QLOGIC

Simplify

SANsurfer FC HBA CLI User's Guide

Command Line Interface for QLogic Fibre Channel Host Bus Adapters

Information furnished in this manual is believed to be accurate and reliable. However, QLogic Corporation assumes no responsibility for its use, nor for any infringements of patents or other rights of third parties which may result from its use. QLogic Corporation reserves the right to change product specifications at any time without notice. Applications described in this document for any of these products are for illustrative purposes only. QLogic Corporation makes no representation nor warranty that such applications are suitable for the specified use without further testing or modification. QLogic Corporation assumes no responsibility for any errors that may appear in this document.

Document Revision History	
Revision A, August 20, 2004	
Revision B, September 28, 2005	
Revision C, June 7, 2006	
Revision D, October 1, 2006	
Revision E, February 1, 2007	
Revision F, February 2008	
Changes	**Sections Affected**
Revision F Changes:	
Changed *NVRAM* to *HBA Parameters*.	All
Changed *Option ROM* to *Flash*.	All

First Published: March 2004

QLogic Corporation, 26650 Aliso Viejo Parkway, Aliso Viejo, CA 92656, (800) 662-4471 or (949) 389-6000

Changed *HBA No*. to *HBA Instance*.	All
Changed *SFF DMI* to *HBA transceiver details*.	All
Updated supported QLogic HBA list.	Section 1.3
Updated supported operating system list.	Section 1.4
All non-interactive information moved from Section 4 to Section 5.	Section 4, Section 5
Command line options put in alphabetical order.	Table 2-1, Section 4
Added Appendix B: XML Format 2.	Appendix B
Added port virtualization (NPIV) information.	Section 4.14, Section 5.3.33
Added support for Red Hat Linux REL 5.1.	Section 3.2.2
Removed installation/uninstallation instructions for Solaris SPARC 6 and 7.	Section 3.2.3
Added NPIV information.	Section 4.14.1
Added OS LUN Name (Solaris and Linux).	Section 4.4
Added guide overview section, including a description of what's in the guide and documentation conventions used.	Section 1.2
Added interactive mode exit codes listing.	Appendix C
Moved tables other than help commands from Help Commands appendix to appropriate interactive commands sections.	Section 4
Expanded iiDMA settings information.	Section 4.5
Added Virtual Menu information.	Section 4.14
Expanded HBA parameter templates information.	Section 4.10.5
Expanded diagnostic testing information.	Section 4.12
Revision E Changes:	
Expanded product description.	Section 1.1
Split supported HBAs and operating systems into two sections. Updated list of supported operating systems.	Section 1.3, Section 1.4
Added system requirements section.	Section 1.5

Changed bullets describing interactive and non-interactive modes.	Section 2.2, Section 2.3
Clarified the note about starting SANsurfer FC HBA CLI on a Solaris console serial port.	Section 2.2
Added Macintosh column to Table 2-1.	Section 2.3
Added support for Linux IOCTL module driver and driver on the OS installation CD (inbox driver).	Section 3, Section 4, Section 5
Split Windows command line installation into two sections (standard and silent). Changed installation instructions. Added new parameters to command line for silent installation.	Section 3.2.1.2
Split Solaris installation and uninstallation into three sections: Solaris SPARC 6 and 7 Solaris SPARC 8, 9, 10 Solaris x86 8, 9, 10	 (These Solaris versions no longer supported.) Section 3.2.3.1, Section 3.3.3.1 Section 3.2.3.2, Section 3.3.3.2
Added Mac OS X command line installation instructions.	Section 3.2.4.2
In Windows uninstall (standard), added how to invoke the exe package and remove the installed features.	Section 3.3.1.1
In Windows uninstall (command line), changed the uninstall directions.	Section 3.3.1.2
Added Mac OS X instructions to manually uninstall the package.	Section 3.3.4
Replaced node name, port name, WWPN, and WWNN with variables (*xx*) in screen shots for security purposes.	Section 4
Added a note to Display LUN List and Selective LUNs sections defining the maximum number of LUNs supported by the Solaris QLA and QLC drivers.	Section 4.7
Added text to the Target Persistent Binding section defining the number of targets and the range of target IDs for Solaris, which is based in the HBA type.	Section 4.6, Section 4.6.2
Changed Boot Device Selection to Boot Device *Settings*.	Section 4.8

Expanded Save/Update Flash section to list which OSs and HBAs save/update flash, BIOS, or the option ROM image.	Section 4.10
Added description and preparation instructions for loopback and read/write buffer tests. Added description of these test results.	Section 4.12.1.1, Section 4.12.2
The following options and commands were added in Rev. E:	
Host Topology (command line option -tp)	Section 4.1.2, Section 5.3.31
HBA Alias (command line option -ha)	Section 4.2.1.2, Section 5.3.14
HBA Port Alias (command line option -pa)	Section 4.2.1.3, Section 5.3.25
SFF DMI (command line option -dm)	Section 4.12, Section 5.3.5
The following options and commands were changed in Rev. E:	
Host Information (command line option -g): removed QLogic direct driver version from the list of displayed information.	Section 4.2.1
For Host Configuration (command line option -z), made the following changes to the list of displayed information:	Section 4.2
Added VPD information to display HBA information (command line option -I).	
Added view driver settings (command line option -fg).	
Removed run loopback test (command line option -kl).	
Removed run read/write test (command line option -kr).	
Removed display and change HBA statistics (command line option -gs).	
Removed display and change link status (command line option -ls).	
Also changed the list order to reflect the order in which the commands are displayed.	
Show HBA Information (command line option -i):	Section 4.2, Section 4.3.1
Added HBA Alias and Port Alias to list of shown information.	
Changed *PCI bus number* to *PCI device number*.	
Show Device List (command line option -t): added Serial Number to the list of displayed information.	4.5, 4.4.1

Configure HBA Settings (-n): added option to restore the BIOS (QLA/QLE/QEM24*xx* HBAs).	4.7.1, Section 5.3.22
Selective LUNs (command line option -m): added ALL option to command line to view all selective LUNs for all HBA ports.	4.8.1.2, Section 5.3.21
Set Boot Device (-e): removed references to OSs from the third paragraph; this command now applies to all OSs.	4.9.2.1.1
Diagnostics (command line options -kl and -dr): DataPattern (DP) parameter: added CRPAT, CSPAT, and CJTPAT. DataSize (DS) parameter: added 128-byte value for read/write buffer test. Added 128, 256, 512, 1024, 2048, 4096, 8192, 16384, 32768, 65535 byte values for loopback test. Added default values. TestCount (TC) parameter: changed the number of loopback tests that can be run from 0–10000 to 0–65535. TestIncrement (TI) parameter: increased test increment for the loopback test from 1–10000 to 1–65535.	4.17.1.2.1, 5.3.17 4.17.1.2.2, Table 5-5 4.17.1.2.3, Table 5-5 4.17.1.2.4, Table 5-5
Output in XML Format (command line option -x): Added XML format for HBA alias (command line option -ha). Added XML format for HBA port alias (command line option -pa). Added XML format for SFF DMI (command line option -dm). Added XML format for host topology (command line option -tp).	Section 5.3.34 Section 5.3.14 Section 5.3.25 Section 5.3.5 Section 5.3.31
Target Persistent Binding (command line option -p): added ALL parameter to show target persistent binding information for all HBA ports.	Section 5.3.24

Revision D Changes:	
Operating systems supported: Windows 2003 Server™ and Enterprise Server: added x64; removed IEM64T and AMD64. Added Windows® XP. Red Hat™ Linux® AS: added x86_64; removed IEM64T and AMD64. SuSE® Linux Enterprise Server (SLES) 8 and 9: added x86_64; removed IEM64T and AMD64. Removed Power PC (PPC) SLES 8 and 9. Solaris® SPARC®: removed v2.7; added version 7. Solaris: removed 9 x86 and 10 x86; added x86, v2.9, 10.	All
Removed the sentence "SANsurfer FC HBA CLI does not provide any features that require a GUI."	Section 1
Added QEM2462 and QLA/QLE2*xx* to list of supported HBAs.	Section 1
Changed standard (GUI) install instructions for Windows operating systems.	3.1.1.1
Changed package name version to *xx*, which indicates the current version of SANsurfer FC HBA CLI.	3.1.1.2, 3.1.3.1, 3.12.3.3
Changed step 1 of the Mac OX installation procedure. Removed the steps to create the root user, log out of the current user account, and log into the root user (previously steps 2, 3, 4).	3.1.4
Changed WWPN in example text to generic *xx* for consistency.	Section 4
Changed name of Show System Information submenus.	4.2.1, 4.2.2, 4.2.4, 4.2.5
Changed name of Boot Device to Boot Device *Selection* in interactive mode.	4.10
HBA Parameters (Table 4-2, Table 6-12): Changed value of ResetDelay, ExecutionThrottle, and LinkDownTimeOut parameters. Added (QLA/QLE23xx HBAs) quantifier to EnableExtended Logging and EnableLIPFullLogin parameters.	4.6.1.2, Table 5-9
Added a list of valid data patterns for the DataPattern diagnostic parameter (Table 4-4, Table 5-6).	4.17.1.2.1, Table 5-6

The following options and commands were changed in Rev. D:	
Interactive mode commands: Changed instructions and the example text to new port sorting and numbering scheme. No change to command function.	
Non-interactive mode commands: Changed the `HBA Port No.` parameter to `HBA No.` parameter to support new port sorting and numbering scheme. No change to command function.	
Display HBA Settings (-c)	4.3, 5.3.3
DisplayHBA Information (-i)	4.4, 5.3.1
Display Device List (-t)	5 4.5, 5
Display LUN List (-l)	4.6, 5
Configure HBA Settings (-n)	4.7, 5
Target Persistent Binding (-p)	4.8, 5
Selective LUNs (-m)	4.9, 5
Boot Device Selection (-e)	4.10, 5
Driver Settings (-fs)	4.11, 5
View Driver Settings (-fg)	4.12, 5
Save/Update Flash (-b)	4.12, 5
Save/Update NVRAM (-r)	4.11, 5
Flash HBA Beacon (-a and -tb)	4.16, 5
Diagnostics (-kl and -kr)	4.17, 5
Statistics (-gs and -ls)	4.18, 5
Host Information (-g):	4.2.1, 4.2.4
Quantified that the direct driver version is only displayed in Windows. No longer shows firmware version. Shows new HBA number (HBA 0–n)	
Display HBA Information (-I).	4.4, 5.4.8
The following new general information shows:	
HBA instance, HBA ID, OptionROM BIOS version, OptionROM FCode version, OptionROM EFI version, OptionROM firmware version, total number of devices.	
The following general information has been removed: Device target count	
The following VPD information has been removed: Asset tag End tag	

