

HP–UX iSCSI Host to MDS/IPS–8 Configuration Example

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Introduction

Cisco iSCSI drivers, which reside on the server, are a key component of an iSCSI solution. These iSCSI drivers intercept **Small Computer System Interface (SCSI)** commands, encapsulate them into IP packets, and redirect them to the Cisco SN 5420, Cisco SN 5428, Cisco SN 5428–2, or Cisco MDS/IPS–8. This document provides sample configurations for the HP–UX iSCSI host to SN 5428.

Prerequisites

Requirements

Before you attempt this configuration, make sure that you meet these requirements:

- Install the iSCSI driver that is compatible to your HP–UX version. The most current version of the driver can be found at the [Cisco iSCSI Driver \(registered customers only\) download page on Cisco.com](#). The README.txt file is included in the driver zip(tar) file. The README contains information about the license agreement, driver installation and configuration instructions, and a technical overview of the driver architecture.
- The operating system requirements and patch requirements are described in the *System Requirements* section of the Cisco iSCSI Driver for HP–UX Release Notes.

Components Used

The information in this document is based on these software and hardware versions:

- HP–UX 9000/800 A500 server with two processors.

Note: In this lab setup, there is no separate Ethernet adapter for iSCSI, and the one in use is 100 Mb.

In any realistic environment, you have a separate Gigabit Ethernet (GE) adapter(s) as your iSCSI initiator(s).

```
[/]# /opt/ignite/bin/print_manifest[...]
System Hardware
  Model:                9000/800/A500-5X
  Main Memory:         1024 MB
  Processors:          2
  OS mode:             64 bit
  LAN hardware ID:     0x00306E1B6F51
  Software ID:         586760518
  Keyboard Language:   Not_Applicable

Storage devices                HW Path      Interface
SEAGATE ST318404LC 17366 Mb    0/0/1/1.15.0 SCSI C896 Ultra Wide Single-Ended
SEAGATE ST318203LC 17366 Mb    0/0/2/1.15.0 SCSI C875 Ultra Wide Single-Ended

I/O Interfaces
Class      H/W Path      Driver      Description
lan        0/0/0/0       btlan3      HP PCI 10/100Base-TX Core
ext_bus    0/0/1/0       c720        SCSI C896 Ultra Wide LVD
ext_bus    0/0/1/1       c720        SCSI C896 Ultra Wide Single-Ended
ext_bus    0/0/2/0       c720        SCSI C875 Fast Wide Single-Ended
ext_bus    0/0/2/1       c720        SCSI C875 Ultra Wide Single-Ended
tty        0/0/4/0       asio0       PCI Serial (103c1048)
tty        0/0/5/0       asio0       PCI Serial (103c1048)
fc         0/2/0/0       td          HP Tachyon XL2 Fibre Channel Mass S
```

Installed Software

Your system was installed with HP-UX version B.11.00.

Your system has the following software products installed and configured on the system disk drive(s).

Product	Revision	Description
A6795A	B.11.00.10	PCI Tachyon TL/TS/XL2 Fibre Channel
BUNDLE	B.11.00	Patch Bundle
HPUXEng64RT	B.11.00.01	English HP-UX 64-bit Runtime Environment
HWE1100	B.11.00.0203.5	Hardware Enablement Patches for HP-UX 11.00,
OnlineDiag	B.11.00.20.09	HP-UX 11.0 Support Tools Bundle, Mar 2002
UXCoreMedia	B.11.00.02	HP-UX Media Kit (Reference Only. See Descript
UnlimUserLic	B.11.00.02	HP-UX Unlimited-User License
XSWGRI100	B.11.00.47.08	General Release Patches, November 1999 (ACE)

[...]

- Cisco iSCSI Driver 3.3.3 for HP-UX has been used. It is recommended that you also install (at least) the latest stable Address Resolution Protocol (ARPA) Transport Cumulative Patch from HP. When this document was written, this was PHNE_28538. This patch has several dependencies, so you have to install them as and when needed. For more installation information, visit the official HP Support Site (registered customers only).

```
[/]# swlist
# Initializing...
# Contacting target "ape"...
#
# Target:  ape:/
#
#
# Bundle(s):
#
A6795A                B.11.00.10      PCI Tachyon TL/TS/XL2 Fibre Channel
BUNDLE                B.11.00         Patch Bundle
HPUXEng64RT          B.11.00.01      English HP-UX 64-bit Runtime Environ
```

```

HWE1100                B.11.00.0203.5 Hardware Enablement Patches for HP-UX
OnlineDiag             B.11.00.20.09  HP-UX 11.0 Support Tools Bundle, Mar 2
QPK1100                B.11.00.56.5   Quality Pack for HP-UX 11.00, March 2
UXCoreMedia           B.11.00.02     HP-UX Media Kit (Reference Only. See
UnlimUserLic          B.11.00.02     HP-UX Unlimited-User License
XSWG1100              B.11.00.47.08  General Release Patches, November 199
#
# Product(s) not contained in a Bundle:
#

```

```

ISCSI                3.3.3          ISCSI software
bison                1.875          bison
flex                 2.5.4a        flex
gcc                  3.2.3          gcc
gettext              0.11.5         gettext
less                 376            less
libiconv             1.9            libiconv
make                  3.80           make
ncurses              5.2            ncurses
termcap              1.3.1          termcap
zsh                   4.0.7          zsh

```

```

[/]# swlist BUNDLE
# Initializing...
# Contacting target "ape"...
#
# Target:  ape:/
#

```

```

# BUNDLE                B.11.00        Patch Bundle
BUNDLE.PHCO_23651       1.0            fsck_vxfs(1M) cumulative patch
BUNDLE.PHKL_28496       1.0            SCSI IO Subsystem Cumulative Patch
BUNDLE.PHKL_27980       1.0            VxFS 3.1 cumulative patch: CR_EIEM
BUNDLE.PHKL_22840       1.0            IDS/9000; syscalls related to file/socket
BUNDLE.PHCO_28505       1.0            user/group(add/mod/del)(1M) cumulative patch
BUNDLE.PHKL_28150       1.0            LVM Cumulative Patch w/Performance Upgrades
BUNDLE.PHNE_28538       1.0            cumulative ARPA Transport patch
BUNDLE.PHNE_28143       1.0            LAN product cumulative patch
BUNDLE.PHNE_27902       1.0            Cumulative STREAMS Patch
BUNDLE.PHKL_29434       1.0            POSIX AIO;getdirenties;MVFS;rcp;mmap/IDS;
BUNDLE.PHKL_28766       1.0            Probe, IDDS, PM, VM, PA-8700, AIO, T600, FS, PDC, CLK
BUNDLE.PHKL_28004       1.0            Fibre Channel Mass Storage Driver Patch
BUNDLE.PHKL_27729       1.0            ioscan -u incorrect display (kernel patch).
BUNDLE.PHKL_24187       1.0            ioscan performance gain for SCSI Subsystem
BUNDLE.PHKL_24165       1.0            Kernel Patch For "ioscan -k" Performance
BUNDLE.PHKL_23409       1.0            NFS, Large Data Space, kernel memory leak
BUNDLE.PHKL_20016       1.0            2nd CPU not recognized in G70/H70/I70
BUNDLE.PHKL_18543       1.0            PM/VM/UFS/async/scsi/io/DMAPI/JFS/perf patch
BUNDLE.PHCO_27818       1.0            ioscan(1M) cumulative patch
BUNDLE.PHCO_27375       1.0            cumulative SAM/ObAM patch

