



CHAPTER 4

Configuring VDC Resource Templates

This chapter describes how to configure virtual device context (VDC) resource templates on Cisco NX-OS devices.

VDC resource templates set the minimum and maximum limits for device resources that the Cisco NX-OS software assigns to a VDC when you create the VDC. You can explicitly specify a VDC resource template, or you can use the default VDC template provided by the Cisco NX-OS software.

This chapter includes the following sections:

- [Information About VDC Resource Templates, page 4-87](#)
- [Licensing Requirements for VDC Templates, page 4-89](#)
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- [Configuring VDC Resource Templates, page 4-89](#)
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- [Field Descriptions for VDC Resource Templates, page 4-97](#)
- [Default Settings for VDC Resource Templates, page 4-97](#)
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- [Feature History for VDC Resource Templates, page 4-98](#)

Information About VDC Resource Templates

VDC resource templates set the minimum and maximum limits for shared physical device resources when you create the VDC. The Cisco NX-OS software reserves the minimum limit for the resource to the VDC. Any resources allocated to the VDC beyond the minimum are based on the maximum limit and availability on the device.

You can explicitly specify a VDC resource template or you can use the default VDC template provided by the Cisco NX-OS software. VDC templates set limits on the following resources:

- IPv4 multicast route memory
- IPv6 multicast route memory
- IPv4 unicast route memory
- IPv6 unicast route memory
- Port channels
- Switch Port Analyzer (SPAN) sessions
- VLANs
- Virtual routing and forwarding instances (VRFs)

**Note**

The default IPv4 and IPv6 route memory available for all VDCs on the supervisor is 250 MB. Beginning with Cisco NX-OS Release 5.2(1), the default memory is 300 MB. This amount remains the same with both the 4-GB and the 8-GB supervisor (see *Adding Memory to a Cisco Nexus 7000 Series Supervisor* for information on 8-GB supervisor modules). You can have approximately 11,000 routes, each with 16 next hops, in 16 MB of route memory. The **show routing memory estimate routes number-of-routes next-hops number-of-next-hops** command shows the amount of unicast RIB (IPv4 RIB and IPv6 RIB) shared memory needed to support the specified number of routes and next hops.

If you do not set a limit for a resource in a VDC resource template, the default limits for that resource are the same as those in the default VDC resource template. [Table 4-1](#) lists the default VDC resource template limits.

Table 4-1 VDC Default Template Resource Limits

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

1. Route memory is in megabytes.

**Note**

You cannot change the limits in the default VDC resource template.

Any changes that you make to a VDC resource template do not affect any VDCs you created using that VDC resource template. To update a VDC with the new limits in the VDC resource, you must explicitly reapply the template to the VDC (see [Chapter 3, “Managing VDCs”](#)).

**Note**

Only the network administrator can change a VDC template in the default VDC.

Licensing Requirements for VDC Templates

The following table shows the licensing requirements for this feature:

Product	License Requirement
Cisco DCNM	VDC templates require 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 an explanation of the Cisco DCNM licensing scheme, see the <i>Cisco DCNM Installation and Licensing Guide, Release 5.x</i> .
Cisco NX-OS	VDC templates require no license. Any feature not included in a license package is bundled with the Cisco NX-OS system images and is provided at no extra charge to you. For an explanation of the Cisco NX-OS licensing scheme for your platform, see the licensing guide for your platform.

Platform Support

The following platform supports this feature. For platform-specific information, including guidelines and limitations, system defaults, and configuration limits, see the corresponding documentation.

Platform	Documentation
Cisco Nexus 7000 Series Switches	Cisco Nexus 7000 Series Switches Documentation

Configuring VDC Resource Templates

The maximum amount of system resources assigned to a VDC is limited by the VDC resource template used when the VDC is created. You can create VDC resource templates to use when creating VDCs to use resource limits other than those provided in the default VDC resource template.

**Note**

If you do not set limits for a resource in a VDC resource template, the default limits are the limits for that resource in the default VDC resource template (see [Table 4-1 on page 4-88](#)).


Adding a VDC Resource Template

You can add a VDC resource template.

BEFORE YOU BEGIN

Ensure that you have discovered the physical device using a username that has the network-admin role.