Display LUN List (-l): In interactive mode, added target type to information displayed. Removed asset tag and end tag from list of VPD information. In example text, changed the first two option names of the Selective LUN(s) Display Configuration menu. In example text, changed the first two option names of the Selective LUN(s) Configuration - HBA/Device menu.	4.6
Boot Device Selection (-eE): In interactive mode, added new HBA Boot Device menu to example text.	4.10, 5.3.6
Target Persistent Binding (-p): In interactive mode, changed first two option names of Target Persistent Binding menu in the example text.	4.8, 5.9
Driver Settings (-fs): Changed from bind By WWPN to bind by Port ID.	4.11
Save/Update Flash (-b): In interactive mode, removed secondary subtitles of Option ROM Update menu in the example text. In non-interactive mode, added new `all` parameter following the `boot` parameter.	4.12, 5.3.2
Save/Update NVRAM (-r): In interactive mode, removed the secondary subtitles of the NVRAM Update Menu in the example text.	4.11

Notes

Table of Contents

Section 4 Interactive Commands

Appendix A XML Format 1

Appendix B XML Format 2

List of Figures

List of Tables

Notes

Section 1
Introduction

1.1 Product Overview

The SANsurfer® FC HBA CLI tool provides a command line interface (CLI) that lets you easily install, configure, and deploy QLogic® Fibre Channel (FC) host bus adapters (HBAs). It also provides robust diagnostic and troubleshooting capabilities and useful statistical information to optimize SAN performance. This tool only configures HBAs on the local machine (where SANsurfer FC HBA CLI is installed.)

SANsurfer FC HBA CLI is a simplified, condensed version of the SANsurfer FC HBA Manager graphical user interface (GUI).

SANsurfer FC HBA CLI can be operated in two modes:

- **Interactive mode** (menu-driven interface). This mode requires user intervention.
- **Non-interactive mode** (command line interface). Use this mode for scripting or when you want to do a single operation.

NOTE:

This guide uses interchangeably the terms *HBA* and *adapter*.

1.2 Guide Overview

This guide is intended for end users responsible for administration of QLogic FC HBAs.

1.2.1 How this Guide is Organized

The *SANsurfer FC HBA CLI User's Guide* is organized into the following sections and appendices:

Section 1 Introduction: This section provides a general overview of the product, lists the supported QLogic HBAs and operating systems, lists the system hardware and software requirements, and provides contact information for technical support.

Section 2 Getting Started: This section describes the two modes used in SANsurfer FC HBA CLI: *interactive* and *non-interactive*. It also explains some special terms used in this guide.

Section 3 Initial Installation: This section provides step-by-step instructions for installing and uninstalling SANsurfer FC HBA CLI on Windows, Linux, Solaris, and Macintosh.

Section 4 Interactive Commands: This section provides detailed explanations and examples of the command line options used in interactive mode.

Section 5 Non-interactive Commands: This section provides detailed explanations and examples of the command line options used in non-interactive mode.

Appendix A XML Format 1: This appendix provides explanations and examples of XML files created with the `-x1` command line option.

Appendix B XML Format 2: This appendix provides explanations and examples of XML files created with the `-x2` command line option.

Appendix C Interactive Exit Codes: This appendix lists the exit codes that can occur while running SANsurfer FC HBA CLI in interactive mode. For each exit code number, it provides the name and description.

Appendix D Non-interactive Error Codes: This appendix lists the error codes that can occur while running SANsurfer FC HBA CLI in interactive mode. For each error code number, it provides the name and description.

Appendix E Help Commands: This appendix provides an alphabetical list of the command line actions, arguments, and functions of the help commands.

Following the appendices are a glossary of terms used and an index that will help you quickly find the information you need.

1.2.2 Documentation Conventions

This guide uses the following documentation conventions:

- Text in **bold font** indicates a menu item, dialog box, tab, button, or check box in the user interface. For example:

  From the **General Information Menu**, type the number for **Host Topology**.

- Text in a sans serif font (`Courier New`) indicates CLI window text output. For example:

  ```
  The HBA already has the device selected as boot device.
  ```

- Text in a bold sans serif font (**`Courier New`**) indicates user input (what you type). For example:

```
# scli -z
```

- Text in ALL CAPITALS usually indicates the name of a key that you press on the keyboard. For example:

  Type the number for Host Information and then press ENTER.

- *Italicized* text indicates either a document reference, glossary term, or emphasis. For example:

  Attached Port means a QLogic HBA....

  For a complete list, see the *QLogic SAN Interoperability Guide*.

- Italicized text within angle brackets indicates user-defined variables. For example:

  ```
  # scli -k (<HBA Instance> | <HBA WWPN>)
  ```

- Text shown in blue indicates a cross-reference hyperlink to a Web site or to another section of this guide. Click the hyperlink to jump to that site or section. For example:

  Visit the QLogic support Web site at support.qlogic.com for the latest firmware and product updates.

  For information on Vital Product Data (VPD), see section 4.2.1.4.

- In Section 4 Interactive Commands, a “breadcrumbs” line follows most command headings to show you how to access that option; that is, it shows the hierarchical path from the top level to the command under discussion. For example, to reach the **Save to Text File** options from the main SANsurfer FC HBA CLI menu, you would select option **1** to open the **General Information** menu, **2** to open the **Host Topology** menu, and **2** again to see the **Save to Text File** options. The following shows a breadcrumbs example:

  1: General Information ▶ 2: Host Topology ▶ 2: Save to Text File

1.3 Supported QLogic HBAs

SANsurfer FC HBA CLI is supported for the following QLogic HBAs:

- QLA234*x*
- QLA2*xx*
- QLE2*xx*
- QLE246*x*
- QLA246*x*
- QLE256*x*

1.4 Supported Operating Systems

SANsurfer FC HBA CLI is supported on the following operating systems:

- Microsoft® Windows®
  - Windows 2000/SP4 Server and Advanced Server
  - Windows 2003 SP2 IA-32/IA-64/x64 Server and Enterprise Server (SP2)
  - Windows XP IA-32/x64 (SP1, 2)
  - Windows Vista® IA-32/x64
  - Windows 2008 Server IA-32/IA-64/x64
- Linux®
  - Red Hat® Enterprise Linux (RHEL) 3.0 IA-32, IA-64, and x86_64 Update 8, 9
  - RHEL 4.0 IA-32, IA-64, and x86_64 Update 5, 6
  - RHEL 5.0 IA-32, IA-64, and x86_64 Update 0, 1
  - SuSE® Linux Enterprise Server (SLES) 8 IA-32, IA64, and x86_64 versions SP 3, 4
  - SLES 9 IA-32, IA64, and x86_64 versions SP 3, 4
  - SLES 10 IA-32, IA64, and x86_64 versions SP 0, 1

  NOTE:

  RHEL 3.0 and SLES 8 do not support 8Gb.

- Solaris®
  - Solaris SPARC 2.8/9/10 (with latest patches)

- Solaris x86 9/10 (with latest patches)

- Apple® Macintosh®
  - Mac OS® X 10.3.x (PowerPC® (PPC)), 10.4.x (PPC/Intel), and 1.5.x (PPC/Intel)

- VMware®
  - VMware ESX Server 3.5

NOTE:

VMware does not support 8Gb.

NOTE:

Throughout this guide, the terms Windows, Linux, Solaris, and Macintosh refer to all the respective supported operating systems unless otherwise noted.

1.5 System Requirements

The hardware and software requirements for SANsurfer FC HBA CLI are described in the following sections.

1.5.1 Hardware Requirements

The minimum hardware requirements are as follows:

- QLogic HBAs (see section 1.3).
- Single- or multiprocessor server or workstation:
  - Pentium® III with 450 MHz or greater for Windows 2000, Windows Server 2003, Windows XP Professional, Linux, and Solaris.
  - Windows Vista and Windows Server 2008—Use the minimum requirements from Microsoft.
  - Power Mac® G5 1.8 MHz or greater with 512 MB of memory.
  - FC devices, such as disks and RAID subsystems.
  - QLogic FC HBAs.

SANsurfer FC HBA CLI supports most FC devices. For a complete list of devices that support failover, see the *QLogic SAN Interoperability Guide*, which you can download from the QLogic Web site, www.qlogic.com/interopguide/info.asp#inter.

NOTE:

Tape devices are shown as part of the configuration, but are *not* fully supported by SANsurfer FC HBA CLI. Only persistent binding and LUN masking are available.

- 256 MB physical RAM are required to run SANsurfer FC HBA CLI; running with less memory can cause disk swapping (“paging” or “paging out”), which severely affects performance.
- Video card capable of 256 colors and a screen resolution of 800x600 pixels.
- About 7 MB of disk space.

1.5.2 Software Requirements

The minimum software requirements are as follows:

- QLogic drivers for your OS platform.
- Administrative privileges to do management functions.
- One of the operating systems listed in section 1.4.

1.5.2.1 Unsupported Features

Depending on your system, not all SANsurfer FC HBA features are available.

