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Solaris iSCSI Host to SN 5428 Configuration Example

Document ID: 45360

Introduction

Prerequisites

- Requirements

- Components Used

- Conventions

- Background Theory

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- Network Diagram

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- IBM Shark Definitions

Related Information

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 Solaris iSCSI host to SN 5428.

Prerequisites

Requirements

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

- Before you create the iSCSI configuration on the SN 5428, you need to install the iSCSI driver that is compatible to your Solaris version. The most current version of the driver can be found at the Cisco iSCSI Driver for Sun Solaris (registered customers only) 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 Sun Solaris Release Notes.
- The Cisco iSCSI Driver for Sun Solaris runs only on SPARC machines. The driver does not work with any other processor types (for example, x86).

Components Used

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

- SunOS 5.9, SPARC Ultra-4 E450

uname -a

SunOS baboon 5.9 Generic sun4u sparc SUNW,Ultra-4

- Cisco iSCSI Driver 3.3.3 for Solaris

```
# pkginfo -l CSC0iscsi
PKGINST: CSC0iscsi
NAME: Cisco iSCSI device driver
CATEGORY: system
ARCH: sparc
VERSION: 3.3.3
BASEDIR: /opt/CSC0iscsi
VENDOR: Cisco Systems, Inc.
DESC: Cisco iSCSI device driver 3.3.3
PSTAMP: solaris-920030807170521
INSTDATE: Aug 25 2003 23:41
HOTLINE: For contracted support, 1-800-553-2447,
Cisco Technical Assistance Center (TAC)
EMAIL: For online help, go to http://www.cisco.com/
STATUS: completely installed
FILES: 74 installed pathnames
16 shared pathnames
29 directories
32 executables
2182 blocks used (approx)

software release
# iscsi-ls -v
iSCSI driver version: 3.3.3
```

- Cisco SN 5428 with Software Version 3.3.2

```
[Rita]# show ver
Cisco SN 5428-K9 Storage Router
  CLI Version: 2.1
  iSCSI Version: 0/2 (Min/Max)
  System Bootstrap: 3.3.2-K9
  Operating System: 3.3.2-K9
  Switch Version: V1.4.0.43-0
  Application: 3.3.2-K9
  Web Server: R6_1_0
  OpenSSH: 3.4p1
  OpenSSL: 0.9.6e
  Zlib: 1.1.4
```

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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

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

Background Theory

SCSI routing provides IP hosts with access to Fibre Channel (FC) storage devices as if the storage devices were directly attached to the hosts. Access to devices is managed primarily in the SN 5428 storage router. An iSCSI target is an arbitrary name for a group of physical storage devices. The iSCSI targets are created and mapped to physical storage devices attached to the SN 5428. The storage router presents the iSCSI targets to IP hosts as if the physical storage devices were directly attached to the hosts. With SCSI routing, storage devices are not aware of each IP host; the storage devices are aware of the SN 5428 and respond to it as if it

were one FC host. SCSI routing consists of routing SCSI requests and responses between hosts in an IP network and FC storage.

Each host that requires IP access to storage by way of an SN 5428 storage router needs to have a compatible iSCSI driver installed. With the iSCSI protocol, the iSCSI driver allows an IP 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 or FC driver for a peripheral channel in the host. SCSI routing consists of these main actions:

- Transporting SCSI requests and responses over an IP network between the hosts and the SN 5428 storage router.
- Routing SCSI requests and responses between hosts on an IP network and FC storage.
- Transporting SCSI requests and responses between the SN 5428 storage router and FC storage.

In the SN 5428 storage router, SCSI routing occurs through the mapping of physical storage devices to iSCSI targets. You can map an iSCSI target to multiple physical devices. An iSCSI target always contains at least one Logical Unit Number (LUN). Each LUN on an iSCSI target is mapped to a single LUN on a physical storage target.

You can choose either of two types of storage mapping: target-and-LUN mapping or target-only mapping. Target-and-LUN mapping maps an iSCSI target and LUN combination to a physical storage target and LUN combination. Target-only mapping maps an iSCSI target to a physical storage target and its LUNs.

With target-and-LUN mapping, an iSCSI target name and iSCSI LUN number are specified and mapped to the physical storage address of one LUN; either a WWPN + LUN (World Wide Port Name + LUN) combination, a LUN ID (unique LUN identifier), or a LUN serial number.

If the LUN is available, it is made available as an iSCSI LUN and numbered with the iSCSI LUN number specified. For example, if an iSCSI target and iSCSI LUN specified as Database, LUN 9 were mapped to the physical storage address, WWPN 3100112233445566, LUN 12, LUN 12 would be available as one iSCSI LUN. An iSCSI driver would see the iSCSI target named Database, with one iSCSI LUN identified as LUN 9. The iSCSI LUN would appear as one storage device to a host.

With target-only mapping, an iSCSI target name is specified and mapped to the physical storage address of a storage controller only, a WWPN. Any LUNs that are available in the storage controller are made available as iSCSI LUNs and are numbered the same as the LUNs in the storage controller. For example, if an iSCSI target specified as Webserver2000 were mapped to the physical storage address WWPN 3100112233445577, and LUNs 0 through 2 were available in that controller, those LUNs would become available as three iSCSI LUNs. An iSCSI driver would see the iSCSI target named Webserver2000 as a controller with three iSCSI LUNs identified as LUN 0, LUN 1, and LUN 2. Each iSCSI LUN would appear as a separate storage device to a host.

Access for SCSI routing is controlled in the IP hosts and the storage router. In an IP host, the iSCSI driver is configured with the Gigabit Ethernet (GE) IP address of the SCSI routing instance in the storage router with which the host is to transport SCSI requests and responses. In a storage router, access is controlled through an access list and a VLAN Identifier (VID) number of the hosts. Additionally, access can be further controlled in the SN 5428 through authentication.

