Lab 3-8: Configuring FCoE

Complete this lab activity to practice what you learned in the related lesson.

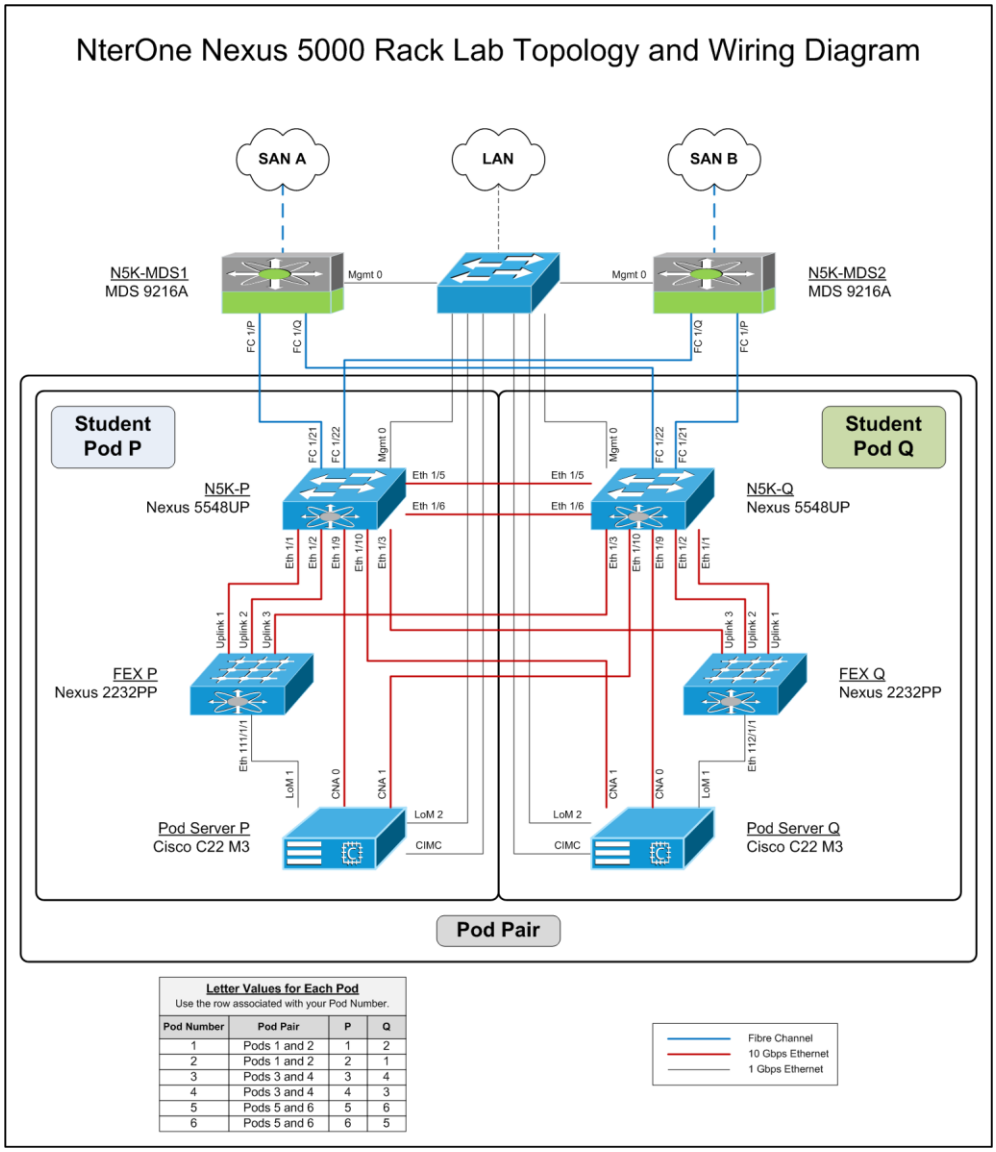
Activity Objective

In this activity, you will configure the Cisco Nexus 5000 Series Switches to support FCoE. After completing this activity, you will be able to meet these objectives:

- Become familiar with, configure, and verify the operation of FCoE using the CLI of the Cisco Nexus 5000 Series switches

Visual Objective

The figure illustrates what you will accomplish in this activity.



Command List

The table below lists the commands that are used in this activity.

