



## Storage VDC

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## Information About Storage VDC

You use a storage virtual device context (VDC) to separate LAN and SAN traffic on the same switch. A VDC allows you to maintain one physical infrastructure but separate logical data paths.

To achieve this configuration, you must perform the following tasks:

- Create a dedicated storage VDC.
- Allocate physical ports to the storage VDC. These can be either ports dedicated to only the storage VDC or ports that are shared between the storage VDC and one other VDC. Dedicated ports can be used to create either VFC E ports (VE ports) or F ports (VF ports). Shared ports can only be used for VFC F ports (VF ports).

Once you share the port to the storage VDC you can create a VFC F-port on top of the shared interface. You cannot modify some details of that port because it must match the underlying shared physical port. If you move the source port to another VDC or delete the VDC, the shared ports are deleted and you must reconfigure them.



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**Note** If the storage VDC restarts or is suspended, any shared Ethernet ports are shut down in the corresponding VDC. These ports come up automatically once the storage VDC is operational.

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## Licensing Requirements for FCoE

Product	License
Cisco Nexus 7000 Series	Each F Series module that runs FCoE requires an FCoE license. FCoE enabled in a nondefault VDC does not require the Advanced Services License. By default, FCoE does not require an additional VDC and is enabled in the storage VDC. For a complete explanation of the Cisco NX-OS licensing scheme and how to obtain and apply licenses, see the <a href="#">Cisco NX-OS Licensing Guide</a> .

## Configuring FCoE VDCs

### Licensing an FCoE Module

You must associate an FCoE license with an FCoE module to configure FCoE. You need one license for each module configured for FCoE.

#### Before you begin

Ensure you have installed the correct license for FCoE.

#### SUMMARY STEPS

1. **configure terminal**
2. **license fcoe module** *module-number*
3. (Optional) **show license usage** *module-name*
4. (Optional) **copy running-config startup-config**

#### DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<b>configure terminal</b> <b>Example:</b> <pre>switch# configure terminal switch(config)#</pre>	Enters configuration mode.
<b>Step 2</b>	Required: <b>license fcoe module</b> <i>module-number</i> <b>Example:</b> <pre>switch(config)# license fcoe module 2</pre>	Associates an FCoE license to a module.

	Command or Action	Purpose
<b>Step 3</b>	(Optional) <b>show license usage <i>module-name</i></b> <b>Example:</b> swtich(config)# show license usage FCOE-N7K-F132XP	Displays the line card usage used by a storage VDC. For details on license packages, see <a href="#">Cisco NX-OS Licensing Guide</a> .
<b>Step 4</b>	(Optional) <b>copy running-config startup-config</b> <b>Example:</b> swtich(config)# copy running-config startup-config	Copies the running configuration to the startup configuration.

## Creating a Dedicated Storage VDC



**Note** Commands from step 1 to step 7 are performed in the admin VDC.  
Commands from step 8 to step 11 are performed in the storage VDC.

### Before you begin

- Ensure you have installed the correct license for FCoE.



**Note** VE ports must exist on dedicated interfaces. VF ports can exist on either dedicated or shared interfaces.

### SUMMARY STEPS

1. **configure terminal**
2. **install feature-set fcoe**
3. **system qos**
4. **service-policy type network-qos *policy-map name***
5. **vdc *vdc-name* type storage**
6. **allocate interface ethernet *int-numb***
7. **switchto vdc *vdc-name***
8. **feature lldp**
9. (Optional) **feature lacp**
10. (Optional) **show feature-set**
11. (Optional) **copy running-config startup-config**

### DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<b>configure terminal</b> <b>Example:</b>	Enters configuration mode.