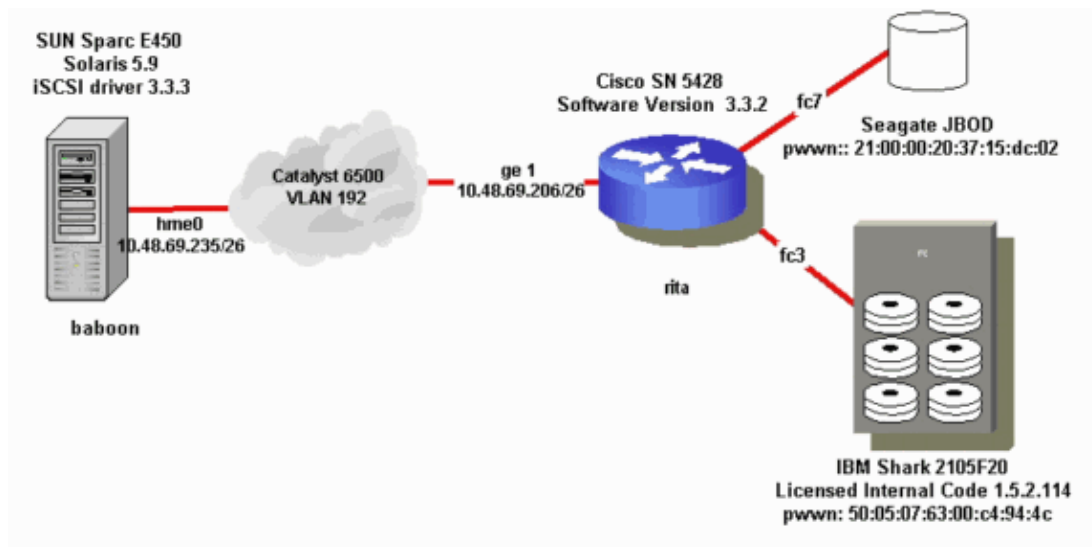
Configure

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, use the Cisco SN 5428 Storage Router documentation and Command Line Interface Reference.

Network Diagram

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



Configurations

This document uses the configurations shown below.

- Baboon (SunOS 5.9 SPARC E 450)
- Rita (SN 5428 3.3.2)

Baboon (SunOS 5.9 SPARC E 450)

On the Solaris host, these files need to be modified:

1. /etc/iscsi.conf
2. /etc/iscsi.bindings
3. /kernel/drv/sd.conf

```
bash-2.05# cat /etc/iscsi.conf
# iSCSI configuration file - see iscsi.conf(4)

# DiscoveryAddress Settings
# -----
# Add "DiscoveryAddress=xxx" entries for each iSCSI router instance.
# The driver will attempt 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=10.48.69.206
```

```

!--- Configure the IP address of the GE interface that will accept iSCSI
!--- requests from your host.

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

!--- Other required driver parameters can be changed in iscsi.conf.

.....
bash-2.05# cat /etc/iscsi.bindings
# iSCSI bindings, file format version 1.0.
# NOTE: this file is automatically maintained by the iSCSI daemon.
# You should 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        0       iqn.1987-05.com.cisco:00.59870777d907.ibm-shark
0        1       iqn.1987-05.com.cisco:00.e80e5ee8680d.seagate
0        2       iqn.1987-05.com.cisco:00.9638ad30d4c1.shark-lun4-lun5

!--- 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 that have been logged-in to 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 should stop the iSCSI driver before editing the
!--- /etc/iscsi.bindings file.

!--- To manually start the iSCSI driver, enter /etc/init.d/iscsi start.

!--- To manually stop the iSCSI driver, enter /etc/init.d/iscsi stop.

bash-2.05# cat /kernel/drv/sd.conf
name="sd" class="scsi" class_prop="atapi"
target=0 lun=0;

name="sd" class="scsi" target=1 lun=0;
name="sd" class="scsi" target=1 lun=1;

```

```

name="sd" class="scsi" target=1 lun=2;

# Start iSCSI auto-generated configuration -- do NOT alter or delete this line
# You may need to add additional lines to probe for additional LUNs
# or targets. You SHOULD delete any lines that represent iSCSI targets
# or LUNs that are not used.
name="sd" parent="iscsi" target=0 lun=0;
name="sd" parent="iscsi" target=1 lun=0;
name="sd" parent="iscsi" target=1 lun=1;
name="sd" parent="iscsi" target=1 lun=2;
name="sd" parent="iscsi" target=2 lun=3;
name="sd" parent="iscsi" target=2 lun=4;
name="sd" parent="iscsi" target=2 lun=5;
name="sd" parent="iscsi" target=2 lun=0;

# End iSCSI auto-generated configuration -- do NOT alter or delete this line

!--- If the targets that get discovered by the iSCSI driver at any point
!--- in time do not have a corresponding entry in the standard device
!--- configuration files (for example, /kernel/drv/sd.conf or
!--- /kernel/drv/st.conf), the corresponding entries for these devices
!--- need to be created in the standard device configuration files, the system
!--- needs to be rebooted, and standard Solaris administrative commands
!--- (devfsadm, drvconfig, and so on) need to be issued once the system comes up.
!--- If the entries in the device configuration files are already present,
!--- you do not have to reboot the system, however, the standard device
!--- configuration commands (devfsadm, drvconfig, and so on) need to be run to
!--- configure the new iSCSI devices in the system.

```

Rita (SN 5428 3.3.2)

```

....
! VLAN
!
! (no vlan(s) found)
!
! SCSIROUTER
!
scsirouter solaris

!--- A SCSI routing instance named solaris has been
!--- created for the Solaris host test.

scsirouter solaris description "solaris_server_baboon"
scsirouter solaris authentication "none"
scsirouter solaris username "none"
scsirouter solaris password "none"
scsirouter solaris primary "none"
scsirouter solaris reserveproxy disable
scsirouter solaris failover primary none
scsirouter solaris failover secondary none
scsirouter solaris lun reset no
scsirouter solaris serverIf ge1 10.48.69.206/255.255.255.192

```

*!--- Interface (ge1) is assigned to SCSI instance solaris. 10.48.69.206 will
!--- be used by IP hosts to access the SCSI routing instance.*

```
scsirouter solaris target ibm-shark lun 0 lunid "db44f747a2cd81a35745889f81c47103"  
scsirouter solaris target ibm-shark lun 1 lunid "55bcd149af855c7091df146880dd4043"  
scsirouter solaris target ibm-shark description "ibm-shark"
```

*!--- Target **ibm-shark** is an example of target-and-LUN
!--- mapping with LUN ID addressing.*

```
scsirouter solaris target ibm-shark enable  
scsirouter solaris target ibm-shark accesslist "any" rw  
scsirouter solaris target ibm-shark accesslist "none" ro  
scsirouter solaris target ibm-shark maxcmdqueuedepth "0"  
scsirouter solaris target ibm-shark trespass  
scsirouter solaris target seagate wwpn "210000203715dc02"  
scsirouter solaris target seagate description "apcon_2"  
scsirouter solaris target seagate enable  
scsirouter solaris target seagate accesslist "any" rw  
scsirouter solaris target seagate accesslist "none" ro  
scsirouter solaris target seagate maxcmdqueuedepth "0"
```