Command	Description
show license usage	Displays licensing information
feature fcoe	Enables FCoE features
show vlan brief	Displays the configured VLANs
vlan n	Creates a VLAN
name vlan-name	Assigns a name to a VLAN
no shutdown	Enables a VLAN
fcoe [vsan <>]	Defines a VLAN as an FCoE VLAN
interface ethernet 1/3	Enters interface configuration mode
switchport mode trunk	Defines an Ethernet port as a trunk
switchport trunk allowed vlan	Defines the VLANs allowed on the trunk
spanning-tree port type edge trunk	Defines an edge port that is configured as a trunk as a PortFast port
interface vfc n	Creates a virtual Fibre Channel (VFC) interface
switchport description	Assigns a description to a switchport
bind interface ethernet module/port	Associates a VFC to a physical interface
vsan database	Enters the VSAN database
vsan id name	Creates a VSAN
vsan id interface vfc n	Binds a VFC to a VSAN
system qos	Enters the system QoS context
service-policy type qos input fcoe-default-in- policy	Assigns the type QoS input policy to an MQC object
service-policy type queuing input fcoe-default-in- policy	Assigns the type queuing input policy to an MQC object
service-policy type queuing output fcoe-default-out- policy	Assigns the type queuing output policy to an MQC object
service-policy type network-qos fcoe-default- nq-policy	Assigns the type network-qos policy to an MQC object
show module n [port type]	Displays the ports of a module
slot 1	Selects a slot in the module
port n-n type [ethernet | fc	Selects the operation of interfaces in a Unified Port module
show interface [brief]	Displays abbreviated interface information
show interface <> fcoe	Displays the FCoE interface parameters
show flogi database	Displays the FLOGI database
show fcns database	Displays the FCNS database
fcping fcid <> vsan n	Generates an FC Ping
show rscn scr-table	Displays the SCR database
show interface fc1/21-22 trunk vsan P00	Displays the trunking status of the interfaces
show interface fc2/1-2 trunk	Displays the trunking status of the interfaces

Task 0: Load the Baseline Configuration

During this task, you will reset your pod's Cisco Nexus 5000 Series Switch (also referred to as your pod switch) to a baseline configuration to prepare for the remaining tasks of this lab.

Activity Procedure

Complete these steps:

Step 1 Connect to the Student Server assigned to you by your instructor for this lab Use the server information and account credentials that are listed in the *Lab Support Document*.

Note	Refer to *Accessing the NterOne Lab Equipment* for detailed instructions regarding how to use Remote Desktop Connection (RDC) to connect to your Student Server.

Step 2 From your Student Server, connect to your pod switch using PuTTY. You can connect to the switch using either the console port or SSH.

Step 3 Login to the switch with the credentials below:

- Username: **admin**
- Password: **Nterone179**

Step 4 In this step you will be "cleaning up" the configuration of your pod switch in preparation for the other tasks in this lab. Copy the "cleanup" configuration from the saved file in the bootflash to the running configuration.

Note	Replace "P" with your assigned pod number for this lab

```
N5K-P# copy bootflash:/configs/n5k-P-cleanup.txt running-config
< … output omitted … >
Copy complete, now saving to disk (please wait)...
```

Note	You will see a number of what looks like error messages scroll by; this is normal behavior. The cleanup config is attempting to remove statements from the running configuration that may or may not exist.

Step 5 Copy the "cleaned up" running configuration to the startup configuration. This is useful if, while performing the following steps in this lab, you made a number of mistakes in the configuration and need to quickly put the switch back to a "clean" state by simply reloading the switch.

```
N5K-P# copy running-config startup-config
[########################################] 100%
Copy complete, now saving to disk (please wait)...
```

Step 6 Copy the lab baseline configuration from the saved file in the bootflash into the running configuration using the command below.

Note	Replace "P" with your assigned pod number for this lab

```
N5K-P# copy bootflash:/configs/dcnx5k/dcnx5k-lab-3-08-n5k-P.txt running-config
< … output omitted … >
Copy complete, now saving to disk (please wait)...
```

Note	You will see a number of what looks like error messages scroll by; this is normal behavior.

Activity Verification

You have completed this task when you attain these results:

- You have reconfigured your pod switch with the baseline configuration for this lab.

Task 1: Install the License and Enable the Fibre Channel Ports

During this task, you will activate and verify the required licensing required for FCoE and enable the Fibre Channel ports of the switch.

Activity Procedure

Complete these steps:

Step 7 View the licenses that are available and in use on your Cisco Nexus 5000 Series switch.

```
N5K-P# show license usage
Feature                      Ins  Lic   Status Expiry Date Comments
                                 Count
--------------------------------------------------------------------------------
FCOE_NPV_PKG                  No    -   Unused             -
FM_SERVER_PKG                 No    -   Unused             -
ENTERPRISE_PKG                Yes   -   Unused Never       -
FC_FEATURES_PKG               Yes   -   Unused Never       -
VMFEX_FEATURE_PKG             No    -   Unused             -
ENHANCED_LAYER2_PKG           No    -   Unused             Grace 103D 9H
LAN_BASE_SERVICES_PKG         Yes   -   In use Never       -
LAN_ENTERPRISE_SERVICES_PKG   Yes   -   Unused Never       -
--------------------------------------------------------------------------------
```

Note	FCoE requires the FC_FEATURES_PKG which contains the Storage Protocol Services license.