1.5.2.1.1 Features Not Available When Running Windows Driver with NPIV Enabled

When running the driver with NPIV enabled on Windows, the following features are not available with virtual port:

- HBA parameters settings
- HBA parameters restore default
- Flash update from file
- Flash save to file
- HBA parameters update from file
- HBA parameters save to file
- HBA parameters update from templates
- Target link speed
- Boot device settings
- Driver settings
- HBA beacon
- Target/LUN list

1.5.2.1.2
Features Not Available When Running ioctl Module Driver

When running the input/output control (ioctl) module driver on a Linux OS, the following features are not available:

- Persistent binding
- Selective LUN
- HBA port statistics
- Driver settings
- Host topology

1.5.2.1.3
Features Not Available When Running Sysfs Inbox Driver

When running the Sysfs Inbox driver on a Linux OS, the following features are not available:

- Persistent binding
- Selective LUN
- HBA port statistics
- Driver settings
- Host topology
- Link status
- Loopback test

1.5.2.1.4
Features Not Available When Running VMware Driver

When running the VMware driver on a Linux OS, the following features are not available with virtual ports:

- HBA parameters settings
- HBA parameters restore default
- Flash update from file
- Flash save to file
- HBA parameters update from file
- HBA parameters save to file
- HBA parameters update from templates

1.6
Technical Support

Customers should contact their authorized maintenance provider for technical support of their QLogic HBA products. QLogic-direct customers may contact QLogic Technical Support; others will be redirected to their authorized maintenance provider.

Visit the QLogic support Web site at: support.qlogic.com for the latest firmware and product updates.

1.6.1 Availability

QLogic Technical Support for products under warranty is available during local standard working hours excluding QLogic Observed Holidays.

1.6.2 Training

QLogic offers certification training for the technical professional for both the QLogic FC HBAs and switches. From the training link at www.qlogic.com, you may choose Electronic-based Training or schedule an intensive “hands-on” Certification course.

Technical Certification courses include installation, maintenance, and troubleshooting QLogic SAN products. Upon demonstrating knowledge using live equipment, QLogic awards a certificate identifying the student as a Certified Professional. The training professionals at QLogic may be reached by e-mail at tech.training@qlogic.com.

1.7 Contact Information

Support Headquarters	QLogic Corporation 4601 Dean Lakes Blvd. Shakopee, MN 55379 USA
QLogic Web Site	www.qlogic.com
Technical Support Web Site	support.qlogic.com
Technical Support E-mail	support@qlogic.com
Technical Training E-mail	tech.training@qlogic.com
North American Region	
E-mail	support@qlogic.com
Phone	+1 952-932-4040
Fax	+1 952-974-4910

Europe, Middle East, and Africa Region	
E-mail	emeasupport@qlogic.com
Phone Numbers by Language	+353 1 6924960 – English +353 1 6924961 – Français +353 1 6924962 – Deutsch +353 1 6924963 – Español +353 1 6924964 – Português +353 1 6924965 – Italiano
Asia Pacific Region	
E-mail	apacsupport@qlogic.com
Phone Numbers by Language	+63-2-885-6712 – English +63-2-885-6713 – (Mandarin) +63-2-885-6714 – (Japanese) +63-2-885-6715 – (Korean)
Latin and South America Region	
E-mail	calasupport@qlogic.com
Phone Numbers by Language	+52 55 5278 7016 – English +52 55 5278 7017 – Español +52 55 5278 7015 – Português

Notes

Section 2
Getting Started

2.1 Introduction

SANsurfer FC HBA CLI operates in two modes:

- **Interactive** (menu-driven). The CLI starts, and then waits for and executes input commands until terminated by the user. Use this mode to do multiple operations. Section 4 Interactive Commands covers this interface.
- **Non-interactive** (command line). The CLI starts, does the functions defined by the list of parameters provided, and then terminates. Use this mode to run SANsurfer FC HBA CLI from a script file or when you want to do a single operation. Section 5 Non-interactive Commands covers this interface.

SANsurfer FC HBA CLIis *not* case sensitive in either mode. However, file names in some operating systems are case sensitive; in this case, SANsurfer FC HBA CLI *is* case sensitive for that specific file.

2.2 Starting Interactive Mode

To start SANsurfer FC HBA CLI in interactive mode, use one of these methods:

- For Windows, click the SANsurfer FC CLI icon on the desktop.
- For Linux or Solaris, open a command window and type:

  ```
  scli INT
  ```

  – Or –

  ```
  scli
  ```

NOTE:

When starting SANsurfer FC HBA CLI from a Solaris console serial port connection, the CLI may take a long time to come up. To resolve this issue, specify the `INT` flag, as shown in the preceding bullet.

- For Mac OS X, follow these steps:
  1. Double-click the SANsurfer FC HBA CLI (SCLI) icon.
  2. A terminal window opens. SCLI (interactive mode) scans the host for QLogic HBAs and SAN storage.

3. Run SCLI commands as required.
4. When finished, return to the main menu, and type `the indicated number` to quit SANsurfer FC HBA CLI.
5. Close the terminal window.

The **Main Menu** appears as shown in the following:

```
    SANsurfer FC HBA CLI
    v1.x.x Build xx

Main Menu

    1: General Information
    2: HBA Information
    3: HBA Parameters
    4: Target/LUN List
    5: Target Link Speed   or 5: iiDMA Settings
    6: Target Persistent Bindings
    7: Selective LUNs
    8: Boot Device
    9: Driver Settings
   10: Utilities
   11: Beacon
   12: Diagnostics
   13: Statistics
   14: Help                or 14: Virtual (if available)
   15: Exit                or 15: Help
                           or 16: Exit
```

NOTE:

The **Virtual** menu is available only on Windows systems running with a driver that supports NPIV (N_Port ID Virtualization).

Depending on which menu you select, may prompt you for more input. For example, if you select **HBA Parameters**, SANsurfer FC HBA CLI prompts you for the port number that corresponds to the HBA model you want to view.

NOTES:

- The **Driver Update** option under **Utilities** (option 10) is only available on Windows.
- In Solaris SPARC, the option to **Save/Update BIOS** is **Save/Update FCode**.

2.3 Starting Non-interactive Mode

To start SANsurfer FC HBA CLI in non-interactive mode, type the following in a command window:

```
scli <Parameters>
```

SANsurfer FC HBA CLI executes the command options, then terminates.

To list all of the available command line parameters and the SANsurfer FC HBA CLI version, type the following:

```
scli -h
```

– Or –

```
scli -?
```

In Solaris SPARC, include double quotes around the view option (?) if the system is running with a csh or tsch shell. For example:

```
# scli -e 0 "?"
```

For world wide node name (WWNN), world wide port name (WWPN), and port ID parameter inputs, SANsurfer FC HBA CLI accepts the notation with and without the dash (–). Hexadecimal values can be uppercase or lowercase.

The following input formats are valid for the WWNN and WWPN:

```
20-00-00-E0-8B-01-83-C4 200000E08B0183C4
```

The following inputs are valid for the port ID:

```
68-5C-AB 685CAB
```

All command line options must be preceded by the dash (–) or forward slash (/) notation. Most options have a corresponding menu selection in interactive mode. The valid command line options are listed in Table 2-1.

Table 2-1. Non-interactive Mode Options

CLI Option	Interactive Menu (Windows)	Interactive Menu (Red Hat/SuSE Linux, Solaris SPARC)	Interactive Menu (Macintosh)	Description	Section
-a	11	11	11	Flash HBA beacon	5.3.1
-b	10	10	—	Save/update BIOS/FCode[a] [b]	5.3.2
-c	2	2	2	Show HBA settings	5.3.3
-d	10	—	10	Update driver	5.3.4
-dM	12	12	12	Transceiver details	5.3.5
-e	8	8	8	Boot device settings	5.3.6
-f	—	—	—	Input from a file	5.3.8
-fg	9	9	9	View Driver Settings	5.3.9
-fs	9	9	9	Driver Settings	5.3.10
–	10	10	10	HBA Utilities	—
-g	1	1	1	Show system information	5.3.11
-gs	13	13	13	HBA Statistics	5.3.12
-h	14	14	14	Show usage	5.3.13
-?	14	14	14	Show usage	
-ha	2	2	2	HBA alias	5.3.14
-i	2	2	2	Show HBA information	5.3.15
-kl	12	12	12	Loopback test	5.3.16
-kr	12	12	12	Read/write buffer test	5.3.18
-l	4	4	4	Show LUN list	5.3.19
-ls	13	13	13	Show Link Status	5.3.20
-m	7	7	7	Selective LUNs	5.3.21
-n	3	3	3	Configure HBA settings	5.3.22
-o	1	1	1	Output to a file	5.3.26
-P	6	6	6	Target persistent binding	5.3.241
-pa	2	2	2	HBA port alias	5.3.25

Table 2-1. Non-interactive Mode Options (Continued)

CLI Option	Interactive Menu (Windows)	Interactive Menu (Red Hat/SuSE Linux, Solaris SPARC)	Interactive Menu (Macintosh)	Description	Section
`-q`	5	5	5	Target link speed	5.3.26
`-r`	—	—	—	Save/update NVRAM	—
—	1	1	1	Refresh	—
—	15 (16)	15 (16)	15 (16)	Quit	—
`-s`	—	—	—	Silent mode	5.3.28
`-t`	4	4	4	Show device list	5.3.29
`-tb`	11	11	11	Flash target beacon	5.3.30
`-tp`	1	1	1	Show host topology	5.3.31
`-v`	—	—	—	Show version	5.3.32
`-x`	1	1	1	Output in XML format	5.3.34
`-z`	2	2	2	Show all information for one or all HBAs	5.3.36

[a] Windows, Linux, Solaris x86

[b] Solaris SPARC

Options that have a corresponding menu selection cannot be combined. That is, only one option is allowed in a single command. If multiple options are specified in a command, only the first one is processed. These options, however, can be combined with one or more options that do not have a corresponding menu selection, with the exception of `-F`.

For all command line options, SANsurfer FC HBA CLI shows the following when there are errors in the command line input:

```
Error <error message>
SANsurfer FC HBA CLI
v1.x.x Build xx
Copyright 2003-2007 QLogic Corp.
All rights reserved.
Command Line QLogic FC Host Bus Adapters

description of command entered
Usage: <current command use usage>
```

2.4 Terminology

Some of the terms used in this guide are similar and some have changed slightly as technology changes. The following definitions apply:

HBA Port

HBA Port refers to the actual physical port on an HBA. For example, a QLA2462 has two ports called *HBA port 1* and *HBA port 2*.

