Configuring VDC Resource Templates

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

This chapter includes the following sections:

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. 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 1-1 lists the default template resource limits of the nondefault VDC.

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

Table 1-1 Default Resource Limits for the Non default VDC

Resource	Minimum	Maximum
IPv4 multicast route memory[1]	8	8
IPv6 multicast route memory[1]	5	5
IPv4 unicast route memory[1]	8	8
IPv6 unicast route memory[1]	4	4
Port channels	0	768
SPAN sessions	0	2
ERSPAN sessions	0	23
VLANs	16	4094
VRFs	2	4096
Inband SRC session	0	1

1. Route memory is in megabytes.

Any changes that you make to a VDC resource template do not affect any VDCs that 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 1, “Managing VDCs”).

Table 1-2 lists the default template resource limits of the global default VDC.

Table 1-2 Default Resource Limits for the Default VDC

Resource	Minimum	Maximum
IPv4 multicast route memory[1]	58	58
IPv6 multicast route memory[1]	8	8
IPv4 unicast route memory[1]	96	96
IPv6 unicast route memory[1]	24	24
Port channels	0	768
SPAN sessions	0	2
ERSPAN sessions	0	23
VLANs	16	4094
VRFs	2	4096
Inband SRC session	0	1

1. Route memory is in megabytes.

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

Licensing Requirements for VDC Templates

Table 1-3 lists the licensing requirements for this feature:

Table 1-3 Licensing Requirements for VDC Templates

Product	License Requirement
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 a complete explanation of the Cisco NX-OS licensing scheme, see the *Cisco NX-OS Licensing Guide*.

Guidelines and Limitations for VDC Resource Templates

VDC templates have the following configuration guidelines and limitations:

- VDC templates can only be created by the network administrator in the default VDC.
- See the *Cisco Nexus 7000 Verified Scalability Guide* for information on the maximum supported number of VDC templates.

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 Cisco NX-OS software uses the default template, vdc-default.

Note As an alternative to using VDC resource templates, you can change the individual resource limits after you create the VDC by changing an individual resource limit for a single VDC or by changing the resource limits in a nondefault VDC resource template and applying the template to the VDC. For information about managing VDC resource limits after you create a VDC, see Chapter 1, "Managing VDCs."

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

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 about managing VDC resource limits after you create a VDC, see Chapter 1, "Managing VDCs."

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 that you can use when creating VDCs that have resource limits other than those provided in the default VDC resource template. For information about the maximum number of VDC resource templates that you can create, see Appendix 1, "VDC Configuration Limits."

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 1-1 on page 1-2).

Note You can set only one value for the multicast and unicast route memory resources maximum and minimum limits. If you specify a minimum limit, that is the value for both the minimum and maximum limits and the maximum limit is ignored. If you specify only a maximum limit, that is the value for both the minimum and maximum limits.

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 vrf minimum *min-value* **maximum** {*max-value* | **equal-to-min**}
4. **exit**
5. (Optional) **show vdc resource template**
6. (Optional) **copy running-config startup-config**

DETAILED STEPS

	Command	Purpose

Step 1	**config t**
	
	Example:
	`switch# config t`
	`switch(config)#`
		Enters global configuration mode.

Step 2	**vdc resource template** *vdc-template-name*
	
	Example:
	`switch(config)# vdc resource template TemplateA`
	`switch(config-vdc-template)#`
		Specifies the VDC resource template name and enters VDC resource template configuration mode. The name is a maximum of 32 alphanumeric characters and is not case sensitive.

	Command	Purpose
Step 3	**limit-resource m4route-mem** [**minimum** *min-value*] **maximum** *max-value* **Example:** `switch(config-vdc-template)# limit-resource m4route-mem minimum 4 maximum 40`	Specifies the limits for IPv4 multicast route memory in megabytes. The range is from 1 to 90.
	limit-resource m6route-mem [**minimum** *min-value*] **maximum** *max-value* **Example:** `switch(config-vdc-template)# limit-resource m6route-mem minimum 4 maximum 8`	Specifies the limits for IPv6 multicast route memory in megabytes. The range is from 1 to 20.
	limit-resource monitor-session minimum *min-value* **maximum** {*max-value* | **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 *min-value* **maximum** {*max-value* | **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** *min-value*] **maximum** *max-value* **Example:** `switch(config-vdc-template)# limit-resource u4route-mem minimum 4 maximum 40`	Specifies the limits for IPv4 unicast route memory in megabytes. The range is from 1 to 250.
	limit-resource u6route-mem [**minimum** *min-value*] **maximum** *max-value* **Example:** `switch(config-vdc-template)# limit-resource u6route-mem minimum 4 maximum 32`	Specifies the limits for IPv6 unicast route memory in megabytes. The range is from 1 to 100.
	limit-resource vrf minimum *min-value* **maximum** {*max-value* | **equal-to-min**} **Example:** `switch(config-vdc-template)# limit-resource vrf minimum 32 maximum 1000`	Specifies the limits for VRF. The range is from 2 to 1000. 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.

Step 5	**show vdc resource template** **Example:** `switch(config)# show vdc resource template`	(Optional) Displays VDC template configuration information.

	Command	Purpose
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*.

Configuration Example for VDC Resource Template

This 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 1000
```

Additional References for VDC Resource Templates

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

- Related Documents for VDC Resource Templates, page 1-7

Related Documents for VDC Resource Templates

Related Topic	Document Title
Cisco NX-OS licensing	*Cisco NX-OS Licensing Guide*
VDC commands	*Cisco Nexus 7000 Series NX-OS Virtual Device Context Command Reference*

Feature History for VDC Resource Templates

Table 1-4 lists the release history for this feature.

Table 1-4 Feature History for VDC Resource Templates

Feature Name	Cisco NX-OS Release	Feature Information
VDC resource templates	6.2(2)	No change from Cisco NX-OS Release 6.1(3).
VDC resource templates	6.1(3)	No change from Cisco NX-OS Release 6.0(1).
VDC resource templates	6.0(1)	No change from Cisco NX-OS Release 5.2.
VDC resource templates	5.2(1)	No change from Cisco NX-OS Release 5.1.
VDC resource templates	5.1(1)	No change from Cisco NX-OS Release 5.0.
IPv4 multicast route memory resource	5.0(2)	Changed the range for the minimum and maximum values.
IPv6 multicast route memory resource	5.0(2)	Changed the range for the minimum and maximum values.
IPv4 unicast route memory resource	5.0(2)	Changed the range for the minimum and maximum values.
IPv6 unicast route memory resource	5.0(2)	Changed the range for the minimum and maximum values.
VRF resource	5.0(2)	Changed the range for the minimum and maximum values.
VDC resource templates	4.2(1)	No change from Cisco NX-OS 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.
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.