	Command or Action	Purpose
	<pre>switch# configure terminal switch(config)#</pre>	
<b>Step 2</b>	<p><b>install feature-set fcoe</b></p> <p><b>Example:</b></p> <pre>switch(config)# install feature-set fcoe</pre>	Installs the FCoE feature-set.
<b>Step 3</b>	<p><b>system qos</b></p> <p><b>Example:</b></p> <pre>switch(config)# system qos switch(config-sys-qos)#</pre>	Enters system qos mode.
<b>Step 4</b>	<p><b>service-policy type network-qos <i>policy-map name</i></b></p> <p><b>Example:</b></p> <pre>switch(config-sys-qos)#service-policy type network-qos default-nq-7e-policy</pre>	<p>Enables no drop queue for FCoE class.</p> <p><b>Note</b> The Cisco MDS 9250i Multiservice Fabric Switch follows a different naming convention which reflects how many ingress queues and egress queues are there in a policy. The name is different, but it is same as the MDS policy. 7e policy is default in MDS and Cisco MDS 9250i Multiservice Fabric Switch, hence it is not shown in <b>show running-config</b> command. The 7e policy is not default in Cisco Nexus 7000 Series Switches, hence it is shown in the <b>show running-config</b> command.</p>
<b>Step 5</b>	<p><b>vdc <i>vdc-name</i> type storage</b></p> <p><b>Example:</b></p> <pre>switch(config)# vdc fcoe-vdc type storage switch(config-vdc)#</pre>	<p>Creates a dedicated storage VDC and enters VDC configuration mode. You can only enable storage features in a storage VDC. You do not need to allow the feature-set or enable it in the storage VDC because this process is handled automatically for a storage VDC.</p> <p><b>Note</b> It is expected that, if feature-set fex is not enabled, "allocate share fex" will fail, on VDC reload. User has to un-configure the share and configure it back .</p>
<b>Step 6</b>	<p><b>allocate interface ethernet <i>int-numb</i></b></p> <p><b>Example:</b></p> <pre>switch(config-vdc)# allocate interface ethernet 2/1-2 switch(config-if)#</pre>	Allocates interfaces to the storage VDC as a dedicated FCoE port. You must allocate all interfaces in the port group. You must configure these interfaces in switchport trunk mode as Spanning Tree Protocol (STP) edge ports.
<b>Step 7</b>	<p><b>switchto vdc <i>vdc-name</i></b></p> <p><b>Example:</b></p> <pre>switch(config-vdc)# switchto vdc fcoe-vdc switchport switch-fcoe-vdc#</pre>	Switches to the storage VDC.

	Command or Action	Purpose
<b>Step 8</b>	<b>feature lldp</b> <b>Example:</b> <pre>switch(config)# feature lldp</pre>	Enables the LLDP feature in the storage VDC.
<b>Step 9</b>	(Optional) <b>feature lacp</b> <b>Example:</b> <pre>switch(config)# feature lacp</pre>	Enables the LACP feature in the storage VDC.
<b>Step 10</b>	(Optional) <b>show feature-set</b> <b>Example:</b> <pre>switch# show feature-set Feature Set Name      ID      State ----- fcoe                  2      enabled fex                   3      disabled switch#</pre>	Displays the status information about the feature-sets in this VDC.
<b>Step 11</b>	(Optional) <b>copy running-config startup-config</b> <b>Example:</b> <pre>switch# copy running-config startup-config</pre>	Copies the running configuration to the startup configuration.

## Allocating the FCoE VLAN Range

### Before you begin

- Ensure you have installed the correct license for FCoE.
- Ensure you are in the correct VDC.

### SUMMARY STEPS

1. **configure terminal**
2. **vdc vdc-name type storage**
3. **allocate fcoe-vlan-range vlan-range [from vdc vdc-name]**
4. (Optional) **show vdc fcoe-vlan-range**
5. (Optional) **copy running-config startup-config**

### DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<b>configure terminal</b> <b>Example:</b> <pre>switch# configure terminal switch(config)#</pre>	Enters configuration mode.

	Command or Action	Purpose
<b>Step 2</b>	<b>vdc vdc-name type storage</b> <b>Example:</b> switch(config)# vdc fcoe-vdc type storage switch(config-vdc) #	Enters VDC configuration mode. You can only enable storage feature in a storage VDC. You do not need to allow the feature-set or enable it in the storage VDC because this process is handled automatically for a storage VDC.
<b>Step 3</b>	<b>allocate fcoe-vlan-range vlan-range [from vdc vdc-name]</b> <b>Example:</b> switch(config-vdc) # allocate fcoe-vlan-range 10-30	Allows the VLAN to be used in the storage VDC-I; and allocates the VLANs that can be used for FCoE and mapped to a VSAN. You can optionally allocate the VLANs from another VDC.
<b>Step 4</b>	(Optional) <b>show vdc fcoe-vlan-range</b> <b>Example:</b> switch(config-vdc) # show vdc fcoe-vlan-range	Displays information about the VLAN range allocated for FCoE.
<b>Step 5</b>	(Optional) <b>copy running-config startup-config</b> <b>Example:</b> switch(config-vdc) # copy running-config startup-config	Copies the running configuration to the startup configuration.

## Allocating Shared Interfaces

You can share interfaces between a storage VDC and another VDC.

### Before you begin

- Ensure you have installed the correct license for FCoE.
- Ensure you are in the correct VDC.
- Ensure any shared interfaces are from an F-series module.
- Ensure you have allocated the FCoE VLAN range.
- Interfaces can only be shared between the storage VDC and one other VDC.



#### Note

- For shared interface, ensure that LLDP feature is enabled in parent VDC also.
- Only VF ports can exist on shared interfaces. VE ports must be on dedicated interfaces.