HBA Instance, HBA Instance number, or HBA Port Instance

When you install HBA in a system with other HBAs, *each* HBA port gets assigned a number by the driver or API so it knows which HBA to communicate with. This assigned number might be called *HBA Instance*, *HBA instance number*, or *HBA Port Instance*.

HBA Alias

When an alias is assigned to a physical HBA, no matter how many *ports* that HBA has, the HBA Alias refers to the HBA, not one of its ports.

Port Alias

You can also assign an alias to an individual port on an HBA. This Port Alias refers to only that port and none other.

Thus, an HBA can only have one HBA Alias, but each port on that HBA must, have a *unique* Port Alias.

Section 3
Initial Installation

Before you run SANsurfer FC HBA CLI, ensure that the following requirements are met:

- The HBAs must be installed.
- The HBA drivers must be installed.

NOTES:

Some SANsurfer FC HBA CLI features are not available when:

- You have a Solaris system that is running with the driver distributed with the OS installation CDs (QLC driver).
- You have a Linux system that is running with the ioctl or sysfs (inbox) driver.
- You have a Linux system that is running with a VMware driver.

3.1 Downloading the Installation Package

To download the SANsurfer FC HBA CLI installation package from the QLogic Web site, follow these steps:

1. From the QLogic home page (www.qlogic.com), click **Downloads** (on the left).
2. On the **Drivers Downloads / Manuals** page, click your HBA model.

   The **Resources** page for the selected model appears.
3. Under **Drivers, Management Tools and API Libraries**, click the appropriate operating system.
4. In the **Management Tools** table, go to the **SANsurfer CLI …** row and in the **Download** column, click **(Download)**.
5. The system shows the **End User License Agreement** box. Scroll to the bottom and click **Agree**.
6. Click **Save**. Select a directory on your system and download the file.

3.2 Installing SANsurfer FC HBA CLI

Follow the installation instructions in the section that corresponds to your operating system (OS):

- Windows—See section 3.2.1.
- Linux—See section 3.2.2.
- Solaris—See section 3.2.3.
- Macintosh—See section 3.2.4.

3.2.1 Windows Installation

To install SANsurfer FC HBA CL on Windows, follow either the GUI or command line installation steps:

- Standard (GUI) installation—See section 3.2.1.1.
- Command line installation—See section 3.2.1.2.

3.2.1.1 Standard (GUI) Installation

To install SANsurfer FC HBA CLI on a Windows operating system, follow these steps:

1. Locate and double-click the installer package. The **Preparing to Install** dialog box appears, as shown in Figure 3-1. The status bar indicates that the installation package is loading.

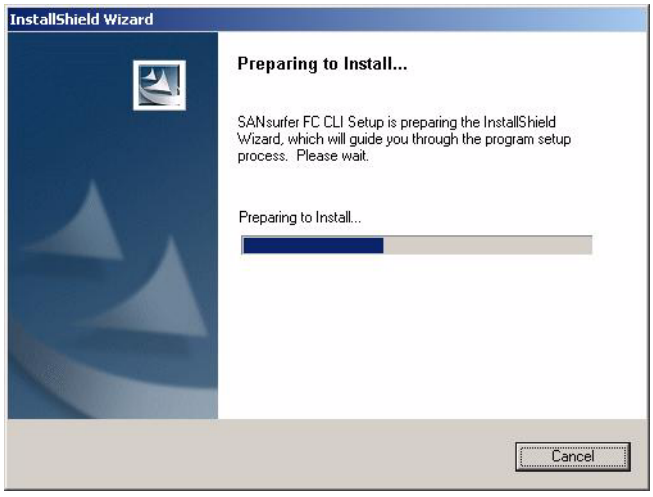

Figure 3-1 Preparing to Install Dialog Box

After the install package is loaded, the **Welcome** dialog box appears as shown in Figure 3-2.

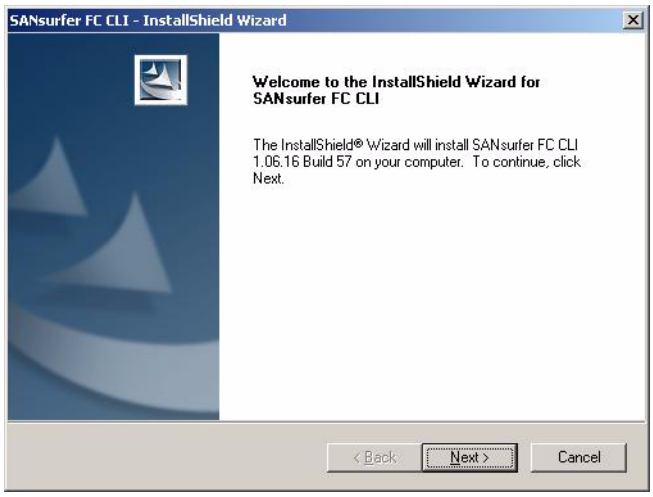

Figure 3-2 Welcome Dialog Box

2. Read the information, and then click **Next**.

   The **Choose Destination Location** dialog box appears as shown in Figure 3-3.

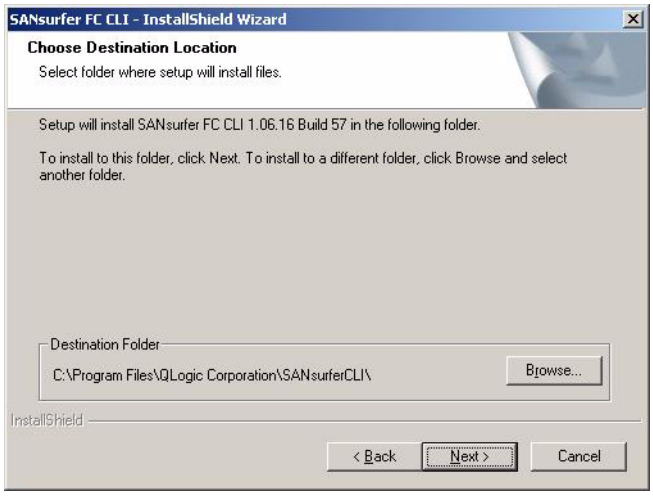

Figure 3-3 Choose Destination Location Dialog Box

3. In the **Choose Destination Location** dialog box, do one of the following:

   - ❑ To select the destination location in the dialog box, click **Next** (recommended). The default location for a Windows system is:

     `Program Files\QLogic Corporation\SANsurferCLI`

- ❑ To select a different location:
  a. Click **Browse**.
  b. Select an installation location.
  c. The **Choose Destination Location** dialog box reappears. Click **Next**.

The **Ready to Install the Program** dialog box appears as shown in Figure 3-4.

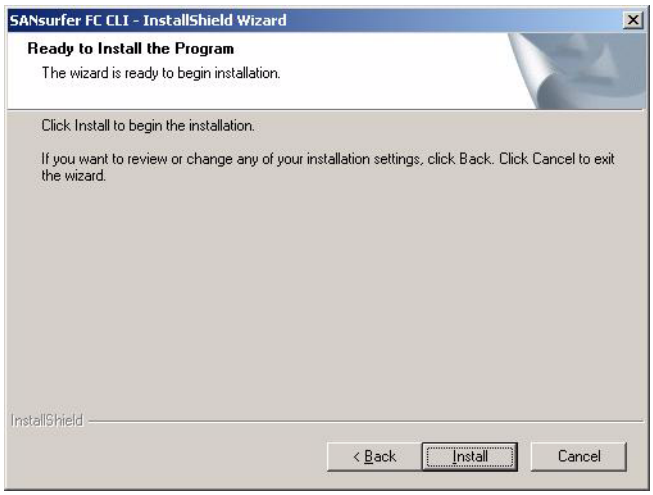

Figure 3-4 Ready to Install the Program Dialog Box

4. Read the information, and then click **Install**.

   The **Setup Status** dialog box appears as shown in Figure 3-5.

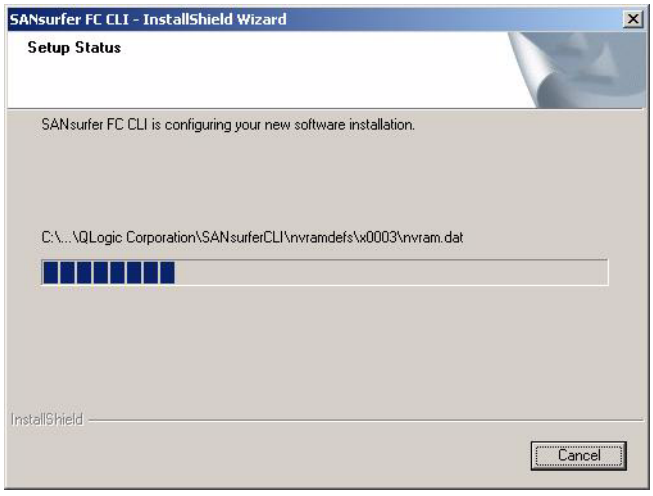

Figure 3-5 Setup Status Dialog Box

If you want to stop the installation, click **Cancel**.

The **InstallShield Wizard Complete** dialog box appears as shown in Figure 3-6.

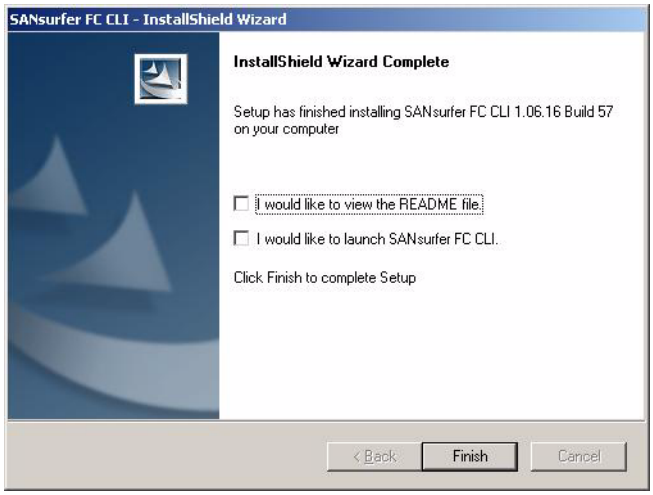

Figure 3-6 InstallShield Wizard Complete Dlalog Box

5. (Optional.) Select one of the following:
   - If you want to see more information about SANsurfer FC HBA CLI, select the **I would like to view the README file** check box.
   - If you want to start SANsurfer FC HBA CLI, select the **I would like to launch SANsurfer FC CLI** check box.
6. Click **Finish**.