Step 8 Enable the FCoE feature, which activates the Storage Protocol Services feature set of the Cisco NX-OS Software.

```
N5K-P# conf
Enter configuration commands, one per line.  End with CNTL/Z.
N5K-P(config)# feature fcoe
FC license checked out successfully fc_plugin extracted successfully
FC plugin loaded successfully
FCoE manager enabled successfully
FC enabled on all modules successfully
Enabled FCoE QoS policies successfully
```

Step 9 View the FCoE enabled QoS policies. If these FCoE aware QoS service policies are not enabled on the switch, FCoE will never function.

```
N5K-P# show running-config ipqos

!Command: show running-config ipqos
!Time: Thu May 16 05:47:15 2013

version 5.1(3)N2(1)
class-map type qos class-fcoe
class-map type queuing class-fcoe
  match qos-group 1
class-map type queuing class-all-flood
  match qos-group 2
class-map type queuing class-ip-multicast
```

```
  match qos-group 2
class-map type network-qos class-fcoe
  match qos-group 1
class-map type network-qos class-all-flood
  match qos-group 2
class-map type network-qos class-ip-multicast
  match qos-group 2
system qos
  service-policy type qos input fcoe-default-in-policy
  service-policy type queuing input fcoe-default-in-policy
  service-policy type queuing output fcoe-default-out-policy
  service-policy type network-qos fcoe-default-nq-policy
```

Note Cisco Nexus 5500 Switches running Cisco NX-OS Software Release 5.1(3)N2(1) or later automatically enable FCoE QoS policies when feature FCoE is enabled.

Note Prior to Cisco NX-OS Software Release 5.1(3)N2(1), Cisco Nexus 5500 Switches did not enable FCoE QoS policies automatically. A warning message is displayed when enabling feature fcoe and the QoS policies must be manually enabled.

Note Cisco Nexus 5000 Switches have FCoE QoS policies enabled by default.

Step 10 View the licenses that are available and in use.

```
N5K-P# show license usage
Feature                      Ins  Lic   Status Expiry Date Comments
                                 Count
--------------------------------------------------------------------------------
FCOE_NPV_PKG                  No    -   Unused             -
FM_SERVER_PKG                 No    -   Unused             -
ENTERPRISE_PKG                Yes   -   Unused Never       -
FC_FEATURES_PKG               Yes   -   In use Never       -
VMFEX_FEATURE_PKG             No    -   Unused             -
ENHANCED_LAYER2_PKG           No    -   Unused             Grace 103D 9H
LAN_BASE_SERVICES_PKG         Yes   -   In use Never       -
LAN_ENTERPRISE_SERVICES_PKG   Yes   -   Unused Never       -
--------------------------------------------------------------------------------
```

Step 11 Verify the model of Cisco Nexus 5000 Series Switch.

```
N5K-P# show module 1
Mod Ports  Module-Type                       Model                 Status
--- -----  ------------------------------ ---------------------- ------------
1    32     O2 32X10GE/Modular Universal Pla N5K-C5548UP-SUP        active *

Mod  Sw              Hw      World-Wide-Name(s) (WWN)
---  --------------  ------  --------------------------------------------------
1    5.1(3)N2(1)     1.0     --

Mod  MAC-Address(es)                         Serial-Num
---  --------------------------------------  ----------
1    002a.6a09.fa28 to 002a.6a09.fa47         FOC17034CBW
```

Q1) What model of switch is being used?

Q2) What does the “UP” in C5548UP-SUP represent?

Step 12 Verify how of the Unified Ports are currently being utilized.

```
N5K-P# show module 1 port type | no-more
Slot/Port  Operational Type       Admin Type
---------  ---------------------- ------------
1/1             Ethernet             Ethernet
1/2             Ethernet             Ethernet
1/3             Ethernet             Ethernet
1/4             Ethernet             Ethernet
1/5             Ethernet             Ethernet
1/6             Ethernet             Ethernet
1/7             Ethernet             Ethernet
1/8             Ethernet             Ethernet
1/9             Ethernet             Ethernet
1/10             Ethernet             Ethernet
1/11             Ethernet             Ethernet
1/12             Ethernet             Ethernet
1/13             Ethernet             Ethernet
1/14             Ethernet             Ethernet
1/15             Ethernet             Ethernet
1/16             Ethernet             Ethernet
1/17             Ethernet             Ethernet
1/18             Ethernet             Ethernet
1/19             Ethernet             Ethernet
1/20             Ethernet             Ethernet
1/21             Ethernet             Ethernet
1/22             Ethernet             Ethernet
1/23             Ethernet             Ethernet
1/24             Ethernet             Ethernet
1/25             Ethernet             Ethernet
1/26             Ethernet             Ethernet
1/27             Ethernet             Ethernet
1/28             Ethernet             Ethernet
1/29             Ethernet             Ethernet
1/30             Ethernet             Ethernet
1/31             Ethernet             Ethernet
1/32             Ethernet             Ethernet
```

Step 13 Refer to your topology diagram. Determine the interfaces of your pod switch that will uplink to the Cisco MDS 9100 Series Switch in the SAN core. Enable these unified ports to operate in Fibre Channel mode.

