adic Intelligent Storage™

SNC® Firmware 4 User's Guide

ADVANCED DIGITAL INFORMATION CORPORATION

www.adic.com

ADIC USA
11431 Willows Road NE
Redmond, Washington
98052-4952
Tel.: 1-800-336-1233
Fax: 1-425-881-2296

ADIC Europe
ZAC des Basses Auges
1, rue Alfred de Vigny
78112 Fourqueux, France
Tel.: 33-0-1-30-87-53-00
Fax: 33-0-1-30-87-53-01

ADIC-Germany GmbH&Co.KG
Eschenstraße 3
89558 Böhmenkirch
Germany
Tel: 49-0-7332-83-0
Fax: 49-0-7332-83-135

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Contents

1

Introduction

This manual contains information necessary for command line management of SNCs (Storage Networking Controllers) in the 5000 and 6000 product lines, as well as for the the SNC 4000. The SNC 6404 is sometimes referred to as the FC blade (FCB) or the I/O blade (IOB). With the restrictions, noted for individual commands or command sequences, command line operation of the SNC 6404 is also within the scope of this document. The level of the firmware code (4.4x.xx) appropriate to a particular SNC is stated in the compatibility matrix portion of the *Release Notes* for the current library or product release.

Intended Audience

This guide is intended for system administrators, operators, service engineers, or anyone interested in learning about or using SNC Firmware 4. Users are expected to understand the SAN architecture they are implementing before using this firmware.

Explanation of Symbols and Notes

The following symbols appear throughout this document to highlight important information.

Note	Indicates important information that helps you make better use of your system.
CAUTION	**Indicates a situation that may cause possible damage to equipment, loss of data, or interference with other equipment.**
WARNING	**INDICATES A POTENTIALLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, COULD RESULT IN DEATH OR BODILY INJURY.**

The following is a list of formatting conventions used throughout this document:

Italics	• Book title, for example, *Quick Start Guide* • File name, for example, *v44020.bin*
Bold	• Menu name, or command on a menu, for example, **Setup Wizard**

`Courier`	• command line input and output

Getting More Information

If you want more information about your product, go to the ADIC website or contact ADIC Technical Assistance Center (ATAC).

ADIC Technical Assistance Center

If problems cannot be solved with the aid of this document or if training is desired, contact the ADIC Technical Assistance Center (ATAC).

In the USA:	800-827-3822
In Europe and Japan:	00-800-9999-3822
For other contact numbers:	www.adic.com/contact
To open a Service Request online:	www.adic.com/techsup

2

Description

This chapter describes the functionality of the Storage Networking Controller (SNC) Firmware 4.

The SNC interface between storage and host provides Fibre Channel to SCSI connectivity or Fibre Channel to Fibre Channel connectivity.

The SNC firmware enables you to map addresses across and between different interfaces, to configure private maps for security purposes, to condition the data path, and to preserve the persistency of the address maps when systems, devices, switches, and the SNC are turned on and off. The SNC supports up to 2048 unique storage devices across multiple interfaces.

Compatible SNC Hardware

This SNC firmware is the operational firmware for the SNC 4000, the Pathlight 5000, SNC 5100, SNC 5101, SNC 6101, and the Fibre Channel I/O blades in the Scalar i2000 Library and the Pathlight VX solution.

Firmware 4 Features

Firmware 4 released functionality builds upon the feature set of previous releases, although not all features are available across product lines. The Firmware 4 code includes the following features:

Data Path Conditioning

Data path conditioning technology is a set of utilities in the SNC that protect the integrity of the paths carrying data. They make data transmission faster and more reliable, and they improve overall system availability. Health checks and heartbeats are conducted at intervals established by the administrator so that fault conditions can be discovered prior to moving data through the fabric. Error recovery is performed in the data path to prevent errors in the Fibre Channel layer from causing data transmission (a backup or a restore) to fail. The error recovery feature requires no administrator intervention. The Host Registration Service (HRS) is a small utility that can be loaded onto attached hosts, to provide data path checks from the host perspective.

Multi-Path Mapping

Multi-path mapping enables an administrator to map a single Fibre Channel-attached storage device through all Fibre Channels on the SNC to provide redundancy. Both manual and automatic versions of the multi-path feature are available. The automatic version of this feature is used by specialized, high-availability host software. Both versions require a license.

WWN Change Capability

The world wide name (WWN) change capability enables an administrator to change the WWN on the SNC. Text is posted during the procedure regarding the requirement to maintain a globally unique name. A password is required in order to complete the change. The world wide node name or just the world wide port name can be changed. This feature is being implemented to facilitate SNC replacement.

eVPS

The extended virtual private SAN (eVPS) feature enables an administrator to map any physical device to any logical unit number (LUN) on any host. This is an additional layer of LUN mapping that is unique for each initiator attached to the SNC through a Fibre Channel port. eVPS automatically provides backwards compatibility with virtual private SAN (VPS), a legacy mapping system, so you can upgrade to firmware that supports this feature transparently. Basic configuration is provided through command line interface (CLI) configuration functions, but the recommended management tool is the graphical user interface for your SNC—either the ADIC Management Console or the Library Management Console. eVPS also supports in-band management through Application Programming Interface (API) extensions to the existing maintenance in/out functions supported by VPS.

Fibre Channel Host Port Failover

This feature establishes one Fibre Channel port as the operating port and the other as the alternate port. The alternate port is on standby for the operating port. If an operating port fails, the alternate port takes over transparently. The configuration is persistent. This feature requires two Fibre Channel ports to be configured as targets in point-to-point mode.

Both SNC FC connections or at least two FC blade connections are run to a FC switch. A single connection to the FC host is then run from the FC switch. No explicit changes to the host driver, host bus adapter firmware or application software is required.


Note

This feature requires a license. Please contact your ADIC representative.

3

Setup and Configuration Routines

CAUTION **This procedures in this section are not intended to be used with FCBs in Scalar i2000 libraries or Pathlight VX systems.**

This section contains detailed procedures for basic configuration:

- Preparing SAN Components
- Configuring a Fibre Channel Host SAN
- Configuring a SCSI Host SAN
- Configuring the Ethernet Network
- Using DHCP
- Setting the Date and Time
- Creating User Accounts
- Configuring Ports

For using special features:

- Replacing a SCSI Drive
- Configuring Channel Zoning
- Configuring Host Port Failover
- Configuring eVPS
- Using the WWN Lock Mode
- Configuring Host Port Failover

For maintaining and troubleshooting the SNC:

- Replacing a SCSI Drive
- Saving a Configuration File
- Updating Firmware
- Loading a Configuration File Using HyperTerminal
- Changing the WWN
- Retrieving Information About Events

Preparing SAN Components

Before connecting FC (Fibre Channel) or SCSI cables to the SNC, make sure that the SNC:

- Has desktop or rack mount hardware installed
- Has Ethernet cable from the network hub or switch connected to its 10/100 BaseT RJ-45 Ethernet port for remote management and optional service access
- Has a null modem RS-232 cable connected from its 9-pin service port to a service terminal (PC or laptop) and a terminal emulation session (for example, HyperTerminal) running on the service terminal at 19.2K-8-N-XON/XOFF

Preparing Fibre Channel Hosts

Make sure that the host systems:

- Are running the required versions of host platform software and operating system patches. Download what you need from the manufacturer's website
- Have compatible Fibre Channel HBAs (Host Bus Adapters) and the appropriate HBA firmware, BIOS, and device driver installed
- Have HBA(s) configured for Fibre Channel (FC) Loop if they are attached to the SNC, or Point-To-Point, if attaching to an FC switch
- Have labeled FC cables attached to them, but not yet attached to the SNC (they may be attached to an intermediate switch, if there is one)
- Have the optional HRS (Host Registration Service) installed if virtual private map (VPM), Scalar firewall manager (SFM) or extended virtual private SAN (eVPS) is being used

Preparing Fibre Channel Switch

If an FC switch or FC disk subsystem is being used, make sure that:

- The switch or subsystem has been configured
- Its FC cables are labeled and have been run to the SNC, but are not yet connected
- The FC cables are long enough to ensure adequate strain relief
- The FC cables are secured
- The switch is turned on and operational

Refer to the device manufacturer's documentation for configuration information.

Preparing SCSI Tape or Disk Devices

If SCSI devices are being used, make sure that:

- SCSI IDs have been configured
- The SCSI cables have been labeled and are connected to the SNC
- The SCSI cables have adequate strain relief
- The SCSI cables are secured with mounting screws
- The SCSI devices are turned on and operational

Refer to the device manufacturer's documentation for configuration information.

Preparing SCSI Hosts

Make sure that the host systems:

- Are running the required versions of host platform software and operating system patches
- Have compatible HBAs (host bus adapters) and the appropriate HBA firmware, BIOS and device driver installed. Download what you need from the manufacturer's websites.
- Have labeled SCSI cables attached to them and to the SNC
- Have the optional HRS (host registration service) installed to facilitate use of VPM (virtual private map)
- Are turned on

Preparing FC Tape or Disk Devices

If FC devices are being used, make sure:

- That the FC cables have been labeled and are connected to the SNC
- That the FC cables have adequate strain relief
- That the FC cables are secured
- That the FC devices are turned on and operational

Refer to the device manufacturer's documentation for configuration information.

Configuring a Fibre Channel Host SAN

After you have prepared system components according to the section Preparing SAN Components on page 6, configure the SAN. Configure features such as HPF before attaching hosts to the SAN.

CAUTION **Do not use this procedure if you are using an FCB in a Scalar i2000 Library or a Pathlight VX system. Use the appropriate graphical user interface.**

1 Connect a service terminal to the service port. For the location of this port, see Figure 1 on page 11, or the User's Guide for your SNC.

Note Instructions for connecting a service terminal are included in the User's Guide for your SNC.

2 Turn the power on the SNC. For the location of this switch, refer to the User's Guide for your SNC.

Allow sufficient time for the SNC to boot up completely.

3 Press the **Enter** key on the service terminal.

If the prompt is not displayed, go to Service Port MAP on page 174.

Within one minute, the **RDY** LED on most SNCs should start flashing once per second and the *done executing startup script* message should be displayed on the service terminal. On the SNC 6101, it may take a little longer.

For the location of the **RDY** LED, see Figure 1 on page 11, or the User's Guide for your SNC.

From the service terminal, issue the `initializeBox` command to return the SNC to its default settings. For more information about this command, refer to initializeBox on page 84. This command causes the SNC to reboot.

CAUTION **Only use the `initializeBox` command on a new or a replacement SNC. This command resets the Fibre and SCSI Channels, clears the device map and the event log, and disables all enabled features.**

4 Issue the `version` command to make sure that the proper version of the operational firmware is installed. For more information about this command, refer to version on page 126.

5 Configure the Ethernet connection. For instructions, refer to Configuring the Ethernet Network on page 11.

6 Optionally, add a user account for telnet. For instructions, refer to Creating User Accounts on page 15.

7 Issue the `targets` command from the service terminal. It can take several minutes for the devices to be available for discovery. For more information about this command, refer to targets on page 121.

If results are not as expected, follow the procedures in the SCSI Channel MAP on page 159.

8 Issue the `hostTypeShow` command to view host type settings for the Fibre Channel ports. For more information about this command, refer to hostTypeShow on page 78.

Note If you are using SFM, VPS, or eVPS, go to the next step. SFM, VPS, and eVPS use an internal setting for the host type.

Table 1 Host Type Settings for Fibre Channel Ports

Host Type	Alias	Usage
AIX	Not Applicable	AIX
AS400	as/400, os/400, os400	AS400
Autosense/NT	Not Applicable	functions identically to “NT”
NT	windows	“NT” is the default setting
Gateway	fcr-2, pv-136t-fc, adic snc	Gateway
Generic	Not Applicable	The host does not use a supported host type
HPUX	hp-ux	HPUX
Linux	Not Applicable	Linux
Netware	Not Applicable	Netware
Solaris	sun, linux	Solaris
Unknown	Not Applicable	The host type is unknown or is based on the value set by VPS
Unisys	Not Applicable	Unisys

If the hosts to be connected are not the type shown in the output of the command, issue the `setHost` command to set the host type for each incorrect Fibre Channel port. For more information about this command, refer to setHost [port],"OS" on page 106.

9 Turn off the FC host(s).

CAUTION **If this SNC is a replacement, and the WWN of the replacement SNC must be the same as the WWN of the replaced SNC, refer to Changing the WWN on page 30.**

10 If you are going to configure host port failover (HPF), refer to Configuring Host Port Failover on page 24 before turning on the FC host(s).

11 Connect the FC cables from the FC HBA(s) to the SNC (or from the intermediate switch to the SNC).

12 Turn on the FC host(s).

- If the appropriate FC connection status LEDs for the attached hosts are not on, check FC cables.
- See Figure 1 on page 11 for the placement of the FC1 and FC2 connection status LEDs on a 5000 series SNC or SNC 6101.
- You may have to change the polarity of the FC cables.
- You may have to change port configuration. For instructions on doing so, refer to Configuring Ports on page 16.
- If problems persist, go to the Fibre Channel MAP on page 165.

13 Issue the `fcShow` command to show the status of the FC interface that is installed and connected. For more information about this command, refer to fcShow [level] on page 67.

14 Issue the `fcShowDevs` command to show SCSI target devices that are connected as seen by the Fibre Channel interface. For more information about this command, refer to fcShowDevs on page 69.

- Look for **FW State=Ready** for each FC interface. If any other state is specified, go to the Fibre Channel MAP on page 165.
- If **FW State=Ready**, but devices are not all displaying, go to the SCSI Channel MAP on page 159.

15 Use appropriate host system utilities for disk and/or tape. If all devices are not available, reboot the host system(s) and check again.

16 Save the configuration to a location you will be able to access if the SNC fails. Refer to Saving a Configuration File on page 27.

17 Issue the `fcShowNames` command and save the output to a location you will be able to access if the SNC fails. For more information about this command, refer to fcShowNames on page 69.

18 Attach the hosts (or the switch to which the hosts are attached) to the SNC.

Configuring a SCSI Host SAN

Note If you are running the 6101 or the 6404, you cannot configure a SCSI Host SAN.

After you have prepared system components according to the section Preparing SAN Components on page 6, configure the SAN. Configure features such as AMP before attaching hosts to the SAN.

1 Connect a service terminal to the service port of your SNC. For the location of this port, see Figure 1 on page 11, or the User's Guide for your SNC.

Note Instructions for connecting a service terminal are included in the User's Guide for your SNC.

2 Turn the power on the SNC. For the location of this switch, refer to the User's Guide for your SNC.

Allow sufficient time for the SNC to boot up completely.

3 Press the **Enter** key on the service terminal.

If the prompt is not displayed, go to Service Port MAP on page 174.

Within one minute, the **RDY** LED should start flashing once per second and the *done executing startup script* message should be displayed on the service terminal.

For the location of the **RDY** LED, see Figure 1 on page 11, or the User's Guide for your SNC.

4 From the service terminal, issue the `initializeBox` command to return the SNC to its default settings.

For a discussion of this command and its output, refer to initializeBox on page 84.

CAUTION **Only use the `initializeBox` command on a new or a replacement SNC. This command resets the Fibre and SCSI Channels, clears the device map and the event log, and disables all enabled features.**

5 From the service terminal, issue the `version` command to make sure the proper version of operational firmware is installed. For more information about this command, refer to version on page 126.

6 Issue the `scsiHostChanSet` command, setting the channel where the host will be connected to "Target." For more information about this command, refer to scsiHostChanSet [channel],[mode] on page 100.

7 Issue the `snReset` command. For more information about this command, refer to snReset [channel] on page 116.

8 Issue the `vpmFeatureEnable` command. For more information about this command, refer to vpmFeatureEnable "licensekeystring" on page 129.

CAUTION **While it is acceptable to enable VPM from the command line by following the procedure specified above, the preferred interface for managing VPM is the graphical user interface.**

- If you are going to use automatic multi-pathing (AMP), go to Replacing a SCSI Drive on page 25.
    - If you configured AMP, issue the `mapRebuildDatabase` command. For more information about this command, refer to mapRebuildDatabase on page 90.

9 To determine what device IDs are available for use, issue the `targets` command.

For an example of the `targets` command and its output, refer to targets on page 121. Take note of the target devices to which you have access. The numbers you need are in the "Idx" column. If you are using AMP, targets will appear twice in the list. Do not map any target more than once.

10 Configure the Ethernet connection.

For instructions, refer to Configuring the Ethernet Network on page 11.

11 Issue the `setScsiAssign` command. For more informationabout this command, refer to setScsiAssign [devID], [channel], [id], [lun] on page 106.

CAUTION **While it is possible to configure VPM assignments from the command line, the code to be manipulated can be so complex, that users are encouraged to use the graphical user interface.**

12 Issue the `showScsiAssign` command.

- Verify that all target devices are available to the host system.
- Use appropriate host system utilities for disk and/or tape.
- If results are not as expected, refer to VPM MAP on page 175 or Start MAP on page 154.

13 Save the configuration to a location you will be able to access if the SNC fails. Refer to Saving a Configuration File on page 27.

14 Attach the hosts to the SAN.

Configuring the Ethernet Network

CAUTION **The recommended interface for FCBs in the Scalar i2000 or Pathlight VX solution is the graphical user interface.**

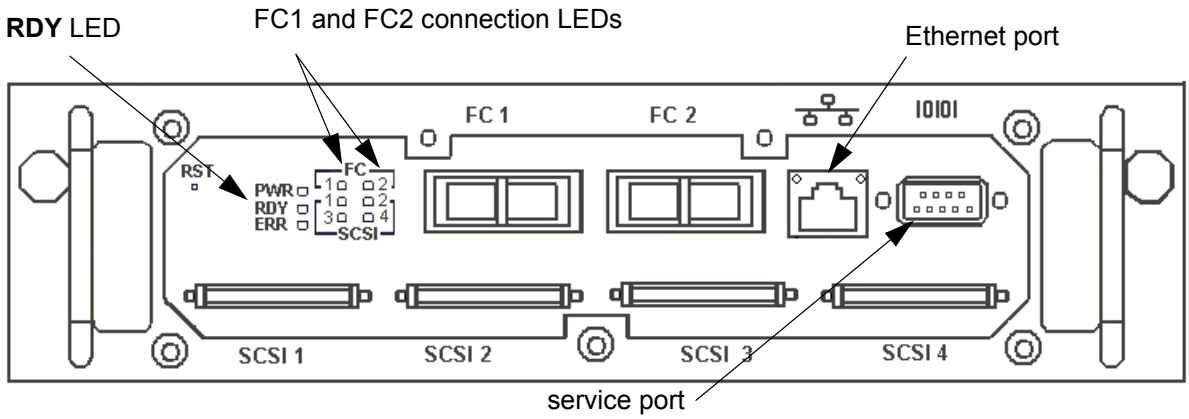
Note If you are configuring an SNC 4000, 51xx, or 6101, you can choose to use DHCP instead of static IP addresses. Refer to Using DHCP.

The SNC can be accessed over an Ethernet connection in addition to access by means of the service port.

1 Connect a service terminal to the service port. For the location of this port, see Figure 1 on page 11, or the User's Guide for your SNC.

Note Instructions for connecting a service terminal are included in the User's Guide for your SNC.

Figure 1 SNC connector and LED panel



Note The placement of the LEDs, SCSI ports, and service port on your SNC may not be the same as in this example. Refer to the Hardware User's Guide for your SNC.

CAUTION **In all of subsequent steps of this procedure, use the name and number values that your network manager and you have agreed to use.**

2 Issue the hostNameSet command to set the SNC name.

In the example shown, the host name of the SNC was “SN60023”, and it is now being set to “foster.” The shell prompt will change to reflect the new name.

```
SN60023 > hostNameSet "foster"
Target hostname set to foster
value = 0 = 0x0
foster >
```

Note Step 2 is optional.

3 Configure a static IP address, by issuing the ethAddrSet command to set the host network address.

The IP address is specified as four decimal numbers, separated by periods.

```
foster > ethAddrSet "192.168.1.54"
Host Address set to 192.168.1.54 for Ethernet interface
value = 0 = 0x0
```

If you need to set a netmask, specify it after the network address:

```
foster > ethAddrSet "10.0.0.2", "255.0.0.0"
```

If you need a network route and/or default gateway, use gateAddrSet to specify it.

```
foster > gateAddrSet "192.168.1.1"
value = 0 = 0x0
```

When more complicated routing is required, use the route command to specify the destination address, as a full address (single host) or as an abbreviated subnet address.

```
foster > route "add", "206.0.0", "192.168.1.1"
value = 0 = 0x0
```

4 If you want to add users, follow the procedure in Creating User Accounts below, before rebooting.

5 Issue the reboot command to reboot the SNC.

Using DHCP

CAUTION **This procedure is not intended to be used with FCBs in Scalar i2000 libraries or in Pathlight VX systems.**

An IP address assigned to a device by a Dynamic Host Configuration Protocol (DHCP) server does not change unless the device is disconnected from the network for a period that exceeds the lease period defined by the DHCP server. This time period is typically around 3 days. The SNC stores information from the DHCP server in its boot parameters and attempts to reuse it on subsequent boots in case the DHCP Server is unreachable.

1 Make sure that a DHCP server is present on the network.

CAUTION **If a DHCP server is unreachable, the SNC Ethernet port will be unusable.**

2 Connect a service terminal to the service port. For the location of this port, see Figure 1 on page 11, or the User's Guide for your SNC.

Note Instructions for connecting a service terminal are included in the User's Guide for your SNC.

3 Issue the `dhcpEnable` command. Refer to dhcpEnable on page 58.

4 Reboot the SNC for the change to take effect.

5 Connect to the SNC serial port and issue the `bootShow` command to determine the assigned network address. Refer to bootShow on page 51.

Note You must know the IP address in order to use telnet or the ADIC Management Console (AMC).

6 If you were referred to this section by another procedure, return to that procedure.

Setting the Date and Time

CAUTION **The recommended interface for FCBs in the Scalar i2000 or Pathlight VX solution is the graphical user interface.**

The SNC allows you to set the real time clock, to add a timeserver to the system, and to synchronize the real time clock to the timeserver.

Setting the Real Time Clock

1 Connect a service terminal to the service port. Alternatively, connect a service computer to the network that the SNC is on or to the Ethernet port of the SNC. For the location of these ports, see Figure 1 on page 11, or the User's Guide for your SNC.

Note Instructions for connecting a service terminal are included in the User's Guide for your SNC.

Note If you are using Ethernet, open a telnet program to connect to the SNC. Before you connect by means of telnet, configure a user account. For instructions, refer to Creating User Accounts on page 15.

2 Use the `rtcDateSet` command to set the real time clock.

```
SNC > rtcDateSet 2001,1,26,5,9,30,00
value = 0 = 0x0
SNC >
```

For detailed information about the parameters taken by the `rtcDateSet` command, refer to rtcDateSet [year],[month],[dayofmonth],[dayofweek],[hour],[minute],[second] on page 97.

In the example, the time is set for 9:30 in the morning on January 26, 2001.

Note Use 24 hour time when programming the real time clock.

Note Use Greenwich Mean Time.

3 Use the `dateSetFromRTC` command to set the real time clock on the SNC as the source of date display. For more information about this command, refer to dateSetFromRTC on page 56:

```
SNC > dateSetFromRTC
value = 0 = 0x0
SNC >
```

4 Use the `tzSet` command to set the timezone. EST, used in the example, stands for Eastern Standard Time. For more information about this command, refer to tzSet "timezone" on page 124.

```
SNC> tzSet "EST"
TZ Set TIMEZONE = EST:EDT:300:040202:101502
value = 0 = 0x0
SNC >
```

Table 2 Valid Timezone Settings

Timezone	GMT offset	Associated Areas
UTC	0	Greenwich, England
GMT	0	Greenwich Meridian Time
EST	GMT -5	Eastern Time (U.S. and Canada), Indiana (East)
CST	GMT -6	Central Standard Time (U.S. and Canada
MST	GMT -7	Mountain Standard Time
PST	GMT -8	Pacific Standard Time (Western U.S. and Canada)

5 Use the `date` command to confirm. For more information about this command, refer to date on page 56.

```
SNC > date
SNC > FRI JAN 26 9:30:49 2001
SNC >
```

Adding a Host System Running Timeserver

1 To enable the timeserver functionality use the `setNettime` command. For more information about this command, refer to setNettime [value] on page 106.

```
SNC > setNettime 1
Nettime 1 value = 0 = 0x0
SNC >
```

2 Add a host running timeserver to the SNC using the `setTimeHost` command. For more information about this command, refer to setTimeHost "timeserver" on page 107.

```
SNC > setTimeHost "butter"
Time Host butter value = 0 = 0x0
SNC >
```

3 Set the remote system as the source of date/time display using the `rdate` command. For more information about this command, refer to rdate "timeserver" on page 95.

```
SNC > rdate "butter"
Get time from butter using UDP/SNTP
value = 0 = 0x0
SNC >
```

4 Use the `tzSet` command to set the timezone

EST, used in the example, stands for Eastern Standard Time.

```
SNC > tzSet "EST" TZ Set TIMEZONE = EST:EDT:300:040202:101502
value = 0 = 0x0
SNC >
```

5 To confirm, use the `date` command. For more information about this command, refer to date on page 56.

```
SNC > date WED JUL 18 14:51:59 2001 value = 0 = 0x0
SNC >
```

Disabling the Timeserver Host

To disable the timeserver functionality issue the `setNettime 0` command.

```
SNC > setNettime 0
Nettime 0 value = 0 = 0x0
SNC >
```

The time will revert to the time set on the real time clock on the SNC.

Synchronizing the Real Time Clock with the Timeserver

1 Use the `setTimeHost` command to add a host running timeserver to the SNC system. For more information about this command, refer to setTimeHost "timeserver" on page 107.

```
SNC > setTimeHost "butter"
Time Host butter value = 0 = 0x0
SNC >
```

2 Synchronize the real time clock on the SNC with the timeserver using the `rtcSetCurrent` command. For more information about this command, refer to rtcSetCurrent on page 99.

```
SNC > rtcSetCurrent
value = 0 = 0x0
SNC >
```

Creating User Accounts

CAUTION **The recommended interface for FCBs in the Scalar i2000 or Pathlight VX solution is the graphical user interface.**

Before you access the SNC using telnet, add a user account.

Note — For inband connections, the default user account name is **admin** and the default user account password is **password**.

1 Connect a service terminal to the service port. For the location of this port, see Figure 1 on page 11, or the User's Guide for your SNC.

Note — Instructions for connecting a service terminal are included in the User's Guide for your SNC.

2 Issue the `userAdd` command. For more information about this command, refer to the commands beginning with `user` in the Service Port Command Reference on page 39.

```
foster > userAdd "username","password"
value = 0 = 0x0
foster >
```

Note — The user name you specify must be three or more characters. The password you specify must be eight or more characters.

Configuring Ports

CAUTION — **The recommended interface for FCBs in the Scalar i2000 or Pathlight VX solution is the graphical user interface.**

The settings in Table 3 are the default settings on the SNC:

Table 3 Default SNC Channel Settings

Fibre Channels	Public, Target, Loop Host Type: NT	Ready for attaching FCAL Windows NT or 2000 Hosts
SCSI Channels	Initiator Termination Enabled	Ready for attaching SCSI disk or tape devices

1 Connect a service terminal to the service port. Alternatively, connect a service computer to the network that the SNC is on or to the Ethernet port of the SNC. For the location of these ports, see Figure 1 on page 11, or the User's Guide for your SNC.

Note — Instructions for connecting a service terminal are included in the User's Guide for your SNC.

Note — If you are using Ethernet, open a telnet program to connect to the SNC. Before you connect by means of telnet, configure a user account. For instructions, refer to Creating User Accounts on page 15.

2 Use appropriate firmware commands to accommodate SAN configurations that do not conform to the default settings. For example, if your system contains few devices that are capable only of arbitrated

loop, the default connection type can be changed to from "loop" to "loop preferred." Refer to Table 4 and Table 5 .

Table 4 Fibre Channel Configuration Quick Reference

FC Device Attachment	Required Channel Settings	Service Port Commands

FC Host type[1]	NT (default)
	AIX
	AS400
	Autosense/NT
	Gateway
	Generic
	HP-UX
	Linux
	Netware
	Solaris
	Unknown
	Unisys
		`setHost [port], "OS"`
		and
		`reboot`

FC Switch	Point-to-Point
	Target (default)
		`fcConnTypeSet [port], [connection]`
		and
		`fcRestart`

FC disk or FC tape device	Loop (default)
	Initiator[2]
		`fcPortModeSet [port], [mode]`
		and
		`fcRestart`

1 If eVPS is being used, the FC Host type does not need to be configured manually.
2 The SNCs that use Firmware 4 support 64 initiators per Fibre Channel port

Table 5 SCSI channel configuration quick reference

SCSI Device Attachment	Required Channel Settings	Service Port Commands

SCSI Host	Target	`scsiHostChanSet [channel],[mode]`
		and
		`reboot`

SCSI disk and tape
SCSI Bus shared (dual paths)
	SCSI Bus Reset on Power Up Disabled	`scsiResetDisableSet [channel],[mode]`
		and
		`reboot`

SCSI disk and tape
SCSI Y-cable (SNC not at end of SCSI bus)
	Termination Disabled	`scsiTermSet [channel],[termination]`
		and
		`reboot`

Mapping Multiple Paths to Targets

CAUTION **The recommended interface for FCBs in the Scalar i2000 or Pathlight VX solution is the graphical user interface.**

The automatic multi-path mapping (AMP) and manual multi-path mapping (MMP) features allow you to map alternate paths to the SNC from switch-attached FC devices.

Note Both automatic and multipath mapping require licensing.

1 Be sure that the devices, the switch, the host, and the SNC have been powered on and have finished booting. The SNC connects at least two of its Fibre Channel connections to the switch, which connects to the devices.

CAUTION **These instructions do not take into account zoning software that may be on the switch.**

2 Connect a service terminal to the service port. Alternatively, connect a service computer to the network that the SNC is on or to the Ethernet port of the SNC. For the location of these ports, see Figure 1 on page 11, or the User's Guide for your SNC.

Note Instructions for connecting a service terminal are included in the User's Guide for your SNC.

Note If you are using Ethernet, open a telnet program to connect to the SNC. Before you connect by means of telnet, configure a user account. For instructions, refer to Creating User Accounts on page 15.

CAUTION **If you are configuring multiple paths to targets after host connections have been established, the change in target IDs can damage host configurations. Optimally, configure multipath mapping as part of setup.**

3 Issue the `ampFeatureEnable` command. For more information about this command, refer to ampFeatureEnable "license" on page 51.

4 Disconnect SNC Fibre Channel cables from the switch.

5 Clear the map database by issuing the `mapWinnowDatabase` command. For more information about this command, refer to mapWinnowDatabase on page 92.

6 Set the multi-path mapping configuration by issuing the `mapMultipathSet` command.

Use manual mode (`mapMultipathSet 1`) when using special host software. Manual mode exposes all paths to devices, including paths that are hidden because one target device's World Wide Port Name is identical to another target device's World Wide Port Name. Manual mode is used in conjunction with special host software, so that the user does not inadvertantly identify a single device as two devices, which can lead to data corruption. Host software allows the user to set one path to the device as primary and the other as secondary.

```
SNC > mapMultipathSet 1
Multipath mode set to manual mode.
value = 1 = 0x1
SNC >
```

Use automatic mode (`mapMultipathSet 2`) when special host software is not available and all devices are capable of responding to an inquiry with a unique serial number. Each target drive must also have two ports, both of which are connected to separate switches. Each switch must be connected to an SNC FC port. If either switch fails or any cables or GBICs fail on one path, failover automatically occurs to the other path.

```
SNC > mapMultipathSet 2
Multipath mode set to automatic mode.
value = 2 = 0x2
SNC >
```

For more information about this multipath settings, refer to mapMultipathSet on page 88.

7 Reconnect SNC Fibre Channel cables to the switch.

8 Issue the `fcRescan` command. For more information about this command, refer to fcRescan [port] on page 66.

9 Issue the `mapShowDevs` command to confirm that devices have been remapped using the multi-path configuration that was selected.

CAUTION **If devices have already been mapped, and they need to be remapped, use the `mapRemoveDevice` command. Then issue the `fcRescan` command.**

Configuring Channel Zoning

CAUTION **The recommended interface for FCBs in the Scalar i2000 or Pathlight VX solution is the graphical user interface.**

Access between ports configured for host access and ports configured for storage access can be enabled or disabled as required. The ability to create restricted access on a full-channel basis is called channel zoning. The default configuration is for all Fibre Channels to have access to all SCSI channels. Channel zoning is also possible from an FC target channel to an FC initiator channel.

In certain instances, customers may wish to combine the channel level security of channel zoning with the advanced LUN level security of Scalar Firewall Manager (SFM) to enable a mix of load balancing and host specific security. In this instance, channel zoning is used to provide load balancing while SFM delivers resource security and heterogenous host support.

Channel zoning enables load balancing by configuring certain SCSI channels to only be accessible across specific SAN connections. This is typically done by defining SCSI channels 1 and 2 to be accessible through FC port 1of the SNC, and SCSI channels 3 and 4 to be to be accessible through FC port 2. This insures that data traffic is split across the SNC SAN interfaces.

SFM is configured as usual, but the administrator must be aware that SFM does not override channel zoning. A host must have LUN level access to a drive through SFM, and be bound to the correct SNC FC port. If the host is incorrectly connected to the SNC, the combination of channel zoning and SFM may prevent the host from seeing resources.

CAUTION **While it is possible to configure channel zoning from the command line by following the procedure specified below, the preferred interface for channel zoning is the ADIC Management Console (AMC). For instructions on installing and using AMC, refer to the** *ADIC Management Console User's Guide.*

1 Connect a service terminal to the service port. Alternatively, connect a service computer to the network that the SNC is on or to the Ethernet port of the SNC. For the location of these ports, see Figure 1 on page 11, or the User's Guide for your SNC.

Note Instructions for connecting a service terminal are included in the User's Guide for your SNC.

Note If you are using Ethernet, open a telnet program to connect to the SNC. Before you connect by means of telnet, configure a user account. For instructions, refer to Creating User Accounts on page 15.

2 Issue the `setFcChanMask` command.

CAUTION **Channel Zoning settings take precedence over settings made by VPS/ SFM, and eVPS.**

This command uses bitmasked values to enable or disable access. For a complete discussion of the formula used to obtain appropriate values, refer to setFcChanMask [channel, bitmask] on page 104.

Table 6 lists some common values. The examples in Table 6 are all given for Fibre Channel 1, but the bitmasked values representing SCSI Channel access would not change if Fibre Channel 2 were specified instead.

Table 6 Common Channel Zoning Configuration Codes

Command String	Effect
`SNC> setFcChanMask 1,1008`	Enables access to SCSI channels 1 - 4 for Fibre Channel 1.
`SNC> setFcChanMask 1,1022`	Enables access to SCSI channel 1 for Fibre Channel 1.
`SNC> setFcChanMask 1,1021`	Enables access to SCSI channel 2 for Fibre Channel 1.
`SNC> setFcChanMask 1,1019`	Enables access to SCSI channel 3 for Fibre Channel 1.
`SNC> setFcChanMask 1,1015`	Enables access to SCSI channel 4 for Fibre Channel 1.

Table 6 Common Channel Zoning Configuration Codes

Command String	Effect
`SNC> setFcChanMask 1,1020`	Enables access to SCSI channels 1-2 for Fibre Channel 1.
`SNC> setFcChanMask 1,1011`	Enables access to SCSI channels 3-4 for Fibre Channel 1.

3 After issuing the `setFcChanMask` command, reboot for the changes to take effect.

Configuring VPM

The VPM (Virtual Private Map) software configures access to specific LUNs for certain SCSI hosts. A maximum of 256 LUNs per host can be mapped.

CAUTION **While it is possible to configure VPM from the command line by following the procedure specified below, the preferred interface for VPM is the ADIC Management Console (AMC). For instructions on installing and using AMC, refer to the** *ADIC Management Console User's Guide***.**

Optionally, before configuring VPM, install the HRS on the hosts involved. Instructions for doing so are in the User's Guide for your SNC. It is available for Windows, AIX, HP-UX, Linux, and Solaris hosts.

Note You must have a license to use VPM.

1 Connect a service terminal to the service port. Alternatively, connect a service computer to the network that the SNC is on or to the Ethernet port of the SNC. For the location of these ports, see Figure 1 on page 11, or the User's Guide for your SNC.

Note Instructions for connecting a service terminal are included in the User's Guide for your SNC.

Note If you are using Ethernet, open a telnet program to connect to the SNC. Before you connect by means of telnet, configure a user account. For instructions, refer to Creating User Accounts on page 15.

2 Issue the `vpmFeatureEnable` command. For more information about this command, refer to vpmFeatureEnable "licensekeystring" on page 129.

3 Issue the `targets` command. For more information about this command, refer to targets on page 121.

Take note of the target devices to which you have access. The numbers you need are in the "Idx" column.

4 Issue the `setScsiAssign` command. For more information about this command, refer to setScsiAssign [devID], [channel], [id], [lun] on page 106.

5 Issue the `showScsiAssign` command.

If results are not as expected, refer to VPM MAP on page 175.

6 Reboot the host(s) or use host utilities to rescan available targets.

Configuring eVPS

CAUTION **The recommended management interface for FCBs in the Scalar i2000 or Pathlight VX solution is the graphical user interface.**

The eVPS (extended Virtual Private SAN) software configures access to specific LUNs for certain Fibre Channel hosts. Access to these LUNs can be ordered in different, host-appropriate ways for each host. A maximum of 256 LUNs per host can be mapped, up to an overall device total of 2048.

CAUTION **While it is possible to configure eVPS from the command line by following the procedure specified below, the preferred interface for eVPS is the ADIC Management Console (AMC). For instructions on installing and using AMC, refer to the** ***ADIC Management Console User's Guide*****.**

Optionally, before configuring eVPS, install HRS on the hosts involved. Instructions for doing so are in the *ADIC Management Console User's Guide*. HRS is available for Windows, AIX, HP-UX, Linux, and Solaris hosts.

Note You must have a license to use eVPS.

1 Connect a service terminal to the service port. Alternatively, connect a service computer to the network that the SNC is on or to the Ethernet port of the SNC. For the location of these ports, see Figure 1 on page 11, or the User's Guide for your SNC.

Note Instructions for connecting a service terminal are included in the User's Guide for your SNC.

Note If you are using Ethernet, open a telnet program to connect to the SNC. Before you connect by means of telnet, configure a user account. For instructions, refer to Creating User Accounts on page 15.

2 Issue the `vpsFeatureEnable` command. For more information about this command, refer to vpsFeatureEnable "license key string" on page 132.

3 Issue the `vpsShow` command. For more information about this command, refer to vpsShow [hostIndex] on page 137.

Take note of the host index number. The host index number is the number in the ID column.

4 Issue the `targets` command. For more information about this command, refer to targets on page 121.

Take note of the target devices to which you have access. The numbers you need are in the "Idx" column.

5 If you are configuring access to all contiguous LUNs, issue the `vpsAccessSet` command. For more information about this command, refer to vpsAccessSet [hostIndex],[Starting lun],[Ending lun],[Access] on page 130.

   Use the number you noted in Step 3 for the value `[hostIndex]`. Use the lowest number that was output by the targets command you issued in Step 4 as the value for the `[Starting lun]`. Use the highest number that was output by the targets command you issued in Step 4 as the value for the `[Ending lun]`. Use an access value of "1" to enable access to these LUNs.

   If LUNS are not contiguous, use the `vpsSparseAccessSet` command. For more information about this command, refer to vpsSparseAccessSet[hostindex],"LUN string",[access] on page 138.

6 Issue the `vpsAccessApply` command.

7 Reboot the host(s) or use host utilities to rescan available targets.

Using the WWN Lock Mode

The `wwnLockModeSet` command gives a SAN administrator more direct control over which hosts (initiators) are able to access the library. SFM/VPS/eVPS must already be enabled for it to be used.

A maximum of 64 initiators can be connected per FC port. If the VPS host table is forced to retain host entries for initiators that do not have authority to access LUNs available through that SNC, then hosts which are authorized to access those LUNs may not be able to connect to the SAN. In situations where there are large numbers of initiators, and SFM/VPS/eVPS has been enabled, the contents of the host table can be controlled by setting the wwnLockMode to ‘1” (enabled). Then use vpsInitDelete [host ID] to remove unauthorized hosts and vpsInitAdd [hiWWN],[loWWN] to add authorized hosts to the host table.

The WWN lock mode default state is disabled.

1 Connect a service terminal to the service port. Alternatively, connect a service computer to the network that the SNC is on or to the Ethernet port of the SNC. For the location of these ports, see Figure 1 on page 11, or the User’s Guide for your SNC.

Note Instructions for connecting a service terminal are included in the User’s Guide for your SNC.

Note If you are using Ethernet, open a telnet program to connect to the SNC. Before you connect by means of telnet, configure a user account. For instructions, refer to Creating User Accounts on page 15.

2 Before you enable WWN lock mode, check to see if if SFM/VPS/eVPS is enabled. If not, enable it first. For instructions, refer to sfmFeatureEnable "license key string" on page 109 or vpsFeatureEnable "license key string" on page 132.

3 Issue the `wwnLockModeSet` command:

```
SNC > wwnLockModeSet 1
WWN Locking Mode: Enabled
value = 1 = 0x1
SNC >
```

   All hosts whose names are unknown in the VPS host table are deleted.

Note The `wwnLockMode` persists across reboots.

