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Deploying IP Storage Solutions with the Cisco MDS 9000

In this lab, you will implement IP storage services on the MDS 9000 platform, including both Fibre Channel over IP (FCIP) and Internet SCSI (iSCSI) services.

After completing this lab, you will be able to meet these objectives:

- Perform the initial switch configuration
- Configure Gigabit Ethernet interfaces and implement an FCIP tunnel
- Use the SAN Extension Tuner to tune the performance of an FCIP tunnel
- Configure a high availability FCIP environment using PortChannels
- Configure and zone iSCSI initiators and targets
- Configure iSCSI Server Load Balancing using VRRP
- Use the Microsoft iSCSI driver to verify access to the iSCSI target

Required Resources

These are the resources and equipment required to complete this activity:

- Two MDS 9000 family switches with at least two ISLs between them
- Two Microsoft Windows 2000 servers with dual Fibre Channel interfaces and the Microsoft iSCSI driver
- One Fibre Channel JBOD attached to both switches



Task 1: Initial Switch Configuration

In this task, you will connect directly to your assigned switch through the console and set up and validate the out-of-band management configuration. You will then create VSANs.

Activity Procedure 1: Initial Switch Configuration

| Note | You must complete this procedure on both switches in your pod. If you are working alone, you must perform the procedure on both switches. If your lab group is split into teams, Team 1 will manage the MDS 9506, Team 2 will manage the MDS 9216. | | |
|--------|--|--|--|
| Step 1 | Access one of the MDS 9000 switches in your pod by clicking one of the green Console buttons in the LabGear interface. | | |
| | Team 1 will manage the MDS 9506. Team 2 will manage the MDS 9216. | | |
| Step 2 | Log in with username admin and the password 1234qwer . | | |
| Step 3 | Erase the existing switch configuration. | | |
| | # write erase | | |
| | Warning: This command will erase the startup- configuration. | | |
| | Do you wish to proceed anyway? (y/n) [n] y | | |
| Step 4 | Reboot the switch. | | |
| | # reload This command will reboot the system. (y/n)? [n] \mathbf{y} | | |
| Step 5 | Wait for the switch to reload. When prompted, enter and confirm the admin password 1234qwer (your keystrokes will not be echoed to the screen). | | |
| | System Admin Account Setup | | |
| | Enter the password for "admin": 1234qwer | | |
| | Confirm the password for "admin": 1234qwer | | |
| Step 6 | Read the message displayed on the screen, and then enter \mathbf{y} to continue. | | |
| | Basic System Configuration Dialog | | |
| | This setup utility will guide you through the basic configuration of the system. Setup configures only enough connectivity for management of the system. | | |
| | Please register Cisco MDS 9000 Family devices promptly with your supplier. Failure to register may affect response times for initial service calls. MDS devices must be registered to receive entitled support services. | | |
| | Press Enter if you want to skip any dialog. Use ctrl-c at anytime to skip all remaining dialogs. | | |
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Would you like to enter the basic configuration dialog (yes/no): ${\bf y}$

Step 7Press Enter three times to *not* create another login account nor
configure SNMP community strings.

Create another login account (yes/no) [n]: **<Enter>** Configure read-only SNMP community string (yes/no) [n]: **<Enter>**

Configure read-write SNMP community string (yes/no)
[n]: <Enter>

Step 8 When prompted for the switch name, enter the letter P, followed by your pod number, followed by -MDS9216 or -MDS9506, depending on which switch you are configuring. For example, for pod 19, MDS 9216, enter P19-MDS9216.

Enter the switch name : **PXX-MDSNNNN**

Step 9 Press **Enter** to continue with the out-of-band management configuration.

Continue with Out-of-band (mgmt0) management configuration? (yes/no) [y]: **<Enter>**

Step 10 When prompted for the IP address, enter 10.0.X.3 for the MDS 9216, or 10.0.X.5 for the MDS 9506 Director Switch (where X = your pod number; Ex: for pod 19, MDS 9216, enter 10.0.19.3)

Mgmt0 IPv4 address : 10.0.X.Y

Step 11 When prompted for the netmask, enter **255.255.255.0**.

Mgmt0 IPv4 netmask : 255.255.255.0

Step 12 Press **Enter** to configure the default gateway, and then enter the IP address **10.0.***X***.254**, where *X* is your pod number.

Configure the default gateway? (yes/no) [y]: <Enter>

IP address of the default gateway : 10.0.X.254

Step 13 Press **Enter** three times to *not* configure advanced IP options, to enable the Telnet service, and to *not* enable the SSH service.

Configure advanced IP options? (yes/no) [n]: <Enter>
Enable the telnet service? (yes/no) [y]: <Enter>

Enable the ssh service? (yes/no) [n]: <Enter>

Step 14 Enter y to configure the NTP server, and then enter the IP address 10.0.253 for the NTP server address.

Configure the ntp server? (yes/no) [n]: y NTP server IPv4 address : 10.0.0.253

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Press Enter four times to accept the default switch port interface Step 15 state of "shut"; the default switch port trunk mode of "on"; the default zone policy of "deny"; and the default full zone set distribution of "no." Configure default switchport interface state (shut/noshut) [shut]: <Enter> Configure default switchport trunk mode (on/off/auto) [on]: <Enter> Configure default zone policy (permit/deny) [deny]: <Enter> Enable full zoneset distribution (yes/no) [n]: <Enter> Step 16 Review the configuration summary and save the configuration as follows: The following configuration will be applied: switchname P29-MDS9506 interface mgmt0 ip address 10.0.29.5 255.255.255.0 no shutdown ip default-gateway 10.0.29.254 telnet server enable no ssh server enable ntp server 10.0.0.253 system default switchport shutdown system default switchport trunk mode on no system default zone default-zone permit no system default zone distribute full Would you like to edit the configuration? (yes/no) [n]: **<Enter>** Use this configuration and save it? (yes/no) [y]: <Enter> If you are working alone, repeat Steps 1 - 16 for the other switch in Step 17 your pod.



Activity Verification

Complete these steps on both switches in your pod to verify your results:

| Step 1 | Log in to the console using the username admin and the password 1234qwer. | | |
|--------|--|--|--|
| Step 2 | Ping the TFTP server. | | |
| | # ping 10.0.0.198 | | |
| | PING 10.0.0.198 (10.0.0.198) 56(84) bytes of data. | | |
| | 64 bytes from 10.0.0.198: icmp_seq=1 ttl=127 time=0.466 ms | | |
| | 64 bytes from 10.0.0.198: icmp_seq=2 ttl=127 time=0.407 ms | | |
| | 64 bytes from 10.0.0.198: icmp_seq=3 ttl=127 time=0.383 ms | | |
| | 64 bytes from 10.0.0.198: icmp_seq=4 ttl=127 time=0.369 ms | | |
| | 64 bytes from 10.0.0.198: icmp_seq=5 ttl=127 time=0.440 ms | | |
| Step 3 | Press Ctrl-C to stop the ping command. | | |
| | 10.0.0.198 ping statistics | | |
| | 5 packets transmitted, 5 received, 0% packet loss, time 3998ms | | |
| | rtt min/avg/max/mdev = 0.369/0.413/0.466/0.035 ms | | |
| Step 4 | Enter the show version command and ensure that you are running Cisco MDS SAN-OS Release 3.0(1). | | |
| | # show version | | |
| | Software | | |
| | BIOS: version 1.1.0 | | |
| | loader: version 1.2(2) | | |
| | kickstart: version 3.0(1) | | |
| | system: version 3.0(1) | | |



Activity Procedure 2: Configure VSANs

| Step 1 | 1 On both switches, configure VSANs 2 and 3 and assign interfaces | | | | |
|--------|---|--|--|--|--|
| | # conf t | | | | |
| | (conf)# vsan dat | | | | |
| | (config-vsan-db)# vsan 2 | | | | |
| | (config-vsan-db)# vsan 2 interface fc1/port | | | | |
| | | | | | |
| Note | <i>port</i> = 6 on 9506; 10 on 9216 | | | | |
| | (config-ysan-db)# ysan 3 | | | | |
| | (config-vsan-db)# vsan 3 interface fc1/port | | | | |
| | (coning visin us), visin 5 incernace ici/poit | | | | |
| Note | <i>port</i> = 5 on 9506; 6 on 9216 | | | | |
| | | | | | |
| | (config-vsan-db)# end | | | | |
| Step 2 | Verify the results on both switches: | | | | |
| | | | | | |
| | 9506# show vsan mem | | | | |
| | vsan 1 interfaces: | | | | |
| | fc1/1 fc1/2 fc1/3 fc1/4 fc1/7 fc1/8 | | | | |
| | $f_{c1}/10$ f $f_{c1}/11$ f $f_{c1}/12$ f $f_{c1}/13$ f $f_{c1}/14$ f $f_{c1}/15$ | | | | |
| | fc1/16 | | | | |
| | vsan 2 interfaces: | | | | |
| | fc1/6 | | | | |
| | vsan 3 interfaces: | | | | |
| | fc1/5 | | | | |
| | <pre>vsan 4094(isolated_vsan) interfaces:</pre> | | | | |
| | 9216# show vsan mem | | | | |
| | vsan 1 interfaces: | | | | |
| | fc1/1 fc1/2 fc1/3 fc1/4 fc1/5 fc1/7 | | | | |
| | fcl/8 | | | | |
| | fc1/9 fc1/11 fc1/12 fc1/13 fc1/14 fc1/15 | | | | |
| | fc1/16 | | | | |
| | vsan 2 interfaces: | | | | |
| | fcl/10 | | | | |
| | vsan 3 interfaces: | | | | |
| | tc1/6 | | | | |
| | vsan 4094(isolated_vsan) interfaces: | | | | |



Activity Procedure 3: Install Fabric Manager

- **Step 1** Access a Microsoft Windows 2000 server in your pod by clicking one of the green MSTS links in the LabGear interface:
 - Team 1, managing the MDS 9506, will use Windows 2000 Server 1.
 - Team 2, managing the MDS 9216, will use Windows 2000 Server 2
- **Step 2** Log in as **administrator** with the password **cisco**.
- Step 3Remove any existing Fabric Manager installations on the server by
choosing Start > Programs > Cisco MDS9000 > Uninstall
- **Step 4** To complete the removal, locate and delete the following two folders:
 - C:\Documents and Settings\Administrator\.cisco_mds9000
 - C:\Program Files\Cisco Systems\MDS 9000
- Step 5Begin a fresh installation of Fabric Manager by opening a web
browser and pointing it to the IP address of your switch (10.0.X.5 for
MDS 9506 Director Switch and Server 1, or 10.0.X.3 for MDS 9216
Fabric Switch and Server 2, where X is your pod number).
- Step 6 Click the Cisco Fabric Manager link on the web page that appears.
- Step 7 Choose the interface on the 10.0.X.0 network from the Local Interface pull-down menu (do not choose the interface on the 10.1.X.0 network). Check the Use Global Device Aliases in place of FC Aliases check box.



