

Windows Server 2003 iSCSI Host to MDS/IPS-8 Configuration I

Document ID: 46060

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Introduction

Cisco's iSCSI drivers, which reside on the server, are a key component of an iSCSI solution. These iSCSI drivers intercept commands, encapsulate them into IP packets, and redirect them to the Cisco SN 5420, Cisco SN 5428, Cisco SN5428, Cisco MDS/IPS-8. This document provides sample configurations for Solaris iSCSI host to MDS/IPS-8.

Before You Begin

Conventions

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).

IPS blade refers to IP Storage Services Module. For more information on document conventions, see the [Cisco Technical Conventions](#).

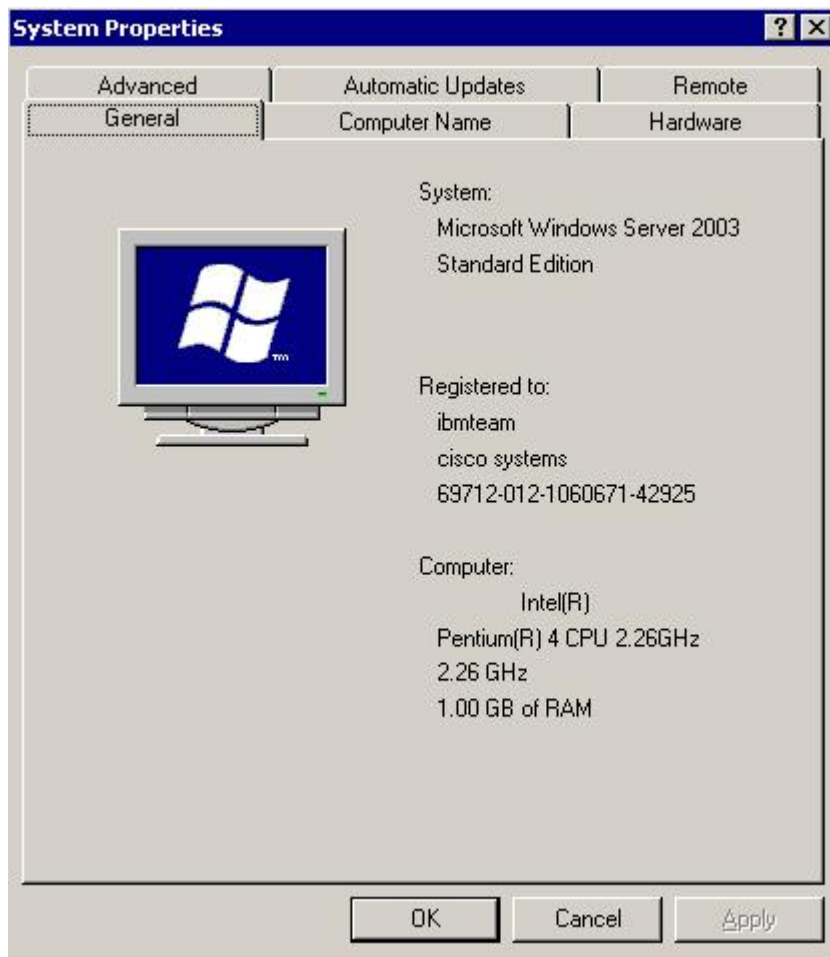
Prerequisites

- Install the iSCSI driver that is compatible to your Windows Server 2003 version. The most current version of the driver is found at the [Cisco iSCSI Driver for Windows Server 2003](#) (registered customers only) page on Cisco.com. The README.txt included in the driver zip(tar) file. The README contains information about the license agreement, driver installation configuration instructions, and a technical overview of the driver architecture.
- The Cisco iSCSI Driver for Microsoft Windows 2003 requires Windows Server 2003 Enterprise Edition or Standard Edition.

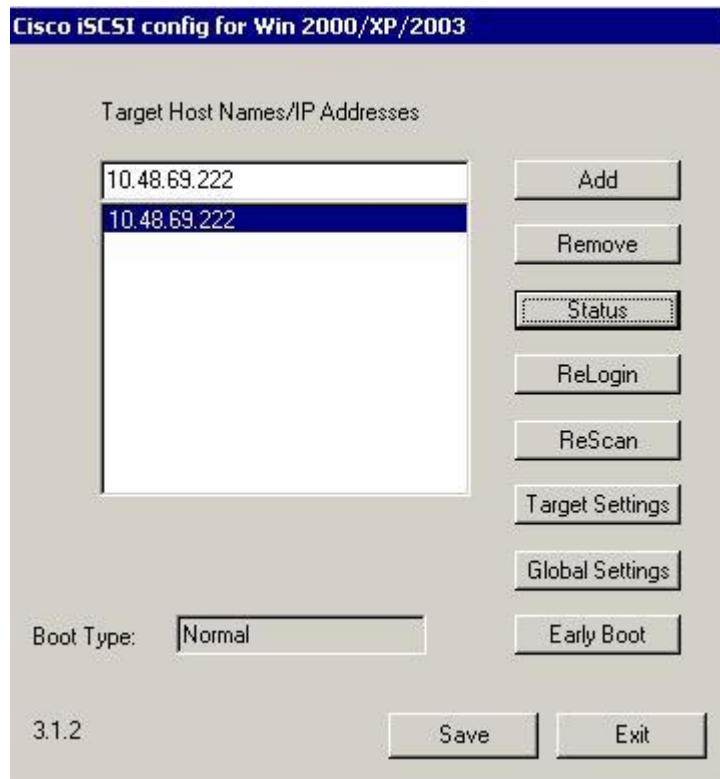
Components Used

The information in this document is based on the software and hardware versions below.

- Host with Windows Server 2003 Standard Edition



- Cisco iSCSI Driver 3.1.2 for Windows Server 2003. iSCSI driver version can be seen at the bottom left of the i window.



- Cisco MDS 9216 with Software Version 1.2(1a)

```
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 Services Module DS-X9308-SMIP       ok

Mod  Sw          Hw          World-Wide-Name(s) (WWN)
---  ---
1    1.2(1a)    1.0        20:01:00:0c:30:6c:24:40 to 20:10:00:0c:30:6c
2    1.2(1a)    0.3        20:41:00:0c:30:6c:24:40 to 20:48:00:0c:30:6c

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#show ver
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 960080 kB
```

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

```
Canterbury uptime is 1 days 12 hours 3 minute(s) 29 second(s)
```

```
Last reset at 39578 usecs after Mon Oct 13 07:32:38 2003
Reason: Reset Requested by CLI command reload
System version: 1.2(1a)
```

The information presented in this document was created from devices in a specific lab environment. All of the devices in this document started with a cleared (default) configuration. If you are working in a live network, ensure that you understand the potential impact of any command before using it.

Background Theory

The IP Storage module provides IP hosts access to FC storage devices. The IPS module is DS-X9308-SMIP. It provides transparent SCSI routing. IP hosts using iSCSI protocol can transparently access SCSI (FCP) targets on the FC network. The IPS module 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 Gigabit Ethernet (GE) interfaces that are appropriately configured. The IPS module enables you to create virtual iSCSI targets and maps them to physical FC targets available on a SAN. It presents the FC targets to IP hosts as if the physical targets were locally attached to the IP network.

Each iSCSI host that requires access to storage via the IPS module needs to have a compatible iSCSI driver installed. 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 the following 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 FCP and vice versa). This routing is performed by the IPS module.
- Transporting FCP requests or responses between the IPS 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 IPS module makes FC targets available to iSCSI initiators. When both are configured, statically mapped FC targets have a configured name. In this configuration you will see an example of static mapping. With dynamic mapping, each iSCSI host connects to the IPS module a new FC N port is created and the nWWNs and pWWNs allocated for this N port are different. Use the static mapping method if you need to obtain the same nWWNs and pWWNs for the iSCSI host each time.

connects to the IPS module. Static mapping can be used on the IPS module to access intelligent FC storage arrays that access control and LUN mapping/masking configuration based on the initiator's pWWNs and/or nWWNs.