3.2.1.2
Command Line Installation

To install SANsurfer FC HBA CLI using the command line installation, follow the steps for either standard or silent installation:

- Standard installation—See section 3.2.1.2.1
- Silent installation—See section 3.2.1.2.2

3.2.1.2.1
Standard Command Line Installation

Type the following text for a standard installation of SANsurfer FC HBA CLI on a Windows operating system, where *xx* indicates the version of SANsurfer FC HBA CLI:

```
scli-1.x.x.xx.windows.exe
```

By default, SANsurfer FC HBA CLI is installed in the following directory:

```
Program files\QLogic Corporation\SANsurferCLI
```

If you want to change the default location, enter the directory in the command line; for example:

`scli-1.x.x-xx.windows.exe installdir="c:\sansurfercli"`

3.2.1.2.2

Silent Command Line Installation

The command for a silent installation is the same as for a standard installation (see section 3.2.1.2.1), with the addition of the command parameters listed in Table 3-2. Examples using these parameters follow the table.

Table 3-2. Windows Command Line Installation Parameters

Parameter	Meaning	Description
`/r`	Record mode[a]	To run the SANsurfer FC HBA CLI installation package in silent mode, first run `scli-1.x.x-xx.windows.exe` with the `/r` parameter to generate a response file, which stores information about the data entered and options selected at run time. By default, the response file is created inside the system's Windows folder. To specify an alternative response file name and location, use the `/f1` parameter.
`/s`	Silent mode	For an InstallScript MSI or InstallScript project, the command `scli-1.x.x-xx.windows.exe /s` runs the installation in silent mode, based on the responses contained in the Setup.iss file, located in the same directory. (Response files are created by running Setup.exe with the `/r` option). To specify an alternative file name or location of the response file, use the `/f1` parameter.
`/f1`	Specify alternative response file name[a]	This parameter allows you to specify the name and location of the response file. The `/f1` parameter is available when creating a response file (with the `/r` option) and when using a response file (with the `/s` option).
`/f2`	Specify alternative log file name[a]	When running an InstallScript MSI or InstallScript installation in silent mode (using the `/s` parameter), the log file Setup.log is created in the same directory and with the same name (except for the extension) as the response file. The `/f2` parameter allows you to specify an alternative log file location and file name.

[a] InstallScript and InstallScript MSI projects only.

To create a response file for a silent installation of SANsurfer FC HBA CLI, enter the following:

scli-1.*x*.*x*-*xx*.windows.exe /r /f1"C:\Temp\install_1.iss"

To run the installation in silent mode with a log file, enter the following:

scli-1.*x*.*x*-*xx*.windows.exe /s /f1"C:\Temp\install_2.iss"

To run the installation in silent mode with an alternate file in a temporary directory, enter the following:

scli-1.x.x-xx.windows.exe /s /f1"C:\Temp\install_1.iss" /f2"C:\Temp\install_3.log"

NOTE:

After installing SANsurfer FC HBA CLI, you can create an uninstallation script for future use by creating a response file with a different name. For example:

scli-1.x.x-xx.windows.exe /r /f1"C:\Temp\uninstall.iss"

3.2.2 Linux Installation

To install SANsurfer FC HBA CLI on a Red Hat/SuSE Linux operating system, follow these steps:

1. Download the scli-*x.xx.xx*-xx.i386.rpm.gz file (from the QLogic Web site or the FC HBA Manager CD-ROM) to your local machine. In the file name, *x.xx.xx* stands for the current version of SANsurfer FC HBA CLI.
2. Uncompress the file with the following command:

   gunzip <*file name*>

3. Enter the following command to install the package:

   rpm -iv scli-*x.xx.xx*-*xx*.i386.rpm

   NOTE:

   For SuSE SLES IA64, the command line is:

   rpm --iv scli-*x.xx.xx*-*xx*.ia64.rpm --nodeps

The new package is installed in the following directory:

/opt/QLogic_Corporation/SANsurferCLI

To query for the installed SANsurfer FC HBA CLI package name, enter the following text from the command line:

```
rpm -q scli
```

3.2.3 Solaris Installation

To install SANsurfer FC HBA CLI on Solaris, follow the steps in one of these sections:

- Solaris SPARC 8, 9, 10—See section 3.2.3.1.
- Solaris x86 9 and 10—See section 3.2.3.2.

3.2.3.1 Solaris SPARC 8, 9, 10 Installation

Follow these steps to install SANsurfer FC HBA CLI on a Solaris SPARC 8, 9, or 10 operating system:

1. Download the `scli-x.xx.xx-xx.sparc.Solaris.pkg` file (from the QLogic Web site or the FC HBA Manager CD-ROM) to a temporary directory on your machine. For example:

   ```
   /tmp
   ```

   NOTE:

   In the file name, *x.xx.xx-xx* stands for the current version of SANsurfer FC HBA CLI. The *-xx* stands for the build version.

2. To see the available package file, type the following:

   ```
   # ls
   ```

   The available packages appear. For example:

   ```
   # scli-x.xx.xx-xx.sparc.Solaris.pkg
   ```

3. To install SANsurfer FC HBA CLI, type the following:

   ```
   # pkgadd -d scli-x.xx.xx-xx.sparc.Solaris.pkg
   ```

4. You are prompted to select a package. For example:

   ```
   The following packages are available:
   1 QLScli QLogic SANsurfer FC HBA CLI (HBA Configuration Utility)
         (sparc) x.xx.xx Build xx

   Select package(s) you wish to process (or 'all' to process all
   packages). (default: all) [?,??,q]:

   Enter 1 to proceed with the installation.
   ```

5. The pkgadd program does a series of checks, and then posts a script warning and asks whether to continue the installation. For example:

```
Processing package instance <QLScli> from
</space/chuynh/scli/qlogic/Solaris/pkgs/x>
QLogic SANsurfer FC CLI (HBA Configuration Utility) (sparc)
x.xx.xx Build xx
QLogic Corporation
## Executing checkinstall script.
Using </> as the package base directory.
## Processing package information.
## Processing system information.
39 package pathnames are already properly installed.
## Verifying disk space requirements.
## Checking for conflicts with packages already installed.
## Checking for setuid/setgid programs.
This package contains scripts which will be executed with
super-user permission during the process of installing this
package.
Do you want to continue with the installation of <QLScli>
[y,n,?]
To continue, type y, then press ENTER.
```

6. Messages appear showing what files have been installed. The system shows a final message when installation is complete. For example:

```
Installing QLogic SANsurfer FC CLI (HBA Configuration Utility)
as <QLScli>
## Installing part 1 of 1.
/opt/QLogic_Corporation/SANsurferCLI/adapters.properties
/opt/QLogic_Corporation/SANsurferCLI/libs/libqlsdm.so
/opt/QLogic_Corporation/SANsurferCLI/menu.properties
/opt/QLogic_Corporation/SANsurferCLI/nvramdefs/default/nvram2
2.dat
/opt/QLogic_Corporation/SANsurferCLI/nvramdefs/default/nvram2
3.dat
. . .
Installation of <QLScli> was successful.
```

3.2.3.2
Solaris x86 9 and 10 Installation

To install SANsurfer FC HBA CLI on a Solaris x86 9 or 10 operating system, follow these steps:

1. Download the `scli-`*`x.xx.xx-xx`*`.x86.Solaris.pkg` file (from the QLogic Web site or the FC HBA Manager CD-ROM) to a temporary directory on your machine. For example:

```
/tmp
```

NOTE:

In the file name, *x.xx.xx-xx* stands for the current version of SANsurfer FC HBA CLI. The *-xx* stands for the build version.

2. To uncompress the file, type the following:

```
# uncompress scli-x.xx.xx-xx.x86.Solaris.pkg
```

3. To see the available package file, type the following:

```
# ls
```

The available packages appear. For example:

```
# scli.x.xx.xx-xx.SPARC-X86.Solaris.pkg
```

4. To install SANsurfer FC HBA CLI, type the following:

```
# pkgadd -d scli-x.xx.xx-xx.SPARC-X86.Solaris.pkg
```

5. You are prompted to select a package. For example:

```
The following packages are available:
1 QLSclix QLogic SANsurfer FC HBA CLI (HBA Configuration Utility)
   (i386) x.xx.xx Build xx

Select package(s) you wish to process (or 'all' to process all
packages). (default: all) [?,??,q]: q

Enter 1 to proceed the installation.
```

6. Type the number that corresponds to your operating system, and then press ENTER.

The pkgadd program does a series of checks, posts a script warning, and asks whether to continue the installation. For example:

```
Processing package instance <QLSclix> from
</space/chuynh/scli/qlogic/Solaris/pkgs/x>
SANsurfer FC HBA CLI (HBA Configuration Utility) (sparc)
1.xx.xx (Build xx Solaris 8-10)
QLogic Corporation
## Executing checkinstall script.
## Processing package information.
## Processing system information. 3 package pathnames are
already properly installed.
## Verifying disk space requirements.
## Checking for conflicts with packages already installed.
## Checking for setuid/setgid programs.
.
.
```

```
.
[ verifying class <none>]
## Executing postinatall script.
Installation of <QLSclix> was successful.
```

3.2.4 Macintosh Installation

To install SANsurfer FC HBA CLI, follow either the standard GUI or command line installation method:

- Standard (GUI) installation—See section 3.2.4.1.
- Command line installation—See section 3.2.4.2.