### SUMMARY STEPS

1. **configure terminal**
2. **interface if-range**
3. **switchport mode trunk**

4. **spanning-tree port type edge trunk**
5. **no shutdown**
6. **vdc vdc-name type storage**
7. **allocate shared interface if-range**
8. (Optional) **show vdc shared membership**
9. (Optional) **switchto vdc vdc-name**
10. **configure terminal**
11. **feature lldp**
12. **interface if-range**
13. **no shutdown**
14. (Optional) **show interface if-range**
15. (Optional) **copy running-config startup-config**

### DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<b>configure terminal</b> <b>Example:</b> <pre>switch# configure terminal switch(config)#</pre>	Enters configuration mode.
<b>Step 2</b>	<b>interface if-range</b> <b>Example:</b> <pre>switch(config)# interface ethernet 2/1</pre>	Enters interface configuration mode for the interface in the Ethernet VDC.
<b>Step 3</b>	<b>switchport mode trunk</b> <b>Example:</b> <pre>switch(config-if)# switchport mode trunk</pre>	Puts the Ethernet interface into trunk mode.
<b>Step 4</b>	<b>spanning-tree port type edge trunk</b> <b>Example:</b> <pre>switch(config-if)# spanning-tree port type edge trunk</pre>	Sets the interface to STP-type edge port to support STP Lite for loop prevention.
<b>Step 5</b>	<b>no shutdown</b> <b>Example:</b> <pre>switch(config-if)# no shutdown</pre>	Administratively enables the Ethernet shared interface.
<b>Step 6</b>	<b>vdc vdc-name type storage</b> <b>Example:</b> <pre>switch(config-if)# vdc fcoe-vdc type storage switch(config-vdc)#</pre>	Enters VDC configuration mode.
<b>Step 7</b>	<b>allocate shared interface if-range</b> <b>Example:</b> <pre>switch(config-vdc)# allocate shared interface ethernet 2/1</pre>	Allocates interfaces that are shared with another VDC for FCoE traffic. You must allocate the shared interfaces to one of the VDC included in the FCoE VLAN allocation. You can only use the <b>shutdown</b> or the <b>switchport trunk</b>

	Command or Action	Purpose
		<b>allowed vlan</b> commands on shared interfaces in the storage VDC.
<b>Step 8</b>	(Optional) <b>show vdc shared membership</b> <b>Example:</b> switch(config-vdc)# show vdc shared membership	Displays the interfaces that are shared for FCoE.
<b>Step 9</b>	(Optional) <b>switchto vdc vdc-name</b> <b>Example:</b> switch(config-vdc)# switchto vdc fcoe-vdc switch-fcoe-vdc#	Switches to the storage VDC.
<b>Step 10</b>	<b>configure terminal</b> <b>Example:</b> switch-fcoe-vdc# configure terminal switch-fcoe-vdc(config)#	Enters configuration mode.
<b>Step 11</b>	<b>feature lldp</b> <b>Example:</b> switch-fcoe-vdc(config)# feature lldp	Enables the LLDP feature in the storage VDC.
<b>Step 12</b>	<b>interface if-range</b> <b>Example:</b> switch-fcoe-vdc(config)# interface ethernet 2/1	Enters interface configuration mode for the shared interface in the storage VDC.
<b>Step 13</b>	<b>no shutdown</b> <b>Example:</b> switch-fcoe-vdc(config-if)# no shutdown	Administratively enables the FCoE shared interface.
<b>Step 14</b>	(Optional) <b>show interface if-range</b> <b>Example:</b> switch-fcoe-vdc(config-if)# show interface ethernet 2/1	Displays information about the shared interface.
<b>Step 15</b>	(Optional) <b>copy running-config startup-config</b> <b>Example:</b> switch-fcoe-vdc(config-if)# copy running-config startup-config	Copies the running configuration to the startup configuration.

## Example: Storage VDC Configuration

### Ethernet VDC Configuration

```
!Enable the interface to share:
switch(config-sys-qos)# interface ethernet 2/1
```



```
!Initially ethernet 2/1 is allocated to ethernet VDC
switch(config-if)# switchport
switch(config-if)# switchport mode trunk

!Allocate resources in admin VDC:
Switch(conf)# vdc storage fcoe_vdc
switch(config-if)# allocate fcoe-vlan-range 10-20 from vdc switch
switch(config-vdc)# allocate shared interface ethernet 2/1
Switch(conf)# show vdc shared membership

!Switch to storage VDC and bring up the shared interface:
switch(config-vdc)# switchto vdc fcoe_vdc
switch-fcoe_vdc# configure terminal
switch-fcoe_vdc(config)# interface ethernet 2/1
switch-fcoe_vdc(config-if)# no shutdown

!A VFC interface is created on top of Ethernet interface. The VFC interface can be created
in 2 ways: implicit and explicit.

!Implicit:
switch-fcoe_vdc(config)# interface vfc 2/1
switch-fcoe_vdc(config-if)# switchport mode f

!Explicit:
switch-fcoe_vdc(config)# interface vfc2
switch-fcoe_vdc(config-if)# bind interface eth2/1
switch-fcoe_vdc(config-if)# switchport mode f
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**Note** Ethernet 2/1 must be from an F-series module.

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