You can control access to each statically-mapped iSCSI target by specifying a list of IPS ports on which it will be advertised by specifying a list of iSCSI initiator node names allowed to access it. FC zoning-based access control and iSCSI-based 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 has been 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 list.
- **iSCSI session creation:** When an IP host initiates an iSCSI session, the IPS module verifies if the specified initiator node name (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 IP Storage module 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 being 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.

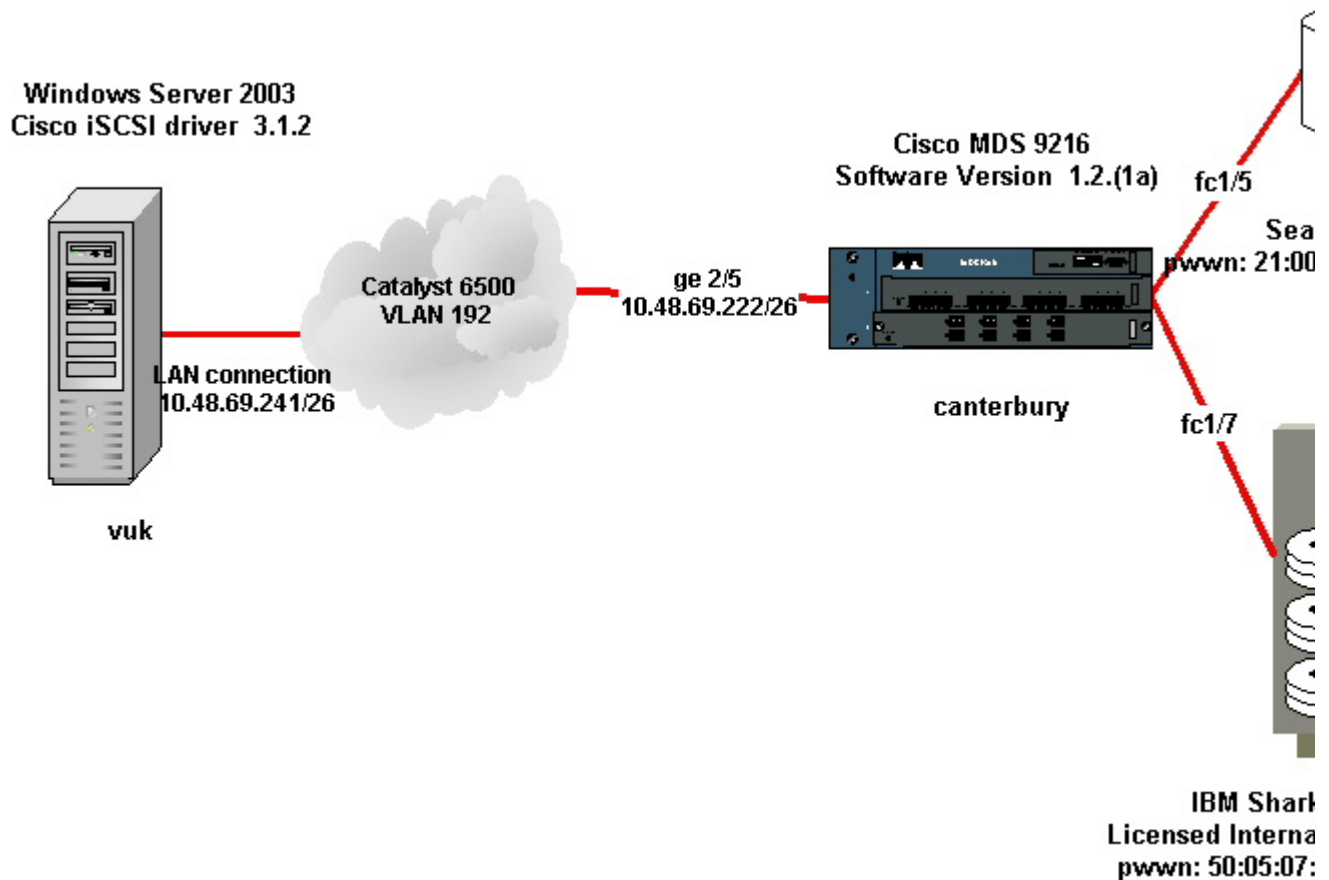
Configure

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

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

Network Diagram

This document uses the network setup shown in the diagram below.



Configurations

This document uses the configurations shown below.

- Vuk (Windows Server 2003)
- Canterbury (MDS 9216)

Vuk (Windows Server 2003)

The initial configuration tasks consist of the following actions:

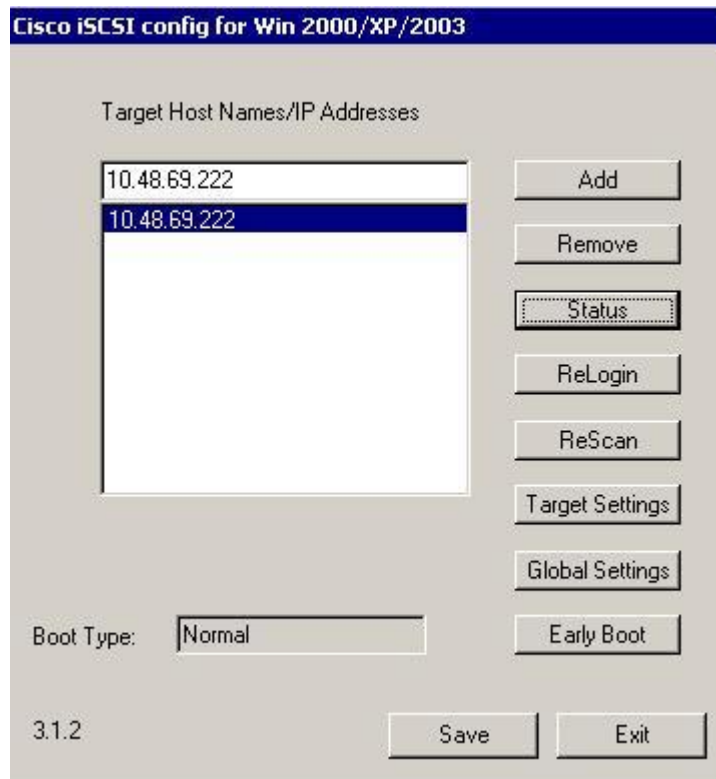
- Setting the iSCSI Itarget IP addresses of MDS 9000 series systems that the driver will access.
- Setting the iSCSI target authentication user name and passwords.
- Saving the iSCSI target configuration, and setting the driver's boot type.

To configure the driver, perform the following steps:

1. Log on to the computer as a user with administrator privileges.
2. Click **Start**, point to **Settings**, click **Control Panel** and then double click **iSCSI Config**.

The **Iscsi Config** program causes the Cisco iSCSI config for Win 2000/XP/2003 dialog box to be displayed.

3. At the Cisco iSCSI config for Win 2000 dialog box, configure the IP address of a SCSI routing instance in an MDS 9000 series system as follows:
 - a. At the **Target Host Names/IP Addresses** text box, type the IP address of a SCSI routing instance in an MDS 9000 Series system. In this configuration example, the IP address is 10.48.69.222.
 - b. Click **Add**. The IP address is displayed in the display area below the **Target Host Names/IP Addresses** text box.