3.2.4.1 Standard (GUI) Installation

Follow these steps to install SANsurfer FC HBA CLI on a Macintosh:

1. You must have Admin privileges to install SANsurfer FC HBA CLI. To verify/enable Admin privileges, go to **System Preferences**, select **Account**, and then **Security Tab**. Make sure the **Allow user to administer this computer** check box is selected.
2. Download the SCLI `zip` file with Safari™ or other browser.
3. When the download has finished, StuffIt® expands the `zip` file to a `tar` file onto the desktop.
4. Double-click the SCLI `tar` file icon to create the SCLI `pkg` file.
5. Double-click the SCLI `pkg` file icon.
6. Follow the **Installer** menu.

   The installation directory is:

   ```
   $HOME/Applications/QLogic_Corporation/SANsurferCLI
   ```

   where `$HOME` is Root.
7. After the installation process has finished, you can delete the SCLI `pkg` and `tar` files.

3.2.4.2 Command Line Installation

To install SANsurfer FC HBA CLI on a Macintosh, follow these steps:

1. Download the SCLI install package for Mac OS x (compressed tar file) to a local directory.
2. Uncompress the file by typing the following command:

```
tar -zxvf <file>.tgz
```

For example:

```
qlogic:~ root#tar -zxvf scli-x.x.x-x.macos.pkg.tgz
./scli-x.x.x-x.pkg/
./scli-x.x.x-x.pkg/Contents/
./scli-x.x.x-x.pkg/Contents/Archive.bom
./scli-x.x.x-x.pkg/Contents/Archive.pax.gz
...
...
```

This command extracts the compressed file to a directory named `scli-x.x.x-x.pkg`.

3. Install the package to the default directory. For example:

```
installer -pkg scli-x.x.x-x.pkg -target /
```

This command installs the product in the default `Applications` directory:

```
/var/root/Applications/QLogic_Corporation/SANsurferCLI
```

If this is the first time you are installing SANsurfer FC HBA CLI, the system shows the following messages:

```
qlogic:~ root# installer -pkg scli-x.x.x-x.pkg -target /
installer: Package name is SANsurfer FC HBA CLI x.x.x Build x
installer: Installing onto volume mounted at /.
installer: The install was successful.
```

If there is a previous version of SANsurfer FC HBA CLI on the system, the installer automatically runs an update operation. For example:

```
qlogic:~ root# installer -pkg scli-x.x.x-x.pkg -target /
installer: Package name is SANsurfer FC HBA CLI x.x.x Build x
installer: Upgrading volume mounted at /.
installer: The upgrade was successful.
```

3.3 Uninstalling SANsurfer FC HBA CLI

Refer to the following sections for the appropriate procedure to uninstall SANsurfer FC HBA CLI from your system:

- 3.3.1 Windows Uninstall
- 3.3.2 Linux Uninstall
- 3.3.3 Solaris Uninstall
- 3.3.4 Macintosh Uninstall

3.3.1
Windows Uninstall

To uninstall SANsurfer FC HBA CLI, use either the standard GUI or command line method:

- Standard (GUI) uninstall—See section 3.3.1.1
- Command line uninstall—See section 3.3.1.2

3.3.1.1
Standard (GUI) Uninstall

To uninstall SANsurfer FC HBA CLI using the GUI, do the following steps:

1. From the Control Panel, click **Add or Remove Programs**.
2. Highlight SANsurfer FC HBA CLI.
3. Click **Remove**. No re-boot is required.

Alternately, invoke `scli-1.x.x-xx.windows.exe` and select the option to **Remove** all installed features.

3.3.1.2
Command Line Uninstall

To uninstall SANsurfer FC HBA CLI using the command line, type the following:

```
scli-1.x.x-x.windows.exe /uninst /s
```

If you created an uninstall script in section 3.2.1.2.2, you can uninstall SANsurfer FC HBA CLI in silent mode by type the following:

```
scli-1.x.x-x.windows.exe /s /f1"C:\Temp\uninstall.iss"
```

3.3.2
Linux Uninstall

To uninstall SANsurfer FC HBA CLI, go to the command line and type one of the following commands, where *x.xx.xx* is the current version of CLI:

```
rpm -e scli-x.xx.xx-xx
rpm -e scli
```

To query for the installed SANsurfer FC HBA CLI package name, type the following text from the command line:

```
rpm -q scli
```

3.3.3
Solaris Uninstall

To uninstall SANsurfer FC HBA CLI, follow one of these procedures:

- Solaris SPARC 8, 9, 10—See section 3.3.3.1.
- Solaris x86 8, 9, 10—See section 3.3.3.2.

3.3.3.1 Solaris SPARC 8, 9, and 10 Uninstall

Follow these steps to uninstall SANsurfer FC HBA CLI:

1. Type the following to remove SANsurfer FC HBA CLI:

```
# pkgrm QLScli
```

2. The program shows the package name and a script warning asking whether to continue the uninstall process. For example:

```
The following package is currently installed:
QLScli   QLogic SANsurfer FC CLI (HBA Configuration Utility)
(sparc) 1.x.x Build xx
Do you want to remove this package?
```

3. Type **y** and press ENTER. The program shows a script warning asking whether to continue the uninstall process. For example:

```
## Removing installed package instance <QLScli>
This package contains scripts which will be executed with
super-user permission during the process of removing this
package
Do you want to continue with the removal of this package
[y,n,?,q]
```

4. Type **y** and press ENTER. The pkgrm program notifies you when the uninstall process is complete. For example:

```
## Verifying package dependencies.
## Processing package information. ...
/opt/QLogic_Corporation/SANsurferCLI/adapters.properties
/opt/QLogic_Corporation/SANsurferCLI
## Executing postremove script.
scli removed.
Menu property file removed.
Adapter property file removed.
SCLI property file removed.
## Updating system information.
Removal of <QLScli> was successful.
```

3.3.3.2 Solaris x86 8, 9, and 10 Uninstall

Follow these steps to uninstall SANsurfer FC HBA CLI:

1. Type the following to remove SANsurfer FC HBA CLI:

```
# pkgrm QLSclix
```

2. The program shows the package name and a script warning asking whether to continue the uninstall process. For example:

```
The following package is currently installed:
QLSclix  QLogic SANsurfer FC CLI (HBA Configuration Utility)
(x86) 1.x.x Build xx
Do you want to remove this package?
```

3. Type **y** and press ENTER. The program shows a script warning asking whether to continue the uninstall process. For example:

```
## Removing installed package instance <QLSclix>
This package contains scripts which will be executed with
super-user permission during the process of removing this
package
Do you want to continue with the removal of this package
[y,n,?,q]
```

4. Type **y** and press ENTER. The pkgrm program notifies you when the uninstall process is complete. For example:

```
## Verifying package dependencies.
## Processing package information.
...
/opt/QLogic_Corporation <shared pathname not removed>
/opt <shared pathname not removed>
## Executing postremove script.
scli removed.
Menu property file removed.
Adapter property file removed.
SCLI property file removed.
## Updating system information.
Removal of <QLSclix> was successful.
```

3.3.4 Macintosh Uninstall

Uninstalling SANsurfer FC HBA CLI is not necessary for Mac OS X; the native installer automatically updates the product whenever it detects a change in the product version.

To manually uninstall SANsurfer FC HBA CLI, delete its folder and any references to the SANsurfer installer package(s) in the `/Library/Receipts` directory. For example:

```
rm -rf /Library/Receipts/scli-x.x.x-x.pkg
```

NOTE:

You must be in the root directory or have root/admin privileges to do this operation.

Notes

Section 4
Interactive Commands

This section describes the interactive mode command line options for specific QLogic FC HBAs. The interactive mode uses a series of menus from which you select the option you want and enter the number for that option. (See Section 5 for non-interactive mode operation in which you simply enter a one- or two-letter code to perform operations on the HBA.)

To start the interactive mode, type one of the following:

`[ scli ]`

`[ scli  int]` (on some Solaris installations)

When you start SANsurfer FC HBA CLI in interactive mode, the **Main Menu** appears as follows:

```
Main Menu

    1: General Information
    2: HBA Information
    3: HBA Parameters
    4: Target/LUN List
    5: Target Link Speed   or 5: iiDMA Settings
    6: Target Persistent Bindings
    7: Selective LUNs
    8: Boot Device
    9: Driver Settings
   10: Utilities
   11: Beacon
   12: Diagnostics
   13: Statistics
   14: Help                or 14: Virtual (if available)
   15: Exit                or 15: Help
                           or 16: Exit
```

NOTE:

Selections on the Main Menu may differ, depending on your system:

- Selection **5:** may be either **Target Link Speed** or **iiDMA Settings**.
- The **Virtual** menu selection is available only on Windows systems running with a driver that supports NPIV (N_Port ID Virtualization).

Selections from the **Main Menu** open new menus. For example, if you click item **1** (**General Information**) on the main interactive menu, the system shows a new menu, the **General Information Menu**. From this menu you have several choices including **1: Host Information**, **2: Host Topology**, and so forth. On every menu you can type the number for **Return to Previous Menu** and move to the next higher level (parent) menu.

In the remainder of this section, you will see a “breadcrumbs” line following most subsection headings. The breadcrumbs line shows you how to access that option; that is, it shows the hierarchical path from the top level to the command under discussion. For example, to reach the **Save to Txt File** options from the main SANsurfer FC HBA CLI menu, you would select option **1** to open the **General Information** menu, **2** to open the **Host Topology** menu, and **2** again to see the **Save As Txt File** options. The following shows the breadcrumbs example:

1: General Information ▶ 2: Host Topology ▶ 2: Save As Txt File

4.1 General Information Menu (Command Line Option -g)

1: General Information

This option shows you general information for the HBA.

To see the HBA **General Information** menu, from the **Main Menu**, type the number for the **General Information** option and then press ENTER.

The **General Information** menu contains the following options:

- Host Information
- Host Topology
- Report
- Refresh

4.1.1 Host Information (Command Line Option -g)

1: General Information ▶ 1: Host Information

This option shows you host information.

From the **Main Menu**, type the number for **General Information** and then press ENTER.

