

IBM AIX iSCSI Host to SN 5428 Configuration Example

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Introduction

Cisco iSCSI drivers, which reside on the server, are a key component of an iSCSI solution. These iSCSI drivers intercept small computer system interface (SCSI) commands, encapsulate them into IP packets, and redirect them to the Cisco SN 5420, Cisco SN 5428, Cisco SN 5428-2, or Cisco MDS or IPS-8. This document provides sample configurations for an IBM AIX iSCSI host to an SN 5428.

Prerequisites

Requirements

Before attempting this configuration, please ensure that you meet the following requirements:

- Install the iSCSI driver that is compatible with your version of IBM AIX. The most current version of the driver can be found at the Cisco iSCSI Drivers (registered customers only) page on Cisco.com. Included in the driver zip (tar) file is a README.txt file which contains license agreement information, driver installation instructions, 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 AIX Release Notes.
- The Cisco iSCSI Driver version 3.3.2 for IBM AIX requires a host running the IBM AIX 4.3.3 operating system. It is recommended that the operating system be upgraded to at least AIX 4.3.3 – Maintenance Level 10. Refer to the IBM website for information on how the corresponding package can be obtained.
- The driver also requires the following packages be installed on the host:

- ◆ devices.fcp.disk.rte

- ◆ devices.fcp.tape.rte

The above packages are present on the AIX operating system CDs.

- The Cisco iSCSI Driver version 3.3.2 for IBM AIX is compatible with Cisco SN 5400 series storage routers running software version 3.x or greater. It is not compatible with Cisco SN 5400 series storage routers running software versions 1.x or 2.x.

Components Used

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

- AIX Server

```
Ades# oslevel
```

```
4.3.3.0
```

```
Cisco-iscsi-3.3.2 has been used.
```

```
Ades# iscsi-ls
```

```
Cisco iSCSI Driver Version ... 3.3.2 (25-Jul-2003)
```

- Cisco SN 5428 with software version 3.3.2

```
[Rita]# show version
```

```
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
```

```
Copyright (c) 1986-2002 by Cisco Systems, Inc
```

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, see the Cisco Technical Tips Conventions.

Background Information

SCSI routing provides IP hosts with access to Fibre Channel (FC) storage devices as if the storage devices were directly attached to the hosts, with access to devices being 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 via an SN 5428 storage router needs to have a compatible iSCSI driver installed. Using 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 the following 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.

SCSI routing occurs in the SN 5428 storage router through the mapping of physical storage devices to iSCSI targets. An iSCSI target is an arbitrary name for a group of physical storage devices. 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-only mapping, an iSCSI target name is specified and mapped to the physical storage address of a storage controller only: a World Wide Port Name (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, then 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.

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 and 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, then 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.

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.

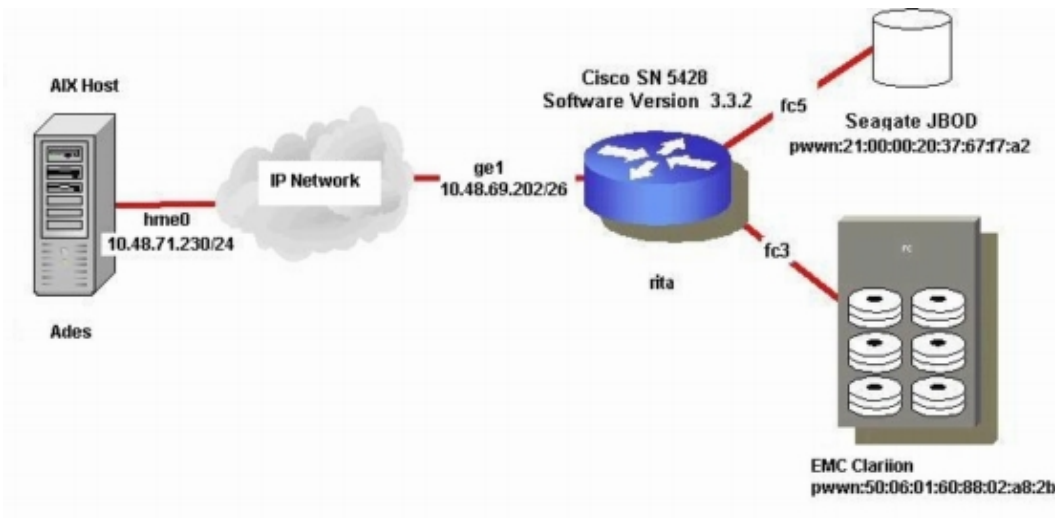
Configure

In this section, you are presented with the information to configure the SN 5428 and Cisco iSCSI Driver for IBM AIX.

Note: To find additional information on the commands used in this document, use the Cisco SN 5428 Family Software Configuration Guide and the 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.