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- Click Finish. Wait a few moments for the installation to complete Step 8 and the Open Fabric dialog to appear.
- Click **Options** >> to expand the Open Fabric dialog. Step 9
- Verify that the switch IP address is correct in the Fabric Seed Switch Step 10 field. Enter the password 1234qwer. Leave the Privacy Password field blank.

| 🛑 Open Fabric - Fabric Manager 3.0(1) 🗖 🗖 🗙 | | | |
|---|--|--|--|
| CISCO SYSTEMS | | | |
| FM Server: localhost | | | |
| Fabric Seed Switch: 10.0.29.3 | | | |
| User Name: admin | | | |
| Password: ******* | | | |
| Privacy Password: | | | |
| 🔽 SNMPV3 🗖 SHA 🗖 AES | | | |
| Accelerate Discovery | | | |
| Use SNMP Proxy | | | |
| Open Options << Exit | | | |

Click Open. Step 11



Task 2: Implement an FCIP Tunnel

In this activity, you will configure an FCIP tunnel between the MDS 9000 switches in your lab pod using the IPS module. After completing this exercise, you will be able to meet these objectives:

- Configure Gigabit Ethernet interfaces
- Configure FCIP profiles and interfaces

Visual Objective

The figure illustrates what you will accomplish in this exercise.





Command List

The table describes the commands used in this activity.

| Command | Description |
|--|--|
| show clock | Display the time & date set on the MDS switch |
| show running | Display the current running-configuration |
| <pre>show fcns database [vsan vsan-id]</pre> | Displays a list of all the ports that are logged in to the FC name server. |
| show interface fc slot/port | Displays the status of and statistics for interface fc <i>slot/port</i> . |
| show interface gigabitethernet | Displays the status of and statistics for |
| slot/port | interface gigabitethernet slot/port. |
| show interface fcip interface-number | Displays the status of and statistics for FCIP interface <i>interface-number</i> . |
| show fcip profile | Display the FCIP profile configuration |
| show wwn switch | Display the local switch's fabric WWN |
| vsan database | Enter VSAN database configuration mode |
| <pre>vsan vsan-id [interface fc slot/port]</pre> | Configure the specified VSAN; add the specified interface to the VSAN. |
| show vsan membership | Display the VSAN port membership |



Activity Procedure 1: Configuring Gigabit Ethernet Interfaces

In this task, you and your teammates will configure Gigabit Ethernet interfaces on your respective MDS switches. Complete these steps on both MDS switches:

| Step 1 | On your Windows 2000 server, obtain your server's IP address by opening a Command Prompt window (Start > Programs > Accessories > Command Prompt) and running the ipconfig command. Record the server address in the space provided below. | | |
|--------|---|--|--|
| | Record the server IP address: 10.0 | | |
| Note | You will see two IP addresses in the report. Record the 10.0.x.y subnet address. | | |
| Step 2 | On your MDS switch console, configure the gigabit Ethernet and iSCSI interfaces using the following command sequence. Verify your results: | | |
| | # conf t | | |
| | (config)# interface gig2/1 | | |
| | (config-if)# ip address 10.1.x.y 255.255.255.0 | | |
| | MDS9216: 10.1.x.11 (where x = your pod number) MDS9506: 10.1.x.21 (where x = your pod number) | | |
| | (config-if)# no shut | | |
| | (config-if)# end | | |
| Step 3 | Display the status of your Gigabit Ethernet interface. Your output should look similar to the display below. | | |
| | <pre># show interface gig2/1</pre> | | |
| | GigabitEthernet2/1 is up | | |
| | Hardware is GigabitEthernet, address is 000c.300c.e978 | | |
| | Internet address is 10.1.29.21/24 | | |
| | MTU 1500 bytes | | |
| | Port mode is IPS | | |
| | Speed is 1 Gbps | | |
| | Beacon is turned off | | |
| | Auto-Negotiation is turned on | | |
| | 5 minutes input rate 8 bits/sec, 1 bytes/sec, 0 frames/sec | | |
| | 5 minutes output rate 136 bits/sec, 17 bytes/sec, 0 frames/sec | | |

45 packets input, 5352 bytes



| 0 | multicast | frames, | 0 | compressed |
|---|-----------|---------|---|------------|
|---|-----------|---------|---|------------|

- 0 input errors, 0 frame, 0 overrun 0 fifo
- 338 packets output, 14196 bytes, 0 underruns
 - 0 output errors, 0 collisions, 0 fifo
 - 0 carrier errors
- **Note** The interface should be in an up state. If this is not the case, correct the problem before proceeding.
- **Step 4** To test the Gigabit Ethernet connectivity, ping port **gigE2/1** on the others team's gigabit Ethernet IP address:

ping 10.1.x.y

PING 10.1.21.y (10.1.21.y): 56 data bytes 64 bytes from 10.1.21.y: icmp_seq=0 ttl=255 time=3.6 ms 64 bytes from 10.1.21.y: icmp_seq=1 ttl=255 time=4.2 ms 64 bytes from 10.1.21.y: icmp_seq=2 ttl=255 time=4.2 ms --- 10.1.21.y ping statistics ---3 packets transmitted, 3 packets received, 0% packet loss round-trip min/avg/max = 3.6/4.0/4.2 ms



Activity Procedure 2: Configuring FCIP Profiles and Interfaces

| Using the CLI, enable the FCIP feature: | | |
|---|--|--|
| # conf t (config)# fcip enable | | |
| Configure the FCIP profile and FCIP interface (tunnel) using the following command sequence: | | |
| (config)# fcip profile 1 (config-profile)# ip address 10.1.x.y | | |
| mds9216 = 10.1.x.11 ; mds9506 = 10.1.x.21 (where x = your pod number) | | |
| <pre>(config-profile)# interface fcip2 (config-if)# use-profile 1 (config-if)# peer-info ipaddr 10.1.x.y</pre> | | |
| mds9216 = 10.1.x.21 ; mds9506 = 10.1.x.11 (where x = your pod number) | | |
| (config-if)# no shutdown (config-if)# end Verify your results: | | |
| # show fcip profile 1 | | |
| FCIP Profile 1 | | |
| Internet Address is 10.1.29.21 (interface GigabitEthernet2/1) | | |
| Tunnels Using this Profile: fcip2 | | |
| Listen Port is 3225 | | |
| TCP parameters | | |
| | | |
| SACK is enabled PMTU discovery is enabled, reset timeout is 3600 sec | | |
| SACK is enabled PMTU discovery is enabled, reset timeout is 3600 sec Keep alive is 60 sec | | |
| SACK is enabled PMTU discovery is enabled, reset timeout is 3600 sec Keep alive is 60 sec Minimum retransmission timeout is 200 ms | | |
| SACK is enabled PMTU discovery is enabled, reset timeout is 3600 sec Keep alive is 60 sec Minimum retransmission timeout is 200 ms Maximum number of re-transmissions is 4 | | |
| SACK is enabled PMTU discovery is enabled, reset timeout is 3600 sec Keep alive is 60 sec Minimum retransmission timeout is 200 ms Maximum number of re-transmissions is 4 Send buffer size is 0 KB | | |
| SACK is enabled PMTU discovery is enabled, reset timeout is 3600 sec Keep alive is 60 sec Minimum retransmission timeout is 200 ms Maximum number of re-transmissions is 4 Send buffer size is 0 KB Maximum allowed bandwidth is 1000000 kbps | | |
| SACK is enabled PMTU discovery is enabled, reset timeout is 3600 sec Keep alive is 60 sec Minimum retransmission timeout is 200 ms Maximum number of re-transmissions is 4 Send buffer size is 0 KB Maximum allowed bandwidth is 1000000 kbps Minimum available bandwidth is 500000 kbps Estimated round trip time is 1000 uses | | |
| SACK is enabled PMTU discovery is enabled, reset timeout is 3600 sec Keep alive is 60 sec Minimum retransmission timeout is 200 ms Maximum number of re-transmissions is 4 Send buffer size is 0 KB Maximum allowed bandwidth is 1000000 kbps Minimum available bandwidth is 500000 kbps Estimated round trip time is 1000 usec Congestion window monitoring is enabled, burst size is 50 KB | | |
| | | |

