Managing VDCs

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

Finding Feature Information

Your software release might not support all the features documented in this module. For the latest caveats and feature information, see the Bug Search Tool at https://tools.cisco.com/bugsearch/ and the release notes for your software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the "New and Changed Information"chapter or the Feature History table in this chapter.

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.

Note Ports on F3 modules may increment L1 and/or L2 errors (symbol errors, FCS errors, CRC errors, and so on) in the following instances:

a) Link goes up and then down (errors will increment during link down and link up; errors will stop incrementing if the link is fully up)

b) Link is down but optics and cable are still plugged in.

Workaround: Administratively shut down any unused ports.

In case, any of these errors are incrementing during traffic transmission, there may be genuine issue with optics and/or cable or F3 hardware and these cases need to be investigated by Cisco TAC.

The following VDC type support is available in Cisco NX-OS Release 7.3(0)DX(1) and Cisco NX-OS Release 7.3(1)D1(1):

VDC Type	Layer 2	Layer 3	Fabric Path	VxLAN	FEX	MPLS	OTV	LISP	GTP	L2 Gateways	Table Sizes
M3	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	M3 size
F3+M3	Yes	Yes	No	Yes	No	Yes	Yes	Yes	No	No	F3 size

Starting from Cisco NX-OS Release 8.0(1), the following VDC type support is available:

VDC Type	Layer 2	Layer 3	Fabric Path	VxLAN	FEX	MPLS	OTV	LISP	GTP	L2 Gateways	Table Sizes
M2+M3	Yes	Yes	No	Yes	No	Yes	Yes	Yes	No	No	M2

Starting from Cisco NX-OS Release 8.3(1), the following VDC type support is available:

VDC Type	Layer 2	Layer 3	Fabric Path	VxLAN	FEX	MPLS	OTV	LISP	GTP	L2 Gateways	Table Sizes
F4	Yes	Yes	No	Yes	No	Yes	Yes	Yes	No	No	F4

For more information on feature support for specific releases, see the Cisco Nexus 7000 Series Release Notes.

Interface Allocation

Note See the *Cisco NX-OS FCoE Configuration Guide for Cisco Nexus 7000 and Cisco MDS 9500 Guide* for information on allocating interfaces for storage VDCs and FCoE.

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.

Note Beginning with Cisco NX-OS Release 5.2(1) for Nexus 7000 Series devices, all members of a port group are automatically allocated to the VDC when you allocate an interface.

The following Cisco Nexus 7000 Series Ethernet modules have the following number of port groups and interfaces:

- N7K-F132XP-15 (2 interfaces x 16 port groups = 32 interfaces)—There are no restrictions on the interface allocation between VDCs, but we recommend that interfaces that belong to the same port group be in a single VDC.

- N7K-F248XP-25, N7K-F248XP-25E, N7K-F248XT-25E, N77-F248XP-23E (4 interfaces x 12 port groups = 48 interfaces)—There are no restrictions on the interface allocation between VDCs, but we recommend that interfaces that belong to the same port group be in a single VDC.

- N77-F248XP-23E (4 interfaces x 12 port groups = 48 interfaces)—There are no restrictions on the interface allocation between VDCs, but we recommend that interfaces that belong to the same port group be in a single VDC.

- N7K-F306CK-25—Has six ASICs, 6 port groups of 1x100G ASIC.

- N7K-F312FQ-25—Has six ASICs, 6 port groups of 2x40G ASIC.

- N7K-F348XP-25—Has six ASICs, 6 port groups of 8x10G ASIC.

- N77-F312CK-26—Has twelve ASICs, 12 port groups of 1x100G ASIC.

- N77-F324FQ-25—Has twelve ASICs, 12 port groups of 2x40G ASIC.

- N77-F348XP-23—Has six ASICs, 6 port groups of 8x10G ASIC.

- N7K-M108X2-12L (1 interface x 8 port groups = 8 interfaces)—There are no restrictions on the interface allocation between VDCs.

- N7K-M132XP-12 (4 interfaces x 8 port groups = 32 interfaces) and N7K-M132XP-12L (same as non-L M132) (1 interface x 8 port groups = 8 interfaces)—All M132 cards require allocation in groups of 4 ports and you can configure 8 port groups. Interfaces belonging to the same port group must belong to the same VDC.

- N7K-M148GS-11 (12 interfaces x 4 port groups = 48 interfaces), N7K-M148GS-11L, N7K-M148GT-11, N7K-M148GT-11L (same as non-L M148) (1interface x 48 port groups = 48 interfaces) —There are no restrictions on the interface allocation between VDCs, but we recommend that interfaces that belong to the same port group be in a single VDC.

- N7K-M202CF-22L (1 interface x 2 port groups = 2 interfaces)—There are no restrictions on the interface allocation between VDCs.

- N7K-M206FQ-23L (1 interface x 6 port groups = 6 interfaces)—There are no restrictions on the interface allocation between VDCs.

- N7K-M224XP-23L (1 interface x 24 port groups = 24 interfaces)—There are no restrictions on the interface allocation between VDCs.

- N7K-M324FQ-25L—Has four ASICs, 4 port groups of 6x40G ASIC.

- N7K-M348XP-25L—Has two ASICs, 2 port groups of 24x10G ASIC.

• N77-F430CQ-36 (30 port 100G Ethernet Module)

The Cisco Nexus 7700 Series M3 Ethernet modules have the following number of port groups and interfaces. VDC allocation is based on port group boundaries.

• N77-M312CQ-26L—Has six ASICs, 6 port groups of 2x100G ASIC

• N77-M324FQ-25L—Has four ASICs, 4 port groups of 6x40G ASIC.

• N77-M348XP-23L—Has two ASICs, 2 port groups of 24x10G ASIC.

On the Cisco Nexus 7000 Series 32-port, 10-Gbps Ethernet module N7K-F132XP-15, you must allocate the interfaces on your physical device in the specified combination. This module has 16 port groups that consist of 2 ports each (2 interfaces x 16 port groups = 32 interfaces). Interfaces that belong to the same port group must belong to the same VDC.

Note You can configure the limit-resource module-type command only from the VDC configuration mode and not from a VDC resource template.

Figure 1: Example Interface Allocation for Port Groups on a Cisco 7000 Series 10-Gbps Ethernet Module (N7K-F132XP-15)
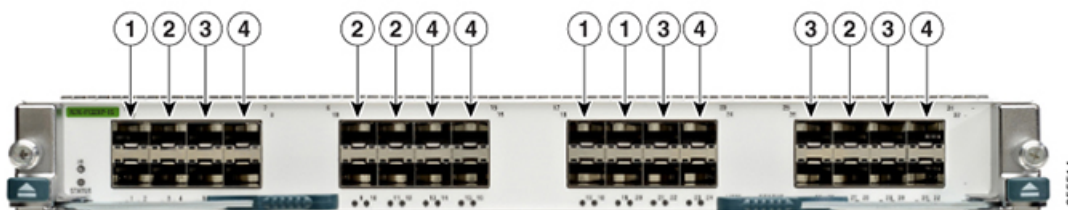
The callouts in the figure above represent an example of VDC allocation. The table below shows the VDC that each callout represents.

Table 1: Example VDC Allocation

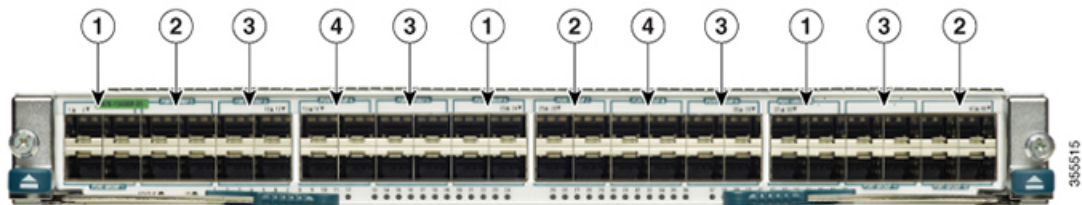| VDC	Callout
VDC A	1
VDC B	2
VDC C	3
VDC D	4

The table below shows the port numbering for the port groups.

Table 2: Port Numbers for Port Groups on the Cisco Nexus 7000 Series 10-Gbps Ethernet Module N7K-F132XP-15

Port Group	Port Numbers
Group 1	1 and 2
Group 2	3 and 4

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

On the Cisco Nexus 7000 Series 48-port, 10-Gbps Ethernet modules N7K-F248XP-25[E] and N7K-F248XT-25[E], you must allocate the interfaces on your physical device in the specified combination. These modules have 12 port groups that consist of 4 ports each (4 interfaces x 12 port groups = 48 interfaces). Interfaces that belong to the same port group must belong to the same VDC.

