

Configuring Microsoft Windows XP iSCSI Host to MDS/IPS-8

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Introduction

Cisco's iSCSI drivers, which reside on the server, are a key component of the iSCSI solution. These iSCSI drivers intercept 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 a host with Microsoft Windows XP iSCSI to MDS/IPS-8.

Prerequisites

Requirements

Before attempting this configuration, ensure that you meet these requirements:

- Before you create your iSCSI configuration on the MDS 9000, you need to install an iSCSI driver that is compatible to your PC running Microsoft Windows XP. The most current version of the Cisco iSCSI Driver for Windows 2000//XP/2003 can be found on the Cisco iSCSI Drivers (registered customers only) page on Cisco.com. The name of the file is **Cisco iSCSI Driver Version *version number* for Win2k** and can be found within the table on this page.

Components Used

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

- PC with Microsoft Windows XP and Cisco iSCSI Driver version 3.1.2
- Cisco MDS 9216 with Software Version 1.1.2

```
canterbury# 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	1.1(2)	1.0	20:01:00:0c:30:6c:24:40 to 20:10:00:0c:30:6c:24:40
2	1.1(2)	0.3	20:41:00:0c:30:6c:24:40 to 20:48:00:0c:30:6c:24:40

Mod	MAC-Address(es)	Serial-Num
1	00-0b-be-f8-7f-08 to 00-0b-be-f8-7f-0c	JAB070804QK
2	00-05-30-00-ad-e2 to 00-05-30-00-ad-ee	JAB070806SB

* this terminal session
canterbury#

canterbury# **show version**

Cisco Storage Area Networking Operating System (SAN-OS) Software
TAC support: <http://www.cisco.com/tac>
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distributed under license.

Software

BIOS: version 1.0.7
loader: version 1.0(3a)
kickstart: version 1.1(2)
system: version 1.1(2)

BIOS compile time: 03/20/03
kickstart image file is: bootflash:/k112
kickstart compile time: 7/13/2003 20:00:00
system image file is: bootflash:/s112
system compile time: 7/13/2003 20:00:00

Hardware

RAM 963112 kB

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

canterbury uptime is 6 days 1 hours 11 minute(s) 5 second(s)

Last reset at 783455 usecs after Thu Aug 28 12:59:37 2003
Reason: Reset Requested by CLI command reload
System version: 1.1(2)

canterbury#

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 term MDS 9000 refers to any Fibre Channel (FC) switch product in the MDS 9000 family (MDS 9506, MDS 9509, or MDS 9216). IPS blade refers to the IP Storage Services Module.

For more information on document conventions, refer to the Cisco Technical Tips Conventions.

Background Theory

The IP Storage module provides IP hosts access to Fibre Channel (FC) storage devices. The IP Storage module is DS-X9308-SMIP. It provides transparent SCSI routing. IP hosts that use the iSCSI protocol can transparently access SCSI (FCP) 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 IP Storage module, connectivity is provided in the form of Gigabit Ethernet (GE) interfaces that are appropriately configured. The IP Storage 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 locally attached.

Each iSCSI host that requires access to storage by way of the IP Storage module needs to have a compatible iSCSI driver installed. With 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 IP Storage module.
- Routing SCSI requests and responses between hosts on an IP network and the FC storage device (converting iSCSI to FCP and vice versa). This is performed by the IP Storage module.
- Transporting FCP requests or responses between the IP Storage module and FC storage devices.

The IP Storage module does not import FC targets to iSCSI by default. Either dynamic or static mapping must be configured before the IP Storage module makes FC targets available to iSCSI initiators. When both are configured, statically mapped FC targets have a configured name. In this configuration, examples of static mapping are provided.

With dynamic mapping, each time that the iSCSI host connects to the IP Storage 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 IP Storage module. Static mapping can be used on the IP Storage module to access intelligent FC storage arrays that have access control and Logical Unit Number (LUN) mapping/masking configuration based on the initiator's pWWNs and/or nWWNs.

You can control access to each statically-mapped iSCSI target if you specify a list of IP Storage ports on which they will be advertised, and specify 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.

iSCSI discovery occurs when an iSCSI host creates an iSCSI discovery session and queries for all iSCSI targets. The IP Storage module returns only the list of iSCSI targets that the iSCSI host is allowed to access based on the access control policies.

iSCSI session creation occurs when an IP host initiates an iSCSI session. The IP Storage module verifies if the specified iSCSI target (in the session login request) is a static mapped target, and if true, verifies that 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 IP Storage 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,

the iSCSI session is accepted. Otherwise, the login request is rejected.

Configure

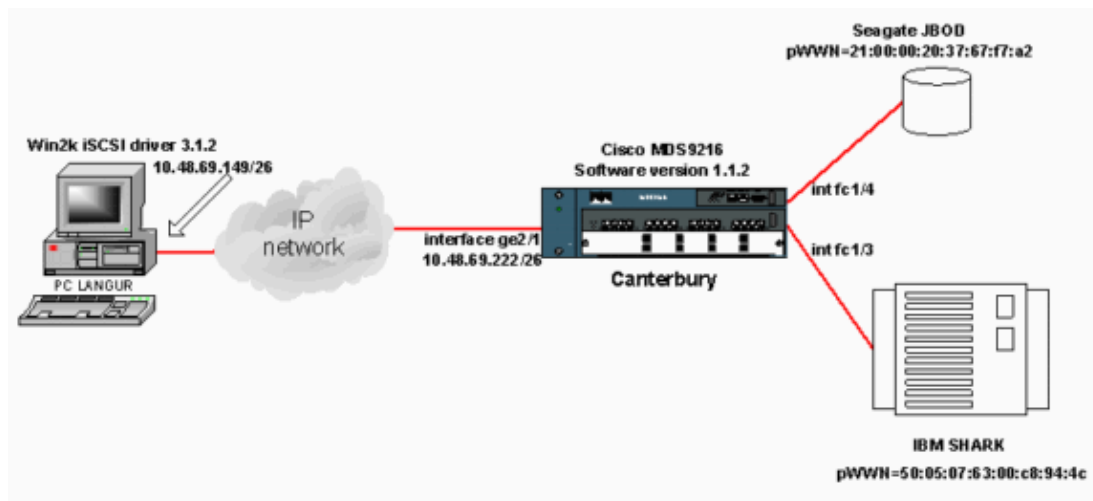
In this section, you are presented with the information to configure the features described in this document.

Note: To find additional information on the commands used in this document, refer to the Cisco MDS 9000 Family Command Reference, Release 1.2.1a and Cisco MDS 9000 Family Software Configuration Guide, Release 1.2.1a configuration guides.

Note: To find additional information on the commands used in this document, use the Command Lookup Tool (registered customers only) .

Network Diagram

This document uses this network setup:



Configurations

This document uses these configurations:

- Canterbury (MDS 9216)

Canterbury (MDS 9216)

```
canterbury# sh run

Building Configuration ...
....
vsan database
vsan 601

!--- VSAN 601 has been used for iSCSI targets.