*!--- Target **seagate** is an example of target-only mapping
!--- with WWPN addressing.*

```
no scsirouter solaris target seagate trespass  
scsirouter solaris target shark-lun4-lun5 lun 4 wwpn "5005076300c4944c" lun "4"  
scsirouter solaris target shark-lun4-lun5 lun 5 wwpn "5005076300c4944c" lun "5"  
scsirouter solaris target shark-lun4-lun5 description "ibm-shark"  
scsirouter solaris target shark-lun4-lun5 enable
```

*!--- Target **shark-lun4-lun5** is an example of target-and-LUN
!--- mapping with WWPN addressing.*

```
scsirouter solaris target shark-lun4-lun5 accesslist "any" rw  
scsirouter solaris target shark-lun4-lun5 accesslist "none" ro  
scsirouter solaris target shark-lun4-lun5 maxcmdqueuedepth "0"  
scsirouter solaris target shark-lun4-lun5 trespass
```

!

! SYSTEM

!

hostname Rita

! Mgmt Port

!

interface mgmt ip-address 10.48.69.148/255.255.255.192

!

! HA Port

!

interface ha ip-address 10.1.1.148/255.255.255.0

!

! GE

!

interface ge1 no autonegotiation

interface ge1 mtusize 1500

```

interface ge1 vlan enable
!
! GE
!
interface ge2 autonegotiation autodetect
interface ge2 mtusize 1500
interface ge2 vlan enable
!
! ROUTES
!
ip default-gateway 10.48.69.129

! RIP
!
no ip rip enable
ip rip timers invalid 180
!
! ADMIN LOGIN
!
admin password <password>
!
! MONITOR LOGIN
!
monitor password <password>
!
! SNTP
!
clock timezone GMT
!
! SNMP
!
snmp-server community public ro
snmp-server community private rw
no snmp-server host all traps
no snmp-server sendauthtraps
snmp-server linkupdown mgmt
snmp-server linkupdown ha
snmp-server linkupdown ge1
snmp-server linkupdown ge2
snmp-server linkupdown fc1
snmp-server linkupdown fc2
snmp-server linkupdown fc3
snmp-server linkupdown fc4
snmp-server linkupdown fc5
snmp-server linkupdown fc6
snmp-server linkupdown fc7
snmp-server linkupdown fc8
!
! DNS
!
ip name-server 144.254.10.123
ip domain-name cisco.com
!
! TELNET
!
no session-timeout
! FC SWITCH
!
fcswitch ratov 10000
fcswitch edtov 2000
fcswitch dstov 5000
fcswitch fstov 1000
fcswitch zoning default All
no fcswitch zoning autosave enable

```

```

fcs switch zoning merge SW2
fcs switch domainid 104 force
no fcs switch domainid lock enable
fcs switch interop-credit 12
!
! FC ZONE ALIAS
!
fcalias iscsi
fcalias iscsi member wwpn 280000059ba695e0

!--- Initiator WWP1.

fcalias iscsi member wwpn 290000059ba695e0

!--- Initiator WWP2.


!--- The LUN-mapping and LUN-masking on the storage device
!--- have to be done with WWP1 and WWP2.


!
! FC PORTS
!
interface fc1 enable
interface fc1 ms-enable enable
no interface fc1 al-fairness enable
interface fc1 fan-enable enable
interface fc1 ext-credit 0
interface fc1 mfs-bundle enable timeout 10
interface fc1 linkspeed auto
interface fc1 type g-port
!
interface fc2 enable
interface fc2 ms-enable enable
no interface fc2 al-fairness enable
interface fc2 fan-enable enable
interface fc2 ext-credit 0
interface fc2 mfs-bundle enable timeout 10
interface fc2 linkspeed auto
interface fc2 type g-port
!
interface fc3 enable
interface fc3 ms-enable enable
no interface fc3 al-fairness enable
interface fc3 fan-enable enable
interface fc3 ext-credit 0
interface fc3 mfs-bundle enable timeout 10
interface fc3 linkspeed auto
interface fc3 type gl-port
!
!
interface fc7 enable
interface fc7 ms-enable enable
no interface fc7 al-fairness enable
interface fc7 fan-enable enable
interface fc7 ext-credit 0
interface fc7 mfs-bundle enable timeout 10
interface fc7 linkspeed auto
interface fc7 type gl-port
!
interface fc8 enable

```

```

interface fc8 ms-enable enable
no interface fc8 al-fairness enable
interface fc8 fan-enable enable
interface fc8 ext-credit 0
interface fc8 mfs-bundle enable timeout 10
interface fc8 linkspeed auto
interface fc8 type gl-port
!
! AAA
!
aaa new-model

```

Verify

This section provides information you can use to confirm 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.

- **netstat -n** verifies the TCP connections on Solaris host.
- **iscsi-ls -l** views devices currently available on Solaris host.
- **show system** displays the system information, serial number, MAC addresses, interfaces, and software version.
- **show fcswitch** displays global configuration information for SN 5428 storage router FC interfaces.
- **show fcswitch nameserver brief** displays brief global configuration information for storage router FC interfaces.
- **show fcswitch nameserver all** displays global configuration information for storage router FC interfaces.
- **show devices** displays all SCSI devices.
- **show scsirouter solaris** displays all configuration information for the specified SCSI routing instance.
- **show scsirouter solaris connection** displays iSCSI initiator information for the Windows 2000 iSCSI session.
- **show scsirouter solaris host** displays host information.
- **show scsirouter solaris stats** displays access and connection information.
- **show scsirouter solaris host stats** displays host statistic information.
- **show scsirouter solaris target all stats** displays statistic information about all targets.
- **show fcswitch linkstate database** displays current link information for all FC ports.
- **show int ge1** displays the GE interface.
- **show ip route** displays IP route information.

Troubleshoot

This section provides information relevant for troubleshooting your configuration.