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show interface fcip2

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| | fcip2 is trunking | | | | |
|--------|--|--|--|--|--|
| | Hardware is GigabitEthernet | | | | |
| | Port WWN is 20:42:00:0d:65:6a:17:c0 | | | | |
| | Peer port WWN is 20:42:00:0b:fd:d0:68:80 | | | | |
| | Admin port mode is auto, trunk mode is on | | | | |
| | snmp traps are enabled | | | | |
| | Port mode is TE | | | | |
| | Port vsan is 1 | | | | |
| | Speed is 1 Gbps | | | | |
| | Trunk vsans (admin allowed and active) (1-3) | | | | |
| | Trunk vsans (up) (1-3) | | | | |
| | Trunk vsans (isolated) () | | | | |
| | Trunk vsans (initializing) () | | | | |
| | Using Profile id 1 (interface GigabitEthernet2/1) | | | | |
| | Peer Information | | | | |
| | Peer Internet address is 10.1.29.11 and port is 3225 | | | | |
| | Write acceleration mode is configured off | | | | |
| | Tape acceleration mode is configured off | | | | |
| | Tape Accelerator flow control buffer size is automatic | | | | |
| | Ficon Tape acceleration configured off for all vsans | | | | |
| | IP Compression is disabled | | | | |
| | Special Frame is disabled | | | | |
| | | | | | |
| Step 4 | On both switches, enable the interfaces that is connected to your Windows 2000 server and JBOD using the following command sequence: | | | | |
| | # conf t | | | | |
| | <pre>(config)# interface fc1/6, fc1/port</pre> | | | | |
| Note | <i>port</i> = 5 on 9506; 10 on 9216 | | | | |
| | (config-if)# no shut | | | | |
| | $(config_if)$ and | | | | |
| | | | | | |
| Note | The FC host and JBOD in your pod are attached to both switches. To simulate a remote SAN environment, the VSAN assignments require the host access the JBOD solely across the FCIP tunnel. | | | | |

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Step 5 On both switches, display the name server database. You should have similar output as below, with each switch displaying several target entries (JBOD disks) in one VSAN and one initiator (host HBA) in the other VSAN:

show fcns database

VSAN 2:

_____ FCID TYPE PWWN (VENDOR) FC4-TYPE:FEATURE _____ _____ 0x0c01dc NL 22:00:00:0c:50:d1:bb:8a (Seagate) scsifcp:target 0x0c01e0 NL22:00:00:0c:50:d1:bc:c4 (Seagate) scsifcp:target 0x0c01e1 22:00:00:0c:50:d1:bc:58 (Seagate) \mathbf{NL} scsifcp:target 0x0c01e2 22:00:00:04:cf:6e:2c:9e (Seagate) \mathbf{NL} scsifcp:target 0x0c01e4 NL 22:00:00:04:cf:6e:60:88 (Seagate) scsifcp:target 22:00:00:04:cf:6e:1d:26 (Seagate) 0x0c01e8 \mathbf{NL} scsifcp:target 0x400100 Ν 21:00:00:e0:8b:0f:88:6d (Qlogic) scsifcp:init Total number of entries = 7 VSAN 3: _____ TYPE PWWN (VENDOR) FC4-FCID TYPE:FEATURE 0x0d0100 Ν 21:01:00:e0:8b:3c:9f:d5 (Qlogic) scsifcp:init

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| 0xee01dc fcp:target | NL | 21:00:00:0c:50:d1:bb:8a | (Seagate) | scsi- |
|------------------------|----|-------------------------|-----------|-------|
| 0xee01e0 fcp:target | NL | 21:00:00:0c:50:d1:bc:c4 | (Seagate) | scsi- |
| 0xee01e1 fcp:target | NL | 21:00:00:0c:50:d1:bc:58 | (Seagate) | scsi- |
| 0xee01e2 fcp:target | NL | 21:00:00:04:cf:6e:2c:9e | (Seagate) | scsi- |
| 0xee01e4 fcp:target | NL | 21:00:00:04:cf:6e:60:88 | (Seagate) | scsi- |
| 0xee01e8 fcp:target | NL | 21:00:00:04:cf:6e:1d:26 | (Seagate) | scsi- |

Total number of entries = 7

Task 3: Using the SAN Extension Tuner

In this activity, you will use the SAN Extension Tuner (SET) to generate test workloads on the SAN, observe the resulting performance metrics, and tune TCP parameters to improve performance based on the observed metrics. After completing this exercise, you will be able to meet these objectives:

- Configure SAN Extension Tuner.
- Tune TCP parameters for FCIP performance.

Command List

The commands used in this exercise are described in the table here.

| Command | Description |
|--|---|
| san-ext-tuner enable | Enable the SAN Extension Tuner feature |
| [no] fcip enable | Enable/disable the FCIP feature |
| show flogi database | Display all connected device on this switch |
| show fcns database | Display the name server entries |
| iscsi enable | Enable the iSCSI feature |
| show interface | Display interface configuration information |
| show fcip profile | Display all current FCIP profiles |
| nwwn 1:00:00:00:00:00:00 | Create a virtual node WWN using 1:00:00:00:00:00:00:00 |
| <pre>nport pWWN 1:00:00:00:00:00:01 vsan vsan-id interf gig slot/port</pre> | Create a virtual port WWN using 1:00:00:00:00:00:00:01 |
| <pre>copy run bootflash:<file></file></pre> | Create a file on bootflash: |
| <pre>data-pattern bootflash:<file></file></pre> | Specify a data pattern file for SAN Extension Tuner |
| write command-id <i>id</i> target <i>pwwn</i> transfer- size 1024000 outstanding-ios 2 continuous | Generate a write command for SAN Extension Tuner |
| <pre>show san-ext-tuner interface gig slot/port nport pwwn 01:00:00:00:00:00:00:01 vsan vsan-id counters</pre> | Display the counters for the SAN Extension Tuner gigE port |
| stop command id | Stop the specified command id in SAN Extension Tuner |
| write | Enable write acceleration for an FCIP interface |



Activity Procedure

| Caution | These steps must be performed concurrently on both switches | | | | |
|---------|--|--|--|--|--|
| Step 1 | From the CLI, create VSAN 100 and set the default zone policy to permit on both switches: | | | | |
| | # conf t | | | | |
| | (config)# vsan database | | | | |
| | (config-vsan-db)# vsan 100 | | | | |
| | (config-vsan-db)# exit | | | | |
| | (config)# zone default-zone permit vsan 100 | | | | |
| Note | VSAN 100 will be used to isolate the SAN Extension tuner (SET) virtual initiator and target from physical initiators and targets. Setting the default zone policy to permit, while not a best practice, allows SET virtual initiators and targets to communicate | | | | |
| Step 2 | Enable SET and iSCSI on both switches: | | | | |
| | (config)# san-ext-tuner enable | | | | |
| | (config)# iscsi enable | | | | |
| Step 3 | Enable GigE interface 2/2 on both switches: | | | | |
| | <pre>(config)# interface gigabitethernet 2/2</pre> | | | | |
| | (config-if)# no shutdown | | | | |
| Step 4 | Enable the iSCSI interface on both switches: | | | | |
| | (config-if)# interface iscsi 2/2 | | | | |
| | (config-if)# no shutdown | | | | |
| | (config-if)# end | | | | |



| Step 5 | Verify that the | interfaces are up | on both switches: |
|--------|-----------------|-------------------|-------------------|
|--------|-----------------|-------------------|-------------------|

| # show in | terface 🤉 | gig 2/2 brief | | | |
|------------------------------|-----------|---|--|-------------------|-----------|
| Interface Port Channel | | Status | IP Address | Speed | MTU |
| GigabitEt | hernet2/2 | 2 up | | 1 Gbps | 1500 |
| # show in | terface : | iscsi 2/2 brief | | | |
| Interface Speed (Gbps) | | Status | Oper Mode | Op | er |
| iscsi2/2 | | up | ISCSI | 1 | |
| | Step 6 | Create a file named <i>ta</i> SAN Extension Tune | est on bootflash: to use a | as a data patterr | n for |
| | Step 7 | Create a virtual node file: | WWN, port WWN and | specify the data | a pattern |
| | | # san-ext-tuner | | | |
| | | (san-ext)# nwwn | nwwn | | |
| | | (san-ext)# nport | pwwn <i>pwwn</i> vsan 1 | 00 interf g | ig2/2 |
| | | (san-ext-nport)‡ | ‡ data-pattern boo | tflash:test | |
| | Note | MDS9506: nwwn = 0 ⁻ 01:00:00:00:00:00:00: MDS9216: nwwn = 02 02:00:00:00:00:00:00:00: | 1:00:00:00:00:00:00:00 p 01 2:00:00:00:00:00:00:00 p 01 | wwn = wwn = | |
| | Caution | Do not proceed until th switches. | ne previous steps have be | en performed on | both |