```

• Cisco MDS 9216 with Software Version 1.2(1a).

```

vatican# show module
Mod  Ports  Module-Type                Model                Status
---  ---
1    16     1/2 Gbps FC/Supervisor     DS-X9216-K9-SUP     active *
2    8      IP Storage Module          DS-X9308-SMIP       ok
Mod  Sw      Hw      World-Wide-Name(s) (WWN)
---  ---
1    1.2(1a)  1.0     20:01:00:0c:30:57:5e:c0 to 20:10:00:0c:30:57:5e:c0
2    1.2(1a)  0.2     20:41:00:0c:30:57:5e:c0 to 20:48:00:0c:30:57:5e:c0

Mod  MAC-Address(es)                Serial-Num
---  ---
1    00-0b-be-f8-7f-00 to 00-0b-be-f8-7f-04  JAB070804Q3

```

* this terminal session

```
vatican# show version
Cisco Storage Area Networking Operating System (SAN-OS) Software
TAC support: http://www.cisco.com/tac
Copyright (c) 2002-2003 by Cisco Systems, Inc. All rights reserved.
The copyright for certain works contained herein are owned by
Andiamo Systems, Inc. and/or other third parties and are used and
distributed under license.
```

```
Software
  BIOS:          version 1.0.8
  loader:        version 1.1(2)
  kickstart:     version 1.2(1a)
  system:        version 1.2(1a)

  BIOS compile time:      08/07/03
  kickstart image file is: bootflash:/k121a
  kickstart compile time: 9/1/2003 17:00:00
  system image file is:   bootflash:/s121a
  system compile time:    9/1/2003 17:00:00
```

```
Hardware
RAM 963108 kB
```

```
bootflash: 500736 blocks (block size 512b)
slot0:      0 blocks (block size 512b)
```

```
vatican uptime is 1 days 6 hours 17 minute(s) 25 second(s)
```

```
Last reset at 955065 usecs after Wed Sep 10 08:13:50 2003
Reason: Reset Requested by CLI command reload
System version: 1.1(2)
```

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command.

Conventions

The Cisco MDS 9000 that is used in this document refers to any Fibre Channel (FC) switch product in the MDS 9000 family (MDS 9506, MDS 9509, MDS 9216). The Cisco Intrusion Prevention System (IPS) blade refers to IP Storage Services Module. For more information on document conventions, refer to the Cisco Technical Tips Conventions.

Background Information

The Cisco Intrusion Prevention System (IPS) module provides IP hosts access to Fibre Channel (FC) storage devices. The IPS module is DS-X9308-SMIP. It provides transparent SCSI routing. IP hosts that use iSCSI protocol can transparently access iSCSI targets on the FC network. The IP host sends SCSI commands encapsulated in iSCSI Protocol Data Units (PDUs) to a MDS 9000 IPS port over a TCP/IP connection. On the IPS module, connectivity is provided in the form of GE interfaces that are appropriately configured. The IPS module enables you to create virtual iSCSI targets and maps them to physical FC targets available in the FC SAN. It presents the FC targets to IP hosts as if the physical targets were attached to the IP network.

Each iSCSI host that requires access to storage through the IPS module needs to have a compatible iSCSI driver installed. With the help of the iSCSI protocol, the iSCSI driver allows an iSCSI host to transport SCSI requests and responses over an IP network. From the perspective of a host operating system, the iSCSI driver

appears to be a SCSI transport driver similar to a FC driver for a peripheral channel in the host. From the perspective of the storage device, each IP host appears as a FC host. Routing SCSI from the IP host to the FC storage device consists of these main actions:

- Transporting iSCSI requests and responses over an IP network between hosts and the IPS module
- Routing SCSI requests and responses between hosts on an IP network and the FC storage device (converting iSCSI to FCP and FCP to iSCSI). This routing is performed by the IPS module.
- Transporting FCP requests or responses between the IPS module and FC storage devices

The IPS module does not import FC targets to iSCSI by default. Either dynamic or static mapping must be configured before the IPS module makes FC targets available to iSCSI initiators. When both are configured, statically mapped FC targets have a configured name. This document provides an example of static mapping. With dynamic mapping, each time that the iSCSI host connects to the IPS module, a new FC N port is created and the nWWNs and pWWNs allocated for this N port may be different. Use the static mapping method if you need to obtain the same nWWNs and pWWNs for the iSCSI host each time it connects to the IPS module. Static mapping can be used on the IPS module to access intelligent FC storage arrays that have access control and logical unit numbers (LUN) mapping and masking configurations based on the initiator's pWWNs or nWWNs.

You can control access to each statically-mapped iSCSI target with the creation of a specific list of IPS ports on which the target is advertised and the creation of a list of iSCSI initiator node names allowed to access it. FC zoning-based access control and iSCSI-based access control are the two mechanisms by which access control can be provided for iSCSI. Both methods can be used simultaneously. In this configuration default zoning is permitted for specific VSAN. IPS modules use both iSCSI node name-based and FC zoning-based access control lists to enforce access control during iSCSI discovery and iSCSI session creation.

- **iSCSI discovery:** When an iSCSI host creates an iSCSI discovery session and queries for all iSCSI targets, the IPS module returns only the list of iSCSI targets this iSCSI host is allowed to access based on the access control policies.
- **iSCSI session creation:** When an IP host initiates an iSCSI session, the IPS module verifies if the specified iSCSI target (in the session login request) is a static mapped target, and if true, verifies if the IP host's iSCSI node name is allowed to access the target. If the IP host does not have access, its login is rejected.

The IPS module, then creates a FC virtual N port (the N port may already exist) for this IP host and does a FC name server query for the FCID of the FC target pWWN that is accessed by the IP host. It uses the IP host virtual N port's pWWN as the requester of the name server query. Thus, the name server does a zone-enforced query for the pWWN and responds to the query. If the FCID is returned by the name server, then the iSCSI session is accepted. Otherwise, the login request is rejected.

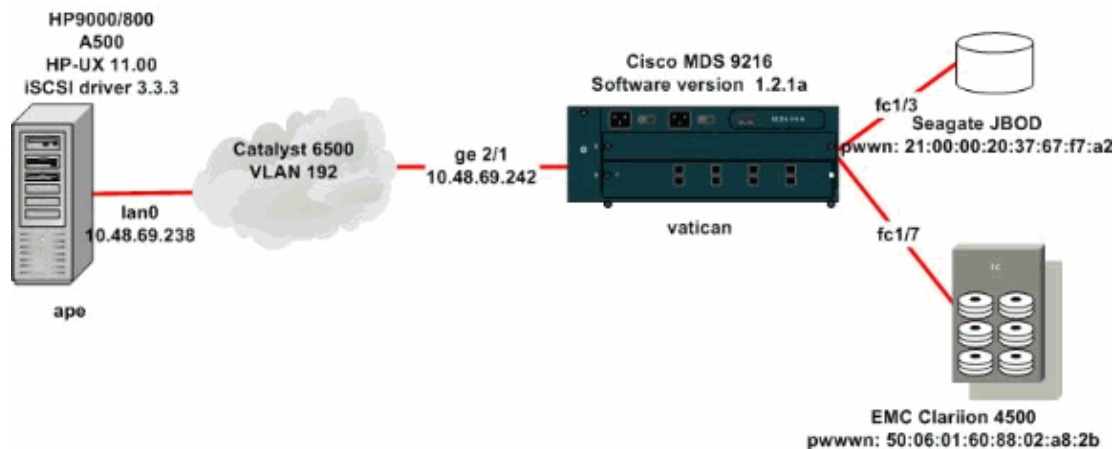
Configure

In this section, you are presented with the information to configure the MDS 9216 and Cisco iSCSI Driver for Linux.