Note	The switch will require a reload to implement the change. Ensure that you save your configuration after this step.

```
N5K-P(config)# slot 1
N5K-P(config-slot)# port 21-32 type fc
N5K-P(config-slot)# end
```

Note	When choosing the unified ports to operate in FC mode, it is recommended to allocate only the number of ports that you require in descending order from the highest port number. They must be in a contiguous range.

```
N5K-P# wr
[########################################] 100%
Copy complete, now saving to disk (please wait)...
```

Step 14 Reload your switch in order to enable the fibre channel interfaces.

```
N5K-P# wr
WARNING: This command will reboot the system
Do you want to continue? (y/n) [n] y
```

Step 15 After the reload is complete, log back in to the switch and verify how the unified ports are now being utilized.

```
N5K-P# show module 1 port type | no-more
Slot/Port  Operational Type       Admin Type
---------  ---------------------- ------------
1/1             Ethernet             Ethernet
1/2             Ethernet             Ethernet
1/3             Ethernet             Ethernet
1/4             Ethernet             Ethernet
1/5             Ethernet             Ethernet
1/6             Ethernet             Ethernet
1/7             Ethernet             Ethernet
1/8             Ethernet             Ethernet
1/9             Ethernet             Ethernet
1/10             Ethernet             Ethernet
1/11             Ethernet             Ethernet
1/12             Ethernet             Ethernet
1/13             Ethernet             Ethernet
1/14             Ethernet             Ethernet
1/15             Ethernet             Ethernet
1/16             Ethernet             Ethernet
1/17             Ethernet             Ethernet
1/18             Ethernet             Ethernet
1/19             Ethernet             Ethernet
1/20             Ethernet             Ethernet
1/21                   Fc                   Fc
1/22                   Fc                   Fc
1/23                   Fc                   Fc
1/24                   Fc                   Fc
1/25                   Fc                   Fc
1/26                   Fc                   Fc
1/27                   Fc                   Fc
1/28                   Fc                   Fc
1/29                   Fc                   Fc
1/30                   Fc                   Fc
1/31                   Fc                   Fc
1/32                   Fc                   Fc
```

Activity Verification

You have completed this task when you attain these results:

- You have activated and verified the required licensing to configure FCoE.
- You have configured the required unified ports to operate in FC mode.

Task 2: Configure FCoE

During this exercise you will configure FCoE on your Cisco Nexus 5000 Series Switch.

Activity Procedure

Complete these steps:

Step 16 Display the VLANs currently defined on the switch.

```
N5K-P# show vlan brief
```

```
VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Eth1/3, Eth1/4, Eth1/5, Eth1/6
                                                Eth1/7, Eth1/8, Eth1/11, Eth1/12
                                                Eth1/13, Eth1/14, Eth1/15
                                                Eth1/16, Eth1/17, Eth1/18
                                                Eth1/19, Eth1/20, Eth2/1, Eth2/2
                                                Eth2/3, Eth2/4, Eth2/5, Eth2/6
                                                Eth2/7, Eth2/8, Eth2/9, Eth2/10
                                                Eth2/11, Eth2/12, Eth2/13
                                                Eth2/14, Eth2/15, Eth2/16
100  Engineers                        active
300  Servers                          active    Eth1/5, Eth1/6, Eth1/9, Eth1/10
```

Step 17 Create a new VLAN 1X that will be used for FCoE traffic. Refer to the table below to determine the value of "X" for your assigned pod.

Pod Number	X	FCoE VLAN Number	FC VSAN Number
1, 3, 5	1	11	11
2, 4, 6	2	12	12

Note Replace "X" with the value in this table in the rest of this lab.

```
N5K-P# conf
N5K-P(config)# vlan 1X
N5K-P(config-vlan)# no shutdown
N5K-P(config-vlan)# name FCoE-SAN-1X
```

Step 18 Refer to your topology diagram. Interfaces Ethernet 1/9 and Ethernet 1/10 on each Cisco Nexus 5000 Series Switch connects to the server CNAs. Configure these interfaces as 802.1Q trunks.

```
N5K-P(config-vlan)# interface ethernet 1/9-10
N5K-P(config-if-range)# switchport mode trunk
N5K-P(config-if-range)# switchport trunk allowed vlan 300,1X
N5K-P(config-if-range)# switchport trunk native vlan 300
N5K-P(config-if-range)# spanning-tree port type edge trunk
Warning: Edge port type (portfast) should only be enabled on ports connected to a
single
 host. Connecting hubs, concentrators, switches, bridges, etc... to this
 interface  when edge port type (portfast) is enabled, can cause temporary bridging
loops.
 Use with CAUTION
```