Figure 2: Example Interface Allocation for Port Groups on the Cisco Nexus 7000 Series 10-Gbps Ethernet Modules N7K-F248XP-25[E] and N7K-F248XT-25[E] and Cisco Nexus 7700 Series 48-Port 1 and 10-Gbps Ethernet Module N77-F248XP-23E

The callouts in the figure above represent an example of VDC allocation. The table below shows the VDC that each callout represents.

Table 3: Example VDC Allocation

VDC	Callout
VDC A	1
VDC B	2

VDC	Callout
VDC C	3
VDC D	4

The table below shows the port numbering for the port groups.

Table 4: Port Numbers for Port Groups on the Cisco Nexus 7000 Series 10-Gbps Ethernet Modules N7K-F248XP-25[E] and N7K-F248XT-25[E] and Cisco Nexus 7700 Series 48-Port 1 and 10-Gbps Ethernet Module N77-F248XP-23E

Port Group	Port Numbers
Group 1	1, 2, 3, 4
Group 2	5, 6, 7, 8
Group 3	9, 10, 11, 12
Group 4	13, 14, 15, 16
Group 5	17, 18, 19, 20
Group 6	21, 22, 23, 24
Group 7	25, 26, 27, 28
Group 8	29, 30, 31, 32
Group 9	33, 34, 35, 36
Group 10	37, 38, 39, 40
Group 11	41, 42, 43, 44
Group 12	45, 46, 47, 48

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

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

Figure 3: Example Interface Allocation for Port Groups on the Cisco Nexus 7000 Series 100-Gbps Ethernet Modules (N7K-F306CK-25)
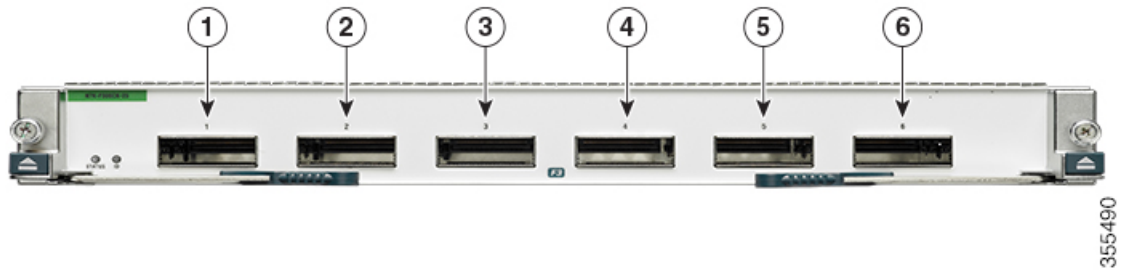
The callouts in the figure above represent an example of VDC allocation. The table below shows the VDC that each callout represents.

Table 5: Example VDC Allocation

VDC	Callout
VDC A	1
VDC B	2
VDC C	3
VDC D	4
VDC E	5
VDC F	6

The table below shows the port numbering for the port groups.

Table 6: Port Numbers for Port Groups on the Cisco Nexus 7000 Series 100-Gbps Ethernet Modules (N7K-F306CK-25)

Port Group	Port Numbers
Group 1	1
Group 2	2
Group 3	3
Group 4	4
Group 5	5
Group 6	6

Figure 4: Example Interface Allocation for Port Groups on the Cisco Nexus 7700 Series 100-Gbps Ethernet Modules (N77-F312CK-26)

The callouts in the figure above represent an example of VDC allocation. The table below shows the VDC that each callout represents.
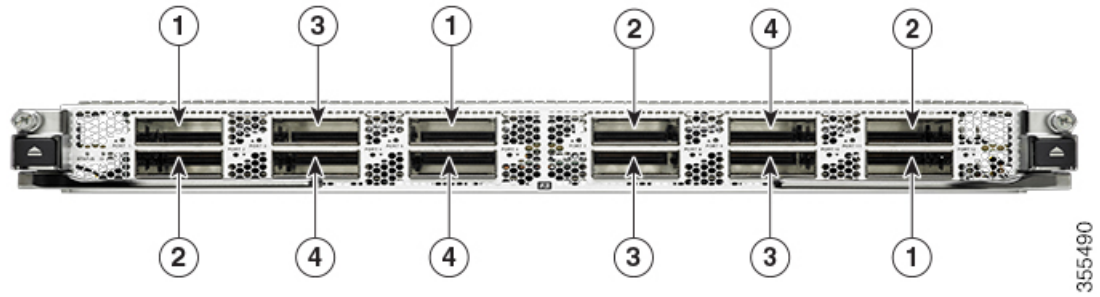
Table 7: Example VDC Allocation

VDC	Callout
VDC A	1
VDC B	2
VDC C	3
VDC D	4

The table below shows the port numbering for the port groups.

Table 8: Port Numbers for Port Groups on the Cisco Nexus 7700 Series 100-Gbps Ethernet Modules (N77-F312CK-26)

Port Group	Port Numbers
Group 1	1
Group 2	2
Group 3	3
Group 4	4
Group 5	5
Group 6	6
Group 7	7
Group 8	8
Group 9	9
Group 10	10
Group 11	11

Port Group	Port Numbers
Group 12	12

Figure 5: Example Interface Allocation for Port Groups on the Cisco Nexus 7000 Series 40-Gbps Ethernet Modules (N7K-F312FQ-25)

The callouts in the figure above represent an example of VDC allocation. The table below shows the VDC that each callout represents.

Table 9: Example VDC Allocation

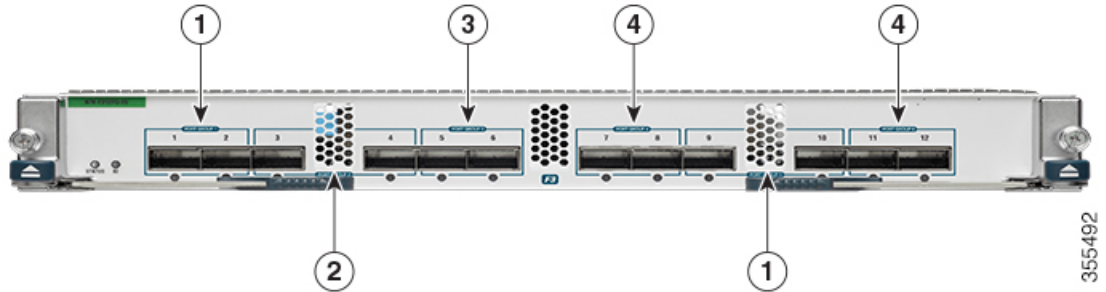| VDC	Callout
VDC A	1
VDC B	2
VDC C	3
VDC D	4

The table below shows the port numbering for the port groups.

Table 10: Port Numbers for Port Groups on the Cisco Nexus 7000 Series 40-Gbps Ethernet Modules (N7K-F312FQ-25)

Port Group	Port Numbers
Group 1	1, 2
Group 2	3, 4
Group 3	5, 6
Group 4	7, 8
Group 5	9, 10
Group 6	11, 12

Figure 6: Example Interface Allocation for Port Groups on the Cisco Nexus 7700 Series 40-Gbps Ethernet Modules (N77-F324FQ-25)

The callouts in the figure above represent an example of VDC allocation. The table below shows the VDC that each callout represents.
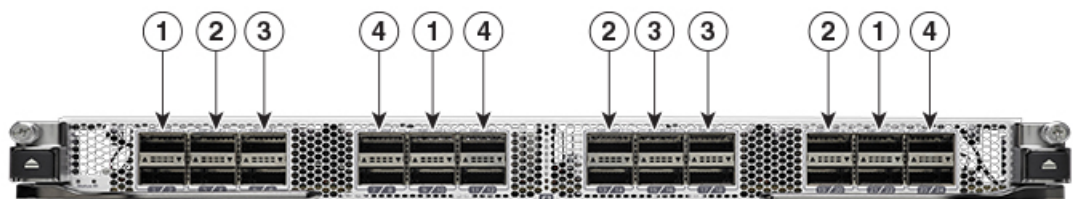
Table 11: Example VDC Allocation

VDC	Callout
VDC A	1
VDC B	2
VDC C	3
VDC D	4

The table below shows the port numbering for the port groups.