Note: To find additional information on the commands used in this document, use the Cisco MDS 9000 Family Command Reference and Cisco MDS 9000 Family Software Configuration Guide.

Network Diagram

This document uses the network setup shown in this diagram:



Configurations

This document uses the configurations shown here:

- Ape (HP 9000/800 A500 HP-UX 11.00)
- Vatican (MDS 9216)

Ape (HP 9000/800 A500 HP-UX 11.00)

On the HP-UX host only the file `/etc/iscsi.conf` has to be modified:

```
[/]# cat /etc/iscsi.conf
# iSCSI configuration file - see iscsi.conf(4)
# DiscoveryAddress Settings
# -----
# Add "DiscoveryAddress=xxx" entries for each iSCSI router instance.
# The driver attempts to discover iSCSI targets at that address
# and make as many targets as possible available for use.
# 'xxx' can be an IP address or a hostname. A TCP port number can be
# specified by appending a colon and the port number to the address.
# All entries have to start in column one and must not contain any
# whitespace.
#
# Example:
#
# DiscoveryAddress=scsirouter1
# DiscoveryAddress=10.48.69.242

!--- Configure the IP address of the GE interface that accepts iSCSI request from your host.

# The DiscoveryAddress Settings can take following entry.
#
# 1) Authentication Settings
# 2) ConnectionTimeout Settings

!--- Other required driver parameters could be changed in the iscsi.conf file.

.....

[/]# cat /etc/iscsi.bindings
# iSCSI bindings, file format version 1.0.
# NOTE: this file is automatically maintained by the iSCSI daemon.
# You do not need to edit this file under most circumstances.
# If iSCSI targets in this file have been permanently deleted, you
# may wish to delete the bindings for the deleted targets.
#
# Format:
```

```
# bus   target  iSCSI
# id    id       TargetName
#
[...]
```

0	10	seagate
0	11	spa-vt

!--- The iSCSI driver discovery daemon process looks up each discovered target in the /etc/iscsi.bindings file. If an entry exists in the file for the target, the corresponding SCSI target ID is assigned to the target. If no entry exists for the target, the smallest available SCSI target ID is assigned and an entry is written to the /etc/iscsi.bindings file for this target.

!--- Note that the /etc/iscsi.bindings file permanently contains entries for all iSCSI targets ever logged into from this host. If a target is no longer available to a host, you can manually edit the file and remove entries so that the obsolete target no longer consumes a SCSI target ID. If you know the iSCSI target name of a target in advance, and you want it to be assigned a particular SCSI target ID, you can add an entry manually. You must stop the iSCSI driver before editing the /etc/iscsi.bindings file. The maximum number of targets is 14.

!--- Enter [/#]/sbin/init.d/iscsi start to manually start the iSCSI driver.

!--- Enter [/#]/sbin/init.d/iscsi stop to manually stop the iSCSI driver.

Vatican (Cisco MDS 9216)

!--- If you are starting from the factory default configuration, you need to setup the IP address and mask of the management interface. This would normally be done during the initial setup

.

```
interface mgmt0
ip address 10.48.69.156 255.255.255.192
```

!--- In this configuration example, all the iSCSI targets are in a single vsan

.

```
vsan database
vsan 1016
vsan 1016 interface fc1/3
vsan 1016 interface fc1/7
```

!--- These are the boot variables.

```
boot system bootflash:/s111a
boot kickstart bootflash:/k111a
```

```
# Simple IP configuration
ip domain-name cisco.com
ip name-server 144.254.10.123
ip default-gateway 10.48.69.129
```

```
!--- Declare that the iSCSI initiator with the IP address of the host.
```

```
# It belongs to the vsan of our choice
iscsi authentication none
iscsi initiator ip-address 10.48.69.238
vsan 1016
```

```
!--- Define the first virtual target, it is a JBOD. Identify the target
!--- by its pWWN, advertise it on a GE interface, and allow access to the initiator.
```

```
iscsi virtual-target name seagate
pWWN 21:00:00:20:37:67:f7:a2
advertise interface GigabitEthernet2/1
initiator ip address 10.48.69.238 permit
```

```
!--- The second target is a Clariion disk array. Since the maximum LUN number that you
!--- can have under HP-UX without additional software is 7, define a mapping from FC LUN numbers
!--- to the iSCSI LUN numbers you are going to present to the host.
```

```
iscsi virtual-target name spa-vt
pWWN 50:06:01:60:88:02:a8:2b fc-lun 0020 iscsi-lun 0003
pWWN 50:06:01:60:88:02:a8:2b fc-lun 0021 iscsi-lun 0004
advertise interface GigabitEthernet2/1
initiator ip address 10.48.69.238 permit
```

```
!--- Permit access to the targets on the FC level. Create a simple zone configuration to do this
!--- Alternatively, you could have simply set the default zoning policy in vsan 1016 to permit
```

```
zone name jbod vsan 1016
member pwwn 21:00:00:20:37:67:f7:a2
member symbolic-nodename 10.48.69.238
```

```
zone name spa vsan 1016
member pwwn 50:06:01:60:88:02:a8:2b
member symbolic-nodename 10.48.69.238
```

```
zoneset name iscsidoc vsan 1016
member jbod
member spa
```

```
zoneset activate name iscsidoc vsan 1016
```

```
!--- Set the IP address and mask of the GE interface and enable it.
```

```
interface GigabitEthernet2/1
ip address 10.48.69.242 255.255.255.192
iscsi authentication none
no shutdown
# Lastly we bring up the iSCSI interface up
interface iscsi2/1
no shutdown
```

Verify

This section provides information you can use to confirm your configuration works properly and troubleshoot in case you notice problems.

Certain **show** commands are supported by the Command Lookup Tool (registered customers only) , which allows you to view an analysis of **show** command output.

HP-UX Host Commands

- **netstat-n** or **lsnf** verifies the TCP connections.
- **iscsi-ls** shows the devices currently available.
- **dmesg** collects diagnostic messages.

MDS/IPS-8 Commands

- **show zone** displays zone information.
- **show flogi database** displays FLOGI Server information.
- **show fcns database** displays Name Server information for a specific VSAN.
- **show vsan membership** displays interface information for different VSANs.
- **show iscsi** displays various iSCSI information.
- **show ips** displays various information about IP services.
- **show scsi-target** displays SCSI devices for specific VSAN (for mapping FC-LUNs to iSCSI-LUNs).
- **show interface** displays information about various interfaces.
- **show ip route** displays IP route information.

Troubleshoot

This section provides information you can use to troubleshoot your configuration.