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|---|--|--|--|--|
| | Step 8 | On both switch | les, generate a continuous series | of write commands to |
| | | the virtual IV_I | oft on the other wilds switch. | |
| | | (san-ext-np transfer-si | ort)# write command-id 1 ze 1024000 outstanding-i | . target <i>pwwn</i> .os 2 continuous |
| | Note | MDS9506: targ MDS9216: targ | et <i>pwwn</i> = 02:00:00:00:00:00:00:01 et <i>pwwn</i> = 01:00:00:00:00:00:00:01 | |
| | Step 9 | Verify that the databases: | virtual N_Ports are present in the | e FLOGI and FCNS |
| (san-exi # show i | t-nport)# flogi data | base vsan 10 | 0 DOPT NAME | NODE NAME |
| (san-exi # show : INTERFAC iscsi2/2 01:00:00 | t-nport)# flogi data CE VSAN 2 100 0:00:00:00 | base vsan 10 FCID 0x640001 01 :00:00 | 0 PORT NAME :00:00:00:00:00:00:00:01 | NODE NAME |
| (san-exi # show : INTERFAG iscsi2/2 01:00:00 Total nu | t-nport)# flogi data CE VSAN 2 100 0:00:00:00 umber of f | base vsan 10 FCID 0x640001 01 :00:00 logi = 1. | 0 PORT NAME :00:00:00:00:00:00:01 | NODE NAME |
| (san-exi # show : INTERFAG iscsi2/2 01:00:00 Total nu # show 1 VSAN 100 | t-nport)# flogi data CE VSAN 2 100 0:00:00:00 umber of f fcns datab 0: | base vsan 10 FCID 0x640001 01 :00:00 logi = 1. pase vsan 100 | 0 PORT NAME :00:00:00:00:00:00:01 | NODE NAME |
| (san-exi # show : INTERFAG iscsi2/2 01:00:00 Total nu # show i VSAN 100 | t-nport)# flogi data CE VSAN 2 100 0:00:00:00 umber of f fcns datab 0: | base vsan 10 FCID 0x640001 01 :00:00 logi = 1. pase vsan 100 | 0 PORT NAME :00:00:00:00:00:00:00:01 | NODE NAME |
| (san-exi # show : INTERFAG iscsi2/2 01:00:00 Total nu # show : VSAN 100 FCID TYPE:FEA | t-nport)# flogi data CE VSAN 2 100 0:00:00:00 umber of f fcns datab 0: TYPE ATURE | base vsan 10 FCID 0x640001 01 :00:00 logi = 1. pwwN | 0 PORT NAME :00:00:00:00:00:00:01 (VENDOR) | NODE NAME |
| (san-exi # show : INTERFAG iscsi2/2 01:00:00 Total nu # show f VSAN 100 FCID TYPE:FEZ | t-nport)# flogi data CE VSAN 2 100 0:00:00:00 umber of f fcns datab 0: TYPE ATURE | base vsan 10 FCID 0x640001 01 :00:00 logi = 1. wase vsan 100 PWWN | 0 PORT NAME :00:00:00:00:00:00:01 (VENDOR) | NODE NAME FC4- |
| (san-exi # show : INTERFAG iscsi2/2 01:00:00 Total nu # show 1 VSAN 100 FCID TYPE:FEZ 0x640000 227 | t-nport)# flogi data | base vsan 10 FCID 0x640001 01 :00:00 logi = 1. pase vsan 100 PWWN 01:00:00:00 | 0 PORT NAME :00:00:00:00:00:00:01 (VENDOR) :00:00:00:01 | NODE NAME FC4- scsi-fcp |

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- On your Windows 2000 host, log in to Device Manager as user Step 10 admin with the password 1234qwer.
- Click the **Summary** tab to monitor ISL link utilization. Step 11

| 💭 Devic | Device Manager 3.0(1) - P29-MDS9506 10.0.29.5 [admin] | | | | | | | |
|-----------|--|-----------|---------|--|------------------|------------------|--------|-----|
| Device F | Device Physical Interface FC FICON IP Security Admin Logs Help | | | | | | | |
| ⊴ ® | 🕣 @ 🛱 🔍 📗 ք 🖺 🕸 🗗 📽 🏍 VSAN All 👻 🤗 | | | | | | | |
| Device S | Summary | | | | | | | |
| 1 | Poll Interval: 1 | Os 💌 Sł | iow Rx/ | лх: Util% 💽 /sec Thresholds 50 🗄 | : %+ | <mark></mark> 80 |) 🕂 %+ | |
| CPU %: | 2 | Memory %: | 20 | D Flash %:87 | | | | |
| Interface | Description | VSAN(s) | Mode | Connected To | S | Rx | Tx | Eri |
| fcip2 | (gigE2/1) | 1-3,100 | TE | 10.0.29.3, Cisco 20:42:00:0b:fd:d0:68:80 | 1 | 53 | 53 | |
| fc1/5 | | 3 | F | L 0x110100, Qlogic 21:00:00:e0:8b:07:2f:5b | 2 | 0 | 0 | |
| fc1/6 | | 2 | FL | 🞯 0x1001dc, Seagate 22:00:00:04:cf:8c:5 | 1 | 0 | 0 | |
| qiqE2/1 | | | | 4503_29_30(10.1.29.254) GigabitEthernet3/3 | 1 | 57 | 56 | |
| qiqE2/2 | | | | 4503_29_30(10.1.29.254) GigabitEthernet3/4 | 1 | 0 | 0 | |
| iscsi2/2 | | 1 | | 0 connections | 1 | 0 | 0 | |
| | | | | | | | | |

Step 12 Click the **Device** tab.

Step 13 Right-click gigE2/1 and choose Monitor.





Step 14 Change the Interval to 2 seconds and the Column Data to Average/Sec:

| P29-M | P29-MDS9506 - gigE2/1 | | | | | | | | |
|------------|---|-----------|----------|-----------|-----------|-----------|-------------|-------------|---|
| GigE Su | GigE Sub Interfaces SCSI SCSI connections TCP | | | | | | | | |
| | 📰 📰 🌑 🔌 🔚 🥞 Interval: 🔽 💌 Average/sec 📊 Elapsed: 00:00:26 | | | | | | | | |
| Intenforce | | Tra | ffic | | | Ĕ | Errors | | |
| Interface | Rx Bytes | Rx Frames | Tx Bytes | Tx Frames | Rx Errors | Tx Errors | Rx Discards | Tx Discards | |
| aiaE2/1 | 58.649M | 58.817K | 54.043M | 52.338K | 0 | 0 | 0 | 0 🗄 | E |
| | | | | | | Refresh | Help | Close | |

Step 15 Observe the Traffic data. Verify there is activity. If there is no activity, verify the SAN Extension configuration on both switchesStep 16 From the CLI, display the SAN Extension Tuner counter for gigE2/2:

show san-ext-tuner interf gig2/2 nport pwwn n
vsan 100 counter

| Note | MDS9506 <i>n</i> = 01:00:00:00:00:00:00:01 MDS9216 <i>n</i> = 02:00:00:00:00:00:00:01 | | | | | | |
|------|--|----------------------------|--|--|--|--|--|
| | | | | | | | |
| | Statistics for nport | | | | | | |
| | Node name 01:00:00:00:0 01:00:00:00:00:00:00:00:00 | 00:00:00:00 Port name 1 | | | | | |
| | I/Os per sec | : 99 | | | | | |
| | Reads | : 0% | | | | | |
| | Writes | : 100% | | | | | |
| | Egress throughput 83.58 MBs/sec) | : 47.36 MBs/sec (Max - | | | | | |
| | Ingress throughput 55.67 MBs/sec) | : 52.51 MBs/sec (Max - | | | | | |
| | Average response time 36363 us | : Read - 0 us, Write - | | | | | |
| | Minimum response time 11819 us | : Read - 0 us, Write - | | | | | |
| | Maximum response time 75500 us | : Read - 0 us, Write - | | | | | |
| | Errors | : 0 | | | | | |

Record the Average response time: ____

| Note | You may need to re-invoke the command several times before a non-zero |
|------|---|
| | value appears |



Record the **Average response time**:

1629934 us

Errors

Maximum response time

Note You may need to re-invoke the command several times before a non-zero value appears. You should see a slight decrease in response time after enabling write acceleration. You may also see errors as enabling write acceleration is disruptive, causing the fcip tunnel to re-establish the link, momentarily preventing traffic.

: 10

: Read - 0 us, Write -

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|-----|------------------------|--|
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| | Step 19 | Exit to CLI EXEC mode. |
| | | (config-if)# end |
| | Step 20 | Stop the I/O on both switches: |
| | | # san-ext-tuner |
| | | (san-ext)# nport pwwn <i>n</i> vsan 100 interfac gig 2/2 |
| | | (san-ext-nport)# stop command-id 1 |
| | | (san-ext-nport)# end |
| | Note | MDS9506 <i>n</i> = 01:00:00:00:00:00:00:01 MDS9216 <i>n</i> = 02:00:00:00:00:00:00:01 |

| Activity | Verification |
|-----------------|--------------|
| ACTIVITY | Vermulation |

You have successfully completed this task when you have:

- Created virtual node and port WWNs on both switches.
- Created a data pattern file on bootflash:
- Verified the virtual N_Ports are present in the FLOGI and FCNS databases.
- Generated write traffic between SAN Extension virtual initiators and targets.
- Deployed Device Manager to monitor ISL link utilization
- Demonstrated how to use the CLI to monitor utilization
- Enabled write acceleration and observed the performance impact



Task 4: Configure FCIP High Availability

In this exercise, you will configure a second FCIP tunnel. Using the PortChannel Wizard, you will then create a Port Channel using the FCIP interfaces. After completing this exercise, you will be able to meet these objectives:

- Implement the FCIP and PortChannel Wizards.
- Configure an FC port channel between the two IPS-modules.

Visual Objective

The figure illustrates what you will accomplish in this activity.



Command List

The commands used in this exercise are described in the table here.

| Command | Description |
|-----------------------------------|--|
| show interface port- channel x | Displays information on the specified PortChannel interface. |
| show fcip profile | Display all configured FCIP profiles |
| show fcns database | Display the name server entries |



Activity Procedure 1: Configure a Second FCIP Tunnel Using the FCIP Wizard

In this task, Team 2 will use the **FCIP Wizard** from Fabric Manager on Server 2 to configure a second FCIP tunnel. Later, Team 1 will configure a PortChannel using both FCIP interfaces as members.

Complete these steps:

- **Step 1** Launch **Fabric Manager** from the Windows desktop.
- **Step 2** In the Fabric Manager window, click the **FCIP Tunnel** icon on the tool bar to launch the FCIP Wizard.



- **Note** It is not necessary to enable the FCIP feature prior to launching the FCIP Wizard. The wizard can enable FCIP upon completion.
- Step 3 In the FCIP Wizard—1 of 4: Select Switch Pair screen, verify the Switch fields display the switch names of both your pod MDS switches.