Table 12: Port Numbers for Port Groups on the Cisco Nexus 7700 Series 40-Gbps Ethernet Modules (N77-F324FQ-25)

Port Group	Port Numbers
Group 1	1, 2
Group 2	3, 4
Group 3	5, 6
Group 4	7, 8
Group 5	9, 10
Group 6	11, 12
Group 7	13, 14
Group 8	15, 16
Group 9	17, 18
Group 10	19, 20
Group 11	21, 22

Port Group	Port Numbers
Group 12	23, 24

Figure 7: Example Interface Allocation for Port Groups on the Cisco Nexus 7000 Series 10-Gbps Ethernet Modules (N7K-F348XP-25)
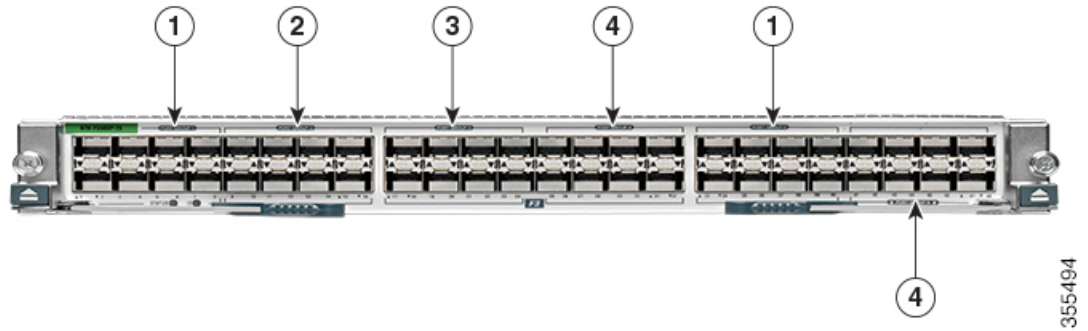
Figure 8: Example Interface Allocation for Port Groups on the Cisco Nexus 7700 Series 10-Gbps Ethernet Modules (N77-F348XP-23)
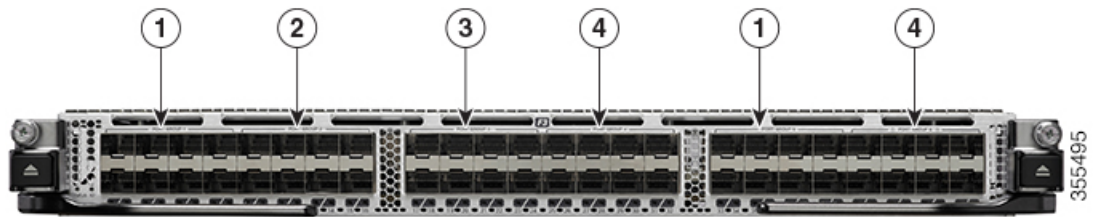
The callouts in the figures above represent an example of VDC allocation. The table below shows the VDC that each callout represents.

Table 13: Example VDC Allocation

VDC	Callout
VDC A	1
VDC B	2
VDC C	3
VDC D	4

The table below shows the port numbering for the port groups.

Table 14: Port Numbers for Port Groups on the Cisco Nexus 7000 Series 10-Gbps Ethernet Modules (N7K-F348XP-25) and the Cisco Nexus 7700 Series 10-Gbps Ethernet Modules (N77-F348XP-23)

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

| Port Group	Port Numbers
Group 2	9, 10, 11, 12, 13, 14, 15, 16
Group 3	17, 18, 19, 20, 21, 22, 23, 24
Group 4	25, 26, 27, 28, 29, 30, 31, 32
Group 5	33, 34, 35, 36, 37, 38, 39, 40
Group 6	41, 42, 43, 44, 45, 46, 47, 48

Figure 9: Example Interface Allocation for Port Groups on the Cisco Nexus 7000 Series 10-Gbps Ethernet Module (N7K-M132XP-12)

The callouts in the figure above represent an example of VDC allocation. The table below shows the VDC that each callout represents.

Table 15: Example VDC Allocation

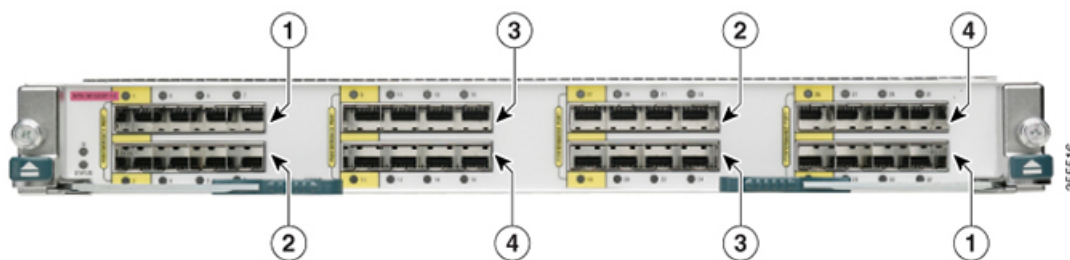| VDC	Callout
VDC A	1
VDC B	2
VDC C	3
VDC D	4

The table below shows the port numbering for the port groups.

Table 16: Port Numbers for Port Groups on the Cisco Nexus 7000 Series 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

Port Group	Port Numbers
Group 6	18, 20, 22, 24
Group 7	25, 27, 29, 31
Group 8	26, 28, 30, 32

Figure 10: Example Interface Allocation for Port Groups on the Cisco Nexus 7700 Series 100-Gbps Ethernet Modules (N77-M312CQ-26L)

The callouts in the figure above represent an example of VDC allocation. The table below shows the VDC that each callout represents.

Table 17: Example VDC Allocation

VDC	Callout
VDC A	1
VDC B	2
VDC C	3
VDC D	4

The table below shows the port numbering for the port groups.

Table 18: Port Numbers for Port Groups on the Cisco Nexus 7700 Series 100-Gbps Ethernet Modules (N77-M312CQ-26L)

Port Group	Port Numbers
Group 1	1, 2
Group 2	3, 4
Group 3	5, 6
Group 4	7, 8
Group 5	9, 10
Group 6	11, 12

Figure 11: Example Interface Allocation for Port Groups on the Cisco Nexus 7000 Series 40-Gbps Ethernet Modules (N7K-M324FQ-25L)

The callouts in the figure above represent an example of VDC allocation. The table below shows the VDC that each callout represents.

Table 19: Example VDC Allocation

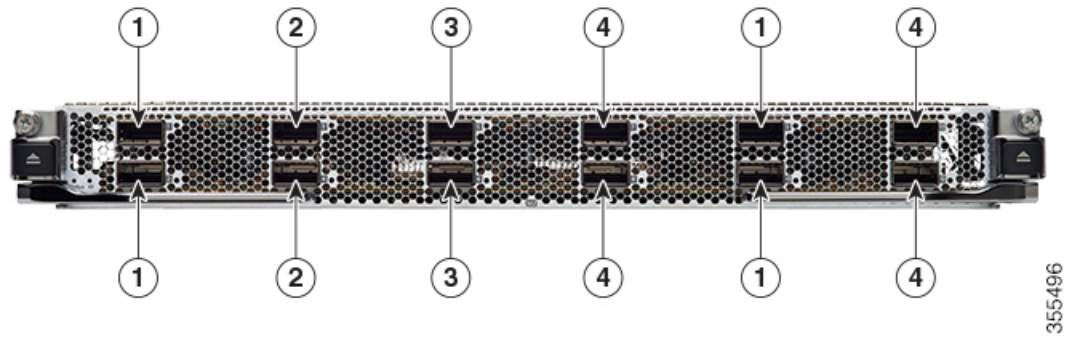| VDC	Callout
VDC A	1
VDC B	2

The table below shows the port numbering for the port groups.

Table 20: Port Numbers for Port Groups on the Cisco Nexus 7000 Series 40-Gbps Ethernet Modules (N7K-M324FQ-25L) and Cisco Nexus 7700 Series 40-Gbps Ethernet Modules (N77-M324FQ-25L)

Port Group	Port Numbers
Group 1	1, 2, 3, 4, 5, 6
Group 2	7, 8, 9, 10, 11, 12
Group 3	13, 14, 15, 16, 17, 18
Group 4	19, 20, 21, 22, 23, 24

Figure 12: Example Interface Allocation for Port Groups on the Cisco Nexus 7000 Series 10-Gbps Ethernet Modules (N7K-M348XP-25L)

Figure 13: Example Interface Allocation for Port Groups on the Cisco Nexus 7700 Series 10-Gbps Ethernet Modules (N77-M348XP-23L)