- Ades (IBM AIX version 4.3.3)
- Rita (SN 5428)

Ades (IBM AIX version 4.3.3)

!--- The iscsi.conf file must be modified on the AIX host, as shown below.

```
Ades# more iscsi.conf
```

```
# iSCSI configuration file - see iscsi.conf(5)
# Authentication Settings
# -----
# You may configure a default Username and Password to use for CHAP
# authentication by specifying the Global username and password parameters
# in the format as mentioned below. These entries will need to precede any
# "DiscoveryAddress" entries if authentication needs to be enabled for all the
# iSCSI targets.
#
# Example:
#
#Username=alice
#Password=nty57nbe
#      or
#OutgoingUsername=alice
#OutgoingPassword=nty57nbe
#
# The "OutgoingUsername" will specify the username to be sent to the target
# for login authentication. The "OutgoingPassword" is the CHAP secret password
# to be used when sending challenge responses to the target.
#
#
# You may configure CHAP authentication settings that will apply to every
# target discovered at a particular address by adding "OutgoingUsername=u"
# and "OutgoingPassword=p" entries indented below the "DiscoveryAddress"
# entry they apply to.
#
# Example:
#
#DiscoveryAddress=192.168.10.94
```

```

#   OutgoingUsername=alice
#   OutgoingPassword=nty57nbe
#
#           or
#
#DiscoveryAddress=192.168.10.94
#   Username=alice
#   Password=nty57nbe

DiscoveryAddress=10.48.69.202

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

# LUN Settings
# -----
# The LUN settings could be specified per TargetName or for all the targets
# whose TargetNames are mentioned in the configuration file. If no TargetName
# is present in the configuration file, the lun(s) will be configured for
# all the available iSCSI targets.
# The LUN settings can be specified in the following 3 formats:
# LUN=<lun_number>
# LUNs=<lun_range>
# LUNs=<lun_list>
# Continuous Discovery settings
# -----
# You can configure discovery session to be kept open by setting
# Continuous=yes(default setting). Set Continuous=no to close
# the discovery session, once the discovery is over.
#
#Continuous=yes
#Continuous=no

Continuous=yes

# TargetName Specific Settings
# -----
# Target-specific settings should be entered below the respective "TargetName"
# entries. If Multipath is enabled, then these target-specific settings will be
# be applicable for all iSCSI sessions to this target.
#
# If settings under "Subnet" entry are conflicting with settings under
# "TargetName" entry, the settings under "Subnet" will be considered.
#
#TargetName=iqn.1987-05.com.cisco:00.0d1d898e8d66.t0
#
# The TargetName Settings can have the following entries specific to a target.
#
# 1) iSCSI Operational Parameter settings
# 2) Timeout Settings
# 3) TCP Settings
# 4) Portal Failover Settings
# 5) Multipath Settings
# 6) LUN settings
# 7) PreferredSubnet and PreferredPortal Settings

TargetName=iqn.1987-05.com.cisco:00.113da1bbe90c.EMn
TargetName=iqn.1987-05.com.cisco:00.0e6d570e6d3c.jb1
LUNs=0-5

!--- You can find the target names in the output of the
!--- show scsirouter name
command on SN 5428.

# NOTES:
# -----

```

```

# If any of the configuration parameters are not mentioned under Configuration
# type DiscoveryAddress, TargetName or Subnet, global values will be
# considered if they are specified, else default settings will apply for these
# configuration parameters.
#
# All entries specified below any of the Configuration types must be indented
# by a whitespace character or a tab to be considered local to a category. If
# they are specified in the 1st column they are by default considered as global
# values.

!--- New targets that become available to the host after the driver is started
!--- will automatically be logged into and added to the /etc/iscsi.bindings file
!--- if they are not already there. The iSCSI driver will establish new sessions
!--- for these targets, probe the LUNs on the new targets, and then create new
!--- device nodes.

Ades# more 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:00.0e6d570e6d3c.jbod_1
0       1        iqn.1987-05.com.cisco:00.113dalbbe90c.EMC_Clariion

!--- AIX assigns SCSI device names and device nodes dynamically whenever a SCSI
!--- logical unit is detected. Variations in process scheduling may result in
!--- iSCSI targets being mapped to different SCSI device nodes every time the
!--- driver is started.

!--- The "Persistent target binding" feature guarantees that a device node
!--- always maps to the same physical storage device from one reboot to the next.
!--- To achieve this, AIX iSCSI driver binds:
!---   a) an iSCSI TargetName to a SCSI target ID
!---   b) a TargetID,LunID to a disk name.
!--- The aforementioned bindings are stored in the files /etc/iscsi.bindings and
!--- /etc/iscsi_device_bindings, respectively.
!--- If the files do not exist, they will be created when the driver is started.
!--- If an entry exists for a discovered target (in /etc/iscsi.bindings), the
!--- SCSI target ID from the entry is assigned to the target. If no entry exists
!--- for a discovered target, an entry is written to the file.
!--- The BusId field is included for compatibility with other UNIX operating
!--- systems. For AIX, the BusId value will always be zero.
!--- Note that the /etc/iscsi.bindings and /etc/iscsi_device_bindings files will
!--- permanently contain entries for all iSCSI targets ever logged into from this
!--- host. If a target is no longer available to a host, you can manually edit the
!--- files and remove entries so the obsolete target no longer consumes a SCSI
!--- target ID and device name(s) (this is normally not needed, because the driver
!--- can maintain up to 64 different bindings). If you know the iSCSI name of a
!--- target in advance and you want it to be assigned a particular SCSI target ID,
!--- you can add an entry manually. Similarly, if you wish a particular name be
!--- assigned for a TargetID,LunID then you must manually add an entry into the
!--- second file. You should stop the iSCSI driver before editing the
!--- aforementioned files. Be careful to keep an entire entry on a single line,
!--- with only space characters between the three fields. Do not use a target
!--- ID number that already exists in the file.
!--- *****
!--- NOTE: iSCSI driver versions earlier than 3.2 use the file /etc/iscsi_bindings
!---       instead of /etc/iscsi.bindings and /etc/iscsi_device_bindings. The
!---       first time you start the new driver version, it will convert the old