4 Check the state of the WWN lock mode, by issuing the `wwnLockModeShow` command.

```
SNC > wwnLockModeShow
WWN Locking Mode: Disabled
value = 0 = 0x0
SNC >
```

5 Display a list of hosts that have access to the SNC by issuing the `sfmShow` command or the vpsShow command:

```
SNC > sfmShow
```

The `sfmShow` command and the `vpsShow` command display all the hosts in the VPS host table. For more information, refer to sfmShow [hostIndex] on page 111.

Note — Only the hosts in the VPS host table have access to the command and control LUN when WWN lock mode is enabled.

a. Remove any unwanted hosts from the VPS host table by issuing the `vpsInitDel` command. For more information, refer to vpsInitDelete [host ID] on page 135.

b. Add hosts to the VPS table by issuing the `vpsInitAdd` command. For more information, refer to vpsInitAdd [hiWWN],[loWWN] on page 135.

Configuring Host Port Failover

CAUTION **The recommended interface for FCBs in the Scalar i2000 or Pathlight VX solution is the graphical user interface.**

The host port failover (HPF) feature uses an active/passive methodology. An active (primary) port is used for host communications, while the passive (standby) port is kept idle. Port failover occurs when connectivity between the primary port and the SAN ceases to function correctly. This can be caused by a loss of signal between the ports or excessive errors on the connection. The Fibre Channel ports are connected to the host computer by means of a switch.

Note — This feature requires a license. Please contact your ADIC representative.

Note — Use automatic or manual multi-pathing (AMP or MMP) to enhance data path protection for the part of the data path that connects the SNC to devices. Refer to Replacing a SCSI Drive on page 25.

1 Connect a service terminal to the service port. Alternatively, connect a service computer to the network that the SNC is on or to the Ethernet port of the SNC. For the location of these ports, see Figure 1 on page 11, or the User's Guide for your SNC.

Note — Instructions for connecting a service terminal are included in the User's Guide for your SNC.

Note — If you are using Ethernet, open a telnet program to connect to the SNC. Before you connect by means of telnet, configure a user account. For instructions, refer to Creating User Accounts on page 15.

2 Issue the `fcConnTypeGet` command to make sure the FC ports on the SNC are configured for point to point.

If necessary, issue the `fcConnTypeSet` command to change the setting. For more information about this command, refer to fcConnTypeSet [port],[connection] on page 63.

3 Issue the `fcPortModeGet` command to make sure the FC ports on the SNC are configured as targets.

If necessary, issue the `fcPortModeSet` command to change the setting. For more information about this command, refer to fcPortModeSet [port],[mode] on page 66.

4 Issue the `hpfFeatureEnable "licensekey"` command. For more information about this command, refer to hpfFeatureEnable "licensekey" on page 78.

5 Issue the `hpfShow` command. For more information about this command, refer to hpfShow on page 82.

The default configuration will not result in host port failover. Both FC ports on an SNC are active after HPF is enabled. Each FC port is a virtual port with a standby list consisting entirely of itself. In order for host port failover to occur, at least one port needs to be on standby list for each active port.

6 Issue the `hpfRemovePort` command to remove one of the active ports from its own virtual port list. For example,

```
SNC > hpfRemovePort 2,2
```

removes active port 2 from the standby list for virtual port 2.

For another example of the command and its output, refer to hpfRemovePort [virtual port],[phys port] on page 80.

7 Issue the `hpfAddPort` command to add the port that you just removed to the other port's standby list. For example,

```
SNC > hpfAddPort 1,2
```

adds port 2 to the standby list for virtual port 1.

For another example of the command and its output, refer to hpfAddPort [virtual port],[phys port] on page 78.

Note Use `hpfShow` as needed to monitor the effects of each command.

8 Issue the `hpfSetErrorRecovery` command to set the recovery scenario for ports configured by HPF.

One choice is to have a port return to active status after recovery occurs. Other choices are "return to standby" which means that the recovered port becomes the new standby port, and "require intervention" which means that the port stays down until the `hpfAddPort` command is issued.

For an example of the command and its output, refer to hpfSetErrorRecovery [value] on page 81.

Replacing a SCSI Drive

When a storage device managed by the SNC is replaced, the device map can be manipulated so that the host does not require reconfiguration. To do this, set the replacement device's SCSI target ID to match the target ID of the removed device.

1 Connect a service terminal to the service port. Alternatively, connect a service computer to the network that the SNC is on or to the Ethernet port of the SNC. For the location of these ports, see Figure 1 on page 11, or the User's Guide for your SNC.

Note Instructions for connecting a service terminal are included in the User's Guide for your SNC.

Note If you are using Ethernet, open a telnet program to connect to the SNC. Before you connect by means of telnet, configure a user account. For instructions, refer to Creating User Accounts on page 15.

2 Issue the `mapShowDatabase` command. Use the listing of the device map that is output to identify the offline drive.

```
SN601193 > mapShowDatabase
devId  Type  Chan  tId  tLun  UID                 Path
-------------------------------------------------------
000    SNA   127   127  007f  00000060:451704a9  SINGLE
    SN: 601193
001    SCSI  001   006  0000  20100060:451704a9  SINGLE
    SN:
002    SCSI  002   002  0000  20200060:451704a9  SINGLE
    SN:
003    SCSI  002   001  0000  20300060:451704a9  SINGLE
    SN:
value = 0 = 0x0
SN601193 >
```

If you are not sure which drive is offline, issue the `scsiShow` command. The `scsiShow` command lists all active SCSI drives attached to the SNC. The offline drive is the drive that appears in `mapShowDatabase`, but not in `scsiShow`.

```
SN601193 > scsiShow
========================================
Ultra2/3 SCSI Initiator Channel 1: 1010 - 0x30c97000 HostId=7 AltId=Auto
ID LUN Vendor   Product          Rev  | Sync/Off     Width
-------------------------------------|--------------------
 6   0 ADIC     Scalar 1000      621A |   10/ 0    8     0/ 0    8
========================================
Ultra2/3 SCSI Initiator Channel 2: 1010 - 0x30cad000 HostId=7 AltId=Auto
No Devices
========================================
Ultra2/3 SCSI Initiator Channel 3: 1010 - 0x30cc3000 HostId=7 AltId=Auto
No Devices
========================================
Ultra2/3 SCSI Initiator Channel 4: 1010 - 0x30cd9000 HostId=3 AltId=6
No Devices
========================================
value = 4 = 0x4
SN601193 >
```

A comparison of the output of the `mapShowdatabase` and `scsiShow` commands makes it clear that the two drives on SCSI Channel 2 (in the `mapShowDatabase` output, check the "Chan" column for devIDs 2 and 3) are not just offline, they are not currently connected at all.

3 Unattach the failed drive from the SNC, if it is not already unattached.

4 Follow the required library procedures to remove and replace the failed drive. For most libraries, the SCSI ID can be confirmed from the library operator panel. For the Scalar 1000 and the Scalar 10K, set the pinwheel on the drive itself to correctly configure the SCSI ID.

CAUTION **Make sure that the SCSI Target ID on the replacement drive is the same as that of the failed drive.**

5 Attach the replacement drive to the same SNC bus as the failed drive.

CAUTION **Do not attach the drive to the SNC SCSI bus before the SCSI ID is set.**

6 Reboot the SNC so that the SNC rescans for devices.

7 Issue the `mapShowDevs` command.

```
SN601193 > mapShowDevs
devId  Type  Chan  iId  iLun  UID              tId  tLun  Handle     Path
-------------------------------------------------------------------------
-------
000    SNA 127 127  007f 20000060.451704a9  001  000   091bf700h  SINGLE
SN: 601193
001    SCSI 001 006 0000 20100060.451704a9  255  255   09ffbc88h  SINGLE
SN: ADIC201101595
002    SCSI 002 002 0000 20200060.451704a9  255  255   091b2488h  SINGLE
SN: 6811121075
003    SCSI 002 001 0000 20300060.451704a9  255  255   09ffb388h  SINGLE
SN: 6811107750
value = 0 = 0x0

SN601193 >
```

If the replacement drive appears at a different ID than the original devID, make sure that the drive is attached to the correct SCSI bus and that the drive's SCSI Target Id (tID) is correct.

Saving a Configuration File

CAUTION **The recommended interface for FCBs in the Scalar i2000 or Pathlight VX solution, as well as for other SNCs, is the graphical user interface.**

Note Using HyperTerminal to save the configuration takes much longer than using the graphical user interface.

It is good practice to save the configuration to a remote system any time it changes.

1 Connect a service computer to the network that the SNC is on or to the Ethernet port of the SNC. For the location of this port, see Figure 1 on page 11, or the User's Guide for your SNC.

Note Before you connect by means of telnet, configure a user account. For instructions, refer to Creating User Accounts on page 15.

2 Follow the manufacturer's instructions for installing HyperTerminal on the service computer and opening a session.

3 Change the working directory to `/nvfs`:

```
cd "/nvfs"
```

4 From the HyperTerminal window, select **Transfer and Receive File**.

5 In the **Receive** dialog box, enter the path to the folder where you want to save the file, or click the **Browse** button and navigate to it.

6 For the receiving protocol select **Zmodem** and press the **Close** button.

From the HyperTerminal window, enter `sz "config.cfg"` and press **Enter**.

The filename "*config.cfg*" is an example of a name. You can specify a different filename, but it must be in quotes, it must be eight characters or less, and it must end in .cfg.

Updating Firmware

CAUTION **The recommended interface for updating firmware to all SNCs is the graphical user interface.**

CAUTION **Do not interrupt a fimware FTP. If the process is disturbed, damage to the SNC can result.**

As part of ongoing maintenance, firmware can be updated using an Ethernet connection or a telnet connection.

Updating Firmware Using FTP

1 Connect a service computer to the network that the SNC is on or to the Ethernet port of the SNC. For the location of ths port, see Figure 1 on page 11, or the User's Guide for your SNC.

2 FTP to the SNC (using usual telnet user and password).

```
C:\>ftp 172.16.77.101
Connected to 172.16.77.101.
220 VxWorks (5.4.2) FTP server ready
User (172.16.77.101:(none)): admin
331 Password required
Password:
230 User logged in
```

3 Switch to binary mode.

```
ftp> binary
200 Type set to I, binary mode
```

4 Upload firmware using "/fwl/fw" as the target.

Note The character after the "fw" is an "el" (l), not a "one" (1).

```
ftp> put v042208.bin /fwl/fw
200 Port set okay
150 Opening BINARY mode data connection
226 Transfer complete
ftp: 3542016 bytes sent in 2.74Seconds 1290.82Kbytes/sec.
ftp> quit
```

```
C:\>
```

5 Wait for the *Firmware Update Complete* status message to be displayed on the service computer indicating successful completion.

6 Reboot the SNC for the update to take effect.

Updating Firmware Using the Serial Port

1 Connect a service computer to the serial port on the SNC. For the location of this port, see Figure 1 on page 11, or the User's Guide for your SNC.

2 Follow the manufacturer's instructions for installing HyperTerminal on the service computer and opening a session.

3 From the HyperTerminal window, at the `SNC >` command prompt, type `rz` and then press the **Enter** key.

4 From the HyperTerminal window select **Transfer** and **Send File**.

5 From the **Send File** dialog enter the path and filename where the firmware file is located or click the `Browse` button and navigate to it.

6 In the **Protocol** field, select **Zmodem** and click the **Send** button.

CAUTION **Make sure the serial cable is secure before you begin. Do not disturb it during the file transfer. If the process is disturbed, damage to the SNC can result.**

7 The Zmodem file send dialog will display the current status and it will close automatically when the file transfer has completed.

8 Wait for the *Firmware Update Complete* status message to be displayed on the service computer indicating successful completion.

9 Reboot the SNC for the update to take effect. For more information about the `reboot` command, refer to reboot on page 95.

If HyperTerminal reports an error, try to send the file again.

10 Use the `exit` command to close the telnet session.

Loading a Configuration File Using HyperTerminal

CAUTION **The recommended interface for FCBs in the Scalar i2000 or Pathlight VX solution is the graphical user interface.**

Note Using HyperTerminal to upload a configuration file takes much longer than using the graphical user interface.

A saved configuration can be uploaded as part of recovery from system failure.

1 Connect a service computer to the serial port on the SNC. For the location of this port, see Figure 1 on page 11, or the User's Guide for your SNC.

2 Follow the manufacturer's instructions for installing HyperTerminal on the service computer and opening a session.

3 Issue the `cd "/fw1/fw"` command at the prompt to change the working directory to `/fw1/fw`.

Note The character after the "fw" is an "el" (l), not a "one" (1).

4 From the HyperTerminal window, at the command prompt, type `rz` and then press the `Enter` key.

5 From the HyperTerminal window select **Transfer** and **Send File**.

6 From the **Send File** dialog enter the path and file name where the configuration file is located or click the **Browse** button and navigate to it. In the **Protocol** field, select **Zmodem** and click the **Send** button.

7 Wait for the *Configuration Update Complete* status message to be displayed on the service computer indicating successful completion.

8 Reboot the SNC for the update to take effect. For more information about the `reboot` command, refer to reboot on page 95.

Changing the WWN

Before making any changes to the world wide names of the SNC, read the following discussion in its entirety.

CAUTION **Do not use this procedure on the SNC 6000 I/O blades in a Pathlight VX I/O system. The Pathlight VX Storage Processor supplies the WWN to the SNC 6000 I/O blades.**

All Fibre Channel devices are identified by world wide names (WWNs). These names are used to uniquely identify a device on a storage area network (SAN) and are used by hosts to correctly connect to the storage networking controller (SNC) or I/O blade. WWNs are divided into two types: port names, which identify individual ports, and node names, which identify the entire unit. WWNs are formed of three critical components:

- Port/Node ID—distinguishes port WWNs from node WWNs
- OUI—identifies the device type, stands for organizational unique identifier
- Device ID—identifies the specific device

Except for the I/O blades in the Pathlight VX, the node ID for ADIC devices is always “10:00” and the port ID is “20:0x” where x is the port number. The OUI is “00:60:45” for the 3000 and 5000 series and “00:30:8C” for the 6000 series. If for any reason you incorrectly enter a WWN, the changes can be cleared and replaced with the original WWN, which is stored in the SNC.

CAUTION **Only trained and authorized service personnel should use these procedures. Data corruption or loss may result from the incorrect use of these procedures. Do not change the WWN of any device on the SAN before talking to your ADIC-authorized service technician.**

Before You Change the WWN on a Replacement SNC

1 Connect a service terminal to the service port. Alternatively, connect a service computer to the network that the SNC is on or to the Ethernet port of the SNC. For the location of these ports, see Figure 1 on page 11, or the User’s Guide for your SNC.

Note Instructions for connecting a service terminal are included in the User’s Guide for your SNC.

Note

If you are using Ethernet, open a telnet program to connect to the SNC. Before you connect by means of telnet, configure a user account. For instructions, refer to Creating User Accounts on page 15.

2 Locate the saved copy of the current (pre-replacement) configuration.

3 Refer to the output of the `fcShowNames` command you saved in Step 17 of Configuring a Fibre Channel Host SAN or Step 14 of Configuring a SCSI Host SAN. For more information, refer to fcShowNames on page 69.

4 Install and cable the replacement SNC. For more information, refer to Preparing SAN Components on page 6.

5 Issue the `targets` command. For more information about this command, refer to targets on page 121.

If the output of the `targets` command is not accurate, go to Start MAP on page 154 and make corrections before proceeding with the WWN change.

Changing the WWN for all FC Ports

Use this procedure when you are replacing one SNC with another, and it is critical that the replacement SNC use the same WWNs as the replaced SNC.

1 Read the section Changing the WWN on page 30.

2 Follow the instructions in Before You Change the WWN on a Replacement SNC on page 30.

CAUTION

The WWN override functions are available only from the service port. These commands cannot be executed if attempted in a telnet session.

3 Issue the `wwnGlobalSet` command to establish a new base WWN.

Using the `wwnGlobalSet` command will update both the node name and port names. For more information about this command, refer to wwnGlobalSet on page 139.

The following messages are displayed:

```
This command will change the WWN for Fibre Channel Ports.
This should only be done when replacing a failed SNC.You should never
operate 2 FC devices that are set to the same WWN. This may destabilize
your SAN.
The unit will be rebooted after the WWN change.
Do you want to proceed (enter "yes" to continue) :
```

4 Type the word `yes` and press **Enter**.

The following message is printed:

```
Enter the new WWN (or q to quit):
```

5 Enter all eight bytes of the new WWN. Each byte of the entry should be delimited by colons. For example, enter:

```
00:00:00:30:8C:02:70:21
```

CAUTION

The `wwnGlobalSet command` requires that the first byte be entered as "00" even if `fcShowNames` displays "10" in that position.

CAUTION **When entering the WWN, the firmware will confirm that the node ID and OUI match the existing values. This prevents a user from accidentally making the SNC appear as another vendor's device.**

The first five bytes of the entry are checked. If the entry is valid, you are prompted for a password.

6 Type the password `OverrideWWN` and press **Enter**.

This causes the SNC to reboot.

7 When the SNC has rebooted, issue the `fcShowNames` command to verify the change.

Verify that the output in the **Node Name** column is correct.

8 Continue with the replacement procedure as specified by the User's Guide for your SNC.

Changing a WWN for one FC port

Use this procedure when you are replacing another vendor's appliance with an SNC and it is critical that one of the replacement SNC FC ports use the same WWN as the FC port of the replaced appliance.

CAUTION **Because you are changing the SNC WWNs to represent another vendor's device, there are no checks to make sure an appropriate node or port ID or OUI are entered. Use caution. Entering in inaccurate WWN information could cause communication issues.**

1 Read the section Changing the WWN on page 30.

2 Follow the instructions in Before You Change the WWN on a Replacement SNC on page 30.

CAUTION **The WWN override functions are available only from the service port. These commands cannot be executed if attempted in a telnet session.**

3 Issue the `wwnPortSet` command to set the WWPN and WWNN for a single FC port. For more information about this command, refer to wwnPortSet [port] on page 141.

The following messages are displayed:

```
This command will change the WWN for Fibre Channel Port <N>.
You will be asked to provide both the Node WWN and Port WWN for this port.
You should never operate 2 FC devices that are set to the same WWN. This
may destabilize your SAN.
The unit will be rebooted after the WWN change.
Do you want to proceed (enter "yes" to continue) :
```

4 Type the word `yes` and press **Enter**.

The following message is displayed:

```
Enter the new Node WWN (or q to quit) :
```

5 Enter all eight bytes of the new WWNN. The entry should be colon delimited between each byte. For example, enter:

```
10:00:00:60:45:02:70:21
```

The syntax of the entry is checked.

6 If the entry is valid, you are prompted to enter the new WWPN:

```
Enter the new Port WWN (or q to quit) :
```

7 Enter all eight bytes of the new WWPN. The entry should be colon delimited between each byte. For example, enter:

```
20:01:00:60:45:02:70:21
```

The syntax of the entry is checked.

CAUTION **Most vendors require the OUI and device ID to match between the WWPN and WWNN. Make sure these values match or device connectivity may not occur. It is possible for the SNC to have a different WWNN for each port.**

If the entry is valid, you are prompted for a password.

8 Type the password `OverrideWWN` and press **Enter**.

This causes the SNC to reboot.

9 When the SNC has rebooted, issue the `fcShowNames` command to verify the change.

Verify that the output in the **Port Name** column is correct.

10 Continue with the replacement procedure as specified by the User's Guide for your SNC.

Clearing Changes to the WWN for all FC ports

Use this procedure when you are removing an SNC that had its WWNs changed to match a pre-existing unit.

1 Read the section Changing the WWN on page 30.

2 Follow the instructions in Before You Change the WWN on a Replacement SNC on page 30.

CAUTION **The WWN override functions are available only from the service port. These commands cannot be executed if attempted in a telnet session.**

CAUTION **The `wwnGlobalClear` command works only if the `wwnGlobalSet` command has been used. To clear port changes made with `wwnPortSet`, follow the steps outlined in Clearing Changes to the WWN for one FC Port on page 34. Then follow this procedure.**

3 Issue the `wwnGlobalClear` command. For more information about this command, refer to wwnGlobalClear on page 139.

The following messages are displayed:

```
This command will restore the WWN for Fibre Channel Ports.
This should only be done when there is no SNC set to this WWN.
You should never operate 2 FC devices that are set to the same WWN. This
may destabilize your SAN.
The unit will be rebooted after the WWN change.
Do you want to proceed (enter "yes" to continue) :
```

4 Type the word `yes` and press **Enter**.

You are prompted for the password.

5 Type the password `OverrideWWN` and press **Enter**.

This causes the SNC to reboot.

6 After the SNC has rebooted, issue the `fcShowNames` command to verify the change.

The output in the **Node Name** column of the of the `fcShowNames` command should no longer match the output saved in Step 17 of Configuring a Fibre Channel Host SAN or Step 14 of Configuring a SCSI Host SAN.

Clearing Changes to the WWN for one FC Port

Use this procedure when you are removing an SNC that had the WWN on one port changed to match the WWN of a pre-existing unit.

1 Read the section Changing the WWN on page 30

2 Follow the instructions in Before You Change the WWN on a Replacement SNC on page 30.

CAUTION **The WWN override functions are available only from the service port. These commands cannot be executed if attempted in a telnet session.**

3 Issue the `wwnPortClear <port>` command. For more information about this command, refer to wwnPortClear [port] on page 140.

CAUTION **The `wwnPortClear` command does not reset the port WWN to the factory default if the `wwnGlobalSet` command has been used. It resets the port WWN to the value assigned by the `wwnPortSet` command.**

```
The following message will display:
This command will restore the WWN for Fibre Channel Port <x>. This should
only be done when there is no SNC set to this WWN.
You should never operate 2 FC devices that are set to the same WWN. This
may destabilize your SAN.
The unit will be rebooted after the WWN change.
Do you want to proceed (enter "yes" to continue) :
```

4 Type the word `yes` and press **Enter**.

You are prompted for the password.

5 Type the password `OverrideWWN` and press **Enter.**

This causes the SNC to reboot.

6 After the SNC has rebooted, issue the `fcShowNames` command to verify the change.

7 The output in the **Node Name** column of the of the `fcShowNames` command should no longer match the output saved in Step 17 of Configuring a Fibre Channel Host SAN or Step 14 of Configuring a SCSI Host SAN.

Retrieving Information About Events

This section contains information about retrieving event logs and Fibre Channel dump information.

Event Log Dump

The events that have been logged in the event log can be displayed. Both normal events and any abnormal events that may lead you to the source of an internal or external failure are displayed. You can choose to view only those events logged since the SNC was last booted (`loggerDumpCurrent`) or you can view a longer list of events that have accumulated from previous boots (`loggerDump`).

1 Connect a service terminal to the service port. Alternatively, connect a service computer to the network that the SNC is on or to the Ethernet port of the SNC. For the location of these ports, see Figure 1 on page 11, or the User's Guide for your SNC.

Note Instructions for connecting a service terminal are included in the User's Guide for your SNC.

Note If you are using Ethernet, open a telnet program to connect to the SNC. Before you connect by means of telnet, configure a user account. For instructions, refer to Creating User Accounts on page 15.

2 Issue one of the following commands:

a. `loggerDumpCurrent`—to view the events listed since the SNC was last booted

b. `loggerDump`—to view events that have accumulated from as many previous boots as can be reported until the limit of 2000 events has been reached

Each entry contains a sequence number, day, and time-stamp, the event code, event source (interface name or system process), an index, and a description of the event.

If the real time clock has been set, the time-stamp will be real time. See also Figure 2.

Retrieving the Code 43 Dump File

Event code 43 is recorded in the SNC event log along with the name of a file that was saved to the flash file system. That file contains information about the state of the Fibre Channel interface prior to the reset.

If an event code 43 was reported to the ADIC Management Console client, it is an indication that the SNC performed an error recovery operation and had to reset the Fibre Channel interface to clear a lock-up condition.

1 Connect a service terminal to the service port. Alternatively, connect a service computer to the network that the SNC is on or to the Ethernet port of the SNC. For the location of these ports, see Figure 1 on page 11, or the User's Guide for your SNC.

Note Instructions for connecting a service terminal are included in the User's Guide for your SNC.

Note If you are using Ethernet, open a telnet program to connect to the SNC. Before you connect by means of telnet, configure a user account. For instructions, refer to Creating User Accounts on page 15.

2 Navigate to the `DUMP` directory by entering the `cd "/ffs/dump"` command.

3 Issue the `ls` command to get a file listing for the directory.

There may be more than one file present if the error condition has occurred more than once.

CAUTION **Dump file names end in .dmp. Existing dump files can be overwritten by newer dump files.**

4 Refer to the section Saving a Configuration File on page 27.

Substitute the name of the dump file and use that procedure to save the file to the service computer.

Repeat this step if there is more than one file.

Save each file to the service computer.

5 Send the file to support@adic.com for analysis, attaching the dump files to the message.

Working With Command Flow Log Information

Two kinds of events are recorded in the command flow log file: sequence events and single command events. Sequence events are Read/Write commands. All other events are single command events. Several commands can be used to produce command flow log information:

- cfLogTimePlayback
- cfLogTimePlaybackAll
- cfLogEventPlayback
- cfLogEventPlaybackAll

Use these commands to get command flow log information limited by a particular LUN, time period, or a specified number of events.

The output that results from these commands starts with the internal LUN number of the device for which information is being provided. The device's vendor, product ID, and serial number are also listed in this line:

```
LUN=1   Vendor=HP       Product=Ultrium 1-SCSI   SN=IE71K05450
```

After this line, numbered events pertaining to the cited LUN are printed. Each line begins with an event number. In the following example, the event number is 506:

```
000000506 MAY27 08:17:12  2 125 WRITE=021540 ERR=000000 08:28:45
```

The event number is followed by the month, day of the month, start time, initiator channel and initiator index. In event 506, the word "Write" after the initiator index indicates that the sequence event "Write" is being logged. The number "021540" after "Write" represents the number of times the SNC carried out the "Write" command. No errors were recorded in the course of the command being carried out. Compare the time stamp at the end of this line to the start time to determine how long it took the SNC to complete the sequence event.

If data was transferred to or from the host, a new line is displayed indicating the direction of the transfer ("DIR=IN" is to the host and "DIR=OUT" is from the host), the number of bytes requested (REQ) and the number of bytes actually transferred (XFER):

```
DIR=IN   REQ=14 XFER=14
```

If the event is a single command event, as in event 511 below, the initiator index is followed by an 8 character abbreviation for the operation code, the command descriptor block—which may be 6, 10, 12 or 16 bytes in length—the command completion status, and end time:

```
000000511 MAY27 08:28:51  2 125 MODE SNS 1a0000000c00 GOOD(00) 08:28:51
```

Refer to a SCSI command reference guide to understand the operation code and command descriptor block information.

Whenever the command completion status is not good (check condition 02), the 18 byte sense data is also displayed, as in event 739 below.

```
000000739 MAY27 08:37:38 2 125 LOG SNS  4d002e00000000040000 CHCK(02)08:37:38
                                         DIR=IN   REQ=400 XFER=00
          DEV-SENSE=70 00 05 00 00 00 00 0a 00 00 00 00 24 00 00 cf 00 02
          Illegal Request: Invalid Field in CDB
```

The status origin is shown as DEV if the status is from the device and SNC if the SNC returned the status. The sense data fields for Filemark, EOM, ILI, key, additional sense code, and additional sense code qualifier are translated and displayed on the next line. Refer to a SCSI command reference guide to understand the the sense data in these fields.

4

Service Port Command Reference

A “shell” interface provides access to the management and configuration commands referenced in this chapter. Connect a terminal or a computer with terminal emulation software to the service port to access the shell. Instructions for doing so are contained in the User’s Guide for your SNC.

Managing the SNC

The ADIC Management Console application (AMC) is the preferred method for managing the SNC. When you use AMC, the operations described in this guide are carried out by means of a graphical user interface. For installation and use, refer to the *ADIC Management Console User’s Guide*. Not all the commands listed in this section are available in AMC.

The following table is a list of the commands grouped by function.

Commands

This section specifies the commands that are available to control, manage, and service the SNC. These commands are listed alphabetically by function in Table 7 and alphabetically. They are also used in Troubleshooting on page 149 and the Diagnostic Command Reference on page 143.

Each command outputs a status “value” in decimal and hexadecimal after execution and before a new prompt is displayed.

```
value = 0 = 0x0
```

Usually a value of 0 indicates success, but some successful commands return a different value.

Table 7 Service port commands listed alphabetically by functional group

Command or Command Group	**Description**	**Page**
disableCC	Disable command and control interface	58
enableCC	Enable command and control interface	59
setSnaCCLun	Change command and control interface LUN	107
Channel Zoning		

Table 7 Service port commands listed alphabetically by functional group (Continued)

Command or Command Group (Continued)	Description (Continued)	Page (Continued)
setFcChanMask	Configure Fibre Channel zoning	104
Data Mover		
sncFeatureEnable	Enable the optional Data Mover feature	114
Data Path Conditioning	Refer also to **Host Port Failover** and **Health Check**	
ghostIOSet	Change the length of time that commands to FC targets remain queued	72
ampFeatureEnable	Enable the optional multi-path mapping feature	51
ethFailoverPingAddrShow	Show the ping address of the Ethernet failover feature	61
ghostIOShow	Display the length of time that commands to FC targets remain queued	73
mapMultipathSet	Change the setting for mapping new targets	88
mapMultipathShow	Display the current setting for mapping new targets	89
mapRemoveDevice	Remove a device from the persistent device map	90
tPathShow	Display the state of targets mapped for failover	123
Diagnostics	Diagnostic commands are located in Diagnostic Command Reference on page 143.	
bootShow	Display the boot parameters	51
diagBoot	Transition an SNC from normal operations to diagnostic mode	144
elTest	Perform an Ethernet loop back test	144
fcSlotTest	Perform a confidence test on a Fibre Channel slot	145
normalBoot	Transition an SNC from diagnostic mode to normal operations	145
scsiChannelTest	Perform a confidence test on a pair of SCSI channels	146
showBox	Display components of the SNC	146
supportDump	Output the result of a number of service port commands in a standard way and in a specific order.	116
Environmental Sensors		
envMonShow	Display all environmental states	60

Table 7 Service port commands listed alphabetically by functional group (Continued)

Command or Command Group (Continued)	Description (Continued)	Page (Continued)
envMonRangeShow	Display the allowable ranges for environmental states	61
Ethernet Network		
arptabShow	Display a list of known ARP entries	51
dhcpClientShow	Display data received from the DHCP server	57
dhcpDisable	Disable DHCP	57
dhcpEnable	Enable DHCP	58
dhcpState	Display whether DHCP is enabled or disable	58
ethAddrGet	Display Ethernet port address	61
ethAddrSet	Set Ethernet port address	61
ethMacGet	Display Ethernet port configuration	61
ethMacSet	Configure Ethernet port	62
gateAddrGet	Display network gateway address	72
gateAddrSet	Set network gateway address	72
host “add”	Add host table entries	76
host “delete”	Delete network host table entries	76
host “list”	List network host table entries	77
hostNameSet	Change network name	77
icmpstatShow	Display statistics for ICMP	83
ifShow	Display Ethernet port parameters and status	83
inetstatShow	Display all Internet protocol sockets	84
ipstatShow	Display statistics for IP	85
macShow	Display Ethernet port media access control address	87
mbufShow	Display mbuf statistics	92
resolvParamShow	Display a list of DNS servers on the network	95
route	Edit route table entries	96
route “add”	Add network route table entries	97
route “delete”	Delete network route table entries	97
route “list”	List network route table entries	97
snmpCommunitiesShow	Display list of Community names currently in use	114

Table 7 Service port commands listed alphabetically by functional group (Continued)

Command or Command Group (Continued)	Description (Continued)	Page (Continued)
snmpReadCommunityAdd	Add Community name with Read permission	115
snmpReadCommunityRemove	Remove Community name Read permission	116
snmpTrapCommunitySet	Set Community name passed with traps	115
snmpWriteCommunityAdd	Add Community name with write permission	115
snmpWriteCommunityRemove	Remove Community name write permission	116
tcpstatShow	Display statistics for TCP	122
trapDestAdd	Add recipient IP address to trap destination table	123
trapDestRemove	Remove recipient IP address from trap destination table	123
trapDestShow	Display trap destination table	124
udpstatShow	Display statistics for UDP	124
userAdd	Add a user and password to the password file	125
userDelete	Delete a user from the password file	125
userList	Display the contents of the password file	125
Event Logging		
cfLogHelp	Display a list of the commands used to work with command flow log information	52
cfLogDetailDisable	Disable detailed command flow logging	52
cfLog DetailEnable	Enable detailed command flow logging	52
cfLogTimePlayback	Display command flow log events for a specified time period for a specified device	53
cfLogDetailShow	Display the current detail trace mode setting	53
cfLogTimePlaybackAll	Display command flow log events for a specified time period for all devices	54
cfLogEventPlayback	Display a specified number of command flow log events for a specified device	53
cfLogEventPlaybackAll	Display a specified number of command flow log events for all devices	53
cleShow	Display command log events for the specified LUN (This command is disabled in newer firmware. Refer to `cfLogHelp`.)	54
cleShowAll	Display command log events for all LUNs (This command is disabled in newer firmware. Refer to `cfLogHelp`.)	55

Table 7 Service port commands listed alphabetically by functional group (Continued)

Command or Command Group (Continued)	Description (Continued)	Page (Continued)
csClearLogFile	Clear the event log	55
loggerDump	Display event log records	86
loggerDumpCurrent	Display event log records for current boot	86
supportDump	Display information used in troubleshooting	116
eVPS	**Refer to SAN Access Security: Extended VPS (eVPS)**	
Fibre Channel		
fcConnTypeGet	Display the current setting of a Fibre Channel port's connection type	62
fcConnTypeSet	Set the type of connection for a Fibre Channel port	63
fcFibreSpeedGet	Display maximum and current speeds of Fibre Channel port	63
fcFibreSpeedSet	Set Fibre Channel port speed	63
fcGbicShow	Display the GBIC information for each installed GBIC	64
fcPortModeGet	Display the mode for the specified Fibre Channel port	65
fcPortModeSet	Set the mode for the specified Fibre Channel port	66
fcRestart	Restart the specified Fibre Channel port	67
fcShow	Display Fibre Channel interface status	67
fcShowDevs	Display attached SCSI and Fibre Channel target devices from Fibre Channel port perspective	69
fcShowNames	Display node and port names for Fibre Channels	69
fcTransceiverShow	Display the SFP information for each installed SFP	70
fcTxDisable	Disable a Fibre Channel port transmitter	71
fcTxEnable	Enable or re-enable a Fibre Channel port transmitter	71
setFcFrameSize	Set frame size for specific Fibre Channel port	105
setFcHardId	Set loop ID for specific Fibre Channel port	105

Table 7 Service port commands listed alphabetically by functional group (Continued)

Command or Command Group (Continued)	Description (Continued)	Page (Continued)
setHost	Set host OS type for specific Fibre Channel port	106
sysNodeNameModeSet	Change the Fibre Channel node name mode	117
sysNodeNameModeShow	Display the current Fibre Channel node name mode	118
targets	Display attached SCSI and Fibre Channel target devices	121
Flash File System		
cd	Set current working path	52
ll	List directory contents in long format	87
ls	List directory contents	87
rm	Remove (delete) a file	96
rz	Initiate a receive Zmodem file transfer session	99
sz	Initiate a send Zmodem file transfer session	121
Health Check		
hlthChkIntervalGet	Display health check interval	74
hlthChkIntervalSet	Set health check interval	75
hlthChkLevelGet	Display health check level	75
hlthChkLevelSet	Set health check level	75
hlthChkNow	Perform a health check now	75
Help		
diagHelp	Display diagnostic command info	58
help	Display info for all shell commands	73
hlthChkhelp	Display health check command info	74
mapHelp	Display device map command info	88
netHelp	Display network command info	93
snmpHelp	Display SNMP command info	115
userHelp	Display user account command info	125
Host Port Failover		
hpfAddPort	Add a physical port to the stand by list for a virtual port	78

Table 7 Service port commands listed alphabetically by functional group (Continued)

Command or Command Group (Continued)	Description (Continued)	Page (Continued)
hpfDisplayLinkDownDelay	Display the length of the delay after link down status has occurred before host port failover occurs	78
hpfFeatureEnable	Enable the optional host port failover feature	78
hpfFeatureDisable	Disable the optional host port failover feature	79
hpfMakeActive	Make a given physical port the active channel for a given virtual port	79
hpfMakePrimary	Make a given physical port the active channel for a given virtual port	80
hpfPortEnable	Re-enable a recovering port that is configured to require intervention after failure	80
hpfRemovePort	Remove a physical port from a virtual port's standby port list	80
hpfSetErrorRecovery	Set the recovery scenario for a port, when the failure of a port is due to error count	81
hpfSetLinkDownDelay	Set the amount of time a port's link is down before failover occurs	81
hpfSetLinkDownRecovery	Set the recovery scenario for a port, when the failure of a port is due to link down	81
hpfShow	Display current host port failure state and configuration	82
hpfShowErrorRecovery	Display the recovery scenario settings	83
Multipath Mapping	**Refer to Data Path Conditioning**	
Product Data and Maintenance		
clearReservation	Force-clear a reservation on the specified target LUN	54
initializeBox	Restore factory defaults by deleting all configuration files including persistent address map and private maps, and then reboot	84
licenseShow	Display information about installed software license keys	85
mapCompressDatabase	Remove inactive device entries and reassign LUNS contiguously in persistent address map database	87
mapRebuildDatabase	Delete and reconstruct persistent address map database	90

Table 7 Service port commands listed alphabetically by functional group (Continued)

Command or Command Group (Continued)	Description (Continued)	Page (Continued)
mapShowDatabase	Display all persistent address map database entries	90
mapShowDevs	Display persistent address map database entries for attached devices only	91
mapWinnowDatabase	Remove inactive device entries from persistent address map database	92
mapWinnowDatabaseLun	Remove specified device entry from persistent address map database	92
pipVpdShow	Display vital product data for the power and identification processor	94
restoreConfig	Restore a previously saved configuration file	96
ridTag	Display and set serial number of replaced base	96
saveConfig	Save a configuration file	99
shellLock	Lock or unlock the shell command interface	112
showBox	Display graphic of hardware	146
showVersions	Displays the version of the operational firmware, Power-On-Self-Test (POST), bootrom and alternate bootrom	113
sysConfigShow	Display configuration settings	117
sysVpdShow	Display vital product data	117
sysVpdShowAll	Display vital product data for all subsystems	117
uptime	Display time elapsed since last boot	125
version	Display firmware version	126
vipGetUMFirmwareVersion	Display version number of functional firmware on utility module	126
vipSendPIPFirmware	Send PIP firmware to the specified I/O blade	126
vipSendPIPFirmwareAll	Send PIP firmware to the both I/O blades	126
vipSendUMFirmware	Send functional firmware to the specified utility module	127
vipSendUMFwloader	Send bootloader firmware to the specified utility module	128
wwnGlobalClear	Restore the node WWN to the factory setting	139
wwnGlobalSet	Set the node WWN for FC ports	139
wwnPortClear	Restore the port WWN to the factory settings	140
wwnPortSet	Set the Port WWN for an FC port	141

Table 7 Service port commands listed alphabetically by functional group (Continued)

Command or Command Group (Continued)	Description (Continued)	Page (Continued)
SAN Access Security: Scalar Firewall Manager (SFM)	**For commands used with extended VPS (eVPS), refer to SAN Access Security: Extended VPS (eVPS).** Note: all commands beginning "sfm" can be interchanged for commands beginning with "vps." Not all commands beginning with "vps" have "sfm" equivalents.	
sfmAccessApply	Apply access settings and save in SFM database	107
sfmAccessClear	Disable SFM access to all LUNs for all hosts	108
sfmAccessSet	Set SFM access permission for a specific host and a specific LUN range	108
sfmActiveSet	Reactivate SFM if inactive	108
sfmConnectionSet	Enter connection information for a specific SFM host	108
sfmFeatureDisable	Disable SFM	109
sfmFeatureEnable	Enable SFM with license key	109
sfmFileShow	Show the SFM data stored in the file	109
sfmHostShow	Display LUN access permissions for a specific SFM host	110
sfmInactiveSet	Deactivate SFM access control allowing all hosts to access all LUNs	111
sfmNameSet	Enter a name for a specific SFM host	111
sfmShow	Display status information for one or all registered SFM hosts	111
sfmSparseAccessSet	Set access permission for a specific SFM host and specific LUNs	112
sfmTypeSet	Enter operating system information for a specific SFM host	112
wwnLockModeSet	Enable or disable the removal of unknown hosts from VPS host table	140
wwnLockModeShow	Display the WWN lock mode setting	140

Table 7 Service port commands listed alphabetically by functional group (Continued)

Command or Command Group (Continued)	Description (Continued)	Page (Continued)
SAN Access Security: Extended VPS (eVPS)	**For commands used with Scalar Firewall Manager (SFM), refer to SAN Access Security: Scalar Firewall Manager (SFM)** Note: all commands beginning "sfm" can be interchanged for commands beginning with "vps." Not all commands beginning with "vps" have "sfm" equivalents	
vpsAccessApply	Apply access settings and save in VPS or eVPS database	130
vpsAccessClear	Disable eVPS access to all LUNs for all hosts	130
vpsAccessSet	Set eVPS access permission for a specific host and a specific LUN range	130
vpsActiveSet	Reactivate VPS or eVPS if inactive	130
vpsConnectionSet	Enter connection information for a specific VPS or eVPS host	131
vpsDefaultInbandAccessGet	Display in-band access settings for the SNC	131
vpsDefaultInbandAccessSet	Set in-band access levels for the SNC	131
vpsFeatureDisable	Disable VPS and eVPS	132
vpsFeatureEnable	Enable VPS and eVPS	132
vpsFileFlush	Save settings into the SFM/VPS/eVPS database	133
vpsFileShow	Show the VPS or eVPS data stored in the file	133
vpsHostInbandAccessGet	Display in-band access settings for a particular eVPS host	133
vpsHostInbandAccessSet	Set the in-band access level for a single eVPS host	133
vpsHostShow	Display LUN access permissions for a specific VPS or eVPS host	134
vpsInactiveSet	Deactivate VPS or eVPS if active	135
vpsInitAdd	Add a host to the SFM/VPS/eVPS database	135
vpsInitDelete	Remove a host from the SFM/VPS/eVPS database	135
vpsInitOffline	Take an SFM/VPS/eVPS host offline	136
vpsMapAdd	Assign a target device to an eVPS host	136
vpsMapClear	Clear all the mapping assignments for a specified eVPS host	136

Table 7 Service port commands listed alphabetically by functional group (Continued)

Command or Command Group (Continued)	Description (Continued)	Page (Continued)
vpsMapDelete	Delete a previous eVPS LUN assignment	136
vpsMapShow	List all available mapping information for an eVPS host	137
vpsNameSet	Enter a name for a specific VPS or eVPS host	137
vpsShow	Display status information for one or all registered VPS or eVPS hosts	137
vpsSparseAccessSet	Set access permission for a specific VPS or eVPS host and specific LUNs	138
vpsTypeSet	Enter operating system information for a specific VPS or eVPS host	138
vpsWwnSet	Remove a host from the SFM/VPS/eVPS database	138
wwnLockModeSet	Enable or disable the removal of unknown hosts from VPS host table	140
wwnLockModeShow	Display the WWN lock mode setting	140
fcShowDevs	Display SCSI and Fibre Channel Target Devices from Fibre Channel port perspective	69
getScsiScanTime	Display the length of time that the SCSI bus is rescanned after boot completes	72
setScsiScanTime	Set the length of time that the SCSI bus is rescanned after boot completes	107
scsiAltIdGet	Display SCSI alternate IDs	99
scsiAltIdSet	Change SCSI alternate IDs	100
scsiHostChanGet	Display SCSI host channel modes	100
scsiHostChanSet	Set SCSI host channel modes	100
scsiHostIdGet	Display SCSI host ID numbers	101
scsiHostIdSet	Set SCSI host ID numbers	101
scsiRescan	Rescan for devices on one or all SCSI channels	101
scsiResetDisableGet	Display SCSI Bus Reset on Power-Up Setting	102
scsiResetDisableSet	Set the SCSI Bus Reset on Power-Up Setting	102
scsiShow	Display SCSI channels and attached devices	102
scsiTermGet	Display termination status information for SCSI channels	104
scsiTermSet	Set termination status for the selected channel	104
snReset	Restart a SCSI channel	116

Table 7 Service port commands listed alphabetically by functional group (Continued)

Command or Command Group (Continued)	Description (Continued)	Page (Continued)
targets	Display attached SCSI and Fibre Channel Target devices	121
Startup		
diagBoot	Shutdown and restart in Diagnostic mode	144
normalBoot	Shutdown and restart in Normal mode	147
reset	Restart without shutdown	95
reboot	Shutdown and restart	95
Time and Date		
date	Display the date and time	56
dateSetFromRTC	Set the real time clock as the source of date display	56
hostShow	Display the IP address of the system timeserver	78
rdate	Set a remote system as the source of date display	95
rtcDateSet	Manually set the real time clock	97
rtcGet	Display the real time clock setting	98
rtcSetCurrent	Synchronize the real time clock with the timeserver	99
setNettime	Enable or disable timeserver functionality	106
setTimeHost	Add a host running timeserver to the system	107
tzSet	Set the time zone offset from Greenwich Mean Time	124
Virtual Private Map		
copyScsiAssign	Copy SCSI assignments from a source channel to a destination channel	55
deleteScsiAssign	Delete an assignment previously created	56
setScsiAssign	Assign a target device to a SCSI channel	106
showScsiAssign	List the current assigned addresses for the indicated channel	113
vpmFeatureEnable	Enable the optional Virtual Private Map feature	129
vpmFeatureEnabled	Display status information about Virtual Private Map	129

ampFeatureEnable “license”

The ampFeatureEnable command enables the optional multipath mapping feature. You enable the feature by entering the unique license key.

```
SNC > ampFeatureEnable "N499F-ZZ"
Copy OK: 60 bytes copied
AMP Enabled, License is Valid
value = 0 = 0x0
SNC >
```

If the license key was factory-installed, you can enter the word “enable” (in quotes) rather than the actual license key.

```
SNC > ampFeatureEnable "enable"
AMP Enabled, License is Valid
value = 0 = 0x0
SNC >
```

If `value = 1 = 0x1` message is displayed, it means the license is already installed and multi-path mapping is already enabled.