Here is troubleshooting information relevant to this configuration:

- Displays from Ape (HP 9000/800 A500 HP-UX 11.00)
- Displays from Vatican (MDS 9216)
- Fabric Manager and Device Manager Displays

Ape (HP 9000/800 A500 HP-UX 11.00)

```
# /sbin/init.d/iscsi stop
Waiting for iscsid to terminate .....
Waiting for iscsid to terminate .....
Waiting for iscsid to terminate .....
Waiting for iscsid to terminate .....
Waiting for iscsi_[tr]x_threads to terminate .....

[[]]# /sbin/init.d/iscsi start
Number of indices in scsi_isc table used by System: 5
Index used by iSCSI controller: 255
Number of free indices: 251
[[]]# netstat -n | grep '10.48.69.242'
```

tcp	0	0	10.48.69.238.49501	10.48.69.242.3260	ESTABLISHED
tcp	0	0	10.48.69.238.49500	10.48.69.242.3260	ESTABLISHED
tcp	0	0	10.48.69.238.49499	10.48.69.242.3260	ESTABLISHED

!--- If you have lsof, you can also try the following:

```
[/]# lsof -i @10.48.69.242
```

```
COMMAND PID USER  FD  TYPE        DEVICE SIZE/OFF NODE NAME
iscsid  2836 root    lu  inet 0x41aa9268  0t1300  TCP ape.cisco.com:49499->10.48.69.242:3260 (
```

!--- Note that ioscan does not report iSCSI devices. To see the list
!--- of available iSCSI devices from the host, issue the **iscsi-ls** command.

```
[/]# iscsi-ls -l
```

```
#####
```

```
TARGET NAME      = seagate
TARGET ID        = 10
ADDRESS          = 10.48.69.242:3260,128
STATUS           = CONNECTED 10.48.69.238:49501 <-> 10.48.69.242:3260
                  9/19/2003 15:40:42
SESSION          = ISID 00023d000001 TSID 80

LUN      0      = DISK c255t10d0 'SEAGATE ST318203FC      0004'
                  BLOCKS : 35566479  BLOCKSIZE : 512 CAPACITY : 17366.00MB
```

```
#####
```

```
TARGET NAME      = spa-vt
TARGET ID        = 11
ADDRESS          = 10.48.69.242:3260,128
STATUS           = CONNECTED 10.48.69.238:49500 <-> 10.48.69.242:3260
                  9/19/2003 15:40:42
SESSION          = ISID 00023d000001 TSID 80

LUN      4      = DISK c255t11d4 'DGC      RAID 1      0632'
                  BLOCKS : 6291419  BLOCKSIZE : 512 CAPACITY : 3071.00MB

LUN      3      = DISK c255t11d3 'DGC      RAID 1      0632'
                  BLOCKS : 10485607  BLOCKSIZE : 512 CAPACITY : 5119.00MB
```

!--- To see detailed statistics for currently established iSCSI sessions, use this:

```
[/]# iscsi-ls -c
```

```
#####
```

```
TARGET NAME      = seagate
TARGET ID        = 10
ADDRESS          = 10.48.69.242:3260,128
STATUS           = CONNECTED 10.48.69.238:49501 <-> 10.48.69.242:3260
                  9/19/2003 15:40:42
SESSION          = ISID 00023d000001 TSID 80
InitialR2T      = Yes
FirstBurstLength = 262144 Bytes
MaxBurstLength  = 16776192 Bytes
Header Digest   = 1
Data Digest     = 1
Login Timeout   = 15 Seconds
Auth Timeout    = 45 Seconds
Active Timeout  = 5 Seconds
Idle Timeout    = 60 Seconds
Ping Timeout    = 5 Seconds
```

```
#####
```

```
TARGET NAME      = spa-vt
TARGET ID        = 11
ADDRESS          = 10.48.69.242:3260,128
STATUS           = CONNECTED 10.48.69.238:49500 <-> 10.48.69.242:3260
                  9/19/2003 15:40:42
SESSION          = ISID 00023d000001 TSID 80
InitialR2T      = Yes
FirstBurstLength = 262144 Bytes
```

```
MaxBurstLength   = 16776192 Bytes
Header Digest    = 1
Data Digest      = 1
Login Timeout    = 15 Seconds
Auth Timeout     = 45 Seconds
Active Timeout   = 5 Seconds
Idle Timeout     = 60 Seconds
Ping Timeout     = 5 Seconds
```

!--- Here are some of the entries you can expect to find in the syslog:

```
[/]# dmesg
[...]
iSCSI: session 0x4179b000 target 11 accepted the preferred value (None) DataDigest=CRC32C
iSCSI: session 0x41a64800 target 10 accepted the preferred value (None) DataDigest=CRC32C
iSCSI: Direct Access Device found at lun 3 on target 11
      Vendor Id   : DGC
      Product Id  : RAID 1                      Product Rev: 0632
iSCSI: Direct Access Device found at lun 0 on target 10
      Vendor Id   : SEAGATE
      Product Id  : ST318203FC                  Product Rev: 0004
iSCSI: Direct Access Device found at lun 4 on target 11
      Vendor Id   : DGC
      Product Id  : RAID 1                      Product Rev: 0632
iSCSI: iscsi_recv_cmd: session (0x4179b000) recv_cmd(sc) (0x41844800), Cmd 0x25, status 0x2,
      senselen 18, sense key 06, ASC/ASCQ 29/00, task (0x40718b00) to (host 255 target 11 lun 3),
      TargetAlias spa-vt
      Sense 70000600 0000000a 00000000 29000000 0000
READ_CAPACITY result = 0x2 Target = 0xb LUN = 0x3
iSCSI: iscsi_recv_cmd: task (0x40718b00) itt 9 to (host 255 target 11 lun 3), Cmd 0x25,
      U(Overflow/Underflow) underflow, received 0(task->rxdata), residual 8, expected 8
iSCSI: iscsi_recv_cmd: session (0x4179b000) recv_cmd(sc) (0x41844800), Cmd 0x25, status 0x2,
      sense key 06, ASC/ASCQ 29/00, task (0x40718c00) to (host 255 target 11 lun 4), TargetAlias
      Sense 70000600 0000000a 00000000 29000000 0000
READ_CAPACITY result = 0x2 Target = 0xb LUN = 0x4
iSCSI: iscsi_recv_cmd: task (0x40718c00) itt 11 to (host 255 target 11 lun 4), Cmd 0x25,
      U(Overflow/Underflow) underflow, received 0(task->rxdata), residual 8, expected 8
```

Displays from Vatican (MDS 9216)

```
vatican# show zone status vsan 1016
VSAN: 1016 default-zone: deny distribute: active only Interop: Off
Full Zoning Database :
      Zonesets:1 Zones:3 Aliases: 0
Active Zoning Database :
      Name: iscsidoc Zonesets:1 Zones:3
Status: Activation completed at Wed Sep 17 13:03:56 2003

vatican# show zone active vsan 1016
zone name jbod vsan 1016
* fcid 0x7902e8 [pwwn 21:00:00:20:37:67:f7:a2]
* fcid 0x790100 [symbolic-nodename 10.48.69.238]

zone name spa vsan 1016
* fcid 0x790104 [pwwn 50:06:01:60:88:02:a8:2b]
* fcid 0x790100 [symbolic-nodename 10.48.69.238]

zone name spb vsan 1016
* fcid 0x790105 [pwwn 50:06:01:68:88:02:a8:2b]
* fcid 0x790100 [symbolic-nodename 10.48.69.238]
```

vatican# show flogi database vsan 1016

INTERFACE	VSAN	FCID	PORT NAME	NODE NAME
fc1/3	1016	0x7902e8	21:00:00:20:37:67:f7:a2	20:00:00:20:37:67:f7:a2
fc1/7	1016	0x790104	50:06:01:60:88:02:a8:2b	50:06:01:60:11:02:a8:2b
fc1/11	1016	0x790105	50:06:01:68:88:02:a8:2b	50:06:01:60:11:02:a8:2b
iscsi2/1	1016	0x790100	20:03:00:0c:30:57:5e:c2	20:02:00:0c:30:57:5e:c2

Total number of flogi = 4.

vatican# show fcns database vsan 1016

VSAN 1016:

FCID	TYPE	PWWN	(VENDOR)	FC4-TYPE:FEATURE
0x790100	N	20:03:00:0c:30:57:5e:c2	(Cisco)	scsi-fcp:init isc..w
0x790104	N	50:06:01:60:88:02:a8:2b	(Clariion)	scsi-fcp:target
0x790105	N	50:06:01:68:88:02:a8:2b	(Clariion)	scsi-fcp:target
0x7902e8	NL	21:00:00:20:37:67:f7:a2	(Seagate)	scsi-fcp:target

Total number of entries = 4

--- FCID 0x790100 is the virtual N port(HBA) for the iSCSI host.

vatican# show fcns database detail vsan 1016

VSAN:1016 FCID:0x790100

port-wwn (vendor) :20:03:00:0c:30:57:5e:c2 (Cisco)
node-wwn :20:02:00:0c:30:57:5e:c2
class :2,3
node-ip-addr :10.48.69.238
ipa :ff ff ff ff ff ff ff ff
fc4-types:fc4_features:scsi-fcp:init iscsi-gw
symbolic-port-name :
symbolic-node-name :10.48.69.238
port-type :N
port-ip-addr :0.0.0.0
fabric-port-wwn :20:41:00:0c:30:57:5e:c0
hard-addr :0x000000

VSAN:1016 FCID:0x790104

port-wwn (vendor) :50:06:01:60:88:02:a8:2b (Clariion)
node-wwn :50:06:01:60:11:02:a8:2b
class :3
node-ip-addr :0.0.0.0
ipa :ff ff ff ff ff ff ff ff
fc4-types:fc4_features:scsi-fcp:target
symbolic-port-name :
symbolic-node-name :
port-type :N
port-ip-addr :0.0.0.0
fabric-port-wwn :20:07:00:0c:30:57:5e:c0
hard-addr :0x000000

VSAN:1016 FCID:0x790105

port-wwn (vendor) :50:06:01:68:88:02:a8:2b (Clariion)
node-wwn :50:06:01:60:11:02:a8:2b
class :3
node-ip-addr :0.0.0.0
ipa :ff ff ff ff ff ff ff ff
fc4-types:fc4_features:scsi-fcp:target
symbolic-port-name :

```
symbolic-node-name      :
port-type               :N
port-ip-addr           :0.0.0.0
fabric-port-wwn        :20:0b:00:0c:30:57:5e:c0
hard-addr               :0x000000
-----
```

```
VSAN:1016 FCID:0x7902e8
-----
```

```
port-wwn (vendor)      :21:00:00:20:37:67:f7:a2 (Seagate)
node-wwn                :20:00:00:20:37:67:f7:a2
class                   :3
node-ip-addr            :0.0.0.0
ipa                     :ff ff ff ff ff ff ff ff
fc4-types:fc4_features:scsi-fcp:target
symbolic-port-name     :
```

```
symbolic-node-name      :
port-type               :NL
port-ip-addr           :0.0.0.0
fabric-port-wwn        :20:03:00:0c:30:57:5e:c0
hard-addr               :0x000000
```

```
Total number of entries = 4
```

```
vatican# show iscsi initiator
```

```
iSCSI Node name is 10.48.69.238
  iSCSI Initiator name: iqn.1987-05.com.cisco.01.a06c4e2b8b247cadceb8af1a8474dale
  iSCSI alias name: ape
  Node WWN is 20:02:00:0c:30:57:5e:c2 (dynamic)
  Member of vsans: 1016
  Number of Virtual n_ports: 1
  Virtual Port WWN is 20:03:00:0c:30:57:5e:c2 (dynamic)
  Interface iSCSI 2/1, Portal group tag: 0x80
  VSAN ID 1016, FCID 0x790100
```

```
vatican# show iscsi initiator configured
```

```
iSCSI Node name is 10.48.69.238
  Member of vsans: 1016
```

```
vatican# show iscsi initiator detail
```

```
iSCSI Node name is 10.48.69.238
  iSCSI Initiator name: iqn.1987-05.com.cisco.01.a06c4e2b8b247cadceb8af1a8474dale
  iSCSI alias name: ape
  Node WWN is 20:02:00:0c:30:57:5e:c2 (dynamic)
  Member of vsans: 1016
  Number of Virtual n_ports: 1
```

```
Virtual Port WWN is 20:03:00:0c:30:57:5e:c2 (dynamic)
```

```
Interface iSCSI 2/1, Portal group tag is 0x80
```

```
VSAN ID 1016, FCID 0x790100
```

```
2 FC sessions, 2 iSCSI sessions
```

```
iSCSI session details
```

```
Target: spa-vt
```

```
Statistics:
```

```
  PDU: Command: 10, Response: 10
```

```
  Bytes: TX: 416, RX: 0
```

```
  Number of connection: 1
```

```
TCP parameters
```

```
  Local 10.48.69.242:3260, Remote 10.48.69.238:49500
```

```
  Path MTU: 1500 bytes
```

```
  Retransmission timeout: 300 ms
```

```
  Round trip time: Smoothed 62 ms, Variance: 3
```

```
  Advertized window: Current: 256 KB, Maximum: 256 KB, Scale: 3
```

```
  Peer receive window: Current: 576 KB, Maximum: 576 KB, Scale: 4
```

```
  Congestion window: Current: 4 KB
```

```
Target: seagate
Statistics:
  PDU: Command: 4, Response: 4
  Bytes: TX: 304, RX: 0
  Number of connection: 1
TCP parameters
  Local 10.48.69.242:3260, Remote 10.48.69.238:49501
  Path MTU: 1500 bytes
  Retransmission timeout: 300 ms
  Round trip time: Smoothed 62 ms, Variance: 3
  Advertized window: Current: 256 KB, Maximum: 256 KB, Scale: 3
  Peer receive window: Current: 576 KB, Maximum: 576 KB, Scale: 4
  Congestion window: Current: 4 KB
```

FCP Session details

```
Target FCID: 0x790104 (S_ID of this session: 0x790100)
pWWN: 50:06:01:60:88:02:a8:2b, nWWN: 50:06:01:60:11:02:a8:2b
Session state: LOGGED_IN
1 iSCSI sessions share this FC session
Target: spa-vt
Negotiated parameters
  RcvDataFieldSize 1024 our_RcvDataFieldSize 1392
  MaxBurstSize 0, EMPD: FALSE
  Random Relative Offset: FALSE, Sequence-in-order: Yes
Statistics:
  PDU: Command: 0, Response: 10
Target FCID: 0x7902e8 (S_ID of this session: 0x790100)
pWWN: 21:00:00:20:37:67:f7:a2, nWWN: 20:00:00:20:37:67:f7:a2
Session state: LOGGED_IN
1 iSCSI sessions share this FC session
Target: seagate
Negotiated parameters
  RcvDataFieldSize 1392 our_RcvDataFieldSize 1392
  MaxBurstSize 0, EMPD: FALSE
  Random Relative Offset: FALSE, Sequence-in-order: Yes
Statistics:
  PDU: Command: 0, Response: 4
```