DETAILED STEPS

-
- Step 1** From the Feature Selector pane, choose **Virtual Devices**.
 - Step 2** From the Summary pane, double-click the device to display the list of VDCs.
 - Step 3** Click the default VDC with the  icon.
 - Step 4** From the Details pane, click the **Resource Templates** tab.
 - Step 5** Right-click in the Details pane and choose **Add Template** from the drop-down list.
 - Step 6** At the cursor, enter the new VDC resource template name and press the **Enter** key.
 - Step 7** From the menu bar, choose **File > Deploy** to apply your changes to the device.
-

RELATED TOPICS

[Adding a Resource Limit to a VDC Resource Template, page 4-90](#)

[Deleting a VDC Resource Template, page 4-92](#)

Adding a Resource Limit to a VDC Resource Template

You can add a resource limit to a VDC resource template.


**Note**

You cannot change the configuration of the default templates.

BEFORE YOU BEGIN

Ensure that you have discovered the physical device using a username that has the network-admin role. Create a VDC resource template (see the [“Adding a VDC Resource Template”](#) section on page 4-89).

DETAILED STEPS

-
- Step 1** From the Feature Selector pane, choose **Virtual Devices**.
 - Step 2** From the Summary pane, double-click the device to display the list of VDCs.
 - Step 3** Click the default VDC with the  icon.
 - Step 4** From the Details pane, click the **Resource Templates** tab.
 - Step 5** Double-click the **VDC resource template**.
 - Step 6** Right-click on the **VDC resource template** and choose **Add Resource Limit** from the drop-down list.
 - Step 7** Choose a VDC resource from the drop-down menu.
 - Step 8** In the limit cell under Minimum, enter the minimum limit.
 - Step 9** In the limit cell under Maximum, enter the maximum limit.
 - Step 10** From the menu bar, choose **File > Deploy** to apply your changes to the device.
-

RELATED TOPICS

[Adding a VDC Resource Template, page 4-89](#)

[Changing a Resource Limit in a VDC Resource Template, page 4-91](#)

[Deleting a Resource Limit from a VDC Resource Template, page 4-92](#)

Changing a Resource Limit in a VDC Resource Template

You can change the values of a resource limit in a VDC resource template.

**Note**

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

**Note**

You cannot change the configuration of the default resource templates.


BEFORE YOU BEGIN

Ensure that you have discovered the physical device using a username that has the network-admin role.

Ensure that a VDC resource template has been created in the default VDC (see the [“Adding a VDC Resource Template”](#) section on page 4-89).

Ensure that resource limits have been added to the VDC resource template (see the [“Adding a Resource Limit to a VDC Resource Template”](#) section on page 4-90).

DETAILED STEPS

-
- Step 1** From the Feature Selector pane, choose **Virtual Devices**.
 - Step 2** From the Summary pane, double-click the device to display the list of VDCs.
 - Step 3** Click the default VDC with the  icon.
 - Step 4** From the Details pane, click the **Resource Templates** tab.
 - Step 5** Double-click the **VDC resource template**.
 - Step 6** Click the limits to change and enter the new values.
 - Step 7** From the menu bar, choose **File > Deploy** to apply your changes to the device.
-

RELATED TOPICS

[Adding a Resource Limit to a VDC Resource Template, page 4-90](#)

[Deleting a Resource Limit from a VDC Resource Template, page 4-92](#)

Deleting a Resource Limit from a VDC Resource Template

You can delete a resource limit from a VDC resource template.



Note

You cannot change the configuration of the default resource templates.


BEFORE YOU BEGIN

Ensure that you have discovered the physical device using a username that has the network-admin role.

Ensure that a VDC resource template has been created in the default VDC (see the [“Adding a VDC Resource Template”](#) section on page 4-89).

Ensure that resource limits have been added to the VDC resource template (see the [“Adding a Resource Limit to a VDC Resource Template”](#) section on page 4-90).