If the `value = -1 = 0xffffffff message` is displayed, it means the license is not already installed and you do need to enter the license key.

arptabShow

The `arptabShow` command displays the contents of the ARP table. The ARP table contains the current Internet-to-Ethernet address mappings. This information can be useful to the LAN administrator.

```
SNC > arptabShow

LINK LEVEL ARP TABLE
destination      gateway            flags  Refcnt  Use Interface
------------------------------------------------------------------
172.16.77.1      00:e0:16:92:91:86    405    1       0             emac0
172.16.77.21     00:d0:59:cf:f3:d1    405    1       28            emac0
172.16.77.50     08:00:09:fd:63:c6    405    1       32            emac0
------------------------------------------------------------------
value = 75 = 0x4b = 'K'
SNC >
```

bootShow

The `bootShow` command displays information about the bootfile and profile used at the last boot.

```
SNC4 > bootShow

boot device          : ibmEmac
unit number          : 0
processor number     : 0
host name            : host
file name            : //ffs/vxWorks.st
inet on ethernet (e) : 172.16.76.253:ffffff00
gateway inet (g)     : 172.16.76.1
flags (f)            : 0x8
target name (tn)     : SNC4K
startup script (s)   : //ffs/sna.rc

value = 0 = 0x0
SNC>
```

cd

You can move to a different directory (usually in the flash file system) using the `cd` command.

```
SNC > cd "MGMT"
value = 0 = 0x0
SNC >
```

cfLogHelp

The `cfLogHelp` command displays a list of the commands used to configure command flow logging or display command flow log information.

```
SNC601112 > cfLogHelp

CFL - Command Flow Logging event facility

cfLogDetailDisable - (default) Disables detailed command flow logging. All
   command events will be logged as single command events and sequence
   command events.
cfLogDetailEnable - Enables detailed command flow logging. All command
   events will be logged as single command events.
cfLogDetailShow - Display the current detail trace mode setting.
cfLogTimePlayback <LUN>,<minutes> - Displays a single LUN's command flow
   log events for the specified number of minutes (0-4320). If minutes not
   specified orZERO, then ALL log entries displayed.
cfLogEventPlayback <LUN>,<events> - Displays a single LUN's command flow
   log entries for the  specified number of events (0-4096). If events not
   specified or ZERO, then ALL log entries displayed.
cfLogEventPlaybackAll <events> - Displays command flow log events for ALL
   LUN’s for the specified number of events (0-4096). If events not
   specified or ZERO, then ALL log entries displayed.

cfLogTimePlaybackAll <minutes> - Displays command flow log events for all
   LUN’s for the specified number of minutes (0-4320). If minutes not
   specified or ZERO, then ALL log entries displayed.
value = 0 = 0x0
SNC601112 >
```

cfLogDetailDisable

The `cfLogDetailDisable` command disables detailed logging if detailed command flow logging had been previously enabled. The default setting for command flow logging is disabled. Logged commands are classified as "sequence events" or "single events."

When the command flow log is disabled, Read and Write commands are the only commands that are logged as sequence command events. Multiple Read or Write commands result in one sequence event log entry. All other commands are logged as single command events.

```
SNC601112 > cfLogDetailDisable
Command Flow Log Details are:DISABLED
value = 0 = 0x0
SNC601112 >
```

cfLogDetailEnable

The `cfLogDetailEnable` command enables detailed command flow logging. All command events are logged as single command events.

```
SNC601112 > cfLogDetailEnable
```

```
Command Flow Log Details are:ENABLED
value = 0 = 0x0
SNC601112 >
```

cfLogDetailShow

The `cfLogDetailShow` command displays the current detail trace mode setting.

```
SNC601112 > cfLogDetailShow
Command Flow Log Details are:ENABLED
value = 0 = 0x0
SNC601112 >
```

cfLogEventPlayback [LUN],[events]

The `cfLogEventPlayback` command displays a specified number of command flow log events for a specified LUN.

 Note

Command flow events for disk devices are not logged.

Enter the number of playback events from 0-4096 to limit the number of events displayed. If the number of events is not specified or is "0", all events for the LUN will be displayed.

```
SNC601112 > cfLogEventPlayback 1,10
LUN=1   Vendor=HP       Product=Ultrium 1-SCSI   SN=IE71K05450
000000497 MAY27 08:16:54  2 125 RDBLKLMT 050000000000                GOOD(00) 08:16:54
                                DIR=IN   REQ=06 XFER=06
000000498 MAY27 08:16:54  2 125 TUR     000000000000                 GOOD(00) 08:16:54
000000499 MAY27 08:16:54  2 125 READ POS 34000000000000000000       GOOD(00) 08:16:54
                               DIR=IN   REQ=14 XFER=14
000000500 MAY27 08:16:54  2 125 WRITE=000001 ERR=000000                      08:16:54
000000501 MAY27 08:16:54  2 125 WRITE FM 100000000100                GOOD(00) 08:16:55
000000502 MAY27 08:16:55  2 125 TUR     000000000000                 GOOD(00) 08:16:55
000000503 MAY27 08:16:55  2 125 READ POS 34000000000000000000       GOOD(00) 08:16:58
                                DIR=IN   REQ=14 XFER=14
000000504 MAY27 08:17:12  2 125 TUR     000000000000                 GOOD(00) 08:17:12
000000505 MAY27 08:17:12  2 125 READ POS 34000000000000000000       GOOD(00) 08:17:12
                               DIR=IN   REQ=14 XFER=14
000000506 MAY27 08:17:12  2 125 WRITE=010011 ERR=000000                     08:21:07
value = 0 = 0x0
SNC601112 >
```

This information can be useful to a customer service representative, although the size of the log can be very large, depending on how long the system has been running.

cfLogEventPlaybackAll [events]

The `cfLogEventPlaybackAll` command displays a specified number of command flow log events for all LUNs (up to 10 devices).

 Note

Command flow events for disk devices are not logged.

Enter the number of playback events from 0-4096 to limit the number of events displayed. If the number of events is not specified or is "0", all events for the LUN will be displayed..

This information can be useful to a customer service representative, although the size of the log can be very large, depending on how long the system has been running.

cfLogTimePlayback [LUN],[minutes]

The `cfLogTimePlayback` command displays command flow log events for a specified LUN for a specified time period.

Note Command flow events for disk devices are not logged.

Enter the number of playback minutes from 0-4320 to limit the number of events displayed. If the number of minutes is not specified or is "0", all events for the LUN will be displayed.

This information can be useful to a customer service representative, although the size of the log can be very large, depending on how long the system has been running.

cfLogTimePlaybackAll [minutes]

The `cfLogTimePlaybackAll` command displays command flow log events for all LUNs (up to 10 devices) for a specified time period.

Note Command flow events for disk devices are not logged.

Enter the number of playback minutes from 0-4320 to limit the number of events displayed. If the number of minutes is not specified or is "0", all events for the LUN will be displayed.

This information can be useful to a customer service representative, although the size of the log can be very large, depending on how long the system has been running.

clearReservation[devId]

The `clearReservation` command can be used to force-clear a reservation held by a host for the specified target device. It can be necessary to issue this command if a host that has a reservation for a shared device was disconnected from the SNC without properly shutting down the application software that issued the reservation. If this is the case, other hosts that attempt to access the shared device will repeatedly receive reservation conflict status from the device. Issuing this command can result in resetting the target device.

Parameter	Value
devId	The index of the device (LUN)

```
SNC > clearReservation 4
value = 0 = 0x0
SNC >
```

The above example shows the `clearReservation` command being used to clear a reservation on a target device at LUN 4.

cleShow [lun]

The `cleShow` command displays the last 64 Command Log events for a device at the specified LUN, or at LUN 0, if no LUN is specified. This log is not maintained for disk devices because the performance impact is significant. The manufacturer may request the contents of the command log for diagnostic purposes. Information about interpreting these events is not provided.

In the following example, only the first ten events and the last ten events are reproduced.

```
SNC > cleShow
LUN 0 devId 0
000173 OCT 13 2028 07:12:05 I 3 125 - 00 00 00 00 00 00
000174 OCT 13 2028 07:12:05 I 3 125 - Sense 06h 29h/00h
000175 OCT 13 2028 07:12:06 I 3 125 - 00 00 00 00 00 00
000176 OCT 13 2028 07:12:06 I 3 125 - Status 00h Data Req. 0, Xfer 0
000177 OCT 13 2028 07:12:06 I 3 125 - 12 00 00 00 24 00
000178 OCT 13 2028 07:12:06 I 3 125 - Status 00h Data Req. 36, Xfer 36
000179 OCT 13 2028 07:12:06 I 3 125 - a0 00 00 00 00 00 00 00 08 00 00 00
000180 OCT 13 2028 07:12:06 I 3 125 - Status 00h Data Req. 2048, Xfer 24
000181 OCT 13 2028 07:12:06 I 3 125 - 12 00 00 00 24 00
000182 OCT 13 2028 07:12:06 I 3 125 - Status 00h Data Req. 36, Xfer 36
...
000227 OCT 17 2028 05:27:36 I 0 0 - 12 01 00 00 3c 00
000228 OCT 17 2028 05:27:36 I 0 0 - Status 00h Data Req. 0, Xfer 0
000229 OCT 17 2028 05:27:36 I 0 0 - 12 01 00 00 3c 00
000230 OCT 17 2028 05:27:36 I 0 0 - Status 00h Data Req. 0, Xfer 0
000231 OCT 17 2028 05:27:36 I 0 0 - 12 01 00 00 3c 00
000232 OCT 17 2028 05:27:36 I 0 0 - Status 00h Data Req. 0, Xfer 0
000233 OCT 17 2028 05:27:36 I 0 0 - 12 01 00 00 3c 00
000234 OCT 17 2028 05:27:36 I 0 0 - Status 00h Data Req. 0, Xfer 0
000235 OCT 17 2028 10:09:28 I 0x3e0b04 3c 02 00 00 00 00 00 80 00 00
000236 OCT 17 2028 10:09:29 I 0x3e0b04 Status 00h Data Req. 0, Xfer 0
value = 0 = 0x0
```

In the following example, events for the device at LUN 31 are reported:

```
SNC > cleShow 31
LUN 31 devId 31
000001 OCT 17 2028 10:22:41 I 0 0 - 12 01 00 00 3c 00
000002 OCT 17 2028 10:22:41 I 0 0 - Status 00h Data Req. 0, Xfer 0
000003 OCT 17 2028 10:22:41 I 0 0 - 12 01 80 00 3c 00
000004 OCT 17 2028 10:22:41 I 0 0 - Status 00h Data Req. 0, Xfer 0
value = 0 = 0x0
SNC >
```

cleShowAll

The `cleShowAll` command performs a `cleShow` for all LUNs. The manufacturer may request the contents of the command log for diagnostic purposes. Information about interpreting these events is not provided.

copyScsiAssign [source channel], [dest channel]


Note

When you are using Firmware 4 on a Fibre Channel blade, this command is unavailable.

The `copyScsiAssign` command copies the SCSI assignments from a source channel to a destination channel.

```
SNC > copyScsiAssign 1,2
value = 0 = 0x0
SNC >
```

csClearLogFile

The `csClearLogFile` command clears the contents of the event log.

```
SNC > csClearLogFile
value = 0 = 0x0
SNC >
```

date

The `date` command displays the system's date and the time. The `date` command takes into account the timezone, but the `rtcGet` command does not. Therefore the output of `rtcGet` and `date` may not show the same value.

The system can be set to read its local real time clock (refer to the `dateSetFromRTC` command) or a remote host. Refer to the `rdate` "`timeserver`" and `rtcSetCurrent` commands.

```
SNC > date
SNC > THU JAN 25 20:32:49 2001
SNC >
```

dateSetFromRTC

The `dateSetFromRTC` command sets the real time clock as the source of the date display. Use the `date` command to display the date and time.

```
SNC > dateSetFromRTC
value = 0 = 0x0
SNC >
```

deleteScsiAssign [devId],[channel], [id],[lun]


Note

When you are using Firmware 4 on a Fibre Channel blade, this command is unavailable.

The `deleteScsiAssign` command deletes assignments previously created.

Example 1 uses the output of Example 2 to delete assignments from SCSI channel 2.

Example 1:

```
SNC > deleteScsiAssign 64,2,0,0
value = 0 = 0x0
SNC > deleteScsiAssign 82,2,0,1
value = 0 = 0x0
SNC > deleteScsiAssign 98,2,0,2
value = 0 = 0x0
SNC > deleteScsiAssign 124,2,0,3
value = 0 = 0x0
```

Example 2:

```
SNC > showScsiAssign
SCSI 2
   ID Lun DevId
    0   0    64
    0   1    82
    0   2    98
    0   3   124
```

dhcpClientShow

The `dhcpClientShow` command displays data received from the Dynamic Host Configuration Protocol (DHCP) server. In response to this command—if DHCP is enabled—information about the configuration displayed, as in the first example shown below.

```
SN601515 > dhcpClientShow
DHCP server: 172.16.72.51
Timer T1: 128274 seconds remaining.
Timer T2: 225474 seconds remaining.
DHCP server name:
Boot file name:
DNS domain name: adic.com
Router discovery enabled.
RFC 894 Ethernet encapsulation enabled.
Maximum datagram size: 576
Default IP Time-to-live: 64
Interface MTU: 576
ARP cache timeout: 60
Default TCP Time-to-live: 64
TCP keepalive interval: 7200
Client lease origin: 1037909691
Client lease duration: 259200
Client renewal (T1) time value: 129600
Client rebinding (T2) time value: 226800
DHCP server: 172.16.72.51
Assigned IP address: 172.16.76.39
Relay agent IP address: 172.16.76.1
Client subnet mask: 255.255.255.0
Client router solicitation address: 255.255.255.255
Client IP routers:
172.16.76.1
Client DNS name servers:
172.16.72.51
172.16.9.63
172.16.40.24
  Domain Name : adic.com
  DNS Addr    : 172.16.72.51
Client DNS name servers:
172.16.72.51
172.16.9.63
172.16.40.24
value = 0 = 0x0
```

If DHCP is disabled, the `dhcpClientShow` command displays the following:

```
SN601515 > dhcpClientShow
  Domain Name : (null)
  DNS Addr    :
value = 0 = 0x0
SN601515 >
```

dhcpDisable

The `dhcpDisable` command disables DHCP. The default setting is disabled. After executing this command, you must reboot the SNC for the change to take effect.

```
SN601515 > dhcpDisable
DHCP is Disabled
```

```
value = 0 = 0x0
```

dhcpEnable

The `dhcpEnable` command enables DHCP. The default setting is disabled. For cautions and instructions on using this command, refer to Using DHCP on page 12.

```
SN601515 > dhcpEnable
DHCP is Enabled
value = 1 = 0x1
```

dhcpState

The `dhcpState` command displays the current state of DHCP indicating whether DHCP is enabled or disabled.

If DHCP is already enabled, the following output is displayed:

```
SN601515 > dhcpState
DHCP is Enabled
value = 1 = 0x1
```

If DHCP is not enabled, the following output is displayed:

```
SN601515 > dhcpState
DHCP is Disabled
value = 0 = 0x0
```

diagBoot

Refer to diagBoot on page 144.

diagHelp

The `diagHelp` command displays a list of the diagnostic commands.

```
SNC > diagHelp
** Diagnostic commands: Available in Diagnostic Mode Only **
elTest    Test Ethernet port w/loop-back cable
fcSlotTest <portnum> Test specified Fibre Channel port w/loop-back cable
normalBoot   Shutdown and restart in normal mode
scsiChannelTest <x,y> Test specified SCSI Channels w/loop-back cable

See User's Guide for more information
value = 0 = 0x0
SNC >
```

disableCC [option number]

Disable the command and control interface (LUN 0) using the `disableCC` command. Specify one of two option parameters as follows.

Option Number	Meaning
1	Hides the command and control interface and results in Inquiry data returning "device not available" for LUN 0.
2	Completely disables all command and control functions

The SNC is addressable as a SCSI target device for command and control support. On a Fibre Channel interface, this device will be seen as logical unit number 0, (LUN 0). The LUN 0 device returns a device type of 0Ch in an inquiry command, indicating it is a controller device. Controller devices are defined in the SCSI-3 Controller Commands specification (SCC).

In some cases, it may be desirable to disable this feature. If LUN 0 is disabled, then a device type of 2Ch will be returned in an inquiry to LUN 0, indicating that the device is not presently available at this LUN. LUN 0 will remain reserved for the command and control interface and will not be allocated to another target device.

Other commands are available for re-enabling the command and control interface or reassigning it to a different LUN rather than hiding or disabling it. Refer to the `enableCC` command and the `setSnaCCLun` command for further information.

CAUTION **If you issue the `disableCC` command without specifying an option number, it has the same effect as `disableCC 1`.**

```
SNC > disableCC
value = 0 = 0x0
SNC >
```

elTest

Refer to elTest on page 144.

enableCC

To restore the capability to send commands to the command and control interface (LUN 0), use the `enableCC` command. The command is typically used to re-enable the interface after it was disabled by the `disableCC` command.

```
SNC > enableCC
value = 0 = 0x0
SNC >
```

envMonRangeShow

The `envMonRangeShow` command specifies operational ranges for the environmental channels. It displays ranges of values associated with the Nominal, Warning, and Alarm states for voltage, temperature, and fan/blower operation according to the channels defined in the `envMonShow` command:

```
SNC > envMonRangeShow
Air Inlet Temp (C):
        Nominal: 5 to 45
        Warning: 4 <= N < 5 or 45 < N <= 50
        Alarm:   N < 4 or N > 50

IO Processor Temp (C):
        Nominal: 5 to 80
        Warning: 4 <= N < 5 or 80 < N <= 108
        Alarm:   N < 4 or N > 108

Input Power: +5 Volts (V):
        Nominal: 4.83 to 5.20
        Warning: 4.75 <= N < 4.83 or 5.20 < N <= 5.25
        Alarm:   N < 4.75 or N > 5.25
```

```
Input Power: +12 Volts (V):
        Nominal: 11.00 to 12.93
        Warning: 10.75 <= N < 11.00 or 12.93 < N <= 13.18
        Alarm:   N < 10.75 or N > 13.18

Local Power: +2.5 Volts (V):
        Nominal: 2.42 to 2.58
        Warning: 2.36 <= N < 2.42 or 2.58 < N <= 2.62
        Alarm:   N < 2.36 or N > 2.62

Local Power: +3.3 Volts (V):
        Nominal: 3.20 to 3.39
        Warning: 3.13 <= N < 3.20 or 3.39 < N <= 3.46
        Alarm:   N < 3.13 or N > 3.46

Local Power: +3.3 Volts Aux (V):
        Nominal: 3.20 to 3.39
        Warning: 3.13 <= N < 3.20 or 3.39 < N <= 3.46
        Alarm:   N < 3.13 or N > 3.46

Fan :
Nominal: 1;  Alarm: 0

value = 1 = 0x1
SNC >
```

envMonShow

The `envMonShow` command lists all of the environmental channel states and their current values. Use the command `envMonRangeShow` to restrict output to a display of the ranges relevant to each state. The following channels have been defined:

Channel Name	Description
Air Inlet Temp	Temperature of the air as it enters the unit
Air Outlet Temp	Temperature of the air as it exits the unit
IO Processor Temperature	Temperature of the IO Processor
Input Power: ±5 Volts	Voltage level of the ±5 input
Input Power: ±12 Volts	Voltage level of the ±12 input
Local Power: ±2.5 Volts	Voltage level of the local 2.5 supply
Local Power: ±3.3 Volts	Voltage level of the local ±3.3 supply
Local Power: ±3.3 Volts Aux	Voltage level of the local auxiliary ±3.3 supply
Fan	Fan running (for tachometer fans: RPM of fan)

```
SNC > envMonShow
Channel      State  Value
```

```
-------------------------------------------------
Air Inlet Temperature   Nominal  44 C
Air Outlet Temperature  Nominal  51 C
IO Processor Temperature  Warning  31 C
Input Power: ±5 Volts   Nominal  5.2 V
Input Power: ±12 Volts  Nominal  12 V
Local Power ±2.5 Volts  Nominal  3.3 V
Local Power ±3.3 Volts  Nominal  3.3 V
Local Power ±3.3 Volts Aux Nominal  3.29 V

All Power      Nominal
All Temp      Nominal
Sample Count        20

value = 1 = 0x1
```

ethAddrGet

The `ethAddrGet` command displays the IP address of the SNC, specified as 4 decimal numbers separated by periods. If there is a subnet mask, it is appended to the end of the IP address, after a semicolon.

```
SNC > ethAddrGet
IP Address set to 172.16.77.106:ffffff00
value = 0 = 0x0
SNC >
```

ethAddrSet

The `ethAddrSet` command changes the IP address of the SNC. An IP address is specified as 4 decimal numbers separated by periods.

```
SNC > ethAddrSet "192.168.1.54"
Host Address set to 192.168.1.54 for Ethernet interface
value = 0 = 0x0
SNC >
```

If a netmask is required, specify it after the IP address in “dotted decimal” form.

For example:

```
SNC > ethAddrSet "10.0.0.2","255.255.0.0"
Inet Mask set to ffff0000 for Ethernet interface
Write complete
Host Address set to 10.0.0.2 for Ethernet interface
value = 0 = 0x0
SNC >
```

ethFailoverPingAddrShow

The `ethFailoverPingAddrShow` command displays the ping address of the Pathlight VX Ethernet failover feature.

```
SNC > ethFailoverPingAddrShow
ethFailoverPing Addr=192.168.270.1
value = 0 = 0x0
SNC >
```

ethMacGet

The `ethMacGet` command displays the configuration settings for the Ethernet interface.

Parameter	Value
auto-negotiate	On, Off
speed	10Mbps, 100Mbps
duplex	Half, Full

It returns values for both current settings and preferred settings. The preferred settings are either system defaults or values that have been set by means of the `ethMacSet` command. If auto-negotiate is set to "On," the speed and duplex preferred values are set to "Auto."

```
SNC > ethMacGet
-------------------------------------
 Setting        : Current : Preferred
-------------------------------------
 auto-negotiate : On      : On
 speed          : 100Mbps : Auto
 duplex         : Half    : Auto
-------------------------------------

value = 0 = 0x0
SNC >
```

ethMacSet "[auto-negotiation]",[speed],"[duplex]"

The `ethMacGet` command configures the Ethernet interface settings. Refer to the ethMacGet command for possible settings. Successful settings return `value = 0`. Unsuccessful settings return `value = -1`. A message indicating the cause of the failure posts to the screen. Changes take effect after a reboot. Pending changes can be viewed by issuing the `ethMacGet` command and looking in the "Pending" column.

```
SNC > ethMacSet "Off",10,"Full"
Ethernet interface modification successful
will take effect upon reboot
```

fcConnTypeGet [port]

The `fcConnTypeGet` command is used to display the current setting of a Fibre Channel port's connection type. Refer also to the `fcConnTypeSet` command.

Parameter	Value	Meaning
port	1	The SNC Connection labeled FC1
	2	The SNC Connection labeled FC2
connection type	0	Loop
	1	Point-to-point
	2	Loop preferred

The following example shows how the connection type is displayed when Fibre Channel port 1 is specified and its connection type is loop.

```
SNC > fcConnTypeGet 1
value = 0 = 0x0
```

```
SNC >
```

fcConnTypeSet [port],[connection]

The `fcConnTypeSet` command is used to set the type of connection for a Fibre Channel port. Refer also to the `fcConnTypeGet` command.

Parameter	Value	Meaning
port	1	The SNC Connection labeled FC1
	2	The SNC Connection labeled FC2
connection type	0	Loop
	1	Point-to-Point
	2	Loop preferred

The following example shows how to set Fibre Channel port 1 connection type to point-to-point.

```
SNC > fcConnTypeSet 1,1
value = 0 = 0x0
SNC >
```

CAUTION **You must issue the `fcRestart` command or reboot the SNC for the new setting to take effect. Refer to fcRestart [port] on page 67 for further information. Using `fcRestart` is less disruptive to an established SAN than a reboot.**

fcFibreSpeedGet [port]

The `fcFibreSpeedGet` command displays the requested speed of the Fibre Channel port. The actual speed can be viewed in the output of the `fcShow` command. The example below shows that Fibre Channel port 1 has a maximum speed of 1 Gb/sec.

```
SNC > fcFibreSpeedGet 1
value = 1= 0x1
SNC >
```

Parameter	Value	Meaning
port	1	The SNC Connection labeled FC1
	2	The SNC Connection labeled FC2
value =	0	Speed is set to Autorange
	1	Speed is set to 1 Gb/sec
	2	Speed is set to 2 Gb/sec

fcFibreSpeedSet [port],[speed]

The `fcFibreSpeedSet` command sets the Fibre Channel port speed to 1 Gb/sec or 2 Gb/sec for a Fibre Channel port. The port can also be set to autorange, as in the example below.

Parameter	Value	Meaning
port	1	The SNC connection labeled FC1
	2	The SNC connection labeled FC2
speed	0	Autorange
	1	1 Gb/sec
	2	2 Gb/sec

```
SNC > fcFibreSpeedSet 1,0
value = 0 = 0x0
SNC >
```

CAUTION **You must issue the `fcRestart` command or reboot the SNC for the new setting to take effect. The host and the device must both be capable of the selected speed. Refer to the `fcRestart` command for further information.**

fcGbicShow [port]

The `fcGbicShow` command displays the GBIC information for each installed GBIC. Specifying the port number is optional.

Parameter	Value	Meaning
port	1	The SNC connection labeled FC1
	2	The SNC connection labeled FC2

```
SNC > fcGbicShow
-----------------------------------------------------------------
 Ctlr : Module :           Module
  ID  :  Code  :         Information
-----------------------------------------------------------------
   1  :   4    : Serial Module Definition Protocol
               :   Transceiver Type ------------ GBIC
               :   Connector Type -------------- SC
               :   Nominal Speed --------------- 2.1 Gb/sec
               :   Link length for 9/125 um ----- 0 meters
               :   Link length for 50/125 um ---- 3000 meters
               :   Link length for 62.5/125 um -- 1500 meters
               :   Vendor Name ----------------- StratosLightwave
               :   Vendor OUI ------------------ 000000
               :   Vendor Part Number ---------- MGBC-20-8-1-S
               :   Vendor Revision ------------
               :   Vendor Serial Number --------- ABAEG316
               :   Vendor Mfg. Date ------------ 04-25-2002
               :   RX LOS Implemented ---------- Yes
               :   TX Fault Implemented --------- Yes
               :   TX Disable Implemented ------- Yes
```

```
   2  :   4    : Serial Module Definition Protocol
               :   Transceiver Type ------------- GBIC
               :   Connector Type --------------- SC
               :   Nominal Speed ---------------- 2.1 Gb/sec
               :   Link length for 9/125 um ----- 0 meters
               :   Link length for 50/125 um ---- 3000 meters
               :   Link length for 62.5/125 um -- 1500 meters
               :   Vendor Name ------------------ StratosLightwave
               :   Vendor OUI ------------------- 000000
               :   Vendor Part Number ----------- MGBC-20-8-1-S
               :   Vendor Revision --------------
               :   Vendor Serial Number --------- ABAGO316
               :   Vendor Mfg. Date ------------- 04-25-2002
               :   RX LOS Implemented ----------- Yes
               :   TX Fault Implemented --------- Yes
               :   TX Disable Implemented ------- Yes
-------------------------------------------------------------------
value = 0 = 0x0
SNC >
```

fcPortModeGet [port]

The `fcPortModeGet` command displays the mode for the specified Fibre Channel port. The default port mode is `Public Target`. Refer also to the `fcPortModeSet` command.

Parameter	Value	Meaning
Port	1	The SNC connection labeled FC1
	2	The SNC connection labeled FC2

After the command executes, the number displayed as a value indicates the port mode as follows:

Value	Port Mode
1	Private Target
2	Private Initiator
3	Private Target and Initiator
17	Public Target
18	Public Initiator
19	Public Target and Initiator

The following example shows how the connection type is displayed when Fibre Channel port 1 is specified and the port mode is `Private Target`.

```
SNC >fcPortModeGet 1
value = 1 = 0x1
SNC >
```

CAUTION **You must issue the `fcRestart` command or reboot the SNC for the new setting to take effect. Refer to the `fcRestart` command for further information. Using `fcRestart` is less disruptive to an established SAN than a reboot.**

fcPortModeSet [port],[mode]

The `fcPortModeSet` command sets the mode for the specified Fibre Channel port. Refer also to the `fcPortModeGet` command.

The default port mode is `Public Target`. Consequently, if attached to a Fabric device the SNC will register as a `Target` with the name server. If the port mode is `Private Target`, the SNC does not register with the name server and the Fabric device will not recognize the SNC as a `Target`.

The port must be in Initiator mode if you want the SNC to scan for target devices on the port. When the port is in `Private Initiator` mode, the SNC only scans for devices on the local loop. If the port mode is in `Public Initiator` mode, the SNC also scans for devices attached to a Fabric.

Parameter	Value	Meaning
Port	1	The SNC connection labeled FC1
	2	The SNC connection labeled FC2
Mode	1	Private Target
	2	Private Initiator
	3	Private Target and Initiator
	17	Public Target
	18	Public Initiator
	19	Public Target and Initiator

```
SNC > fcPortModeSet 1,2
value = 0 = 0x0
SNC >
```

CAUTION **You must issue the `fcRestart` command or reboot the SNC for the new setting to take effect. Refer to the `fcRestart` command for further information. Using `fcRestart` is less disruptive to an established SAN than a reboot.**

fcRescan [port]

The `fcRescan` command rescans the specified Fibre Channel port to see if new devices have been added.

```
SNC > fcRescan 2
value = 0 = 0x0
SNC >
```

Parameter	Value	Meaning
Port	1	The SNC connection labeled FC1
	2	The SNC connection labeled FC2

fcRestart [port]

The `fcRestart` command restarts the specified Fibre Channel port. You typically use this command to restart the port after changing its configuration settings so that the changes take effect. Issuing this command is an alternative to rebooting the SNC in order to make the configuration changes take effect. It is less disruptive than a reboot.

CAUTION **This command interrupts traffic.**

Parameter	Value	Meaning
Port	1	The SNC connection labeled FC1
	2	The SNC connection labeled FC2

The following example shows the display when Fibre Channel port 1 is specified.

```
SNC > fcRestart 1
value = 0 = 0x0:
Restart of FC Channel 1 succeeded
```

In order to get the command prompt (for example, `SNC >`) to show after you have executed the `fcRestart` command, you will need to press the Enter key.

fcShow [level]

The `fcShow` command displays the channel status for each Fibre Channel interface.

Level	Meaning
0 or <blank>	sets the verbosity level to the display in the example below
1	displays the information displayed below, and appends a break-out for each channel that includes node type, node name, port name and port ID
2	displays the information included at levels 0 and 1, and appends loop ID link stats

```
SNC > fcShow
-----------------Fibre Channel Controllers----------------------
Ctlr : PCI Addr : ISP   :  Firmware   :  Firmware  : Loop :  Fabric  :
Port : Ext. : Link
  Id  : Bs Dv Fn : Type  :   State     :  Version   :  ID  : Attached :
Mode : FIFO : Speed
----------------------------------------------------------------
```

```
   1  : 00 07 00 : 2300  :  Sync Lost  :   3.00.25  : None :    No    :
Targ : None : 1 Gbps
   2  : 00 08 00 : 2300  :  Sync Lost  :   3.00.25  : None :    No    :
Targ : None : 2 Gbps
-----------------------------------------------------------------
value = 95 = 0x5f = '_'
SNC >
```

Parameter	Meaning
Ctlr Id	Indicates the port number for this interface.
PCI Addr	The PCI address of the interface, showing bus, device id, and function number.
ISP Type	The type of Fibre Channel controller.
Firmware State	The current state of the interface as reported by the Fibre Channel controller. Firmware states are listed below.
Configuration Wait	Firmware is not initialized.
Waiting for AL_PA	Firmware is performing or waiting to perform loop initialization.
Waiting for login	Firmware is attempting port and process logins with all loop ports.
Ready	Indicates that the interface is connected and operational and ready to process SCSI commands. Any other value indicates intermediate states or interface failure.
Sync Lost	The firmware has detected a loss-of-sync condition and is re-synchronizing the serial link receiver. This is the state reported when the Fibre Channel link does not detect a connection to a Fibre Channel device.
Error	The firmware has detected an unrecoverable error condition.
Nonparticipating	The firmware is not participating on the loop since it did not acquire an AL_PA during initialization.
Failed	The firmware is not responding to commands
Firmware Version	The version of firmware on the Fibre Channel controller.
Loop ID	The Fibre Channel loop ID for this interface. PtoP indicates a point-to-point connection.
Fabric Attached	Indicates whether the port is attached to a Fabric.
Port Mode	Indicates whether the port is set to Target or Initiator mode
Ext. FIFO	Indicates that FIFOs external to the FC controller are on the board. If they are, their size in KB will be output into this column.
Link Speed	Indicates the actual speed of the connection. This figure is only meaningful when the Firmware State is reported as **Ready**.

CAUTION **If the Firmware State is anything but Ready, the information output by this command will be unreliable.**

fcShowDevs

The `fcShowDevs` command displays information about the devices that are accessible from each Fibre Channel interface. The display shows the LUN that the SNC has assigned to each device, the SCSI Channel that the device is attached to, the actual SCSI ID and LUN of the device, the vendor, product, revision and serial number of the device.

In the example, channel zoning was used for access control. Fibre Channel 1 has access to all of the attached SCSI tape and disk devices. For the other Fibre Channel interface, channel zoning has been set up to restrict access to certain devices.

```
SNC> fcShowDevs
Targets Visible to Hosts on FC 1:
LUN Chan  Id  Lun  Vendor   Product          Rev   SN
-----------------------------------------------------
  0   0    0    0  ADIC     Scalar SNC       4142  601515
  2   1    0    0  IBM      ULT3580-TD1      18N2  6811041299
  4   1    1    0  IBM      ULT3580-TD1      18N2  1311037924
  6   2    2    0  IBM      ULT3580-TD1      18N2  1311025713
  8   3    3    0  IBM      ULT3580-TD1      18N2  6811001578
 10   3    4    0  IBM      ULT3580-TD1      18N2  6811041040
 12   4    5    0  IBM      ULT3580-TD1      18N2  1311024394

Targets Visible to Hosts on FC 2:
LUN Chan  Id  Lun  Vendor   Product          Rev   SN
-----------------------------------------------------
  0   0    0    0  ADIC     Scalar SNC       4142  601515
  2   1    0    0  IBM      ULT3580-TD1      18N2  6811041299
 12   4    5    0  IBM      ULT3580-TD1      18N2  1311024394
```

fcShowNames

The `fcShowNames` command displays the node and port names (addresses) of the Fibre Channels.

Parameter	Meaning
Ctlr Id	Indicates the channel number for the interface
PCI Addr	The PCI address of the interface, showing bus, device id, and function number.
ISPType	The type of Fibre Channel controller
Node Name	The Fibre Channel node name for the SNC
Port Name	The Fibre Channel port name for the interface

```
SNC > fcShowNames
-------------------------------------------------------------------
 Ctlr : PCI Addr : ISP   :        Node       :        Port
  Id  : Bs Dv Fn : Type  :        Name       :        Name
-------------------------------------------------------------------
   1  : 00 07 00 : 2300  : 10000060.451705eb : 20010060.451705eb
```

```
   2  : 00 08 00 : 2300  : 10000060.451705eb : 20020060.451705eb
-------------------------------------------------------------------
value = 66 = 0x42 = 'B'
SNC >
```

The port name is the world wide name. The OUI is “00:60:45” for the 3000 and 5000 series and “00:30:8C” for the 6000 series products. The first example shows an SNC in the 5000 series. The following example is from an SNC 6000.

```
SNC > fcShowNames

-------------------------------------------------------------------
 Ctlr : PCI Addr : ISP   :        Node       :        Port
  Id  : Bs Dv Fn : Type  :        Name       :        Name
-------------------------------------------------------------------
   1  : 00 01 00 : 2312  : 500308c0.05024000 : 500308c0.05024001
   2  : 00 01 01 : 2312  : 500308c0.05024000 : 500308c0.05024002
   3  : 00 02 00 : 2312  : 500308c0.05024000 : 500308c0.05024003
   4  : 00 02 01 : 2312  : 500308c0.05024000 : 500308c0.05024004
   5  : 00 03 00 : 2312  : 500308c0.05024000 : 500308c0.05024005
   6  : 00 03 01 : 2312  : 500308c0.05024000 : 500308c0.05024006
-------------------------------------------------------------------
value = 66 = 0x42 = 'B'
SNC >
```

fcSlotTest

Refer to fcSlotTest [x] on page 145.

fcTransceiverShow [port]

The `fcTransceiverShow` command displays the SFP (small form-factor pluggable transceiver) information for each installed SFP. Specifying the port number is optional.