```

```

!---      file to the new file format and create entries in the new files. Your
!---      old file will be renamed /etc/iscsi_bindings.old in case you need it
!---      for reference purposes.
!--- *****
!--- To manually start the iSCSI driver, issue the following command:

/etc/rc.iscsi

!--- When the driver is started, the startup script will automatically mount the
!--- partitions listed in /etc/filesystems.iscsi. To see the iSCSI devices
!--- currently available, issue the following command:

/usr/bin/iscsi-ls -l

!--- To manually stop the iSCSI driver, issue the following command:

/etc/iscsi.clean rem

!--- When the driver is stopped, the shutdown script will attempt to unmount
!--- file systems listed in /etc/filesystems.iscsi. If the file systems are in use,
!--- the script will fail to unmount them. The applications using them must first
!--- be stopped and the script must be re-run. File systems not listed in
!--- /etc/filesystems.iscsi will not be unmounted by the script and should be
!--- manually unmounted prior to a system shutdown.
!--- It is very important to unmount all file systems on iSCSI devices before
!--- stopping the iSCSI driver. If the iSCSI driver is stopped while iSCSI devices
!--- are mounted, buffered writes may not be committed to disk and file system
!--- corruption may occur.
!--- -----LOG MESSAGES-----
!--- The iSCSI driver contains components in the kernel and user level utilities.
!--- The log messages from these components are sent to syslog. Based on the
!--- syslog configuration on the AIX host, the messages will be sent to the
!--- appropriate destination. iSCSI driver messages can be received from the
!--- following facilities:
!---   1. kernel
!---   2. daemon (iscsid)
!---   3. user (iscsiactlun)
!--- The log messages from the iSCSI driver are redirected to the location as
!--- specified during the syslogd configuration. For example, consider a
!--- /etc/syslog.conf file that has the following entries:
!---   kern.debug /dev/console
!---   user.debug /usr/adm/ras/iscsi.log
!--- All the kernel messages will go to the console and all the user
!--- messages will go to /usr/adm/ras/iscsi.log.

```

Rita (SN 5428)

```

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

!--- A SCSI routing instance AIX that has been created for the AIX host test.

scsirouter aix authentication "none"
scsirouter aix username "none"
scsirouter aix password "none"
scsirouter aix primary "none"
scsirouter aix reserveproxy disable
scsirouter aix failover primary none
scsirouter aix failover secondary none