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In the 2 of 4: Select Ethernet Ports screen, select gigE2/2 in both Step 5 panes and clear the Use Large MTU Size (Jumbo Frames) box.

| FCIP Wizard - /SAN/Fabric P29-MDS | 9216 🛛 🗙 | | | | | |
|--|------------------------|--|--|--|--|--|
| | | | | | | |
| 2 of 4: Select Ethernet F | Ports | | | | | |
| Please select ethernet ports to be used in FCIP ISL between P29-MDS9506 and P29-MDS9216. Down ports should be enabled to function correctly. Security can be enforced for unconfigured 14+2 ethernet ports. | | | | | | |
| P29-MDS9506: | P29-MDS9216: | | | | | |
| gigE2/1, 10.1.29.21/24 | gigE2/1, 10.1.29.11/24 | | | | | |
| gigE2/2 | gigE2/2 | | | | | |
| gigE2/3, (down) | gigE2/3, (down) | | | | | |
| gigE2/4, (down) | gigE2/4, (down) | | | | | |
| Use Large MTU Size (Jumbo Frames) | | | | | | |
| | Back Next Cancel | | | | | |

Click Next Step 6

- Caution Be sure Large MTU Size is NOT selected before continuing. The Ethernet switches in your pod do not support Jumbo Frames
- In the 3 of 4: Specify Tunnel Properties screen, leave all parameters Step 7 with the default values and click Next.

| FCIP Wizard - / | /SAN/Fabric P29-MDS9216 | × |
|--|--|--------|
| 3 of 4: Sp | ecify Tunnel Properties | \sim |
| Please supply the Acceleration is ena muttiple ISLs. | following parameters to tune the TCP connections. If Write abled, ensure that flows will not load balanced across | |
| Max Bandwidth: | 1000 I1000 Mb | |
| Min Bandwidth: | Shared Dedicated | |
| min Danamath. | 500 | Mb |
| Estimated RTT (RoundTrip Time): | 1000 ÷ 0300000 us | |
| (| Write Acceleration | |
| | Enable Optimum Compression | |
| | | |
| | | Cancel |

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Step 8 In the **4 of 4: Create FCIP ISL** screen, configure the following settings:

- Enter the IP Address/Mask of the gigabit Ethernet interface for each switch in the appropriate field:
 - MDS 9506 = 10.1.x.22/24 (where *x* is your pod number)
 - MDS 9216 = 10.1.x.12/24 (where x is your pod number)
- Set the Trunk Mode option to trunk to enable trunk mode on (TE_Port)
- Click **Finish**.

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| FCIP Wizard - 79 | SAN/Fabric P2 | 29-MDS9216 | |
|---|--|---|---------------|
| 4 of 4: Cre | ate FCIP | ' ISL | |
| Please supply follov VSAN for nontrunk/ NOTE: the FCIP link r | ving parameters auto and allowe may take time to | to create a FCIP tunnel. Specify Por d VSAN list for Trunk tunnel. appear in map. | |
| -Between Switc | h P29-MDS9506 | i (fcip3 over gigE2/2) | |
| IP Address/Mask: 1 | 0.1.29.22/24 | e.g. 10.1.1.1/24 | |
| -And Switch P29 | -MDS9216 (fcip | 3 over gigE2/2) | |
| IP Address/Mask: 1 | 0.1.29.12/24 | e.g. 10.1.1.1/24 | |
| Attributes | | | |
| VSAN List: 1 | -4093 | (1-4093) e.g. 1-22,29-45 | |
| Trunk Mode: (| 🖯 nonTrunk 🤅 | trunki 🔿 auto | |
| | | | |
| | | | |
| | | < Back | Einish Cancel |

Step 9 From the CLI, both teams verify the FCIP configuration:

show fcip profile

| ProfileId | Ipaddr | TcpPort |
|-----------|------------|---------|
| 1 | 10.1.29.21 | 3225 |
| 2 | 10.1.29.22 | 3225 |

You should see two profiles.



Step 10 Verify that both FCIP interfaces are active:

| <pre># show interface fcip2-3 brief</pre> | | | | | | |
|---|-----------------|-------|----------|------|---------|--|
| | | | | | | |
| Interface Vsan Eth Int Port-cl | Admin hannel | Admiı | n Status | Oper | Profile | |
| | Mode | Trunl | ĸ | Mode | | |
| | | Mode | | | | |
| | | | | | | |
| | | | | | | |
| fcip2 1 | auto | on | trunking | TE | 1 | |
| GigabitEthernet | t2/1 | | | | | |
| fcip3 1 | auto | on | trunking | TE | 2 | |
| GigabitEthernet | t2/2 | | | | | |

Step 11 From Fabric Manager, verify the FCIP links in the fabric map. Hold your cursor over the line between the two switches.





Activity Procedure 2: Create a PortChannel

Team 1 should perform this procedure on Server 1.

- Step 1 Open Fabric Manager from the Windows desktop and connect to the MDS 9506.
- Step 2 From the Fabric Manager tool bar, click the Port Channel icon.



Step 3In the 1 of 3: Select Switch Pair screen, select the pair showing both
MDS switches and click Next to continue.

| FC Port Channel Wizard - /SAN/Fabric P29-MDS9506 | × |
|--|-----------------|
| 1 of 3: Select Switch Pair | |
| Select switch pair to be linked by an FC Port Channel. | |
| P29-MDS9216 - P29-MDS9506 (2 ISLs) | |
| | |
| | |
| | |
| | |
| | |
| Create New C Edit Existing | |
| | Next 🗁 💦 Cancel |

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Step 4 In the 2 of 3: Select ISLs screen, verify both FCIP interface pairs are in the Selected pane. Click Next to continue.

| FC Por | rt Channel Wizard - /SAN/Fabric P29-MDS9506 | X |
|------------------------------|---|-------|
| 2 of Select or P29-MDS | 3: Select ISLs ne or more ISLs to create a new Channel between P29-MDS9216 and S9506. |) |
| Available | Image: Selected Image | |
| | | ancel |
| Caution | Be sure to clear Dynamically form Port Channel Group from selected ISLs if | |



- **Step 5** In the **3 of 3: Create Port Channel** screen, configure the following settings:
 - In the VSAN List use the default value (1-4093)
 - Set the Trunk Mode option to trunk to enable trunk mode on (TE_Port).

| Please revie ISL(s) simult NOTE: the Cł | w the Channel attributes before pressing Finish to create. Converting all aneously into a port channel may be disruptive. hannel may take time to appear in map. |
|---|--|
| -Between | Switch P29-MDS9216 (fcip3, fcip2) |
| Channel Id: | 1 1256 |
| Description: | To P29-MDS9506 |
| -And Swit | ch P29-MDS9506 (fcip3, fcip2) |
| Channel Id: | 1 |
| Description: | To P29-MDS9216 |
| Channel | Attributes |
| Port VSAN: | 1.4093 |
| VSAN List: | 1-4093 (1-4093) e.g. 1-22,29-45 |
| Trunk Mode: | O nonTrunk |
| | Force Admin, Trunk, Speed, and VSAN attributes to be Identical |
| | |

- Step 5 Click Finish.
- **Step 6** A FC Port Channel Wizard warning dialog box appears, requesting confirmation to continue. Click **Yes** to create the PortChannel.

| FC Port Channel Wizard - /SAN/Fabric P29-MDS9506 🗙 | | | | |
|--|--|--|--|--|
| ⚠ | Converting ISL(s) into a port channel may be disruptive. Do you want to continue? | | | |
| | Yes No | | | |



- **Step 7** Display the Port Channel database information.
 - # show port-chan database
 port-channel 1
 Administrative channel mode is active
 Operational channel mode is active
 Last membership update succeeded
 First operational port is fcip2
 2 ports in total, 2 ports up
 Ports: fcip2 [up] *
 fcip3 [up]
- **Step 8** In Fabric Manager, verify the Port Channel in the fabric map. Hold your cursor over the line between the two switches.





Task 4 Answer Key

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When you complete this activity, your switch running-configuration file will be similar to the following, with differences that are specific to your device or workgroup. The following is a partial output of the **show run** command from P29-MDS9506 after completing this lab activity:

vsan database vsan 2 vsan 3 vsan 100 fcip enable fcip profile 1 ip address 10.1.29.21 fcip profile 2 ip address 10.1.29.22 iscsi enable iscsi interface vsan-membership islb distribute interface port-channel 1 switchport description To P29-MDS9216 switchport mode E channel mode active interface fcip2 switchport mode E channel-group 1 force use-profile 1 peer-info ipaddr 10.1.29.11 write-accelerator no shutdown interface fcip3 switchport mode E channel-group 1 force use-profile 2 peer-info ipaddr 10.1.29.12 no shutdown vsan database vsan 3 interface fc1/5 vsan 2 interface fc1/6 switchname P29-MDS9506 san-ext-tuner enable zone default-zone permit vsan 100 zone name ISCSI-Zonel vsan 2 member pwwn 22:00:00:04:cf:8c:53:26 member pwwn 20:0e:00:0d:65:6a:17:c2 zoneset name ZoneSet1 vsan 2