4. Click Save and Exit.
5. Restart the computer.

Canterbury (Cisco MDS 9216)

```

vsan database
vsan 222 name ozden
!--- VSAN 222 has been used for iSCSI targets.

vsan database
vsan 222 interface fc1/5
!--- Seagate is connected to fc1/5.
vsan 222 interface fc1/6
vsan 222 interface fc1/7
!--- IBM Shark is connected to fc1/7.
vsan 222 interface fc1/8

!--- System boot variables.
boot system bootflash:/s121a
boot kickstart bootflash:/k121a

!--- IP configurations.
ip domain-name cisco.com
ip name-server 144.254.10.123

```

```

ip default-gateway 10.48.69.129
ip routing
iscsi authentication none

!--- Identify the iSCSI initiator based on the IP address of your host
!--- A static virtual N port is defined for each NIC or network interface
!--- LUN-mapping and LUN-masking on the storage device has to be done
!--- that you have defined for the initiator. Refer to the Enterprise
!--- (ESSS) screen capture in the Fabric Manager and Device Manager 1
!--- for more information.
iscsi initiator ip-address 10.48.69.241
static nWWN 22:01:00:0c:30:6c:24:42
static pWWN 21:03:00:0c:30:6c:24:42
!--- Targets via Vsan 222 are accesible by iSCSI initiators.
vsan 222

!--- A virtual target has been defined for the JBOD. The target has
!--- been identified by it's pWWN. The target has been advertised via
!--- GE interface 2/5. Host 10.48.69.241 is the only initiator.
iscsi virtual-target name seagate
pWWN 21:00:00:04:cf:db:3e:a7 fc-lun 0x0000 iscsi-lun 0x0000
advertise interface GigabitEthernet2/5
initiator ip address 10.48.69.241 permit

!--- A virtual target has been defined for the IBM Shark. The target
!--- Do not specify the LUN if you wish to map the entire FC target
!--- In the virtual-target shark-lun, LUN-mapping options have been
!--- mapped to iSCSI-LUN 0x0000. It is also possible to map FC-LUN 0x
iscsi virtual-target name shark-lun
pWWN 50:05:07:63:00:c4:94:4c fc-lun 0x0000 iscsi-lun 0x0000
pWWN 50:05:07:63:00:c4:94:4c fc-lun 0x0001 iscsi-lun 0x0001
advertise interface GigabitEthernet2/5
initiator ip address 10.48.69.241 permit

line console
exec-timeout 0
line vty
exec-timeout 0
ntp server 10.48.64.100

switchname canterbury
..
zone default-zone permit vsan 1
!--- Default zone policy is set to permit for VSAN 222.
zone default-zone permit vsan 222

interface GigabitEthernet2/5
ip address 10.48.69.222 255.255.255.192
no shutdown
...
```



```

interface fc1/5
no shutdown

interface fc1/6

interface fc1/7
no shutdown

...

interface mgmt0
ip address 10.48.69.156 255.255.255.192

!---The iSCSI interface has to be set no shut.
interface iscsi2/5
no shutdown

```

Verify

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

- **show zone status** - displays Zone information.
- **show fcns database vsan 222** - displays Name Server information for a specific VSAN.
- **show flogi database vsan 222** - displays FLOGI Server information for a specific VSAN.
- **show vsan membership** - displays interface information for different VSANs.
- **show iscsi initiator detail** - displays iSCSI initiator information.
- **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 2/5 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 2/5** - displays IPS arp information for specific GE interface.
- **show scsi-target lun vsan 222** - displays SCSI devices for specific VSAN(for mapping FC-LUNs to iSCSI-LUNs).
- **show int iscsi 2/5** - displays iSCSI interfaces.
- **show iscsi stats iscsi 2/5** - displays iSCSI statistics.
- **show int gigabitethernet 2/5** - displays GE interface.
- **show ip route** - displays IP route information.

Troubleshoot

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

Note: To find additional information on Troubleshooting IP Storage Issues, use the [Cisco MDS 9000 Family Troubleshooting Guide](#).

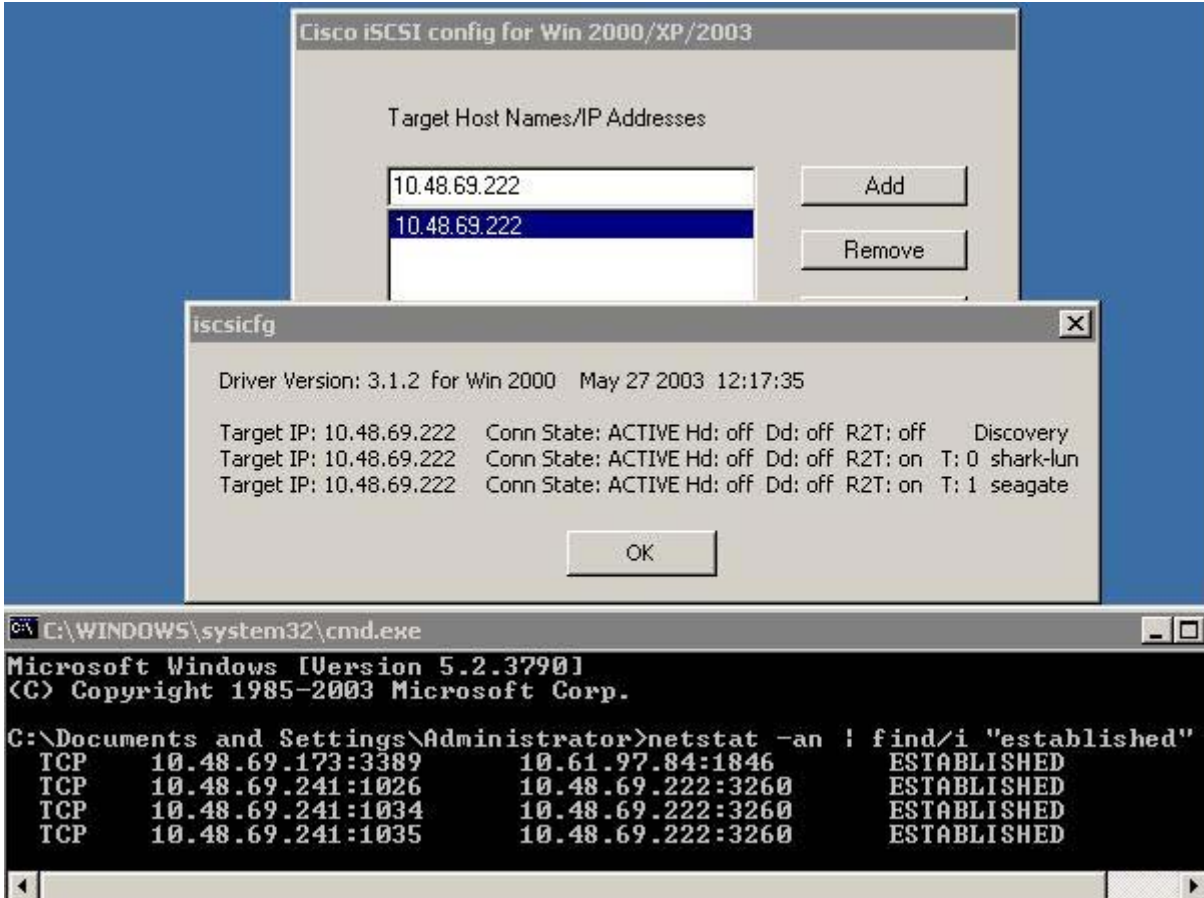
Troubleshooting Procedure

Below is troubleshooting information relevant to this configuration.

- Displays from Vuk (Windows Server 2003)
- Displays from Canterbury Cisco MDS 9216

Displays from Vuk (Windows Server 2003)

On the **Cisco iSCSI config** window, click on **Status** to check if the host has successfully logged into the iSCSI targ command line, issue **netstat -an | find/i "established"** to see ESTABLISHED TCP sesions between 10.48.69.222.