Table 21: Example VDC Allocation

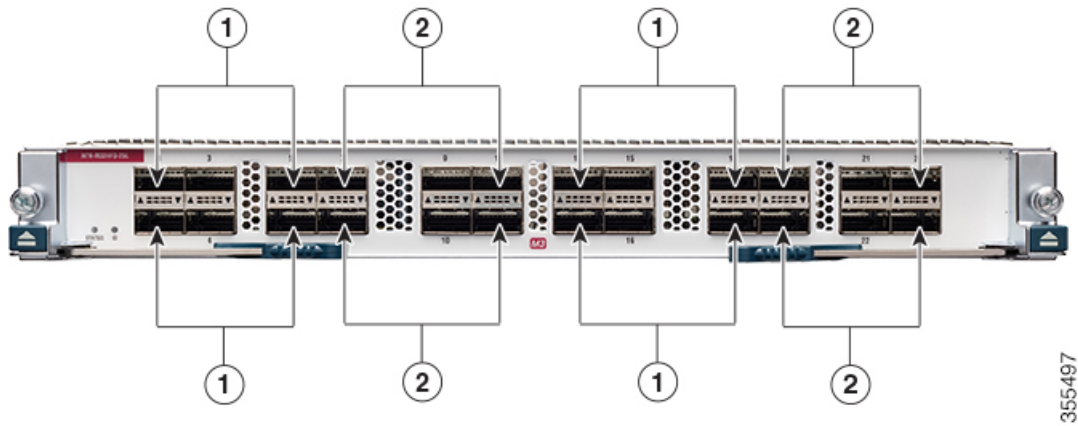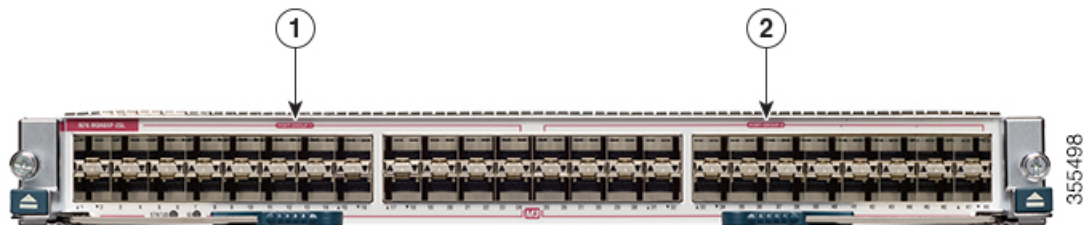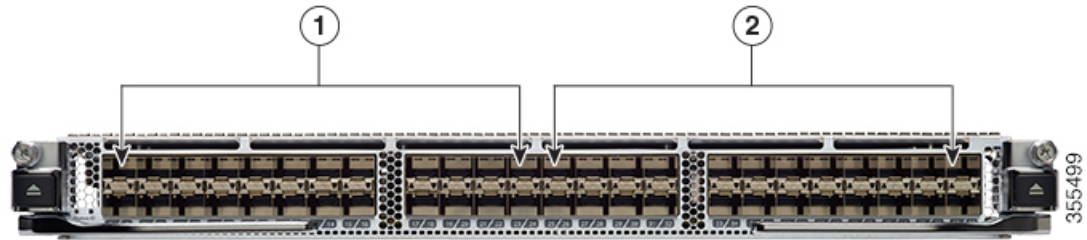| VDC	Callout
VDC A	1
VDC B	2

The table below shows the port numbering for the port groups.

Table 22: Port Numbers for Port Groups on the Cisco Nexus 7000 Series 10-Gbps Ethernet Modules (N7K-M348XP-25L) and Cisco Nexus 7700 Series 10-Gbps Ethernet Modules (N77-M348XP-23L)

Port Group	Port Numbers
Group 1	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24
Group 2	25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48

When interfaces in different VDCs share the same port ASIC, reloading the VDC (with the reload vdc command) or provisioning interfaces to the VDC (with the allocate interface command) might cause short traffic disruptions (of 1 to 2 seconds) for these interfaces. If such behavior is undesirable, make sure to allocate all interfaces on the same port ASIC to the same VDC.

This example shows how to map interfaces to the port ASIC:

```
# slot slot_number show hardware internal dev-port-map
+--------------------------------------------------------------+
+-----------+++FRONT PANEL PORT TO ASIC INSTANCE MAP+++--------+
+--------------------------------------------------------------+
FP port|PHYS  |SECUR |MAC_0 |RWR_0 |L2LKP |L3LKP |QUEUE |SWICHF
   1     0      0      0      0      0      0      0      0
   2     0      0      0      0      0      0      0      0
   3     0      0      0      0      0      0      0      0
   4     0      0      0      0      0      0      0      0
   5     0      1      0      0      0      0      0      0
   6     0      1      0      0      0      0      0      0
   7     0      1      0      0      0      0      0      0
   8     0      1      0      0      0      0      0      0
   9     1      2      0      0      0      0      0      0
  10     1      2      0      0      0      0      0      0
  11     1      2      0      0      0      0      0      0
```

```
12    1    2    0    0    0    0    0    0
13    1    3    1    0    0    0    0    0
14    1    3    1    0    0    0    0    0
15    1    3    1    0    0    0    0    0
16    1    3    1    0    0    0    0    0
17    2    4    1    0    0    0    0    0
```

The interface number is listed in the FP port column, and the port ASIC number is listed in the MAC_0 column, which means that in the above example, interfaces 1 through 12 share the same port ASIC (0).

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 multicast route memory

- IPv6 multicast route memory

- IPv4 unicast route memory

- IPv6 unicast route memory

- Port channels

- Switched Port Analyzer (SPAN) monitor sessions

- VLANs

- Virtual routing and forwarding (VRF) instances

HA Policies

The HA policy determines the action that the physical device takes when the VDC encounters an unrecoverable error. 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.

Suspending and Resuming VDCs

Users with the network-admin role can suspend and resume a nondefault VDC. You must save the VDC running configuration to the startup configuration before suspending the VDC. Otherwise, you will lose the changes to the running configuration when you resume the VDC. You cannot remove interfaces allocated to a suspended VDC. All other resources in use by the VDC are released while the VDC is suspended.

Note You cannot perform an in-service software upgrade (ISSU) when a VDC is suspended.

Note You cannot suspend the default VDC.

Caution Suspending a VDC disrupts all traffic on the VDC.

VDC Reloads

You can reload an active nondefault VDC that is in any state. The impact of reloading a nondefault VDC is similar to reloading a physical device. The VDC reloads using the startup configuration.

Note You cannot reload the default or admin VDC.

Caution Reloading a VDC disrupts all traffic on the VDC.

MAC Addresses

The default VDC has a management MAC address. Beginning with Cisco NX-OS Release 5.2(1) for the Cisco Nexus 7000 Series devices, subsequent nondefault VDCs that you create are assigned MAC addresses automatically as part of the bootup process.

You will see a syslog message if there are not sufficient MAC addresses to supply all the VDCs on the device.

VDC Boot Order

You can specify the boot order for the VDCs on the Cisco NX-OS device. By default, all VDCs start in parallel with no guarantee as to which VDC completes starting first. Using the boot order value, the Cisco NX-OS software starts the VDCs in a predictable sequence. The boot order feature has the following characteristics:

• More than one VDC can have the same boot order value. By default, all VDCs have the boot order value of 1.

• VDCs with the lowest boot order value boot first.

• The Cisco NX-OS software starts all VDCs with the same boot order value followed by the VDCs with the next highest boot order value.

• The Cisco NX-OS software starts VDCs that have the same boot order value in parallel.

• You cannot change the boot order for the default VDC or admin VDC; you can change the boot order only for nondefault VDCs.

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 or admin VDC.

Guidelines and Limitations for Managing VDCs

VDC management has the following configuration guidelines and limitations:

• Only users with the network-admin user role can manage VDCs.

• You can change VDCs only from the default or admin VDC.

• If sufficient MAC addresses to program the management port of all the nondefault VDCs are unavailable, do not program the MAC address in any of the nondefault VDCs.

• A syslog message is generated if sufficient MAC addresses are unavailable to program the management port in all VDCs.

• When a hardware issue occurs, syslog messages are sent to all VDCs.

• When you have back-to-back connected interfaces in two different virtual routing and forwarding (VRF) instances within the same VDC, the Address Resolution Protocol (ARP) fails to complete and packet drops occur because the VRFs obtain their own source MAC addresses. If you need two interfaces on the same VDC with different VRFs, assign a static MAC address to the VRF interfaces.

• When you replace an I/O module by another I/O module in the same slot of a Cisco Nexus 7000/7700 Series switch and power up the switch, the new I/O module is powered down and the following syslog message is displayed: **Slot-<x> has failed to boot up because of service "Im SAP" due to module insertion failure**. To resume normal operations, power up the I/O module after all the VDCs are online. The following syslog message is then displayed: **IM-1-IM_LC_INCOMPATIBLE_COPY_R_S: Module <x> inserted is not compatible with previous module in this slot. To ensure correct operation, do <copy run start vdc-all> to purge the previous module's configuration**. After the I/O module is online, use the **copy run start vdc-all** command and perform the required configurations.