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```
member ISCSI-Zonel
zoneset activate name ZoneSet1 vsan 2
zoneset activate name ZoneSet1 vsan 3
interface fc1/5
no shutdown
interface fc1/6
no shutdown
interface GigabitEthernet2/1
ip address 10.1.29.21 255.255.255.0
no shutdown
interface GigabitEthernet2/2
ip address 10.1.29.22 255.255.255.0
no shutdown
interface iscsi2/2
no shutdown
```



Task 5: Configuring iSCSI and iSCSI Server Load Balancing

In this exercise, you will first configure and zone iSCSI initiators and targets using the Cisco Fabric Manager Wizard. You will then configure iSLB initiators, auto-zoned target entries and load balancing for iSLB initiators using VRRP.

After completing this exercise, you will be able to meet these objectives:

- Create and zone iSCSI initiators and targets.
- Configure iSLB initiators and auto-zoned targets.
- Configure VRRP for load balancing with iSLB.

Visual Objective

The figure illustrates what you will accomplish in this activity.





Command List

The commands used in this exercise are described in the table here.

| Command | Description |
|-------------------------|---|
| iscsi enable | Enables iSCSI feature on an MDS switch |
| sh iscsi virtual-target | Lists all the active iSCSI virtual-targets |
| sh iscsi initiator | Displays iSCSI information for the initiators |
| sh iscsi session | Lists all the active iSCSI initiator or target sessions |

Activity Procedure 1: Creating Static iSCSI Initiators

In this task you will enable the iSCSI feature and create static iSCSI initiators (the Windows 2000 Servers) specifying the workstation's IP address.

| Note | e Complete these steps on both the MDS 9506 and MDS 9216 | | | 16 | | |
|--------|---|----------------------|------------|--------|--|--|
| Step 1 | From the CLI, enable the iSCSI feature and iSCSI interfaces: | | | | | |
| | # conf t | | | | | |
| | (config)# iscsi enable (config)# interface iscsi 2/1-2 (config-if)# no shut | | | | | |
| | | | | | | |
| | | | | | | |
| | (config-if)# end | | | | | |
| Step 2 | Verify your resu | Verify your results: | | | | |
| | # show inter | face iscsi 2 | /1-2 brief | | | |
| | | | | | | |
| | Interface Speed | Status | Oper Mode | Oper | | |
| | | | | (Gbps) | | |
| | | | | | | |
| | iscsi2/1 | up | ISCSI | 1 | | |
| | iscsi2/2 | up | ISCSI | 1 | | |



Step 3From your Windows 2000 server, get the server IP address by
opening a Command Prompt window and running the **ipconfig**
command. Record the server address in the space provided below:

Record your IP address: 10.1.____.

| 🖾 Command Prompt 📃 🗆 🔀 |
|---|
| C:\> C:\>ipconfig |
| Windows 2000 IP Configuration |
| Ethernet adapter Local Area Connection 6: |
| Connection-specific DNS Suffix IP Address |
| Ethernet adapter Local Area Connection 5: |
| Connection-specific DNS Suffix .: IP Address |
| C:\> C:\> |
| |

- Note You will see two IP addresses in the report. Record the **10.1.x.y** subnet address. You will use the server's IP address to configure the iSCSI initiator.
- Step 4Open Fabric Manager and log in to your assigned switch with the
username admin and the password 1234qwer.Step 5Learnah the iSCCL Winserd
- Step 5Launch the iSCSI Wizard.





Step 6 Enter the **IP address** of the server that you recorded in **Step 3**.

| iSCSI Wizard - /SAN/Fabric P29-MDS9506 | × |
|--|--------|
| | |
| 1 of 3: Configure Initiator | |
| | |
| Select an existing iSCSI initiator or configure a new initiator on a switch. | |
| | |
| Name IP Address VSAN List VWWN | |
| | |
| | |
| | |
| Name or IP Address: 10.1.29.2 | |
| On Switch: P29-MDS9506 | |
| P29-MDS9216 | |
| P29-MDS9506 Next ▷ | Cancel |
| W4 | |

- Step 7Select the appropriate switch from the On Switch: pull-down menu
(Server 1 = MDS9506, Server 2 = MDS9216)
- Step 8 Click Next.



Step 9 In the **Select Targets** dialog, specify the following information:

- VSAN: [9506 = VSAN 2; 9216 = VSAN 3]
- Select a disk target:
 - 9506 Select the first Seagate disk
 - 9216 Select the second Seagate disk

| iSCSI Wizard - /SAN/Fa | abric P29-MDS9216 | | | х |
|-------------------------------|----------------------------------|----------|------------|----------|
| | | | | |
| 2 of 3: Select T | argets | | 22 | |
| | | _ | | |
| Select targets to be associat | ted with iSCSI initiator | | 200 | |
| - | | | | |
| | | | | - |
| Available | | | | |
| Name | Switch Interface | Fold | iSCSI Name | |
| Seagate 21:00:00:04:cf:8c:5 | 53:26 P29-MDS9216 fc1/6 | 0x1501e8 | | 1 |
| Seagate 21:00:00:04:cf:8c:6 | 5b:2a P29-MDS9216 fc1/6 | 0x1501dc | | |
| Seagate 21:00:00:04:cf:92:3 | 73:ac P29-MDS9216 fc1 <i>/</i> 6 | 0x1501e0 | | |
| Seagate 21:00:00:04:cf:92:3 | 74:f1 P29-MDS9216 fc1/6 | 0x1501e2 | | <u>.</u> |
| | | | | |
| | ▼ Add N Remov | e | | |
| | | | | |
| Selected | | | | _ |
| Name Switch Interface | cid ISCSI Name | | | |
| | | | | |
| | | | | |
| · | | | | |
| | Back | Next | Cancel | |
| | | | | |

Step 10Click Add.Step 11Click Next.



Step 12 Accept the default Zone and Zoneset names.

| 🌎 iSCSI W | /izard - /SAN/Fabric P2 | 9-MDS9216 | | × |
|---|--|---|---------------------------|----------|
| 3 of 3 | 3: Select Zone | | | |
| Press 'Fir VSAN000 ports and P29-MDS | nish' to add the iSCSI initiator 03 and make its VW/N persis I initiator VW/N will be addeo 9506 and activated. | 10.1.29.2 to VSA stent. The selected to a new zone or | N Istorage n switch | RE. |
| | | | | |
| Zone: ZoneSet: | ISCSI-Zone1 ZoneSet1 | | ead Only | |
| | | Back | Finish | N Cancel |
| Zone: ZoneSet: | ISCSI-Zone1 ZoneSet1 | R R Back | ead Only | Cancel |

Step 13 Click Finish

- Step 14Select Continue Activation to Save the Running to Startup
configuration
- Step 15 Click close to close the iSCSI Wizard.

| 💭 iSCSI W | Wizard - /SAN/Fabric P29-MDS9216 | × |
|--|--|-------|
| 3 of 3 | 3: Select Zone | |
| Press 'Fin VSAN000 ports and P29-MDS9 | nish' to add the iSCSI initiator 10.1.29.2 to VSAN 103 and make its VWVN persistent. The selected storage d initiator VWVN will be added to a new zone on switch S9506 and activated. | Ę |
| Zone: | : SCSI-Zone1 Read Only | |
| ZoneSet: | ZoneSet1 | |
| Success | < Back Einish C | ilose |



Step 16 From the CLI, verify the results:

show iscsi initiator configured iSCSI Node name is 10.1.29.2 Member of vsans: 3 Node WWN is 24:02:00:0b:fd:d0:68:82 No. of PWWN: 1 Port WWN is 24:01:00:0b:fd:d0:68:82 Configured node (iSCSI)

Step 17 From the Windows Server desktop, launch the Microsoft iSCSI Initiator:





| iSCSI Initiator Propert | ties | | ? × |
|--|---------------|---------|----------------|
| iSNS Servers Persistent Targets Initiator Settings MPIO Devices Target Portals Available Targets Active Sessions Description Click Add to connect to a target portal identified by its IP address or DNS name. The initiator will connect to the portal, establish a discovery session, and gather target information. After adding a target portal, click the Available Targets tab to view the targets and start the logon process. | | | |
| Available portals: | ocket Adapter | Port | |
| | | | |
| | | emove R | <u>e</u> fresh |
| | ОК | Cancel | Apply |