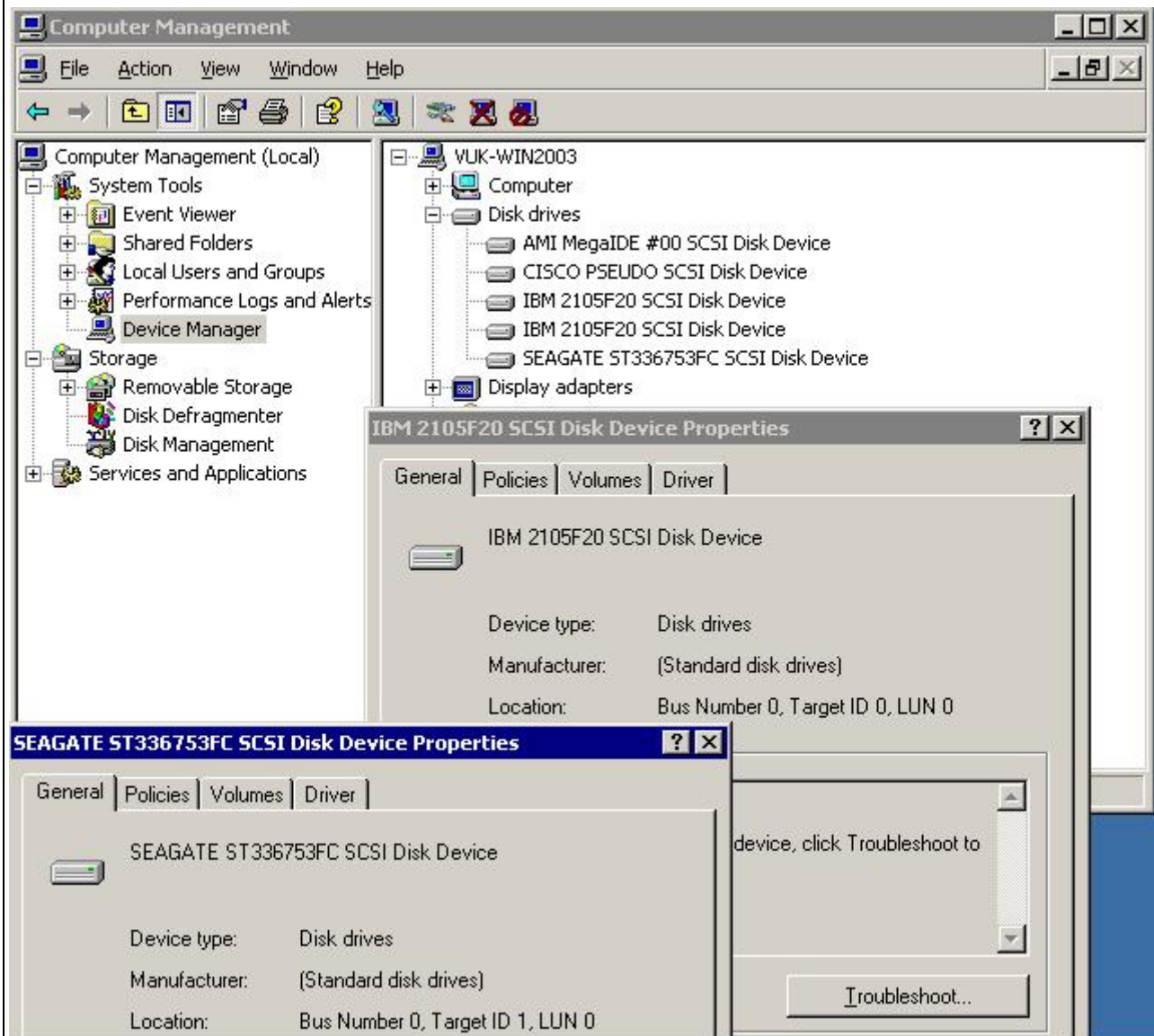


The screenshot displays two windows. The top window is titled "Cisco iSCSI config for Win 2000/XP/2003" and shows a list of "Target Host Names/IP Addresses" with two entries: "10.48.69.222". The bottom window is a command prompt titled "C:\WINDOWS\system32\cmd.exe" showing the output of the command "netstat -an | find/i 'established'". The output lists four established TCP connections to 10.48.69.222.

Protocol	Local Address	Foreign Address	State
TCP	10.48.69.173:3389	10.61.97.84:1846	ESTABLISHED
TCP	10.48.69.241:1026	10.48.69.222:3260	ESTABLISHED
TCP	10.48.69.241:1034	10.48.69.222:3260	ESTABLISHED
TCP	10.48.69.241:1035	10.48.69.222:3260	ESTABLISHED

To see the new disks, right click **My Computer** on the desktop. Double click on **Computer Manager**.

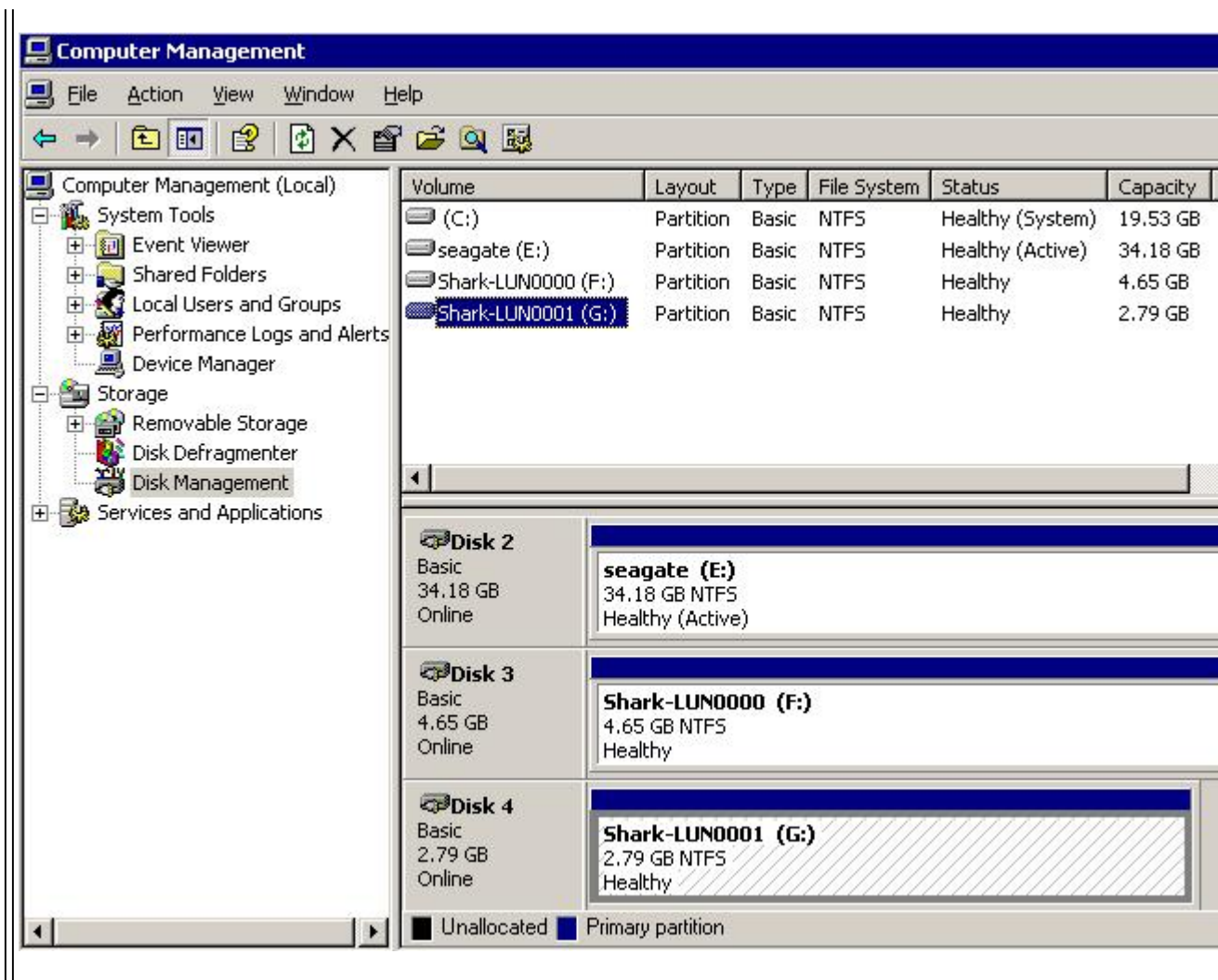
In the console tree under **System Tool**, click **Device Manager**



For the proper functioning of the driver under Windows 2003 Server, the driver needs to create a pseudo disk drive, as an unknown disk under the Disk Management MMC application. The user can ignore this, as it does not affect the functioning of the system in any way. It must **not** be deleted.