Step 19 Create virtual Fibre Channel interfaces for the FCoE traffic to the interfaces connected to the Pod Servers. Each vFC interface will be associated to a physical Ethernet interface, which together form the FCoE trunk.

```
N5K-P(config-if-range)# interface vfc 9
N5K-P(config-if)# switchport description FCoE to Server P CNA 0
N5K-P(config-if)# switchport trunk allowed vsan 1X
N5K-P(config-if)# bind interface ethernet 1/9
N5K-P(config-if)# no shutdown
N5K-P(config-if)# interface vfc 10
N5K-P(config-if)# switchport description FCoE to Server Q CNA 1
N5K-P(config-if)# switchport trunk allowed vsan 1X
N5K-P(config-if)# bind interface ethernet 1/10
N5K-P(config-if)# no shutdown
```

Step 20 VSANs must be created for connectivity to the SAN core switch. Each vFC interface must be assigned to a VSAN.

```
N5K-P(config-if)# vsan database
N5K-P(config-vsan-db)# vsan 1X
N5K-P(config-vsan-db)# vsan 1X interface vfc 9
N5K-P(config-vsan-db)# vsan 1X interface vfc 10
N5K-P(config-vsan-db)# exit
```

Step 21 FCoE traffic from the server CNA arrives on a VFC interface, but is inside the FCoE VLAN. The FCoE VLAN must be mapped to a VSAN to enable connectivity to the SAN core.

```
N5K-P(config)# vlan 1X
N5K-P(config-vlan)# fcoe vsan 1X
N5K-P(config-vlan)# end
```

Step 22 Confirm the VLAN to VSAN FCoE assignment.

```
N5K-P# show vlan fcoe

Original VLAN ID        Translated VSAN ID      Association State
----------------        ------------------      -----------------

      1X                        1X               Operational
```

Step 23 Display the interface membership for all VSANs.

```
N5K-P# show vsan membership
vsan 1 interfaces:
    fc1/21            fc1/22            fc1/23            fc1/24
    fc1/25            fc1/26            fc1/27            fc1/28
    fc1/29            fc1/30            fc1/31            fc1/32

vsan 1X interfaces:
    vfc9              vfc10

vsan 4079(evfp_isolated_vsan) interfaces:


vsan 4094(isolated_vsan) interfaces:
```

Step 24 Verify the state of the VFC interfaces.

```
N5K-P# show interface vfc 9-10 brief

--------------------------------------------------------------------------------
Interface  Vsan   Admin  Admin   Status          SFP    Oper  Oper   Port
                  Mode   Trunk                         Mode  Speed  Channel
                         Mode                                (Gbps)
--------------------------------------------------------------------------------
vfc9       1X     F      on      trunking         --     TF      auto --
vfc10      1X     F      on      trunking         --     TF      auto --

N5K-P# show interface vfc 9-10 | no-more
vfc9 is trunking
    Bound interface is Ethernet1/9
    Port description is FCoE to Server P CNA 0
    Hardware is Ethernet
    Port WWN is 20:08:00:2a:6a:09:fa:7f
    Admin port mode is F, trunk mode is on
    snmp link state traps are enabled
```

```
    Port mode is TF
    Port vsan is 1X
    Trunk vsans (admin allowed and active) (1X)
    Trunk vsans (up)                       (1X)
    Trunk vsans (isolated)                 ()
    Trunk vsans (initializing)             ()
    1 minute input rate 0 bits/sec, 0 bytes/sec, 0 frames/sec
    1 minute output rate 0 bits/sec, 0 bytes/sec, 0 frames/sec
      14 frames input, 1992 bytes
        0 discards, 0 errors
      14 frames output, 1708 bytes
        0 discards, 0 errors
    last clearing of "show interface" counters never
    Interface last changed at Thu May 16 06:25:38 2013


vfc10 is trunking
    Bound interface is Ethernet1/10
    Port description is FCoE to Server Q CNA 1
    Hardware is Ethernet
    Port WWN is 20:09:00:2a:6a:09:fa:7f
    Admin port mode is F, trunk mode is on
    snmp link state traps are enabled
    Port mode is TF
    Port vsan is 1X
    Trunk vsans (admin allowed and active) (1X)
    Trunk vsans (up)                       (1X)
    Trunk vsans (isolated)                 ()
    Trunk vsans (initializing)             ()
    1 minute input rate 0 bits/sec, 0 bytes/sec, 0 frames/sec
    1 minute output rate 0 bits/sec, 0 bytes/sec, 0 frames/sec
      21 frames input, 2740 bytes
        0 discards, 0 errors
      22 frames output, 2796 bytes
        0 discards, 0 errors
    last clearing of "show interface" counters never
    Interface last changed at Thu May 16 06:25:38 2013
```

Note	Although the VFC interfaces are working at this time, there are no uplink ports available to the SAN. There is no connectivity until the uplinks and the SAN configuration is completed.