M2-M3 Interop limitations

The following rules will be enforced for M line modules:

• M2 interfaces can coexist with M3 or M2 interfaces in same VDC. However, F2E and M3 interfaces cannot coexist.

• No interface from M2 module working with M3 interface can be allocated to other VDC.

• M2 module must be in M2-M3 interop mode, if M3 interface exists in same VDC.

- M2 module must be in M2-F2E mode, if F2E interface exists in same VDC.

- M2 LC must be in M2-M3 mode, if its ports must work in/be allocated to a M2-M3 VDC.

> **Note** This is applicable even if M3 ports exists or not.

- M2 LC must be in M2-F2E mode(default mode), to operate in other VDC.

You must configure interop mode, before applying the ASCII configuration. This avoids applying port related configuration while LC reboots. For information about M2-M3 VDC and Interoperability mode, see M2-M3 VDC and Interoperability mode, on page 29.

If the topology configuration consists of any VDC type M2 M3 with ports allocated from a M2 module to this VDC, performing a write-erase+reload+ascii configuration replay may result in port allocation errors during the configuration replay.

1. Save the running configuration to the bootflash.

   Verify the configuration to contain **system interop-mode m2-m3 module** x.

2. Perform write-erase and reload the configuration.

3. Bring up the switch and verify all the modules are online.

4. Configure the interop mode using the commands in the saved configuration.

   Type **Yes** when prompted to reload the modules.

5. Wait until all the modules are Online.

6. Apply the saved ASCII configuration.

If you reload configuration using **reload ascii** command, port allocation errors may occur during the configuration replay. Perform the following procedure to troubleshoot.

1. Save the running configuration to bootflash.

2. Perform reload ascii.

3. Wait until all modules and VDCs are online.

4. Apply the saved ASCII configuration from bootflash.

Along with the above mentioned guidelines and restrictions, the following are applicable from Cisco Nexus 7000 NX-OS Release 7.3(0)DX(1):

- Cisco Nexus 7700 series had the following types of M3 module:

    - Nexus 7700 M3 48-Port 1G/10G Module

    - Nexus 7700 M3 24-Port 40G

- The 48 port 10G module has two sockets of 24 X 10G ASIC.

- The 24 port 40G module has four sockets of 6 X 40G ASIC.

- The port group mappings are per ASIC.

- Interface allocation is done on the port group boundaries. The interfaces align ASIC resources to VDCs.

- The port group size varies depending on the module type.

Along with the above mentioned guidelines and restrictions, the following are applicable from Cisco Nexus 7000 NX-OS Release 8.0(1):

- Cisco Nexus 7000 Series switches has the following types of M3-Series modules:

    - 48-port 1-/10-Gigabit Ethernet I/O module (N7K-M348XP-25L)

    - 24-port 40-Gigabit Ethernet I/O module (N7K-M324FQ-25L)

- The 48 port 10G module has two sockets of 24 X 10G ASIC.

- The 24 port 40G module has four sockets of 6 X 40G ASIC.

- Cisco Nexus 7700 Series switches has the following types of M3-Series modules:

    - 48-Port 1-/10-Gigabit Ethernet I/O module (N7K-M348XP-25L)

    - 24-Port 10-/40-Gigabit Ethernet (N7K-M324FQ-25L)

    - 12-port 100-Gigabit Ethernet I/O module (N77-M312CQ-26L)

- The 48 port 10G module has two sockets of 24 X 10G ASIC.

- The 24 port 40G module has four sockets of 6 X 40G ASIC.

- The 12 port 100G module has six sockets of 2 X 100G ASIC.

- The port group mappings are per ASIC.

- Interface allocation is done on the port group boundaries. The interfaces align ASIC resources to VDCs.

- The port group size varies depending on the module type.

VDC Type Support

The following VDC type support is available in Cisco NX-OS Release 8.0(1):

VDC Type	M3 support	M3 + F3 Support
Layer 2	Yes	Yes
Layer 3	Yes	Yes
Fabric Path	No	No
VxLAN	Yes	Yes
FEX	Yes	Yes
MPLS	Yes	Yes
OTV	Yes	Yes
LISP	Yes	Yes

VDC Type	M3 support	M3 + F3 Support
GTP	Yes	No
Layer 2 Gateways	Yes	No
Table Size	M3 Size	F3 Size

Managing VDCs

Changing the Nondefault VDC Prompt Format

You can change the format of the CLI prompt for nondefault VDCs. By default, the prompt format is a combination of the default VDC name and the nondefault VDC name. You can change the prompt to only contain the nondefault VDC name.

Before you begin

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

Procedure

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters global configuration mode.
Step 2	switch(config)# [**no**] **vdc combined-hostname**	Changes the format of the CLI prompt for the nondefault VDC. To change the prompt to show only the nondefault VDC name, use the no format of the command. By default, the CLI prompt for a nondefault VDC consists of the default VDC name and the nondefault VDC name.
Step 3	(Optional) switch(config)# **copy running-config startup-config vdc-all**	Copies the running configuration for all the VDCs to the startup configuration. If you disable the combined hostname, this command prevents the VDC names from reverting back to their original format (with combined hostnames) after the running configuration is saved and the system is reloaded. Enter this command after turning off the combined hostname.

Allocating Interfaces to an Ethernet VDC

Note See the *Cisco NX-OS FCoE Configuration Guide for Cisco Nexus 7000 and Cisco MDS 9500* for information on allocating interfaces to storage VDCs for Fibre Channel over Ethernet (FCoE).

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.

Note Beginning with Cisco NX-OS Release 5.2(1) for Nexus 7000 Series devices, all members of a port group are automatically allocated to the VDC when you allocate an interface.

Before you begin

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

Procedure

	Command or Action	**Purpose**
Step 1	switch# **configure terminal**	Enters global configuration mode.
Step 2	switch(config)# **vdc** *vdc-name*	Specifies a VDC and enters VDC configuration mode.
Step 3	(Optional) switch(config-vdc)# **show vdc membership** [**status**]	Displays the status of VDC interface membership
Step 4	switch(config-vdc)# [**no**] **allocate interface ethernet** *slot/port*	Allocates one interface to the VDC. Beginning with Cisco NX-OS Release 6.1(1), you can use the **no allocate interface ethernet** command to remove the interface from the VDC and place it in an unallocated pool.
Step 5	(Optional) switch(config-vdc)# [**no**] **allocate interface ethernet** *slot/port* **-** *last-port*	Allocates a range of interfaces on the same module to the VDC.
Step 6	(Optional) switch(config-vdc)# [**no**] **allocate interface ethernet** *slot/port,* **ethernet** *slot/port,*	Allocates a list of interfaces to the VDC.
Step 7	switch(config-vdc)# **exit**	Exits the VDC configuration mode.
Step 8	(Optional) switch(config-vdc)# **show vdc membership** [**status**]	Displays VDC interface membership information.

	Command or Action	Purpose
Step 9	(Optional) switch(config)# **copy running-config startup-config**	Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.
		Note After you add an interface to a VDC, you must copy the default or admin 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 effect immediately except for the IPv4 and IPv6 route memory limits, which take effect after the next VDC reset, physical device reload, or physical device stateful switchover.

Procedure

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters global configuration mode.
Step 2	switch# **show vdc resource detail**	Displays the resource information for all VDCs.
Step 3	switch(config)# **vdc** *vdc-name*	Specifies a VDC and enters VDC configuration mode.
Step 4	switch(config-vdc)# **template** *template-name*	Applies a new resource template for the VDC.
Step 5	switch(config-vdc)# **exit**	Exits VDC configuration mode.
Step 6	(Optional) switch(config)# **show vdc** *vdc-name* **resource**	Displays the resource information for a specific VDC.
Step 7	(Optional) switch(config)# **copy running-config startup-config**	Saves the change persistently through reboots and restarts by copying 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 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.

Beginning with Cisco NX-OS Release 6.1, CPU shares are used to control the CPU resources among the VDCs by allowing you to prioritize VDC access to the CPU during CPU contention. CPU shares are supported on Supervisor 2/2e modules only. You can also configure the number of CPU shares on a VDC. For example, a VDC with 10 CPU shares gets twice the CPU time compared to a VDC that has 5 CPU shares.

Some features require that all modules in a chassis be of a certain type. Beginning with Cisco NX-OS Release 6.1(3), you can apply the switchwide VDC mode to prevent accidental insertion of a module or to restrict certain line cards from powering on in the system. For example, the result bundle hashing (RBH) modulo feature does not operate with M Series modules in the system. Use the system module-type command to apply the switchwide VDC mode. This command controls which line cards are allowed in the chassis (see the table below). Otherwise, widespread disruption is caused within a VDC.