- Displays from Baboon
- Displays from Rita (SN 5428)

Displays from Baboon

```

bash-2.05# cat /etc/iscsi.bindings
# iSCSI bindings, file format version 1.0.
# NOTE: this file is automatically maintained by the iSCSI daemon.
# You should 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        0        iqn.1987-05.com.cisco:00.59870777d907.ibm-shark
0        1        iqn.1987-05.com.cisco:00.e80e5ee8680d.seagate
0        2        iqn.1987-05.com.cisco:00.9638ad30d4c1.shark-lun4-lun5
```

```
bash-2.05# netstat -n
```

```
TCP: IPv4
```

Local Address	Remote Address	Swind	Send-Q	Rwind	Recv-Q	State
10.48.69.235.23	144.254.8.34.35178	24820	1	49560	0	ESTABLISHED
10.48.69.235.32836	10.48.69.206.3260	65535	0	49044	0	ESTABLISHED
10.48.69.235.32837	10.48.69.206.3260	524280	0	512188	0	ESTABLISHED
10.48.69.235.32838	10.48.69.206.3260	524280	0	512192	0	ESTABLISHED
10.48.69.235.32839	10.48.69.206.3260	524280	0	512184	0	ESTABLISHED

```
Active UNIX domain sockets
```

Address	Type	Vnode	Conn	Local Addr	Remote Addr
30002dc9c88	dgram	30000203528	00000000	/tmp/portal	

```
bash-2.05# netstat -rn
```

```
Routing Table: IPv4
```

Destination	Gateway	Flags	Ref	Use	Interface
10.48.69.192	10.48.69.235	U	1	4	hme0
224.0.0.0	10.48.69.235	U	1	0	hme0
default	10.48.69.200	UG	1	13	
127.0.0.1	127.0.0.1	UH	2	12	lo0

```
!--- The standard device configuration commands (devfsadm, drvconfig, and so on)
!--- need to be run to configure the new iSCSI devices in the system.
```

```
bash-2.05# devfsadm
```

```
bash-2.05# format
```

```
Searching for disks...done
```

```
c3t1d0: configured with capacity of 34.18GB
```

```
c3t2d4: configured with capacity of 951.56MB
```

```
AVAILABLE DISK SELECTIONS:
```

0. c0t0d0 <SUN18G cyl 7506 alt 2 hd 19 sec 248>
/pci@1f,4000/scsi@3/sd@0,0
1. c0t1d0 <SUN18G cyl 7506 alt 2 hd 19 sec 248>
/pci@1f,4000/scsi@3/sd@1,0
2. c3t0d0 <IBM-2105F20-.114 cyl 2948 alt 2 hd 30 sec 64>
/iscsipseudo/iscsi@0/sd@0,0
3. c3t0d1 <IBM-2105F20-.114 cyl 2032 alt 2 hd 30 sec 64>
/iscsipseudo/iscsi@0/sd@0,1
4. c3t1d0 <SEAGATE-ST336753FC-0005 cyl 31275 alt 2 hd 4 sec 573>
/iscsipseudo/iscsi@0/sd@1,0
5. c3t2d0 <drive type unknown>
/iscsipseudo/iscsi@0/sd@2,0

6. c3t2d4 <IBM-2105F20- cyl 1015 alt 2 hd 30 sec 64>
/iscsipseudo/iscsi@0/sd@2,4
7. c3t2d5 <IBM-2105F20-.114 cyl 2948 alt 2 hd 30 sec 64>
/iscsipseudo/iscsi@0/sd@2,5

Specify disk (enter its number): 4

FOR SEAGATE:

partition> p

Current partition table (default):

Total disk cylinders available: 31275 + 2 (reserved cylinders)

Part	Tag	Flag	Cylinders	Size	Blocks
0	root	wm	0 - 114	128.70MB	(115/0/0) 263580
1	swap	wu	115 - 229	128.70MB	(115/0/0) 263580
2	backup	wu	0 - 31274	34.18GB	(31275/0/0) 71682300
3	unassigned	wm	0	0	(0/0/0) 0
4	unassigned	wm	0	0	(0/0/0) 0
5	unassigned	wm	0	0	(0/0/0) 0
6	usr	wm	230 - 31274	33.93GB	(31045/0/0) 71155140
7	unassigned	wm	0	0	(0/0/0) 0

*!--- To view the devices currently available, issue the
!--- utility **iscsi-ls -l** or **iscsi-ls** commands.*