vatican# show iscsi initiator iscsi-session detail

```
iscsi Node name is 10.48.69.238
  iscsi Initiator name: iqn.1987-05.com.cisco.01.a06c4e2b8b247cadceb8af1a8474dale
  iscsi alias name: ape
  Node WWN is 20:02:00:0c:30:57:5e:c2 (dynamic)
  Member of vsans: 1016
  Number of Virtual n_ports: 1
  Virtual Port WWN is 20:03:00:0c:30:57:5e:c2 (dynamic)
  Interface iSCSI 2/1, Portal group tag is 0x80
  VSAN ID 1016, FCID 0x790100
  2 FC sessions, 2 iSCSI sessions
iscsi session details
  Target: spa-vt
  Statistics:
    PDU: Command: 10, Response: 10
    Bytes: TX: 416, RX: 0
    Number of connection: 1
  TCP parameters
    Local 10.48.69.242:3260, Remote 10.48.69.238:49500
    Path MTU: 1500 bytes
    Retransmission timeout: 300 ms
    Round trip time: Smoothed 62 ms, Variance: 2
    Advertized window: Current: 256 KB, Maximum: 256 KB, Scale: 3
    Peer receive window: Current: 576 KB, Maximum: 576 KB, Scale: 4
    Congestion window: Current: 4 KB
  Target: seagate
  Statistics:
    PDU: Command: 4, Response: 4
```

```
Bytes: TX: 304, RX: 0
Number of connection: 1
TCP parameters
Local 10.48.69.242:3260, Remote 10.48.69.238:49501
Path MTU: 1500 bytes
Retransmission timeout: 300 ms
Round trip time: Smoothed 62 ms, Variance: 2
Advertized window: Current: 256 KB, Maximum: 256 KB, Scale: 3
Peer receive window: Current: 576 KB, Maximum: 576 KB, Scale: 4
Congestion window: Current: 4 KB
```

vatican# **show iscsi initiator fcp-session detail**

```
iSCSI Node name is 10.48.69.238
  iSCSI Initiator name: iqn.1987-05.com.cisco.01.a06c4e2b8b247cadceb8af1a8474dale
  iSCSI alias name: ape
  Node WWN is 20:02:00:0c:30:57:5e:c2 (dynamic)
  Member of vsans: 1016
  Number of Virtual n_ports: 1
  Virtual Port WWN is 20:03:00:0c:30:57:5e:c2 (dynamic)
  Interface iSCSI 2/1, Portal group tag is 0x80
  VSAN ID 1016, FCID 0x790100
  2 FC sessions, 2 iSCSI sessions
  FCP Session details
    Target FCID: 0x790104 (S_ID of this session: 0x790100)
      pWWN: 50:06:01:60:88:02:a8:2b, nWWN: 50:06:01:60:11:02:a8:2b
      Session state: LOGGED_IN
      1 iSCSI sessions share this FC session
      Target: spa-vt
    Negotiated parameters
      RcvDataFieldSize 1024 our_RcvDataFieldSize 1392
      MaxBurstSize 0, EMPD: FALSE
      Random Relative Offset: FALSE, Sequence-in-order: Yes
    Statistics:
      PDU: Command: 0, Response: 10
    Target FCID: 0x7902e8 (S_ID of this session: 0x790100)
      pWWN: 21:00:00:20:37:67:f7:a2, nWWN: 20:00:00:20:37:67:f7:a2
      Session state: LOGGED_IN
      1 iSCSI sessions share this FC session
      Target: seagate
    Negotiated parameters
      RcvDataFieldSize 1392 our_RcvDataFieldSize 1392
      MaxBurstSize 0, EMPD: FALSE
      Random Relative Offset: FALSE, Sequence-in-order: Yes
    Statistics:
      PDU: Command: 0, Response: 4
```

vatican# **show iscsi virtual-target configured**

```
target: seagate
  * Port WWN 21:00:00:20:37:67:f7:a2
  === The "*" means you have both discovery and target session. If there
  is no "*" in front of the pWWN, it means you only have discovery session.
  Configured node
    No. of LU mapping: 1
      iSCSI LUN: 0000, FC LUN: 0000
    No. of advertised interface: 1
      GigabitEthernet 2/1
    No. of initiators permitted: 1
      initiator 10.48.69.238/32 is permitted
      all initiator permit is disabled
target: spa-vt
  * Port WWN 50:06:01:60:88:02:a8:2b
  Secondary PWWN 50:06:01:68:88:02:a8:2b
  Configured node
    No. of LU mapping: 2
      iSCSI LUN: 0003, FC LUN: 0020
      iSCSI LUN: 0004, FC LUN: 0021
```

No. of advertised interface: 1
GigabitEthernet 2/1
No. of initiators permitted: 1
initiator 10.48.69.238/32 is permitted
all initiator permit is disabled

vatican# **show iscsi stats iscsi 2/1**

iscsi2/1

5 minutes input rate 16 bits/sec, 2 bytes/sec, 0 frames/sec
5 minutes output rate 16 bits/sec, 2 bytes/sec, 0 frames/sec
iSCSI statistics
50932 packets input, 60370640 bytes
Command 3659 pdus, Data-out 41069 pdus, 56533832 bytes, 2476 fragments
output 115926 packets, 112863536 bytes
Response 3374 pdus (with sense 206), R2T 1897 pdus
Data-in 103999 pdus, 106404584 bytes

vatican# **show ips arp interface gigabitethernet 2/1**

Protocol	Address	Age (min)	Hardware Addr	Type	Interface
Internet	10.48.69.200	0	0008.e21e.c7bc	ARPA	GigabitEthernet2/1
Internet	10.48.69.201	5	0202.3d30.45c9	ARPA	GigabitEthernet2/1
Internet	10.48.69.206	5	0202.3d30.45ce	ARPA	GigabitEthernet2/1
Internet	10.48.69.209	3	0202.3d30.45d1	ARPA	GigabitEthernet2/1
Internet	10.48.69.226	2	0060.08f6.bc1a	ARPA	GigabitEthernet2/1
Internet	10.48.69.229	4	0800.209e.edab	ARPA	GigabitEthernet2/1
Internet	10.48.69.231	1	0002.b3c1.7dab	ARPA	GigabitEthernet2/1
Internet	10.48.69.233	0	0010.4200.7d5b	ARPA	GigabitEthernet2/1
Internet	10.48.69.238	0	0030.6e1b.6f51	ARPA	GigabitEthernet2/1
Internet	10.48.69.239	10	0030.6e1c.a00b	ARPA	GigabitEthernet2/1
Internet	10.48.69.241	0	000b.cdaf.b4c3	ARPA	GigabitEthernet2/1
Internet	10.48.69.248	4	0202.3d30.45f8	ARPA	GigabitEthernet2/1
Internet	10.48.69.252	1	0202.3d30.45fc	ARPA	GigabitEthernet2/1
Internet	10.10.2.28	7	0202.3d0a.021c	ARPA	GigabitEthernet2/1

vatican# **show ips stats tcp interface gigabitethernet 2/1 detail**

TCP Statistics for port GigabitEthernet2/1

TCP send stats

261205 segments, 117757220 bytes
140632 data, 51907 ack only packets
2655 control (SYN/FIN/RST), 0 probes, 2639 window updates
63382 segments retransmitted, 90885612 bytes
63382 retransmitted while on ethernet send queue, 1 packets split
13327 delayed acks sent

TCP receive stats

249073 segments, 72669 data packets in sequence, 61525764 bytes in sequence
2335 predicted ack, 68605 predicted data
0 bad checksum, 0 multi/broadcast, 0 bad offset
0 no memory drops, 0 short segments
4396 duplicate bytes, 205 duplicate packets
0 partial duplicate bytes, 0 partial duplicate packets
0 out-of-order bytes, 2625 out-of-order packets
0 packet after window, 0 bytes after window
0 packets after close
80504 acks, 117762158 ack bytes, 0 ack toomuch, 96274 duplicate acks
0 ack packets left of snd_una, 7 non-4 byte aligned packets
54199 window updates, 0 window probe
6343 pcb hash miss, 709 no port, 6 bad SYN, 0 paws drops