....
vsan database
vsan 601 interface fc1/3
vsan 601 interface fc1/4
....
boot system bootflash:/s112
boot kickstart bootflash:/k112
```

```
ip domain-name cisco.com
ip name-server 144.254.10.123
ip default-gateway 10.48.69.129
ip route 10.48.69.149 255.255.255.255 interface GigabitEthernet2/1
ip routing
iscsi authentication none
iscsi initiator ip-address 10.48.69.149

!--- Identifies the iSCSI initiator based on the IP address.
!--- A virtual N port is created for each NIC or network interface.

static pWWN 20:03:00:0c:30:6c:24:4c

!--- Defining the PC Langur`s pwwn above; this is necessary here since lunmasking is
!--- enforced on the IBM Shark, but not on the JBOD. Therefore, pWWN must be statically
!--- bound to the initiator to be able to access and manage disks on IBM Shark.

vsan 601

!--- VSAN 601 has been used for iSCSI targets.

!--- Targets by way of VSAN 601 are accessible by iSCSI initiators. The
!--- targets are defined below. Create a static iSCSI virtual target
!--- for Seagate JBOD.

iscsi virtual-target name san-fc-jbod-1
  pWWN 21:00:00:20:37:67:f7:a2
advertise interface GigabitEthernet2/1
initiator ip address 10.48.69.149 permit

!--- Create a static iSCSI virtual target for IBM Shark.

iscsi virtual-target name shark-c8
  pWWN 50:05:07:63:00:c8:94:4c
advertise interface GigabitEthernet2/1
initiator ip address 10.48.69.149 permit

...

!--- Here, the zone named 'Zone1' is used under VSAN 601 for connectivity.
!--- Both initiator and targets are assigned as members of this zone.

switchname canterbury
zone name Zone1 vsan 601
  member pWWN 50:05:07:63:00:c8:94:4c
```

```

!--- This is IBM Shark.

member pWWN 20:03:00:0c:30:6c:24:4c

!--- This is PC Langur.

member pWWN 21:00:00:20:37:67:f7:a2

!--- This is Seagate JBOD.

member symbolic-nodename 10.48.69.149

!--- You have this entry since zone membership is based on pWWN (not on IP address).

zoneset name ZoneSet1 vsan 601
  member Zone1
zoneset activate name ZoneSet1 vsan 601
....
interface GigabitEthernet2/1
ip address 10.48.69.222 255.255.255.192
iscsi authentication none
no shutdown
....
interface fc1/3
no shutdown

interface fc1/4
no shutdown
...