Activity Verification

You have completed this task when you attain these results:

- You have configured and verified the operation of the VFC interface and FCoE between the edge switch Ethernet interface and the server CNA.

Task 3: Enable Fibre Channel Connectivity to the SAN Core

Activity Procedure

During this exercise you will enable Fibre Channel connectivity to the Cisco MDS-9124 SAN core switch on the edge switch.

Complete these steps:

Step 25 Display the state of the Fibre Channel interfaces.

```
N5K-P# show interface fc1/21-22 brief
```

```
--------------------------------------------------------------------------------
Interface  Vsan   Admin  Admin   Status          SFP    Oper  Oper   Port
                  Mode   Trunk                         Mode  Speed  Channel
                         Mode                                (Gbps)
--------------------------------------------------------------------------------
fc1/21     1      auto   on      down             swl    --           --
fc1/22     1      auto   on      down             swl    --           --
```

Step 26 Enable the Fibre Channel uplinks to the SAN core.

```
N5K-P# conf
Enter configuration commands, one per line. End with CNTL/Z
N5K-P(config)# interface fc1/21-22
N5K-P(config-if)# no shutdown
```

Step 27 Verify the state of the Fibre Channel uplinks to the SAN core.

```
N5K-P(config-if)# show interface fc 1/21-22 brief

--------------------------------------------------------------------------------
Interface  Vsan   Admin  Admin   Status          SFP    Oper  Oper   Port
                  Mode   Trunk                         Mode  Speed  Channel
                         Mode                                (Gbps)
--------------------------------------------------------------------------------
fc1/21     1      auto   on      trunking         swl    TE      4    --
fc1/22     1      auto   on      trunking         swl    TE      4    --
```

Step 28 To simplify Fibre Channel zoning, configure a default policy of permit for the VSAN.

```
N5K-P(config)# zone default-zone permit vsan 1X
N5K-P(config)# end
```

Note	This zoning policy is not a recommended practice and is being used for lab purposes only. Zoning will be examined further in a later lab.

Activity Verification

You have completed this task when you attain these results:

- You have configured and verified the operation of the Fibre Channel interfaces on the Cisco Nexus 5000 Series Switch towards the Fibre Channel core Cisco MDS Switch.

Task 4: Verify Server Fibre Channel Operation

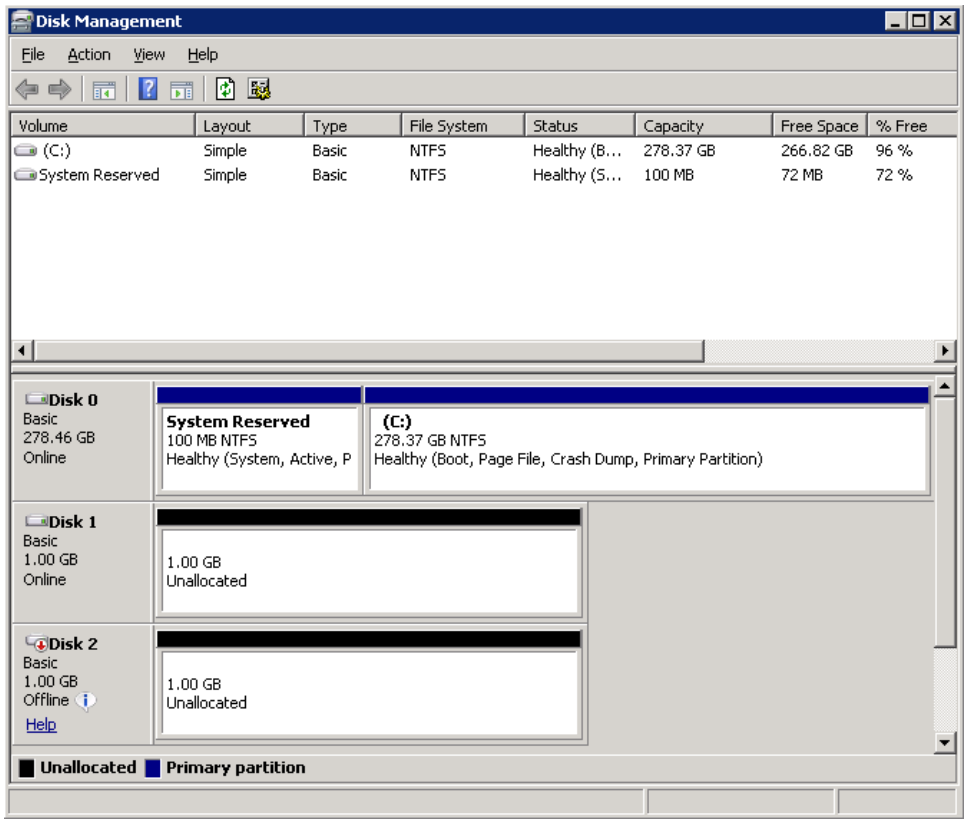
During this exercise you will verify Fibre Channel connectivity to the lab SAN.