```

```
scsirouter aix lun reset no
scsirouter aix serverIf gel 10.48.69.202/255.255.255.192

!--- Interface (gel) assigned to SCSI instance AIX. 10.48.69.202 will be used by
!--- IP hosts to access the SCSI routing instance.

scsirouter aix target EMC_Clariion wwpn "500601608802a82b"
scsirouter aix target EMC_Clariion enable
scsirouter aix target EMC_Clariion accesslist "any" rw
scsirouter aix target EMC_Clariion accesslist "none" ro
scsirouter aix target EMC_Clariion maxcmdqueuedepth "0"

scsirouter aix target jbod_1 wwpn "210000203767f7a2"
scsirouter aix target jbod_1 enable
scsirouter aix target jbod_1 accesslist "any" rw
scsirouter aix target jbod_1 accesslist "none" ro
scsirouter aix target jbod_1 maxcmdqueuedepth "0"
!

!--- Target-only mapping using WWPN addressing is configured for EMC_Clariion
!--- and jbod_1.

!
! SYSTEM
!
hostname Rita
! Mgmt Port
!
interface mgmt ip-address 10.48.69.148/255.255.255.192
!
! GE
!
interface gel no autonegotiation
interface gel mtusize 1500
interface gel vlan enable
!
! GE
!
interface ge2 autonegotiation autodetect
interface ge2 mtusize 1500
interface ge2 vlan enable
!
! ROUTES
!
ip default-gateway 10.48.69.129
ip route 10.48.71.0/255.255.255.0 10.48.69.202
!
! 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
fcswitch zoning merge SW2
fcswitch domainid 104 force
no fcswitch domainid lock enable
fcswitch interop-credit 12
!
! 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 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.

- **netstat -n** Used to verify the TCP connections on the AIX host.
- **iscsi-ls** Displays the devices currently available on the AIX host.
- **lscfg** Lists the devices on the AIX 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 fcswitch linkstate database** Display current link information for all FC ports.
- **show devices** Displays all SCSI devices.
- **show scsirouter name** Display all configuration information for the specified SCSI routing instance.
- **show scsirouter name connection tcp** Displays iSCSI initiator information for the specified SCSI routing instance.
- **show scsirouter name host** Displays host information for the specified SCSI routing instance.
- **show scsirouter name stats** Displays access and connection information for the specified SCSI routing instance.
- **show scsirouter name host stats** Displays host statistic information for the specified SCSI routing instance.
- **show scsirouter name target all stats** Displays statistic informations about all targets for the specified SCSI routing instance.
- **show interface ge1** Display GE interface **ge1**.
- **show ip route** Display IP route information.

Troubleshoot

Below is troubleshooting information relevant to this configuration.

- Displays from Ades (IBM AIX version 4.3.3)
- Displays from Rita (Cisco SN 5428)

Displays from Ades (IBM AIX version 4.3.3)

```
!--- To see the current TCP connections on the AIX host,  
!--- issue the following command:
```

```
Ades# netstat -n
```

```
Active Internet connections
```

Proto	Recv-Q	Send-Q	Local Address	Foreign Address	(state)
tcp4	0	0	10.48.71.230.33032	10.48.69.202.3260	ESTABLISHED
tcp4	0	0	10.48.71.230.33031	10.48.69.202.3260	ESTABLISHED
tcp4	0	0	10.48.71.230.33030	10.48.69.202.3260	ESTABLISHED
tcp4	0	0	10.48.71.230.23	144.254.7.155.1843	ESTABLISHED

```
!--- To see the devices currently available,  
!--- issue the following command:
```

```
Ades# iscsi-ls
```

```
*****  
                Cisco iSCSI Driver Version ... 3.3.2 (25-Jul-2003)  
*****  
NAME                : iqn.1987-05.com.cisco:00.0e6d570e6d3c.jbod_1  
TARGET ADDRESS      : 10.48.69.202:3260,1  
TARGET ID           : 0  
STATUS              : Connected 10.48.71.230:33031<->10.48.69.202:3260  
                    at Thu Oct 23 15:07:35 2003  
SESSION             : ISID 00023d000001 TSID 02  
*****  
NAME                : iqn.1987-05.com.cisco:00.113da1bbe90c.EMC_Clariion  
TARGET ADDRESS      : 10.48.69.202:3260,1  
TARGET ID           : 1  
STATUS              : Connected 10.48.71.230:33032<->10.48.69.202:3260  
                    at Thu Oct 23 15:07:35 2003  
SESSION             : ISID 00023d000001 TSID 03  
*****
```

```
Ades# iscsi-ls -c
```

```
*****  
                Cisco iSCSI Driver Version ... 3.3.2 (25-Jul-2003)  
*****  
NAME                : iqn.1987-05.com.cisco:00.0e6d570e6d3c.jbod_1  
TARGET ADDRESS      : 10.48.69.202:3260,1  
TARGET ID           : 0  
STATUS              : Connected 10.48.71.230:33052<->10.48.69.202:3260 at W3  
SESSION             : ISID 00023d000001 TSID 02  
InitialR2T         : No  
HeaderDigest       : HEADER DIGESTS NOT SUPPORTED  
DataDigest         : DATA DIGESTS NOT SUPPORTED  
FirstBurstLength   : 65536  
MaxBurstLength     : 4194304  
MaxRecvDataSegmentLength: initiator - 131072  
                   : target    - 524288  
Login Timeout      : 15  
Auth Timeout       : 45
```