TCP Connection Stats

0 attempts, 2718 accepts, 2718 established
2716 closed, 15 drops, 0 conn drops
3 drop in retransmit timeout, 10 drop in keepalive timeout
0 drop in persist drops, 0 connections drained

TCP Miscellaneous Stats

37062 segments timed, 41787 rtt updated
817 retransmit timeout, 1 persist timeout
22654 keepalive timeout, 22643 keepalive probes

TCP SACK Stats

0 recovery episodes, 0 data packets, 0 data bytes
 0 data packets retransmitted, 0 data bytes retransmitted
 0 connections closed, 0 retransmit timeouts

TCP SYN Cache Stats

2720 entries, 2718 connections completed, 0 entries timed out
 0 dropped due to overflow, 2 dropped due to RST
 0 dropped due to ICMP unreachable, 0 dropped due to bucket overflow
 0 abort due to no memory, 2 duplicate SYN, 183 no-route SYN drop
 0 hash collisions, 0 retransmitted

TCP Active Connections

Local Address	Remote Address	State	Send-Q	Recv-Q
10.48.69.242:3260	10.48.69.238:49499	ESTABLISH	0	0
10.48.69.242:3260	10.48.69.238:49500	ESTABLISH	0	0
10.48.69.242:3260	10.48.69.238:49501	ESTABLISH	0	0
0.0.0.0:3260	0.0.0.0:0	LISTEN	0	0

vatican# **discover scsi-target local**
 discovery started

vatican# **show scsi-target devices vsan 1016**

VSAN	FCID	PWWN	VENDOR	MODEL	REV
1016	0x790104	50:06:01:60:88:02:a8:2b	DGC	RAID 0	0632
1016	0x7902e8	21:00:00:20:37:67:f7:a2	SEAGATE	ST318203FC	0004

vatican# **show scsi-target lun vsan 1016**

- RAID from DGC (Rev 0632)

FCID is 0x790104 in VSAN 1016, PWWN is 50:06:01:60:88:02:a8:2b

LUN	Capacity (MB)	Status	Serial Number	Device-Id
0x0	1074	Online	f60004202091	C:1 A:0 T:3 60:06:01:60:88:02:a8:2b da:05:b6:a9:b6:9d:7b:00 C:1 A:0 T:0 00:00:00:00
0x1	1074	Online	f60004202091	C:1 A:0 T:3 60:06:01:60:88:02:a8:2b 6a:66:0d:74:cb:33:88:6c C:1 A:0 T:0 00:01:00:00
0x2	1074	Online	f60004202091	C:1 A:0 T:3 60:06:01:60:88:02:a8:2b ec:81:5b:a2:c4:43:0d:8a C:1 A:0 T:0 00:02:00:00
0x3	2147	Online	f60004202091	C:1 A:0 T:3 60:06:01:60:88:02:a8:2b e0:47:b3:be:3b:00:e0:d5 C:1 A:0 T:0 00:03:00:00
0x4	1074	Online	f60004202091	C:1 A:0 T:3 60:06:01:60:88:02:a8:2b 00:51:5b:7f:3d:9a:7b:ce C:1 A:0 T:0 00:04:00:00
0x5	1074	Online	f60004202091	C:1 A:0 T:3 60:06:01:60:88:02:a8:2b ab:b1:ae:80:59:c0:fc:f0 C:1 A:0 T:0 00:05:00:00
0x6	1074	Online	f60004202091	C:1 A:0 T:3 60:06:01:60:88:02:a8:2b ad:91:58:af:d2:fd:c7:47 C:1 A:0 T:0 00:06:00:00
0x7	1074	Online	f60004202091	C:1 A:0 T:3 60:06:01:60:88:02:a8:2b b1:ef:e7:6c:44:5c:16:97 C:1 A:0 T:0 00:07:00:00
0x8	1074	Online	f60004202091	C:1 A:0 T:3 60:06:01:60:88:02:a8:2b 84:4f:09:60:30:1e:fc:50 C:1 A:0 T:0 00:08:00:00
0x9	1074	Online	f60004202091	C:1 A:0 T:3 60:06:01:60:88:02:a8:2b aa:6d:e2:0e:ce:7a:cc:21 C:1 A:0 T:0 00:09:00:00
0xa	1074	Online	f60004202091	C:1 A:0 T:3 60:06:01:60:88:02:a8:2b 5b:66:67:89:6c:f2:d1:56 C:1 A:0 T:0 00:0a:00:00

```

0xb 1074 Online f60004202091 C:1 A:0 T:3 60:06:01:60:88:02:a8:2b
a9:32:bd:04:4a:bb:3d:9b
C:1 A:0 T:0 00:0b:00:00
0xc 1074 Online f60004202091 C:1 A:0 T:3 60:06:01:60:88:02:a8:2b
cd:d9:96:f7:57:3f:07:0c
C:1 A:0 T:0 00:0c:00:00
0xd 1074 Online f60004202091 C:1 A:0 T:3 60:06:01:60:88:02:a8:2b
0c:e5:ba:39:68:ca:d6:f0
C:1 A:0 T:0 00:0d:00:00
0xe 1074 Online f60004202091 C:1 A:0 T:3 60:06:01:60:88:02:a8:2b
60:6e:ee:76:98:fc:ab:97
C:1 A:0 T:0 00:0e:00:00
0xf 1074 Online f60004202091 C:1 A:0 T:3 60:06:01:60:88:02:a8:2b
8b:58:80:7b:12:fb:6b:12
C:1 A:0 T:0 00:0f:00:00
0x10 1074 Online f60004202091 C:1 A:0 T:3 60:06:01:60:88:02:a8:2b
a1:2f:6d:b0:c3:d6:c2:46
C:1 A:0 T:0 00:10:00:00
0x11 1074 Online f60004202091 C:1 A:0 T:3 60:06:01:60:88:02:a8:2b
2c:48:c4:74:25:4b:26:dd
C:1 A:0 T:0 00:11:00:00
0x20 5369 Online f60004202091 C:1 A:0 T:3 60:06:01:60:88:02:a8:2b
ba:18:6a:40:22:40:94:75
C:1 A:0 T:0 00:20:00:00
0x21 3221 Online f60004202091 C:1 A:0 T:3 60:06:01:60:88:02:a8:2b
74:d2:42:9e:31:8d:ff:86
C:1 A:0 T:0 00:21:00:00

```

- ST318203FC from SEAGATE (Rev 0004)

FCID is 0x7902e8 in VSAN 1016, PWWN is 21:00:00:20:37:67:f7:a2

```

-----
LUN Capacity Status Serial Number Device-Id
(MB)
-----
0x0 18210 Online LRE8091500007039 C:1 A:0 T:3 20:00:00:20:37:67:f7:a2