Activity Procedure

Complete these steps:

Step 29 From your Student Server use Remote Desktop Client to connect to your Pod Server, which is at 10.0.0.15P. Use the account name **student** and the password **Nterone179**.

Step 30 From your Pod Server open the Disk Management tool by clicking the start button and then entering "**diskmgmt.msc**" in the "Search programs and files" field directly above the Start button. The Disk Management will appear and look *similar* to the image below.



Step 31 The 1 GB Basic disks are the Fibre Channel connected storage targets. If these disks are visible, the Pod Server has a connection to the SAN verifying the FCoE link is working

Note	If both SAN-A and SAN-B are working, there should be at least 2 storage targets available.

Step 32 Exit the Pod Server.

Activity Verification

You have completed this task when you attain these results:

- You verified the Windows server has access to Fibre Channel storage targets.

Task 5: Verify Edge Switch Fibre Channel Operation

During this exercise you will verify various aspects of your pod's Fibre Channel connectivity.

Activity Procedure

Complete these steps:

Step 33 On your pod switch verify that the VFC interfaces are working.

```
N5K-P# show interface vfc 9-10
vfc9 is trunking
    Bound interface is Ethernet1/9
    Port description is FCoE to Server P CNA 0
    Hardware is Ethernet
    Port WWN is 20:08:00:2a:6a:09:fa:7f
```

```
    Admin port mode is F, trunk mode is on
    snmp link state traps are enabled
    Port mode is TF
    Port vsan is 1X
    Trunk vsans (admin allowed and active) (1X)
    Trunk vsans (up)                       (1X)
    Trunk vsans (isolated)                 ()
    Trunk vsans (initializing)             ()
    1 minute input rate 0 bits/sec, 0 bytes/sec, 0 frames/sec
    1 minute output rate 0 bits/sec, 0 bytes/sec, 0 frames/sec
      248 frames input, 34208 bytes
        0 discards, 0 errors
      399 frames output, 89116 bytes
        0 discards, 0 errors
    last clearing of "show interface" counters never
    Interface last changed at Thu May 16 06:25:38 2013


vfc10 is trunking
    Bound interface is Ethernet1/10
    Port description is FCoE to Server Q CNA 1
    Hardware is Ethernet
    Port WWN is 20:09:00:2a:6a:09:fa:7f
    Admin port mode is F, trunk mode is on
    snmp link state traps are enabled
    Port mode is TF
    Port vsan is 1X
    Trunk vsans (admin allowed and active) (1X)
    Trunk vsans (up)                       (1X)
    Trunk vsans (isolated)                 ()
    Trunk vsans (initializing)             ()
    1 minute input rate 0 bits/sec, 0 bytes/sec, 0 frames/sec
    1 minute output rate 0 bits/sec, 0 bytes/sec, 0 frames/sec
      341 frames input, 43444 bytes
        0 discards, 0 errors
      722 frames output, 564660 bytes
        0 discards, 0 errors
    last clearing of "show interface" counters never
    Interface last changed at Thu May 16 06:25:38 2013
```

Step 34 Verify the addresses that are associated to the FCoE links.

```
N5K-P# show interface ethernet 1/9-10 fcoe
Ethernet1/9 is FCoE UP
    vfc9 is Up
        FCID is 0x010001
        PWWN is 20:00:00:00:00:99:0P:02
        MAC addr is 7c:ad:74:27:c4:65
Ethernet1/10 is FCoE UP
    vfc10 is Up
        FCID is 0x010000
        PWWN is 20:00:00:00:00:99:0Q:03
        MAC addr is 7c:ad:74:27:4f:2a
```

Note	The addresses that are listed in the output of the show interface ethernet 1/9-10 fcoe command are assigned to the server CNA, not to the switch interface.

Step 35 View the FLOGI database of the pod switch.

```
N5K-P# show flogi database
--------------------------------------------------------------------------------
```

```
INTERFACE        VSAN    FCID           PORT NAME               NODE NAME
------------------------------------------------------------------------------
vfc9             1X    0x010001  20:00:00:00:00:99:0P:02 20:00:00:00:00:99:0P:01
vfc10            1X    0x010000  20:00:00:00:00:99:0Q:03 20:00:00:00:00:99:0Q:01

Total number of flogi = 2.
```

Q3) What is the domain ID of the pod switch?