From the **General Information Menu**, type the number for **Host Information**, and then press ENTER. Host information includes the following data:

- Host name
- OS type

- OS version (patches where applicable)
- SDM API version
- A list of HBAs including, for each HBA:
  - HBA model and serial number (SN)
    - Port number
    - WWPN
    - HBA Instance number
    - Status (online/offline)
  - (Repeats for each HBA)
- Total number of QLogic HBAs detected

NOTE:

The SAN Device Management (SDM) API is a QLogic-specific library required for SANsurfer FC HBA CLI. The version number of this library is useful in debugging.

```
--------------------------------------------------------------------------------
Host Name                     : BRAGI
OS Type                       : Microsoft Windows Svr 2003 Enterprise Ed. x86
OS Version                    : Service Pack 1 (Build 3790
SDM API Uersion               : 1.28.0.50 QLSDM.DLL
--------------------------------------------------------------------------------
HBA Model QLA2342 (SN C28750):
   Port 1 WWPN 21-00-00-E0-8B-01-43-9B SN B05283 (HBA Instance 0) Online
   Port 2 WWPN 21-01-00-E0-8B-21-43-9B SN B05283 (HBA Instance 1) Online
HBA Model QLA2300 (SN D825408):
   Port 1 WWPN 21-00-00-E0-8B-05-CB-D8 SN D83179 (HBA Instance 2) Loop down
   Port 2 WWPN 21-01-00-E0-8B-25-CB-D8 SN D83179 (HBA Instance 3) Online
HBA Model QLA2462 (SN FFC0551C34679):
   Port 1 WWPN 21-00-00-E0-8B-1F-9D-F0 SN FFC0519U93213 (HBA Instance 4) Online
   Port 2 WWPN 21-01-00-E0-8B-3F-9D-P0 SN FFC0519U93213 (HBA Instance 5) Loop down
HBA Model QLA21O (SN C655417):
   Port 1 WWPN 21—00—00—E0—8B—1A—3F—E0 SN R61343 (HBA Instance 6) Online
--------------------------------------------------------------------------------

Total QLogic HBA(s) : 4
```

4.1.2 Host Topology (Command Line Option -tp | -topology)

1: General Information ▶ 2: Host Topology

This option shows you the HBA Host Topology menu.

NOTE:

Under Linux, host topology (`-tp`) is disabled if you are using the ioctl or sysfs (inbox) driver.

From the **General Information Menu**, type the number for **Host Topology**, and then press ENTER. When you select this option, the following options appear:

- Display
- Save As Txt file
- Save As XML File

4.1.2.1
Display (Host Topology)
(Command Line Option -tp | -topology)

1: General Information ▶ 2: Host Topology ▶ 1: Display

The host topology option shows information about interconnect elements (switches or HBAs) and switch ports.

NOTE:

Attached Port means a QLogic HBA, a tape or disk target device, or GBIC connected to a physical port on a switch.

If the interconnect element is a switch:

- Interconnect Element (switch)
  - Type (Switch or HBA)
  - World wide name
  - Domain ID
  - Management ID
  - IP address
  - Model
  - Symbolic name
  - Serial number
  - MAC address
  - Firmware version
  - Port count
  - Beacon status

If the interconnect element is an HBA:

- Interconnect element (HBA)
  - Type
  - World wide node name
  - World wide port name
  - Vendor ID
  - HBA Model
  - HBA Serial Number
  - HBA Alias
  - Port Alias
  - Driver Version
  - Firmware Version
  - Total Number of Devices
  - Host
  - Number of Port
  - Beacon Status
  - Port Type
  - Port State

- Port Information (repeats for each port) (Every port may not use all items):
  - Physical Port Number (Switch or HBA port number), including:
    - Port Name (WWPN)
    - Port State (Online or Loop Down)
    - Port Type
    - TX Port Type
    - Port Module Type
  - Attached Port (Repeats for every Target/Initiator that functions as an Attached Port). (Not all items may appear for every port):
    - Target/Initiator
    - Node Name
    - Port Name
    - Vendor ID
    - Product ID (if applicable)
    - Product Revision (if applicable)
    - Product Serial Number (if applicable)
    - HBA Model (if applicable)
    - HBA Serial Number (if applicable)
    - HBA Alias (if applicable)
    - Port Alias (if applicable)
    - Driver Version (if applicable)
    - Firmware version (if applicable)
    - Total number of devices (targets, if applicable)
    - Host (if applicable)

Here is an example:

```
================================
= InterConnect Element         =
================================
Type                      : HBA
World Wide Node Name      : 20-00-00-E0-8B-03-55-7C
World Wide Port Name      : 21-00-00-E0-8B-03-55-7C
Vendor Id                 : QLogic Corporation
HBA Model                 : 2200
HBA Serial Number         : C28437
HBA Alias                 :
Port Alias                :
Driver Version            : SCSI Miniport 8.1.5.15 (W2K IP)
Firmware Version          : 2.02.03
Total Number of Devices   : 0
Host                      : BRAGI
Number of Port            : 1
Beacon status             : Unsupported
Port Type                 : L_Port
Port State                : Online
================================
= InterConnect Element         =
================================
Type                      : Switch
World Wide Name           : 10-00-00-C0-DD-00-6A-9F
Domain ID                 : 4 (0x4)
Management ID             : 0
IP Address                : 10.3.10.178
Model                     :
Symbolic Name             :
Serial Number             :
MAC Address               :
Firmware Version          :
Port Count                : 8
Beacon Status             : Unsupported
============================
= Port Information        =
============================
============================
Physical Port Number      : 1
============================
  Port Name               : 20-00-00-C0-DD-00-6A-9F
  Port state              : Offline
  Port Type               : F_Port
  TX Port Type            : Electrical - EL
  Port Module Type        : GBIC
============================
Physical Port Number      : 2
============================
```

```
  Port Name              : 20-01-00-C0-DD-00-6A-9F
  Port state             : Offline
  Port Type              : Vendor Specific/Reserved Port Type.
  TX Port Type           : Electrical - EL
  Port Module Type       : GBIC
  ========================
  =  Attached Port       =
  ========================
        Target/Initiator       : Target
        Node Name              : 20-00-00-20-37-1A-6B-CF
        Port Name              : 21-00-00-20-37-1A-6B-CF
        Vendor Id              : SEAGATE
        Product Id             : ST136403FC
        Product Revision       : FF5F
        Product Serial Number  : LT06464600001011HGGH

        Target/Initiator       : Target
        Node Name              : 20-00-00-20-37-11-FF-EF
        Port Name              : 21-00-00-20-37-11-FF-EF
        Vendor Id              : SEAGATE
        Product Id             : ST118273 CLAR18
        Product Revision       : SG1D
        Product Serial Number  : LP60266900001919HQ1K
. . .
============================
Physical Port Number     : 8
============================
  Port Name              : 20-07-00-C0-DD-00-6A-9F
  Port state             : Offline
  Port Type              : Vendor Specific/Reserved Port Type.
  TX Port Type           : Short wave laser - SN (850nm)
  Port Module Type       : GBIC
  ========================
  =  Attached Port       =
  ========================
        Target/Initiator       : ISL
        Node Name              : 20-00-00-E0-8B-03-55-7C
        Port Name              : 21-00-00-E0-8B-03-55-7C
        Vendor Id              : QLogic Corporation
        HBA Model              : 2200
        HBA Serial Number      : C28437
        HBA Alias              :
        Port Alias             :
        Driver Version         : SCSI Miniport 8.1.5.15 (W2K IP)
        Firmware Version       : 2.02.03
        Total Number of Devices: 0
        Host                   : BRAGI
================================
= InterConnect Element          =
```

```
================================
Type                      : HBA
World Wide Node Name      : 20-00-00-E0-8B-85-8C-7C
World Wide Port Name      : 21-00-00-E0-8B-85-8C-7C
Vendor Id                 : QLogic Corporation
HBA Model                 : QLA2462
HBA Serial Number         : FFC0551D59564
HBA Alias                 :
Port Alias                :
Driver Version            : STOR Miniport 9.1.0.18 (w32)
Firmware Version          : 4.00.12
Total Number of Devices   : 0
Host                      : BRAGI
Number of Port            : 1
Beacon status             : Off
Port Type                 : Unknown
Port State                : LinkDown

                Hit <RETURN> to continue:
```

4.1.2.2
Save As Txt File
(Command Line Option -b)

1. General Information ▶ 2: Host Topology ▶ 2: Save As Txt File

When you save the host topology to a text file, the system responds with the file name. For example:

```
Topology has been successfully saved to file
BRAGI_topology_06152007_093855.txt
```

4.1.2.3
Save As XML File

1: General Information ▶ 2: Host Topology ▶ 3: Save As XML File

When you choose to save the host topology to an XML file, the system responds with the **Host Topology Menu** with options to:

- Save as XML Format 1
- Save as XML Format 2

4.1.2.3.1
Save As XML File – Format 1
(Command Line Option -x)

1: General Information ▶ 2: Host Topology ▶ 3: Save As XML File ▶ 1: Save As XML File format 1

The system responds with the name of the XML Format 1 file; for example:

```
Topology has been successfully saved to file
BRAGI_topology_06152007_093855.xml
```

4.1.2.3.2
Save to XML File – Format 2 (Command Line Option -x2)

1: General Information ▶ 2: Host Topology ▶ 3: Save As XML File ▶ 2: Save As XML File format 2

The system responds with the name of the XML Format 2 file; for example:

```
Topology has been successfully saved to file
BRAGI_topology_06152007_093855.xml
```

4.1.3
Generate Report (Command Line Option -z)

1: General Information ▶ 3: Report

The **Report Menu** provides the option to select an individual port instance from a list of all HBAs or to select **All HBAs**.