To manage the storage, right click **My Computer** on the desktop. Double click on **Computer Manager**.

In the console tree under **Storage**, click **Disk Management**.



Displays from Canterbury (Cisco MDS 9216)

```

canterbury#show vsan membership
vsan 1 interfaces:
  fc1/3 fc1/10 fc1/12 fc1/13 fc1/14 fc1/16

vsan 222 interfaces:
  fc1/5 fc1/6 fc1/7 fc1/8

vsan 4094(isolated_vsan) interfaces:

canterbury#show zone status
VSAN: 1 default-zone: permit distribute: active only Interop: 100
Full Zoning Database :
  Zonesets:0 Zones:0 Aliases: 0
Active Zoning Database :
  Database Not Available
Status:

```

```

VSAN: 222 default-zone: permit distribute: active only Interop: 100
Full Zoning Database :
  Zonesets:0 Zones:0 Aliases: 0
Active Zoning Database :
  Database Not Available
Status:
!--- VSAN 222 has been used for this configuration, default-zone beha
canterbury#show flogi database vsan 222

```

```

-----
INTERFACE VSAN FCID PORT NAME NODE NAME
-----
fc1/5 222 0x62011e 21:00:00:04:cf:db:3e:a7 20:00:00:04:cf:db:3e:a7
fc1/7 222 0x620003 50:05:07:63:00:c4:94:4c 50:05:07:63:00:c0:94:4c
iscsi2/5 222 0x620001 21:03:00:0c:30:6c:24:42 22:01:00:0c:30:6c:24:42

```

```

Total number of flogi = 3.
!--- FCID 0X620001 is the virtual N port(HBA) for the iSCSI host Vuk.
canterbury#show fcns database vsan 222

```

VSAN 222:

```

-----
FCID TYPE PWWN (VENDOR) FC4-TYPE:FEATURE
-----
0x620001 N 21:03:00:0c:30:6c:24:42 (Cisco) scsi-fcp:init isc..w
0x620003 N 50:05:07:63:00:c4:94:4c (IBM) scsi-fcp:target fc..
0x62011e NL 21:00:00:04:cf:db:3e:a7 (Seagate) scsi-fcp:target

```

```

Total number of entries = 3
canterbury#show fcns database detail vsan 222

```

```

-----
VSAN:222 FCID:0x620001
-----
port-wwn (vendor) :21:03:00:0c:30:6c:24:42 (Cisco)
node-wwn :22:01:00:0c:30:6c:24:42
class :2,3
node-ip-addr :10.48.69.241
ipa :ff ff ff ff ff ff ff ff
fc4-types:fc4_features:scsi-fcp:init iscsi-gw
!--- Virtual N port for host.
symbolic-port-name :
symbolic-node-name :10.48.69.241
port-type :N
port-ip-addr :0.0.0.0
fabric-port-wwn :20:51:00:0c:30:6c:24:40
hard-addr :0x000000
-----
VSAN:222 FCID:0x620003
-----
port-wwn (vendor) :50:05:07:63:00:c4:94:4c (IBM)

```

```

node-wwn :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-wwn :20:07:00:0c:30:6c:24:40
hard-addr :0x000000
-----
VSAN:222 FCID:0x62011e
-----
port-wwn (vendor) :21:00:00:04:cf:db:3e:a7 (Seagate)
node-wwn :20:00:00:04:cf:db:3e:a7
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 :20:05:00:0c:30:6c:24:40
hard-addr :0x000000

Total number of entries = 3
canterbury#show iscsi session
Initiator 10.48.69.241
Initiator name iqn.1987-05.com.cisco:02.9a74eb40e94d.vuk-win2003
Session #1
Discovery session, ISID 00023d000023, Status active

Session #2
Target shark-lun
VSAN 222, ISID 00023d000024, Status active, no reservation

Session #3
Target seagate
VSAN 222, ISID 00023d000025, Status active, no reservation

canterbury#show iscsi initiator
iSCSI Node name is 10.48.69.241
iSCSI Initiator name: iqn.1987-05.com.cisco:02.9a74eb40e94d.vuk-win:
iSCSI alias name: VUK-WIN2003
Node WWN is 22:01:00:0c:30:6c:24:42 (dynamic)
Member of vsans: 222
Number of Virtual n_ports: 1
Virtual Port WWN is 21:03:00:0c:30:6c:24:42 (configured)

```

```
Interface iSCSI 2/5, Portal group tag: 0x84  
VSAN ID 222, FCID 0x620001
```

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

```
iSCSI Node name is 10.48.69.241  
iSCSI Initiator name: iqn.1987-05.com.cisco:02.9a74eb40e94d.vuk-win  
iSCSI alias name: VUK-WIN2003  
Node WWN is 22:01:00:0c:30:6c:24:42 (dynamic)  
Member of vsans: 222  
Number of Virtual n_ports: 1
```

```
Virtual Port WWN is 21:03:00:0c:30:6c:24:42 (configured)
```

```
Interface iSCSI 2/5, Portal group tag is 0x84
```

```
VSAN ID 222, FCID 0x620001
```

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

```
iSCSI session details
```

```
Target: seagate
```

```
Statistics:
```

```
PDU: Command: 16, Response: 16
```

```
Bytes: TX: 188, RX: 0
```

```
Number of connection: 1
```

```
TCP parameters
```

```
Local 10.48.69.222:3260, Remote 10.48.69.241:1035
```

```
Path MTU: 1500 bytes
```

```
Retransmission timeout: 350 ms
```

```
Round trip time: Smoothed 165 ms, Variance: 46
```

```
Advertized window: Current: 125 KB, Maximum: 125 KB, Scale: 1
```

```
Peer receive window: Current: 118 KB, Maximum: 118 KB, Scale: 1
```

```
Congestion window: Current: 9 KB
```

```
Target: shark-lun
```

```
Statistics:
```

```
PDU: Command: 2343, Response: 2343
```

```
Bytes: TX: 46363700, RX: 45494272
```

```
Number of connection: 1
```

```
TCP parameters
```

```
Local 10.48.69.222:3260, Remote 10.48.69.241:1034
```

```
Path MTU: 1500 bytes
```

```
Retransmission timeout: 390 ms
```

```
Round trip time: Smoothed 136 ms, Variance: 65
```

```
Advertized window: Current: 125 KB, Maximum: 125 KB, Scale: 1
```

```
Peer receive window: Current: 118 KB, Maximum: 118 KB, Scale: 1
```

```
Congestion window: Current: 11 KB
```

```
FCP Session details
```

```
Target FCID: 0x62011e (S_ID of this session: 0x620001)
```

```
pWWN: 21:00:00:04:cf:db:3e:a7, nWWN: 20:00:00:04:cf:db:3e:a7
```

```
Session state: LOGGED_IN
```

```
1 iSCSI sessions share this FC session
```

```
Target: seagate
```

```
Negotiated parameters
```

```
RcvDataFieldSize 1404 our_RcvDataFieldSize 1404
MaxBurstSize 0, EMPD: FALSE
Random Relative Offset: FALSE, Sequence-in-order: Yes
Statistics:
PDU: Command: 0, Response: 16
Target FCID: 0x620003 (S_ID of this session: 0x620001)
pWWN: 50:05:07:63:00:c4:94:4c, nWWN: 50:05:07:63:00:c0:94:4c
Session state: LOGGED_IN
1 iSCSI sessions share this FC session
Target: shark-lun
Negotiated parameters
RcvDataFieldSize 2048 our_RcvDataFieldSize 1404
MaxBurstSize 0, EMPD: FALSE
Random Relative Offset: FALSE, Sequence-in-order: Yes
Statistics:
PDU: Command: 0, Response: 2343
```