bash-2.05# **iscsi-ls -l**

```
*****
TARGET NAME iqn.1987-05.com.cisco:00.59870777d907.ibm-shark
TARGET ID 0:
  ADDRESS = 10.48.69.206:3260, 1
  STATUS = Connected 10.48.69.235:32837<->10.48.69.206:3260 9/15/2003 17:28:43
  SESSION = ISID 00023d000001 TSID 2 PID 397
  LUN 0 = DISK c3t0d0 (sd296) 'IBM-2105F20-' SERIAL# 11A22196
    BLOCKS: 5664063 BLOCK SIZE: 512
  LUN 1 = DISK c3t0d1 (sd374) 'IBM-2105F20-' SERIAL# 10222196
    BLOCKS: 3906303 BLOCK SIZE: 512
*****
TARGET NAME iqn.1987-05.com.cisco:00.e80e5ee8680d.seagate
TARGET ID 1:
  ADDRESS = 10.48.69.206:3260, 1
  STATUS = Connected 10.48.69.235:32838<->10.48.69.206:3260 9/15/2003 17:28:43
  SESSION = ISID 00023d000001 TSID 3 PID 398
  LUN 0 = DISK c3t1d0 (sd297) 'SEAGATE-ST336753FC-0005' SERIAL# 3HX0H0MV
    BLOCKS: 71687371 BLOCK SIZE: 512
  LUN 1 : Open of /devices/iscsipseudo/iscsi@0/sd@1,1:a,raw failed -
    No such device or address
  LUN 2 : Open of /devices/iscsipseudo/iscsi@0/sd@1,2:a,raw failed -
    No such device or address
*****
TARGET NAME iqn.1987-05.com.cisco:00.9638ad30d4c1.shark-lun4-lun5
TARGET ID 2:
  ADDRESS = 10.48.69.206:3260, 1
  STATUS = Connected 10.48.69.235:32839<->10.48.69.206:3260 9/15/2003 17:28:43
  SESSION = ISID 00023d000001 TSID 4 PID 399
  LUN 0 : SCSI Inquiry failed - Bad file number
  LUN 3 : Open of /devices/iscsipseudo/iscsi@0/sd@2,3:a,raw failed -
    No such device or address
  LUN 4 = DISK c3t2d4 (sd372) 'IBM-2105F20-' SERIAL# 00722196
    BLOCKS: 1953151 BLOCK SIZE: 512
  LUN 5 = DISK c3t2d5 (sd373) 'IBM-2105F20-' SERIAL# 11B22196
    BLOCKS: 5664063 BLOCK SIZE: 512
```

```

*****

!--- To see detailed statistics for currently established iSCSI sessions,
!--- issue the iscsi-ls -c command.

bash-2.05# iscsi-ls -c
*****
TARGET NAME iqn.1987-05.com.cisco:00.59870777d907.ibm-shark
TARGET ID 0:
  ADDRESS = 10.48.69.206:3260, 1
  STATUS = Connected 10.48.69.235:32837<->10.48.69.206:3260 9/15/2003 17:28:43
  SESSION = ISID 00023d000001 TSID 2 PID 397
  InitialR2T = No
  MaxRecvDataSegmentLength = 131072 Bytes
  MaxXmitDataSegmentLength = 524288 Bytes
  FirstBurstLength = 65536 Bytes
  MaxBurstLength = 4194304 Bytes
  LoginTimeout = 15 Seconds
  AuthTimeout = 45 Seconds
  ActiveTimeout = 5 Seconds
  IdleTimeout = 60 Seconds
  PingTimeout = 5 Seconds
  HeaderDigest = None
  DataDigest = None
  ConnFailTimeout = Default
  MultiPath = None
*****
TARGET NAME iqn.1987-05.com.cisco:00.e80e5ee8680d.seagate
TARGET ID 1:
  ADDRESS = 10.48.69.206:3260, 1
  STATUS = Connected 10.48.69.235:32838<->10.48.69.206:3260 9/15/2003 17:28:43
  SESSION = ISID 00023d000001 TSID 3 PID 398
  InitialR2T = No
  MaxRecvDataSegmentLength = 131072 Bytes
  MaxXmitDataSegmentLength = 524288 Bytes
  FirstBurstLength = 65536 Bytes
  MaxBurstLength = 4194304 Bytes
  LoginTimeout = 15 Seconds
  AuthTimeout = 45 Seconds
  ActiveTimeout = 5 Seconds
  IdleTimeout = 60 Seconds
  PingTimeout = 5 Seconds
  HeaderDigest = None
  DataDigest = None
  ConnFailTimeout = Default
  MultiPath = None
*****
TARGET NAME iqn.1987-05.com.cisco:00.9638ad30d4c1.shark-lun4-lun5
TARGET ID 2:
  ADDRESS = 10.48.69.206:3260, 1
  STATUS = Connected 10.48.69.235:32839<->10.48.69.206:3260 9/15/2003 17:28:43
  SESSION = ISID 00023d000001 TSID 4 PID 399
  InitialR2T = No
  MaxRecvDataSegmentLength = 131072 Bytes
  MaxXmitDataSegmentLength = 524288 Bytes
  FirstBurstLength = 65536 Bytes
  MaxBurstLength = 4194304 Bytes
  LoginTimeout = 15 Seconds
  AuthTimeout = 45 Seconds
  ActiveTimeout = 5 Seconds

```

```

IdleTimeout           = 60 Seconds
PingTimeout           = 5 Seconds
HeaderDigest          = None
DataDigest            = None
ConnFailTimeout       = Default
MultiPath              = None
*****

```

*!--- To view the devices currently available, issue the
!--- iscsi-ls -l or iscsi-ls commands.*

```

bash-2.05# iscsi-ls
*****
TARGET NAME iqn.1987-05.com.cisco:00.59870777d907.ibm-shark
TARGET ID 0:
  ADDRESS = 10.48.69.206:3260, 1
  STATUS  = Connected 10.48.69.235:32837<->10.48.69.206:3260  9/15/2003 17:28:43
  SESSION = ISID 00023d000001 TSID 2 PID 397
*****
TARGET NAME iqn.1987-05.com.cisco:00.e80e5ee8680d.seagate
TARGET ID 1:
  ADDRESS = 10.48.69.206:3260, 1
  STATUS  = Connected 10.48.69.235:32838<->10.48.69.206:3260  9/15/2003 17:28:43
  SESSION = ISID 00023d000001 TSID 3 PID 398
*****
TARGET NAME iqn.1987-05.com.cisco:00.9638ad30d4c1.shark-lun4-lun5
TARGET ID 2:
  ADDRESS = 10.48.69.206:3260, 1
  STATUS  = Connected 10.48.69.235:32839<->10.48.69.206:3260  9/15/2003 17:28:43
  SESSION = ISID 00023d000001 TSID 4 PID 399
*****

```

!--- In the /var/adm/messages or dmesg, you can see these iSCSI connections:

```

Sep 15 17:28:43 baboon iscsid[388]: [ID 702911 daemon.notice] version 3.3.3 ( 7-Aug-2003)
Sep 15 17:28:43 baboon iscsid[397]: [ID 702911 daemon.notice]
  iSCSI normal session to iqn.1987-05.com.cisco:00.59870777d907.ibm-shark established
Sep 15 17:28:43 baboon iscsid[397]: [ID 702911 daemon.notice]
  logged into target iqn.1987-05.com.cisco:00.59870777d907.ibm-shark -- id 0,
  Initiator sid 00023d000001, target sid 2
Sep 15 17:28:43 baboon iscsid[398]: [ID 702911 daemon.notice]
  iSCSI normal session to iqn.1987-05.com.cisco:00.e80e5ee8680d.seagate established
Sep 15 17:28:43 baboon iscsid[398]: [ID 702911 daemon.notice]
  logged into target iqn.1987-05.com.cisco:00.e80e5ee8680d.seagate -- id 1,
  Initiator sid 00023d000001, target sid 3
Sep 15 17:28:43 baboon iscsid[399]: [ID 702911 daemon.notice]
  iSCSI normal session to iqn.1987-05.com.cisco:00.9638ad30d4c1.shark-lun4-lun5 established
Sep 15 17:28:43 baboon iscsid[399]: [ID 702911 daemon.notice]
  logged into target iqn.1987-05.com.cisco:00.9638ad30d4c1.shark-lun4-lun5 -- id 2,
  Initiator sid 00023d000001, target sid 4
Sep 15 17:32:34 baboon iscsimod:

```

Displays from Rita (SN 5428)

```

[Rita]# show system
      System Name: Rita
      System Deployed For: SCSI routing
      Software Capacity: 59392.0 KB
      Free Software Space: 30705.0 KB
      Configuration Capacity: 14464.0 KB
      Free Configuration Space: 13816.0 KB
      Log Capacity: 29056.0 KB
      Free Log Space: 28865.0 KB
      Software Version: 3.3.2-K9
      Last Reset: Mon Sep 15 15:11:32 GMT 2003
      Current Time: Mon Sep 15 15:38:05 GMT 2003
      Time Zone: GMT
      NTP Server: none
      Name Servers: 144.254.10.123(Pri) (Sec)
      Domain: cisco.com
      Telnet session timeout: none

      Model Number  Rev  Serial Number  Part Number
System          SN 5428-K9   00   Unit SN        800part_number
Processor       Rainmaker  02   SAD061200UJ    73-7996-03

Device      IP/Netmask                MAC
lo0         127.0.0.1/8
mgmt        10.48.69.148/26        00:05:9b:a6:95:e0
ha          10.1.1.148/24        00:05:9b:a6:95:e1
ge1         10.48.69.206/26        02:02:3d:30:45:ce
ge2

[Rita]# show fcswitch
Global attributes                               Value
-----
Domain ID                                     104
Domain ID lock                               disabled
Active Zoneset                               None
Zoning Merge                                 SW2
Zoning Default                               All
Zoning Autosave                             disabled
Distributed Services timeout (dstov)         5000
Fabric Services timeout (fstov)              1000
Error Detect timeout (edtov)                 2000
Resource Allocation timeout (ratov)          10000
Buffer to Buffer Credit (interop)            12
Initiator WWPN1                             2800000059ba695e0
Initiator WWPN2                             2900000059ba695e0

[Rita]#
[Rita]# show int brief XX
Interface Stat IP/Netmask                MAC                Options
-----
lo0          up   127.0.0.1/ff000000
mgmt         up   10.48.69.148/ffffffc0  00059ba695e0
ha           up   10.1.1.148/ffffff00   00059ba695e1
fei2         up   2.0.0.1/ffffff00     00059ba695e2
fc0          up
fc1          down
fc2          down
fc3          up
fc4          down
fc5          down
fc6          down
fc7          up
fc8          down
fc15         up

```

```

fci1      up
fci2      up
ge1       up    10.48.69.206/ffffffc0    02023d3045ce
ge2       down

```

[Rita]# show fcswitch nameserver brief

Port Id	Port Type	Port Number	Port WWN	Port IP Address
680000	N	0	280000059ba695e0	00000000
680300	N	3	5005076300c4944c	00000000
680723	NL	7	210000203715dc02	00000000
680f00	N	15	290000059ba695e0	00000000

4 entries found

[Rita]# show fcswitch nameserver all

```

Port Id          680000
Port Type        N
Port Number      0
Port WWN         280000059ba695e0
Port IP Address  00000000
Sym Port Name
Sym Node Name
Node WWN         100000059ba695e0
Node IP Address  00000000
Fabric Port Name 200000059ba695e1
Class of Service 3
FC-4 Types       FCP
FC-4 Description (NULL)

Port Id          680300
Port Type        N
Port Number      3
Port WWN         5005076300c4944c
Port IP Address  00000000
Sym Port Name
Sym Node Name
Node WWN         5005076300c0944c
Node IP Address  00000000
Fabric Port Name 200300059ba695e1
Class of Service 2,3
FC-4 Types       FCP,FC-SB2 Channel to Control,
FC-4 Description IBM      2105F20      (Rev. .114)

Port Id          680723
Port Type        NL
Port Number      7
Port WWN         210000203715dc02
Port IP Address  00000000
Sym Port Name
Sym Node Name
Node WWN         200000203715dc02
Node IP Address  00000000
Fabric Port Name 200700059ba695e1
Class of Service 3
FC-4 Types       FCP
FC-4 Description SEAGATE  ST336753FC

Port Id          680f00
Port Type        N
Port Number      15
Port WWN         290000059ba695e0
Port IP Address  00000000
Sym Port Name

```

```
Sym Node Name
Node WWN      100000059ba695e0
Node IP Address 00000000
Fabric Port Name 200f00059ba695e1
Class of Service 3
FC-4 Types      FCP
FC-4 Description (NULL)
```

4 entries found

[Rita]# show devices

Fabric Attached Devices detected

Interface	WWPN	PortId	Device Type	Lun	Lunid Type	Lunid
fc7	210000203715dc02	0x680723	Disk	0	IEEE Extended	200000203715dc02
fc3	5005076300c4944c	0x680300	Disk	0	MD5	db44f747a2cd81a35745
fc3	5005076300c4944c	0x680300	Disk	1	MD5	55bcd149af855c7091df
fc3	5005076300c4944c	0x680300	Disk	3	MD5	81574f330626c402176b
fc3	5005076300c4944c	0x680300	Disk	4	MD5	c51f6656b8a5c4788792
fc3	5005076300c4944c	0x680300	Disk	5	MD5	a9cdfdb04d88ad48ef0a
fc3	5005076300c4944c	0x680300	Disk	6	MD5	198f1b0a2bbad5642dca
fc3	5005076300c4944c	0x680300	Disk	7	MD5	7f73aa862b5660bd8407
fc3	5005076300c4944c	0x680300	Disk	8	MD5	6f0f630181fe99e4d29c
fc3	5005076300c4944c	0x680300	Disk	9	MD5	d05849e3d6d9bfa7eba4
fc3	5005076300c4944c	0x680300	Disk	10	MD5	62d9cf9ed7176332f76c

Lun Description Table

Interface	WWPN	Lun	Capacity	Vendor	Product	Serial
fc7	210000203715dc02	0	34GB	SEAGATE	ST336753FC	3HX0H0MV000083394XG6
fc3	5005076300c4944c	0	2GB	IBM	2105F20	11A22196
fc3	5005076300c4944c	1	1GB	IBM	2105F20	10222196
fc3	5005076300c4944c	3	953MB	IBM	2105F20	00122196
fc3	5005076300c4944c	4	953MB	IBM	2105F20	00722196
fc3	5005076300c4944c	5	2GB	IBM	2105F20	11B22196
fc3	5005076300c4944c	6	3GB	IBM	2105F20	10022196
fc3	5005076300c4944c	7	2GB	IBM	2105F20	11F22196
fc3	5005076300c4944c	8	953MB	IBM	2105F20	00322196
fc3	5005076300c4944c	9	2GB	IBM	2105F20	12022196
fc3	5005076300c4944c	10	2GB	IBM	2105F20	40022196