Parameter	Value	Meaning
port	1	The SNC connection labeled FC1
	2	The SNC connection labeled FC2

```
SNC > fcTransceiverShow
-------------------------------------------------------------------
 Ctlr : Module :           Module
  ID  :  Code  :         Information
-------------------------------------------------------------------
   1  :   4    : Serial Module Definition Protocol
               :   Transceiver Type ------------ GBIC
               :   Connector Type -------------- SC
               :   Nominal Speed --------------- 2.1 Gb/sec
               :   Link length for 9/125 um ----- 0 meters
               :   Link length for 50/125 um ---- 300 meters
               :   Link length for 62.5/125 um -- 200 meters
               :   Vendor Name ----------------- StratosLightwave
               :   Vendor OUI ------------------ 000000
               :   Vendor Part Number ---------- MGBC-20-8-1-S
               :   Vendor Revision ------------- 1000
               :   Vendor Serial Number --------- 3871
```

```
                :   Vendor Mfg. Date ------------- 08-17-2001
                :   RX LOS Implemented ----------- Yes
                :   TX Fault Implemented --------- Yes
                :   TX Disable Implemented ------- No
   2  :   4     : Serial Module Definition Protocol
                :   Transceiver Type ------------- GBIC
                :   Connector Type --------------- SC
                :   Nominal Speed ---------------- 2.1 Gb/sec
                :   Link length for 9/125 um ----- 0 meters
                :   Link length for 50/125 um ---- 300 meters
                :   Link length for 62.5/125 um -- 200 meters
                :   Vendor Name ------------------ StratosLightwave
                :   Vendor OUI ------------------- 000000
                :   Vendor Part Number ----------- MGBC-20-8-1-S
                :   Vendor Revision -------------- 1000
                :   Vendor Serial Number --------- 1476
                :   Vendor Mfg. Date ------------- 04-02-2001
                :   RX LOS Implemented ----------- Yes
                :   TX Fault Implemented --------- Yes
                :   TX Disable Implemented ------- No
-------------------------------------------------------------------------
value = 0 = 0x0
```

fcTxDisable [port]

The `fcTxDisable` command disables a Fibre Channel port transmitter.

Parameter	Value	Meaning
Port	1	The SNC connection labeled FC1
	2	The SNC connection labeled FC2

```
SNC > fcTxDisable 1
value = 0 = 0x0
SNC >
```

fcTxEnable [port]

The `fcTxEnable` command enables or re-enables a Fibre Channel port transmitter.

Parameter	Value	Meaning
Port	1	The SNC connection labeled FC1
	2	The SNC connection labeled FC2

```
SNC > fcTxEnable 1
value = 0 = 0x0
SNC >
```

gateAddrGet

The `gateAddrGet` command displays the default network gateway address if one has been set. This address is used when connections are made to a different subnet and there are no explicit routes defined for that subnet. Consult your network administrator for more information on the default gateway (sometimes referred to as default router) address.

```
SNC > gateAddrGet
Gateway Address set to 192.168.1.1
value = 0 = 0x0
SNC >
```

gateAddrSet

The `gateAddrSet` command changes the default network gateway address. This address is used when connections are made to a different subnet and there are no explicit routes defined for that subnet. Consult your network administrator for more information on the default gateway (sometimes referred to as default router) address.

Successful `gateAddrSet`

```
SNC > gateAddrSet "10.0.0.1"
value = 0 = 0x0
SNC >
```

Failed `gateAddrSet` **(1)**

The following message is received when trying to set a new gateway address and that address is currently unreachable. The following message is sent to the terminal.

```
SNC > gateAddrSet "10.0.0.1"
gateAddrSet: Error setting current gate addr: S_errno_ENETUNREACH
value = -1 = 0xffffffff = payloadChecksum + 0xffd418a3
```

The new gateway address is written to the bootup parameters to be used at the next boot. If at next boot, the address is reachable, then it will be written to the system file. If at next boot the gateway address is not reachable and therefore not written to the system file, the following message is displayed:

Failed `gateAddrSet` **(2):**

```
SNC > gateAddrSet "172.16.76.1"
gateAddrSet: Error deleting old gateway addr: S_errno_ESRCH
Gateway Address set to 172.16.76.1 for Ethernet interface
value = 0 = 0x0
SNC >
```

getScsiScanTime

The `getScsiScanTime` command displays the number of minutes that the SNC rescans the SCSI bus in order to discover devices that come online slowly. The default is 5 minutes.

```
SNC > getScsiScanTime
scsiScanTime 5
value = 15 = 0xf
SNC >
```

ghostIOSet [ticks]

The `ghostIOSet` command changes the number of ticks that a command remains queued for transmissions to the target. Each tick is 1/60th of a second. The number of ticks can be set from 1 to 60. If ticks are set to 0, command queuing is disabled.

Parameter	Value	Valid Range	Meaning
Ticks	1/60th of a second	0-60	Number of ticks commands remain in queue

```
SNC > ghostIOSet 30
Ghost I/O support is enabled.
Stale commands will be deleted after 30 ticks (500 ms).
value = 30 = 0x1e
SNC >
```

ghostIOShow

The `ghostIOShow` command displays the current status of command queuing. The value 0 is returned when command queuing is disabled. Otherwise the number of ticks that commands remain in queue is displayed.

```
SNC > ghostIOShow
Ghost I/O is disabled.
value = 0 = 0x0
SNC >
```

help

The `help` command displays a list of the shell commands.

```
SNC > help

help                          Print this list
cfLogHelp                     Print Command Flow Log Entry info
diagHelp                      Print Diagnostic Help info
hlthChkHelp                   Print Health Check Help info
ioHelp                        Print I/O Utilities Help info
mapHelp                       Print Device Map Help info
netHelp                       Print Network Help info
snmpHelp                      Print SNMP Help info
userHelp                      Print User account info
h          [n]                Print (or set) shell history
pwd                           Print working path
shellLock                     Lock or unlock shell command interface
version                       Print Version info
whoami                        Print user name
clearReservation [devId]  Clear reservation on a target (may reset target)
diagBoot                      Shutdown and restart in diagnostic mode
initializeBox           Delete all device maps, restore factory defaults,
reboot
saveConfig <index>            Saves configuration. Index may be 1 to 4
restoreConfig <index>         Restores configuration. Index may be 1 to 4
ridTag ["value"]        Display and set serial number of replaced base unit
disableCC [option]            Disable Command and Control Interface
                              option 1 - Report as Invalid (AIX mode)
                              option 2 - Fully disabled
enableCC                      Enable Command and Control Interface
scsiRescan [chan]           Rescan SCSI Channel (all if chan not specified)
scsiShow                      Display info for SCSI Channels
fcShow                        Display info for Fibre Channels
```

```
fcShowDevs                Display devices available on each Fibre Channel
fcShowNames               Display Node and Port names for Fibre Channels
hostTypeShow              Display Default Host Type settings
loggerDump [count]        Display Logger Dump Records
loggerDumpCurrent [level] Display Logger Dump Records for current boot
reboot                    Shut down and restart
reset                     Restart without shut down
setFcScsiChanMask [chan],[scsi],[allow]  Set Channel Access Control
setFcFrameSize [chan],[size] Set FC Frame Size
setFcHardId [chan],[id]      Set FC Loop ID
setHost [chan],["OS"]      Set default host type for FC Channel
                             OS may be "aix", "nt", "solaris", "hpux",
"as400", "autosense/nt", ...
setSnaCCLun               Set LUN for Controller Device (typically zero)
showBox                 Display graphic of current hardware configuration
showVersions             Display System Version Information for BootROM,
POST, and Application
sysConfigShow             Display System Config Parameters
sysVpdShow                Display Vital Product Data
sysVpdShowAll             Display Vital Product Data for all subsystems
sysNodeNameModeSet        Change Fibre Channel Node Name mode
sysNodeNameModeShow       Display current Fibre Channel Node Name mode
targets                   List all known target devices
uptime                    Display time since last boot

See User's Guide for more infomation

value = 0 = 0x0
SNC >
```

hlthChkHelp

The `hlthChkHelp` command displays a list of the health check commands.

```
SNC > hlthChkHelp

hlthChkIntervalGet   - Show Check Interval
hlthChkIntervalSet <interval> - Set Check Interval
hlthChkLevelGet    - Show Check Level
hlthChkLevelSet <level>  - Set Check Level
hlthChkNow     - Run Health Check Now

See User’s Guide for more information

value = 0 = 0x0
SNC >
```

hlthChkIntervalGet

The current health check interval can be viewed using the `hlthChkIntervalGet` command. The example below shows the current interval is 60 minutes.

```
SNC > hlthChkIntervalGet
value = 60 = 0x3c = '<'
SNC >
```

hlthChkIntervalSet [number of seconds]

The health check interval controls how often the health check process runs. The interval can range from 1 to 65,535 minutes (about 45 days).

```
SNC > hlthChkIntervalSet 60
value = 0 = 0x0
SNC >
```

hlthChkLevelGet

To display the current health check level, use the `hlthChkLevelGet` command. The example below shows that the current level is 2.

```
SNC > hlthChkLevelGet
value = 2 = 0x02
SNC >
```

hlthChkLevelSet [level]

To set the health check level, use the `hlthChkLevelSet` command. The example below shows setting the level to “3”. The default level is “2.”

Health Check Level	Meaning
1	Checks the health of the SNC, the environment, PCI errors, and the like.
2	Checks the interfaces, for example, the FC controllers + Level 1 check.
3	Checks the devices by sending a SCSI Inquiry command to each known device + Level 1 and Level 2 checks.
4	Checks the device states. This sends a Test Unit Ready command to each device + Level 1, 2, and 3 checks.

```
SNC > hlthChkLevelSet 3
value = 0 = 0x0
SNC >
```

hlthChkNow

The `hlthChkNow` function causes the SNC to execute an immediate, level four health check. Results are displayed that will indicate which devices or subsystems failed the check.

```
SNC > hlthChkNow
Health Check: Starting level 4 check
Health Check: Step 1 -- Checking System
Health Check: Step 2 -- Checking Interfaces
Health Check: Step 3 -- Checking Devices
Health Check: Step 4 -- Checking Device States
Health Check: Passed

value = 0 = 0x0
SNC >
```

host "add","hostname","ipAddress"

The `host "add"` command adds the named host to the host table and host file. If the IP address is already assigned to a host, then the new name is added as an alias for the host. The `host "add"` command is invoked to add known hosts and their IP addresses. Alias names are supported, allowing multiple names to a single host.

The `host` utilities maintain a host file, `nvfs:/mgnt/hosts`, which is used at system startup to initialize the network hosts table. This table associates network names with IP addresses. Use of the `hosts` table is entirely optional, but might facilitate frequently needed connections. Each host entry is a single line of the format:

```
[IP-address][official_host_name][nicknames ...]
```

where

IP-address	is a text string in standard IP address format (i.e., 10.0.0.2).
official_host_name	is the first name selected for this host.
nicknames	is an optional list of additional aliases for the host (separated by spaces).

The following is an example of host file contents.

```
192.168.1.90 bruno
200.0.0.42 socrates
200.0.0.45 plato
200.0.0.47 fred
```

Note The host file does not exist until you issue the `host "add"` command.

```
SNC > host "add","plato","200.0.0.45"
SNC >
```

host "delete","hostname"

The `host "delete"` command deletes the named host from the hosts table and hosts file. If the `hostname` is an alias, then only the alias is removed. If `hostname` is the official host name, the entry and all aliases are removed.

The `host` utilities maintain a host file, `nvfs:/mgnt/hosts`, which is used at system startup to initialize the network hosts table. This table associates network names with IP addresses. Use of the `hosts` table is entirely optional, but might facilitate frequently needed connections. Each host entry is a single line of the format:

```
[IP-address][official_host_name][nicknames ...]
```

where

IP-address	is a text string in standard IP address format (i.e., 10.0.0.2).
official_host_name	is the first name selected for this host.
nicknames	is an optional list of additional aliases for the host (separated by spaces).

The following is an example of host file contents.

```
192.168.1.90 bruno
200.0.0.42 socrates
200.0.0.45 plato
200.0.0.47 fred
SNC > host "delete", "plato"
SNC>
```

host "list"

The `host "list"` command prints the content of the hosts file.

The `host` utilities maintain a host file, `nvfs:/mgnt/hosts`, which is used at system startup to initialize the network hosts table. This table associates network names with IP addresses. Use of the `hosts` table is entirely optional, but might facilitate frequently needed connections. Each host entry is a single line of the format:

```
[IP-address][official_host_name][nicknames ...]
```

where

IP-address	is a text string in standard IP address format (i.e., 10.0.0.2).
official_host_name	is the first name selected for this host.
nicknames	is an optional list of additional aliases for the host (separated by spaces).

The following is an example of host file contents.

```
SNC > host "list"
192.168.1.90 bruno
200.0.0.42 socrates
200.0.0.45 plato
200.0.0.47 fred
value = 0 = 0x0
SNC >
```

hostNameGet

The `hostNameGet` command causes the network name of the SNC to display.

```
SNC > hostNameGet
SNC
value = 0 = 0x0
SNC >
```

hostNameSet

The `hostNameSet` command changes the network name of the SNC. The shell prompt will be set to the new host name. The name you choose cannot be longer than 19 characters. Spaces are not allowed.

```
SNC > hostNameSet "foster"
Target hostname set to foster
value = 0 = 0x0
foster >
```

hostShow

The `hostShow` command displays the IP address and alias (if any) of the unit processing the `hostShow` command, the localhost and the timeserver host.

```
SNC > hostShow
hostname          inet address       aliases
--------          ------------       -------
SNC               192.168.1.172
localhost         127.0.0.1
host              192.168.1.127
value = 0 = 0x0
SNC >
```

hostTypeShow

The `hostTypeShow` command displays the host type setting for each Fibre Channel.

```
SNC > hostTypeShow
FC 1: Type 2 - nt
FC 2: Type 1 - solaris
value = 0 = 0x0
SNC >
```

When a host type is entered, it can be entered either as a valid host type or as an alias. (To enter a host type, use the `setHost` command.) The alias is accepted by the system, but only the valid host type is displayed as output to this command. The output in the example could be the result of the user's having chosen either "Linux" or "Solaris" for the host attached to FC2. Valid aliases are listed and notes on usage are specified in Table 8 on page 104.

hpfAddPort [virtual port],[phys port]

In order for host port failover to configured, one or more FC port(s) must have a virtual port stand by list that includes at least one port not identical to itself. The default state for the SNC, even after the host port failover license has been enabled, is that each of the two FC ports is an active physical port with its own virtual port (itself) and its own virtual port standby list consisting entirely of itself.

The `hpfAddPort` command adds a different physical port to a virtual port's standby port list. This allows host port failover to occur, should the physical port fail. Before adding a physical port to the standby list for a virtual port, be sure it has been removed from any other virtual port standby list. Refer also to hpfRemovePort [virtual port],[phys port] on page 80, hpfShow on page 82, and Configuring Host Port Failover on page 24.

```
SNC > hpfAddPort (1,2)
```

This command adds physical port 2 to the standby list for virtual port 1.

hpfDisplayLinkDownDelay

The `hpfDisplayLinkDownDelay` command sets the amount of time in seconds that a link down status applies to a port before failover occurs. The default is three seconds.

```
SNC > hpfDisplayLinkDownDelay
The current link down delay is set to 3.
value = 0 = 0x0
SNC >
```

hpfFeatureEnable "licensekey"

The `hpfFeatureEnable` command enables the optional host port failover feature. You enable the feature by entering the unique license key.

```
SNC > hpfFeatureEnable "BC-G7ZDN"
value = 0 = 0x0
SNC >
```

If the license key was factory-installed, you can enter the word “enable” (in quotes) rather than the actual license key.

```
SNC > hpfFeatureEnable "enable"
HPF Enabled, License is Valid
The Fibre Channel Host Port Failover Feature is now Enabled.
value = 0 = 0x0
SNC >
```

If the HPF license is valid, but the ports are incorrectly configured, the following output is displayed:

```
SNC > hpfFeatureEnable "BC-G7ZDN"
Copy OK: 96 bytes copied
Feature NOT enabled. Ports setup Incorrectly.
value = -1 = 0xffffffff=payloadChecksum + 0xffc765af
SNC >
```

hpfFeatureDisable

The `hpfFeatureDisable` command disables host port failover. It erases the appropriate configuration file, and reboots the SNC. No provision is made to restore the existing configuration. Users should save the SNC configuration before disabling the feature.

For more information, refer to Saving a Configuration File on page 27.

```
SNC > hpfFeatureDisable
This will delete the HPF Config File.  Continue? (y/n)y
You have chosen to delete the HPF Config File.
You must restart the SNC for this to take effect.
HPF Command line functionality will no longer work.
value = 0 = 0x0
SNC>
```

hpfMakeActive [virtual port],[phys port]

An effective host port failover configuration includes at least one virtual port with a standby list of two or more physical ports. The `hpfMakeActive` command makes a given physical port the active channel for a given virtual port.

```
SNC > hpfMakeActive 1,1
Physical Port 1 is now active on virtual port 1.
value = 0 = 0x0
SNC233 > Restarting FC Channel 2
Restarting FC Channel 1
Restart of FC Channel 2 succeeded
Restart of FC Channel 1 succeeded
```

Note — You must press the **Enter** key to force the command prompt to display after a Fibre Channel restarts.

In the example, physical port 1 takes on the virtual port 1’s characteristics and any data traffic directed to virtual port 1 will go through physical port 1.

hpfMakePrimary [virtual port],[phys port]

An effective host port failover configuration includes at least one virtual port with a standby list of two or more physical ports. The first physical port in the standby port list is the primary port. The primary port is initially the active port, but if it fails, another port on the standby list can become the active port. Use the `hpfMakePrimary` command to make a port that is not listed first in the standby ports list into the primary port.

In the following example, the `hpfShow` command is issued first, to show the order of the ports listed in the standby ports list.

```
SNC  > hpfShow

------------------------------------------------------------------
                      Fibre Channel Host Port Failover Display
------------------------------------------------------------------
    Virtual Port Number  |   Active Port Index |    Standby Port Index(es)
------------------------------------------------------------------
              1          |        none         |          2  1
              2          |        none         |          none
------------------------------------------------------------------
       Link Down Error Recovery Setting:    Return to Standby
       Error Count Recovery Setting:        Requires Intervention
       Link Down Delay Timer Setting:       3
------------------------------------------------------------------
Physical Port |  failure type |   Current Port |    Requires    |  Active
|   Virtual
index         |               |     State      |Intervention    |
        |   Port
------------------------------------------------------------------
       1      |    NONE     |     OFFLINE     |      NO      |   NO |   NONE
       2      |    NONE     |     OFFLINE     |      NO      |   NO |   NONE
------------------------------------------------------------------

value = 0 = 0x0
SNC > hpfMakePrimary 1,1
Physical port 1 is now the primary port for virtual port 1.
value = 0 = 0x0
SNC >
```

hpfPortEnable [phys port]

When a port's recovery type has been set to require intervention, the port will not be usable upon recovery, until the port has been enabled by an administrator.The `hpfPortEnable` function is used to re-enable the port.

hpfRemovePort [virtual port],[phys port]

The `hpfRemovePort` command is used to remove a physical port from a virtual port's standby port list.

```
SNC  > hpfRemovePort 1,2
Found the Physical port on the Virtual Ports list.
Port has been removed.
value = 0 = 0x0
SNC >
```

In this example, physical port 2 has been removed from the standby list for virtual port 1.

hpfSetErrorRecovery [value]

This function sets the recovery scenario for all ports, when the failure of the port was due to error count. The parameter "Value" corresponds to the output of `hpfShowErrorRecoveryValues` command.

Value	Meaning
0	Return to active
1	Return to standby
2	Require intervention

In the following example, the ports have been configured to return to standby when they recover from failure.

```
SNC > hpfSetErrorRecovery 1
value = 0 = 0x0
SNC >
```

hpfSetLinkDownDelay

The `hpfSetLinkDownDelay` command sets the amount of time in seconds before failover occurs when a port's link goes down.

```
SNC > hpfSetLinkDownDelay 30
The current link down delay is set to 30.
value = 0 = 0x0
SNC >
```

CAUTION **Consult an ADIC-authorized service technician before changing this value.**

In this example, failover is configured to occur when a link is not back up after 30 seconds. The default is three seconds.

hpfSetLinkDownRecovery [value]

This function sets the recovery scenario for a all ports, when the failure of the port was due to the link being down. The parameter "Value" corresponds to the output of the `hpfShowErrorRecoveryValues` command.

Value	Meaning
0	Return to active
1	Return to standby
2	Require intervention

In the following example, the ports have been configured to return to standby when they recover from a failed link.

```
SNC > hpfSetLinkDownRecovery 1
value = 0 = 0x0
SNC >
```

hpfShow

The `hpfShow` command displays the current host port failover state and configuration. The default configuration for an SNC with two FC ports is shown below.

```
SNC > hpfShow

--------------------------------------------------------------------------
--------
Fibre Channel Host Port Failover Display
--------------------------------------------------------------------------
--------
Virtual Port Number  |   Active Port Index |    Standby Port Index(es)
--------------------------------------------------------------------------
--------
1                      |        none         |          1
2                  |      none       |        2
--------------------------------------------------------------------------
--------
Link Down Error Recovery Setting:    Return to Standby
       Error Count Recovery Setting:        Requires Intervention
       Link Down Delay Timer Setting:       3
--------------------------------------------------------------------------
--------
Physical Port |  failure type |   Current Port |    Requires     |  Active
|   Virtual
index         |               |     State      |Intervention     |
         |   Port
--------------------------------------------------------------------------
--------
1             |     NONE      |    OFFLINE     |       NO        |    NO
   |    NONE
--------------------------------------------------------------------------
--------
value = 0 = 0x0
SNC >
```

CAUTION **Host port failover cannot occur in the default SNC configuration, even when host port failure is enabled.**

For configuration instructions, refer to Configuring Host Port Failover on page 24. The output of the `hpfShow` command for a system configured to allow host port failover to occur is printed below. Virtual port 1 consists of standby physical ports 1 and 2, with physical port 1 (the primary port) currently active.

```
SNC233 > hpfShow

--------------------------------------------------------------------------
Fibre Channel Host Port Failover Display
--------------------------------------------------------------------------
Virtual Port Number  |   Active Port Index |    Standby Port Index(es)
--------------------------------------------------------------------------
              1      |          1          |          1  2
              2      |        none         |          none
--------------------------------------------------------------------------
       Link Down Error Recovery Setting:    Requires Intervention
       Error Count Recovery Setting:        Return to Standby
```

```
       Link Down Delay Timer Setting:       3
-------------------------------------------------------------------------
-------------------------------------------------------------------------
--------
Physical Port |  failure type |   Current Port |    Requires    |  Active
|   Virtual
index         |               |     State      |   Intervention  |
        |   Port
-------------------------------------------------------------------------
--------
1          |     NONE  |     ONLINE     |     NO       | YES   |     1
2          |     NONE  |     ONLINE     |     NO       | NO    |    NONE
-------------------------------------------------------------------------
value = 0 = 0x0
SNC >
```

hpfShowErrorRecovery

The `hpfShowErrorRecoveryValues` command displays the settings configured for recovery scenarios. These settings are referenced by the `hpfSetErrorRecovery` command and the `hpfSetLinkDownRecovery` command.

```
SNC > hpfShowErrorRecoveryValues
HPF_MODE_RETURN_TO_ACTIVE = 0
HPF_MODE_RETURN_TO_STANDBY = 1
HPF_MODE_REQUIRE_INTERVENTION = 2
value = 0 = 0x0
SNC >
```

icmpstatShow

The `icmpstatShow` command displays ICMP statistics for the Ethernet network. Interpreting these statistics requires detailed knowledge of Internet networking protocols. This information can be useful to the LAN administrator.

```
SNC > icmpstatShow
ICMP:
0 call to icmp_error
0 error not generated because old message was icmp
0 message with bad code fields
0 message < minimum length
0 bad checksum
0 message with bad length
Input histogram:
destination unreachable: 1
0 message response generated
value = 30 = 0x1e
SNC >
```

ifShow

The `ifShow` command is used to show the Ethernet port parameters and status as shown below. The SNC will show two devices. `ibmEmac` is the Ethernet port. `lo` is the local loopback port. If there is no functional emac, users are unable to connect using either the serial port or a telnet session over the Ethernet port.

```
SNC > ifShow
ibmEmac (unit number 0):
     Flags: (0x8063) UP BROADCAST MULTICAST ARP RUNNING
```

```
     Type: ETHERNET_CSMACD
     Internet address: 172.16.76.211
     Broadcast address: 172.16.255.255
     Netmask 0xffff0000 Subnetmask 0xffff0000
     Ethernet address is 00:60:45:17:02:f0
     Metric is 0
     Maximum Transfer Unit size is 1500
     114192 packets received; 364 packets sent
     114023 multicast packets received
116 multicast packets sent
     0 input errors; 0 output errors
     0 collisions; 0 dropped
lo (unit number 0):
     Flags: (0x8069) UP LOOPBACK MULTICAST ARP RUNNING
     Type: SOFTWARE_LOOPBACK
     Internet address: 127.0.0.1
     Netmask 0xff000000 Subnetmask 0xff000000
     Metric is 0
Maximum Transfer Unit size is 32768
     0 packets received; 0 packets sent
     0 multicast packets received
     0 multicast packets sent
     0 input errors; 0 output errors
     0 collisions; 0 dropped
value = 29 = 0x1d
SNC >
```

inetstatShow

The `inetstatShow` command displays statistics about Internet protocol sockets for the Ethernet network. Interpreting these statistics requires detailed knowledge of Internet networking protocols. This information can be useful to the LAN administrator.

```
SNC > inetstatShow
Active Internet connections (including servers)
PCB  Proto Recv-Q Send-Q Local Address  Foreign Address (state)
-------- ----- ------ ------ ------------------ -------------
c1fee18c TCP  0  0 192.168.1.59.23 206.0.64.117.4239 ESTABLISHED
c1fee40c TCP  0  0 0.0.0.0.52787  0.0.0.0.0   LISTEN
c1fee58c TCP  0  0 0.0.0.0.21   0.0.0.0.0   LISTEN
c1fee68c TCP  0  0 0.0.0.0.23   0.0.0.0.0   LISTEN
c1feea0c TCP  0  0 0.0.0.0.513  0.0.0.0.0   LISTEN
c1fee48c UDP  0  0 0.0.0.0.161  0.0.0.0.0
value = 1 = 0x1
SNC >
```

initializeBox

CAUTION **Do not use the `initializeBox` command on FCBs in the Scalar i2000 or Pathlight VX.**

CAUTION **Use this function with care on other SNCs, as data can be lost as a result of devices moving to different LUNs when the mapping database is removed. Make sure all I/O has been stopped.**

The `initializeBox` command

- removes configuration files, such as management configuration, SCSI device maps, SNMP parameters, and health check parameters
- shuts down the log service
- removes the log file from the /log directory
- restores factory defaults

When the command has executed, you are prompted to reboot. The Ethernet address and SNC name remain unchanged. Factory installed license keys remain, but features will have to be re-enabled.

The `initializeBox` command does not erase a global WWN override. Global WWN overrides are stored in the VPD and are not touched by `initializeBox`. The port overrides, however, are stored in the configuration database, which is cleared by the `initializeBox` command. As a result, individual port WWN overrides will be cleared.

ipstatShow

The `ipstatShow` command displays Internet protocol statistics for the Ethernet network. Interpreting these statistics requires detailed knowledge of Internet networking protocols. This information can be useful to the LAN administrator.

```
SNC > ipstatShow
total 8380
badsum 0
tooshort 0
toosmall 0
badhlen 0
badlen 0
fragments 0
fragdropped 0
fragtimeout 0
forward 0
cantforward 0
redirectsent 0

value = 1 = 0x1
SNC >
```

licenseShow

The `licenseShow` command displays information about software license keys that are installed and the corresponding features that are available. The following example shows an SNC that contains a license key for the SFM and Data Mover features.

```
SNC > licenseShow
License "wsk96-sd59a": Valid
Features:
SFM,
Data Mover.
value = 1 = 0x1
SNC >
```

loggerDump [number]

The `loggerDump` command dumps records from the system event log to the console. A numeric parameter can be used to indicate the number of events to display. With no parameter specified, all events in the log file are displayed starting with the most recent events.

```
SNC > loggerDump
*** Dumping 10 of 10 records ***
SEQUENCE  TIME                      CODE    DESCRIPTION
0001      FEB 21 2002 17:58:06    31     NOTICE: LOGGING STARTED
0002      FEB 21 2002 17:58:06    14     CS 1: Rev. 4.11.05 Built Feb  5
2002, 18:03:37
0003     FEB 21 2002 17:58:12   14SFM1: Enabled: State = Active, Hosts = 1
0004      FEB 21 2002 17:58:12    14     FCAL 1: External FIFO depth is
unknown (0x0700)
0005      FEB 21 2002 17:58:12    14     FCAL 2: External FIFO depth is
unknown (0x0700)
0006      FEB 21 2002 17:58:13    14     FCAL 1: LIP Initiated
0007      FEB 21 2002 17:58:13    14     FCAL 2: LIP Initiated
0008      FEB 21 2002 17:58:13    28     USCSI 2: Bus RESET
0009      FEB 21 2002 17:58:13    28     USCSI 4: Bus RESET
0010      FEB 21 2002 17:58:13    14     System 0: ES 1 CC 0/0 Prd 2 Snp
1 HP 1 fMax 254 RstI 0
SNC >
```

loggerDumpCurrent [level]

The `loggerDumpCurrent` command dumps records from the system event log to the console. With `loggerDumpCurrent` (as opposed to `loggerDump`) only records logged since the system was booted are dumped. Unless the device time was configured, the time stamp is based on the time of the last boot. The “level” specifies the event log level for the events as follows:

Number	Level	Explanation
0	Notice	Events recorded in the event log but not displayed by the event viewer
1	Warning	Includes events that should always be reported, such as device removals, and changes to temperature or power systems
2	Information	Includes events that might result in later problems

```
SNC > loggerDumpCurrent 2
*** Dumping 5 current records (of 13 total) with level <= 2 ***
SEQUENCE  TIME                      CODE    DESCRIPTION
0007      FEB 26 2002 19:01:14    28     USCSI 2: Bus RESET
0008      FEB 26 2002 19:01:14    28     USCSI 4: Bus RESET
0010      FEB 26 2002 19:01:14    29     Mapping 1: Target Device Added:
index 0
, handle 0x08fda380
0012      FEB 26 2002 19:01:26    29     Mapping 1: Target Device Added:
index 1
, handle 0x09ffcf08
0013      FEB 26 2002 19:01:27    70     NOTICE: Reboot Complete
value = 0 = 0x0
SNC >
```

ls or ll

The SNC contains a file system in its flash memory. Use the `ls` command to display the files as shown below.

```
SNC >ls
license.dat
sna.rc
vxWorks.st
value = 0 = 0x0
SNC >
```

To obtain detailed information about the file, use the `ll` command instead.

```
SNC > ll
-rwxrwxrwx  1 0       0          5339103 Oct  9 12:24 vxworks_iob
-rwxrwxrwx  1 0       0              142 Oct  9 12:24 firmwareInfo.txt
drwxrwxrwx  1 0       0             2048 Oct  9 12:24 mt/
-rwxrwxrwx  1 0       0               91 Oct  9 12:24 sna_IOB.rc
value = 0 = 0x0
SNC >
```

macShow

The `macShow` command displays the media access control (MAC) address for the Ethernet interface.

```
SNC > macShow
Enet MAC Address: 0.60.45.d.0.80
value = 33 = 0x21 = '!'
SNC >
```

mapCompressDatabase

CAUTION **Compressing the map database will cause device addresses to change unpredictably. Use this command only when no host systems are expecting devices to remain at their current addresses.**

Occasionally, it is necessary to eliminate inactive entries and reorder the active entries in the persistent device map database. The `mapCompressDatabase` command removes entries for devices that are no longer present and reassigns existing device entries to new addresses. The devices will be assigned new addresses immediately and hosts must rescan for devices or they must be rebooted.

This can be required when a host system has a limited number of logical units that can be supported, and changing devices on the SNC has caused the logical unit numbers to increase beyond the host's supported level.

When you run this command you will be given the option of also clearing the SFM and eVPS access settings. Because devices will be assigned new addresses, clearing the SFM and eVPS database makes sure that hosts will not have access to the wrong LUNs. Accepting this option requires that the system administrator must reassign SFM and eVPS access permissions between the hosts and LUNs.

```
SNC > mapCompressDatabase
This command will compress the Persistent Device Map.

Existing SFM Access Settings may become invalid and
should be cleared because LUN assignments may change!
Do you want to compress the Device Map? (y or n) y
0xc1689ac0 (tShell): Wrote 23 device maps to file 'nvfs:config/device.map'
Device Map Compressed
```

```
- Do you want to clear SFM Access Settings? (y or n) y
SFM Access Cleared
value = 23 = 0x17
SNC >
```

If you have not been using SFM/VPS, or eVPS, the output of this command will not reference SFM.

```
SNC > mapCompressDatabase
This command will compress the Persistent Device Map.

Do you want to compress the Device Map? (y or n) y
xc1689ac0 (tShell): Wrote 23 device maps to file 'nvfs:config/device.map'
Device Map Compressed

value = 23 = 0x17
SNC >
```

mapHelp

The `mapHelp` command displays a list of the persistent address map database commands.

```
SNC > mapHelp

mapCompressDatabase - Compress Device Map Database
(reboot required)
mapRebuildDatabase - Rebuild Device Map Database (reboot required)
mapShowDatabase  - Show the Map Database
mapShowDevs   - Show currently attached devices
mapWinnowDatabase - Remove unattached devices from database

See User's Guide for more information

value = 0 = 0x0
SNC >
```

mapMultipathSet

The `mapMutipathSet` command configures a Fibre Channel device for one of three possible path support options: single path, manual multipath, and automatic multipath.

The single path mode is the default mode. In this mode, targets are mapped only once, regardless of how many physical paths there are to the device. In single mode, if you connect the two SNC FC ports to a switch, any target connected to the switch appears as a single target to the host. If the path in use fails due to a cable or GBIC failure, no attempt is made to failover to the other path and the result is that the host loses connectivity to the device.

The second mode is called "manual multi-path" (MMP). In this mode the SNC maps a device through both SNC FC ports when the SNC FC ports are cabled to separate switch ports on the same fabric. Manual mutipath mode is a separately licensed feature. In this configuration, a single device appears as multiple LUNs in the SNC device map. Manual mode can be useful when combined with host-based failover software. Hosts using such software can be configured to treat the “two” devices as a single device, one primary and one secondary. To the applications running on such a host, only a single device appears because the software hides the secondary path. If the primary path fails, I/O is retried on the other path, and other applications (such as a database programs) continue uninterrupted.

The third mode is called "automatic multi-path" (AMP). In this mode the SNC maps multiple Fibre Channel paths to a target device and automatically switches the I/O to a good link when link failures occur. Automatic multipath is a separately licensed feature. Connect each of the two ports of relevant devices to its own FC switch. Connect the SNC FC ports to each switch. If either switch fails or any cable or GBIC fails on one path, the other path is automatically used. Like “single path” mode, the host sees a single target when there are multiple paths. However, with automatic multipath mode, the SNC uses all paths to the target to provide redundancy. This ability depends upon the SNC being able to obtain a unique serial number from a device. Because not all devices are capable of providing this information, not all devices can be configured to use automatic mode.

CAUTION **After setting up the mapping mode, the device must be mapped by using the `fcRescan` command. For more information, refer to `fcRescan [port]` on page 66.**

Value	Meaning
0	Multipath mode set to single path mode. Default value
1	Multipath mode set to manual control mode. The `mapshowDevs` command shows both paths, one of which the operator can designate for use with high-availability software
2	Multipath mode set to automatic mode. The `mapshowDevs` command shows both paths. If the current path becomes unavailable, the other path is automatically used

```
SNC > mapMultipathSet 0
Multipath mode set to single path mode.
value = 0 = 0x0
SNC >
```

In order to change the mapping mode associated with a given device, the device must first be removed from the device map using `mapRemoveDevice`. For more information about this command, refer to mapRemoveDevice [devId] on page 90.

The `mapRemoveDatabase [devId]` command takes a single parameter which is the device ID (DevId) of the device to be removed from the map. Device ID can be determined by finding the device in the list generated by mapShowDevs.For more information about this command, refer to the mapShowDevs on page 91.

Refer also to mapMultipathShow.

mapMultipathShow

The `mapMultipathShow` command displays the current setting for mapping new targets.

```
SNC > mapMultipathShow
Multipath mode set to automatic mode.
value = 2 = 0x2
SNC >
```

mapRebuildDatabase

CAUTION **Clearing the map database will cause device addresses to change unpredictably. Use this command only when no host systems are expecting devices to remain at their current addresses. The SNC must be rebooted after executing this command.**

Occasionally, it is necessary to eliminate the persistent device map database entirely to reassign new addresses to existing devices. The `mapRebuildDatabase` command deletes the current database. When the SNC is next booted, the devices found will be assigned new addresses.

When you run this command you will be given the option of clearing the SFM and eVPS access settings. Because devices will be assigned new addresses, clearing the SFM and eVPS database makes sure that hosts will not have access to the wrong LUNs. Accepting this option requires that the system administrator must reassign SFM and eVPS access permissions between the hosts and LUNs.

This can be required when a host system has a limited number of logical units that can be supported, and changing devices on the SNC has caused the logical unit numbers to increase beyond the host's supported level.

```
SNC > mapRebuildDatabase
This command will clear the Persistent Device Map.
Existing SFM Access Settings may become invalid and
should be cleared because LUN assignments may change!
These changes will take effect when the SNC is rebooted.
Do you want to clear the Device Map? (y or n) y
Removing the Persistent Device Map
Device Map Cleared - Do you want to clear SFM Access Settings? (y or n) y
SFM Access Cleared - Reboot SNC (y or n) y== reboot
SNC >
```

mapRemoveDevice [devId]

The `mapRemoveDevice` command is used to remove a device from the persistent device map. This command takes a single parameter which is the device ID (devId) of the device to be removed from the map. Device ID can be determined by finding the device in the list generated by mapShowDevs.

```
SNC > mapRemoveDevice 2
Must stop the IO for this device before continue. Continue(y/n)? y
value = 0 = 0x0
SNC >
```

mapShowDatabase

The SNC maintains a database of attached devices so that each time a host attaches to the SNC, the target devices are seen at a consistent address. The database will list not only the devices presently connected, but also devices that have previously been connected. If a previously attached device is later reattached, it will be assigned back to its previous address. Use the `mapShowDatabase` command to display the persistent device map table.

```
SNC > mapShowDatabase
devId Type Chan tId tLun UID
-----------------------------------------------
000 SNA 127 127 127 00000060:450d00c0
001 SCSI 001 003 000 00000060:450d00c0
002 SCSI 001 002 000 00000060:450d00c0
003 SCSI 001 001 000 00000060:450d00c0
004 SCSI 002 002 000 00000060:450d00c0
```

```
005 SCSI 002 000 000 00000060:450d00c0
006 SCSI 002 006 000 00000060:450d00c0
007 SCSI 002 009 000 00000060:450d00c0
008 SCSI 002 002 001 00000060:450d00c0
009 SCSI 002 005 000 00000060:450d00c0
010 SCSI 002 005 001 00000060:450d00c0
011 SCSI 001 000 000 00000060:450d00c0
012 SCSI 001 006 000 00000060:450d00c0
value = 0 = 0x0
SNC >
```

Parameter	Meaning
devId	The index of the device in the database.
Type	The type of interface where the device is connected. SNA indicates an internal device. SCSI or Fibre Channel indicate I/O interfaces.
Chan	The channel number of the interface where the device is attached.
TId	Target ID mapping for SCSI initiators
TLun	Target LUN mapping for SCSI initiators
UID	For a Fibre Channel interface, the unique ID of the device. For SCSI interface, the unique ID of the SNC.

mapShowDevs

The SNC maintains a cross-reference map of device addresses. Information about the presently attached and available devices in the map can be displayed using the `mapShowDevs` command.

```
SNC > mapShowDevs
devId Type Chan iId iLun UID    tId tLun Handle  Itl
-------------------------------------------------------------
000 SNA 127 127 127 00000060.450d00c0 001 000 c0ec2600h 00000000h
009 SCSI 002 005 000 09000060.450d00c0 255 255 c1f9e090h 00000000h
010 SCSI 002 005 001 0a000060.450d00c0 255 255 c0ad2590h 00000000h
012 SCSI 001 006 000 0c000060.450d00c0 255 255 c1ffdf10h c1ffdc80h
value = 0 = 0x0
SNC >
```

Parameter	Meaning
Type	The type of interface where the device is attached to the SNC.
Chan	The channel number of the interface
iId	For a SCSI interface only - device ID of the device
iLun	For a SCSI interface only – Logical unit number of the device.
TId	Target ID mapping for SCSI initiators
TLun	Target LUN mapping for SCSI initiators
UID	For a Fibre Channel interface, the unique ID of the device. For SCSI interface, the unique ID of the SNC.
Handle	An internal pointer used for some diagnostic operations.