```

vatican# **show interface iscsi 2/1**

iscsi2/1 is up

Hardware is GigabitEthernet

Port WWN is 20:41:00:0c:30:57:5e:c0

Admin port mode is ISCSI

Port mode is ISCSI

Speed is 1 Gbps

iSCSI initiator is identified by name

Number of iSCSI session: 0, Number of TCP connection: 0

Configured TCP parameters

Local Port is 3260

PMTU discover is enabled, reset timeout is 3600 sec

Keepalive-timeout is 60 sec

Minimum-retransmit-time is 300 ms

Max-retransmissions 4

Sack is disabled

Maximum allowed bandwidth is 500000 kbps

Minimum available bandwidth is 500000 kbps

Estimated round trip time is 10000 usec

5 minutes input rate 16 bits/sec, 2 bytes/sec, 0 frames/sec

5 minutes output rate 16 bits/sec, 2 bytes/sec, 0 frames/sec

iSCSI statistics

Input 50920 packets, 60370032 bytes

Command 3659 pdus, Data-out 41069 pdus, 56533832 bytes fragments 2476

Output 115914 packets, 112862928 bytes

Response 3374 pdus (with sense 206), R2T 1897 pdus

Data-in 103999 pdus, 106404584 bytes

```
vatican# show interface gigabitethernet 2/1
GigabitEthernet2/1 is up
  Hardware is GigabitEthernet, address is 0005.3000.a85a
  Internet address is 10.48.69.242/26
  MTU 1500 bytes
  Port mode is IPS
  Speed is 1 Gbps
  Beacon is turned off
  Auto-Negotiation is turned on
  iSCSI authentication: NONE
  5 minutes input rate 440 bits/sec, 55 bytes/sec, 0 frames/sec
  5 minutes output rate 80 bits/sec, 10 bytes/sec, 0 frames/sec
  850346 packets input, 127958119 bytes
    6488 multicast frames, 0 compressed
    0 input errors, 0 frame, 0 overrun 0 fifo
  289960 packets output, 201600774 bytes, 0 underruns
    0 output errors, 0 collisions, 0 fifo
    0 carrier errors

vatican# show ip route

Codes: C - connected, S - static

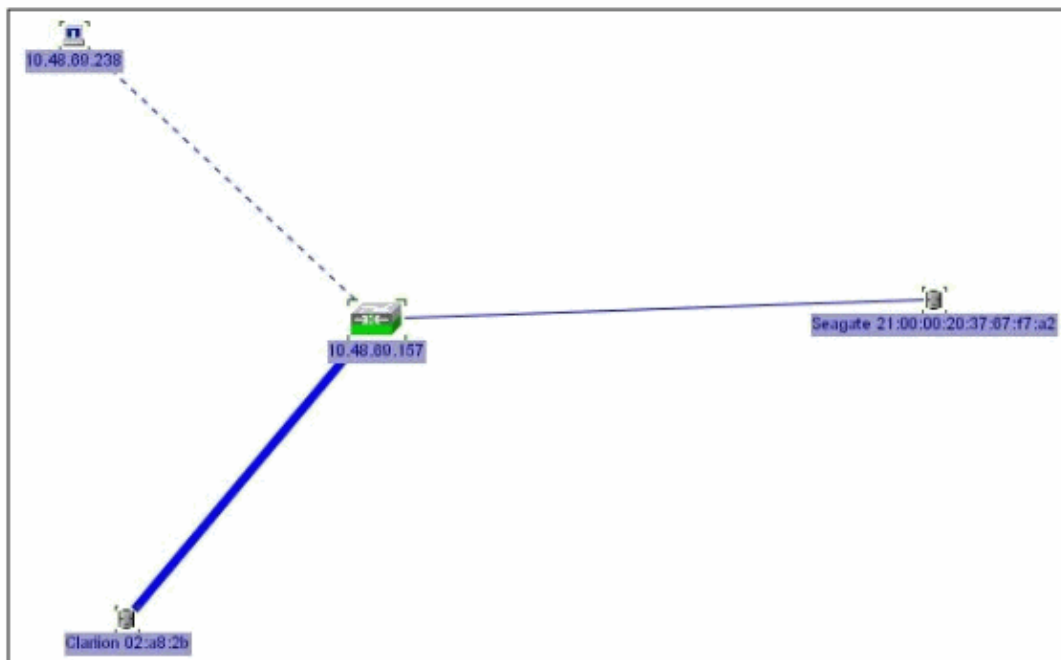
Default gateway is 10.48.69.129

C 10.48.69.192/26 is directly connected, gigabitethernet2-1
C 10.48.69.128/26 is directly connected, mgmt0
```

Fabric Manager and Device Manager Displays

This section provides screen captures from MDS Fabric Manager 1.2(1a) and Device Manager 1.2(1a).

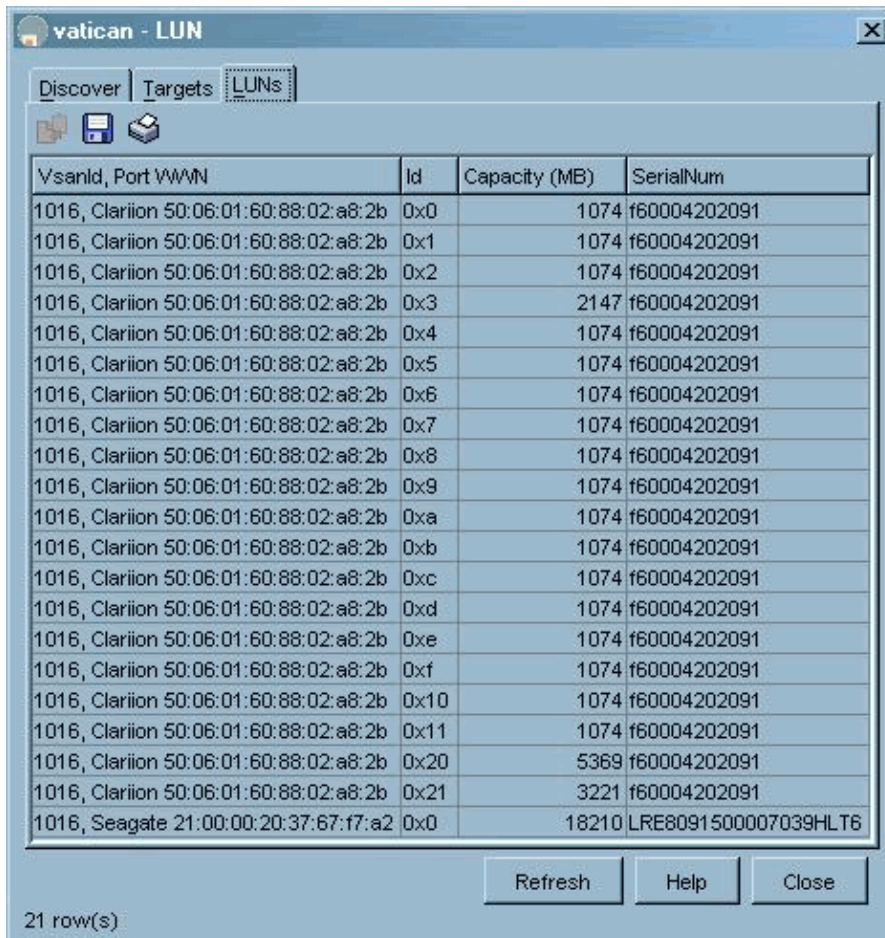
Topology diagram from the Fabric Manager



The Device Manager



Select **FC** -> **LUNs** in Device Manager to display the pWWNs, LUN IDs, and capacity of your LUNs.



Select **IP** > **iSCSI** in Device Manager to display the iSCSI sessions.

The screenshot shows a window titled "vatican - iSCSI" with tabs for "Initiators", "Targets", "Sessions", "Sessions Detail", and "Session Statistics". The "Sessions Detail" tab is active, displaying a table with the following data:

Name or IpAddress	TargetName	Immediate Data	Ready To Transfer		Burst Size		Data InOrder		Connection Number	Recovery Level
			Initial	MaxOutstanding	First	Max	Sequence	PDU		
10.48.69.238		false	true	1	0	0	false	false	1	0
10.48.69.238	spa-vt	false	true	1	0	0	false	false	1	0
10.48.69.238	seagate	false	true	1	0	0	false	false	1	0

Buttons: Refresh, Help, Close

Data retrieved at 17:49:36

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