canterbury#show iscsi initiator iscsi-session detail

```
iSCSI Node name is 10.48.69.241
iSCSI Initiator name: iqn.1987-05.com.cisco:02.9a74eb40e94d.vuk-win:
iSCSI alias name: VUK-WIN2003
Node WWN is 22:01:00:0c:30:6c:24:42 (dynamic)
Member of vsans: 222
Number of Virtual n_ports: 1
```

```
Virtual Port WWN is 21:03:00:0c:30:6c:24:42 (configured)
Interface iSCSI 2/5, Portal group tag is 0x84
VSAN ID 222, FCID 0x620001
2 FC sessions, 2 iSCSI sessions
iSCSI session details
Target: seagate
Statistics:
PDU: Command: 16, Response: 16
```

```
Bytes: TX: 188, RX: 0
Number of connection: 1
TCP parameters
Local 10.48.69.222:3260, Remote 10.48.69.241:1035
Path MTU: 1500 bytes
Retransmission timeout: 350 ms
Round trip time: Smoothed 165 ms, Variance: 46
Advertized window: Current: 125 KB, Maximum: 125 KB, Scale: 1
Peer receive window: Current: 118 KB, Maximum: 118 KB, Scale: 1
Congestion window: Current: 9 KB
Target: shark-lun
Statistics:
PDU: Command: 2343, Response: 2343
Bytes: TX: 46363700, RX: 45494272
Number of connection: 1
TCP parameters
```



```
Local 10.48.69.222:3260, Remote 10.48.69.241:1034
Path MTU: 1500 bytes
Retransmission timeout: 390 ms
Round trip time: Smoothed 136 ms, Variance: 65
Advertized window: Current: 125 KB, Maximum: 125 KB, Scale: 1
Peer receive window: Current: 118 KB, Maximum: 118 KB, Scale: 1
Congestion window: Current: 11 KB
```

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

```
iSCSI Node name is 10.48.69.241
iSCSI Initiator name: iqn.1987-05.com.cisco:02.9a74eb40e94d.vuk-win:
iSCSI alias name: VUK-WIN2003
Node WWN is 22:01:00:0c:30:6c:24:42 (dynamic)
Member of vsans: 222
Number of Virtual n_ports: 1

Virtual Port WWN is 21:03:00:0c:30:6c:24:42 (configured)
Interface iSCSI 2/5, Portal group tag is 0x84
VSAN ID 222, FCID 0x620001
2 FC sessions, 2 iSCSI sessions
```

```
FCP Session details
```

```
Target FCID: 0x62011e (S_ID of this session: 0x620001)
pWWN: 21:00:00:04:cf:db:3e:a7, nWWN: 20:00:00:04:cf:db:3e:a7
Session state: LOGGED_IN
1 iSCSI sessions share this FC session
Target: seagate
Negotiated parameters
RcvDataFieldSize 1404 our_RcvDataFieldSize 1404
MaxBurstSize 0, EMPD: FALSE
Random Relative Offset: FALSE, Sequence-in-order: Yes
Statistics:
PDU: Command: 0, Response: 16
Target FCID: 0x620003 (S_ID of this session: 0x620001)
pWWN: 50:05:07:63:00:c4:94:4c, nWWN: 50:05:07:63:00:c0:94:4c
Session state: LOGGED_IN
1 iSCSI sessions share this FC session
Target: shark-lun
Negotiated parameters
RcvDataFieldSize 2048 our_RcvDataFieldSize 1404
MaxBurstSize 0, EMPD: FALSE
Random Relative Offset: FALSE, Sequence-in-order: Yes
Statistics:
PDU: Command: 0, Response: 2343
```

```
canterbury#show ips stats tcp interface gigabitethernet 2/5
```

```
TCP Statistics for port GigabitEthernet2/5
Connection Stats
0 active openings, 345 accepts
0 failed attempts, 0 reset received, 345 established
```

Segment stats

160524 received, 158647 sent, 1 retransmitted

0 bad segments received, 1 reset sent

TCP Active Connections

Local Address	Remote Address	State	Send-Q	Recv-Q
---------------	----------------	-------	--------	--------

10.48.69.222:3260	10.48.69.241:1026	ESTABLISH	0	0
-------------------	-------------------	-----------	---	---

10.48.69.222:3260	10.48.69.241:1034	ESTABLISH	0	0
-------------------	-------------------	-----------	---	---

10.48.69.222:3260	10.48.69.241:1035	ESTABLISH	0	0
-------------------	-------------------	-----------	---	---

0.0.0.0:3260	0.0.0.0:0	LISTEN	0	0
--------------	-----------	--------	---	---

canterbury#show ips stats tcp interface gigabitethernet 2/5 detail

TCP Statistics for port GigabitEthernet2/5

TCP send stats

158647 segments, 132538432 bytes

113573 data, 44411 ack only packets

318 control (SYN/FIN/RST), 0 probes, 344 window updates

1 segments retransmitted, 48 bytes

1 retransmitted while on ethernet send queue, 0 packets split

29286 delayed acks sent

TCP receive stats

160524 segments, 102518 data packets in sequence, 125344708 bytes in

0 predicted ack, 94889 predicted data

0 bad checksum, 0 multi/broadcast, 0 bad offset

0 no memory drops, 0 short segments

0 duplicate bytes, 0 duplicate packets

0 partial duplicate bytes, 0 partial duplicate packets

0 out-of-order bytes, 0 out-of-order packets

0 packet after window, 0 bytes after window

0 packets after close

58221 acks, 132539086 ack bytes, 0 ack toomuch, 6563 duplicate acks

0 ack packets left of snd_una, 0 non-4 byte aligned packets

37322 window updates, 0 window probe

865 pcb hash miss, 171 no port, 1 bad SYN, 0 paws drops

TCP Connection Stats

0 attempts, 345 accepts, 345 established

342 closed, 341 drops, 0 conn drops

0 drop in retransmit timeout, 10 drop in keepalive timeout

0 drop in persist drops, 0 connections drained

TCP Miscellaneous Stats

26399 segments timed, 26398 rtt updated

1 retransmit timeout, 0 persist timeout

6702 keepalive timeout, 6692 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