interface mgmt0
ip address 10.48.69.156 255.255.255.192

interface iscsi2/1
no shutdown
canterbury#

```

Verify

This section provides information you can use to confirm that your configuration is working properly.

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

On the PC, go to **Control Panel** and check these items:

- **Network Connections** -> **Local Area Connection** -> **TCP/IP properties**
- **iSCSI Config** -> **status of the target** (to view a screen capture, see the Displays from PC section of this document).

On the MDS 9216, issue these commands to verify the connectivity:

- **show zone status** displays Zone information.
- **show zone active vsan 601** display zones belonging to the specified VSAN.
- **show fcns database vsan 601** displays Name Server information for a specific VSAN.
- **show fcns database detail vsan 601** displays the local entries for given VSAN.
- **show flogi database vsan 601** displays FLOGI Server information for a specific VSAN.
- **show vsan membership** displays interface information for different VSANs.
- **show iscsi initiator** displays iSCSI initiator information.
- **show iscsi initiator detail** displays iSCSI initiator information in more detail.
- **show iscsi initiator iscsi-session detail** displays detailed information for iSCSI initiator session.
- **show iscsi initiator fcp-session detail** displays detailed information for iSCSI initiator FCP session.
- **show ips stats tcp interface gigabitethernet 2/1 detail** displays TCP statistics for specific GE interface.
- **show iscsi virtual-target configured** displays iSCSI virtual targets that has been configured on the MDS 9000.
- **show iscsi initiator configured** displays iSCSI initiators that have been configured on the MDS 9000.
- **show ips arp interface gigabitethernet 2/1** displays IP Storage ARP information for a specific GE interface.
- **show scsi-target devices vsan 601** displays SCSI devices for specific VSAN (for mapping FC-LUNs to iSCSI-LUNs).
- **show int iscsi 2/1** displays iSCSI interfaces.
- **show iscsi stats iscsi 2/1** displays iSCSI statistics.
- **show int gigabitethernet 2/1** displays GE interface.
- **show ip route** displays IP route information.
- **show ips ip route interface gigabitethernet 2/1** displays the route table.

Troubleshoot

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

Troubleshoot Procedure

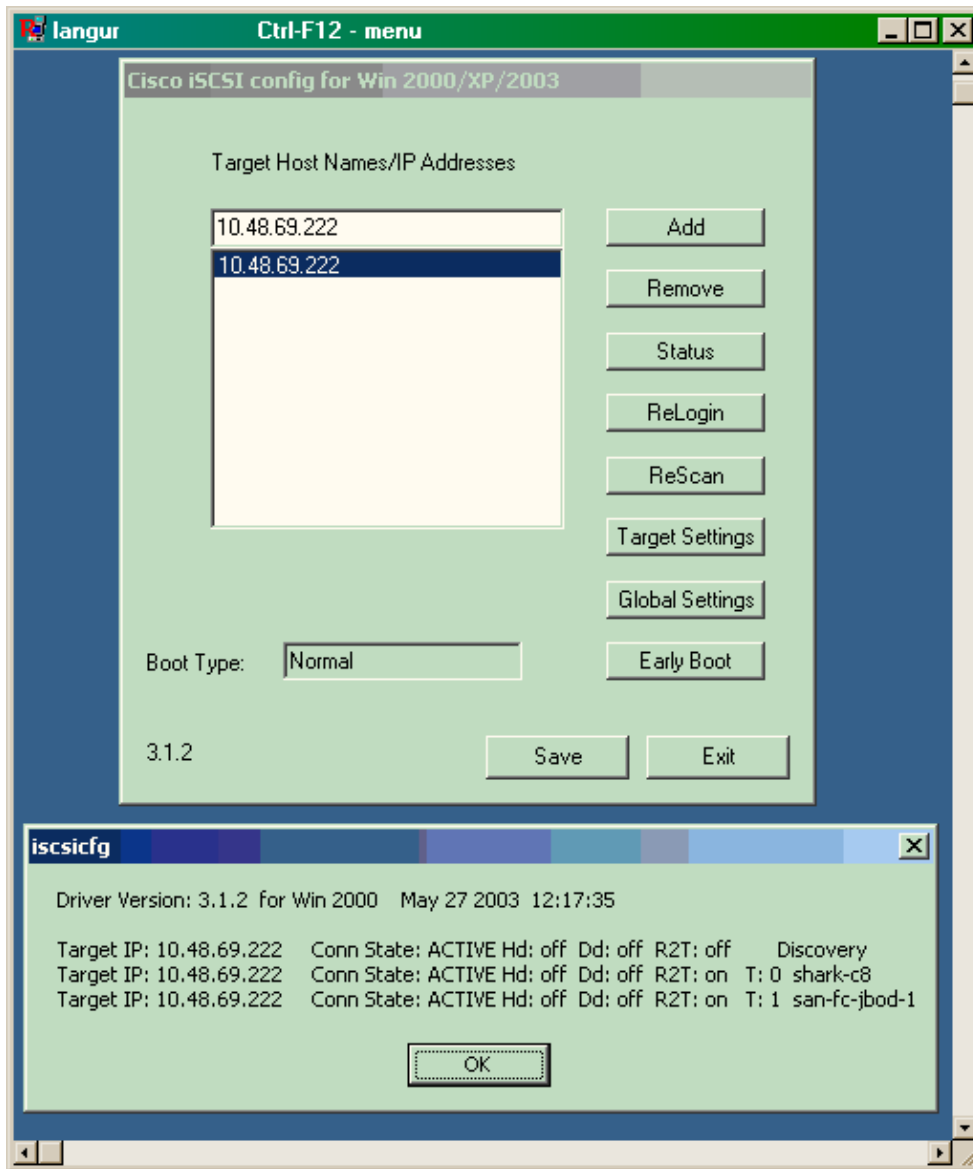
This section provides information you can use to troubleshoot your configuration.

Here is some relevant troubleshooting information for this configuration:

- Displays from PC
- Displays from Canterbury Cisco MDS 9216
- Fabric Manager and Device Manager Displays

Displays from PC

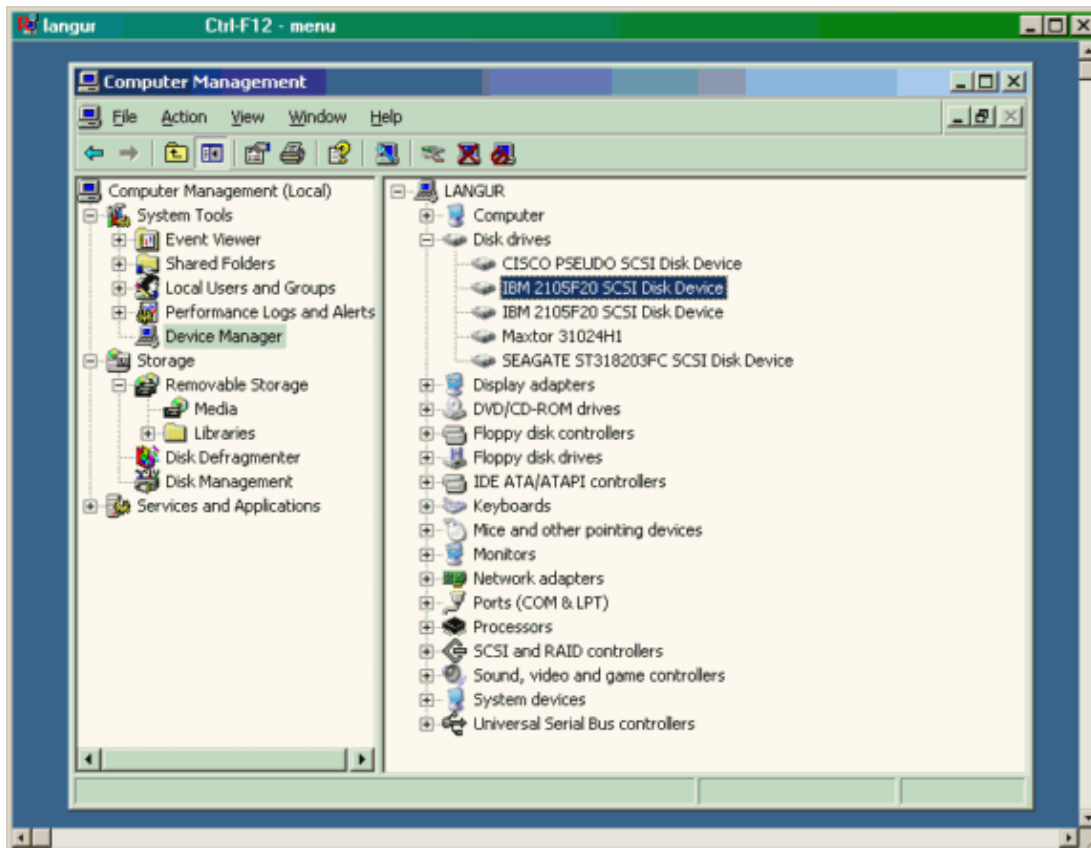
This screen capture is the iSCSI display from PC Langur:



To check these new disks, click on **Start** in the left lower corner of the PC. Select these options:

My Computer -> Control Panel -> Administrative Tools -> Computer Management

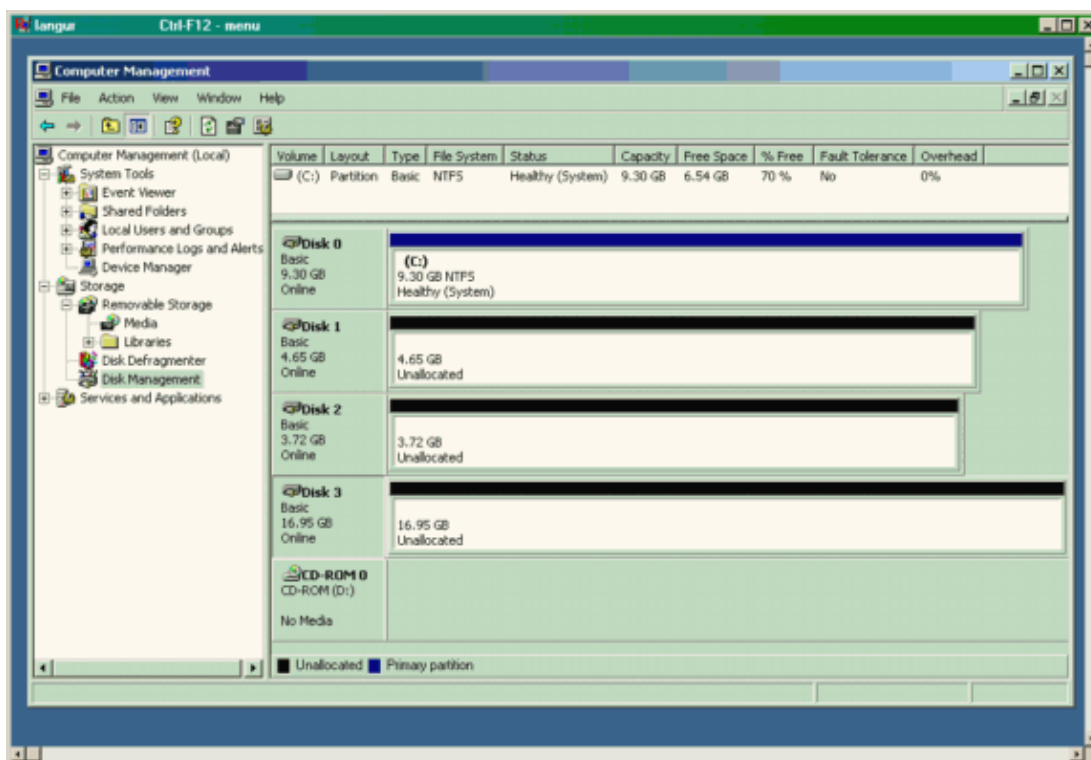
Under **System Tools**, select **Device Manager**. On the right side, click on **Disk Drives**. You should see this:



To manage these disks, click on **Start** in the left lower corner of the PC. Select these options:

My Computer → Control Panel → Administrative Tools → Computer Management

Under **Storage**, click on **Disk Management**. The display capture from PC Langur is shown below. Note that Disk1 and Disk2 are from IBM Shark, and Disk3 is the Seagate JBOD.



Displays from Canterbury (MDS 9216)

Displays from Canterbury (MDS 9216)