```

Active Timeout          : 5
Idle Timeout           : 60Ping Timeout           : 10
*****
NAME                   : ign.1987-05.com.cisco:00.113dalbbe90c.EMC_Clariion
TARGET ADDRESS        : 10.48.69.202:3260,1
TARGET ID             : 1
STATUS                : Connected 10.48.71.230:33053<->10.48.69.202:3260 at W3
SESSION               : ISID 00023d000001 TSID 03
InitialR2T            : No
HeaderDigest          : HEADER DIGESTS NOT SUPPORTED
DataDigest            : DATA DIGESTS NOT SUPPORTED
FirstBurstLength      : 65536
MaxBurstLength        : 4194304
MaxRecvDataSegmentLength: initiator - 131072
                       : target    - 524288
Login Timeout         : 15
Auth Timeout          : 45
Active Timeout        : 5
Idle Timeout          : 60
Ping Timeout          : 10
*****

```

Ades# **iscsi-ls -l**

```

*****
                Cisco iSCSI Driver Version ... 3.3.2 (25-Jul-2003)
*****
NAME                   : ign.1987-05.com.cisco:00.0e6d570e6d3c.jbod_1
TARGET ADDRESS        : 10.48.69.202:3260,1
TARGET ID             : 0
STATUS                : Connected 10.48.71.230:33031<->10.48.69.202:3260
                       : at Thu Oct 23 15:07:35 2003
SESSION               : ISID 00023d000001 TSID 02
LUN 0                 : hdisk1
DEVICE STATUS        : AVAILABLE
DEVICE DETAILS :
    VENDOR             : SEAGATE
    PRODUCT             : ST318203FC
    PRODUCT REVISION   : 0004
    DISK CAPACITY      : BLOCKCOUNT 0x21eb38f, BLOCKLEN 0x200,
                       : DISKSIZE 17366.45 MB
*****
NAME                   : ign.1987-05.com.cisco:00.113dalbbe90c.EMC_Clariion
TARGET ADDRESS        : 10.48.69.202:3260,1
TARGET ID             : 1
STATUS                : Connected 10.48.71.230:33032<->10.48.69.202:3260
                       : at Thu Oct 23 15:07:35 2003
SESSION               : ISID 00023d000001 TSID 03
LUN 0                 : hdisk2
DEVICE STATUS        : AVAILABLE
DEVICE DETAILS :
    VENDOR             : DGC
    PRODUCT             : RAID 0
    PRODUCT REVISION   : 0632
    DISK CAPACITY      : BLOCKCOUNT 0x1fff7f, BLOCKLEN 0x200,
                       : DISKSIZE 1023.94 MB
LUN 1                 : hdisk3
DEVICE STATUS        : AVAILABLE
DEVICE DETAILS :
    VENDOR             : DGC
    PRODUCT             : RAID 0
    PRODUCT REVISION   : 0632
    DISK CAPACITY      : BLOCKCOUNT 0x1fff7f, BLOCKLEN 0x200,
                       : DISKSIZE 1023.94 MB
LUN 2                 : hdisk4
DEVICE STATUS        : AVAILABLE

```

```

DEVICE DETAILS :
    VENDOR          : DGC
    PRODUCT         : RAID 0
    PRODUCT REVISION: 0632
    DISK CAPACITY   : BLOCKCOUNT 0x1fff7f, BLOCKLEN 0x200,
                    DISKSIZE 1023.94 MB
LUN 3              : hdisk5
DEVICE STATUS     : AVAILABLE
DEVICE DETAILS :
    VENDOR          : DGC
    PRODUCT         : RAID 0
    PRODUCT REVISION: 0632
    DISK CAPACITY   : BLOCKCOUNT 0x3ffeff, BLOCKLEN 0x200,
                    DISKSIZE 2047.87 MB
LUN 4              : hdisk6
DEVICE STATUS     : AVAILABLE
DEVICE DETAILS :
    VENDOR          : DGC
    PRODUCT         : RAID 0
    PRODUCT REVISION: 0632
    DISK CAPACITY   : BLOCKCOUNT 0x1fff7f, BLOCKLEN 0x200,
                    DISKSIZE 1023.94 MB
LUN 5              : hdisk7
DEVICE STATUS     : AVAILABLE
DEVICE DETAILS :
    VENDOR          : DGC
    PRODUCT         : RAID 0
    PRODUCT REVISION: 0632
    DISK CAPACITY   : BLOCKCOUNT 0x1fff7f, BLOCKLEN 0x200,
                    DISKSIZE 1023.94 MB
*****

```

Ades# **lscfg |grep hdisk**

```

+ hdisk0          10-80-00-4,0      16 Bit SCSI Disk Drive (4500 MB)
* hdisk1          -01              Other FC SCSI Disk Drive
* hdisk2          -02              Other FC SCSI Disk Drive
* hdisk3          -03              Other FC SCSI Disk Drive
* hdisk4          -04              Other FC SCSI Disk Drive
* hdisk5          -05              Other FC SCSI Disk Drive
* hdisk6          -06              Other FC SCSI Disk Drive
* hdisk7          -07              Other FC SCSI Disk Drive

```

*!--- When iSCSI is stopped on the AIX host, all the disks reached by iSCSI
!--- will disappear.*

Ades# **./iscsi.clean rem**