Q4) How many entries should be present in the FLOGI database?

Step 36 View the FCNS database of the pod switch.

```
N5K-P# show fcns database

VSAN 1X:
------------------------------------------------------------------------
FCID        TYPE  PWWN                    (VENDOR)        FC4-TYPE:FEATURE
------------------------------------------------------------------------
0x010000    N     20:00:00:00:00:99:0Q:03                 scsi-fcp:init fc-gs
0x010001    N     20:00:00:00:00:99:0P:02                 scsi-fcp:init fc-gs
0x470000    N     20:41:00:05:73:cc:bc:80 (Cisco)         npv
0x47000a    N     50:0a:09:81:86:08:22:ca (NetApp)        scsi-fcp:target
0x47000b    N     20:00:00:25:b5:20:00:21                 scsi-fcp:init fc-gs
0x47000c    N     20:00:00:25:b5:20:00:11                 scsi-fcp:init fc-gs
0x47000d    N     20:00:00:25:b5:20:00:31                 scsi-fcp:init fc-gs
0x470011    N     20:00:00:25:b5:00:1a:31                 scsi-fcp:init fc-gs
0x470012    N     20:41:00:05:73:cc:77:00 (Cisco)         npv
0x47001c    N     20:00:00:25:b5:20:00:41                 scsi-fcp:init fc-gs
0x47001d    N     20:00:00:25:b5:20:00:51                 scsi-fcp:init fc-gs
0x47001e    N     20:00:00:25:b5:20:00:61                 scsi-fcp:init fc-gs
0x47001f    N     20:00:00:25:b5:20:00:71                 scsi-fcp:init fc-gs
0x470020    N     20:00:00:25:b5:20:00:81                 scsi-fcp:init fc-gs
0x470041    N     20:00:00:25:b5:00:1a:13                 scsi-fcp:init fc-gs
0x470043    N     20:00:00:25:b5:00:1a:11                 scsi-fcp:init fc-gs
0x470047    N     20:20:54:7f:ee:63:6a:c0 (Cisco)         npv

Total number of entries = 17
```

Q5) How many domain ID's are present in the SAN?

Q6) How many entries should be present in the FCNS database?

Step 37 Choose one of the targets from the list above. Verify connectivity between the VFC and the target.

```
N5K-P# fcping fcid 0x47000a vsan 1X
28 bytes from  0x47000a  time = 184 usec
28 bytes from  0x47000a  time = 149 usec
28 bytes from  0x47000a  time = 207 usec
28 bytes from  0x47000a  time = 216 usec
28 bytes from  0x47000a  time = 205 usec

5 frames sent, 5 frames received, 0 timeouts
Round-trip min/avg/max = 149/192/216 usec
```

Step 38 View the RSCN database of the pod switch.

```
N5K-P# show rscn scr-table

SCR table for VSAN: 1X
-----------------------------------------
FC-ID         REGISTERED FOR
-----------------------------------------
0x010000      fabric and nport detected rscns
0x010001      fabric and nport detected rscns

Total number of entries = 2
```

Q7) What is the significance of a device being listed in this table?

Step 39 Verify that your FCoE VSAN is being trunked to the SAN core.

```
N5K-P# show interface fc 1/21-22 trunk vsan 1X
fc1/21 is trunking
    Vsan 1X is up (None)
fc1/22 is trunking
    Vsan 1X is up (None)
```

Step 40 Verify the role of this switch within the Fibre Channel domain.

```
N5K-P# show fcdomain vsan 1X
The local switch is a Subordinated Switch.

Local switch run time information:
        State: Stable
        Local switch WWN:    20:0b:00:2a:6a:09:fa:41
        Running fabric name: 20:0b:00:0d:ec:63:65:c1
        Running priority: 128
        Current domain ID: 0x01(1)

Local switch configuration information:
        State: Enabled
        FCID persistence: Enabled
        Auto-reconfiguration: Disabled
        Contiguous-allocation: Disabled
        Configured fabric name: 20:01:00:05:30:00:28:df
        Optimize Mode: Disabled
        Configured priority: 128
        Configured domain ID: 0x00(0) (preferred)

Principal switch run time information:
        Running priority: 2

Interface                Role          RCF-reject
------------------    -------------    ------------
fc1/21                Upstream         Disabled
fc1/22                Non-principal    Disabled
------------------    -------------    ------------
```

Activity Verification

You have completed this task when you attain these results:

- You verified the Cisco Nexus 5000 Series Switch is fully operational in support of the FCoE connected Windows server