```
canterbury# show zone status
```

```
...
```

```
VSAN: 601 default-zone: deny distribute: active only Interop: Off
Full Zoning Database :
  Zonesets:1 Zones:1 Aliases: 0
Active Zoning Database :
  Name: ZoneSet1 Zonesets:1 Zones:1
Status: Activation completed at Wed Sep 10 09:25:45 2003
```

```
...
```

```
canterbury#
```

```
canterbury# show zone active vsan 601
```

```
zone name Zone1 vsan 601
symbolic-nodename 10.48.69.231
* fcid 0x020001 [pWWN 50:05:07:63:00:c8:94:4c]
* fcid 0x020005 [pWWN 20:03:00:0c:30:6c:24:4c]
* fcid 0x0201e8 [pWWN 21:00:00:20:37:67:f7:a2]
* fcid 0x020005 [symbolic-nodename 10.48.69.149]
canterbury#
```

```
canterbury# show fcns database vsan 601
```

```
VSAN 601:
```

```
-----
FCID          TYPE  pWWN                               (VENDOR)          FC4-TYPE:FEATURE
-----
0x020001      N     50:05:07:63:00:c8:94:4c (IBM)             scsi-fcp:target fc..
0x020005      N     20:03:00:0c:30:6c:24:4c (Cisco)           scsi-fcp:init isc..w
0x0201e8      NL    21:00:00:20:37:67:f7:a2 (Seagate)         scsi-fcp:target
Total number of entries = 3
```

```
canterbury#
```

```
canterbury# show fcns database detail vsan 601
```

```
-----
VSAN:601 FCID:0x020001
-----
```

```
port-wnn (vendor)      :50:05:07:63:00:c8:94:4c (IBM)
node-wnn               :50:05:07:63:00:c0:94:4c
class                  :2,3
node-ip-addr           :0.0.0.0
ipa                    :ff ff ff ff ff ff ff ff
fc4-types:fc4_features:scsi-fcp:target fcsb2-ch-cu fcsb2-cu-ch
symbolic-port-name     :
symbolic-node-name     :
port-type              :N
port-ip-addr           :0.0.0.0
fabric-port-wnn        :20:03:00:0c:30:6c:24:40
hard-addr              :0x000000
```

```
-----
VSAN:601 FCID:0x020005
-----
```

```
port-wnn (vendor)      :20:03:00:0c:30:6c:24:4c (Cisco)
node-wnn               :21:00:00:0c:30:6c:24:42
```

```

class                :2,3
node-ip-addr         :10.48.69.149
ipa                  :ff ff ff ff ff ff ff ff
fc4-types:fc4_features:scsi-fcp:init iscsi-gw
symbolic-port-name   :
symbolic-node-name   :10.48.69.149
port-type            :N
port-ip-addr         :0.0.0.0
fabric-port-wwn      :20:41:00:0c:30:6c:24:40
hard-addr            :0x000000
-----
VSAN:601    FCID:0x0201e8
-----
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      :20:04:00:0c:30:6c:24:40
hard-addr            :0x000000

```

Total number of entries = 3

canterbury#

canterbury# **show flogi database vsan 601**

```

-----
INTERFACE  VSAN    FCID          PORT NAME          NODE NAME
-----
fc1/3      601    0x020001    50:05:07:63:00:c8:94:4c  50:05:07:63:00:c0:94:4c
fc1/4      601    0x0201e8    21:00:00:20:37:67:f7:a2  20:00:00:20:37:67:f7:a2
iscsi2/1   601    0x020005    20:03:00:0c:30:6c:24:4c  21:00:00:0c:30:6c:24:42

```

Total number of flogi = 3.

canterbury#

canterbury# **show vsan membership**

...

vsan 601 interfaces:

```

    fc1/3    fc1/4

```

...

canterbury#

canterbury# **show iscsi initiator**

...