The modules that you do not enable must not be powered on after you configure this feature and enter yes. An error message forces you to manually disable these modules before proceeding, which prevents major disruptions and service issues within a VDC.

Beginning with Cisco NX-OS Release 6.2(2), the F2e Series module can be enabled on the chassis, which now allows interoperability with the M Series modules. For a chassis with only F2e Series modules, the default VDC will be created using an F2e Series module as a supported module unless you apply your own configuration. F2 Series modules are only compatible with F2e Series modules on the chassis. The F2e and F2 Series modules cannot exist with the F1 Series module in the same VDCs. Currently, only F1, F2, and F2e Series modules are supported by storage VDCs. While Supervisor 1 supports only F1 Series modules in a storage VDC, Supervisor 2/2e supports all these types. The rules of mixing module types in a storage VDC is the same as in an ethernet VDC.

> **Note** When using the system module-type command to apply the switchwide VDC mode, there are no restrictions on the module types that can be mixed

Modules	F1	F2	F3
F1 with Supervisor 1 only	Yes	No	No
F2 with Supervisor 2/2e	No	Yes	Yes
F2 / F2e with Supervisor 2/2e	No	Yes	Yes

> **Note** For Cisco NX-OS Release 6.1 only, because F2e Series modules are supported as F2 Series modules, F2e Series modules follow the same mixing rules as F2 Series modules.

Note Storage VDCs in Cisco NX-OS Release 6.2(6) do not support F3 Series modules.

Table 23: Restrictions and Conditions of Allowed Module Type Mix on Ethernet VDCs

Module	M1	F1	M1XL	M2XL	F2	F2e	F3	M3
M1	Yes	Yes	Yes	Yes	No	Yes	No	No
F1	Yes	Yes	Yes	Yes	No	No	No	No
M1XL	Yes	Yes	Yes	Yes	No	Yes	No	No
M2XL	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
F2	No	No	No	No	Yes	Yes	Yes	No
F2e	Yes	No	Yes	Yes	Yes	Yes	Yes	No
F3	No	No	No	Yes	Yes	Yes	Yes	Yes
M3	No	No	No	Yes	No	No	Yes	Yes

Note • F3 F2E M2XL cannot coexist in the same VDC (although any two of them can coexist).

Table 24: Module Type Support on a Default VDC

Cisco NX-OS Release	All Line Cards Present in Chassis	Default Module Type Support for Default VDC (without user configuration)
5.1	M (any) and/or F1	M1 F1
6.0	F2	F2
	M* and/or F1 (and any other combination)	M1 F1
6.1	F2 and/or F2e **Note** During an upgrade from Cisco NX-OS Release 6.1x to 6.2(2), F2 Series module type is automatically upgraded to F2 F2e Series.	F2

Cisco NX-OS Release	All Line Cards Present in Chassis	Default Module Type Support for Default VDC (without user configuration)
6.2	F2	F2 F2e
	F2e	F2e
	F2 F2e	F2 F2e
	F3	F3
	F2e F3	F3 F2e
	Other combinations	M1 M1XL M2XL F2e
	Note Support for F3 Series modules was added in Cisco NX-OS Release 6.2(6).	
7.3(1)D1(1)	F2	F2
	F2e	F2e
	F2 F2e	F2 F2e
	F3	F3
	F2e F3	F2e F3
	M1	M1
	M2	M2
7.3(0)DX(1)	F2	F2
	F2e	F2e
	F2 F2e	F2 F2e
	F3	F3
	F2e F3	F2e F3
	M1	M1
	M2	M2
	M2 M3	M2 M3
	M3	M3
	F3 M3 (Cisco Nexus 7700 Series switches only)	F3 M3 (Cisco Nexus 7700 Series switches only)

Cisco NX-OS Release	All Line Cards Present in Chassis	Default Module Type Support for Default VDC (without user configuration)
8.0 (1)	F2	F2
	F2e	F2e
	F2 F2e	F2 F2e
	F3	F3
	F2e F3	F2e F3
	M2	M2
	M2 M3	M2 M3
	M3	M3
	F3 M3	F3 M3

Note

- The Cisco Nexus 7710 switch and Cisco Nexus 7718 switch supports F2e and F3 Series module types in both an Ethernet VDC and Storage VDC. F3 Series modules do not support storage VDCs in Cisco NX-OS Release 6.2(6).

- Fabric-1 modules, F1 Series modules, M1 Series modules (non-XL mode), and Cisco Nexus 7000 Supervisor-1 modules are not supported in Cisco NX-OS Release 7.3(0)D1(1) and later releases.

F2e Proxy Mode

To support the coexistence of an F2e Series module with an M Series module in the same VDC, the F2e Series module operates in a proxy mode so that all Layer 3 traffic is sent to an M Series module in the same VDC. For F2e proxy mode, having routing adjacencies connected through F2e interfaces with an M1 Series module is not supported. However, routing adjacencies connected through F2e interfaces with an M2 Series module is supported.

You cannot allocate F2e ports as shared interfaces in the storage VDC if the F2e port is in proxy mode in the Ethernet VDC.

When you enter the **limit-resource module-type** command and it changes the F2e mode between the old VDC type and the new VDC type, you are prompted to enter the **rebind interface** command, as shown below:

```
switch(config-vdc)# limit-resource module-type m1 m1xl m2xl f2e
This will cause all ports of unallowed types to be removed from this vdc. Continue (y/n)?
[yes]
Note: rebind interface is needed for proper system operation.
Please backup the running-configuration for interface by redirecting the output of "show
running-config interface".
Reapply the interface configuration after the "rebind interface" command
switch(config)# vdc vdc2
switch(config-vdc)# rebind interfaces
All interfaces' configurations of the current vdc will be lost during interface rebind.
Please back up the configurations of the current vdc. Do you want to proceed (y/n)? [no]
yes
switch(config-vdc)#
```

Note   If an interface rebind is required, users are displayed with a yes/no prompt on Cisco NX-OS Release 6.2(8) and later, as opposed to entering the rebind interface command manually in earlier releases.

The table below shows the VDC type changes that require the rebind interface command:

Table 25: VDC Types That Require Rebind Interface Command

Old VDC Type	New VDC Type	Rebind Required	Description	Impact
F2,F2e	M,F2e	Yes	Changes F2e from Layer 3 to proxy mode.	You will lose the F2,F2e configuration during the rebinding of the interface. F2 configuration loss should not have much impact because F2 ports are not part of the new VDC.
M,F2e	F2,F2e	Yes	Changes F2e from proxy to Layer 3 mode.	You will lose the M,F2e configuration during the rebinding of the interface. M configuration loss should not have much impact because M ports are not part of the new VDC.
F2e	M,F2e	Yes	Changes F2e from Layer 3 to proxy mode.	You will lose only the F2e configuration.
M,F2e	F2e	Yes	Changes F2e from proxy to Layer 3 mode.	You will lose the M,F2e configuration during the rebinding of the interface. M configuration loss should not have much impact because M ports are not part of the new VDC.
F2,F2e	F2e	Yes	Enables F2e-only capabilities like SVI statistics.	You will lose the F2,F2e configuration during the rebinding of the interface. F2 configuration loss should not have much impact because F2 ports are not part of the new VDC.
F2e	F2e,F3	No	N/A	N/A
F2e	F2,F2e	Yes	Disables F2e-only capabilities like SVI statistics.	You will lose only the F2e configuration.
F3	F3,F2e	No	N/A	N/A

Old VDC Type	New VDC Type	Rebind Required	Description	Impact
F3,F2e	F3	No	N/A	N/A
F3	F3,M2XL	No	N/A	N/A
F3,M2XL	F3	No	N/A	N/A
F3,F2,F2e	F3	Yes	Changes LCD to F3.	You will lose the F3 configuration.
F3	F3,F2,F2e	Yes	Changes F3 to LCD.	You will lose the F3 configuration.
F3,F2	F3	Yes	Changes LCD to F3.	You will lose the F3 configuration.
F3	F3,F2	Yes	Changes F3 to LCD.	You will lose the F3 configuration.
M3	M3, F3	Yes	N/A	N/A
M3, F3	M3	Yes	N/A	N/A
M3	M3, M2	Yes	N/A	N/A
M3, M2	M3	Yes	N/A	N/A

Note   M1 and F3 modules cannot co-exist. When an existing module (for exaxmple, M1) is replaced with a new module (for example, F3) rebind is not required. Rebind is required only when a VDC module type is changed along with the existing module types.

M2-M3 VDC and Interoperability mode

In Cisco Nexus 7000 Series Switches, the M2 line module packet supports both M2-F2E and M2-M3 interop header formats. By default, the M2 module operates in the M2-F2E mode. M3 line module supports M2-M3 interop header only. M2 and F3/F2E modules supports both modes of operation.