[Rita]# show scsirouter solaris

SCSI Router Information

Status Codes: A=active, I=inactive, C=create failed, D=not enabled, S=slave

Router	Stat	CDB	Retry	Reserve Proxy	Pass Thru	Lun Reset	Description
solaris	A	6	disabled	no	no		solaris_server_baboon

SCSI Router Authentication Information

Router	Authentication	Username	Password
solaris	none	none	none

Router	ServerIf	Vlan Vid	IP/Netmask	Secondary	TCP Port	SLP
solaris	ge1		10.48.69.206/26	none	3260	ON

Target Attribute Information

Router	Target	Status	Accesslist Read-Write	Accesslist Read-Only	Profile	CRC	Description
solaris	ibm-shark	enabled	any	none	High	prefer-off	ibm-shark

```

solaris      seagate      enabled any      none      High      prefer-off apcon_2
solaris      shark-lun4-lun5 enabled any      none      High      prefer-off ibm-shark

Target Mapping Information
Router      Target      Mapping      iSCSI Name
-----
solaris      ibm-shark      Lun-lunid      iqn.1987-05.com.cisco:00.59870777d907.ibm-shark
solaris      seagate      Tgt      iqn.1987-05.com.cisco:00.e80e5ee8680d.seagate
solaris      shark-lun4-lun5 Lun-wwpn      iqn.1987-05.com.cisco:00.9638ad30d4c1.shark-lun4-lun5

Targets - Target Mapped
Router      Target      WPN Primary      WPN Secondary
-----
solaris      seagate      210000203715dc02

Targets - Lun Mapped via Lunid
Router      Target      Lun      Lunid
-----
solaris      ibm-shark      0      db44f747a2cd81a35745889f81c47103
solaris      ibm-shark      1      55bcd149af855c7091df146880dd4043

Targets - Lun Mapped via WPN
Router      Target      Lun      WPN Primary      Lun      WPN Secondary      Lun
-----
solaris      shark-lun4-lun5 4      5005076300c4944c 4
solaris      shark-lun4-lun5 5      5005076300c4944c 5

[Rita]# show scsirouter solaris connection

CRC values (Header / Data)
N = No CRC negotiated
H = Hardware CRC
S = Software CRC

router      sid cid      host:port      login      ver      crc      rtt      target      access
solaris      1      1      10.48.69.235:32836 Sep 15 15:25:53 0      N/N      on
solaris      2      2      10.48.69.235:32837 Sep 15 15:25:53 0      N/N      off      ibm-shark      RW
solaris      3      3      10.48.69.235:32838 Sep 15 15:25:53 0      N/N      off      seagate      RW
solaris      4      4      10.48.69.235:32839 Sep 15 15:25:53 0      N/N      off      shark-lun4-lun5 RW

4 connections listed
[Rita]# show scsirouter solaris host

router      host      name      logins      active      last login      last disconnect
solaris      10.48.69.235 baboon      4      4      Sep 15 15:25:53

1 host listed

[Rita]# show scsirouter solaris stats
Router      Started      Logins Accepted      Logins Active      Target Access      Authentication Failures
-----
solaris      Sep 15 15:17:34 4      4      0      0
1 scsirouter listed

[Rita]# show scsirouter solaris host stats

solaris host 10.48.69.235 alias "baboon"
Login info:
loginsActive = 4
lastLoginTime: Mon Sep 15 15:25:53 GMT 2003
loginsTerminated = 0
lastLoginTerminatedTime:
loginsFailed = 0

```

```

lastLoginFailedTime:
loginsDiscovery = 1
loginsNormal = 3
stats:

```

RECEIVE		SEND	
OK	ERROR		
0000000159		0000000229	total msgs
0000000066		0000000066	no-op msgs
0000000001		0000000001	ping msgs/rsps
0000000086	0000000000	0000000086	SCSI cmd msgs/rsps
0000000000	0000000000	0000000070	SCSI data msgs
0000000000	0000000000	0000000000	task mgt msgs/rsps
0000000005	0000000000	0000000005	login msgs/rsps
0000000001	0000000000	0000000001	text msgs/rsps
0000000000		0000000000	invalid msgs/rsps
		0000000000	RTT msgs
		0000000000	async msgs
bytes rcvd 0000000000000000			
discarded 00000000			
bytes sent 0000000000001052			

1 host listed

```

[Rita]# show scsirouter solaris target all stats
solaris target ibm-shark:

```

RECEIVED		TRANSMITTED		
count	error	count	error	
0000000023		0000000023		Messages
0000000023	0000000000	0000000023	0000000003	SCSI cmd/resp
0000000000	0000000000	0000000000		task mgt
0000000001	0000000000	0000000000		login cmd
0000000000				logout
	0000000000			async event
0000000000		0000000018		data msg
0000000000000000 bytes received				
00000000 discarded				
0000000000000416 bytes transmitted				

target seagate:

RECEIVED		TRANSMITTED		
count	error	count	error	
0000000020		0000000020		Messages
0000000020	0000000000	0000000020	0000000002	SCSI cmd/resp
0000000000	0000000000	0000000000		task mgt
0000000001	0000000000	0000000000		login cmd
0000000000				logout
	0000000000			async event
0000000000		0000000017		data msg
0000000000000000 bytes received				
00000000 discarded				
0000000000000414 bytes transmitted				

target shark-lun4-lun5:

RECEIVED		TRANSMITTED		
count	error	count	error	
0000000043		0000000043		Messages
0000000043	0000000000	0000000043	0000000004	SCSI cmd/resp
0000000000	0000000000	0000000000		task mgt
0000000001	0000000000	0000000000		login cmd
0000000000				logout
	0000000000			async event
0000000000		0000000035		data msg
0000000000000000 bytes received				
00000000 discarded				
0000000000000828 bytes transmitted				
totals for all targets:				
RECEIVED		TRANSMITTED		
count	error	count	error	
0000000086		0000000086		Messages
0000000086	0000000000	0000000086	0000000009	SCSI cmd/resp
0000000000	0000000000	0000000000		task mgt
0000000003	0000000000	0000000000		login cmd
0000000000				logout
	0000000000			async event
0000000000		0000000070		data msg
0000000000000000 bytes received				
00000000 discarded				
0000000000001052 bytes transmitted				
[Rita]# show fcswitch linkstate database				
Local Node WWN	100000059ba695e1			
Local Port	3			
Local Port WWN	200300059ba695e1			
Remote Node WWN	5005076300c0944c			
Remote Port	ffffffff			
Remote Port WWN	5005076300c4944c			
Remote Agent Address	00000000			
Remote Agent Type	0			
Remote Agent Port	0			
Remote Unit Type	Unknown			
Remote Connection Id	680300			
Local Node WWN	100000059ba695e1			
Local Port	7			
Local Port WWN	200700059ba695e1			
Remote Node WWN	200000203715dc02			
Remote Port	ffffffff			
Remote Port WWN	210000203715dc02			
Remote Agent Address	00000000			
Remote Agent Type	0			
Remote Agent Port	0			
Remote Unit Type	Unknown			
Remote Connection Id	000023			
Local Node WWN	100000059ba695e1			
Local Port	0			
Local Port WWN	200000059ba695e1			
Remote Node WWN	100000059ba695e0			
Remote Port	ffffffff			
Remote Port WWN	280000059ba695e0			

```
Remote Agent Address 00000000
Remote Agent Type    0
Remote Agent Port    0
Remote Unit Type     Unknown
Remote Connection Id 680000
```

```
Local Node WWN      100000059ba695e1
Local Port          15
Local Port WWN      200f00059ba695e1
Remote Node WWN     100000059ba695e0
Remote Port         ffffffff
Remote Port WWN     290000059ba695e0
Remote Agent Address 00000000
Remote Agent Type    0
Remote Agent Port    0
Remote Unit Type     Unknown
Remote Connection Id 680f00
```

4 entries found

[Rita]# **show int ge1**

Operational Data

Interface	Stat	IP/Netmask	MAC	Options
ge1	up	10.48.69.206/ffffffc0	02023d3045ce	type Gigabit Ethernet mtusize 1500 speed 1000000000 flags UP BRDCST RUNNING MLTCT signal signal detect duplex full auto-negotiate complete flow control rx pause SFPVendor CISCO-AGILENT SFPVendorID A00258957 SFPPartNumber QFBR-5790L SFPRev -5790L

Configuration Data

Interface	MTU	Size	AutoNegotiation	Vlan	IP/Netmask	Secondary
ge1	1500		enabled	enabled		None

[Rita]# **show ip route**

Codes: C - connected, S - static, R - RIP

```
S    0.0.0.0/0 [1/0] via 10.48.69.129, mgmt
C    10.1.1.0/24 is directly connected, ha
C    10.48.69.128/26 is directly connected, mgmt
C    10.48.69.192/26 is directly connected, ge1
C    127.0.0.1/8 is directly connected, lo0
S    144.254.7.0/24 [0/0] via 10.48.69.200, ge1
```

[Rita]# **show zone brief**

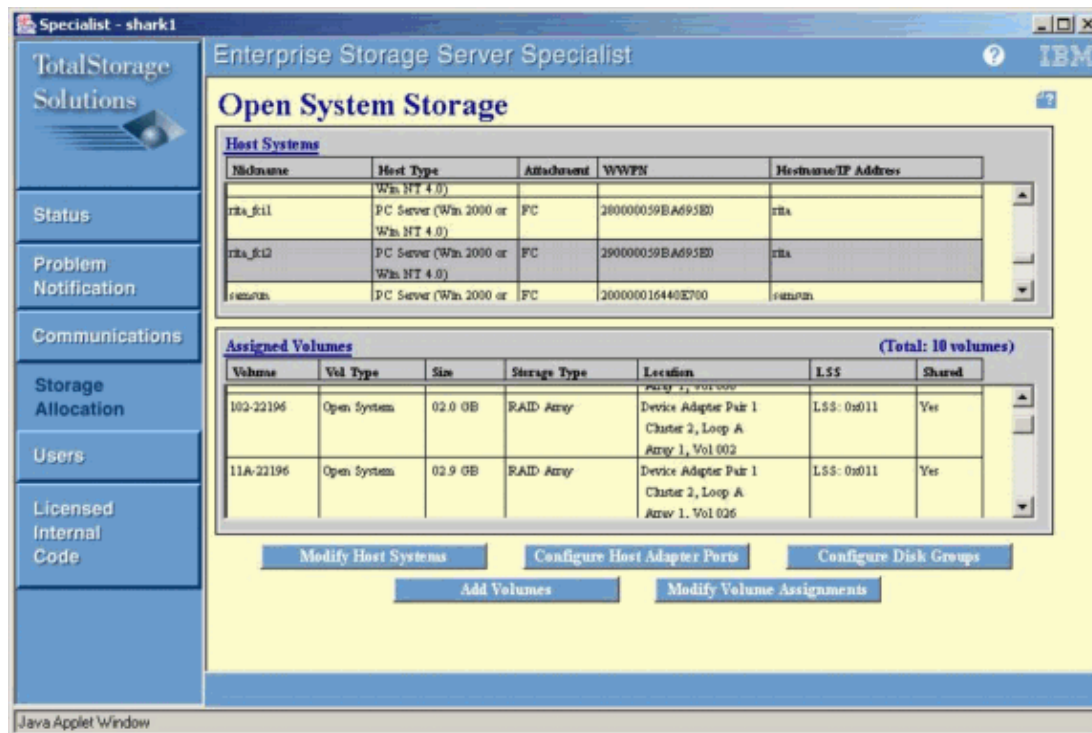
No zones.

IBM Shark Definitions

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

Two hosts have been defined on the ESSS, one with WWPN of initiator1 and one with WWPN of initiator2. Ten volumes have been assigned to each host.

Cisco - Solaris iSCSI Host to SN 5428 Configuration Example



Related Information

- [iSCSI Driver for Solaris Frequently Asked Questions](#)
- [Cisco iSCSI Drivers \(registered customers only\)](#)
- [Cisco iSCSI Driver for Sun Solaris Release Notes](#)
- [Troubleshooting the iSCSI Driver for Solaris](#)
- [Technical Support – Cisco Systems](#)

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Updated: Dec 29, 2004

Document ID: 45360