```

Stopping iSCSI services
iscsi0 deleted

```

Ades# **lscfg |grep hdisk**

```

+ hdisk0          10-80-00-4,0      16 Bit SCSI Disk Drive (4500 MB)

```

Ades# **./rc.iscsi**

```

iscsi0 iscsi0 Available
iscsi_wait_for_devices: Waiting for session establishment with target: 0
iscsi_wait_for_devices: Waiting for session establishment with target: 1
iscsi_wait_for_devices: session established and lun cfg done for target: 0
iscsi_wait_for_devices: session established and lun cfg is in progress for target: 1
iscsi_wait_for_devices: session established and LUN configured for target-id: 0
iscsi_wait_for_devices: session established and LUN configured for target-id: 1
mounting filesystems on iscsi devices

```

Ades# **lscfg |grep hdisk**

```

+ hdisk0          10-80-00-4,0      16 Bit SCSI Disk Drive (4500 MB)
* hdisk1          -01              Other FC SCSI Disk Drive
* hdisk2          -02              Other FC SCSI Disk Drive
* hdisk3          -03              Other FC SCSI Disk Drive
* hdisk4          -04              Other FC SCSI Disk Drive
* hdisk5          -05              Other FC SCSI Disk Drive
* hdisk6          -06              Other FC SCSI Disk Drive
* hdisk7          -07              Other FC SCSI Disk Drive

```

Displays from Rita (Cisco 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
ge1                 10.48.69.202/26          02:02:3d:30:45:ca
ge2

```

[Rita]# **show fcswitch**

```

Global attributes                               Value
-----
Domain ID                                       1
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 WWP1                                 280000059ba695e0
Initiator WWP2                                 290000059ba695e0

```

[Rita]# **show interface brief XX**

```

Interface Stat IP/Netmask                MAC                Options
-----
lo0         up    127.0.0.1/ff000000
mgmt        up    10.48.69.148/ffffffc0    00059ba695e0
ha          down
fei2        up    2.0.0.1/ffffff00        00059ba695e2
fc0         up

```

```

fc1      down
fc2      down
fc3      up
fc4      down
fc5      up
fc6      down
fc7      up
fc8      down
fc15     up
fcil     up
fcil     up
fcil     up
ge1      up    10.48.69.202/ffffffc0    02023d3045ca
ge2      down

```

[Rital]# **show fswitch nameserver brief**

Port Id	Port Type	Port Number	Port WWN	Port IP Address
010000	N	0	280000059ba695e0	00000000
010300	N	3	500601608802a82b	00000000
0105e8	NL	5	210000203767f7a2	00000000
010700	N	7	200000e069f18c59	00000000
010f00	N	15	290000059ba695e0	00000000

5 entries found

[Rital]# **show fswitch nameserver all**

```

Port Id          010000
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          010300
Port Type        N
Port Number      3
Port WWN         500601608802a82b
Port IP Address  00000000
Sym Port Name
Sym Node Name
Node WWN         500601601102a82b
Node IP Address  00000000
Fabric Port Name 200300059ba695e1
Class of Service 3
FC-4 Types       FCP
FC-4 Description DGC      RAID 0      (Rev. 0632)
Port Id          0105e8
Port Type        NL
Port Number      5
Port WWN         210000203767f7a2
Port IP Address  00000000
Sym Port Name
Sym Node Name
Node WWN         200000203767f7a2
Node IP Address  00000000
Fabric Port Name 200500059ba695e1
Class of Service 3
FC-4 Types       FCP
FC-4 Description SEAGATE  ST318203FC  (Rev. 0004)

```

```

Port Id          010700
Port Type       N
Port Number     7
Port WWN        200000e069f18c59
Port IP Address 00000000
Sym Port Name
Sym Node Name
Node WWN        100000e069f18c59
Node IP Address 00000000
Fabric Port Name 200700059ba695e1
Class of Service 2,3
FC-4 Types     Unknown
FC-4 Description (NULL)
Port Id        010f00
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)
5 entries found