```

iSCSI Node name is 10.48.69.149
  iSCSI Initiator name: iqn.1987-05.com.cisco:02.e746244830dd.langur
  iSCSI alias name: LANGUR
  Node WWN is 21:00:00:0c:30:6c:24:42 (dynamic)
  Member of vsans: 601

```

```
Number of Virtual n_ports: 1
Virtual Port WWN is 20:03:00:0c:30:6c:24:4c (configured)
Interface iSCSI 2/1, Portal group tag: 0x80
VSAN ID 601, FCID 0x020005
```

```
canterbury#
```

```
canterbury# show iscsi initiator detail
```

```
...
```

```
iscsi Node name is 10.48.69.149
iscsi Initiator name: iqn.1987-05.com.cisco:02.e746244830dd.langur
iscsi alias name: LANGUR
Node WWN is 21:00:00:0c:30:6c:24:42 (dynamic)
Member of vsans: 601
Number of Virtual n_ports: 1

Virtual Port WWN is 20:03:00:0c:30:6c:24:4c (configured)
Interface iSCSI 2/1, Portal group tag is 0x80
VSAN ID 601, FCID 0x 20005
2 FC sessions, 2 iSCSI sessions
iscsi session details
Target: shark-c8
  Statistics:
    PDU: Command: 45, Response: 45
    Bytes: TX: 5968, RX: 0
    Number of connection: 1
  TCP parameters
    Local 10.48.69.222:3260, Remote 10.48.69.149:2196
    Path MTU: 1500 bytes
    Retransmission timeout: 300 ms
    Round trip time: Smoothed 219 ms, Variance: 15
    Advertized window: Current: 61 KB, Maximum: 62 KB, Scale: 0
    Peer receive window: Current: 63 KB, Maximum: 63 KB, Scale: 0
    Congestion window: Current: 11 KB
Target: san-fc-jbod-1
  Statistics:
    PDU: Command: 26, Response: 26
    Bytes: TX: 3168, RX: 0
    Number of connection: 1
  TCP parameters
    Local 10.48.69.222:3260, Remote 10.48.69.149:3124
    Path MTU: 1500 bytes
    Retransmission timeout: 300 ms
    Round trip time: Smoothed 219 ms, Variance: 15
    Advertized window: Current: 61 KB, Maximum: 62 KB, Scale: 0
    Peer receive window: Current: 63 KB, Maximum: 63 KB, Scale: 0
    Congestion window: Current: 11 KB
```

```
FCP Session details
```

```
Target FCID: 0x020001 (S_ID of this session: 0x020005)
pWWN: 50:05:07:63:00:c8:94:4c, nWWN: 50:05:07:63:00:c0:94:4c
Session state: LOGGED_IN
1 iSCSI sessions share this FC session
Target: shark-c8
Negotiated parameters
RcvDataFieldSize 2048 our_RcvDataFieldSize 1392
MaxBurstSize 0, EMPD: FALSE
Random Relative Offset: FALSE, Sequence-in-order: Yes
Statistics:
PDU: Command: 0, Response: 45
Target FCID: 0x0201e8 (S_ID of this session: 0x020005)
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: san-fc-jbod-1
Negotiated parameters
  RcvDataFieldSize 1392 our_RcvDataFieldSize 1392
  MaxBurstSize 0, EMPD: FALSE
  Random Relative Offset: FALSE, Sequence-in-order: Yes
Statistics:
  PDU: Command: 0, Response: 26
```

```
canterbury# show iscsi initiator iscsi-session detail
```

```
iSCSI Node name is 10.48.69.149
  iSCSI Initiator name: iqn.1987-05.com.cisco:02.e746244830dd.langur
  iSCSI alias name: LANGUR
  Node WWN is 21:00:00:0c:30:6c:24:42 (dynamic)
  Member of vsans: 601
  Number of Virtual n_ports: 1

Virtual Port WWN is 20:03:00:0c:30:6c:24:4c (configured)
  Interface iSCSI 2/1, Portal group tag is 0x80
  VSAN ID 601, FCID 0x 20005
  2 FC sessions, 2 iSCSI sessions
  iSCSI session details
    Target: shark-c8
    Statistics:
      PDU: Command: 45, Response: 45
      Bytes: TX: 5968, RX: 0
      Number of connection: 1
    TCP parameters
      Local 10.48.69.222:3260, Remote 10.48.69.149:2196
      Path MTU: 1500 bytes
      Retransmission timeout: 300 ms
      Round trip time: Smoothed 217 ms, Variance: 14
      Advertized window: Current: 62 KB, Maximum: 62 KB, Scale: 0
      Peer receive window: Current: 63 KB, Maximum: 63 KB, Scale: 0
      Congestion window: Current: 11 KB
    Target: san-fc-jbod-1
    Statistics:
      PDU: Command: 26, Response: 26
      Bytes: TX: 3168, RX: 0
      Number of connection: 1
    TCP parameters
      Local 10.48.69.222:3260, Remote 10.48.69.149:3124
      Path MTU: 1500 bytes
      Retransmission timeout: 300 ms
      Round trip time: Smoothed 217 ms, Variance: 14
      Advertized window: Current: 61 KB, Maximum: 62 KB, Scale: 0
      Peer receive window: Current: 63 KB, Maximum: 63 KB, Scale: 0
      Congestion window: Current: 11 KB
```