Step 19 Enter the IP address for the interface gigabit Ethernet 2/1. Click **OK**.

| Add Target Portal | | × |
|---|--|------------------------------------|
| Type the IP address or DNS name an want to add. Click Advanced to select session to the portal. | id socket number of it specific settings fo | the portal you or the discovery |
| IP address or DNS name: | Socket: | Advanced |
| 10.1.23.11 | 3260 | |
| | ОК | Cancel |

Note Server 1 = 10.1.x.21; Server 2 = 10.1.x.11 (where X is your Pod number)

Step 20 Choose the Available Targets tab.

| iSCSI Initiator Properties |
|---|
| iSNS Servers Persistent Targets Initiator Settings MPIO Devices Target Portals Available Targets Active Sessions |
| Description Select a target and click Log On to access the storage devices for that target. Each logon starts an iSCSI session. After you log on, you can click the Active Sessions tab to see details about the newly established session. |
| Select a target: Name Status |
| ign. 1987-05.com.cisco:05.p29-mds9216.02-01 Inactive |
| Log On Refresh |
| OK Cancel Apply |

Step 21 Click Log On.

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Select OK to Log On to Target Step 22

| Log On to Target | | × |
|--|----------------------------|----------|
| Target name: | | |
| ign.1987-05.com.cisco:05.p29-mds9216 | 02-01.21000004cf8c5b | 28 |
| Automatically restore this connection | when the system boots | |
| Enable multi-path | | |
| ▲ Only select this option if iSCSI multi- on your computer. | path software is already i | nstalled |
| Advanced | ок с | ancel |

The status should reflect Connected. Step 23

| iSCSI Initiator Properties |
|---|
| iSNS Servers Persistent Targets Initiator Settings MPID Devices Target Portals Available Targets Active Sessions Description Select a target and click Log On to access the storage devices for that target. Each logon starts an iSCSI session. After you log on, you can click the Active Sessions tab to see details about the newly established session. After you log on, you can click the Active Sessions tab to see details |
| Select a target: Name Status Ign.1987-05.com.cisco:05.p29-mds9216.02-01 Connected |
| Log On Refresh |

Click OK to close the iSCSI Initiator Properties Step 24

Cisco Networkers 2010 .1 1.1 1. January 30 - February 2 CISCO Cannes, France From the CLI, display the iSCSI initiator: Step 25 # show iSCSI initiator iSCSI Node name is 10.1.29.2 iSCSI Initiator name: iqn.1991-05.com.microsoft:p29-server1 iSCSI alias name: Configured node (iSCSI) Node WWN is 24:02:00:0b:fd:d0:68:82 (configured) Member of vsans: 3 Number of Virtual n_ports: 1 Virtual Port WWN is 24:01:00:0b:fd:d0:68:82 (configured) Interface iSCSI 2/1, Portal group tag: 0x3080 VSAN ID 3, FCID 0x150001 From the CLI, display the iSCSI target Step 26 # show iscsi virtual-target target: iqn.1987-05.com.cisco:05.p29-mds9216.02-01.2100004cf8c5b2a * Port WWN 21:00:00:04:cf:8c:5b:2a , VSAN 3 Auto-created node (iSCSI) From the CLI, display the active zoneset Step 27 # show zoneset active zoneset name ZoneSet1 vsan 2 zone name ISCSI-Zonel vsan 2 * fcid 0x1001e8 [pwwn 22:00:00:04:cf:8c:53:26] * fcid 0x100001 [pwwn 20:0e:00:0d:65:6a:17:c2] zoneset name ZoneSet1 vsan 3 zone name ISCSI-Zonel vsan 3 * fcid 0x1501dc [pwwn 21:00:00:04:cf:8c:5b:2a] * fcid 0x150001 [pwwn 24:01:00:0b:fd:d0:68:82]]



Step 28 From the CLI, display the active iSCSI session.

show iscsi session Initiator 10.1.29.2 Initiator name iqn.1991-05.com.microsoft:p29server1 Session #1 Target iqn.1987-05.com.cisco:05.p29-mds9216.02-01.21000004cf8c5b2a VSAN 3, ISID 400001370000, Status active, no reservation

Step 29 On your W2K Server desktop, right-click My Computer and select Manage



Step 30 In the Computer Management window, select Storage | Disk Management. In the lower right panel of Disk Manager, you will see the disk drives. Scroll down and right-click your disk, select Properties. (Be sure to right-click the box that says "Disk N", not the volume area to the right)





Step 31 The disk should have an Adapter Name of Microsoft iSCSI Initiator.

| Disk 3 Pro | perties | ? × |
|-----------------------------------|--|--|
| General | | |
| Status: Capacity: | Disk: Type: | Disk 3 Basic Online 35001 MB |
| Device T Hardware Adapter 1 | ied space: ype: e Vendor: Name: | UNKNOWN (Port:5, Target ID: 0, LUN:0) SEAGATE ST336607FC SCSI Disk Microsoft iSCSI Initiator |

If the Adapter name is not the Microsoft iSCSI initiator, try another disk until you find the iSCSI-attached disks.

- Step 32 Identify the iSCSI-attached disk. Write its number here:
- **Step 33** Click **Cancel** to close the Properties dialog.



Activity Procedure 2: Configure iSCSI Server Load Balancing (iSLB)

Both teams complete these steps on your respective servers and switches.

| Note | Team 1 = MDS9506 and W2k Server 1, Team 2 = MDS 9216 and W2K |
|------|--|
| | Server 2. |

Step 1 On your W2K Server desktop, launch the Microsoft iSCSI Initiator.



| Step 2 | Select the Active Sessions tab and click Log Off. |
|--------|--|
| Step 3 | Select the Target Portals tab and click Remove |

| iSCSI Initiator Prop | erties | | | | ? X | |
|--|---|---------------------------------------|----------------------|---------------------------|---------------|--|
| iSNS Servers F Target Portals | Persistent T | argets Initiato vailable Targets | r Settings Ac | MPIO Dev stive Session | /ices is | |
| Description Click Add to con DNS name. The session, and gat After adding a ta targets and start | Description Click Add to connect to a target portal identified by its IP address or DNS name. The initiator will connect to the portal, establish a discovery session, and gather target information. After adding a target portal, click the Available Targets tab to view the targets and start the logon process. | | | | | |
| Available portals: | | | | | _ | |
| Address | Socket | Adapter | | Port | - 1 | |
| | | | | | | |
| | | <u>A</u> dd <u>F</u> | <u>}emove</u> | R <u>e</u> fresł | 1 | |
| | | OK | Cancel | Apr | yly | |

- **Step 4** Click **OK** to close the Microsoft iSCSI Initiator
- Step 5 Launch Device Manager and login with the username admin and the password 1234qwer

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Select IP > iSCSI Step 6



Select the initiator and click Delete. Step 7

| P29-MDS9 | i06 - iSCSI | | | | | |
|-----------------|------------------|-----------|-----------------|------------------------------|----------------------|-----------------|
| Initiators Targ | ets Session Init | iators iS | NS Profiles | | | |
| 🗗 🔂 🖓 | 🚽 🗳 | | | | | |
| Name or IP A | VSAN Memb | Discover | Node Address | Node Addres: SystemAssigr | Node Address VWVN | Port Address |
| 10.1.29.2 | 2 | | | | 20:0f:00:0d:65:6 | true |
| 1 row(s) | | | Edit Port | WWN | Create | Delete |

- Answer Yes to confirm the deletion Step 8
- Click **Close** to close the iSCSI configuration window. Step 9
- Return to the CLI for your switch to create the VRRP group that will Step 10 be used for iSLB load-balancing.
- Step 11 Configure the VRRP group 200 for both GigE interfaces on both switches with the IP address 10.1.x.100 (where x = your pod number)

config