Parameter	Meaning
Itl	An internal pointer used for some diagnostic operations.

mapWinnowDatabase

Occasionally, it is useful to eliminate inactive entries from the database. The `mapWinnowDatabase` command reduces the database to only the devices presently attached. The address mapping of the current devices will not be altered.

```
SNC > mapWinnowDatabase
0xc0ac8340 (tShell): Wrote 4 device maps to file 'nvfs:config/device.map'
value = 4 = 0x4
SNC >
```

CAUTION **Winnowing the database might cause unattached devices to change addresses unpredictably if they are reattached. Use this command only when you are sure that the specific devices are connected and available to the SNC. You must reboot the SNC after executing this command for the new setting to take effect.**

mapWinnowDatabaseLun [devId]

The `mapWinnowDatabaseLun` command acts like the existing function `mapWinnowDatabase` except that it operates on only one specified LUN, which is input as a parameter. The `mapWinnowDatabaseLun` command operates against the device list output by the `mapShowDatabase` command. Issue the `mapShowDatabase` command before and after issuing the `mapWinnowDatabaseLun` command to verify functionality.

The `mapWinnowDatabaseLUN` command frees the LUN for use in the device map. If the LUN is currently assigned to an attached device, no action is taken. If the LUN refers only to historical data (device not currently attached), the LUN is freed for reuse.

```
SNC > mapWinnowDatabaseLun 14
value = 31 = 0x1f
SNC >
```

mbufShow

The `mbufShow` command displays statistics about the distribution of mbufs on the Ethernet network. Interpreting these statistics requires detailed knowledge of Internet networking protocols. This information can be useful to the LAN administrator.

```
SNC  > mbufShow
type         number
---------    ------
FREE     :     397
DATA     :       2
HEADER   :       1
SOCKET   :       0
PCB      :       0
RTABLE   :       0
HTABLE   :       0
ATABLE   :       0
SONAME   :       0
ZOMBIE   :       0
SOOPTS   :       0
```

```
FTABLE  :      0
RIGHTS  :      0
IFADDR  :      0
CONTROL :      0
OOBDATA :      0
IPMOPTS :      0
IPMADDR :      0
IFMADDR :      0
MRTABLE :      0
TOTAL   :    400
number of mbufs: 400
number of times failed to find space: 0
number of times waited for space: 0
number of times drained protocols for space: 0

_____________________
CLUSTER POOL TABLE

_____________________________________________________________________________
_______
size     clusters  free      usage
-----------------------------------------------------------------------------
-------
64       100       98        428
128      100       100       1294
256      40        40        5
512      40        40        20
1024     25        25        4
2048     25        25        0
-----------------------------------------------------------------------------
-------
value = 80 = 0x50 = 'P'
SNC  >
```

netHelp

The `netHelp` command displays a list of the Ethernet network commands.

```
SNC > netHelp

arptabShow  - Display a list of known ARP entries
ethAddrSet"inetaddr","netmask" - set IP Address
gateAddrGet       - Display Default IP gateway
gateAddrSet "inetaddr"   - set Default IP gateway
host "<func>","hostname","inetaddr"
func - "add" - add to host table
- "delete" - delete from host table
- "list" - list host table
hostNameSet  - set host name
icmpstatShow  - Display statistics for ICMP
ifShow   - Display info about network interfaces
inetstatShow  - Display all Internet protocol sockets
ipstatShow  - Display statistics for IP
macShow   - Display Media Access Control Address
mbufShow   - Display mbuf statistics
route "<func>","destination","gateway"
func - "add" - add route to route table
- "delete" - delete route from route table
- "list" - list route table
```

```
tcpstatShow  - Display statistics for TCP
udpstatShow  - Display statistics for UDP
See User's Guide for more information

value = 0 = 0x0
SNC >
```

normalBoot

Refer to normalBoot on page 145.

pipVpdShow

The `pipVpdShow` command displays the vital product data for the power and identification processor.

```
SNC >
I0411051 > pipVpdShow
Vendor Name ------------------------- ADIC
Part Number ------------------------- FCB
Serial Number ----------------------- AMJ000150-0021
Manufacturing Timestamp ------------- 29Apr2003:170900
Power Requirement ------------------- 40
Blade Type -------------------------- F
Blade Revision Level ---------------- 2
Geographic Address ------------------ 0x2125
External MAC Address ---------------- 026045:EFFC48
Reset Actions, Default -------------- 0x00
Reset Actions, Working -------------- 0x00
Power Up Actions, Default ----------- 0x00
Power Up Actions, Working ----------- 0x00
Reset/Power Switch Actions, Default -- 0x07
Reset/Power Switch Actions, Working -- 0x07
PIP Power Up Counter ---------------- 0xFF
Program Flash CRC ------------------- 0x99E4
VPD CRC ----------------------------- 0xC863
Blade is in standalone mode? -------- No
Base MAC Address -------------------- 02308C:010929
PIP Firmware Version ---------------- 2.1.0
value = 0 = 0x0
SNC >
```

Blade Type Code	Meaning
C	Chassis Management Blade
F	FC IOB
G	GbE IOB
M	MCB
R	RCU
S	SCSI IOB

rdate "timeserver"

The `rdate "timeserver"` command sets the system date and time to be read from a remote system. The setTimeHost "timeserver" command must already have been entered before the `rdate "timeserver"` command is issued. To see data from the new setting, use the `date` command. To set the date and time to be read from a remote system named “Cronos,” issue the following command:

```
SNC > rdate "Cronos"
value = 0 = 0x0
SNC >
```

reboot

The `reboot` command requests that the SNC shut down existing operations and then restart. This is the preferred method of restarting the SNC. There are processes running within the SNC that can have writes pending to files within the flash file system. Following a reboot command, these processes flush their data to the flash file system, and the flash file system writes all pending data out to the flash memory. Only after all pending data has successfully been written to flash, will the SNC start a reset cycle.

```
SNC > reboot
```

reserveShow [level]

The `reserveShow` command outputs a list of devices with reservations.By adding the flag “1” a list of all devices is output.

Level	Explanation
<blank>	Show target devices with reservations
1	Show all target devices regardless of whether a reservation is held or not

```
SNC > reserveShow
Idx Tdev       Vendor   Product          Rev  | Reservation ITL   Host's
Port Name
-----------------------------------------------|--------
value = 0 = 0x0

SNC > reserveShow 1
Idx Tdev       Vendor   Product          Rev  | Reservation ITL   Host's
Port Name
-----------------------------------------------|--------
  0 0x8fda380 ADIC     SNC               40b5 |
  1 0x9ffcf08 IBM      DNES-309170W      SA30 |
value = 0 = 0x0
SNC >
```

reset

The `reset` command immediately initiates a reset cycle. Any pending data writes to the flash file system will be lost. This operation is not typically used. The `reboot` command should be used to gracefully shutdown and restart the SNC.

```
SNC > reset
```

resolveParamShow

The `resolvParamShow` command displays a list of DNS servers on the network in priority order.

```
SNC > resolvParamShow
Stored Resolv Params:
 Order : 2
 Domain : adic.com
 Server 00: 172.16.72.51
 Server 01: 172.16.9.63
 Server 02: 172.16.40.24
value = 3 = 0x3
SNC >
```

If DHCP is disabled, the `resolvParamShow` command displays the following.

```
SNC > resolvParamShow
Stored Resolv Params:
 Order : 3
 Domain : wrs.com
 Server 00: 90.0.0.3
value = 1 = 0x1
SNC >
```

restoreConfig <index>

The `restoreConfig` command restores the specified configuration to the SNC. Refer to saveConfig <index> on page 99.

ridtag "value"

The `ridtag` command is used to change the replacement identifier (RID) tag for the SNC after it has been replaced by the service representative. This should be the final step after replacing and verifying that the replacement unit is performing satisfactorily.

The `sysVpdShow` command will display the RID tag. Before replacing the SNC, you must determine the existing RID tag, if there is one, or the original serial number if no replacement has been made.

If the `ridtag` command is entered with a string, that string becomes the RID tag recorded for the unit.

```
SNC > ridtag "12D345677"
*** value = 0 = 0x0
```

If a string is not entered, the existing RID tag is displayed.

```
SNC > ridtag
RID Tag = 12D345677
value = 0 = 0x0
SNC >
```

On original equipment, the RID tag will be blank.

rm

To remove a file, use the `rm` command and specify the file name in quotes:

```
SNC > rm "file.ext"
```

route

The `route` utilities maintain a route file, `nvfs:/mgmt/route`, which is used at system startup to initialize the network routing table. Each route entry is a single line of the format:

```
[destination]:[gateway]
```

where

destination	is an IP address (for a subnet or host) or the name of a host that is described in the hosts file.
gateway	is an IP address or the name of a gateway to a host. The gateway must be a device on the local subnet.

An IP address is a text string in standard IP Address format (i.e., 10.0.0.2). A host or gateway name must be listed in the hosts file.

Here is an example of the contents of the route file.

```
socrates:bruno
10.0.0:bruno
```

The first line instructs the system to reach the host “socrates” by directing the IP packets to the host “bruno”. The second example shows how all traffic for the subnet 10.0.0 (implied netmask is 255.255.255.0) is sent to the host “bruno” for forwarding. By default, no routes are defined in the route file.

The `route` command is invoked to add, remove, and list the route table.

route "add","destination","gateway"

The `route "add"` command adds a route to the destination through the gateway.

```
SNC > route "add","200.0.0","bruno"
SNC >
```

route "delete","destination","gateway"

The `route "delete"` command removes a route to the destination through the gateway.

```
SNC > route "delete","200.0.0","bruno"
SNC >
```

route "list"

The `route "list"` command lists the existing routes.

```
SNC > route "list"
Destination SNC
------------------- -------------------
socrates    bruno
Destination SNC
------------------- -------------------
200.0.0    bruno
value = 0 = 0x0
SNC >
```

rtcDateSet [year],[month],[dayofmonth],[dayofweek],[hour],[minute],[second]

The `rtcDateSet` command allows you to set the date and time manually. If you are going to follow the use of this command with the `tzSet` command, use Greenwhich mean time in the `rtcDateSet` command.

- You must use a 24-hour clock.
- All parameters are digits.
- The year can be either two or four digits.

- Single digit months or hours should not be filled out with leading zeroes.
- A digit from 1-7 must be entered for the `[dayofweek]` parameter. To determine the correct digit, use the rtcGet command.

To set the display for the new time and date data, issue the `dateSetFromRTC` command. To display the new time and date, issue the `date` command.

To set the real time clock to 9:35 A.M. on Friday, January 26, 2001, enter the following string:

```
SNC > rtcDateSet 2001,1,26,6,9,35,00
value = 0 = 0x0
SNC > dateSetFromRTC
value = 0 - 0x0
SNC > date
FRI JAN 26 09:35:10 2001
value = 0 - 0x0
```

rtcGet

The `rtcGet` command displays the real time clock (RTC) setting, which can have been set either from a timeserver or manually. It displays, incidentally, the day associated with the digit representing the `rtcDateSet` command's [dayofweek] parameter.

Note A timeserver will always set the RTC to Greenwich mean time (GMT).

Value	Meaning
1	Sunday
2	Monday
3	Tuesday
4	Wednesday
5	Thursday
6	Friday
7	Saturday

```
SNC> rtcDateSet 2004,7,13,3,10,11,0
value = 0 = 0x0
SNC> dateSetFromRTC
value = 0 = 0x0
SNC> date
TUE JUL 13 10:11:05 2004
value = 0 = 0x0
SNC> rtcGet
Date: Tuesday, 13-JUL-2004.
Time: 10:11:09.
value = 0 = 0x0
SNC>
```

rtcSetCurrent

The `rtcSetCurrent` command is used after the `rdate "timeserver"` command in order to synchronize the local real time clock with the timeserver running on a remote host. Use the `date` command to see the synchronized settings.

```
SNC > rtcSetCurrent
value = 0 = 0x0
SNC >
```

rz

The `rz` command initiates a receive Zmodem file transfer session. You use this command when you want to download a file to the SNC. The file can be either a firmware or configuration file. After issuing this command, you start the file transfer by initiating a send file operation that uses Zmodem protocol.

The example below shows the `rz` command when it is used to receive a file that contains operational firmware. The SNC extracts individual firmware modules from the file and saves them temporarily in memory. After the file transfer has completed, the SNC copies the firmware modules to nonvolatile flash memory. The SNC must be rebooted to use the updated firmware.

```
SNC > rz
**B000000023be50
Firmware Update in Progress....
Found Image File BOOTROM.IMG – loading
.........Found Image File IPOST.IMG – loading
.........Found Image File SPOST.IMG – loading
Firmware Update Complete. Reboot for Update to Take Effect.
value = 0 = 0x0
SNC >
The example below shows the rz command when it is used to receive a file
that contains configuration parameters. See also the sz command for
information about sending a configuration file.

SNC > rz
**B000000023be50
Configuration Update in Progress....
Configuration Update Complete. Reboot for Update to Take Effect.
value = 0 = 0x0
SNC >
```

saveConfig <index>

The `saveConfig` command saves the configuration as the specified index number. Arbitrarily assign index values 1-4 if you are saving more than one configuration.

scsiAltIdGet [channel]

The `scsiAltIdGet` command displays the alternate ID number for a specified channel. If no channel is specified, alternate IDs are displayed for all SCSI channels.

```
SNC > scsiAltIdGet
SCSIbus AltId ------- ---------------
SCSI 1 1
SCSI 2 6
value = -1 = 0xffffffff
SNC >
```

scsiAltIdSet [channel],[id]

The `scsiAltIdSet` command sets the alternate ID for the specified SCSI channel.

CAUTION Setting the SCSI Alternate ID of an SNC to the same SCSI ID as the SNC Host ID can produce Inquiry timeouts when preceded by a slow executing command. Set the SCSI AltID of the SNC either to Auto or to something other than the HostID.

Parameter	Value	
SCSI channel number	1 - 4	1-4
ID	-1	Auto
ID	0 -15	0-15

```
SNC > scsiAltIdSet 2,6
Alternate Id set to 6 for SCSI 2
will take effect upon reboot
value = 0 = 0x0
SNC >
```

CAUTION **You must reboot the SNC after executing this command for the new setting to take effect.**

scsiChannelTest

Refer to scsiChannelTest (x,y) on page 146.

scsiHostChanGet [channel]

The `scsiHostChanGet` command displays host channel modes for a SCSI channel. If no channel is specified, host channel modes are displayed for all SCSI channels.

```
SNC > scsiHostChanGet
SCSIbus HostChan ------- ---------------
SCSI 1 Channel is Target
SCSI 2 Channel is Initiator
value = -1 = 0xffffffff
SNC >
```

scsiHostChanSet [channel],[mode]

The `scsiHostChanSet` command sets the channel mode to `Target or Initiator` for the specified SCSI channel.

Parameter	Value	Meaning
SCSI channel number	1 - 4	Selected channel
Mode	0	Initiator
	1	Target

```
SNC > scsiHostChanSet 2,1
Host Chan set to TARGET for SCSI 2 will take effect upon reboot
value = 0 = 0x0
SNC >
```

CAUTION **You must reboot the SNC after executing this command for the new setting to take effect.**

scsiHostIdGet [channel]

The `scsiHostIDGet` command displays the host ID number for a specified SCSI channel. If no channel is specified, host IDs are displayed for all SCSI channels.

```
SNC > scsiHostIdGet
SCSIbus HostId ------- ---------------
SCSI 1 7
SCSI 2 7
value = -1 = 0xffffffff
SNC >
```

scsiHostIdSet [channel],[id]

The `scsiHostIdSet` command sets the host ID for a specified SCSI channel.

Parameter	Value
Channel number	1 - 4
ID	0 -15

```
SNC > scsiHostIdSet 2,7
Host Id set to 7 for SCSI 2
will take effect upon reboot
value = 0 = 0x0
SNC >
```

CAUTION **You must reboot the SNC after executing this command for the new setting to take effect.**

scsiRescan [channel]

Note When you are using Firmware 4 on a Fibre Channel blade, this command is unavailable.

The command `scsiRescan` requests a SCSI rescan for new devices. If channel is specified (1 or 2), then only that channel is scanned. Otherwise, if channel is not specified or if channel is 0, then all channels are scanned.

```
SNC > scsiRescan 2
Done
value = 0 = 0x0
SNC >
```

Rescanning a SCSI bus can delay I/O commands pending on that bus for several seconds. Do not rescan SCSI buses when no delay can be tolerated. When possible, only scan the bus where a new device has been added.

After a device is discovered by the `scsiRescan` command, it may not show up immediately in response to the `fcShowDevs` command. An example of this is a disk that requires a *SCSI Start Unit* command to become ready. (Tape and changer devices and disks that indicate *Ready* status are available as soon as the scan completes.) If a device does not appear in response to the `fcShowDevs` command, wait a few minutes, then try the command again.

If a SCSI target device should require replacement, remove the old device, set the new device to the same SCSI bus ID as the old device and attach it to the same channel. Rescan the channel to update the configuration data. The new device should be available to host systems with the same LUN as the old device.

scsiResetDisableGet [channel]

The `scsiResetDisableGet` command displays the SCSI Bus Reset On Power Up is enabled. False means that SCSI Bus Reset On Power Up is disabled.

```
SNC  > scsiResetDisableGet

  SCSIbus    Reset on Power-up
  -------    ---------------

  SCSI  1    Enabled - default
  SCSI  2    Enabled - default
  SCSI  3    Enabled - default
  SCSI  4    Enabled - default
value = -1 = 0xffffffff = payloadChecksum + 0xffc8377f
SNC >
```

scsiResetDisableSet [channel],[mode]

The `scsiResetDisableSet` command sets the SCSI Bus Reset On Power Up for the specified SCSI channel. False is default and enables reset of SCSI bus on power-up. True disables SCSI bus reset on power-up.

Parameter	Value	Meaning
Channel number	1 - 4	Selected channel
Mode	0	Enable Reset on Power Up
	1	Disable Reset on Power Up

```
SNC > scsiResetDisableSet 1,1
Reset Disable set to TRUE for SCSI 1
will take effect upon reboot
value = 0 = 0x0
SNC >
```

scsiShow

Note — When you are using Firmware 4 on a Fibre Channel blade, this command is unavailable.

The `scsiShow` command displays all SCSI channels and information about the devices attached to each channel. The following example shows the display for two disk devices attached to SCSI channel 1 and a tape library attached to SCSI channel 2:

```
SNC > scsiShow
SCSI Initiator Channel 1: 0xc08b5b60
ID LUN Vendor Product   Rev | Sync/Off Width
-------------------------------------|------------
1 0 OEM OEM DCHS04X   6363 | 12/15 16 S W  0/ 0 8 S W Q
2 0 OEM OEM DCHS04X   6363 | 12/15 16 S W  0/ 0 8 S W Q
SCSI Initiator Channel 2: 0xc08d26e0
ID LUN Vendor Product   Rev | Sync/Off Width
-------------------------------------|------------
0 0 OEM  03570C12   5346 | 25/15 16 S W  0/ 0 8 S W
0 1 OEM  03570C12   5346 |
1 0 OEM  03570C12   5346 | 25/15 16 S W  0/ 0 8 S W
value = 0 = 0x0
SNC >
```

Parameter	Meaning
ID	The SCSI ID of the target device
LUN	The SCSI LUN of the target device
Vendor	The content of the "Vendor ID" field from the SCSI inquiry data
Product	The content of the "Product ID" field from the SCSI inquiry data
Rev	The content of the "Revision ID" field from the SCSI inquiry data
SYNC/Off	The negotiated synchronous transfer period and offset. The period is the negotiated transfer period. Multiply the period times 4 nanoseconds to determine the actual period (exception: if the period is negotiated to 12, then 50ns. is used). The offset indicates the REQ/ACK offset that was negotiated. A zero in these fields indicates that asynchronous transfer is in use.
Width	The negotiated transfer width in bits, either 8 or 16.

scsiTermGet [channel]

The `scsiTermGet` command displays termination status information for the specified channel. If no channel is specified, status information is displayed for all SCSI channels.

```
SNC > scsiTermGet
 SCSIbus Termination ------- ---------------
SCSI 1 Enabled - default
SCSI 2 Enabled
value = 0 = 0x0
SNC >
SNC > scsiTermGet 2
SCSIbus Termination ------- ---------------
SCSI 2 Enabled - default
value = 0 = 0x0
SNC >
```

scsiTermSet [channel],[termination]

The `scsiTermSet` command enables or disables the termination for the SCSI channel. After setting SCSI channel termination values, reboot the SNC to effect the changes.

Parameter	Value	Meaning
Channel number	1 - 4	Selected channel
Termination	0	Enable termination
	1	Disable termination

```
SNC > scsiTermSet 2,1
Termination Disabled for SCSI 2
will take effect upon channel reset
value = 0 = 0X0
SNC >
```

setFcChanMask [channel, bitmask]

The `setFcChanMask` command allows you to assign Fibre Channel(s) access to an exclusive group of SCSI channels.

The command syntax includes a Fibre Channel number and a bitmask value. The value for `[channel]` is the Fibre Channel number. The `[bitmask]` value, which sets access to SCSI channels, is calculated using the method explained below.

In Table 8 on page 104, each SCSI channel (Row A) corresponds to a bit, the weight of which is indicated in Row B. The bits are grouped by fours and the weights follow the pattern 1, 2, 4, 8, reading from right to left. In Row C, "0" indicates that access to a SCSI channel is enabled and "1" indicates that access to a SCSI channel is disabled. Groups 2 and 1 are legacy number groups, and Row C values there are always "1."

Table 8 Channel weights used in calculating bitmasks

		Group 3		Group 2				Group 1				To Hex	To Dec
A	Channel	10	9	8	7	6	5	4	3	2	1		
B	Bit weights	2	1	8	4	2	1	8	4	2	1		
C	Example 1	1	1	1	1	1	1	0	0	0	0	3F0	1008

In Row C of Table 9 on page 105, the "1"s indicate that access is to be disabled to currently nonexistent SCSI channels 5 -10 (follow up the column from the "1" to the channel number in row A). The "0"s indicate that access is to be enabled for channels 1- 4 (follow up the column from the "0" in Row C to the channel number in Row A). Within each group of four, the bit weights (read up the column from Row C to the values in Row B) for all channels marked with a "1" are totaled, converted to a hexadecimal value, and recorded side-by-side in the "To Hex" column, working from right to left, according to the following formula:

Group 1: No bit weights need to be added together since there are no "1"s. Record "0" in the first position of the "To Hex" column.

Group 2: The bit weight for SCSI channel 5 is "1," the bit weight for SCSI channel 6 is "2," the bit weight for channel 7 is "4," the bit weight for channel 8 is "8." If you add these numbers, the total is "15," which is the hexadecimal equivalent of "F," refer to Table 9 on page 105. Record "F" in the second position of the "To Hex" column.

Group 3: The bit weight for channel 9 is "1." The bit weight for channel 10 is "2." According to Table 9 on page 105, the hex equivalent of "3" is "3." Record "3" in the third position of the "To Hex," column.

The number showing in the "To Hex" column of Row C is "3F0."

Open your desktop calculator, click the **View** menu, then select **Scientific**. Click **Hex** and key in "3F0." Click **Dec**. The value "3F0" changes to the value "1008." Use "1008" in the `setFcChanMask` command:

```
SNC> setFcChanMask 1,1008
```

Access to SCSI channels 5 - 10 has been denied to Fibre Channel 1. You must reboot for the changes to take effect.

Table 9 Hex and decimal values

Hex Value	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Decimal Value	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

setFcFrameSize [channel],[size]

Set the frame size for a channel using the `setFcFrameSize` command.

Parameter	Value
SAN channel number	1 - 2
Frame size	512,1024, or 2048

If an invalid size is set, then the frame size of 2048 will be used.

CAUTION **You must reboot the SNC after executing this command for the new setting to take effect.**

```
SNC > setFCFrameSize 1,2048
value = 2048 = 0x800
SNC >
```

setFcHardId [channel],[id]

Set the Hard AL_PA for a channel using the `setFcHardId` command.

Parameter	Value	Meaning
FC connection number	1 or 2	
ID number	0 to 125	
	255	Use Soft ID method

The ID settings 0 to 125, inclusive, are valid IDs. [255] requests the Soft ID method. If an invalid id is requested, then the Soft ID method will be used.

```
SNC > setFcHardId 1,1
value = 0 = 0x0
SNC >
```

CAUTION **You must reboot the SNC after executing this command for the new setting to take effect.**

setHost [port],"OS"

The `setHost` command sets the host operating system type, or host type, for the specified SAN interface. This provides some customization in the way the SNC is presented to the particular operating system. If [`port`] is 0, the change applies to all SAN connections; otherwise the host type is applied to the specified port.

For "OS" values, refer to Table 1 on page 8.

When multiple hosts have access to the SNC, make sure that the correct host type value is set for each port. When you set a port to a particular host type value, all attached hosts must be that host type. If you are using more than host type, you must use SFM, VPS, or eVPS.

Parameter	Value	Meaning
Port	0	Changes will apply to all FC Connections
	1 or 2	Changes will apply to FC Connection 1 or 2, as specified

CAUTION **You must reboot the SNC after executing this command for the new setting to take effect.**

setNettime [value]

The `setNettime` command enables or disables timeserver functionality.

Value	Meaning
0	Disables timeserver functionality
1	Enables timeserver functionality

```
SNC > setNettime 1
Nettime 1 value = 0 = 0x0
SNC >
```

setScsiAssign [devID], [channel], [id], [lun]

Note When you are using Firmware 4 on a Fibre Channel blade, this command is unavailable.

The `setScsiAssign` command assigns a target device with a particular target ID and LUN to a particular SCSI channel.

The indicated channel must be configured to be running in target mode. The values [id] and [lun] must be available on that channel.

The example below shows the device with [devID] of 64 assigned to ID 0, LUN 0 on SCSI channel 2.

Note The `targets` command displays the devID as the Idx.

```
SNC > setScsiAssign 64,2,0,0
value = 0 = 0x0
SNC > setScsiAssign 82,2,0,1
value = 0 = 0x0
SNC > setScsiAssign 98,2,0,2
value = 0 = 0x0
SNC > setScsiAssign 124,2,0,3
value = 0 = 0x0
```

setScsiScanTime

The `setScsiScanTime` command sets the number of minutes that the SNC rescans the SCSI bus in order to discover devices that come online slowly. The value `0` disables rescan. The initial scan will complete as usual, however. The lengthiest period of time you can select for rescan to run is `30`. The default setting is `5`. Refer also to `getScsiScanTime`.

```
SNC > setScsiScanTime 10
value = 15 = 0xf
SNC >
```

setSnaCCLun [newLUN]

The `setSnaCCLun` command reassigns the command and control LUN to the specified value.

`newLUN` is the new value for the command and control LUN. Valid values are 0 through 255.

The new setting takes effect immediately. The previous value is removed from the device map and database and a trap is generated indicating that the device was removed.

If the new LUN is not currently in use, a new entry is added in the device map and database. A trap will be generated indicating the new device was added.

If the new LUN is already in use, the command and control LUN will be disabled. It will remain disabled until the device mapped at the requested LUN is removed and deleted from the database. In this case, you can use the `mapRebuildDatabase` command to remove the previous LUN assignment and to allow the new command and control LUN to be enabled.

CAUTION **Because AIX and NT use LUN 0 when they issue a Report LUNs command, you must make sure that a device is configured at LUN 0.**

setTimeHost "timeserver"

The `setTimeHost` command adds a host running timeserver to the SNC system. The "`setNettime 1`" command must already have been issued. To add a host named Cronos to the system issue the following command:

```
SNC > setTimeHost "Cronos"
Time Host Cronos value = 0 = 0x0
SNC >
```

sfmAccessApply

The `sfmAccessApply` command causes the settings that have been changed and stored in memory to take effect immediately and also saves them to the SFM database.

```
SNC > sfmAccessApply
```

```
value = 0 = 0x0
SNC >
```

sfmAccessClear [disable code]

The `sfmAccessClear` command disables all SFM host access to all LUNs except to LUN 0 (the command and control interface). The disable code is stored as the "MagicNumber" in the output of the `sfmFileShow` command.

The following command example shows how to disable all access using the disable code `0xfacade03`.

```
SNC >sfmAccessClear 0xfacade03
value = 0 = 0x0
SNC >
```

sfmAccessSet [hostIndex],[Starting lun],[Ending lun],[Access]

The `sfmAccessSet` command sets the access for the specified range of LUNs for the specified SFM host connection index.

Access Value	
0	Disables access to the LUNs
1	Enables access to the LUNs

When you issue this command, the settings are stored in memory but are not applied until you issue the `sfmAccessApply` command. The following example shows how to enable the host at connection index 1 to access LUNs 2 through 32. Existing hostIndex values can be determined by looking at the “Id” column in the output of `sfmShow [hostIndex]`.

```
SNC > sfmAccessSet 1,2,32,1
value = 0 = 0x0
SNC >
```

sfmActiveSet

The `sfmActiveSet` command places SFM in the active state. The means that all of the current access settings are put into effect. You would typically only use this command after making SFM inactive. Refer to the `sfmInactiveSet` command.

```
SNC > sfmActiveSet
value = 0 = 0x0
SNC >
```

If SFM is already active, the following is displayed.

```
SNC > sfmActiveSet
SFM: Already Active
value = 21 = 0x15
SNC >
```

sfmConnectionSet [hostIndex],"host connection string"

The `sfmConnectionSet` command sets the SFM host connection information for the host at the specified connection index. The connection can be a device name, port address, etc. The following example shows setting the host connection information. Existing hostIndex values can be determined by looking at the “Id” column in the output of the `sfmShow -1` command.

```
SNC > sfmConnectionSet 1,"ScsiPort2 [0:0:0] (QLA2100)"
value = 0 = 0x0
SNC >
```

sfmFeatureDisable

The `sfmFeatureDisable` command disables the SFM feature. It erases the appropriate configuration file, and reboots the SNC. No provision is made to restore the existing configuration. Users should save the SNC configuration before disabling the feature.

For more information, refer to Saving a Configuration File on page 27.

```
SNC > sfmFeatureDisable
All SFM configuration information will be lost,
the feature disabled, and the system will be atuomatically rebooted!
Do you want to disable SFM? (y or n) y
```

sfmFeatureEnable "license key string"

The `sfmFeatureEnable` command enables the optional SFM feature. You enable these features by entering the unique license key.

```
SNC > sfmFeatureEnable "BVRXC-G79DN"
value = 0 = 0x0
SNC >
```

If the license key was factory-installed, you can enter the word “enable” rather than the actual license key.

```
SNC > sfmFeatureEnable "enable"
value = 0 = 0x0
SFM License is Valid
SNC >
```

If `value = 1 = 0x1` message is displayed, it means the license is already installed and SFM is already enabled.

If the `value = -1 = 0xffffffff message` is displayed, it means the license is not already installed and you do need to enter the license key.

Refer also to the `licenseShow` command.

sfmFileShow

The `sfmFileShow` command shows the SFM data stored in the file.

```
SNC > sfmFileShow
SFM File: '/nvfs/config/iac.pif'
  MagicNumber = 0xfacade03, State = 2, Hosts = 3, Writes = 14.
SFM License Key = "MDDVHH-MX9XXXx"
  State = 0, Type = 1, Flags = 0xffc00001, Offline
  WWN:       00000060:45abcdef
  Name:      'ASAHI'
  Host Type: 'Windows 2000 SP 1'
  Device Id: 'FC 1'
  LUN Access:
  0: 01 01 01 01 00 00 00 00 00 00 00 00 00 00 00 00
 16: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 32: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 48: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 64: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
LUN MAP:
```

```
   0: 0000 0001 0002 0004 ffff ffff ffff ffff ffff ffff ffff ffff ffff
ffff ffff ffff
  16: ffff ffff ffff ffff ffff ffff ffff ffff ffff ffff ffff ffff ffff
ffff ffff ffff
  32: ffff ffff ffff ffff ffff ffff ffff ffff ffff ffff ffff ffff ffff
ffff ffff ffff
  48: ffff ffff ffff ffff ffff ffff ffff ffff ffff ffff ffff ffff ffff
ffff ffff ffff
  64: ffff ffff ffff ffff ffff ffff ffff ffff ffff ffff ffff ffff ffff
ffff ffff ffff
SNC >
```

sfmHostShow [hostIndex]

The `sfmHostShow` command displays all known SFM information for the specified host connection index. The LUN access map is displayed as 16 rows of 16 bytes, one byte for each LUN.

Parameter	Value	Meaning
hostIndex		is the ID obtained from the `sfmShow` command.
[LUN]	00	in the LUN Access map indicates the host has no access to the LUN.
	01	in the LUN Access map indicates the host has access to the LUN.

The following command example shows SFM information for host ID 1.

```
SNC > sfmHostShow 1
Host(1):
State = 0, Type = 1, Flags = 0x00000000, Online
WWN:  200000e0:8b0057d8
Name:  'LABATTS'
Host Type: 'NT 4.0 SP5'
Device Id: 'ScsiPort6 [0:0:0] (QLA2100)
LUN Access:
0: 01 01 01 00 00 00 00 00 00 00 00 00 00 01 01 00
16: 00 00 00 00 00 00 00 00 00 01 01 00 00 00 00 00
32: 00 00 00 00 00 01 01 00 00 00 00 00 00 00 00 00
48: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
64: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
80: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
96: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
112: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
128: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
144: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
160: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
176: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
192: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
208: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
224: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
240: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
value = 0 = 0x0
SNC >
```

sfmInactiveSet

The `sfmInactiveSet` command de-activates SFM making all LUNs available to all host connections. This command typically would be used when troubleshooting a SAN configuration. It removes SFM access control without deleting SFM access settings. Use the `sfmActiveSet` command to re-activate SFM.

```
SNC > sfmInactiveSet
value = 0 = 0x0
SNC >
```

If SFM is already inactive, the following is displayed.

```
SNC > sfmInactiveSet
SFM: Already Inactive
value = 23 = 0x17
SNC >
```

sfmNameSet [hostIndex],"name string"

The `sfmNameSet` command sets the host name field to the specified “name string” for the specified host connection index. The following command example shows setting the host name for host ID 1 to “LANDERS”. Existing "hostIndex" and "name" values can be determined by looking at the "Id" and "Host Name" columns in the output of the `sfmShow -1` command.

```
SNC > sfmNameSet 1,"LANDERS"
value = 0 = 0x0
SNC >
```

sfmShow [hostIndex]

The `sfmShow` command displays information about hosts that have been registered with SFM based on the value of "hostIndex." This command provides the same information as the `vpsShow` command.

hostIndex	Meaning
-1	Displays brief list of all known host connections
0	Full display of all known host connections, and if online displays a list of all LUNs available to that connection
N (1-48)	Displays the full information for the host N only

The following command example shows SFM information for the hosts that have been registered by SFM. Hosts that have HRS (host registration service) running with periodic re-registration are shown with a status of "Periodic." In the example, one of the hosts has more than one Fibre Channel connection to the SNC. For an explanation of “host types,” refer to Host Type Settings for Fibre Channel Ports on page 178.

```
SNC > sfmShow -1
SFM State: Active
Id World Wide Name St. Typ HexFlags Status Host Name Host Type Host
Connection
--- ----------------- --- --- -------- --------- ---------- --
001 200000e0.8b0057d8 000 001 00000000 Online LANDERS NT 4.0 SP5 ScsiPort6
[0:0:0](QLA2200)
002 200000e0.8b16014d 000 001 00000000 Periodic SUPERIOR NT 4.0 SP5
ScsiPort7 [0:0:0](QLA2200)
003 200000e0.8b160152 000 001 00000000 Offline SUPERIOR NT 4.0 SP5
ScsiPort7 [0:0:0](QLA2200)
value = 0 = 0x0
```

```
SNC >
```

sfmSparseAccessSet [hostIndex],"lun string",[Access]

The `sfmSparseAccess` command sets the access for the specified LUNs for the specified host connection index. It is the same as `sfmAccessSet` except LUNs are entered as a string of characters separated by commas. Existing "hostIndex" values can be determined by looking at the “Id” column in the output of the `sfmShow -1` command.

Access	Meaning
0	Disables access to the LUNs
1	Enables access to the LUNs

When you issue this command, the settings are stored in memory but are not applied until you issue the `sfmAccessApply` command. The following command example enables host access to the LUNs 1, 2, 3, 4, 6, 9, 22, 23 and 45 on host connection index 1.

```
SNC >sfmSparseAccessSet 1,"1,2,3,4,6,9,22,23,45,"1
value = 0 = 0x0
SNC >
```

sfmTypeSet [hostIndex],"OS type string"

The `sfmTypeSet` command sets the operating system type for the specified host connection index. Existing "hostIndex" values can be determined by looking at the "Id" column in the output of the `sfmShow -1` command. The `OS type string` must begin with a supported operating system type or a valid alias for one of those operating systems. For host operating systems and aliases, refer to hostTypeShow on page 78. Additional information can be appended to the `OS type string`, as desired.

In the example, service pack information is appended to the host type.

```
SNC > sfmTypeSet 1,"NT Win2K, SP3"
value = 0 = 0x0
SNC >
```

shellLock

Only one telnet interface to the SNC can be in use at any one time. A numeric parameter specifies if the shell is locked or unlocked. The default value for `shellLock` is '0' or unlocked. This can be seen when someone connects directly to the service (serial) port and enters `shellLock` from the command line:

```
SNC > shellLock
value = 0 = 0x0
SNC >
```

When a user connects to the SNC via a telnet session the `shellLock` value is changed to '1' as seen from the results of the telnet session below:

```
SNC> shellLock
value = 1 = 0x1
SNC >
```

and the output on the serial port of the SNC being telneted to is as seen below:

```
telnetd: This system *IN USE* via telnet.
shell restarted.
```

A telnet session, therefore, will lock the serial port access to the shell. This setting is not persistent across power cycles or reboots. When the telnet session is discontinued a user can once again gain access to the shell via the serial port. This command is not intended to be invoked directly from the command line.

showBox

Refer to showBox on page 146.

showScsiAssign [channel]


Note

When you are using Firmware 4 on a Fibre Channel blade, this command is unavailable.

The `showScsiAssign` command lists the current assigned addresses for the indicated channel. If a channel is omitted, or is 0 (zero) then all assignments are shown for all target channels.

```
SNC > showScsiAssign
SCSI  1
   ID Lun DevId
    0   0     1
    0   1    17
    0   2    35
    0   3    51
SCSI  3
   ID Lun DevId
    0   0   134
    0   1   150
    0   2   165
    0   3   182
SCSI  4
   ID Lun DevId
    0   0   198
    0   1   214
    0   2   230
    0   3   246
value = 0 = 0x0

SNC >
```

showVersions

The `showVersions` command displays the version of the operational firmware, Power-On-Self-Test (POST), bootrom and alternate bootrom.

```
SNC > showVersions
ADIC Scalar Storage Network Controller Firmware-4
Version 0404.05 Built Oct 19 2001, 14:40:29 on 5xame by jsmyder
  POST         version v040405
  Bootrom      version v040405
  Alt Bootrom  version v040405
value = 0 = 0x0
SNC >
```

The output of the `showVersions` command can also collapse some of this information.

```
SNC > showVersions
ADIC SNC 6404 Firmware-4 Release Build
Version 0442.05 Built Aug 19 2003, 11:47:08 by tHussain
```

```
POST/Bootrom version v044205
value = 0 = 0x0
SNC >
```

sncFeatureEnable "licensekeystring"

The `sncFeatureEnable` command enables the optional data mover feature. You enable the feature by entering the unique license key.

```
SNC > sncFeatureEnable "BVZC-G79DN"
value = 0 = 0x0
SNC >
```

If the license key was factory-installed, you can enter the word “enable” rather than the actual license key.

```
SNC > sncFeatureEnable "enable"
value = 0 = 0x0
Data Mover License is Valid
SNC >
```

If `value = 1 = 0x1` message is displayed, it means the license is already installed and Data Mover is already enabled.

If the `value = -1 = 0xffffffff message` is displayed, it means the license is not already installed and you do need to enter the license key.

Refer also to the the `licenseShow` command.

snmpCommunitiesShow

The `snmpCommunitiesShow` command displays the list of SNMP community strings in use by the SNC.

```
SNC > snmpCommunitiesShow

ReadCommunity  ViewIndex
----------------------------
pub     1
ReadCommunity  ViewIndex
----------------------------
public     1
icmp     2

WriteCommunity  ViewIndex
----------------------------
priv     1
private    1
TrapCommunity
----------------------------
private
value = 9 = 0x9
SNC >
```

SNMP community strings serve to group network devices into logical collections for management purposes. The community string must match on both the ADIC Management Console server and the SNC you wish to manage. The default settings do match.

Use the ADIC Management Console to view or edit strings that apply to the server. To view or edit strings that apply to the SNC, use the `snmp...` commands explained below.

snmpHelp

The `snmpHelp` command displays a list of the snmp commands.

```
SNC > snmpHelp
snmpCommunitiesShow
snmpReadCommunityAdd "string"
snmpReadCommunityRemove "string"
snmpTrapCommunitySet "string"
snmpWriteCommunityAdd "string"
snmpWriteCommunityRemove "string"
trapDestAdd "ipaddress"
trapDestRemove "ipaddress"
trapDestShow

See User's Guide for more information

value = 0 = 0x0
SNC >
```

snmpReadCommunityAdd "string",[view]

The `snmpReadCommunityAdd` command adds the specified string to the list of accepted strings for SNMP Read operations (`Get and GetNext`). The "View" switch must be set to “1” to be accepted by the ADIC Management Console and framework applications.