```

[Rita]# show devices

Fabric Attached Devices detected

Interface	WWPN	PortId	Device Type	Lun	Lunid	Type	Lund
fc5	210000203767f7a2	0x105e8	Disk	0	IEEE	Extended	2002
fc3	500601608802a82b	0x10300	Disk	0	IEEE	Reg Extended	6000
fc3	500601608802a82b	0x10300	Disk	1	IEEE	Reg Extended	600c
fc3	500601608802a82b	0x10300	Disk	2	IEEE	Reg Extended	600a
fc3	500601608802a82b	0x10300	Disk	3	IEEE	Reg Extended	6005
fc3	500601608802a82b	0x10300	Disk	4	IEEE	Reg Extended	600e
fc3	500601608802a82b	0x10300	Disk	5	IEEE	Reg Extended	6000
fc3	500601608802a82b	0x10300	Disk	6	IEEE	Reg Extended	6007
fc3	500601608802a82b	0x10300	Disk	7	IEEE	Reg Extended	6007
fc3	500601608802a82b	0x10300	Disk	8	IEEE	Reg Extended	6000
fc3	500601608802a82b	0x10300	Disk	9	IEEE	Reg Extended	6001
fc3	500601608802a82b	0x10300	Disk	10	IEEE	Reg Extended	6006
fc3	500601608802a82b	0x10300	Disk	11	IEEE	Reg Extended	600b
fc3	500601608802a82b	0x10300	Disk	12	IEEE	Reg Extended	600c
fc3	500601608802a82b	0x10300	Disk	13	IEEE	Reg Extended	6000
fc3	500601608802a82b	0x10300	Disk	14	IEEE	Reg Extended	6007
fc3	500601608802a82b	0x10300	Disk	15	IEEE	Reg Extended	6002
fc3	500601608802a82b	0x10300	Disk	16	IEEE	Reg Extended	6006
fc3	500601608802a82b	0x10300	Disk	17	IEEE	Reg Extended	600d
fc3	500601608802a82b	0x10300	Disk	32	IEEE	Reg Extended	6005
fc3	500601608802a82b	0x10300	Disk	33	IEEE	Reg Extended	6006

Lun Description Table

Interface	WWPN	Lun	Capacity	Vendor	Product	Serial
fc5	210000203767f7a2	0	16GB	SEAGATE	ST318203FC	LRE809150006
fc3	500601608802a82b	0	1023MB	DGC	RAID	f60004202091
fc3	500601608802a82b	1	1023MB	DGC	RAID	f60004202091
fc3	500601608802a82b	2	1023MB	DGC	RAID	f60004202091
fc3	500601608802a82b	3	1GB	DGC	RAID	f60004202091
fc3	500601608802a82b	4	1023MB	DGC	RAID	f60004202091
fc3	500601608802a82b	5	1023MB	DGC	RAID	f60004202091
fc3	500601608802a82b	6	1023MB	DGC	RAID	f60004202091
fc3	500601608802a82b	7	1023MB	DGC	RAID	f60004202091

```

fc3      500601608802a82b 8      1023MB  DGC      RAID      f60004202091
fc3      500601608802a82b 9      1023MB  DGC      RAID      f60004202091
fc3      500601608802a82b 10     1023MB  DGC      RAID      f60004202091
fc3      500601608802a82b 11     1023MB  DGC      RAID      f60004202091
fc3      500601608802a82b 12     1023MB  DGC      RAID      f60004202091
fc3      500601608802a82b 13     1023MB  DGC      RAID      f60004202091
fc3      500601608802a82b 14     1023MB  DGC      RAID      f60004202091
fc3      500601608802a82b 15     1023MB  DGC      RAID      f60004202091
fc3      500601608802a82b 16     1023MB  DGC      RAID      f60004202091
fc3      500601608802a82b 17     1023MB  DGC      RAID      f60004202091
fc3      500601608802a82b 32     4GB     DGC      RAID      f60004202091
fc3      500601608802a82b 33     2GB     DGC      RAID      f60004202091

```

[Rita]# show scsirouter aix

SCSI Router Information

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

```

          CDB   Reserve  Pass Lun
Router   Stat Retry Proxy  Thru Reset Description
-----
aix      A     6     disabled no   no   (not set)

```

SCSI Router Authentication Information

```

Router   Authentication  Username  Password
-----
aix      none                none      none
Router   ServerIf  Vlan Vid IP/Netmask  Secondary  TCP P
-----
aix      gel      10.48.69.202/26  none      3260N

```

Target Attribute Information

```

Router   Target  Status  Read-Write  Accesslist  Accesslist  Profile  CRC  Dn
-----
aix      jbod_1  enabled any         none        High  prefer-off  ()
aix      EMC_Clariion  enabled any         none        High  prefer-off  ()

```

Target Mapping Information

```

Router   Target  Mapping  iSCSI Name
-----
aix      jbod_1  Tgt      iqn.1987-05.com.cisco:00.0e6d570e6d3c.jb1
aix      EMC_Clariion  Tgt      iqn.1987-05.com.cisco:00.113dalbbe90c.EMN

```

Targets - Target Mapped

```

Router   Target  WWPN Primary  WWPN Secondary
-----
aix      jbod_1  210000203767f7a2
aix      EMC_Clariion  500601608802a82b

```

[Rita]# show scsirouter aix 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  acs
aix     1  115  10.48.71.230:33051  Oct 29 09:06:07  0  N/N  on
aix     2  116  10.48.71.230:33052  Oct 29 09:06:08  0  N/N  off  jbod_1  W
aix     3  117  10.48.71.230:33053  Oct 29 09:06:08  0  N/N  off  EMC_ClariiiW
3 connections listed

```

[Rita]# show scsirouter aix connection tcp