```
canterbury#
```

```
canterbury# show iscsi initiator fcp-session detail
```

```
iSCSI Node name is 10.48.69.149
  iSCSI Initiator name: iqn.1987-05.com.cisco:02.e746244830dd.langur
  iSCSI alias name: LANGUR
  Node WWN is 21:00:00:0c:30:6c:24:42 (dynamic)
  Member of vsans: 601
  Number of Virtual n_ports: 1

Virtual Port WWN is 20:03:00:0c:30:6c:24:4c (configured)
  Interface iSCSI 2/1, Portal group tag is 0x80
```

VSAN ID 601, FCID 0x 20005
2 FC sessions, 2 iSCSI sessions

FCP Session details

Target FCID: 0x020001 (S_ID of this session: 0x020005)
pWWN: 50:05:07:63:00:c8:94:4c, nWWN: 50:05:07:63:00:c0:94:4c
Session state: LOGGED_IN
1 iSCSI sessions share this FC session
Target: shark-c8
Negotiated parameters
RcvDataFieldSize 2048 our_RcvDataFieldSize 1392
MaxBurstSize 0, EMPD: FALSE
Random Relative Offset: FALSE, Sequence-in-order: Yes
Statistics:
PDU: Command: 0, Response: 45
Target FCID: 0x0201e8 (S_ID of this session: 0x020005)
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: san-fc-jbod-1
Negotiated parameters
RcvDataFieldSize 1392 our_RcvDataFieldSize 1392
MaxBurstSize 0, EMPD: FALSE
Random Relative Offset: FALSE, Sequence-in-order: Yes
Statistics:
PDU: Command: 0, Response: 26

canterbury#

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

TCP Statistics for port GigabitEthernet2/1

TCP send stats

241247690 segments, 176414627280 bytes
239428551 data, 1738205 ack only packets
42541 control (SYN/FIN/RST), 0 probes, 38280 window updates
498 segments retransmitted, 526612 bytes
464 retransmitted while on ethernet send queue, 111295209 packets split
2505024 delayed acks sent

TCP receive stats

34418285 segments, 8983771 data packets in sequence, 9282604852 bytes in s
equence

854523 predicted ack, 6126542 predicted data
0 bad checksum, 0 multi/broadcast, 0 bad offset
0 no memory drops, 0 short segments
1844 duplicate bytes, 77 duplicate packets
0 partial duplicate bytes, 0 partial duplicate packets
123700 out-of-order bytes, 2235 out-of-order packets
6 packet after window, 0 bytes after window
0 packets after close
28128679 acks, 173967225697 ack bytes, 0 ack toomuch, 75348 duplicate acks
0 ack packets left of snd_una, 12 non-4 byte aligned packets
18442549 window updates, 0 window probe
88637 pcb hash miss, 2150 no port, 14 bad SYN, 0 paws drops

TCP Connection Stats

26 attempts, 42272 accepts, 42274 established
42327 closed, 40043 drops, 24 conn drops
106 drop in retransmit timeout, 152 drop in keepalive timeout
0 drop in persist drops, 0 connections drained

TCP Miscellaneous Stats

9776335 segments timed, 9780142 rtt updated
402 retransmit timeout, 457 persist timeout
69188 keepalive timeout, 69015 keepalive probes

TCP SACK Stats

100 recovery episodes, 231520160 data packets, 330107461536 data bytes
396 data packets retransmitted, 482072 data bytes retransmitted
13 connections closed, 46 retransmit timeouts

TCP SYN Cache Stats

42281 entries, 42272 connections completed, 3 entries timed out
0 dropped due to overflow, 6 dropped due to RST
0 dropped due to ICMP unreach, 0 dropped due to bucket overflow
0 abort due to no memory, 43 duplicate SYN, 1833 no-route SYN drop
0 hash collisions, 0 retransmitted

TCP Active Connections

Local Address	Remote Address	State	Send-Q	Recv-Q
10.48.69.222:3260	10.48.69.149:1026	ESTABLISH	0	0
10.48.69.222:3260	10.48.69.149:2196	ESTABLISH	0	0
10.48.69.222:3260	10.48.69.149:3124	ESTABLISH	0	0
0.0.0.0:3260	0.0.0.0:0	LISTEN	0	0

canterbury#

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

target: shark-c8

* Port WWN 50:05:07:63:00:c8:94:4c

!--- The asterisk () in front of the pWWN means
!--- that you have both discovery and target sessions. If
!--- you do not see this, it means that only a discovery
!--- session exists.*

Configured node

No. of advertised interface: 1
GigabitEthernet 2/1
No. of initiators permitted: 2
initiator 10.48.69.231/32 is permitted
initiator 10.48.69.149/32 is permitted
all initiator permit is disabled

target: san-fc-jbod-1

* Port WWN 21:00:00:20:37:67:f7:a2

Configured node

No. of advertised interface: 1
GigabitEthernet 2/1
No. of initiators permitted: 2
initiator 10.48.69.232/32 is permitted
initiator 10.48.69.149/32 is permitted
all initiator permit is disabled

canterbury#

canterbury# **show iscsi initiator configured**

...

iSCSI Node name is 10.48.69.149

Member of vsans: 601

No. of pWWN: 1

Port WWN is 20:03:00:0c:30:6c:24:4c

canterbury#

canterbury# show ips arp interface gigabitethernet 2/1

Protocol	Address	Age (min)	Hardware Addr	Type	Interface
Internet	10.48.69.149	3	0008.e21e.c7bc	ARPA	GigabitEthernet2/1
Internet	10.48.69.200	0	0008.e21e.c7bc	ARPA	GigabitEthernet2/1
Internet	10.48.69.201	4	0202.3d30.45c9	ARPA	GigabitEthernet2/1
Internet	10.48.69.206	9	0005.9ba6.95ff	ARPA	GigabitEthernet2/1
Internet	10.48.69.209	6	0009.7c60.561f	ARPA	GigabitEthernet2/1
Internet	10.48.69.229	4	0800.209e.edab	ARPA	GigabitEthernet2/1
Internet	10.48.69.233	0	0010.4200.7d5b	ARPA	GigabitEthernet2/1
Internet	10.48.69.235	0	0800.20b6.6559	ARPA	GigabitEthernet2/1
Internet	10.48.69.238	4	0030.6e1b.6f51	ARPA	GigabitEthernet2/1
Internet	10.48.69.239	1	0030.6e1c.a00b	ARPA	GigabitEthernet2/1
Internet	10.48.69.248	7	0202.3d30.45f8	ARPA	GigabitEthernet2/1
Internet	10.48.69.252	1	0202.3d30.45fc	ARPA	GigabitEthernet2/1
Internet	10.10.2.28	0	0202.3d0a.021c	ARPA	GigabitEthernet2/1

canterbury#

canterbury# show scsi-target devices vsan 601

VSAN	FCID	pWWN	VENDOR	MODEL	REV
601	0x020001	50:05:07:63:00:c8:94:4c	IBM	2105F20	.114
601	0x0201e8	21:00:00:20:37:67:f7:a2	SEAGATE	ST318203FC	0004

canterbury#

canterbury# show int iscsi 2/1

iscsi2/1 is up

Hardware is GigabitEthernet

Port WWN is 20:41:00:0c:30:6c:24:40

Admin port mode is ISCSI

Port mode is ISCSI

Speed is 1 Gbps

iSCSI initiator is identified by name

Number of iSCSI session: 3, Number of TCP connection: 3

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 enabled

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 76856 packets, 8696216 bytes

Command 13139 pdus, Data-out 85 pdus, 84292 bytes

Output 89876 packets, 6629892 bytes

Response 13132 pdus (with sense 16), R2T 25 pdus

Data-in 13072 pdus, 2125736 bytes

canterbury#

canterbury# show iscsi stats iscsi 2/1