345 entries, 345 connections completed, 0 entries timed out

0 dropped due to overflow, 0 dropped due to RST

0 dropped due to ICMP unreachable, 0 dropped due to bucket overflow

```
0 abort due to no memory, 0 duplicate SYN, 2 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 10.48.69.241:1026 ESTABLISH 0 0
10.48.69.222:3260 10.48.69.241:1034 ESTABLISH 0 0
10.48.69.222:3260 10.48.69.241:1035 ESTABLISH 0 0
0.0.0.0:3260 0.0.0.0:0 LISTEN 0 0
```

canterbury#show iscsi virtual-target configured

```
target: seagate
```

```
* Port WWN 21:00:00:04:cf:db:3e:a7
```

```
!--- The "*" means you have both discovery and target session. If the
!--- front of the pWWN, it means either you only have discovery sess:
!--- you have no active session.
```

```
Configured node
```

```
No. of LU mapping: 1
```

```
iSCSI LUN: 0x0000, FC LUN: 0x0000
```

```
No. of advertised interface: 1
```

```
GigabitEthernet 2/5
```

```
No. of initiators permitted: 1
```

```
initiator 10.48.69.241/32 is permitted
```

```
all initiator permit is disabled
```

```
target: shark-lun
```

```
* Port WWN 50:05:07:63:00:c4:94:4c
```

```
Configured node
```

```
No. of LU mapping: 2
```

```
iSCSI LUN: 0x0000, FC LUN: 0x0000
```

```
iSCSI LUN: 0x0001, FC LUN: 0x0001
```

```
No. of advertised interface: 1
```

```
GigabitEthernet 2/5
```

```
No. of initiators permitted: 1
```

```
initiator 10.48.69.241/32 is permitted
```

```
all initiator permit is disabled
```

canterbury#show iscsi initiator configured

```
iSCSI Node name is 10.48.69.241
```

```
Member of vsans: 222
```

```
No. of PWWN: 1
```

```
Port WWN is 21:03:00:0c:30:6c:24:42
```

canterbury#show ips arp interface gigabitethernet 2/5

```
Protocol Address Age (min) Hardware Addr Type Interface
Internet 10.48.69.200 0 0008.e21e.c7bc ARPA GigabitEthernet2/5
Internet 10.48.69.202 4 0202.3d30.45ca ARPA GigabitEthernet2/5
Internet 10.48.69.206 4 0202.3d30.45ce ARPA GigabitEthernet2/5
Internet 10.48.69.226 10 0060.08f6.bcl1a ARPA GigabitEthernet2/5
Internet 10.48.69.229 10 0800.209e.edab ARPA GigabitEthernet2/5
```

```

Internet 10.48.69.232 5 0003.4796.34c3 ARPA GigabitEthernet2/5
Internet 10.48.69.238 5 0030.6e1b.6f51 ARPA GigabitEthernet2/5
Internet 10.48.69.239 11 0030.6e1c.a00b ARPA GigabitEthernet2/5
Internet 10.48.69.241 4 000b.cdaf.b4c3 ARPA GigabitEthernet2/5
Internet 10.48.69.248 2 0202.3d30.45f8 ARPA GigabitEthernet2/5
Internet 10.10.2.28 5 0202.3d0a.021c ARPA GigabitEthernet2/5
canterbury#show scsi-target devices vsan 222

```

```

-----
VSAN FCID PWWN VENDOR MODEL REV
-----

```

```

222 0x62011e 21:00:00:04:cf:db:3e:a7 SEAGATE ST336753FC 0003
222 0x620003 50:05:07:63:00:c4:94:4c IBM 2105F20 .114

```

```

!--- All LUNs that have been exported by the IBM Shark are not shown
canterbury#show scsi-target lun vsan 222

```

```

- ST336753FC from SEAGATE (Rev 0003)
FCID is 0x62011e in VSAN 222, PWWN is 21:00:00:04:cf:db:3e:a7
-----

```

```

LUN Capacity Status Serial Number Device-Id
(MB)
-----

```

```

0x0 36704 Online 3HX00Q2600007326 C:1 A:0 T:3 20:00:00:04:cf:db:3e:a7

```

```

- 2105F20 from IBM (Rev .114)
FCID is 0x620003 in VSAN 222, PWWN is 50:05:07:63:00:c4:94:4c
-----

```

```

LUN Capacity Status Serial Number Device-Id
(MB)
-----

```

```

0x5100 4000 Online 10022196 C:2 A:0 T:1 IBM 2105

```

```

0x5101 4000 Online 10122196 C:2 A:0 T:1 IBM 2105

```

```

....

```

```

0x5011 5000 Online 01122196 C:2 A:0 T:1 IBM 2105

```

```

0x5012 5000 Online 01222196 C:2 A:0 T:1 IBM 2105

```

```

0x5013 5000 Online 01322196 C:2 A:0 T:1 IBM 2105

```

```

0x5014 5000 Online 01422196 C:2 A:0 T:1 IBM 2105

```

```

0x5400 3000 Online 40022196 C:2 A:0 T:1 IBM 2105

```

```

0x5401 5000 Online 40122196 C:2 A:0 T:1 IBM 2105

```

```

0x5200 3000 Online 20022196 C:2 A:0 T:1 IBM 2105

```

```
0x5201 3000 Online 20122196 C:2 A:0 T:1 IBM 2105
0x5202 3000 Online 20222196 C:2 A:0 T:1 IBM 2105
0x5203 3000 Online 20322196 C:2 A:0 T:1 IBM 2105
0x5204 3000 Online 20422196 C:2 A:0 T:1 IBM 2105
0x5205 3000 Online 20522196 C:2 A:0 T:1 IBM 2105
0x5206 3000 Online 20622196 C:2 A:0 T:1 IBM 2105
0x5207 3000 Online 20722196 C:2 A:0 T:1 IBM 2105
0x5208 3000 Online 20822196 C:2 A:0 T:1 IBM 2105
0x5209 3000 Online 20922196 C:2 A:0 T:1 IBM 2105
```

.....

```
canterbury#show int iscsi 2/5
```

```
iscsi2/5 is up
```

```
Hardware is GigabitEthernet
```

```
Port WWN is 20:51:00:0c: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 disabled
```

```
QOS code point is 0
```

```
Forwarding mode: pass-thru
```

```
TMF Queueing Mode : disabled
```

```
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 132567 packets, 125344708 bytes
```

```
Command 8637 pdus, Data-out 117005 pdus, 118916096 bytes
```

```
Output 113573 packets, 132538432 bytes
```

```
Response 8439 pdus (with sense 10), R2T 3913 pdus
```

```
Data-in 93902 pdus, 127070632 bytes
```

```
canterbury#show iscsi stats iscsi 2/5
```

```
iscsi2/5
 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
132567 packets input, 125344708 bytes
Command 8637 pdus, Data-out 117005 pdus, 118916096 bytes, 0 fragment
output 113573 packets, 132538432 bytes
Response 8439 pdus (with sense 10), R2T 3913 pdus
Data-in 93902 pdus, 127070632 bytes

canterbury#show int gigabitethernet 2/5
GigabitEthernet2/5 is up
  Hardware is GigabitEthernet, address is 0005.3000.adea
  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
  5 minutes input rate 224 bits/sec, 28 bytes/sec, 0 frames/sec
  5 minutes output rate 80 bits/sec, 10 bytes/sec, 0 frames/sec
  205453 packets input, 138346789 bytes
  0 multicast frames, 0 compressed
  0 input errors, 0 frame, 0 overrun 0 fifo
  165673 packets output, 141485482 bytes, 0 underruns
  0 output errors, 0 collisions, 0 fifo
  0 carrier errors

canterbury#show ip route

Codes: C - connected, S - static

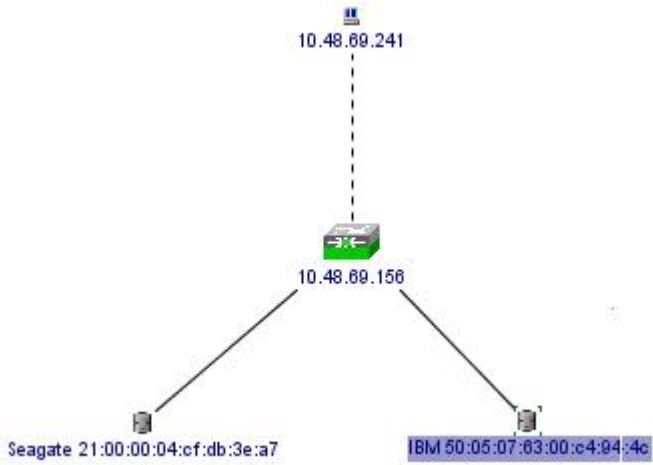
Gateway of last resort is 10.48.69.129

C 10.48.69.192/26 is directly connected, GigabitEthernet2/5
C 10.48.69.128/26 is directly connected, mgmt0
canterbury#
```