```

          TCP window sizes
          current          maximum
router  sid cid  host:port  rcv  snd  rcv  snd
aix     1  115  10.48.71.230:33051  65535  2920  65535  16384
aix     2  116  10.48.71.230:33052  524280  188340  524280  260640
aix     3  117  10.48.71.230:33053  524280  260640  524280  260640
3 connections listed

```

[Rita]# show scsirouter aix stats

Router	Started	Logins Accepted	Logins Active	Target Failures	Access	Authentication Failures
aix	Oct 20 09:47:11	34	3	0		0

1 scsirouter listed

[Rita]# show scsirouter aix host stats

aix host 10.48.71.230 alias "ades"

Login info:

loginsActive = 3
lastLoginTime: Wed Oct 29 09:06:08 GMT 2003
loginsTerminated = 30
lastLoginTerminatedTime: Wed Oct 29 09:04:54 GMT 2003
loginsFailed = 3
lastLoginFailedTime: Mon Oct 20 09:47:29 GMT 2003
loginsDiscovery = 10
loginsNormal = 20

stats:

RECEIVE		SEND	
OK	ERROR		
0000069578		0000071068	total msgs
0000009550		0000009550	no-op msgs
0000057892		0000057892	ping msgs/rsp
0000002083	0000000000	0000002083	SCSI cmd msgs/rsp
0000000000	0000000000	0000001490	SCSI data msgs
0000000000	0000000000	0000000000	task mgt msgs/rsp
0000000043	0000000003	0000000043	login msgs/rsp
0000000010	0000000000	0000000010	text msgs/rsp
0000000000		0000000000	invalid msgs/rsp
		0000000000	RTT msgs
		0000000000	async msgs
bytes rcvd	0000000000000000		
discarded	00000000		
bytes sent	0000000000002d3e8		

1 host listed

[Rita]# show scsirouter aix target all stats

aix target jbod_1:

RECEIVED		TRANSMITTED		
count	error	count	error	
0000000334		0000000325		Messages
0000000325	0000000000	0000000325	0000000101	SCSI cmd/resp
0000000000	0000000000	0000000000		task mgt
0000000010	0000000000	0000000000		login cmd
0000000009				logout
		0000000000		async event
0000000000		0000000186		data msg
0000000000000000	bytes received			
	00000000 discarded			
0000000000005c40	bytes transmitted			

target EMC_Clariion:

RECEIVED		TRANSMITTED		
count	error	count	error	
0000001767		0000001758		Messages
0000001758	0000000000	0000001758	0000000184	SCSI cmd/resp
0000000000	0000000000	0000000000		task mgt
0000000010	0000000000	0000000000		login cmd
0000000009				logout
		0000000000		async event
0000000000		0000001304		data msg
0000000000000000	bytes received			

```

00000000 discarded
00000000000277a8 bytes transmitted
totals for all targets:
      RECEIVED          TRANSMITTED
      count      error      count      error
0000002101          0000002083      Messages
0000002083 0000000000 0000002083 0000000285      SCSI cmd/resp
0000000000 0000000000 0000000000          task mgt
0000000020 0000000000 0000000000          login cmd
0000000018          0000000000          logout
0000000000          0000000000          async event
0000000000          0000001490          data msg
0000000000000000 bytes received
00000000 discarded
0000000000002d3e8 bytes transmitted

[Rita]# show interface ge1

Operational Data
Interface Stat IP/Netmask          MAC          Options
-----
ge1          up    10.48.69.202/ffffffc0    02023d3045ca  type Gigabit Ethernet
                                     mtusize 1500
                                     speed 1000000000
                                     flags UP BRDCST RUNNING MLT
                                     signal signal detect
                                     duplex full
                                     auto-negotiate disabled
                                     flow control full
                                     SFPVendor CISCO-AGILENT
                                     SFPVendorID A00258957
                                     SFPPartNumber QFBR-5790L
                                     SFPRev      -5790L

Configuration Data
Interface MTU Size  AutoNegotiation  Vlan  IP/Netmask          Seconday
-----
ge1          1500          disabled          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   10.48.69.128/26 is directly connected, mgmt
C   10.48.69.192/26 is directly connected, ge1
S   10.48.71.0/24 [1/0] via 10.48.69.202, ge1
C   127.0.0.1/8 is directly connected, lo0

[Rita]# show zone brief

No zones.
```

Related Information

- [iSCSI Driver for AIX Frequently Asked Questions](#)
- [Cisco iSCSI Driver for IBM AIX Release Notes](#)
- [Cisco iSCSI Drivers Software Download \(registered customers only\)](#)
- [Technical Support – Cisco Systems](#)