```

iscsi2/1
  5 minutes input rate 8 bits/sec, 1 bytes/sec, 0 frames/sec
  5 minutes output rate 8 bits/sec, 1 bytes/sec, 0 frames/sec
  iSCSI statistics
    76857 packets input, 8696264 bytes
      Command 13139 pdus, Data-out 85 pdus, 84292 bytes, 0 fragments
    output 89877 packets, 6629940 bytes
      Response 13132 pdus (with sense 16), R2T 25 pdus
      Data-in 13072 pdus, 2125736 bytes

canterbury#

canterbury# show interface gigabitethernet 2/1

GigabitEthernet2/1 is up
  Hardware is GigabitEthernet, address is 0005.3000.ade6
  Internet address is 10.48.69.222/26
  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 464 bits/sec, 58 bytes/sec, 0 frames/sec
  5 minutes output rate 64 bits/sec, 8 bytes/sec, 0 frames/sec
  30544982 packets input, 9266250283 bytes
    29435 multicast frames, 0 compressed
    0 input errors, 0 frame, 0 overrun 0 fifo
  233947842 packets output, 179379369852 bytes, 0 underruns
    0 output errors, 0 collisions, 0 fifo
    0 carrier errors

canterbury#

canterbury# show ip route
Codes: C - connected, S - static
Gateway of last resort is 10.48.69.129
S 10.48.69.149, gigabitethernet2-1
C 6.6.6.0/30 is directly connected, gigabitethernet2-6
C 5.5.5.0/30 is directly connected, gigabitethernet2-5
C 10.48.69.192/26 is directly connected, gigabitethernet2-1
C 10.48.69.128/26 is directly connected, mgmt0

canterbury#
canterbury# show ips ip route interface gigabitethernet 2/1
Codes: C - connected, S - static
No default gateway
S 10.48.69.149/32 via 0.0.0.0, GigabitEthernet2/1
C 10.48.69.192/26 is directly connected, GigabitEthernet2/1
canterbury#