```
(config)# interface gigabitethernet 2/1
(config-if)# vrrp 200
(config-if-vrrp)# address 10.1.x.100
(config-if-vrrp)# no shut
(config-if-vrrp)# interface gigabitethernet 2/2
(config-if)# vrrp 200
(config-if-vrrp)# address 10.1.x.100
(config-if-vrrp)# no shut
(config-if-vrrp)# end
```



| 12 | Confirm the creat | ion of the V | RRP gro | up 200 on | each switch. | |
|----|----------------------------|--------------|---------|-----------|--------------|----|
| | # show vrrp | | | | | |
| | Interface VR IP addr | IpVersio | on Pri | Time 1 | Pre State | VR |
| | | | | | | |
| | GigE2/1 200 10.1.29.100 | IPv4 | 100 | 1 s | backup | |
| | GigE2/2 200 10.1.29.100 | IPv4 | 100 | 1 s | master | |
| | # show vrrp | | | | | |
| | Interface VR IP addr | IpVersi | on Pri | Time 1 | Pre State | VR |
| | | | | | | |
| | GigE2/1 200 10.1.29.100 | IPv4 | 100 | 1 s | backup | |
| | GigE2/2 200 10.1.29.100 | IPv4 | 100 | 1 s | backup | |

Step 13 Return to your W2K Server desktop

Step

Step 14 From Device Manager select **IP** > **iSCSI iSLB**.



Step 15 Click Create on the iSCSI iSLB initiators tab.

| P29 |)-MD | \$95 | i06 - iS | CSI iSI | .B | | | | | | | | | × |
|-----------------|-------------|-------|----------|---------|-----------------|----------------------|-----------------|-----------------|-----------------|--------|------------------|-----------------|-----|--------|
| Initiato | ors | Targ | etsÌ⊻F | RRP | | | | | | | | | | |
| P | ¢. | 3 | 8 | | | | | | | | | | | |
| Name | or I | . vs | AN M | Discov | Node Address | Node Add SystemAs | Node Address | Port Addres: | Port Address | Aut | Target UserN∉ | Target Pass∿ | Loa | AutoZ |
| Edit 0 row(s | Port' s) | VVVVI | ۷ | Edit (| nitiator Sp | ecific Targ | st | Create. | | Delete | | Apply | R | efresh |



Step 16 Configure the iSCSI iSLB initiator as follows:

IP Address:

- MDS 9506, W2K Server 1 = 10.1.x.2 (where x = your pod number)
- MDS 9216, W2K Server 2 = 10.1.x.6 (where x = your pod number)

VSAN Membership:

- **MDS 9506, W2K Server** 1 = 2
- $\blacksquare MDS 9216, W2K Server 2 = 3$

Node WWN Mapping

Check the boxes for both Persistent and SystemAssigned

Port WWN Mapping

■ Check the boxes for both Persistent and System Assigned

Initiator Specific Target

■ MDS 9506, W2K Server 1

Select the first Seagate WWN that begins with 22:00:00

■ MDS 9216, W2K Server 2 = 3

Select the second Seagate WWN that begins with 21:00:00

Primary VSAN

- MDS 9506, W2K Server 1 = 2
- $\blacksquare MDS 9216, W2K Server 2 = 3$

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|---------|-----|-----|-----|---|
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| 🕘 P29-MDS9506 - 0 | Create iSCSI iSLB Initiators | x |
|---------------------|------------------------------|---|
| | | |
| Name or IP Address: | 10.1.29.2 | |
| VSAN Membership: | 2 | |
| -Node WWN Mapp | ping | |
| | Persistent | |
| | ✓ SystemAssigned | |
| Static VW/N: | | |
| -Port WWN Mappi | ing | |
| | Persistent | |
| | System Assigned 1 + 164 | |
| | | |
| | | |
| Or Static VWVN(s): | | |
| (One Per Line) | | |
| | | |
| AuthUser: | | |
| - Target Authentie | cation | |
| UserName: | | |
| Password: | | |
| -Initiator Specific | Target | |
| Port WWN: | 22:00:00:04:cf:8c:53:26 | |
| Name: | | |
| | | |
| | TrespassMode | |
| | RevertToPrimary | |
| PrimaryVsan: | 2 14093 | |
| , | | |
| | Create Close | |
| | | |

Step 17 Click Create

Step 18 Click Close

Step 19 Select the iSCSI iSLB **VRRP** tab

| P29-MDS9506 - iSCSI iSLB | × |
|---|--------------------|
| Initiators Targets VRRP | |
| B # 3 8 6 | |
| Vrld, lpVersion | LoadBalance |
| Create Delete Apply Data retrieved at 11:29:45 | Refresh Help Close |



Step 20 Click Create.

| 🗬 P29-MDS9506 - Creat 💌 |
|--------------------------------|
| Vrld: 200 ≛ 1255 lpVersion: |
| Create Close |

- Step 21Enter the Virtual Router ID 200 for the VRRP group you created in
Step 11
- Step 22 Select the LoadBalance check box
- Step 23 Click Create and Close.

| P29-MDS9506 - iSCSI iSLB | × |
|------------------------------|--------------------|
| Initiators Targets VRRP | |
| 1 1 2 3 🔒 😂 | |
| Vrld, lpVersion | LoadBalance |
| 200, IPV4, | |
| Create Delete Apply created. | Refresh Help Close |

Step 24 Click Close to close the iSCSI iSLB menu.

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| Step 25 Step 26 | Return to the CLI for your switch. Check the CFS distribution status for the iSLB | application |
|--------------------|---|-------------|
| | # show cfs application name islb | |
| | Enabled : No | |
| | Timeout : 60s | |
| | Merge Capable : Yes | |
| | Scope : Physical-fc | |
| Step 27 | Enable CFS distribution for iSLB # config (config)# islb distribute | |
| Step 28 | Commit the CFS iSLB distribution | |
| | (config)# islb commit (config)# end | |
| Step 29 | Show the iSLB merge status | |
| | <pre># show islb merge status</pre> | |

Merge Status: SUCCESS



Step 30 On your W2K Server desktop, launch the Microsoft iSCSI Initiator.



- Step 31 On the Target Portals tab click Add.
- Step 32 Enter the IP address of the VRRP group 200 10.1.x.100 (where x = your pod number) in the IP address field of the Add Target Portal dialogue.

| Add Target Portal | × |
|---|--|
| Type the IP address or DNS name ar want to add. Click Advanced to select session to the portal. | nd socket number of the portal you ct specific settings for the discovery |
| IP address or DNS name: 10.1.29.100 | Socket: 3260 <u>A</u> dvanced |
| | OK Cancel |

Step 33 Click OK

Step 34 Select the Available Targets tab and click Log On.

| Select a target: | | |
|--|-----------------------|--|
| Name | Status | |
| ign.1987-05.com.cisco:05.p29-mds9506.3c177 | Inactive | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| J | | |
| Log (| Dn N R <u>e</u> fresh | |
| | | |



|--|



Step 36 Confirm that the iSCSI target status reads Connected in the Available Targets tab.

| Select a target: | |
|--|------------|
| Name | Status |
| iqn.1987-05.com.cisco:05.p29-mds9506.3c177 | Connected |
| | \searrow |
| | v |
| | |
| | |
| | |
| | |
| | |
| | Jn Refresh |



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Initiator VR Id VRRP IP Switch WWN Interfac 10.1.29.2 200 10.1.29.100 20:00:00:0b:fd:d0:68:80 GigabitEthernet2/2 10.1.29.6 200 10.1.29.100 20:00:00:0b:fd:d0:68:80 GigabitEthernet2/1

Step 40 View the current iSLB initiator VRRP assignments

show islb vrrp assignment

-- Initiator To Interface Assignment -Initiator 10.1.29.2
VRRP group id: 200, VRRP IP address: 10.1.29.100
Assigned to switch wwn: 20:00:00:0b:fd:d0:68:80
ifindex: GigabitEthernet2/2
Waiting for the redirected session request: False
Initiator weighted load: 1000
Initiator 10.1.29.6
VRRP group id: 200, VRRP IP address: 10.1.29.100
Assigned to switch wwn: 20:00:00:0b:fd:d0:68:80
ifindex: GigabitEthernet2/1
Waiting for the redirected session request: False
Initiator weighted load: 1000



Activity Procedure 3: Partition and Format the iSCSI Disk

Both teams complete these steps on your respective server:

- Step 1 On your W2K Server desktop, right-click My Computer and select Manage.
- Step 2 In the Computer Management window, select Storage | Disk
 Management. In the lower right panel of Disk Manager, you will see the disk drives. Scroll down and right-click your disk, select
 Properties. (Be sure to right-click the box that says "Disk N", not the volume area to the right)



Step 3 The disk should have an Adapter Name of Microsoft iSCSI Initiator.

| Disk 3 Pra | perties | ? × |
|------------|-------------|---------------------------------------|
| General | | |
| | Disk: | Disk 3 |
| ~~~ | Туре: | Basic |
| Status: | | Online |
| Capacity | <i>)</i> : | 35001 MB |
| Unalloca | ated Space: | 35001 MB |
| Device | Туре: | UNKNOWN (Port:5, Target ID: 0, LUN:0) |
| Hardwar | re Vendor: | SEAGATE ST336607FC SCSI Disk |
| Adapter | Name: | Microsoft iSCSI Initiator |



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If the Adapter name is not the Microsoft iSCSI initiator, try another disk until you find the iSCSI-attached disks.

- Step 4 Identify the iSCSI-attached disk. Write its number here: ____
- Step 5 Click Cancel to close the Properties dialog.
- **Step 6** Follow the procedure to create a partition. Right-click on the Unallocated space and select **Create Partition**.



Note If a partition already exists, delete it and recreate another partition

Step 7 The Create Partition Wizard will begin. Click Next.

Step 8 Select Primary Partition and click Next.

Select the type of partition you want to create:

Primary partition

C Extended partition

Step 9 Configure a partition size of 4321 MB and click **Next**.

| Maximum disk space: | 35001 MB |
|------------------------------|-----------|
| Minimum disk space: | 7 MB |
| Amount of disk space to use: | 4321 ★ MB |

Step 10 Assign a drive letter E: and click Next.

| Assign a drive letter: | E: 💌 |
|-------------------------------------|--|
| ○ <u>M</u> ount this volume at an e | mpty folder that supports drive paths: |
| | Browse |
| O Do not assign a drive lette | r or drive path |



Step 11 Check Perform a Quick Format, and click Next

Specify whether you want to format this partition.

- O Do not format this partition
- Format this partition with the following settings:

| File system to use: | NTFS |
|-----------------------|------------------------------------|
| Allocation unit size: | Default 💌 |
| ⊻olume label: | New Volume |
| Perform a Quick Forma | Enable file and folder compression |

- **Step 12** Review your configuration and click **Finish**.
- Step 13 Disk Manager will show that the volume is formatting. This will take a few seconds. When the formatting is done, the New Volume will be marked Healthy.

| CP Disk 0 Basic 33.91 GB Online | 104 I Heali | (C:) 16.60 GB NTF Healthy (Syste | 16.60 GB Healthy | 618 MB Unalloca |
|--|--|---|-------------------------|--------------------|
| CP Disk 3 Basic 34.18 GB Online | New Volume (E:) 4.22 GB NTFS Healthy | | 29.96 GB Unallocated | _ |
| CDRom 0 CDRom (D:) | | | | • |

Activity Verification

Complete these steps to test your new volumes:

- **Step 1** Close all open applications and log out. (You do not need to reboot, just log out.)
- **Step 2** When the PC desktop window closes, return to the LabGear window, access your PC's remote desktop, and log in as **administrator** with password **cisco**.
- Step 3 On the Windows desktop, right-click My Computer and choose Explore.
- Step 4 Verify the drive New Volume (E:) is visible.
- **Step 5** Copy a folder from the C: drive to **New Volume(E:)**.

You have completed this lab successfully if you can create and copy files to the iSCSI-attached volume.



Task 5 Answer Key

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When you complete this activity, your switch running-configuration file will be similar to the following, with differences that are specific to your device or workgroup. The following is a partial output of the **show run** command from P29-MDS9506 after completing this lab activity:

vsan database vsan 2 vsan 3 vsan 100 fcip enable fcip profile 1 ip address 10.1.29.21 fcip profile 2 ip address 10.1.29.22 iscsi enable iscsi interface vsan-membership islb distribute interface port-channel 1 switchport description To P29-MDS9216 switchport mode E channel mode active interface fcip2 switchport mode E channel-group 1 force use-profile 1 peer-info ipaddr 10.1.29.11 write-accelerator no shutdown interface fcip3 switchport mode E channel-group 1 force use-profile 2 peer-info ipaddr 10.1.29.12 no shutdown vsan database vsan 3 interface fc1/5 vsan 2 interface fc1/6 switchname P29-MDS9506 iscsi import target fc islb initiator ip-address 10.1.29.2 static nWWN 20:0f:00:0d:65:6a:17:c2 static pWWN 20:0e:00:0d:65:6a:17:c2 vsan 2 target pwwn 22:00:00:04:cf:8c:53:26 vsan 2

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islb initiator ip-address 10.1.29.6 static nWWN 24:02:00:0b:fd:d0:68:82 static pWWN 24:01:00:0b:fd:d0:68:82 vsan 3 target pwwn 21:00:00:04:cf:8c:5b:2a vsan 3 islb vrrp 200 load-balance islb commit san-ext-tuner enable zone default-zone permit vsan 100 zone name ISCSI-Zonel vsan 2 member pwwn 22:00:00:04:cf:8c:53:26 member pwwn 20:0e:00:0d:65:6a:17:c2 zoneset name ZoneSet1 vsan 2 member ISCSI-Zonel zoneset activate name ZoneSet1 vsan 2 zoneset activate name ZoneSet1 vsan 3 interface fc1/5 no shutdown interface fc1/6 no shutdown interface GigabitEthernet2/1 ip address 10.1.29.21 255.255.255.0 no shutdown vrrp 200 address 10.1.29.100 no shutdown interface GigabitEthernet2/2 ip address 10.1.29.22 255.255.255.0 no shutdown vrrp 200 address 10.1.29.100 no shutdown interface iscsi2/1 no shutdown interface iscsi2/2 no shutdown interface mgmt0 switchport speed 100 ip address 10.0.29.5 255.255.255.0

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