For more information about the SNMP communities, refer to the *ADIC Management Console User's Guide.*

```
SNC > snmpReadCommunityAdd "adic",1
Success
value = 4 = 0x4
SNC>
```

snmpReadCommunityRemove "string"

The `snmpReadCommunityRemove` command removes the specified string from the list of accepted strings for SNMP Read operations.

```
SNC > snmpReadCommunityRemove "adic"
Success
value = 3 = 0x3
SNC >
```

snmpTrapCommunitySet "string",[view]

The `snmpTrapCommunitySet` command sets the community string passed with all SNMP traps. The "View" switch must be set to “1” to be accepted by the ADIC Management Console.

For more information about the SNMP communities, refer to the *ADIC Management Console User's Guide*.

```
SNC > snmpTrapCommunitySet "adic",1
Success
value = 8 = 0x8
SNC >
```

snmpWriteCommunityAdd "string",[view]

The `snmpWriteCommunityAdd` command adds the specified string to the list of accepted strings for SNMP Write operations (Set). The "View" switch must be set to “1” to be accepted by the ADIC Management Console and framework applications.

For more information about the SNMP communities, refer to the *ADIC Management Console User's Guide*.

```
SNC > snmpWriteCommunityAdd "adic",1
Success
value = 0 = 0x0
SNC >
```

snmpWriteCommunityRemove "string"

The `snmpWriteCommunityRemove` command removes the specified string from the list of accepted strings for SNMP write operations.

```
SNC > snmpWriteCommunityRemove "adic"
Success
value = 0 = 0x0
SNC >
```

For more information about the SNMP communities, refer to the *ADIC Management Console User's Guide*.

snReset [channel]

The `snRest` command restarts the specified SCSI channel without issuing a bus reset.

```
SNC > snReset 1
value = 0 = 0x0
SNC>
```

supportDump

The `supportDump` command outputs the result of a number of service port commands in a standard way and in a specific order. The resulting output is used for troubleshooting. The individual commands called by `supportDump` are:

```
envShow
version
bootShow
showBox
sysVpdShowAll
sysConfigShow
licenseShow
vpsShow
hostTypeShow
targets
getScsiTimeScan
scsiShow
fcShow 2
fcShowDevs
mapShowDevs
mapShowDatabase
showScsiAssign
tpathShow
mapMultipathShow
ghostIOShow
fcGbicShow
fctShowChan 1
fctShowChan 2
cfLogTimePlaybackAll
loggerDumpCurrent
envMonShow
```

```
dmva
reserveShow 1
persistentReserveShow
tardump
stShow
vcmTaskShow
uptime
```

sysConfigShow

The `sysConfigShow` command displays current system parameter settings. The display shows whether or not the command and control interface is enabled or disabled and the LUN that is assigned to it, whether or not enhanced tape performance features are enabled, the MAC address of the Ethernet port, and the Fibre Channel world wide node name.

```
SNC > sysConfigShow
Current System Parameter Settings:
Command and Control Device (CC) : 0 Enabled
LUN : 0
Allow Early Write Status for Tape : 1 Enabled
Allow R/W Acceleration for Tape : 1 Enabled
Enet MAC Address: 0.60.45.16.1.4
FC Node WWN: 10000060.45160104
value = 0 = 0x0
SNC >
```

sysNodeNameModeSet [Mode]

The `sysNodeNameModeSet` command changes the Fibre Channel node name mode for the Fibre Channel interface ports. This capability is used by specialized host bus adapter software to facilitate load balancing and failover. Special software must be used to take advantage of changes made to this setting. The ADIC Management Console does not use node name modes.

In the default mode (Mode 0), each Fibre Channel port on the SNC has the same node name. For configurations that require the node name to be different, use the `sysNodeNameModeSet` command to change the mode to 1.

An example configuration that requires the node name on each Fibre Channel port to be different is where the host has two Host Bus Adapters (HBAs) installed for redundancy. In this configuration, each HBA is connected to a different Fibre Channel port on the SNC. Fail-over software on the host defines one of the HBAs as the primary connection and the other HBA as a spare. If the primary HBA should fail, the fail-over software routes data transfers to the SNC through the spare HBA.

Mode	Definition
0	Node name is the same on all Fibre Channel interfaces (default)
1	Node name is based on port name but different from port name

If you change the mode, you must reboot the SNC for new setting to take effect.

Refer also to the `sysNodeNameModeShow` command.

```
SNC > sysNodeNameModeSet 1
Please REBOOT the box to activate your new mode
value = 0 = 0x0
SNC >
```

sysNodeNameModeShow

The `sysNodeNameModeShow` command displays the current Fibre Channel Node Name mode. The default mode is 0. Refer to the `sysNodeNameModeSet` command for further information.

```
SNC > sysNodeNameModeShow
Active system node name mode is 0
Mode 0: Node name is the same on all FC Interfaces
Mode 1: Node name is based on port name, but different from port name
value = 0 = 0x0
SNC >
```

sysVpdShow or sysVpdShowAll

The `sysVpdShow` command displays Vital Product Data (VPD) information. VPD for the SNC includes such items as serial numbers and installed memory sizes, as shown below.

```
SNC > sysVpdShow

 ******** VPD Base Rev. 1 ********

 Name    SNC
 Mfg   ADIC
 OEM    ADIC
 Manufacture Date JUN 13 05:19:59 1974
 UID    00:00:00:60:45:17:00:17
 S/N    600023
 Assy HCO   BKA01001P
 RID Tag
 Firmware ID  Firmware-4
 FirmwareVend  ADIC
 Firmware Version 4.01
 Config File Sys /nvfs
 Code File Sys  /ffs

 A Board Name  ADIC FCR2
 A Board S/N
 A Board HCO  BK001120P

 B Board Name  B Board Proc
 B Board S/N
 B Board HCO  BK002100P

value = 0 = 0x0
SNC >
```

The `sysVpdShowAll` shows a little more information and includes product data for the Fibre Channel GBIC.

```
SNC > sysVpdShowAll
===[ Vital Product Data ]===

 ******** VPD Base ********

 Name   SNC
 Mfg   ADIC
OEM    ADIC
 Manufacture Date JAN 25 20:39:29 2001
 UID    00:00:00:60:45:17:00:0C
```

```
 S/N    600012
 Assy HCO   BKA01001P
RID Tag
 Firmware ID  Firmware-4
 FirmwareVend  ADIC
 Firmware Version 4.01
 Config File Sys /nvfs
 Code File Sys  /ffs

 ******** A BOARD ********

 -------- Processor Board VPD --------
 Name    ADIC FCR2
 S/N    00034689
 HCO    BK001120P
 Flash Megs  8 Meg
 Dram Megs   32 Meg
 Sys Ram   n/a
 NV RAM   512K
 CPU    PPC405GP
 IO Devices
 -------- Ethernet VPD --------
 IO Class   Fixed IO
 IO Type   Ether
 IO Mfg   IBM
 Device Index  01
 IO Class Enum  n/a
 IO Type Enum  n/a
 Label Index  02
 Bus Id   n/a12
 -------- FC 1 VPD --------
 IO Class   Fixed IO
 IO Type   Fibre Channel
 IO Mfg   QLogic
Device Index  02
 IO Class Enum  n/a
 IO Type Enum  n/a
 Label Index  02
 Bus Id   0.7.0
 -------- FC 2 VPD --------
 IO Class   Fixed IO
 IO Type   Fibre Channel
 IO Mfg   QLogic
 Device Index  03
 IO Class Enum  n/a
 IO Type Enum  n/a
 Label Index  02
 Bus Id   0.8.0
 -------- IO Option Card VPD --------
 IO Class   Option IO
 IO Type   GBIC
 IO Mfg    unknown
 S/N    unknown
 HCO    none
 Device Index  04
 IO Class Enum  n/a
 IO Type Enum  n/a
```

```
Slot Index   1
Bus Id   n/a12
Device Data  unknown

-------- IO Option Card VPD --------
IO Class   Option IO
IO Type   GBIC
IO Mfg    unknown
S/N    unknown
HCO    none
Device Index  05
IO Class Enum  n/a
IO Type Enum  n/a
Slot Index   2
Bus Id   n/a12
Device Data  unknown

-------- RS232 VPD --------
IO Class   RS232
IO Type   RS232
IO Mfg    unknown
S/N    n/a
HCO    n/a
Device Index  06
IO Class Enum  n/a
IO Type Enum  n/a
Baud    19200
Flow    Hardware
-------- RS232 VPD --------
IO Class   RS232
IO Type   RS232
IO Mfg    unknown
S/N    n/a
HCO    n/a
Device Index  07
IO Class Enum  n/a
IO Type Enum  n/a
Baud    unknown
Flow    unknown

******** B BOARD ********

-------- Processor Board VPD --------
Name    B Board Proc
S/N    00032601
HCO    BK002100P
Flash Megs  none
Dram Megs   128 Meg
Sys Ram
NV RAM
CPU    80303
IO Devices
-------- SCSI 1 VPD --------
IO Class   Fixed IO
IO Type   SCSI
IO Mfg   LSI Logic
Device Index  08
```

```
 IO Class Enum  n/a
 IO Type Enum  n/a
 Label Index  03
 Bus Id   1.0.0
 -------- SCSI 2 VPD --------
 IO Class   Fixed IO
 IO Type   SCSI
 IO Mfg   LSI Logic
 Device Index  09
 IO Class Enum  n/a
 IO Type Enum  n/a
 Label Index  03
 Bus Id   1.0.1
 -------- SCSI 3 VPD --------
 IO Class   Fixed IO
 IO Type   SCSI
 IO Mfg   LSI Logic
 Device Index  10
 IO Class Enum  n/a
 IO Type Enum  n/a
 Label Index  03
 Bus Id   1.1.0
 -------- SCSI 4 VPD --------
 IO Class   Fixed IO
 IO Type   SCSI
 IO Mfg   LSI Logic
 Device Index  11
 IO Class Enum  n/a
 IO Type Enum  n/a
 Label Index  03
 Bus Id   1.1.1
value = 0 = 0x0
SNC >
```

sz "filename”

The `sz` command initiates a send Zmodem file transfer session. Use this command when you want to save configuration information to a file in case the SNC needs to be replaced. The SNC uses Zmodem protocol to upload its persistent address map database and configuration parameter settings from its nonvolatile flash memory to a file on the service terminal. After issuing this command, you start the file transfer by initiating a receive file operation that uses Zmodem protocol.

The filename *config.cfg* is shown in the example below. You can specify a different name for the file but the name must not exceed 8 characters and it must end in .cfg. Refer also to the `rz` command for information about receiving a configuration file.

```
SNC > sz "config.cfg"
Configuration Download Complete: config.cfg
value = 0 = 0x0
SNC >
```

targets

The SNC maintains a list of target devices that are attached to the I/O channels. The `targets` command will list each device currently attached, providing descriptions of the devices.

```
SNC > targets
Idx Tdev  Vendor Product   Rev | Type Specific
```

```
-------------------------------------------|--------------
0 0xc194a400 ADIC Local 0252 | Cmd/Cntrl Status 0h
2 0xc1ffc390 ADIC 5324 | Tape: Blk Size 32768 , flags 7h
3 0xc1ffc290 ADIC 5324 | Changer: flags 7h
value = 4 = 0x4
SNC >
```

CAUTION **Devices can be mirrored in the list as a result of multiple mappings.**

Parameter	Meaning
Idx	Device Index in the target list.
Tdev	An internal pointer, used for some diagnostic operations.
Vendor	The content of the Vendor ID field from the SCSI Inquiry Data.
Product	The content of the Product ID field from the SCSI Inquiry Data.
Rev	The content of the Revision ID field from the SCSI Inquiry Data.
Type Specific	For each device type, information pertinent to the device.

tcpstatShow

The `tcpstatShow` command displays TCP statistics for the Ethernet network. Interpreting these statistics requires detailed knowledge of Internet networking protocols. This information can be useful to the LAN administrator.

```
SNC > tcpstatShow
TCP:
301 packets sent
278 data packets (18371 bytes)
0 data packet (0 byte) retransmitted
23 ack-only packets (22 delayed)
0 URG only packet
0 window probe packet
0 window update packet
0 control packet
516 packets received
    272 acks (for 18372 bytes)
1 duplicate ack
0 ack for unsent data
276 packets (322 bytes) received in-sequence
0 completely duplicate packet (0 byte)
0 packet with some dup. data (0 byte duped)
0 out-of-order packet (0 byte)
0 packet (0 byte) of data after window
0 window probe
0 window update packet
0 packet received after close
0 discarded for bad checksum
0 discarded for bad header offset field
0 discarded because packet too short
0 connection request
1 connection accept
```

```
1 connection established (including accepts)
1 connection closed (including 0 drop)
0 embryonic connection dropped
272 segments updated rtt (of 272 attempts)
0 retransmit timeout
0 connection dropped by rexmit timeout
0 persist timeout
1 keepalive timeout
1 keepalive probe sent
0 connection dropped by keepalive
value = 36 = 0x24 = '$
SNC >
```

tPathShow

The `tpathShow` command displays the state of targets that are mapped for automatic failover. If there are no targets mapped for failover, no targets are displayed.

```
SNC > tpathShow
value = 0 = 0x0
SNC >
```

If there are targets mapped for failover, `tpathShow` displays each target and all of the alternate paths that can be used for each target.

```
SNC > tpathShow
FC deviceId=1 SN=A276CC34
FC1 WWPN=20100060.451702ca loopId=130 <next path>
FC2 WWPN=20200060.451702ca loopId=131
FC deviceId=2 SN= A276CC32
FC1 WWPN=20100060.451702ca loopId=130 <next path>
FC2 WWPN=20200060.451702ca loopId=131
value = 0 = 0x0
SNC >
```

trapDestAdd "ipAddress"

The `trapDestAdd` command allows you to add an ethernet address as a trap recipient to the SNMP trap destination table that is maintained within the SNC. The broadcast address for the Ethernet port is also automatically included in the table. When the ADIC Management Console is running, it inserts its address into the table automatically. The maximum number of entries that can be accomodated in the trap destination table is 128.

```
SNC > trapDestAdd 192.168.1.75
value = 0 = 0x0
SNC >
```

trapDestRemove "ipAddress"

The `trapDestRemove` command allows you to remove an ethernet address as a trap recipient from the SNMP trap destination table that is maintained within the SNC. When the ADIC Management Console is running, it inserts its address into the table automatically. The maximum number of entries that can be accomodated in the trap destination table is 128.

The broadcast address for the Ethernet port is also automatically included in the table

```
SNC > trapDestRemove "10.0.0.2"
value = 0 = 0x0
SNC >
```

trapDestShow

The `trapDestShow` command allows you to view the SNMP trap destination table maintained within the SNC. The broadcast address for the Ethernet port is also automatically included in the table. When the ADIC Management Console is running, it inserts its address into the table automatically. The maximum number of entries that can be accomodated in the trap destination table is 128.

```
SNC > trapDestShow
Trap Destination IP Address
---------------------------
192.168.30.255
206.0.64.17
206.0.64.25
206.0.64.35
206.0.64.255
value = 1 = 0x1
SNC >
```

tzSet "timezone"

The `tzSet` command sets the timezone offset from Greenwich Mean Time.

Timezone	GMT offset	Associated Areas
UTC	0	Greenwich, England
GMT	0	Greenwich Meridian Time
EST	GMT -5	Eastern Time (U.S. and Canada), Indiana (East)
CST	GMT -6	Central Standard Time (U.S. and Canada
MST	GMT -7	Mountain Standard Time
PST	GMT -8	Pacific Standard Time (Western U.S. and Canada)

```
SNC > tzSet "PST"
TZ Set TIMEZONE
value = 0 = 0x0
SNC >
```

udpstatShow

The `udpstatShow` command displays UDP statistics for the Ethernet network. Interpreting these statistics requires detailed knowledge of Internet networking protocols. This information can be useful to the LAN administrator.

```
SNC > udpstatShow
UDP:
8514 total packets
8445 input packets
69 output packets
0 incomplete header
0 bad data length field
0 bad checksum
8383 broadcasts received with no ports
0 full socket
value = 15 = 0xf
SNCC >
```

uptime

The `uptime` command displays the elapsed time since the last boot of the SNC.

```
SNC > uptime
Elapsed time since reset 4d:23h:12m:46s:10t
value = 10 = 0xa
SNC >
```

The example indicates that 4 days, 23 hours, 12 minutes, 46 seconds and 10 clock ticks have elapsed since the SNC was last booted. There are 60 ticks per second.

user

The `userAdd`,`userDelete`, and `userList` commands provide control of the user list. The persistent address map file can be sent to the SNC or retrieved from it using FTP. If you need to use FTP, use the user commands to create a login and password so you can access the SNC from the Ethernet network.

userAdd "username","password"

The `userAdd` command adds a user and password to the password file. The parameter username must be from 3 to 80 characters. The parameter password must be from 8 to 40 characters.

```
SNC > userAdd "nancy","password"
value = 0 = 0x0
SNC >
```

userDelete "username","password"

The `userDelete` command deletes a user from the password file. It is not possible to remove a user without knowing the user's password. If the user's password is forgotten or unknown, you have to delete the password file, reboot the SNC, and then add all user names and passwords again.

```
SNC > userDelete "nancy","password"
value = 0 = 0x0
SNC >
```

userList

The `userList` command displays the contents of the password file (passwords are encrypted).

```
SNC > userList
Name : Password
nancy : SyecycRz
fred : b9dczebQbd
martha : RQQdRedb9d
user : cScQRSQzzz
value = 0 = 0x0SNC >
```

userHelp

The `userHelp` command displays a list of the user commands.

```
SNC > userHelp

userAdd "name","password" - Add user to user list
userDelete "name","password" - Delete user from user list
userList       - Display user list

See User's Guide for more information
```

```
value = 0 = 0x0
SNC>
```

version

The SNC is an intelligent device and has software that controls all functions. The revision of that operating software can be displayed with the `version` command. The first line displayed is the SNC firmware version. The lines that follow pertain to the operating system software version.

```
SNC > version

ADIC Scalar Storage Network Controller Firmware-4
Version 0440.03 Built Mar 4  2003, 14:57:27 on 78-G1403 by jsmithy
VxWorks (for Buckhorn - IBM PowerPC 405GP Rev. E) version 5.4.2.
Kernel: WIND version 2.5.
value = 26 = 0x1a
SNC >
```

vipGetUMFirmwareVersion [UM#]

UM#	Meaning
1	utility module 1
2	utility module 2

The `vipGetUMFirmwareVersion` command is used to check the firmware versions on the utility module in an SNC 6000.

```
SNC > vipGetUMFWVersion 1
FW version: 1.02.04 FF
value = 0 = 0x0
SNC >
```

vipSendPIPFirmware [IOB#]

IOB#	Meaning
1	I/O blade1
2	I/O blade 2

The `vipSendPIPFirmware` command is used to update power and identification processor (PIP) firmware on a particular SNC 6000 I/O blade. Progress for this command is not displayed on the console if the I/O blade to which the command is directed is the same as the blade from which the command is issued. You would be able to see progress for the command issued in the example below, because a PIP update was requested for the “other” I/O blade. If a PIP update had been requested for itself, the I/O blade would have been set to PIP programming mode, which is a shutdown state. The I/O blade prints its startup messages to the screen after the command executes.

```
SNC> vipSendPIPFirmware 2
```

vipSendPIPFirmwareAll

The `vipSendPIPFirmwareAll` command is used to upgrade PIP firmware for both SNC 6000 I/O blades.

Progress for this command is not displayed on the console. After the PIP firmware is updated, the I/O blade resets. Console output is the POST message.

```
SNC> vipSendPIPFirmwareAll
```

vipSendUMFirmware [UM#],[“path to UM firmware”]

The `vipSendUMFirmware` command is used in updating SNC 6000 utility module firmware from the SNC 6000 I/O blade. This command is used after firmware has been FTPed to the I/O blade.

Parameter	Meaning	Value
UM#	utility module number	1, 2
path to UM firmware	unless a path is specifie, the default path listed in the “Value” column is used	/ffs/UtilMod.H86

During the command execution, the packet count and current transferred size are display to indicate progress. After the utility module receives the firmware, it will restart and prompt for confirmation of the update. In the example, the firmware located at ” /ffs/UtilMod.H86” is loaded onto utility module “2”.

```
SNC> vipSendUMFirmware 2

Updating Utility Module firmware from IO Blade...
packet 1, size= 1024, total= 1024
Prepare flash for transfer.
Erasing Sector  9  ...
Erasing Sector  10 ...
packet 361, size= 368, total= 3690080
Utility module will restart to continue firmware load
value = 0 = 0x0
SNC >
**********************************************

Would you like to use the newly downloaded firmware ?

**********************************************

(y OR Y FOR YES --- ANY OTHER KEY TO ABORT).
y

Erasing FFW Sectors...
Copying firmware from VIP FW load region...
Successful.  VIP firmware has been copied as 'current'.


Flash has been copied with VIP download image.
Resetting the Utility Module to begin running this firmware..


STARTING UTILITY MODULE FUNCTIONAL FIRMWARE VERSION  1.02.0550 FF

============================
 Firmware Build Information:
     Date: Sep 17 2003
     Time: 17:25:37
============================
```

```
...
```

vipSendUMFwloader [UM#] [“path”]

The `vipSendUMFwloader` command is used in updating SNC 6000 utility module bootloader firmware from the SNC 6000 I/O blade. This command is used after firmware has been FTPed to the I/O blade.

Parameter	Meaning	Value
UM#	utility module number	1, 2
path to UM bootloader firmware	unless a path is specified the default path listed in the “Value” column is used	/ffs/UMfwl.H86

While the command is executing, the packet count and current transferred size are display to indicate progress. After the utility module receives the firmware, it will restart and prompt for confirmation of the update.

In the example below, the file at “/nfs/UMfwl.H86” is being sent to utility module 2, and the update will be performed immediately because the “goadic” password has been coded into the command.

```
SNC > vipSendUMFwloader 2, "/nfs/UMfwl.H86", "goadic"
UM firmware loader update password accepted.
Updating Utility Module firmware loader from IO Blade...
packet 1, size= 1024, total= 1024
Prepare flash for transfer.
Erasing Sector 9 ...
Erasing Sector 10 ...
packet 259, size= 130, total= 2643222
Firmware loader update password confirmed.
Utility module will restart after firmware loader update ...
value = 0 = 0x0
IOB234 >
STARTING UTILITY MODULE FUNCTIONAL FIRMWARE VERSION 1.02.0550 FF
============================
Firmware Build Information:
Date: Sep 17 2003
Time: 17:25:37
============================
Command Output
=============
IOB234 > vipSendUMFwloader 1
Updating Utility Module firmware loader from IO Blade...
packet 1, size= 1024, total= 1024
Prepare flash for transfer.
Erasing Sector 9 ...
Erasing Sector 10 ...
packet 259, size= 130, total= 2643222
Firmware loader update requires confirmation.
Please invoke the UM console and issue umFwloader command.
value = 0 = 0x0
IOB234 >
(ESCAPE sequence issued to invoke UM console)
Utility Module FW 1.02.04 FF Built Sep 15 2003 at 14:40:30 EST
please type 'h' for help
UtilityModule1> umFwloader
Would you like to perform firmware loader update ?
```

```
( [Y/y] for yes, any other key to abort )
y
Enter password : ******
Invalid password.
Enter password : ******
Password accepted
Utility module will restart after firmware loader update ...
STARTING UTILITY MODULE FUNCTIONAL FIRMWARE VERSION 1.02.04 FF
============================
Firmware Build Information:
Date: Sep 15 2003
Time: 14:40:16
============================
```

vpmFeatureEnable "licensekeystring"

Note When you are using Firmware 4 on a Fibre Channel blade, this command is unavailable.

The `vpmFeatureEnable` command enables the optional VPM feature. You enable the feature by entering the unique license key.

```
SNC > vpmFeatureEnable "BVRXC-G79DN"
value = 0 = 0x0
SNC >
```

If the license key was factory-installed, you can enter the word “enable” rather than the actual license key.

```
SNC > vpmFeatureEnable "enable"
value = 0 = 0x0
VPM License is Valid
SNC >
```

If `value = 1 = 0x1` message is displayed, it means the license is already installed and VPM is already enabled.

If the `value = -1 = 0xffffffff message` is displayed, it means the license is not already installed and you do need to enter the license key.

Refer also to the `licenseShow` command.

vpmFeatureEnabled

Note When you are using Firmware 4 on a Fibre Channel blade, this command is unavailable.

The `vpmFeatureEnabled` command allows you to check the status of the VPM feature. A returned value of "1" means that VPM is already enabled. A returned value of "0" means that VPM is disabled. In the following example, VPM is already enabled.

```
SNC > vpmFeatureEnabled
_vpmFeatureEnabled = 0xc0199468: value = 1 = 0x1
SNC >
```

vpsAccessApply

The `vpsAccessApply` command causes the settings that have been changed and stored in memory to take effect immediately and also saves them to the VPS or eVPS database.

```
SNC  > vpsAccessApply
value = 0 = 0x0
SNC >
```

vpsAccessClear [disable code]

The `vpsAccessClear` command disables all VPS or eVPS host access to all LUNs except to LUN 0 (the command and control interface). The disable code is stored as the "MagicNumber" in the output of the `vpsFileShow` command.

The following command example shows how to disable all access using the disable code `oxfacade03`.

```
SNC >vpsAccessClear 0xfacade03
value = 0 = 0x0
SNC >
```

vpsAccessSet [hostIndex],[Starting lun],[Ending lun],[Access]

The `vpsAccessSet` command sets the access for the specified range of LUNs for the specified VPS or eVPS host connection index.

Access	Meaning
0	Disables access to the LUNs
1	Enables access to the LUNs

When you issue this command, the settings are stored in memory but are not applied until you issue the `vpsAccessApply` command. The following example shows how to enable the host at connection index 1 to access LUNs 2 through 32. Existing hostIndex values can be determined by looking at the "ID" column in the output of vpsShow [hostIndex].

```
SNC > vpsAccessSet 1,2,32,1
value = 0 = 0x0
SNC >
```

vpsActiveSet

The `vpsActiveSet` command places VPS or eVPS in the active state. The means that all of the current access settings are put into effect. You would typically only use this command after making VPS or eVPS inactive. Refer to the `vpsInactiveSet` command.

```
SNC > vpsActiveSet
value = 0 = 0x0
SNC >
```

If VPS or eVPS is already active, the following is displayed.

```
SNC > vpsActiveSet
VPS: Already Active
value = 21 = 0x15
SNC >
```

vpsConnectionSet [hostIndex],"host connection string"

The `vpsConnectionSet` command sets the host connection information for the VPS or eVPS host at the specified connection index. The connection can be a device name, port address, etc. The following example shows setting the host connection information. Existing "hostIndex" values can be determined by looking at the “Id” column in the output of the `vpsShow -1` command.

```
SNC > vpsConnectionSet 1,"ScsiPort2 [0:0:0] (QLA2100)"
value = 0 = 0x0
SNC >
```

vpsDefaultInbandAccessGet 1

The `vpsDefaultInbandAccessGet` command gets the default access level to in-band API commands for all hosts. It takes a verbose argument of `1`. The output of this command lists the current read and write access levels for the system itself and for other hosts.

To view the in-band access level for a particular host, use vpsHostInbandAccessGet [hostIndex],1.

If maintenance in/out commands are not working, this is the first thing to check. To change the default in-band access setting for all hosts, refer to vpsDefaultInbandAccessSet [setting].

```
SNC > vpsDefaultInbandAccessGet 1
Read Access:
Self:  1, 3rd Party:  1
Write Access:
Self:  0, 3rd Party:  0
value = 3 = 0x3
```

vpsDefaultInbandAccessSet [setting]

The `vpsDefaultInbandAccessSet` command sets the default access level for in-band API commands for all hosts. After you have made the setting, check the results with sfmFileShow.

Value	Meaning
1	Self-read
2	3rd-Party read
3	Self-read + 3rd-Party read
4	Self-write
5	Self-read + Self-write
6	3rd-Party read + Self-write
7	Self-read + 3rd-Party read + Self-write
8	3rd Party write
9	Self-read + 3rd-Party write
10	3rd-Party read + 3rd-Party write
11	3rd-Party read + 3rd-Party write + Self-read
12	Self-write + 3rd-Party write
13	Self-read + Self-write + 3rd-Party write

Value	Meaning
14	3rd-Party read + 3rd-Party write + Self-write
15	Self-read + 3rd-Party read + Self-write + 3rd-Party write

```
SNC > vpsDefaultInbandAccessGet 1
Read Access:
Self:  1, 3rd Party:  1
Write Access:
Self:  0, 3rd Party:  0
value = 3 = 0x3
SNC > vpsDefaultInbandAccessSet 15
value = 0 = 0x0
SNC > vpsDefaultInbandAccessGet 1
Read Access:
Self:  1, 3rd Party:  1
Write Access:
Self:  1, 3rd Party:  1
value = 15 = 0xf
```

To set the in-band access level for a particular host, use vpsHostInbandAccessSet 1,[setting].

vpsFeatureDisable

The `vpsFeatureDisable` command disables the eVPS feature. It erases the appropriate configuration file, and reboots the SNC. No provision is made to restore the existing configuration. Users should save the SNC configuration before disabling the feature.

For more information, refer to Saving a Configuration File on page 27.

```
SNC > vpsFeatureDisable
All VPS and eVPS configuration information will be lost,
the features disabled, and the system will be atuomatically rebooted!
Do you want to disable VPS and eVPS? (y or n) y
```

vpsFeatureEnable "license key string"

The `vpsFeatureEnable` command enables the optional VPS or eVPS feature. You enable these features by entering the unique license key.

```
SNC > vpsFeatureEnable "BVRXC-G79DN"
value = 0 = 0x0
SNC >
```

If the license key was factory-installed, you can enter the word “enable” rather than the actual license key.

```
SNC > vpsFeatureEnable "enable"
value = 0 = 0x0
eVPS License is Valid
SNC >
```

If `value = 1 = 0x1` message is displayed, it means the license is already installed and VPS or eVPS is already enabled.

If the `value = -1 = 0xffffffff message` is displayed, it means the license is not already installed and you do need to enter the license key.

Refer also to the `licenseShow` command.

vpsFileFlush

The `vpsFileFlush` command saves changes made to the SFM/VPS/eVPS settings into the SFM/VPS/eVPS database.

vpsFileShow

The `vpsFileShow` command shows the VPS or eVPS data stored in the file.

```
SNC > vpsFileShow
VPS File: '/nvfs/config/iac.pif'
  MagicNumber = 0xfacade03, State = 2, Hosts = 3, Writes = 14.
VPS License Key = "MDDVHH-MX9XXXx"
  State = 0, Type = 1, Flags = 0xffc00001, Offline
  WWN:       00000060:45abcdef
  Name:      'ASAHI'
  Host Type: 'Windows 2000 SP 1'
  Device Id: 'FC 1'
  LUN Access:
  0: 01 01 01 01 00 00 00 00 00 00 00 00 00 00 00 00
 16: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 32: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 48: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 64: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
LUN MAP:
   0: 0000 0001 0002 0004 ffff ffff ffff ffff ffff ffff ffff ffff ffff
ffff ffff ffff
  16: ffff ffff ffff ffff ffff ffff ffff ffff ffff ffff ffff ffff ffff
ffff ffff ffff
  32: ffff ffff ffff ffff ffff ffff ffff ffff ffff ffff ffff ffff ffff
ffff ffff ffff
  48: ffff ffff ffff ffff ffff ffff ffff ffff ffff ffff ffff ffff ffff
ffff ffff ffff
  64: ffff ffff ffff ffff ffff ffff ffff ffff ffff ffff ffff ffff ffff
```

vpsHostInbandAccessGet [hostIndex],1

The `vpsHostInbandAccessGet` command displays the current in-band access settings for a particular host. To view the default setting for all hosts, use the sfmFileShow command.

Existing hostIndex values can be determined by looking at the “Id” column in the output of sfmShow [hostIndex].

For more information about the verbosity argument, refer to sfmFileShow.

```
SNC > vpsHostInbandAccessGet 1,1
Read Access:
Self:  1, 3rd Party:  1
Write Access:
Self:  0, 3rd Party:  0
value = 3 = 0x3
```

vpsHostInbandAccessSet 1,[setting]

The `vpsHostInbandAccessSet` command sets the default access level for in-band API commands for a particular host. After you have made the setting, check the results with vpsHostInbandAccessGet [hostIndex],1.

The default access level is 5, self-read and self-write access only.

Value	Meaning
1	Self-read
2	3rd-Party read
3	Self-read + 3rd-Party read
4	Self-write
5	Self-read + Self-write
6	3rd-Party read + Self-write
7	Self-read + 3rd-Party read + Self-write
8	3rd Party write
9	Self-read + 3rd-Party write
10	3rd-Party read + 3rd-Party write
11	3rd-Party read + 3rd-Party write + Self-read
12	Self-write + 3rd-Party write
13	Self-read + Self-write + 3rd-Party write
14	3rd-Party read + 3rd-Party write + Self-write
15	Self-read + 3rd-Party read + Self-write + 3rd-Party write

```
SNC > vpsHostInbandAccessSet 1,7
value = 0 = 0x0
SNC > vpsHostInbandAccessGet 1,1
Read Access:
Self:  1, 3rd Party:  1
Write Access:
Self:  1, 3rd Party:  0
value = 7 = 0x7
```

To view the in-band access level for a particular host, use vpsHostInbandAccessGet [hostIndex],1.

vpsHostShow [hostIndex]

The `vpsHostShow` command displays all known VPS or eVPS information for the specified host connection index. The LUN access map is displayed as 16 rows of 16 bytes, one byte for each LUN.

Parameter	Value	Meaning
`hostIndex`		is the `Id` obtained from the `vpsShow` command.
[`LUN`]	00	in the LUN Access map indicates the host has no access to the LUN.
	01	in the LUN Access map indicates the host has access to the LUN.

The following command example shows VPS or eVPS information for host ID 1.

```
SNC > vpsHostShow 1
Host(1):
State = 0, Type = 1, Flags = 0x00000000, Online
WWN:  200000e0:8b0057d8
Name:  'LABATTS'
Host Type: 'NT 4.0 SP5'
Device Id: 'ScsiPort6 [0:0:0] (QLA2100)
LUN Access:
0: 01 01 01 00 00 00 00 00 00 00 00 00 01 01 00
16: 00 00 00 00 00 00 00 00 00 01 01 00 00 00 00 00
32: 00 00 00 00 00 01 01 00 00 00 00 00 00 00 00 00
48: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
64: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
80: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
96: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
112: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
128: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
144: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
160: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
176: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
192: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
208: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
224: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
240: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
value = 0 = 0x0
SNC >
```

vpsInactiveSet

The `vpsInactiveSet` command de-activates VPS or eVPS making all LUNs available to all host connections. This command typically would be used when troubleshooting a SAN configuration. It removes eVPS access control without deleting VPS or eVPS access settings. Use the `vpsActiveSet` command to re-activate VPS or eVPS.

```
SNC > vpsInactiveSet
value = 0 = 0x0
SNC >
```

If VPS or eVPS is already inactive, the following is displayed.

```
SNC > vpsInactiveSet
VPS: Already Inactive
value = 23 = 0x17
SNC >
```

vpsInitAdd [hiWWN],[loWWN]

The `vpsInitAdd` command adds a host with the specified WWN to the SFM/VPS/eVPS database.

```
SNC > vpsInitAdd 0x20000e0,0x8b046807
Host 210000e0.8b046807 is added,index=2
value = 2 =0x2
SNC >
```

vpsInitDelete [host ID]

The `vpsInitDelete` command removes a host with the specified host ID from the SFM/VPS/eVPS database. Existing `hostID` values can be determined by looking at the "Id" column in the output of the `vpsShow -1` command.

```
SNC > vpsInitDelete 6
Host 01ffff00.00000000 is added,index=6
value = 0 = 0x0
SNC >
```

vpsInitOffline [hostIndex]

The `vpsInitOffline` command removes a host with the specified `hostIndex` "N" from the SFM/VPS/eVPS database. Existing `hostIndex` values can be determined by looking at the "ID" column in the output of the `vps` command or the `sfmShow -1` command.

vpsMapAdd [hostIndex],[lun],[devID]

The `vpsMapAdd` command assigns a target device (`devId`) to a host (`hostIndex`) with the specified Logical Unit Number of (`lun`). If the assignment is successful, the value `0` is output. If the assignment fails, the value `-1` is output. In the example below, the assignment was successful.

Device ID can be determined by finding the device in the list generated by mapShowDevs.

Existing `hostIndex` values can be determined by looking at the "ID" column in the output of vpsShow [hostIndex].

To verify the effects of the `vpsMapAdd` command, issue vpsMapShow [hostIndex].

```
SNC > vpsMapAdd 1,6,3
value = 0 = 0x0
SNC > vpsMapShow
Host Lun Internal Chan Id Lun Vendor Product Rev SN
---- --- -------- ---- -- --- ------ ------- --------
1 0 0 0 0 0 ADIC Scalar SNC 4134 600613
1 1 1 4 5 0 ADIC Scalar 1000 3.01 123456789
1 2 2 4 6 0 ADIC Scalar 1000 3.00 123444789
1 4 4
1 6 3 4 6 1 ADIC Scalar 1000 3.00 123455589
value = 0 = 0x0
SNC >
```

vpsMapClear [index]

The `vpsMapClear` command clears all of the mapping assignments for the host specified by `[index]`. Existing `index` values can be determined by looking at the "Id" column in the output of the `vpsShow -1` command.

```
SNC > vpsMapClear 4
value = 0 = 0x0
SNC >
```

vpsMapDelete [hostIndex],[lun],[devID]

The `vpsMapDelete` command deletes a previous LUN assignment. If the deletion is successful, the value `0` is output. If the deletion fails, the value `-1` is output. In the example below, the deletion was successful.

To verify the effects of the `vpsMapDelete` command, issue vpsMapShow [hostIndex].

```
SNC > vpsMapDelete 1,3
value = 0 = 0x0
SNC > vpsMapShow
Host Lun Internal Chan Id Lun Vendor Product Rev SN
---- --- -------- ---- -- --- ------ ------- --------
1 0 0 0 0 0 ADIC Scalar SNC 4134 600613
```

```
1 1 1 4 5 0 ADIC Scalar 1000 3.01 123456789
1 2 2 4 6 0 ADIC Scalar 1000 3.00 123444789
1 4 4
value = 0 = 0x0
SNC >
```

vpsMapShow [hostIndex]

The `vpsMapShow` command lists all available eVPS mapping information for a host. If no host is specified then the device maps for all hosts are listed.

```
SNC > vpsMapShow
Host Lun Internal Chan Id Lun Vendor Product Rev SN
---- --- -------- ---- -- --- ------ ------- --------
1 0 0 0 0 0 ADIC Scalar SNC 4134 600613
1 1 1 4 5 0 ADIC Scalar 1000 3.01 123456789
1 2 2 4 6 0 ADIC Scalar 1000 3.00 123444789
1 4 4
value = 0 = 0x0
SNC >
```

vpsNameSet [hostIndex],"name string"

The `vpsNameSet` command sets the host name field to the specified “name string” for the specified host connection index. The following command example shows setting the host name for host ID 1 to “LANDERS”. Existing `hostIndex` and name values can be determined by looking at the "Id" and "Host Name" columns in the output of the `vpsShow -1` command. The `vpsNameSet` command setting is not persistent across power cycles.To make the setting persistent, issue the `vpsFileFlush` command after the `vpsNameSet` command.

```
SNC > vpsNameSet 1,"LANDERS"
value = 0 = 0x0
SNC >
```

vpsShow [hostIndex]

The `vpsShow` command displays information about hosts that have been registered with VPS or eVPS based on the value of hostIndex. For an explanation of “host types,” refer to Host Type Settings for Fibre Channel Ports on page 8. This command provides the same information as the `sfmShow` command.

Hostindex	Meaning
-1	Displays brief list of all known host connections
0	Full display of all known host connections, and if online displays a list of all LUNs available to that connection
N (1-48)	Display the full information for the host N only

The following command example shows VPS or eVPS information for the hosts that have been registered by VPS or eVPS. Hosts that have the HRS (host registration service) running with periodic re-registration are shown with a status of "Periodic." One of the hosts has more than one Fibre Channel connection to the SNC.

```
SN60023 > vpsShow -1
VPS State: Active
Id World Wide Name St. Typ HexFlags Status Host Name Host Type Host
Connection
```

```
--- ---------------- --- --- -------- -------- ---------- --
001 200000e0.8b0057d8 000 001 00000000 Online LANDERS NT 4.0 SP5 ScsiPort6
[0:0:0](QLA2200)
002 200000e0.8b16014d 000 001 00000000 Periodic SUPERIOR NT 4.0 SP5
ScsiPort7 [0:0:0](QLA2200)
003 200000e0.8b160152 000 001 00000000 Offline SUPERIOR NT 4.0 SP5
ScsiPort7 [0:0:0](QLA2200)
value = 0 = 0x0
SN60023 >
```

vpsSparseAccessSet[hostindex],"LUN string",[access]

The `vpsSparseAccess` command sets the access for the specified LUNs for the specified host connection index. Same as `vpsAccessSet` except LUNs are entered as a string of characters separated by commas. Existing hostindex values can be determined by looking at the "ID "column in the output of the `vpsShow -1` command.