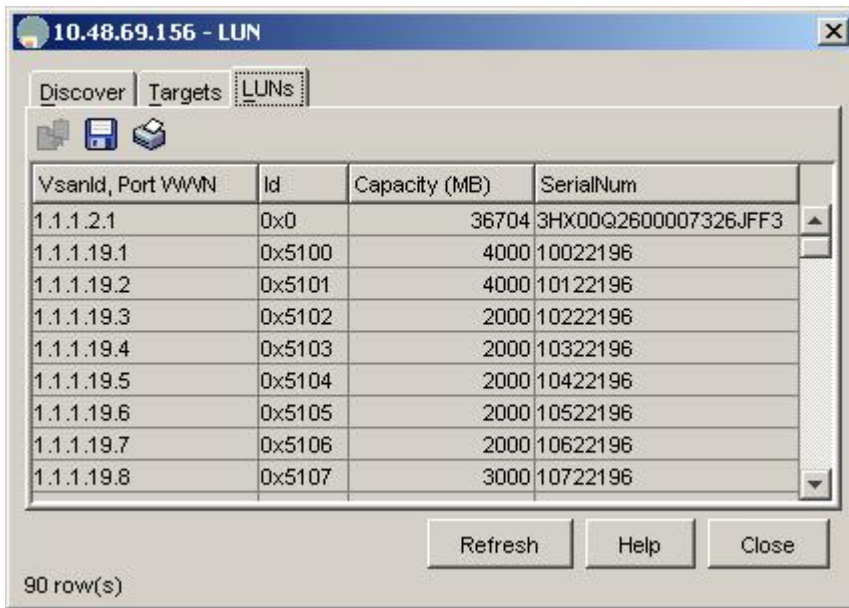
Fabric Manager and Device Manager Displays

This section provides screen captures from MDS Fabric Manager 1.2(2) and Device Manager 1.2(2).

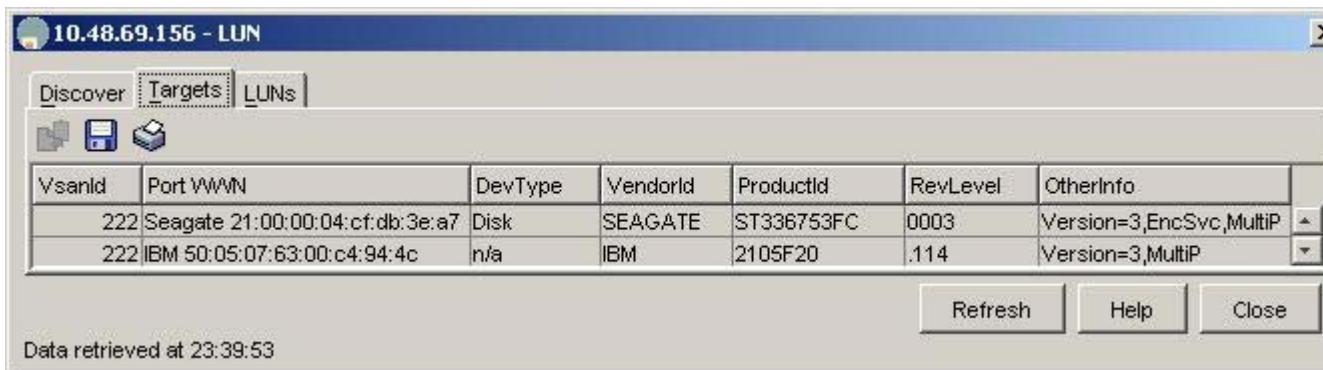
Topology diagram from the Fabric Manager



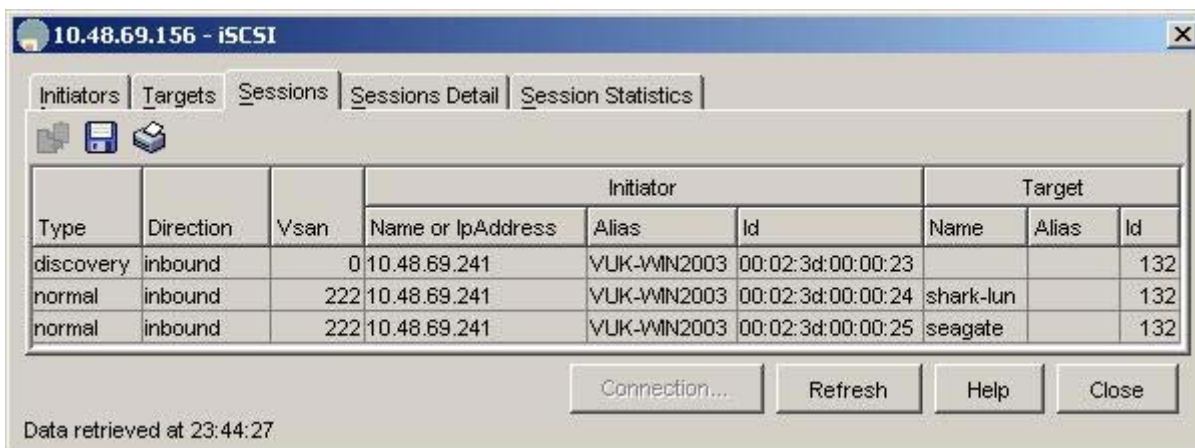
Select **FC-LUNs** to display the pWWNs, LUN IDs, and the capacity of your LUNs from the Device Manager.



Select **FC-LUNs** to display the Targets from the Device Manager.



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



IBM Shark Definitions

This section provides screen capture from Enterprise Storage Server Specialist (ESSS).

One host has been defined on the ESS with static WWPN 21:03:00:0c:30:6c:24:42 that has been defined for initiator volumes have been assigned to this host.

Specialist - shark1

TotalStorage Solutions

Enterprise Storage Server Specialist

Open System Storage

Host Systems

Nickname	Host Type	Attachment	WWPN	Hostname/IP Address
sonja_fci1	PC Server (Win 2000 or Win NT 4.0)	FC	2800000653389EA0	sonja
sonja_fci2	PC Server (Win 2000 or Win NT 4.0)	FC	2900000653389EA0	sonja
vuk-iscsi	PC Server (Win 2000 or Win NT 4.0)	FC	2103000C306C2442	vuk

Assigned Volumes

Volume	Vol Type	Size	Storage Type	Location	LSS
012-22196	Open System	05.0 GB	RAID Array	Device Adapter Pair 1 Cluster 1, Loop A Array 2, Vol 018	LSS: 0x010
209-22196	Open System	03.0 GB	RAID Array	Device Adapter Pair 2 Cluster 1, Loop A Array 2, Vol 009	LSS: 0x012

Java Applet Window

Related Information

- [Cisco iSCSI Software Downloads \(registered customers only\)](#)
- [iSCSI Driver for Windows 2000 Frequently Asked Questions](#)
- [Release Notes for Cisco Windows 2000 iSCSI Driver](#)
- [Troubleshooting the iSCSI Driver for Windows 2000](#)
- [Cisco MDS 9000 Family Troubleshooting Guide, Release 1.2\(1a\)](#)
- [Technical Support & Documentation - Cisco Systems](#)

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