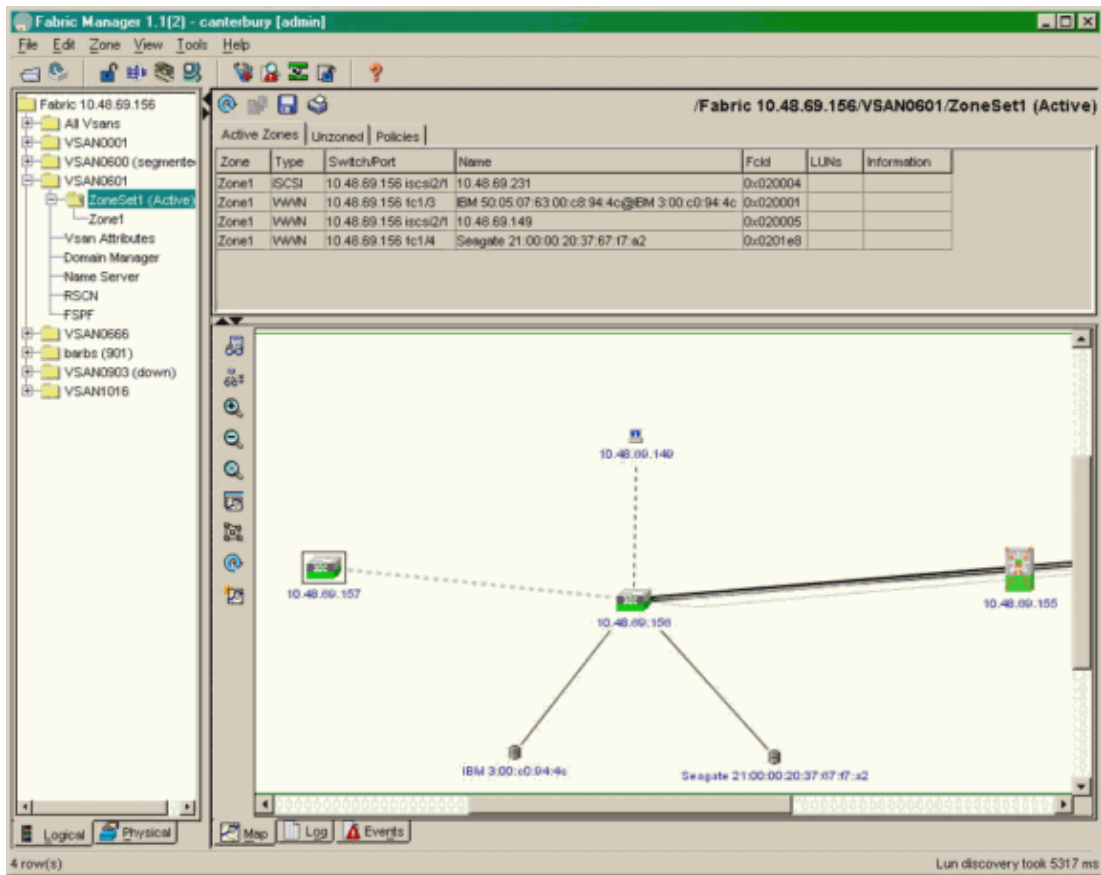
```

Fabric Manager and Device Manager Displays

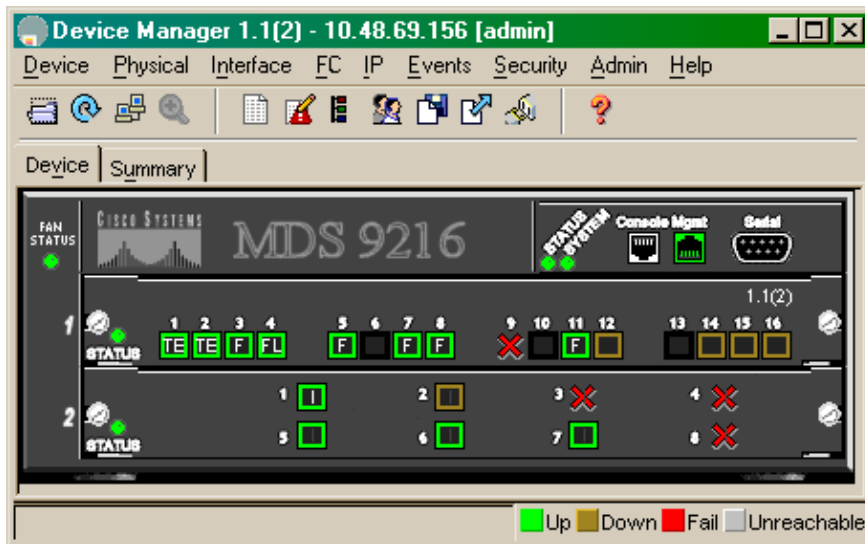
This section provides screen captures from MDS Fabric Manager 1.1(2) and Device Manager 1.1.(2).

Topology Diagram from the Fabric Manager

This screen capture is the topology diagram from the Fabric Manager:



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



10.48.69.156 - LUN

Discover | Targets | LUNs

VsanId, Port WWN	Id	Capacity (MB)	SerialNum
601, Clarion 50:06:01:60:88:02:a8:2b	0x10	1074	f600042...
901, Clarion 50:06:01:60:88:02:a8:2b	0x11	1074	f600042...
601, Seagate 21:00:00:20:37:67:f7:a2	0x0	18210	LRE8091...
601, IBM 50:05:07:63:00:c8:94:4c	0x5600	17500	60022196
601, IBM 50:05:07:63:00:c8:94:4c	0x5601	17500	60122196
601, IBM 50:05:07:63:00:c8:94:4c	0x5602	17500	60222196
601, IBM 50:05:07:63:00:c8:94:4c	0x5000	10000	00022196
601, IBM 50:05:07:63:00:c8:94:4c	0x500b	5000	00B22196
601, IBM 50:05:07:63:00:c8:94:4c	0x500c	5000	00C22196
601, IBM 50:05:07:63:00:c8:94:4c	0x500d	5000	00D22196
601, IBM 50:05:07:63:00:c8:94:4c	0x500e	5000	00E22196
601, IBM 50:05:07:63:00:c8:94:4c	0x500f	5000	00F22196
601, IBM 50:05:07:63:00:c8:94:4c	0x5010	5000	01022196
601, IBM 50:05:07:63:00:c8:94:4c	0x5011	5000	01122196
601, IBM 50:05:07:63:00:c8:94:4c	0x5012	5000	01222196
601, IBM 50:05:07:63:00:c8:94:4c	0x5013	5000	01322196
601, IBM 50:05:07:63:00:c8:94:4c	0x5014	5000	01422196
601, IBM 50:05:07:63:00:c8:94:4c	0x5401	5000	40122196
601, IBM 50:05:07:63:00:c8:94:4c	0x5100	4000	10022196
601, IBM 50:05:07:63:00:c8:94:4c	0x5101	4000	10122196
601, IBM 50:05:07:63:00:c8:94:4c	0x5107	3000	10722196
601, IBM 50:05:07:63:00:c8:94:4c	0x5108	3000	10822196
601, IBM 50:05:07:63:00:c8:94:4c	0x5109	3000	10922196
601, IBM 50:05:07:63:00:c8:94:4c	0x510a	3000	10A22196
601, IBM 50:05:07:63:00:c8:94:4c	0x510b	3000	10B22196
601, IBM 50:05:07:63:00:c8:94:4c	0x510c	3000	10C22196
601, IBM 50:05:07:63:00:c8:94:4c	0x511d	3000	11D22196
601, IBM 50:05:07:63:00:c8:94:4c	0x511e	3000	11E22196
601, IBM 50:05:07:63:00:c8:94:4c	0x511f	3000	11F22196

Refresh Help Close

127 row(s)

Select **IP-iSCSI** to display the iSCSI sessions from **Device Manager**.

10.48.69.156 - iSCSI

Initiators | Targets | Sessions | Sessions Detail | Session Statistics

Type	Direction	Initiator			Target		
		Name or IpAddress	Alias	Id	Name	Alias	Id
discovery	inbound	10.48.69.149	LANGUR	00:02:3d:00:90:ec			128
normal	inbound	10.48.69.149	LANGUR	00:02:3d:00:90:ed	shark-c8		128
normal	inbound	10.48.69.149	LANGUR	00:02:3d:00:90:ee	san-fc-jbod-1		128

Connection ... Refresh Help Close

3 row(s)

Related Information

- [Cisco iSCSI Software Downloads \(registered customers only\)](#)
- [iSCSI Driver for Windows 2000 Frequently Asked Questions](#)

- **iSCSI Driver: Release Notes for Cisco iSCSI Driver for Microsoft Windows, Driver Release 3.1.2**
 - **Troubleshooting the iSCSI Driver for Windows 2000**
 - **Technical Support – Cisco Systems**
-

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