Access	Meaning
0	Disables access to the LUNs
1	Enables access to the LUNs

When you issue this command, the settings are stored in memory but are not applied until you issue the `vpsAccessApply` command. The following command example enables host access to the LUNs 1, 2, 3, 4, 6, 9, 22, 23 and 45 on host connection index 1.

```
SNC >vpsSparseAccessSet 1,"1,2,3,4,6,9,22,23,45,"1
value = 0 = 0x0
SNC >
```

vpsTypeSet [hostIndex],"OS type string"

The `vpsTypeSet` command sets the operating system type for the specified host connection index. Existing hostIndex values can be determined by looking at the "Id" column in the output of the `vps` command. The `OS type string` must begin with a supported operating system type or a valid alias for one of those operating systems. For operating systems and aliases, refer to Table 1 on page 8. Additional information can be appended to the `OS type string`, as desired. The `vpsTypeSet` command setting is not persistent across power cycles.To make the setting persistent, issue the `vpsFileFlush` command after the `vpsTypeSet` command.

In the example, version and service pack information is appended to the host type.

```
SNC > vpsTypeSet 1,"NT Win2K, SP3"
value = 0 = 0x0
SNC >
```

vpsWwnSet [hostIndex],[hiWWN],[loWWN]

The `vpsWwnSet` command identifies a host to the SFM/VPS/eVPS database. It can be used to add a host to the database before the host is brought online. If you use it that way, be sure to read the output of the `vps command` or the `sfmShow -1` command first, so that you pick a `hostIndex` that is not already in use. Use the HBA software on your host to ascertain the host's WWN. The `vpsWwnSet` command setting is not persistent across power cycles.To make the setting persistent, issue the `vpsFileFlush` command after the `vpsWwnSet` command.

In the example, a host with `hostIndex` "6" is being brought online. Its WWN is "0x20000001:0x73002ee6."

```
SNC > vpsWwnSet 6,0x20000001,0x73002ee6
```

```
value = 0 = 0x0
SNC >
```

Use the commands `vpsNameSet` and `vpsTypeSet` (or `sfmNameSet` and `sfmTypeSet`, as appropriate) to further characterize the new host.

The `vpsWwnSet` command can also be used to remove a host from the SFM/VPS/eVPS database. The host must first be taken offline. Use the `sfmShow -1` command or the `vps` command to find the `hostIndex`. Use the `vpsInitOffline` command to take the host offline. Then set both the the `hiWWN` value and the `loWWN` value for offline initiator to `0` (zero). In the example, the host with `hostIndex` 12 is being removed from the SFM/VPS/eVPS database.

```
SNC > vpsWwnSet 12,0,0
value = 0 = 0x0
SNC >
```

wwnGlobalClear

CAUTION **Only trained and authorized service personnel should use this command. Data corruption or loss can result from the incorrect use of this command.**

The `wwnGlobalClear` command removes the override set by `wwnGlobalSet` and restores the WWN to the factory configuration. You are prompted to continue after you have read the warning statements. You are prompted to enter a password if you agree to continue. You are prompted to reboot the SNC after you have entered a valid password.

```
SNC > wwnGlobalClear
This command will restore the WWN for Fibre Channel Ports. This should
only be done when there is no SNC set to this WWN.

You should never operate 2 FC devices that are set to the same WWN. This
may destabilize your SAN.

Do you want to proceed (enter "yes" to continue) : yes

Enter the Password : OverrideWWN
...value = -1071415856 = 0xc0237dd0 = _fcSupCtrls
```

CAUTION **If the WWNs of the SNC were changed using `wwnPortSet`, `wwnGlobalClear` will not work. You must use `wwnPortClear` to remove updates.**

wwnGlobalSet

CAUTION **Only trained and authorized service personnel should use this command. Data corruption or loss can result from the incorrect use of this command.**

The `wwnGlobalSet` command is used to set the WWN for FC ports. It establishes a new base WWN that will be used for FC port WWNs only. There is no modification to the on-board UID or the MAC address. You will be prompted to proceed after you read the warnings.

The first five bytes of the WWN you enter are checked for content and the entire eight bytes are checked for syntax. If the WWN you enter is valid, you will be prompted to enter a password in order to continue.

If the password you enter is valid, you will be prompted to reboot the SNC.

```
SNC > wwnGlobalSet
This command will change the WWN for Fibre Channel Ports. This should only
be done when replacing a failed SNC.

You should never operate 2 FC devices that are set to the same WWN. This
may destabilize your SAN.

Do you want to proceed (enter "yes" to continue) : yes

Enter the new WWN (or q to quit) : 00:00:00:60:45:11:11:11
Enter the Password : OverrideWWN
...value = -1071415856 = 0xc0237dd0 = _fcSupCtrls
```

wwnLockModeSet [setting]

Setting	Meaning
0	Disable WWN locking mode, and allow all hosts to be enetered into the VPS host table in the order in which they connect to the SNC.
1	Enable WWN locking mode, and remove all unknown hosts from the VPS host table

The `wwnLockModeSet` command sets the WWN lock mode state.

```
SNC > wwnLockModeSet 1
WWN Locking Mode: Enabled
value = 1 = 0x1
SNC >
```

wwnLockModeShow

The `wwnLockModeShow` command displays the current setting for WWN lock mode.

```
SNC > wwnLockModeShow
WWN Locking Mode: Disabled
value = 0 = 0x0
SNC >
```

wwnPortClear [port]

CAUTION **Only trained and authorized service personnel should use this command. Data corruption or loss can result from the incorrect use of this command.**

Parameter	Value	Meaning
Port	1	The SNC connection labeled FC1

CAUTION **If the WWNs of the SNC were changed using `wwnPortSet`, `wwnGlobalClear` will not work. You must use `wwnPortClear` to remove updates.**

The `wwnPortClear` command removes the override and restores the WWN to the factory configuration. You are prompted to continue after you have read the warning statements. You are prompted to enter a password if you agree to continue. You are prompted to reboot the SNC after you have entered a valid password.

```
SNC > wwnPortClear 1
This command will restore the WWN for Fibre Channel Port <2>. This should
only be done when there is no SNC set to this WWN.

You should never operate 2 FC devices that are set to the same WWN. This
may destabilize your SAN.

Do you want to proceed (enter "yes" to continue) : yes

Enter the Password : OverrideWWN
value = -1044740816 = 0xc1ba8530
```

wwnPortSet [port]

CAUTION **Only trained and authorized service personnel should use this command. Data corruption or loss can result from the incorrect use of this command.**

Parameter	Value	Meaning
Port	1	The SNC connection labeled FC1

The `wwnPortSet` command sets the Port and Node WWNs for a single FC port. The port number is specified on the command line. You will be prompted to proceed after you read the warnings.

The entry is checked for syntax. If the WWN you enter is valid, you are prompted to enter a password in order to continue. Enter a `q` and return to quit.

If the password you enter is valid, you will be prompted to reboot the SNC.

```
SNC > wwnPortSet 2

This command will change the WWN for Fibre Channel Port <2>. You will be
asked to provide both the Node WWN and Port WWN for this port.

You should never operate 2 FC devices that are set to the same WWN. This
may destabilize your SAN.

Do you want to proceed (enter "yes" to continue) : yes

Enter the new Node WWN (or q to quit) : 10:20:30:40:50:60:70:80

Enter the new Port WWN (or q to quit) : 11:21:31:41:51:61:71:81

Enter the Password : OverrideWWN
```

5

Diagnostic Command Reference

This section specifies the procedures used when diagnostics are required.

Boot Modes

The SNC has two modes of operation: `normal` mode and `diagmode`. Two commands are available to reboot the SNC to the desired mode. The SNC remains in the existing mode until you direct it to reboot in the other mode.

When the SNC is booted in `diagmode`, the command prompt displayed on the service terminal is `diagmode >`. While in `diagmode`, a limited command set is available for testing the SNC interfaces. In addition, the device drivers for the Ethernet, Fibre Channel, and SCSI interfaces are disabled so loop back tests can be performed on them.

Entering Diagnostic Mode

Use the `diagBoot` command when the special features of the diagnostic module are required.

1 Stop all I/O.

CAUTION **Before entering `diagmode`, you must disconnect all SCSI and FC cables from the SNC. If you do not, the data on the attached disk or tape devices will become corrupted.**

2 Shut down the SNC.

3 Remove the Ethernet cable, if installed.

4 Connect a service terminal to the service port. For the location of this port, see Figure 1 on page 11, or the User's Guide for your SNC.

Note Instructions for connecting a service terminal are included in the User's Guide for your SNC.

5 Turn on the SNC and wait for it to finish booting.

6 If the command prompt displayed on the service terminal is `diagmode` > , proceed with the appropriate diagnostic tests.

If the command prompt displayed on the service terminal is not `diagmode >`, issue the `diagBoot` command.

7 Wait for the SNC to reboot.

8 At the `diagmode >` prompt, proceed with the appropriate diagnostic tests.

Diagnostic Commands

This section is a reference for the commands that are available when the SNC is booted in diagmode.

The command set is limited while in `diagmode`. You will need to use the `showBox` command and three commands (with the suffix `Test`) when testing the Ethernet, Fibre Channel, and SCSI interfaces.

An Ethernet loop back plug, Fibre Channel loop back plug, and SCSI cable are required for the corresponding loop back tests.

CAUTION **You must disconnect the FC and SCSI cables from the SNC. If you do not, the data on the attached disk or tape devices will become corrupted.**

diagBoot

This command is used only to transition an SNC from normal operations to the special diagnostic mode.

CAUTION **All SCSI and FC cables must be disconnected before entering the `diagBoot` command.**

- The `diagBoot` command first makes sure that the `/nvfs:mt` directory exists.
- It copies the existing bootline to a file in the `/nvfs:mt` directory on the SNC.
- It installs a new bootline directing the SNC to boot using a special diagnostic startup *script /ffs:mt/diagnstk.rc*.
- It renames the persistent map file *config/device.map as config/device.bak* (a new file will be generated after rebooting).
- It issues a `reboot` command to put the changes into effect.

Issue the `diagBoot` command at the command prompt.

```
SNC> diagBoot
```

elTest

`elTest` is the Ethernet loop back test. The SNC must be in diagnostic mode to use this command and a loop back plug must be installed on the Ethernet port.

```
diagmode > elTest
==== Testing Ethernet ====
Init complete.
Ethernet OK
value = 0 = 0x0
```

The test issues a series of loop back tests. Test data is transferred and verified. A good test ends with `Ethernet OK`.

If errors are detected, the test displays the number of bad test iterations as shown below. If your test was not succesful, return to the MAP that sent you here.

```
diagmode > elTest
==== Testing Ethernet ====
Init complete.
Ethernet timeout error
Ethernet timeout error
Ethernet timeout error
Ethernet timeout error
Ethernet timeout error
Ethernet timeout error
Ethernet test reported 6 errors out of 12 iterations
value = 6 = 0x6
```

fcSlotTest [x]

The SNC must be in diagnostic mode to use this command and a loop back plug must be connected to the GBIC.

The `fcSlotTest` command performs a confidence test on a Fibre Channel slot. Substitute for `x` the Fibre Channel slot number you want to test. This command can be used to test the slot or the cable.

The following example code shows the display for a test Fibre Channel slot 1.

```
diagmode > fcSlotTest 1
FC 1 [##########] Iterations 72 Errors 0 - PASSED
Fibre Channel Port 1 returns PASSED
value = 0 = 0x0
diagmode > fcSlotTest 2
FC 1 [##########] Iterations 72 Errors 0 - PASSED
Fibre Channel Port 2 returns PASSED
value = 0 = 0x0
```

The following outputs are examples Fibre Channel port tests that were not successful. If your test was not successful, return to the MAP that sent you here.

Unsuccessful Fibre Test 1:

```
diagmode > fcSlotTest 1
FC 1 [##########] Iterations 7799 Errors 7799 - FAILED
Fibre Channel Port 1 returns FAILED
value = -1 = 0xffffffff = pNullDmaDesc + 0xfe4ea9f7
```

Note If the Fibre Channel “link” LED does not come on, the test will not pass.

Unsuccessful Fibre Test 2 (cable not plugged in):

```
diagmode > fcSlotTest 1
FC 1 [##########] Iterations 37 Errors 37 - FAILED
Fibre Channel Port 1 returns FAILED
value = -1 = 0xffffffff = pNullDmaDesc + 0xfe4ea9f7
```

normalBoot

The `normalBoot` command is used only to transition the SNC from the special diagnostic mode back to the normal operational mode.

Because certain commands and tests are only available in diagnostic mode, you must enter diagnostic mode to use them. Switching to diagnostic mode saves all configuration parameters so that they can be restored when returning to normal operation. The `normalBoot` command performs the following functions:

- Restores the bootline that was copied by `diagBoot`
- Erases the new persistent device map
- Renames the original map file *config/device.map* – restoring it for use when the SNC reboots

The `normalBoot` command is issued at the `diagmode` prompt:

```
diagmode> normalBoot
```

scsiChannelTest (x,y)


Note

When you are using Firmware 4 on a Fibre Channel blade, this command is unavailable.

The SNC must be in diagnostic mode to use this command and a SCSI cable must be connected between two SCSI channels.

The `scsiChannelTest` command performs a confidence test on a pair of SCSI channels. Substitute for `x` and `y` the SCSI channel numbers you want to test. Parentheses are optional. This command can be used to test the SCSI interface or the SCSI cable.

The example below shows the display for a test on SCSI channels 1 and 2.

```
diagmode > scsiChannelTest (3,4)
SCSI-3 -> SCSI-4 [##########] 10 iterations PASSED
SCSI-4 -> SCSI-3 [##########] 10 iterations PASSED
value = 0 = 0x0
diagmode > scsiChannelTest (1,2)
SCSI-1 -> SCSI-2 [##########] 10 iterations PASSED
SCSI-2 -> SCSI-1 [##########] 10 iterations PASSED
value = 0 = 0x0
```

The following output is an example of a SCSI port test that was not successful. If your test was not succesful, return to the MAP that sent you here.

Unsuccessful SCSI Test (cable not plugged in):

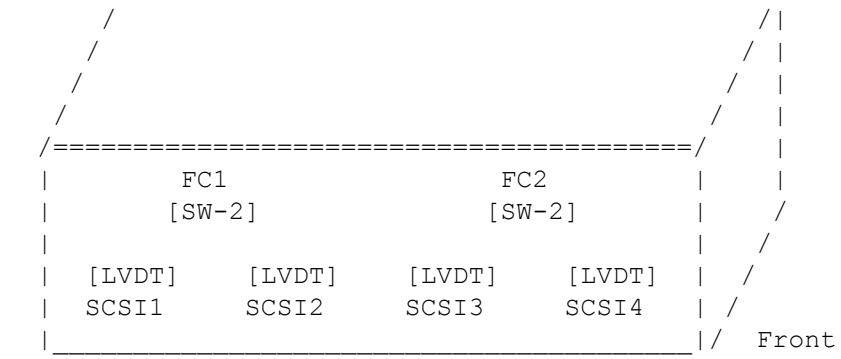
```
diagmode > scsiChannelTest (1,2)
SCSI Initiator Error(s) - STO iUnk
SCSI Initiator Error(s) - STO iUnk
SCSI-1 -> SCSI-2 [SCSI Initiator Error(s) - STO iUnk
 ERROR, i = 1 ] 1 iterations FAILURE
SCSI-2 -> SCSI-1 [SCSI Initiator Error(s) - STO iUnk
 ERROR, i = 1 ] 1 iterations FAILURE
value = -1 = 0xffffffff = pNullDmaDesc + 0xfe4ea9f7
```

showBox

The `showbox` command displays components of the SNC using characters to form a picture of the unit, as viewed from the back of the SNC

The `showBox` command also displays the cabling requirements for each slot. The example below is for an SNC 5101. Your SNC may look different:

```
SNC > showBox
 Back  ____________________________________________
```




```
LVDT = SCSI Low Voltage Differential - Terminated
SW-2 = Short Wave - Two GB

value = 0 = 0x0
SNC >
```

The abbreviations used in the drawing are explained in a legend immediately below the drawing.

Restoring Normal Mode

1. Connect the terminal to the service port, if it is not already connected.
2. If it is not already on, turn on the SNC and wait for it to finish booting.
3. Issue the `normalBoot` command.

   The SNC reboots.
4. Wait for the SNC to reboot.
5. At the command prompt, continue with the MAP that sent you here.

6

Troubleshooting

This section describes the Maintenance Action Plans (MAPs) for the SNC. MAPs exist for all of the SNC component systems. When you see an error message or you notice degraded performance, use the MAPs in this section to correct the situation

- If an event code is reported in the error message, go to Table 10 with that event code and then refer to the recommended action.
- To determine relevant event codes, refer to Checking Event Logs on page 150.
- If the event code or error symptom cannot be determined, go to Start MAP on page 154, which provides instructions for a visual inspection and in-depth troubleshooting.
- If it is clear that a particular component system is at fault in a problem situation, go directly to the MAP for that component by consulting Table 10.

Table 10 Component Errors Referenced to MAPs

Component Subsystem	**Go To**
If event code 42 has been reported	Database Full MAP
If you are unable to access SCSI or Fibre devices	Device Access MAP
If SCSI I/O fails or errors on the SCSI bus are reported	SCSI Channel MAP
If the **SAN Connection** LED is off or Fibre Channel errors are reported	Fibre Channel MAP
If the SNC continually reboots or all LEDs are off	MAP for the SNC
If the temperature **Warning** or **Alarm** LEDs are on	Temperature MAP
If all LEDs are off or the SNC fails to respond to any method of management	Power MAP
If the ADIC Management Console client and server cannot communicate or the Ethernet LED is off	Ethernet MAP

Table 10 Component Errors Referenced to MAPs (Continued)

If the ADIC management console client is communicating with the server, but the service terminal does not respond	Service Port MAP
If VPM devices are not available	VPM MAP
If SFM, VPS, or eVPS devices are not available	SFM/VPS/eVPS MAP

Event Codes and Actions

If you do not know which component to troubleshoot, check the event log for a listing of recent events. Then check the listed event code(s) against Table 12 on page 154.

Checking Event Logs

1 Connect a service terminal to the SNC.

Instructions for doing so are contained in the User's Guide for your SNC.

2 Press the **Enter** key on the service terminal.

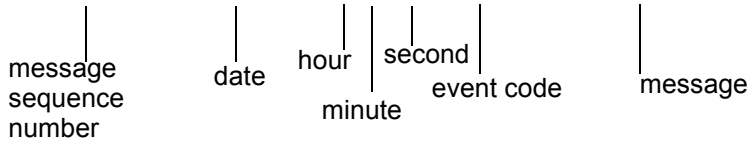
If the prompt is not displayed, go to Service Port MAP on page 174.

3 Issue the `loggerDump` command. For more information about this command, refer to loggerDump [number] on page 86.

Messages that look like the ones in Figure 2 display:

Figure 2 Event log listing from service port

```
SNC > loggerDumpCurrent
*** Dumping All current records (total 20) since last reboot ***
SEQUENCE  TIME                  CODE   DESCRIPTION
0001      MAR 27 2003 09:53:58   31    NOTICE: LOGGING STARTED
0002      MAR 27 2003 09:53:58   14    CS 1: Rev. 4.40.05 Built Jan 30 2003, 1
0:38:15
0003      MAR 27 2003 09:54:04   14    VPS 1: Enabled: State = Inactive, Hosts
 = 4
0004      MAR 27 2003 09:54:04   14    Debug 0: HPF Activated.
0005      MAR 27 2003 09:54:04   14    FCAL 1: Reinitializing controller
0006      MAR 27 2003 09:54:05   14    FCAL 2: Reinitializing controller
0007      MAR 27 2003 09:54:05   14    FCAL 1: LIP Initiated
0008      MAR 27 2003 09:54:06   14    FCAL 2: LIP Initiated
0009      MAR 27 2003 09:54:06   28    USCSI 1: Bus RESET
0010      MAR 27 2003 09:54:06   28    USCSI 2: Bus RESET
0011      MAR 27 2003 09:54:06   28    USCSI 3: Bus RESET
0012      MAR 27 2003 09:54:06   28    USCSI 4: Bus RESET
```



4 Check the listed event codes against the "Event Code" column of Table 10.

   See Figure 2 to interpret the log listing.

5 Read across Table 11 on page 151 to the "Action" column to see the action number associated with the event code you are checking.

6 Check that number in Table 11, and complete the indicated MAP or action.

7 To see additional log messages, follow the procedure Event Log Dump on page 34.

8 If there are no abnormal events, go to Performing Health Check on page 157

Checking Reported Event Codes

Event codes are listed in numerical order in Table 11.

Table 11 Reported Event Codes

Event Code	Description	Action[1]
8	Sense data recorded following a check condition. **Caution:** Normally, the host system will request and process send data and then perform error recovery	0
9	LUN reports a “unit attention” condition on a non-removable media device	0
11	ADIC Management Console reports a temperature change (event message indicates the change to High, Very High, Reduced, to High, or OK	4
13	SNC is shutting down as requested by the ADIC Management Console (a Restart was requested)	0
14	Additional status information used for diagnostics	0
16	A SCSI bus reports an unexpected interrupt	1
17	Fibre Channel interface reports a LIP reset was received from a host	0, 2
18	Fibre Channel interface reports a system error	2
19	Fibre Channel interface reports an error processing a request	2
20	Fibre Channel interface reports an error processing a response	2
21	SNC processor memory fault detected	1, 2, 3
22	Fibre Channel interface detected a LIP	2
23	Fibre Channel interface reports a loop up	0
24	Fibre Channel interface reports a loop down	0
25	SNC PCI bus parity error detected	3, 2, 1
26	SNC PCI interface error detected	3, 2, 1
27	A device has been added to a SCSI bus	0
28	A SCSI bus reports a reset has been detected	0

Table 11 Reported Event Codes (Continued)

Event Code	Description (Continued)	Action[1]
29	SNC has added a device to its configuration table **Caution:** The trap is held off until the SNC has been up for 60 seconds	0
30	SNC has removed a device from its configuration	0, 1, 2
31	SNC logging service has started	0
33[2]	An interface has detected a bus fault (event message indicates the specific interface)	1, 2
34[2]	An interface has detected a device fault (event message indicates the specific interface)	1, 2
35	A SCSI interface reported an unexpected disconnect by a device	1
36	A parity error was detected on a SCSI bus	1
37	Fibre Channel Port Database change detected	0
39	Directory server on Fabric has changed	0
40	Maximum LUN limit has been exceeded	10
41	Fibre Channel transfer failure **Caution:** error recovery may have succeeded	0
42	Maximum device limit has been exceeded (persistent Address Map database is full)	10
43	Fibre Channel interface driver reported debug file dump (event log contains further information)	13
58	Power has returned to Nominal from Warning or Alarm Stage	0
59	Power has entered Warning Range from Nominal Range (Power falling) or Alarm Range (Power improving)	5
60	Power has entered Alarm Range	5
61[3]	Inlet Air, Outlet Air, or I/O Processor temperatures have entered Nominal Range from a Warning or Alarm Range	0
62[3]	Inlet Air Temperature has entered Warning Range from Nominal Range (heating up) or Alarm Range (cooling down)	4
63	Inlet Air Temperature has entered Alarm Range	4
64[3]	Outlet Air Temperature or I/O Processor Temperature has entered Warning Range from Nominal or Alarm Ranges	4
65	Outlet Air Temperature or I/O Processor Temperature has entered Alarm Range	4
66	Fan is operating in Nominal Range after operating in a fault state	0
67	Fan speed has entered Warning Range (Tachometer fans only)	4
68	Fan speed has entered Alarm Range (Tachometer fans) or is stalled (rotor stall fans)	4

Table 11 Reported Event Codes (Continued)

Event Code	Description (Continued)	Action[1]
70[4]	Firmware upload completed	0
71[4]	SNC restart completed	0
72	Maximum number of initiators has been exceeded. The SNCs that use Firmware 4 support 64 initiators per Fibre Channel port.	0
75	Host connectivity lost.	2, 1
76	Host connectivity established.	0
150	The event log is about to overwrite the earliest events	0
	Health Check Event Descriptions	
100	Power supply is out of specification	5
102	Temperature change detected since the last report (event message indicates the change to High, Very High, Reduced to High, or OK)	4, 0
106	Fibre Channel interface failed health check	2
107	SCSI interface failed health check	1
109	Target device failed health check	1
110	Fibre Channel link status changed	0, 2
111	Fibre Channel transfer failures detected since the last report **Caution:** error recovery may have succeeded	0
112	Blower/Fan is running in Warning or Alarm Range	4
113	Power is running in Warning or Alarm Range	5
114	Temperature is running in Warning or Alarm Range	4
115	Network is running at 10 Mb/sec	7
118	Device connections have recovered	0
	Heartbeat Event Descriptions **Caution:** These event codes are not logged in the event log. Notification of these events occurs from the ADIC Management Console. For more information on heartbeats, refer to the *ADIC Management Console User's Guide*.	
200[5]	The server could not verify the connection to the SNC	7,3
201[5]	The client could not communicate with the server	7,9
202[5,6]	The server could not communicate with the client	7,9
203[5]	Heartbeat communication restored	0

Table 11 Reported Event Codes (Continued)

Event Code	Description (Continued)	Action[1]

Notes:
[1] See Table 12 on page 154.
[3] Check the event log to find out which interface (FCAL or SCSI) caused this event. Then use the appropriate action number.
[4] This trap signals a change in state. A string sent with the trap will indicate the nature of the previous state.
[5] Events not logged in SNC event log. Event reported by the ADIC Management Console.
[6] Not reported, but logged in the server log.

Action Reference Table

Take the number from the **Action** column of Table 11 on page 151 and look it up in the **Action Number** column of Table 12.

Table 12 Maintenance Action Reference

Action Number	Action
0	No action necessary
1	Go to SCSI Channel MAP on page 159
2	Go to Fibre Channel MAP on page 165
3	Go to MAP for the SNC on page 168
4	Go to Temperature MAP on page 169
5	Go to Power MAP on page 170
7	Go to Ethernet MAP on page 170
8	Go to Service Port MAP on page 174
9	Contact your network administrator
10	Reduce the number of target devices attached to the SNC
11	Go to Start MAP on page 154
12	Go to Device Access MAP on page 158
13	Go to Retrieving the Code 43 Dump File on page 35

Start MAP

Gather as much information as possible before performing a repair action. When gathering information, you must connect the service terminal to the service port. Instructions for doing so are contained in the User's Guide for your SNC.

Visually Inspecting the LEDs

The Light Emitting Diodes (LEDs) on the face panel of your SNC carry information about system status.

1 Observe front-panel SNC LED status indicators.

If the **RDY** LED is flashing as expected but the SCSI, Ethernet and SAN Connection LEDs are off, the SNC may have been left in diagnostic mode.

The device drivers for SCSI, Fibre Channel and Ethernet interfaces are disabled when in diagnostic mode.

If the command prompt on the service terminal is `diagmode >`, return the SNC to normal mode by entering the `normalBoot` command on the service terminal.

For more information, refer to Boot Modes on page 143.

2 Check LED observations against Table 13.

Table 13 LED Observations

Description	Action
All LEDs are off	5
RDY LED not blinking once per second after power has been on for one minute	3
Temperature Warning LED on	4
Temperature Alarm LED on	4

3 Refer to Table 12 on page 154 and complete the action.

4 If actions associated with LED observations do not solve the problem, check other visual observations against Table 14.

Table 14 Visual Observations

Description	Action
SNC not responding	3
Persistent reboots	3
Host application error message or host log entry indicates SCSI target error	12
Host cannot access attached devices	12
SAN Connection LED off although cables are attached and host systems are on and have booted	2
Heartbeat failure	7
The `fcShow` command returns `Firmware State = Sync Lost`	2, 0
ADIC Management Console failure	7
Service terminal connection failure	8

5 If actions associated with other visual observations did not solve the problem, go to Checking for Problems on Attached Devices.

Checking for Problems on Attached Devices

Check the following in order to find problems on attached devices:

- LEDs

- Display panels
- Firmware levels
- Operability

Checking Host Versions

Check the following to find problems on attached hosts:

- Operating system version
- Service pack version
- Hot-fix version
- HBA hardware version
- HBA firmware version
- HBA device driver version

If an update is required, perform the update.

For an updated list of supported SNC host platforms and Fibre Channel HBAs (Host Bus Adapters), visit www.adic.com.

Checking SNC Product Versions

For a current list of required updates, visit www.adic.com.

Checking ADIC Management Console Version

Use this procedure to check the version level of the ADIC Management Console application, if you are running it.

1 Start the ADIC Management Console server and client.

For installation and operating instructions, as well as access to version information, refer to the *ADIC Management Console User's Guide*.

2 If an update is needed, download the update from **www.adic.com**, and perform the update.

Checking Firmware Code Level

Use this procedure to check the firmware code level.

1 Connect a service terminal to the SNC.

Instructions for doing so are contained in the User's Guide for your SNC.

2 Press the **Enter** key on the service terminal.

If the prompt is not displayed, go to Service Port MAP on page 174.

3 Issue the `showVersions` command. For more information about this command, refer to showVersions on page 113.

4 If an update is required, download the update from **www.adic.com**, and perform the update.

Checking Hardware Version

Use this procedure to check the hardware version information.

1 Connect a service terminal to the SNC.

   Instructions for doing so are contained in the User's Guide for your SNC.

2 Press the **Enter** key on the service terminal.

   If the prompt is not displayed, go to Service Port MAP on page 174.

3 Issue the `sysVpdShow` command. For more information about this command, refer to `sysVpdShow or sysVpdShowAll` on page 118.

4 Report this information to your service representative, if you are asked for it.

Checking Components

Use this procedure to check system components:

1 Connect a service terminal to the SNC.

   Instructions for doing so are contained in the User's Guide for your SNC.

2 Press the **Enter** key on the service terminal.

   If the prompt is not displayed, go to Service Port MAP on page 174.

3 Issue the `showBox` command. For more information about this command, refer to showBox on page 113.

4 If an installed component does not show up in the display, go to the correct MAP.

   For example, if a SCSI interface is missing, go to the SCSI Channel MAP on page 159.

   If a Fibre Channel is missing, go to the Fibre Channel MAP on page 165.

5 If all components display properly, go to Performing Health Check on page 157.

Performing Health Check

1 Stop all I/O.

2 Connect a service terminal to the SNC.

   Instructions for doing so are contained in the User's Guide for your SNC.

3 Press the **Enter** key on the service terminal.

   If the prompt is not displayed, go to Service Port MAP on page 174.

4 Issue the `hlthChkNow` command. For other commands associated with health checks, refer to terms beginning with the `hlthChk` prefix in Service Port Command Reference on page 39.

5 Check the results displayed on the service terminal to determine the status of the interfaces and attached devices. If a failure is indicated, perform the appropriate MAP.

Checking the Host Event Log

Check the event log on the Fibre Channel host. Look for the most recent entries and check to see if there are any Fibre Channel HBA driver errors. If there are, go to Fibre Channel MAP on page 165.

Database Full MAP

Perform these steps if event code 42 is reported. Event code 42 indicates that the persistent address map database is full.

There cannot be more than 2048 devices in the database. If devices were moved to different ports or channels, event code 42 can be reported, even when fewer than 2048 devices are actually present.

Use the following procedure to free up database entries that are no longer needed, and keep the devices that are currently attached at the same Assigned LUNs.

CAUTION **Use this procedure only when you are sure that the devices you are interested in are connected and available to the SNC. Devices that are not currently attached will be removed from the database. You must reboot the SNC after performing this procedure for the changes to take effect.**

1. Connect a service terminal to the SNC.

   Instructions for doing so are contained in the User's Guide for your SNC.

2. Press the **Enter** key on the service terminal.

   If the prompt is not displayed, go to Service Port MAP on page 174.

3. Issue the `mapShowDatabase` command to display the contents of the database. For more information, refer to mapShowDatabase on page 90.

4. Issue the `mapShowDevs` command to display LUN assignments for the attached devices that have been mapped. For more information, refer to mapShowDevs on page 91.

5. Issue the `mapWinnowDatabase` command to remove LUN assignments for devices that no longer need to be kept. For more information, refer to mapWinnowDatabase on page 92.

6. Reboot the SNC.

7. After the SNC has finished booting, repeat Step 3 and Step 4 to verify that all attached devices have been mapped.

Device Access MAP

Perform these steps if a host is not able to access SCSI or Fibre Channel devices.

1. Connect a service terminal to the SNC.

   Instructions for doing so are contained in the User's Guide for your SNC.

2. Press the **Enter** key on the service terminal.

   If the prompt is not displayed, go to Service Port MAP on page 174.

Checking Fibre Channel Port Status

1. Issue the `fcShow` command. For more information about this command, refer to fcShow [level] on page 67.

   If the `fcShow` command does not display a Firmware State of **Ready** for the attached Fibre Channel SAN connections, go to Fibre Channel MAP on page 165.

2. If a Fibre Channel host should have access to SCSI Channel devices, verify that the FC port mode is **Target**.

   The SNC Fibre Channel ports are set by default to **Target** mode. If the port mode for the host connection was changed to **Initiator**, the host will not be able to see the SCSI devices.

   For more information on setting channel modes, refer to Configuring Ports on page 16.

3. If the host should have access to devices on a Fibre Channel, verify that the FC port mode is set to **Initiator** or **Target and Initiator**.

If the port mode for the host connection is set to **Target**, the host will not be able to see the attached Fibre Channel devices.

Checking SCSI Channel Devices

Issue the `scsiShow` command. For more information about this command, refer to scsiShow on page 102.

If all of the attached SCSI devices are not displayed, go to the SCSI Channel MAP on page 159.

Checking Channel Zoning Settings

CAUTION

While it is possible to configure and troubleshoot channel zoning from the command line, the preferred interface for channel zoning is ADIC Management Console (AMC) or the Library Management Console (LMC).

For instructions on installing and using AMC, refer to the *ADIC Management Console User's Guide***. For instructions on installing and using LMC, refer to the** *Scalar i2000 User's Guide***.**

1. Issue the `fcShowDevs` command. For more information about this command, refer to fcShowDevs on page 69.

   Look at the display for each Fibre Channel interface. If all of the SCSI devices are displayed under each Fibre Channel interface, then host access to SCSI devices is not being restricted by Channel Zoning.

2. Issue the `setFcChanMask` command to change channel zoning settings to accommodate your configuration. For more information about this command, refer to setFcChanMask [channel, bitmask] on page 104.

SCSI Channel MAP

- SCSI device reports unit attention on non-removable device
- Unexpected SCSI bus reset occurs
- Unexpected SCSI disconnect reported by a SCSI device
- SCSI Channels are missing

Getting SCSI Information

1. Connect a service terminal to the SNC.

   Instructions for doing so are contained in the User's Guide for your SNC.

2. Press the **Enter** key on the service terminal.

   If the prompt is not displayed, go to Service Port MAP on page 174.

3. If the SNC is off, then turn it on.

4. Verify that the **RDY** LED is blinking once per second.

   As the SNC is booting, several status messages should be displayed on the service terminal. The last status message is "Done executing startup script."

   If no status messages are displayed, go to Service Port MAP on page 174.

5 Issue the `showBox` command. For more information about this command, refer to showBox on page 113.

6 Write down the information for each SCSI channel, for example, “SCSI -1 requires Low Voltage Differential cable.”

7 If the SCSI interfaces are not all displayed, power cycle the SNC. After shutting off the power, wait for a minimum of 10 seconds before restoring power. Repeat Step 4 and Step 5.

If the SCSI interfaces are not all displayed, replace the SNC.

Instructions for doing so are contained in the User’s Guide for your SNC.

Exit this MAP.

If the SCSI interfaces display properly, go to Checking Attached SCSI Devices.

Checking Attached SCSI Devices

CAUTION **The SNC supports up to 2048 LUNs. If more than 2048 LUNs are attached, unreliable behavior will result. The SNC takes up one LUN (0) as its command and control LUN. Therefore, only 2047 LUNs are available to the user.**

1 Issue the `scsiShow` command to display a list of attached SCSI devices. For more information about this command, refer to scsiShow on page 102.

2 For each SCSI channel, make a list of attached devices. Include SCSI device ID, manufacturer, and device status/flags.

3 Go to Comparing Listed versus Physical Devices.

Comparing Listed versus Physical Devices

For each SCSI channel, compare the list of attached devices with the physical devices.

If any of the physical devices are not shown, go to Checking SCSI Bus Termination.

If all the physical devices are shown, go to Comparing Listed versus Supported Devices.

Comparing Listed versus Supported Devices

1 Compare the attached devices to the list of supported devices listed.

2 If the attached devices are all supported, go to Performing SCSI Loop Back Test on page 163.

If any attached devices are not supported, report them to the system administrator for possible replacement.

CAUTION **If all other diagnostic procedures fail to isolate a SCSI problem, and there are unsupported SCSI devices attached to the SNC, those devices will need to be removed or replaced.**

Checking SCSI Bus Termination

CAUTION **If in this procedure you determine that you need to remove a SCSI cable or terminator, all I/O to the SNC must be stopped and the SNC must be turned off.**

1 Verify the termination for the end device attached to the channel in question.

- The last physical device on a chain of SCSI devices needs to be terminated.
- If the end device has internal termination, be sure it is enabled.
- Otherwise check that an external terminator is attached to the device.
- A Differential (DE) terminator on a Single Ended (SE) bus or an SE terminator on a DE bus will cause the bus to be unusable.

2 Verify the termination for the other devices attached to the channel in question.

- Check that all SCSI devices other than the end devices have internal termination disabled.
- A Differential (DE) terminator on a Single Ended (SE) bus or an SE terminator on a DE bus will cause the bus to be unusable.

3 If there are SCSI termination problems, power down the SNC and correct them.

If you corrected SCSI termination problems, go to Performing SCSI Health Check.

If SCSI termination is OK, go to Checking for Multiple SCSI IDs.

4 If you powered down the SNC, turn it back on.

Checking for Multiple SCSI IDs

If two or more devices on the same SCSI channel are configured at the same SCSI ID, only one of those devices will be seen by the SNC. Data transfers to that device will be unreliable.

CAUTION **If in this procedure you determine that you need to correct any SCSI IDs, all I/O to the SNC must be stopped and the SNC must be turned off.**

1 Issue the `scsiShow` command. For more information about this command, refer to scsiShow on page 102.

2 Write down the SCSI IDs of all devices connected to each SCSI channel.

3 Check that only one device is set to each ID for each SCSI channel.

Assign a new SCSI ID to any conflicting target device.

4 Check that for each SCSI Channel, no devices are set to ID 7 except the SNC channel ID.

If a target device is set to the same ID as the SNC (ID 7), the bus will be unstable and data corruption may result.

5 If you do not need to correct any SCSI IDs, go to Checking Device Type.

6 If you corrected any SCSI IDs, reboot the SNC.

7 After it finishes booting, issue the `scsiShow` command. For more information about this command, refer to scsiShow on page 102.

8 Compare the list of attached devices with the physical devices.

If not all of the physical devices are shown, go to Checking Device Type.

If all of the physical devices are shown, go to Performing SCSI Health Check.

Checking Device Type

1 Check to be sure that all the devices attached to a single SCSI bus are of the same type.

- Only low voltage differential devices must be attached to low voltage differential SCSI channels.
- When a mix of Ultra2/3 SCSI and Ultra SCSI devices are connected to a single bus, the bus will run at the Ultra SCSI speed. Because the bus will auto-adjust to the slowest speed, it is not recommended that you run both Ultra2/3 SCSI and Ultra SCSI devices on the same bus.

CAUTION **If in this procedure you determine that you need to replace a SCSI device, all I/O to the SNC must be stopped and it must be turned off.**

2 Replace any improper SCSI device with a proper device.

3 Reconnect the SCSI cable.

4 If you do not have to replace an improper device, go to Examining SCSI Cables.

If you replaced any devices, reboot the SNC.

5 After the SNC finishes booting, issue the `scsiShow` command from the service terminal. For more information about this command, refer to scsiShow on page 102.

6 Compare the list of attached devices with the physical devices.

If not all of the physical devices are shown, go to Examining SCSI Cables.

If all of the physical devices are shown, go to Performing SCSI Health Check.

Examining SCSI Cables

CAUTION **During this procedure, if you determine that you need to remove a SCSI cable, all I/O to the SNC must be stopped and the SNC must be turned off.**

1 Look for damaged cables.

Check for breaks in the cable jacket, exposed or frayed cable shield, exposed or broken wires.

2 Replace any damaged cables.

3 Look for inadequate cables.

Older SCSI cables may not be suitable for running at Ultra2/3 speeds. Be sure all cables are rated for Ultra2/3.

4 Replace any cables not suitable for running at Ultra 2/3 speeds.

5 Check for mixed cable types.

If a SCSI bus has both round cables and flat ribbon cables, it may suffer problems when running at Ultra2/3 speeds.

Use the same cable type consistently for all segments of the SCSI bus.

6 Replace any cables that are of the wrong type.

7 Check for unshielded cables.

An unshielded SCSI cable used external to a cabinet may cause reliability problems, due to interference from other electrical devices.

8 Replace all unshielded cables.

If no cables are replaced, go to Examining SCSI Connectors.

If cables were replaced, go to Performing SCSI Health Check.

Examining SCSI Connectors

CAUTION **Before removing a SCSI cable, all I/O to the SNC must be stopped and the SNC must be turned off.**

1 Inspect each connector to find out if pins were bent when the connector was attached.

2 Replace any cables that have bent pins.

3 If you did not have to replace or re-secure a SCSI cable, go to Performing SCSI Loop Back Test.

4 If you replaced or re-secured a SCSI cable, turn on the SNC.

5 After it finishes booting, issue the `scsiShow` command. For more information about this command, refer to scsiShow on page 102.