If M2 and M3 modules operates in the same VDC, M2 module must be changed to M2-M3 interop mode. When M2 module works with M2 or F2E module in proxy mode, M2 module must be in M2-F2E mode.

M2 LC must be in M2-M3 mode, if its ports must work in/be allocated to a M2-M3 VDC.

Note   This is applicable even if M3 ports exists or not.

M2 LC must be in M2-F2E mode(default mode), to operate in other VDC.

To change the M2 module mode,

- To change M2 module to M2-M3 interop mode, use the **system interop-mode m2-m3 module** command.

Enter **Y** when prompted to reload the module.

- To change M2 module to M2-F2E mode, you must unallocate any M2 interfaces from the M2-M3 VDC.

  Use the **no system interop-mode m2-m3 module** command.

  Enter **Y** when prompted to reload the module.

Note Ensure that all the interfaces from the same M2 module working with the M3 module must be in the same VDC.

Note You can insert a maximum of ten 24-port 40-Gigabit Ethernet QSFP+ (N7K-M324FQ-25L) I/O modules in the Cisco Nexus 7018 switch. This I/O module uses 96 VQI per slot. The maximum VQI of a Cisco Nexus 7018 switch is 1024 and a total of eleven 24-port 40-Gigabit Ethernet QSFP+ I/0 modules will require 1056 VQI. In such a scenario, the eleventh I/O module will attempt to come online 3 times and then will get powered down. During reload of a switch with eleven 24-port 40-Gigabit Ethernet QSFP+ I/0 modules, the I/O module that comes up last will be powered down.

Configuring VDC Resource Limits

Procedure

	Command or Action	**Purpose**
Step 1	switch# **configure terminal**	Enters global configuration mode.
Step 2	(Optional) switch(config)# [**no**] **system module-type** *module-type*	Enters switchwide VDC mode and specifies which modules can be enabled on a chassis. You can enable a mix of F1, F2, F2e, M1, M1XL, and M2 Series modules. There are no restrictions on the type of mix allowed for the **system module-type** command.
		Note Restrictions on the module types that can be mixed in a VDC are controlled by the **limit-resource module-type** command.
		Note The modules that you do not enable must not be powered on after you configure this feature and enter yes. An error message forces you to manually disable these modules before proceeding, which prevents major disruptions and service issues within a VDC.

	Command or Action	Purpose
		The **no** form of this command resets the configuration mode to allow all modules.
Step 3	(Optional) switch(config)# **show vdc**	Displays which modules are enabled in the chassis.
Step 4	(Optional) switch(config)# **show vdc resource detail**	Displays the resource information for all VDCs.
Step 5	switch(config)# **vdc** *vdc-name*	Specifies a VDC and enters VDC configuration mode.
Step 6	switch(config-vdc)# **limit-resource m4route-mem** [**minimum** *min-value*] **maximum** *max-value*	Specifies the limits for IPv4 multicast route memory in megabytes. The range is from 1 to 90.
Step 7	switch(config-vdc)# **limit-resource m6route-mem** [**minimum** *min-value*] **maximum** *max-value*	Specifies the limits for IPv6 multicast route memory in megabytes. The range is from 1 to 20.
Step 8	switch(config-vdc)# **limit-resource monitor-session minimum** *min-value* **maximum** {*max-value* | **equal-to-min**}	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. **Note** You can have a maximum of two SPAN monitoring sessions on your physical device.
Step 9	switch(config-vdc)# **limit-resource monitor-session-erspan-dst minimum** *min-value* **maximum** {*max-value* | **equal-to-min**}	Configures the ERSPAN monitor session resource limits. The range is from 0 to 23. The equal-to-min keyword automatically sets the maximum limit equal to the minimum limit.
Step 10	switch(config-vdc)# **limit-resource port-channel minimum** *min-value* **maximum** {*max-value* | **equal-to-min**}	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.
Step 11	switch(config-vdc)# **limit-resource u4route-mem** [**minimum** *min-value*] **maximum** *max-value*	Specifies the minimum and maximum limits for IPv4 unicast route memory in megabytes. The range is from 1 to 512.
Step 12	switch(config-vdc)# **limit-resource u6route-mem** [**minimum** *min-value*] **maximum** *max-value*	Specifies the minimum and maximum limits for IPv6 unicast route memory in megabytes. The range is from 1 to 200.
Step 13	switch(config-vdc)# **limit-resource vlan minimum** *min-value* **maximum** {*max-value* | **equal-to-min**}	Configures the VLAN resource limits. The range is from 16 to 4094. The **equal-to-min**

	Command or Action	Purpose
		keyword automatically sets the maximum limit equal to the minimum limit.
Step 14	switch(config-vdc)# **limit-resource vrf minimum** *min-value* **maximum** {*max-value* | **equal-to-min**}	Specifies the limits for VRF. The range is from 2 to 4096. The **equal-to-min** keyword automatically sets the maximum limit equal to the minimum limit.
Step 15	switch(config-vdc)# **limit-resource module-type** *module type*	Configures the specified line card type. VDCs support the F1, F2, F2e, M1, M1XL, and M2XL Series module types.
		Note F2e Series modules cannot exist in the same VDC with F1 Series modules. The **limit-resource module-type** command allows a mix of F1, M1, M1XL, and M2XL Series modules or a mix of F2e, M1, M1XL, and M2XL Series modules in the same VDC.
		Note F2 Series modules cannot exist in the same VDC with F1, M1, M1XL, and M2XL Series modules. Use the **limit-resource module-type f2** command to allow only F2 Series modules into a VDC. Use the **limit-resource module-type f2 f2e** command to enable an F2e Series module in an F2 VDC. The ports from F2 and F2e Series modules can be allocated like any other ports.
Step 16	switch(config-vdc)# **cpu-shares** *shares*	Sets the number of CPU shares on a VDC. The range is from 1 to 10. For example, a VDC with 10 CPU shares gets twice the CPU time compared to a VDC that has 5 CPU shares.
Step 17	(Optional) switch(config-vdc)# **show vdc detail**	Displays the VDC status information.
Step 18	switch(config-vdc)# **exit**	Exits VDC template configuration mode.
Step 19	(Optional) switch(config)# **show vdc vdc-name resource**	Displays VDC template configuration information.
Step 20	(Optional) switch(config)# **copy running-config startup-config**	Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

Displaying show vdc detail Output

This example displays the output of show vdc detail command:

```
switch# show vdc detail

vdc id: 1
vdc name: switch
vdc state: active
vdc mac address: 00:26:51:cb:bf:41
vdc ha policy: RELOAD
vdc dual-sup ha policy: SWITCHOVER
vdc boot Order: 1
CPU Share: 5
CPU Share Percentage: 22%
vdc create time: Wed Jul 18 18:08:15 2012
vdc reload count: 0
vdc restart count: 0
vdc type: Admin
vdc supported linecards: None

vdc id: 2
vdc name: vdc2
vdc state: active
vdc mac address: 00:26:51:cb:bf:42
vdc ha policy: RESTART
vdc dual-sup ha policy: SWITCHOVER
vdc boot Order: 1
CPU Share: 10
CPU Share Percentage: 45%
vdc create time: Wed Jul 18 18:17:14 2012
vdc reload count: 0
vdc restart count: 0
vdc type: Ethernet
vdc supported linecards: m1 f1 m1xl m2xl

vdc id: 3
vdc name: new-vdc
vdc state: active
vdc mac address: 00:26:51:cb:bf:43
vdc ha policy: RESTART
vdc dual-sup ha policy: SWITCHOVER
vdc boot Order: 1
CPU Share: 7
CPU Share Percentage: 31%
vdc create time: Wed Jul 18 18:29:51 2012
vdc reload count: 0
vdc restart count: 0
vdc type: Ethernet
vdc supported linecards: m1 f1 m1xl m2xl
switch#
```

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.

- Restart—Restarts the VDC. This process includes shutting down all the interfaces within that VDC and stopping all the virtualized services processes. The Cisco 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.

  - Reload—Reloads the supervisor module.

$\triangle$

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 Cisco 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.

$\triangle$

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 or admin VDC.

Before you begin

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

Procedure

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters global configuration mode.
Step 2	switch(config)# **vdc** *vdc-name*	Specifies a VDC and enters VDC configuration mode.