DETAILED STEPS

-
- Step 1** From the Feature Selector pane, choose **Virtual Devices**.
 - Step 2** From the Summary pane, double-click the device to display the list of VDCs.
 - Step 3** Click the default VDC with the  icon.
 - Step 4** From the Details pane, click the **Resource Templates** tab.
 - Step 5** Double-click the **VDC resource template** to display the resource limits.
 - Step 6** Click the resource limit to delete.
 - Step 7** In the Details pane, right-click and choose **Delete Resource Limit** from the drop-down list.
 - Step 8** From the menu bar, choose **File > Deploy** to apply your changes to the device.
-

RELATED TOPICS

[Adding a Resource Limit to a VDC Resource Template, page 4-90](#)

[Changing a Resource Limit in a VDC Resource Template, page 4-91](#)

Deleting a VDC Resource Template

You can delete a VDC resource template.



Note


You cannot delete the default resource templates.

BEFORE YOU BEGIN

Ensure that you have discovered the physical device using a username that has the network-admin role.

Ensure that a VDC resource template has been created in the default VDC (see the [“Adding a VDC Resource Template”](#) section on page 4-89).

DETAILED STEPS

-
- Step 1** From the Feature Selector pane, choose **Virtual Devices**.
 - Step 2** From the Summary pane, double-click the device to display the list of VDCs.
 - Step 3** Click the default VDC with the  icon.
 - Step 4** From the Details pane, click the **Resource Templates** tab.
 - Step 5** Click the **VDC resource template**.
 - Step 6** In the Details Pane, right-click and choose **Delete Template** from the drop-down list.
 - Step 7** From the menu bar, choose **File > Deploy** to apply your changes to the device.
-

RELATED TOPICS

[Adding a VDC Resource Template, page 4-89](#)

Configuring VDC Resource Templates

The maximum amount of system resources assigned to a VDC is limited by the VDC resource template used when the VDC is created. You can create VDC resource templates to use when creating VDCs to use resource limits other than those provided in the default VDC resource template. You can create a maximum of 64 VDC resource templates.



Note

If you do not set limits for a resource in a VDC resource template, the default limits are the limits for that resource in the default VDC resource template (see [Table 4-1 on page 4-88](#)).



Note

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



Note

You cannot change the configuration of the default resource templates.

SUMMARY STEPS

1. `config t`
2. `vdc resource template vdc-template-name`
3. `limit-resource m4route-mem [minimum min-value] maximum max-value`
`limit-resource m6route-mem [minimum min-value] maximum max-value`
`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**
5. **show vdc resource template**
6. **copy running-config startup-config**

DETAILED STEPS

	Command	Purpose
Step 1	<pre>config t</pre> <p>Example: <pre>switch# config t switch(config)#</pre></p>	Enters configuration mode.
Step 2	<pre>vdc resource template <i>vdc-template-name</i></pre> <p>Example: <pre>switch(config)# vdc resource template TemplateA switch(config-vdc-template)#</pre></p>	Specifies the VDC resource template name and enters VDC resource template configuration mode. The name is a maximum of 32 characters and is not case sensitive.