6 Compare the list of attached devices with the physical devices.

If not all of the physical devices are shown, go to Performing SCSI Loop Back Test.

If all of the physical devices are shown, go to Performing SCSI Health Check.

Performing SCSI Health Check

1 Perform a health check.

For more information, refer to Performing Health Check on page 157.

2 Check the event log for SCSI errors.

For more information, refer to Checking the Host Event Log on page 157.

3 Perform a component check.

For more information, refer to Checking Components on page 157.

4 If errors are still indicated, go to Performing SCSI Loop Back Test.

If no errors are reported, exit this MAP.

Performing SCSI Loop Back Test

1 Stop all I/O to the SNC.

2 Turn off the SNC.

3 In addition to the suspect SCSI channel, choose one of the other SCSI channels to use for the loop back test.

4 Label and remove those cables.

5 Connect a short SCSI loopback test cable to those two SCSI channels.

6 Turn on the SNC.

7 Wait for the SNC to finish booting.

8 If the command prompt on the terminal is not `diagmode >`, issue the `diagBoot` command on the service terminal.

For more information, refer to Entering Diagnostic Mode on page 143.

CAUTION **Before performing diagnostics, all FC and SCSI cables must be disconnected from the SNC. Before changing any SCSI cables, all I/O to the SNC must be stopped and the SNC must be turned off. Do not perform SCSI loop back tests on SCSI channels that are attached to SCSI target devices. If you do this, you will corrupt the data on the device.**

Wait for the SNC to finish booting.

9 Issue the `scsiChannelTest(1,2)` command. The following example shows a loop back test on SCSI channels 1 and 2.

```
diagmode > scsiChannelTest (1,2)
SCSI-1 -> SCSI-2 [##########] 10 iterations PASSED
SCSI-2 -> SCSI-1 [##########] 10 iterations PASSED
value = 0 = 0x0
```

If the SNC returns a PASSED status, go to Testing SCSI Cables.

Testing SCSI Cables

If the cables of the devices attached to a channel have a compatible pinout on both sides, the SNC can test the cable using the loop back test.

1 Stop all I/O to the SNC.

2 If the command prompt on the terminal is not `diagmode >` place the SNC in diagnostic mode

For more information, refer to Entering Diagnostic Mode on page 143.

3 Turn off the SNC.

4 Remove the cable from one attached SCSI device, and attach it as a loop back cable to the SNC.

5 Turn on the SNC.

6 After the SNC has finished booting, issue the `scsiChannelTest(x,y)` command (where '`x`' and '`y`' are the slot numbers connected by the loopback cable) to perform a loop back test.

For an example, refer to Performing SCSI Loop Back Test on page 163, Step 9

7 If the SNC returns a FAILED status, the cable is faulty and must be replaced.

If the SNC returns a PASSED status, go to Isolating SCSI devices to isolate bad devices on the SCSI bus.

Isolating SCSI devices

1 Restore the SNC to normal operation.

Refer to Restoring Normal Mode on page 147.

2 Turn off the SNC.

3 Perform Step 4 - Step 11 for each SCSI device that was found missing in Step 1 under Comparing Listed versus Physical Devices on page 160.

4 Remove all devices from the SCSI buses.

5 Attach ONLY the device in question to the SCSI channel it was originally connected to using a known-good SCSI cable and terminators.

6 Power the SNC back on. Wait for it to finish booting.

7 Issue the `scsiShow` command and verify that the device is present. For more information about the command, refer to scsiShow on page 102.

8 If the device is missing from the display, it needs to be replaced and/or serviced.

Inform the system administrator of any suspected bad devices found in this step.

Replace or remove any bad devices.

9 If the device is present, perform a health check.

For more information, refer to Performing Health Check on page 157.

10 Review the host event log.

For more information, refer to Checking the Host Event Log on page 157.

11 If SCSI errors are found, then inform the system administrator that the connected device appears to be bad.

Replace or remove any bad devices.

12 After all possible device checks are performed, go to Restoring SCSI Setup.

Restoring SCSI Setup

1 Shut down the SNC.

2 Reconnect all available SCSI devices to their proper channel assignments.

Use the original configuration, except where changes have been made per this MAP.

3 Wait for the SNC to finish booting.

4 If the SNC is in diagnostic mode (command prompt = `diagmode >`), then restore normal operation.

For more information, refer to Restoring Normal Mode on page 147.

5 Perform a health check.

For more information, refer to Performing Health Check on page 157.

6 Review the host event log.

For more information, refer to Checking the Host Event Log on page 157.

If all attached SCSI devices and cables are determined to be good, yet SCSI errors persist, replace the SNC.

Instructions for doing so are contained in the User's Guide for your SNC.

Exit this MAP.

Fibre Channel MAP

Perform these steps if:

- The Fibre Channel interface reports a reset or system error
- The Fibre Channel interface reports an error processing a request or response
- The Fibre Channel interface reports an excess of 10 LIPs in a 10-minute interval

- Other Fibre Channel errors reported
- FC connection LED is off

Verifying Fibre Channel Connections

1 Connect the service terminal to the service port.

Instructions for doing so are contained in the User's Guide for your SNC.

2 Press the **Enter** key on the service terminal.

If the prompt is not displayed, go to Service Port MAP on page 174.

3 Issue the `showBox` command. For more information about this command, refer to showBox on page 113.

4 Confirm that the Fibre Channel connections are correctly displayed. If `showBox` displays the Fibre Channel connections correctly, go to Examining Cables.

5 If the Fibre Channel connections do not display correctly in the `showBox` display, remove the GBIC and replace it with a known-good GBIC.

Instructions for doing so are contained in the User's Guide for your SNC.

6 Go to Testing the GBIC.

Testing the GBIC

CAUTION **You must stop I/O at the Fibre Channel host.**

1 With a known-good GBIC installed, confirm that the Fibre Channel connections are correctly displayed by issuing the `showBox` command from the service terminal. For more information about this command, refer to showBox on page 113.

2 If the output of the `showBox` command matches the Fibre Channel configuration, exit this MAP.

If the output of the `showBox` command, still does not match the Fibre Channel configuration, remove the known-good GBIC and reinstall the original GBIC.

Go to Examining Cables.

Examining Cables

CAUTION **During this procedure, if you need to remove or replace the Fibre Channel cable, you must stop I/O at the Fibre Channel host.**

1 Remove the cables.

2 If any cables are obviously damaged, replace them.

3 Use dusting spray/compressed gas to dust off optical connectors on the GBIC and cable ends.

4 Reconnect the cables.

5 Perform health check.

For more information, refer to Performing Health Check on page 157.

6 View the event log.

For instructions, refer to Checking Event Logs on page 150.

7 If errors are gone, exit this MAP.

If errors persist, go to Performing Fibre Channel Loop Back Test on page 167.

Performing Fibre Channel Loop Back Test

CAUTION **Before performing diagnostics, the Fibre Channel cables must be removed from the SNC. All I/O to the SNC must be stopped.**

1 Attach a Fibre Channel loop back plug to the Fibre Channel port.

2 If the front-panel **FC Connection Status** LED is not on, replace the SNC.

Instructions for doing so are contained in the User's Guide for your SNC.

Exit this MAP.

If the front-panel **FC Connection Status** LED is on, go to Step 3.

3 If the command prompt on the service terminal is not `diagmode >`, place the SNC in diagnostic mode.

For more information, refer to Entering Diagnostic Mode on page 143.

4 Substituting the Fibre Channel port number for `x`, issue the `fcSlotTest x` command.

For more information, refer to fcSlotTest [x] on page 145.

5 If the test failed, replace the SNC.

Instructions for doing so are contained in the User's Guide for your SNC.

Exit this MAP.

If the test passed, the Fibre Channel port is good.

6 Remove the loop back plug.

Go to Testing Fibre Channel Optical Cable.

Testing Fibre Channel Optical Cable

CAUTION **If the Fibre Channel cable is extremely long it may be more practical to replace the Fibre Channel device first; then if the problem is not resolved, replace the cable.**

1 If the cables are already removed, reattach them.

Attach matching cable ends (red-to-red or 'A'-to-'A' and so on) to two Fibre Channel port slots.

2 Substituting the Fibre Channel port number for `x`, issue the `fcSlotTest x` command.

For more information, refer to fcSlotTest [x] on page 145.

3 If the test passes, the Fibre Channel optical cable is good.

Go to Replacing Fibre Channel Devices on page 168.

If the test fails, go to Replacing Fibre Channel Cable.

Replacing Fibre Channel Cable

1 Replace the cables to the Fibre Channel ports with known good cables.

2 Perform health check.

For more information, refer to Performing Health Check on page 157.

3 View the event log.

For instructions, refer to Checking Event Logs on page 150.

4 If problems persist, inform the network administrator that there seems to be a problem with a device or a host bus adapter.

If problems are gone, exit this MAP.

Replace external devices that are attached to the Fibre Channel ports.

Go to Replacing Fibre Channel Devices.

Replacing Fibre Channel Devices

The device that needs to be replaced is one of the following:

- Fibre Channel HBA
- Fibre Channel Switch
- Fibre Channel Hub
- Fibre Channel Disk subsystem

1 Inform the system administrator that it is necessary to replace the Fibre Channel device connected to the SNC to resolve the Fibre Channel errors.

2 Repeat this MAP, beginning with the section Verifying Fibre Channel Connections on page 166, after replacing the external component.

MAP for the SNC

Perform these steps if any one of the following is true:

- **RDY** LED not blinking once per second after power has been on for one minute
- The SNC is not responding
- SNC processor memory fault detected
- SNC PCI bus parity error detected
- SNC PCI interface error detected
- The ADIC Management Console server could not verify the connection to the SNC

Observing Operational LED Behavior

When the SNC is first powered on, the front panel LEDs flash a variety of patterns as the SNC performs its Power On Self Test (POST) and starts booting.

These patterns are documented in the User's Guide for your SNC.

Within one minute, the SNC should have booted successfully and the **Ready** LED should be blinking once per second.

If the **Ready** LED is not blinking as expected, go to Start MAP on page 154.

Temperature MAP

Perform these steps if:

- The SNC generates trap event codes 62, 64, or 67 (Inlet Air, Outlet Air, I/O Processor, or Fan have entered a Warning Range)
- The SNC generates trap event codes 63, 65, or 68 (Inlet Air, Outlet Air, I/O Processor, or Fan have entered Alarm Range)
- Health check generates trap event code 112 or 114 (Fan or Power are running in Warning or Alarm Range)

Interpreting Problems in the Temperature Subsystem

System operators are normally notified of problems or potential problems in SNC subsystems by the event traps that appear in the **Received Event Trap** window of the ADIC Management Console client. For more information about this window, refer to the *ADIC Management Console User's Guide*.

However, when sensors detect a **Warning** or **Alarm** condition in the temperature subsystem, not only are trap event codes 62, 63, 64, or 65 generated, but a pop-up dialog box immediately alerts the user.

Refer to the envMonShow on page 60 for operational temperature ranges that will generate these messages.

If the temperature problems are due to a reduction in blower functionality, event codes 62, 63, 64, or 65 will be accompanied by event codes 67 or 68.

Refer to ethAddrGet on page 61 for conditions that will generate these messages.

Receiving Temperature Warnings or Alarms

1 Verify that room temperature is within satisfactory limits.

2 If room temperature is not within satisfactory limits, adjust it.

3 If the room temperature is within satisfactory limits, and alarm or warning messages are being generated, check the air intake for obstructions.

CAUTION **The Inlet Air sensor is at the end with the plastic bezel and the on/off switch. The Outlet Air sensor is the end with the connectors.**

4 If obstructions are found, remove them and permit the SNC to cool.

5 If temperatures stabilize, exit this MAP.

6 If no obstructions are found, or temperatures do not stabilize, check the air outlet for obstructions.

7 If obstructions are found, remove them and permit the SNC to cool.

8 If temperatures stabilize, exit this MAP.

9 If no obstructions are found, or temperatures do not stabilize, replace the SNC.

Instructions for doing so are contained in the User's Guide for your SNC.

Receiving Fan Speed Warnings or Alarms

If you were directed to this MAP because of trap event code 67, indicating that the fan is in warning range--replace the SNC at the next scheduled maintenance.

If you were directed to this MAP because of trap event code 68, indicating that the fan is in alarm range, replace the SNC.

Instructions for doing so are contained in the User's Guide for your SNC.

Power MAP

Perform these steps if:

- All LEDs are off
- The SNC generates trap event codes 59 or 60, indicating that the power is running in the warning or alarm range. A string accompanying the trap event will indicate which power supply is specifically involved.
- Health check generates a trap event code 113, indicating that power is running in warning or alarm range

1 Verify that the SNC is plugged into an active AC power source.

2 Verify the status of the **Power** LED.

For more information, go to Figure 3.

3 If the **Power** LED remains off, try a different power cord.

4 If the **Power** LED remains off, remove the SNC.

Instructions for doing so are contained in the User's Guide for your SNC.

Ethernet MAP

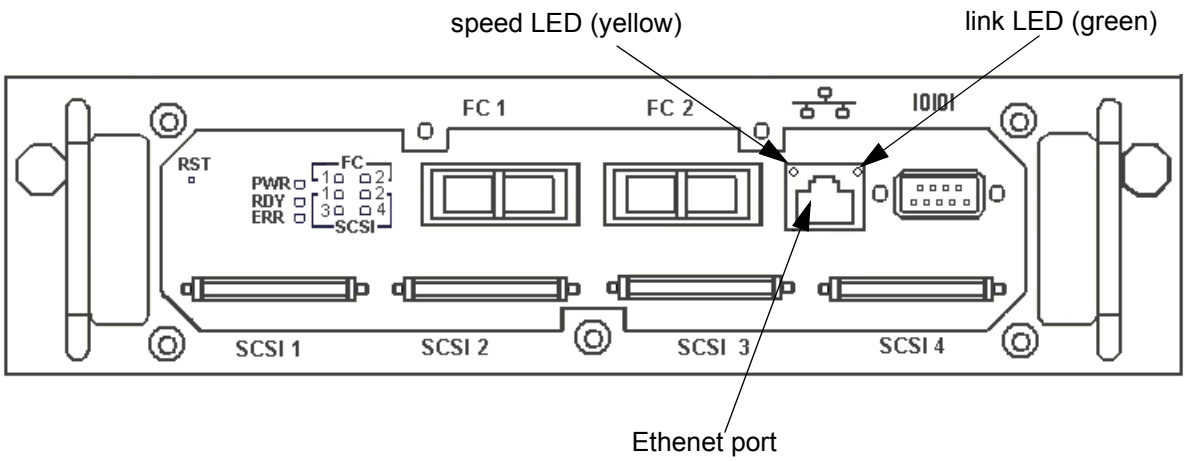
The network administrator must provide the following information before you can perform this MAP:

- The IP address for the SNC - REQUIRED
- The net mask for the SNC in decimal and hex formats - REQUIRED
- The network gateway IP address for the SNC - if assigned
- The IP address of a computer on the same subnet as the SNC for PING tests - REQUIRED
- The IP address of the ADIC Management Console server - REQUIRED. For more information about this server, refer to the *ADIC Management Console User's Guide*.

1 The SNC must be booted and its Ethernet port must be attached to the local area network.

For the position of the Ethernet port on a Pathlight 5000, see Figure 3. The position of the Ethernet port may be different on your SNC.

Figure 3 Ethernet port on faceplate of an SNC



Note The placement of the Ethernet port on your SNC may not be the same as in this example. Refer to the Hardware User's Guide for your SNC.

2 Verify that the **Ethernet Link** LED, which is the green LED on the right, is on.

3 If the LED is on, go to Step 4.

If the LED is not on, replace the SNC.

Instructions for doing so are contained in the User's Guide for your SNC.

Exit this MAP.

4 Determine the speed of the network, by following the procedure in Performing Health Check on page 157.

If the health check generates a trap event code of 115, then the yellow **Speed** LED should be on.

Verify that the yellow **Speed** LED, which is the yellow LED on the left, correctly reflects the speed of the network.

5 If the yellow **Speed** LED correctly reflects the speed of the network, go to Step 7.

If the yellow **Speed** LED does not correctly reflect the speed of the network, go to Step 6.

6 Inform the system administrator that there may be a problem with the Ethernet cable quality, the intermediate link speeds or interconnect speeds.

If the system administrator can find no problems with the Ethernet cable quality, the intermediate link speeds, or interconnect speeds, but the yellow **Speed** LED does correctly reflect the network speed, replace the SNC.

Instructions for doing so are contained in the User's Guide for your SNC.

Exit this MAP.

7 Remove the Ethernet cable from the SNC Ethernet port and attach the Ethernet loop back plug.

8 Verify that the Ethernet LEDs are functioning correctly.

If they are, go to Step 9.

If they are not, inform the system administrator that there is a network hardware problem where the SNC is attached.

Exit this MAP.

9 Remove the Ethernet loop back plug.

10 Obtain another Ethernet cable.

11 Use this cable to attach the SNC to the local area network.

12 Connect a service terminal to the service port. For the location of this port, see Figure 1 on page 11, or the User's Guide for your SNC.

Note — Instructions for connecting a service terminal are included in the User's Guide for your SNC.

13 Press the **Enter** key on the service terminal.

If the prompt is not displayed, go to Service Port MAP on page 174.

14 Issue the `ifShow` command. For more information about this command, refer to ifShow on page 83.

```
SNC > ifShow
ibmEmac (unit number 0):
     Flags: (0x8063) UP BROADCAST MULTICAST ARP RUNNING
     Type: ETHERNET_CSMACD
     Internet address: 172.16.76.211
     Broadcast address: 172.16.255.255
     Netmask 0xffff0000 Subnetmask 0xffff0000
     Ethernet address is 00:60:45:17:02:f0
     Metric is 0
     Maximum Transfer Unit size is 1500
     114192 packets received; 364 packets sent
     114023 multicast packets received
     116 multicast packets sent
     0 input errors; 0 output errors
     0 collisions; 0 dropped
lo (unit number 0):
     Flags: (0x8069) UP LOOPBACK MULTICAST ARP RUNNING
     Type: SOFTWARE_LOOPBACK
     Internet address: 127.0.0.1
     Netmask 0xff000000 Subnetmask 0xff000000
     Metric is 0
     Maximum Transfer Unit size is 32768
     0 packets received; 0 packets sent
     0 multicast packets received
     0 multicast packets sent
     0 input errors; 0 output errors
     0 collisions; 0 dropped
value = 29 = 0x1d
```

If there is no entry for `ibmEmac` or `emac`, replace the SNC.

Instructions for doing so are contained in the User's Guide for your SNC.

Exit this MAP.

If there is an entry for `ibmEmac` or `emac`, write down the values:

- internet address,
- netmask,
- subnetmask

15 Verify that the internet address is the same as the IP address supplied by the network administrator.

16 Verify that the netmask value is the same as the netmask in hex format supplied by the network administrator.

17 Verify that the subnetmask is the same as the netmask. If these values are correct, go to Step 20.

If these values are not correct, go to Step 18.

18 Use the `ethAddrSet` command to set the correct IP address and netmask values. For more information about this command, refer to ethAddrSet on page 61 or Configuring the Ethernet Network on page 11.

19 Issue the `reboot` command and wait for the SNC to finish booting.

Go back to Step 14.

20 Issue the `ping <host IP address>` command, where `<host IP address>` is four decimal numbers separated by periods.

`<host IP address>` is the address provided by the network administrator for PING testing.

Display of successful PING test:

```
SNC > ping "192.168.1.1", 10
PING 192.168.1.1: 56 data bytes
64 bytes from 192.168.1.1: icmp_seq=0. time=0. ms
64 bytes from 192.168.1.1: icmp_seq=0. time=0. ms
64 bytes from 192.168.1.1: icmp_seq=0. time=0. ms
64 bytes from 192.168.1.1: icmp_seq=0. time=0. ms
64 bytes from 192.168.1.1: icmp_seq=0. time=0. ms
64 bytes from 192.168.1.1: icmp_seq=0. time=0. ms
64 bytes from 192.168.1.1: icmp_seq=0. time=0. ms
64 bytes from 192.168.1.1: icmp_seq=0. time=0. ms
64 bytes from 192.168.1.1: icmp_seq=0. time=0. ms
64 bytes from 192.168.1.1: icmp_seq=0. time=0. ms
----192.168.1.1 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms) min/avg/max = 0/0/0
value = 0 = 0x0
```

Display of failed PING test:

```
SNC > ping "192.168.1.251",10
PING 192.168.1.251: 56 data bytes
request timed out
value = -1 = 0xffffff
```

21 If the PING test passes, go to Step 22.

If the PING test fails, inform the system administrator that there is a network hardware problem where the SNC is attached.

Exit this MAP.

22 Remove the Ethernet cable from the SNC and install the Ethernet loop back plug.

23 From the service terminal, issue the `diagBoot` command. For more information, refer to Entering Diagnostic Mode on page 143.

24 Wait for the SNC to finish booting.

25 Verify that the `diagmode>` prompt is displayed.

26 From the service port, issue the `elTest` command.

```
diagmode > elTest
```

```
==== Testing Ethernet ====
Init complete.
Ethernet OK
value = 0 = 0x0
```

27 If the test fails, replace the SNC.

Instructions for doing so are contained in the User's Guide for your SNC.

Exit this MAP.

If the test passes, remove the Ethernet loop back plug.

Go to Step 28.

28 From the service terminal, issue the `normalBoot` command and wait for the SNC to finish booting.

29 Reattach the Ethernet cable to the SNC.

30 From the service terminal, issue the `gateAddrGet` command and write down the network gateway address that is displayed. For more information about this command, refer to gateAddrGet on page 72.

31 Compare this address to the one provided by the network administrator.

If both addresses are the same, go to Step 32.

```
SNC > gateAddrGet
Gateway Address set to 192.168.1.1
value = 0 = 0x0
```

If the network gateway address is incorrect, set it to the value provided by the network administrator using the `gateAddrSet` command. For more information about this command, refer to gateAddrSet on page 72.

32 From the service terminal, issue the `reboot` command.

Wait until the SNC has finished booting.

33 From the service terminal, use the `ping` command to PING the IP address of the ADIC Management Console server. For more information about this command, refer to the *ADIC Management Console User's Guide*.

34 From the host running the ADIC Management Console server, PING the SNC.

If both PING tests succeed, exit this MAP.

If a PING test fails, ask the network administrator to check and correct the network connection, route tables, and network gateway addresses for both the ADIC Management Console server and the SNC.

Service Port MAP

These steps are performed if the SNC boots and responds to the ADIC Management Console, but the service port does not respond.

Check the RS-232 Cable

This test requires another laptop or desktop computer with a functioning RS-232 9-pin port. Terminal emulation software must be installed and running.

1 Remove the RS-232 null-modem cable from the service port.

2 Connect it to the compatible port on the other computer.

3 Connect the service terminal to the cable.

4 Set the service terminal and the other computer to 19200 baud, 8 data bits, no parity, one stop, Xon/Xoff flow control.

5 Enter test lines in the service terminal and the other computer.

6 Confirm that they are displayed on each other.

If this fails, replace the RS-232 cable.

If this succeeds, remove the cable from the other computer

Go to Checking the Connection with Boot Messages.

Checking the Connection with Boot Messages

1 Reconnect the terminal to the SNC with the RS-232 null modem cable.

2 Stop all I/O to the SNC.

3 Shut down the SNC and keep the power off for 60 seconds.

4 Turn the SNC on.

If boot messages fail to appear on the service terminal, then replace the SNC.

Instructions for doing so are contained in the User's Guide for your SNC.

VPM MAP

VPM (virtual private map) gives you the ability to map devices from the viewpoint of a SCSI host.

CAUTION

While it is not difficult to enable VPM from the command line, the preferred interface for VPM is the ADIC Management Console (AMC) or the Library Management Console (LMC).

For instructions on installing and using AMC, refer to the *ADIC Management Console User's Guide***. For instructions on installing and using LMC, refer to the** *Scalar i2000 User's Guide***.**

Perform these steps if VPM commands are not functioning, VPM devices are not available, or VPM hosts are not communicating.

Checking Virtual Private Map Access Settings

Follow the procedure in this section if VPM commands are not functioning.

1 Connect the service terminal to the service port.

Instructions for doing so are contained in the User's Guide for your SNC.

2 Press the **Enter** key on the service terminal.

If the prompt is not displayed, go to Service Port MAP on page 174.

3 Issue the `vpmFeatureEnabled` command.

If the output value is '1', VPM is already enabled. Go to Step 5.

If the output value is '0', VPM is not enabled. Go to Step 4.

4 Issue the `vpmFeatureEnable` command. For more information about this command, refer to vpmFeatureEnable "licensekeystring" on page 129.

If VPM commands begin to function, exit this MAP.

If VPM commands are still not functioning, go to Step 5.

5 Issue the `licenseShow` command. For more information about this command, refer to licenseShow on page 85.

```
SNC >licenseShow
License "s2zhq-7xdxd": Valid
Features:
VPM
Value = 2 = 0 x 2
SNC >
```

6 If the output from the `licenseShow` command shows that VPM is Valid, as in the example, go to Verifying SCSI Host Configuration Settings.

If the output from the `licenseShow` command shows that VPM is not Valid, exit this MAP and contact your service representative.

Verifying SCSI Host Configuration Settings

1 Issue the `scsiHostChanGet` command. Specify the channel where the host is attached. For more information about this command, refer to scsiHostChanGet [channel] on page 100.

2 Verify that the SCSI host channel is set to "Target."

If it is, go to Verifying VPM Device Assignments.

If it is not, issue the `scsiHostChanSet` command to set the channel mode to “Target.” For more information about this command, refer to scsiHostChanSet [channel],[mode] on page 100.

3 After you make the necessary change, issue the `snReset` command. For more information about this command, refer to snReset [channel] on page 116.

If problems persist, go to Verifying VPM Device Assignments.

Verifying VPM Device Assignments

CAUTION

While it is possible to configure VPM assignments from the command line, the code to be manipulated is so complex, that users are enjoined to use the ADIC Management Console (AMC) or the Library Management Console (LMC).

For instructions on installing and using AMC, refer to the *ADIC Management Console User’s Guide***. For instructions on installing and using LMC, refer to the** *Scalar i2000 User’s Guide***.**

If, according to AMC or LMC, assignments are accurate, but problems persist, refer to Device Access MAP on page 158 or the Fibre Channel MAP on page 165.

SFM/VPS/eVPS MAP

SFM (Scalar firewall manager), VPS (virtual private SAN), and eVPS (extended VPS) are all ways of creating private device maps for Fibre Channel hosts. SFM is a SAN-wide LUN masking scheme for SNCs embedded in Scalar library systems. VPS is also a SAN-wide LUN masking scheme, but it is used for systems with standalone SNCs. eVPS is an advanced LUN masking scheme, which operates on a per host basis, whether or not the SNC is embedded or integrated into a Scalar library.


Note

In the interests of brevity, these instructions use the "sfm" suite of commands. If you are using VPS, eVPS, or FC Host, substitute "vps" for "sfm". Almost all SFM commands have VPS counterparts. Some commands are used with eVPS only. To verify the syntax for any particular command, refer to Service Port Command Reference on page 39.


CAUTION

While it is not difficult to enable SFM, VPS, eVPS from the command line, the preferred interface for managing these features is the ADIC Management Console (AMC) or the Library Management Console (LMC).

For instructions on installing and using AMC, refer to the *ADIC Management Console User's Guide***. For instructions on installing and using LMC, refer to the** *Scalar i2000 User's Guide.*

Perform these steps if SFM/VPS/eVPS devices are unavailable.

Checking SFM/VPS/eVPS Access Settings

1 Connect the service terminal to the service port.

Instructions for doing so are contained in the User's Guide for your SNC.

2 Press the **Enter** key on the service terminal.

If the prompt is not displayed, go to Service Port MAP on page 174.

3 Issue the `sfmShow -1` command. For more information about this command, refer to sfmShow [hostIndex] on page 111.

- If **SFM State: Inactive** is displayed, SFM is not controlling access between the host and target devices.
  - Go to Step 4.
- If **SFM State: Active** is displayed, SFM is controlling access between the host and the target devices.
  - Use AMC or LMC to verify that SFM device access is correctly configured.
    - If device access is correctly configured, but devices are still not available, go to Verifying FC Host Configuration Settings on page 178.
    - If device access is not correctly configured, use AMC or LMC to configure device access. Exit this MAP.

4 Issue the `sfmFeatureEnable` command. For more information about this command, refer to sfmFeatureEnable "license key string" on page 109.

- If you successfully issued the `sfmFeatureEnable` command, use AMC or LMC to verify that devices are correctly configured. If they are, but problems persist, go to Verifying FC Host Configuration Settings.
- If you could not enable SFM, go to Step 5.

5 Issue the `licenseShow` command. For more information about this command, refer to licenseShow on page 85.

```
License "s2zhq-7xdhd": Valid
Features:
SFM
Value = 2 = 0 x 2
```

- If the output from the `licenseShow` command shows that SFM is not “Valid”, exit this MAP and contact your service representative.
- If the output from the `licenseShow` command shows that SFM is “Valid”, as in the example, but SFM cannot be enabled, contact your service representative.

Verifying FC Host Configuration Settings

1 Issue the `sfmShow -1` command to produce a listing of the hosts that are available to SFM. For more information about this command, refer to sfmShow [hostIndex] on page 111.

If the host is not listed, it could be attached to the incorrect SNC or incorrectly attached to the correct SNC. Go to Step 2.

If hosts are listed, go to Step 3.

2 Verify all SAN connections from the host.

- Check the cabling.
- Refer to Fibre Channel MAP on page 165, if necessary.
- If more than 64 hosts are active in the system, you may need to remove non-SFM hosts from the SFM host table in order to make room for an SFM host, go to Removing an FC Host.

Note Hosts are added automatically to the database when they come online, even if they are not configured by SFM.

3 If a host is listed, issue the `sfmShow N` command, where "`N`" is the ID that SFM has assigned to that host.

For more information about `sfmShow`, refer to sfmShow [hostIndex] on page 111.

4 Verify that the host type is set correctly for host “`N`”.

Table 15 Host Type Settings for Fibre Channel Ports

Host Type	Alias	Usage
AIX	Not Applicable	AIX
AS400	as/400, os/400, os400	AS400
Autosense/NT	Not Applicable	functions identically to “NT”
NT	windows	“NT” is the default setting
Gateway	fcr-2, pv-136t-fc, adic snc	Gateway

Table 15 Host Type Settings for Fibre Channel Ports (Continued)

Host Type	Alias	Usage
Generic	Not Applicable	The host does not use a supported host type
HPUX	hp-ux	HPUX
Linux	Not Applicable	Linux
IRIX	irix	SGI
Netware	Not Applicable	Netware
Solaris	sun, linux	Solaris
Unknown	Not Applicable	The host type is unknown or is based on the value set by VPS
Unisys	Not Applicable	Unisys

- If so, check the host type for all relevant hosts. If all are accurate, go to Step 5.
- If host types are inaccurate, issue the `sfmTypeSet` command to correct every relevant incorrect host. Refer to sfmTypeSet [hostIndex],"OS type string" on page 112.

5 If the host type is correct, but devices are still not available, there may be problems with the Fibre Channel settings.

- Use the Fibre Channel Configuration Quick Reference on page 17 to verify that Fibre Channel settings are correct. If correcting FC settings corrects the problem, exit this MAP.
- If the FC setings are correct, but devices are still not available, go to Verifying SFM/VPS/eVPS Device Assignments, below.

Removing an FC Host

1 Make a list of the hosts that are reported by `sfmShow -1`, but are not being used by SFM.

Consider enabling WWN lock mode to prevent unwanted hosts from filling up the SFM/VPS/eVPS host table. For instructions, refer to Using the WWN Lock Mode on page 23.

2 Use the vpsInitOffline [hostIndex] command to move hosts not authorized for SFM to offline mode.

Note There is no "sfm" variant of the `vpsInitOffline` command.

In the example, a host with `hostIndex` "`1`" is taken offline.

```
SNC > vpsInitOffline 1
value = 0 = 0x0
SNC >
```

Note When non-SFM hosts are removed from the SFM host table, SFM hosts that came online after the SFM host table was full are added to the table.

3 Issue the vpsWwnSet [hostIndex],[hiWWN],[loWWN] command to remove a host from the SFM/VPS/eVPS database.

Note There is no "sfm" variant of the `vpsWwnSet` command.

In the example, the host with `hostIndex` "`1`" is removed from the SFM/VPS/eVPS database.

```
SNC > vpsWwnSet 1,0,0
value = 0 = 0x0
SNC >
```

- If the output of `sfmShow -1` shows the relevant host, go to Step 3 in Verifying FC Host Configuration Settings on page 178.
- If the output of `sfmShow -1` does not show the relevant host, refer to Fibre Channel MAP on page 165.

Verifying SFM/VPS/eVPS Device Assignments

CAUTION

While it is possible to configure SFM, VPS, and eVPS assignments from the command line, the code to be manipulated is so complex, that users are enjoined to use the ADIC Management Console (AMC) or the Library Management Console (LMC).

For instructions on installing and using AMC, refer to the *ADIC Management Console User's Guide***. For instructions on installing and using LMC, refer to the** *Scalar i2000 User's Guide***.**

If, according to AMC or LMC, assignments are accurate, but problems persist, refer to Device Access MAP on page 158 or the SCSI Channel MAP on page 159.

A

Vendor Unique Codes

Table 16 lists the vendor unique Additional Sense Codes (ASC) and Additional Sense Code Qualifiers (ASCQ) that the SNC or I/O blade may return.

Table 16 Vendor Unique Additional Sense Code and Qualifiers

ASC	ASCQ	Description
08h	80h	Logical Unit Communication - SCSI Failure
08h	82h	Logical Unit Communication - SCSI Command Execution or Queuing Failure
08h	83h	Logical Unit Communication - SCSI Command Failed
08h	84h	Logical Unit Communication - SCSI Time-Out
08h	85h	Logical Unit Communication - SCSI Autosense Failed
08h	86h	Logical Unit Communication - SCSI Aborted
08h	87h	Logical Unit Communication - SCSI Abort Failed
08h	88h	Logical Unit Communication - SCSI Status Failed
XX	90h	Out of Buffer Resources (Not currently reported - future use)
80h	91h	General SCSI - Out of FC Command Resources
80h	92h	General SCSI - Multi-Path Configuration Error
80h	93h	General SCSI - Multi-Path Queue Error
80h	94h	General SCSI - Multi-Path Bad Controller Not Found
80h	95h	General SCSI - Multi-Path No Path Error
80h	96h	General SCSI - Out of QLogic Resources for commands
08h	B0h	Logical Unit Communication - Data Underrun (Not currently reported - future use)
08h	B1h	Logical Unit Communication - SNA ISP DMA Error
08h	B2h	Logical Unit Communication - SNA ISP Reset
08h	B3h	Logical Unit Communication - SNA ISP Data Overrun
08h	B4h	Logical Unit Communication - SNA ISP Queue Full

Table 16 Vendor Unique Additional Sense Code and Qualifiers (Continued)

ASC	ASCQ	Description
08h	B5h	Logical Unit Communication - Port Unavailable
08h	B6h	Logical Unit Communication - Port Logged Out
08h	B7h	Logical Unit Communication - Port Configuration Changed

B

Glossary

This glossary consists of terms that can be used when describing the SNC and the Scalar libraries that you may have in your SAN.

AMC (ADIC Management Console)

Client-server software. The AMC server is used to manage the SAN and the library. It has two clients, the the AMC client (which manages the SAN) and the LMC client (which manages the Scalar i2000).

ATAC

ADIC Technical Assistance Center. The ADIC customer help desk.

Blade

A printed circuit board, especially a board-level component of the Scalar 12000 or the Pathlight VX, that is responsible for the data interface between hosts and storage devices. See also FCB.

Channel zoning

A method of subdividing a SAN into disjoint zones on a per-channel basis in order to enhance security and qualify access.

CLI (Command Line Interface)

A means of communicating directly with the firmware, generally by means of a service terminal connected to the RS232 port.

Community strings

Statements describing administrative relationships between SNMP agents and community members.

Data path

One of the many possible paths that data can move over in the SAN environment, potentially involving many components or connections between initiators and targets that have been massaged since the initial configuration occurred.

DNS (Domain Name Service)

A service that translates domain names into IP addresses.

Event

A condition that matches a numbered, predefined set of circumstances. The AMC client can be configured to display events at specified severity levels and to generate traps (also called “event traps”) for specified occurrences.

Event log

A list of all pre-defined events logged by the AMC server, whether or not the AMC client has been configured to display these events to the user.

eVPS (extended Virtual Private SAN)

A virtual LUN mapping scheme for Fibre Channel hosts that runs on the SNC. It allows each host to see the LUN map as if the LUN map began at “1”, subject to an overall device total of 2048, and a per-host device total of 256. Refer to FC Host.

FC Host

A virtual LUN mapping scheme for Fibre Channel hosts that runs on the MCB. It allows each host to see the LUN map as if the LUN map began at “1”, subject to an overall device total of 2048, and a per-host device total of 256. Refer to eVPS.

FC (Fibre Channel)

A high speed data transfer architecture. Using optical fibre to connect devices, Fibre Channel communications are serial communications that occur at full duplex and achieve data transfer rates of 200 MBps.

FCB (Fibre Channel blade)

A board-level component of the Scalar 12000 or the Pathlight VX that is responsible for the data interface between hosts and storage devices.

Graphical panel

The upper right quadrant of the AMC window, where configuration information is displayed in graphical format.

Health check

An AMC feature that provides predictive alerts, warning of any loss of connectivity or device failure using local or remote alerts. Health check allows administrators to correct faults before they affect backup or other data transfer operations.

Host initiator

A host bus adapter that provides the host with a Fibre Channel port capable of initiating SCSI commands at the host’s request.

HRS (Host Registration Service)

Software that presents host information the AMC server uses to manage host access and data retrieval. This information includes host name, host type, host connection and the online or offline status.

I/O blade

A board-level component of the Scalar 12000 or the Pathlight VX that is responsible for the data interface between hosts and storage devices. See FCB.

IP (Internet Protocol)

A protocol that specifies the formats of packets and addresses. Addresses are formulated as dotted quads, for example, 123.456.789.123.

Library

An ADIC tape library product including the Scalar 24, Scalar 100, Scalar 1000, Scalar 10K, and Scalar i2000.

LMC (Library Management Console)

LMC is the management software for the Scalar i2000 library that runs on that library’s touch screen. It can also run remotely if there is a Scalar i2000 in the SAN. It is client software that communicates with the AMC server.

LUN (Logical Unit Number)

A unique identifier used on a SCSI bus to distinguish between devices that share the same bus. SCSI is a parallel interface that allows up to eight devices (target IDs) to be connected along a single cable. Each of these eight devices has access to 16 unique address spaces (LUNs). A specified intersection of target ID and target LUN can be construed as the Assigned LUN.

Mac address

An IEEE-defined globally unique address for Ethernet controllers. Short for “Universal LAN MAC Address.”

MAP (Maintenance Action Plan)

A CLI routine that guide a user through troubleshooting system or component error.

MCB (Management Control Blade)

A PCB that passes commands to and from the robotics control unit as well as to SAN components in order to manage the Scalar i2000 intelligent library. All control modules have an MCB. No expansion module has an MCB.

MIB (Management Information Base)

A database of objects that can be monitored by SNMP or other database management system.

NDMP

Network Data Management Protocol

NVRAM (Non-Volatile Random Access memory)

A type of memory that retains its contents when power is turned off.

Organizationally unique identifier

A number assigned to organizations by a recognized naming authority. It is part of the world wide name.

PCB (Printed Circuit Board)

A thin plate on which chips and other electronic components are placed. A board. A blade.

PIP (Power and Identification Processor)

A chip on an I/O blade.

POST (Power On Self Test)

A diagnostic testing sequence run by the SNC or MCB BIOS (basic input/output system) when the power is initially turned on.

Point to Point

A Fibre Channel topology.

SAN (Storage Area Network)

A SAN is a dedicated, high-performance network whose primary purpose is the transfer of data along FC or high-speed Ethernet connections between servers, interconnect devices, and storage peripherals.

SCSI (Small Computer System Interface)

A parallel interface standard.

SCSI Host

A virtual LUN mapping scheme for SCSI-attached hosts, allowing an overall LUN total of 256 devices to be virtually remapped. For Scalar libraries other than the Scalar i2000, called VPM.

SFM (Scalar Firewall Manager)

A virtual LUN mapping scheme for Fibre Channel hosts, allowing an overall LUN total of 2048 devices to be virtually remapped on a SAN-wide basis.

SNC (Storage Networking Controller)

ADIC term for a storage networking appliance. The SNC enables high-performance, networked communications that support intelligence functionality within the Scalar storage system. For the Scalar i2000, SNC functions are carried out by the MCB.

SNMP (Simple Network Management Protocol)

SNMP is the protocol governing network management and the monitoring of network devices and their functions.

Target ID

SCSI bus address. Refer also to LUN.

Trap

An SNMP alert that is sent to the AMC client when predefined conditions are met.

VPM (Virtual Private MAP)

A virtual LUN mapping scheme for SCSI-attached hosts, allowing an overall LUN total of 256 devices to be virtually remapped.

WWN (World Wide Name)

A unique number assigned by a recognized naming authority. The WWN is integral to Fibre Channel operations.

Index

P

R

S

T

U

V

W