	Command or Action	Purpose
Step 3	switch(config-vdc)# **ha-policy** {**dual-sup** {**bringdown**	**restart**	**switchover**}	**single-sup** {**bringdown**	**reload**	**restart**}}	Configures the HA policy for the VDC. The **dual-sup** and **single-sup** keyword values are as follows: • **bringdown**—Puts the VDC in the failed state. • **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 processes and interfaces and restarts it using the startup configuration. • **switchover**—Initiates a supervisor module switchover. **Note** You cannot change the HA policies for the default or admin VDC.
Step 4	switch(config-vdc)# **exit**	Exits VDC configuration mode.
Step 5	(Optional) switch(config)# **show vdc detail**	Displays VDC status information.
Step 6	(Optional) switch(config)# **copy running-config startup-config**	Saves the change persistently through reboots and restarts by copying 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 or admin VDC with a username that has the network-admin user role.

Procedure

	Command or Action	Purpose
Step 1	switch# **switchto vdc** *vdc-name*	Switches to the nondefault VDC.
Step 2	(Optional) switch-TestVDC# **copy running-config startup-config**	Copies the running configuration for the VDC to the startup configuration.
Step 3	switch-TestVDC# **switchback**	Switches back to the default or admin VDC.

	Command or Action	Purpose
Step 4	(Optional) switch# **copy running-config startup-config vdc-all**	Copies the running configuration for all the VDCs to the startup configuration.

Suspending a Nondefault VDC

You can suspend an active nondefault VDC. You must save the VDC running configuration to the startup configuration before suspending the VDC. Otherwise, you will lose the changes to the running configuration.

Note You cannot suspend the default and admin VDC.

Caution Suspending a VDC disrupts all traffic on the VDC.

Before you begin

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

Procedure

	Command or Action	Purpose
Step 1	(Optional) switch# **copy running-config startup-config vdc-all**	Copies the running configuration for all the VDCs to the startup configuration.
Step 2	switch# **configure terminal**	Enters global configuration mode.
Step 3	switch(config)# **vdc** *vdc-name* **suspend**	Suspends a nondefault VDC.

Resuming a Nondefault VDC

You can resume a nondefault VDC from the suspended state. The VDC resumes with the configuration saved in the startup configuration.

Before you begin

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

Procedure

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters global configuration mode.
Step 2	switch(config)# **no vdc** *vdc-name* **suspend**	Resumes a suspended nondefault VDC.

Reloading a Nondefault VDC

You can reload a nondefault VDC that is in a failed state. The VDC reloads using the startup configuration.

Note Use the **reload** command to reload the default or admin VDC. Reloading the default or admin VDC reloads all VDCs on the Cisco NX-OS device.

Caution Reloading a VDC disrupts all traffic on the VDC.

Before you begin

Log in to the nondefault VDC with a username that has the vdc-admin user role or use the **switchto vdc** command from the default or admin VDC to access the nondefault VDC.

Procedure

	Command or Action	Purpose
Step 1	(Optional) switch# **copy running-config startup-config vdc-all**	Copies the running configuration for the nondefault VDC to the startup configuration.
Step 2	switch-TestVDC# **reload vdc**	Reloads a nondefault VDC.

Configuring the VDC Boot Order

You can configure the boot order for the VDCs on your Cisco NX-OS device.

Note You cannot change the boot order of the default or admin VDC.

Before you begin

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

Procedure

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters global configuration mode.
Step 2	switch(config)# **vdc** *vdc-name*	Specifies a VDC and enters VDC configuration mode.
Step 3	switch(config-vdc)# **boot-order** *number*	Configures the boot order value for the VDC. The range for the number argument is from 1 to 4 on a Supervisor 2 module and from 1 to 8

	Command or Action	Purpose
		on a Supervisor 2e module. The VDC starts from the lowest to the highest boot order value.
		You cannot change the boot order for the default VDC.
Step 4	switch(config-vdc)# **exit**	Exits VDC configuration mode.
Step 5	(Optional) switch(config)# **show vdc detail**	Displays VDC status information.
Step 6	(Optional) 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 ports on the VDC are moved to unallocated interfaces.

Note   You cannot delete the default VDC (VDC 1) and the admin VDC.

Caution   Deleting a VDC disrupts all traffic on the VDC.

Before you begin

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

Procedure

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters global configuration mode.
Step 2	switch(config)# **no vdc** *vdc-name*	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	switch(config)# **exit**	Exits VDC configuration mode.
Step 4	(Optional) switch# **show vdc**	Displays VDC configuration information.
Step 5	(Optional) switch# **copy running-config startup-config**	Copies the running configuration to the startup configuration.

Verifying the VDC Configuration

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

Command	Purpose
show running-config {**vdc** | **vdc-all**}	Displays the VDC information in the running configuration.
show vdc [*vdc-name*]	Displays the VDC configuration information.
show vdc detail	Displays the detailed information about many VDC parameters.
show vdc current-vdc	Displays the current VDC number.
show vdc membership [**status**]	Displays the VDC interface membership information.
show vdc resource template	Displays the VDC template configuration.
show resource	Displays the VDC resource configuration for the current VDC.
show vdc [*vdc-name*] **resource** [*resource-name*]	Displays the VDC resource configuration for all VDCs.
show mac vdc {*vdc-id*}	Displays the MAC address for a specific VDC.

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*.

Configuration Examples for VDC Management

This example shows how to allocate interfaces between VDCs for port groups on a Cisco Nexus 7000 Series 32-port, 10-Gbps Ethernet module:

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
```

Related Documents for Managing VDCs

Related Topic	Document Title
Cisco NX-OS licensing	*Cisco Nexus 7000 Series NX-OS Unicast Routing Command Reference*
Cisco Nexus 7000 Series Hardware Installation and Reference Guide	*Cisco Nexus 7000 Series Hardware Installation and Reference Guide*
VDC commands	*Cisco Nexus 7000 Series NX-OS Virtual Device Context Command Reference*
FCoE commands	*Cisco NX-OS FCoE Command Reference for Cisco Nexus 7000 and Cisco MDS 9500*

Feature History for Managing VDCs

This table includes only the updates for those releases that have resulted in additions or changes to the feature.

Table 26: Feature History for Managing VDCs

Feature Name	Release	Feature Information
M3 Series Module	8.0(1)	Added guidelines and limitations for support of M3 Series modules on Cisco Nexus 7000 Series switches.
M3 Series Module	7.3(0)DX(1)	Added guidelines and limitations for support of M3 Series modules on Cisco Nexus 7700 Series switches.
F3 Series module	6.2(6)	Added support for the F3 Series module.
Cisco Nexus 7710 switch and Cisco Nexus 7718 switch	6.2(2)	Added support for the Cisco Nexus 7710 switch and the Cisco Nexus 7718 switch on the Supervisor 2e module.
Admin VDC on Supervisor 1 module	6.2(2)	Added support for admin VDCs on the Supervisor 1 module.
F2e Series module	6.2(2)	Added the ability to enable the F2e Series module (a new configurable VDC module type, independent from and separate to the F2 VDC module type) on the chassis.

Feature Name	Release	Feature Information
F2e proxy mode	6.2(2)	Introduced this feature to support the coexistence of an F2e Series module with an M Series module in the same VDC.
Switchwide VDC mode	6.1(3)	Added the ability to enable specific line cards in the chassis and prevent others from powering on.
Support for F2e Series modules	6.1(2)	Added support for F2e Series modules as part of the F2 Series modules.
Support for Supervisor 2 and M2 Series modules.	6.1(1)	Added support for Supervisor 2 and M2 Series modules.
CPU shares	6.1(1)	Added support for CPU shares on a VDC.
VDC resource limits	6.0(1)	Added support for F2 Series modules.
MAC addresses	5.2(1)	The default VDC has a MAC address, and subsequent nondefault VDCs that are created are assigned MAC addresses.
VDC resource limits	5.2(1)	Added support for M1XL Series modules.
N7K-F132XP-15 module	5.1(1)	Added support for the N7K-F132XP-15 module.
VDC resource limits	5.1(1)	Added the ability to configure ERSPAN monitor session resource limits.
VDC resource limits	5.0(2)	The range for the minimum and maximum values changed for the **limit-resource m4route-mem**, **limit-resource m6route-mem**, **limit-resource u4route-mem**, **limit-resource u6route-mem**, and **limit-resource vrf** commands.
Restarting VDCs	4.2(4)	The vdc restart command was replaced by the **reload vdc** command.
Suspending and resuming VDCs	4.2(1)	You can suspend and resume nondefault VDCs.
Restarting VDCs	4.2(1)	You can restart active nondefault VDCs and nondefault VDCs in the failed state.
Reloading VDCs	4.2(1)	You can reload nondefault VDCs.
VDC prompt format	4.2(1)	You can change the format of the CLI prompt for nondefault VDCs.
VDC boot order	4.2(1)	You can configure the boot order for nondefault VDCs.

Feature Name	Release	Feature Information
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.