	Command	Purpose
Step 3	limit-resource m4route-mem [minimum <i>min-value</i>] maximum <i>max-value</i> Example: switch(config-vdc-template)# limit-resource m4route-mem minimum 4 maximum 40	Specifies the limits for IPv4 multicast route memory in megabytes. The default minimum and maximum value is 8. The range is from 1 to 200.
	limit-resource m6route-mem [minimum <i>min-value</i>] maximum <i>max-value</i> Example: switch(config-vdc-template)# limit-resource m6route-mem minimum 4 maximum 8	Specifies the limits for IPv6 multicast route memory in megabytes. The default minimum and maximum value is 2. The range is from 1 to 20.
	limit-resource monitor-session minimum <i>min-value</i> maximum { <i>max-value</i> equal-to-min } Example: switch(config-vdc-template)# limit-resource monitor-session minimum 1 maximum equal-to-min	Specifies the limits for SPAN monitor session resources. The default minimum value is 0. The default maximum value is 2. The range is from 0 to 2. The equal-to-min keyword automatically sets the maximum limit equal to the minimum limit. Note You can have a maximum of two SPAN monitoring sessions on your physical device.
	limit-resource port-channel minimum <i>min-value</i> maximum { <i>max-value</i> equal-to-min } Example: switch(config-vdc-template)# limit-resource port-channel minimum 4 maximum 128	Specifies the limits for port channels. The default minimum value is 0. The default maximum value is 768. The range is from 0 to 768. The equal-to-min keyword automatically sets the maximum limit equal to the minimum limit.
	limit-resource u4route-mem [minimum <i>min-value</i>] maximum <i>max-value</i> Example: switch(config-vdc-template)# limit-resource u4route-mem minimum 4 maximum 40	Specifies the limits for IPv4 unicast route memory in megabytes. The default minimum and maximum value is 8. The range is from 1 to 80.
	limit-resource u6route-mem [minimum <i>min-value</i>] maximum <i>max-value</i> Example: switch(config-vdc-template)# limit-resource u6route-mem minimum 4 maximum 32	Specifies the limits for IPv6 unicast route memory in megabytes. The default minimum and maximum value is 4. The range is from 1 to 48.
	limit-resource vrf minimum <i>min-value</i> maximum { <i>max-value</i> equal-to-min } Example: switch(config-vdc-template)# limit-resource vrf minimum 32 maximum 4096	Specifies the limits for VRF. The default minimum value is 16. The default maximum value is 8192. The range is from 16 to 8192. The equal-to-min keyword automatically sets the maximum limit equal to the minimum limit.
Step 4	exit Example: switch(config-vdc-template)# exit switch(config)#	Exits VDC template configuration mode.

	Command	Purpose
Step 5	show vdc resource template Example: switch(config)# show vdc resource template	(Optional) Displays VDC template configuration 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.

Verifying the VDC Resource Template Configuration

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

Command	Purpose
show running-config {vdc vdc-all}	Displays the VDC information in the running configuration.
show vdc resource template [template-name]	Displays the VDC template configuration.

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

Example VDC Resource Template Configuration

The following example shows how to configure a VDC resource template:

```
vdc resource template TemplateA
  limit-resource port-channel minimum 4 maximum 128
  limit-resource span-ssn minimum 1 maximum equal-to-min
  limit-resource vlan minimum 32 maximum 1024
  limit-resource vrf minimum 32 maximum 4096
```

Field Descriptions for VDC Resource Templates

This section includes the following topic:

- [Field Description: Virtual Devices: Default VDC: Resource Template Tab, page 4-97](#)

Field Description: Virtual Devices: Default VDC: Resource Template Tab

This tab allows you to configure VDC resource templates for the physical device.

Table 4-2 *Field Description: Virtual Devices: Default VDC: Resource Template Tab*

Element	Description
Name	Resource name.
Minimum	Minimum limit. The minimum limit is reserved for the VDC.
Maximum	Maximum limit. The maximum limit is allocated on a first-come, first-serve basis.

Default Settings for VDC Resource Templates

[Table 4-3](#) lists the default settings for VDC resource template parameters.

Table 4-3 *Default VDC Resource Template Settings*

Parameter	Minimum	Maximum
IPv4 route memory resource limit ¹	8	256
IPv6 route memory resource limit ¹	4	256
Port channel resource limit	0	256
SPAN session resource limit	0	2
VLAN resource limit	16	4094
VRF resource limit	16	8192

1. Route memory limits are in megabytes.

Additional References for VDC Resource Templates

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

- [Related Documents for VDC Resource Templates, page 4-97](#)

Related Documents for VDC Resource Templates

Related Topic	Document Title
Cisco DCNM Licensing	<i>Cisco DCNM Installation and Licensing Guide, Release 5.x</i>

Related Topic	Document Title
Cisco NX-OS Licensing	<i>Cisco NX-OS Licensing Guide</i>
VDC commands	<i>Cisco Nexus 7000 Series NX-OS Virtual Device Context Command Reference</i>

Feature History for VDC Resource Templates

Table 4-4 lists the release history for this feature.

Table 4-4 Feature History for VDC Resource Templates

Feature Name	Releases	Feature Information
VDC resource templates	5.2(1)	No change from Release 5.1.
VDC resource templates	5.1(1)	No change from Release 5.0.
VDC resource templates	5.0(2)	No change from Release 4.2.
VDC resource templates	4.2(1)	No change from Release 4.1.