config startup-config	(Optional) Copies the running configuration to the startup configuration.

Changing the HA Policies

You can change the HA policies for a VDC. The VDC HA policies are as follows:

- Dual supervisor modules:
 - Bringdown—Puts the VDC in the failed state. To recover from the failed state, you must reload the physical device.
 - Restart—Restarts the VDC. This process includes shutting down all the interfaces within that VDC and stopping all the virtualized services processes. The NX-OS software restarts all the virtualized services saved in the startup configuration and brings the interfaces back up with the configuration saved in the startup configuration. Any configuration that you did not save in the startup configuration prior to the restart is lost.
 - Switchover—Initiates a supervisor module switchover.
- Single supervisor modules:
 - 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.



Caution With the reload action, any configuration that you did not save in the startup configuration prior to the reload is lost.



Note The reload action affects all interfaces and all VDCs on the physical device.

- Restart—Restarts the VDC. This process includes shutting down all the interfaces within that VDC and stopping all the virtualized services processes. The NX-OS software restarts all the virtualized services saved in the startup configuration and brings the interfaces back up with the configuration saved in the startup configuration. Any configuration that you did not save in the startup configuration prior to the restart is lost.



Caution With the reload action, any configuration that you did not save in the startup configuration prior to the reload is lost.



Note You cannot change the HA policies for the default VDC.

Send document comments to nexus7k-docfeedback@cisco.com

BEFORE YOU BEGIN

Log in to the default VDC with a username that has the network-admin user role.

SUMMARY STEPS

1. `config t`
2. `vdc vdc-name`
3. `ha-policy {dual-sup {bringdown | restart | switchover} | single-sup {bringdown | reload | restart}}`
4. `exit`
5. `show vdc detail`
6. `copy running-config startup-config`

DETAILED STEPS

	Command	Purpose
Step 1	<code>config t</code> Example: <pre>switch# config t switch(config)#</pre>	Enters configuration mode.
Step 2	<code>vdc vdc-name</code> Example: <pre>switch(config)# vdc Engineering switch(config-vdc)#</pre>	Specifies a VDC and enters VDC configuration mode.
Step 3	<code>ha-policy {dual-sup {bringdown restart switchover} single-sup {bringdown reload restart}}</code>	<p>Configures the HA policy for the VDC. The dual-sup and single-sup option keyword values are as follows:</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—Initiates a supervisor module switchover for physical devices with two supervisor modules, or reloads physical devices with one supervisor module. • restart—Takes down the VDC and recreates it using the startup configuration. • switchover—Initiates a supervisor module switchover. <p>Note You cannot change the HA policies for the default VDC.</p>
Step 4	<code>exit</code> Example: <pre>switch(config-vdc)# exit switch(config)#</pre>	Exits VDC configuration mode.

Send document comments to nexus7k-docfeedback@cisco.com

	Command	Purpose
Step 5	show vdc detail Example: switch(config)# show vdc detail	(Optional) Displays VDC status information.
Step 6	copy running-config startup-config Example: switch(config)# copy running-config startup-config	(Optional) Copies the running configuration to the startup configuration.

Saving VDC Configurations

You can save the configuration of all the VDCs on the physical device to the startup configuration.

BEFORE YOU BEGIN

Log in to the default VDC with a username that has the network-admin user role.

SUMMARY STEPS

1. **switchto vdc vdc**
2. **copy running-config startup-config**
3. **switchback**
4. **copy running-config startup-config vdc-all**

	Command	Purpose
Step 1	switchto vdc vdc	Switches to the VDC.
Step 2	copy running-config startup-config	Copies the running configuration for the VDC to the startup configuration.
Step 3	switchback	Switches back to the default VDC.
Step 4	copy running-config startup-config vdc-all Example: switch(config)# copy running-config startup-config vdc-all	Copies the running configuration for all the VDCs to the startup configuration.

Deleting a VDC

When you delete a VDC, the NX-OS software removes the configuration for all interfaces allocated to the VDC and returns the interfaces to the default VDC. Deleting a VDC stops all virtualized services and removes any configuration within that VDC.



Note

You cannot delete the default VDC (VDC 1).

Send document comments to nexus7k-docfeedback@cisco.com

**Caution**

Deleting a VDC disrupts all traffic on the VDC.


BEFORE YOU BEGIN

Log in to the default VDC with a username that has the network-admin user role.

SUMMARY STEPS

1. `config t`
2. `no vdc vdc-name`
3. `exit`
4. `show vdc`
5. `copy running-config startup-config`

DETAILED STEPS

	Command	Purpose
Step 1	config t Example: switch# config t switch(config)#	Enters configuration mode.
Step 2	no vdc vdc-name Example: switch(config)# no vdc NewVDC Deleting this vdc will remove its config. Continue deleting this vdc? [yes] yes	Removes the VDC.  Caution Deleting a VDC disrupts all traffic on the VDC and removes all configuration on all the interfaces allocated to the VDC.
Step 3	exit Example: switch(config)# exit switch#	Exits VDC configuration mode.
Step 4	show vdc Example: switch# show vdc	(Optional) Copies the running configuration to the startup configuration.
Step 5	copy running-config startup-config Example: switch(config)# copy running-config startup-config	Copies the running configuration to the startup configuration.

Send document comments to nexus7k-docfeedback@cisco.com

Verifying the VDC Configuration

To display VDC configuration information, perform one of the following tasks:

Command	Purpose
<code>show running-config {vdc vdc-all}</code>	Displays the VDC information in the running configuration.
<code>show vdc [vdc-name]</code>	Displays the VDC configuration information.
<code>show vdc current-vdc</code>	Displays the current VDC number.
<code>show vdc membership [status]</code>	Displays the VDC interface membership information.
<code>show vdc resource template</code>	Displays the VDC template configuration.
<code>show resource</code>	Displays the VDC resource configuration for the current VDC.
<code>show vdc [vdc-name] resource [resource-name]</code>	Displays the VDC resource configuration for all VDCs.

For detailed information about the fields in the output from these commands, see the [Cisco Nexus 7000 Series NX-OS Virtual Device Context Command Reference, Release 4.1](#).

Example VDC Management Configuration

The following example shows how to allocate interfaces between VDCs for port groups on a Cisco Nexus 7000 32-port 10-Gbps Ethernet module as described in [Figure 4-1 on page 4-2](#):



Note

VDC-A is the default VDC.

```

config t
hostname VDC-A
vdc VDC-B
! Port group 2
allocate interfaces ethernet 2/2, ethernet 2/4, ethernet 2/6, ethernet 2/8
! Port group 3
allocate interfaces ethernet 2/9, ethernet 2/11, ethernet 2/13, ethernet 2/15
vdc VDC-C
! Port group 4
allocate interfaces ethernet 2/10, ethernet 2/12, ethernet 2/14, ethernet 2/16
! Port group 5
allocate interfaces ethernet 2/17, ethernet 2/19, ethernet 2/21, ethernet 2/23
vdc VDC-D
! Port group 6
allocate interfaces ethernet 2/18, ethernet 2/20, ethernet 2/22, ethernet 2/24
! Port group 7
allocate interfaces ethernet 2/25, ethernet 2/27, ethernet 2/29, ethernet 2/30

```

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

Additional References

For additional information related to VDCs, see the following sections:

- [Related Documents, page 4-15](#)

Related Documents

Related Topic	Document Title
DCNM Licensing	<i>Cisco Nexus 7000 Series NX-OS Licensing 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 Managing VDCs

[Table 4-2](#) lists the release history for this feature.

Table 4-2 Feature History for VDC Resource Templates

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.

Send document comments to nexus7k-docfeedback@cisco.com