- HBA Model
  - Port Number
  - Port WWPN
  - Port Status

4.1.3.1
Generate Report (Per HBA Port)

1: General Information ▶ 3: Report ▶ 1 - n: Port Number

If you enter the number for an HBA port instance from the list, the system shows a variety of HBA and system information including:

- SANsurfer FC HBA CLI header
  - Version and build
- HBA header
  - Host name
  - OS type
  - OS version
  - SDM API version
  - HBA Model (Serial Number)
    - Port number
    - Port WWPN
    - HBA instance
    - Status (online/offline

- HBA General Information
  - Host Name
  - HBA Instance
  - HBA Model
  - HBA Description
  - HBA ID
  - HBA Alias
  - HBA Port
  - Port Alias
  - Node Name (WWNN)
  - Port Name (WWPN)
  - Port ID
  - Serial Number
  - Driver Version
  - BIOS Version (Windows and Linux)
  - Firmware Version
  - Flash BIOS Version
  - Flash FCode Version
  - Flash EFI Version
  - Flash Firmware Version
  - Actual Connection Mode
  - Actual Data Rate
  - PortType (Topology)
  - Target Count
  - PCI Bus Number (Windows and Linux)
  - PCI Device Number (Windows and Linux)
  - HBA Status (online, offline)
- HBA VPD Header (Vital Product Data) Information (for QLA/QLE24*xx* only)
  - HBA Instance
  - HBA Type
  - Port Number
  - WWPN
  - Port ID
- The actual VPD information:
  - Product Identifier
  - Part Number
  - Serial Number
  - Misc. Information (for example, PCI and PCI-X speeds)
  - Manufacturing ID
  - EFI Driver Version
  - Firmware Version
  - BIOS Version (Windows and Linux)
  - FCode Version (Solaris)

- HBA Parameters Settings Header (Command Line Options -c)
  - HBA Instance
  - HBA Part Number
  - Port Number
  - WWPN
  - Port ID
- HBA Parameter Settings
  - Connection Options
  - Data Rate (QLA23*xx*, QLA24*xx*, QLE23*xx*, and QLE24*xx* HBAs)
  - Frame Size
  - Hard Loop ID
  - Loop Reset Delay (in seconds)
  - Enable Host HBA BIOS
  - Enable Hard Loop ID
  - Enable FC Tape Support
  - Operation Mode
  - Interrupt Delay Timer
  - Execution Throttle
  - Login Retry Count
  - Port Down Retry Count
  - Enable LIP Full Login
  - Link Down Timeout (in seconds)
  - Enable Target Reset
  - LUNs Per Target
  - Enable Receive Out Of Order Frame
- Driver Settings Information Header (Command Line Options -fg)
  - HBA Instance
  - HBA Part Number
  - Port Number
  - WWPN
  - Port ID
- Driver Settings (repeats for each HBA Instance)
  - Driver Settings - Group: Persistent
    - Persistently bound Plus New targets
    - Persistently bound targets only
  - Driver Settings - Group: Binding
    - Bind by WWPN
    - Bind by Port ID
- Device/LUNs Information Header (Repeats for each HBA Instance)
  - HBA Instance

- HBA Part Number
- Port Number
- WWPN
- PORT ID

- Device/LUNs Information (Repeats for each LUN)
  - Path
  - Target
  - Device ID
  - Product Vendor
  - Product ID
  - Product Revision
  - Serial number
  - Node name
  - Port Name
  - Port ID
  - Product Type
  - LUN count(s)
  - Status
- LUN N (Repeats for each LUN)
  - Product Vendor
  - Product ID
  - Product revision
  - LUN
  - Size
  - Type
  - WWULN
- Selective LUN Information Header (repeats for each selective LUN)
  - HBA Instance
  - HBA Part Number
  - Port Number
  - WWPN
  - Port ID
- Selective LUN Information
  - Device Vendor ID
  - Device Product ID
  - Serial Number
  - Device Port Name
  - Device Port ID
- Boot Device Settings
  - Selectable Boot
  - Primary Boot Port Name

- Primary Boot Port Address
- Alternate 1 Boot Port Name
- Alternate 1 Boot Port Address
- Alternate 2 Boot Port Name
- Alternate 2 Boot Port Address
- Alternate 3 Boot Port Name
- Alternate 3 Boot Port Address

An example follows:

```
SANsurfer FC HBA CLI
v1.7.1 Build 9
Copyright (C) 2003-2007 QLogic Corp.
All rights reserved.
Command Line QLogic FC Host Bus Adapters
Build Type:  Release
Build Date:  10/25/2007 5:18:58 PM

--------------------------------------------------------------------------------
Host Name                       : BRAGI
OS Type                         : Microsoft Windows Server 2003 Enterprise Edition x86
OS Version                      : Service Pack 1 (Build 3790)
SDM API Version                 : 1.28.0.50 QLSDM.DLL
--------------------------------------------------------------------------------
HBA Model 2200 (SN C28437):
  Port   1 WWPN 21-00-00-E0-8B-03-55-7C (HBA instance  0) Online
  Port   2 WWPN 21-01-00-E0-8B-23-55-7C (HBA instance  1) Online
HBA Model QLA2300 (SN D83179):
  Port   1 WWPN 21-00-00-E0-8B-05-CB-D8 (HBA instance  2) Online
  Port   2 WWPN 21-01-00-E0-8B-25-CB-D8 (HBA instance  3) Online
HBA Model QLA2462 (SN FFC0551D59564):
  Port   1 WWPN 21-00-00-E0-8B-85-8C-7C (HBA instance  4) Loop down
  Port   2 WWPN 21-01-00-E0-8B-A5-8C-7C (HBA instance  5) Online
--------------------------------------------------------------------------------
Total QLogic HBA(s) : 3

Time and date:                  Tue Nov 20 16:11:43 2007

--------------------------------------------------------------------------------

HBA General Information

--------------------------------------------------------------------------------
--------------------------------------------------------------------------------
Host Name                       : BRAGI
HBA Instance                    : 1
HBA Model                       : 2200
HBA Description                 : QLA2200 /02/12/04 QLA2202FS QCP2202
HBA ID                          : 1-2200
HBA Alias                       :
HBA Port                        : 2
Port Alias                      :
Node Name                       : 20-00-00-E0-8B-03-55-7C
```

```
Port Name                       : 21-01-00-E0-8B-23-55-7C
Port ID                         : 11-06-00
Serial Number                   : C28437
Driver Version                  : SCSI Miniport 8.1.5.15 (W2K IP)
BIOS Version                    : 1.83
Firmware Version                : 2.02.03
Actual Connection Mode          : Point to Point
Actual Data Rate                : 1 Gbps
PortType (Topology)             : NPort
Target Count                    : 2
PCI Bus Number                  : 1
PCI Device Number               : 5
HBA Status                      : Online
-------------------------------------------------------------------------------

HBA VPD Information

-------------------------------------------------------------------------------
Feature is not supported with selected HBA (Instance 1 - 2200)!
-------------------------------------------------------------------------------

HBA Parameters Settings

-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
HBA Instance 1: 2200 Port 2 WWPN 21-01-00-E0-8B-23-55-7C PortID 11-06-00
-------------------------------------------------------------------------------
Connection Options              : 3 - Point-to-Point, Otherwise Loop
Frame Size                      : 1024
Hard Loop ID                    : 0
Loop Reset Delay (seconds)      : 5
Enable Host HBA BIOS            : Disabled
Enable Hard Loop ID             : Disabled
Enable FC Tape Support          : Enabled
Execution Throttle              : 16
Login Retry Count               : 8
Enable LIP Reset                : Disabled
Port Down Retry Count           : 30
Enable LIP Full Login           : Enabled
Link Down Timeout (seconds)     : 0
Enable Target Reset             : Enabled
LUNs Per Target                 : 8
-------------------------------------------------------------------------------

Driver Settings Information

-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
HBA Instance 1: 2200 Port 2 WWPN 21-01-00-E0-8B-23-55-7C PortID 11-06-00
-------------------------------------------------------------------------------
---------------------------------
Driver Settings - Group: Persistent
---------------------------------
Present targets that are persistently bound plus any new target(s)   : Enable
```

```
Present targets that are persistently bound Only                    : Disable
--------------------------------
Driver Settings - Group: Binding
--------------------------------
Bind by World Wide Port Name      : Enable
Bind by Port ID                   : Disable
-------------------------------------------------------------------------------

Devices/LUNs Information

-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
HBA Instance 1: 2200 Port 2 WWPN 21-01-00-E0-8B-23-55-7C PortID 11-06-00
-------------------------------------------------------------------------------
Path                            : 0
Target                          : 0
Device ID                       : 0x82
Product Vendor                  : SEAGATE
Product ID                      : ST136403FC
Product Revision                : FF5F
Serial Number                   : LT06464600001011HGGH
Node Name                       : 20-00-00-20-37-1A-6B-CF
Port Name                       : 21-00-00-20-37-1A-6B-CF
Port ID                         : 11-01-E4
Product Type                    : Disk
LUN Count(s)                    : 1
Status                          : Online
-------------------------------------------------------------
--------------------------------------
LUN 0
--------------------------------------
Product Vendor                  : SEAGATE
Product ID                      : ST136403FC
Product Revision                : FF5F
LUN                             : 0
Size                            : 33.92 GB
Type                            : SBC-2 Direct access block device
                                  (e.g., magnetic disk)
WWULN                           : 20-00-00-20-37-1A-6B-CF
-------------------------------------------------------------
-------------------------------------------------------------------------------
HBA Instance 1: 2200 Port 2 WWPN 21-01-00-E0-8B-23-55-7C PortID 11-06-00
-------------------------------------------------------------------------------
Path                            : 0
Target                          : 1
Device ID                       : 0x83
Product Vendor                  : SEAGATE
Product ID                      : ST118273 CLAR18
Product Revision                : SG1D
Serial Number                   : LP60266900001919HQ1K
Node Name                       : 20-00-00-20-37-11-FF-EF
Port Name                       : 21-00-00-20-37-11-FF-EF
Port ID                         : 11-01-E8
Product Type                    : Disk
```

```
LUN Count(s)                    : 1
Status                          : Online
------------------------------------------------------------
-------------------------------------
LUN 0
-------------------------------------
Product Vendor                  : SEAGATE
Product ID                      : ST118273 CLAR18
Product Revision                : SG1D
LUN                             : 0
Size                            : 16.95 GB
Type                            : SBC-2 Direct access block device
                                  (e.g., magnetic disk)
WWULN                           : 20-00-00-20-37-11-FF-EF
------------------------------------------------------------
--------------------------------------------------------------------------------

Target Persistent Binding Information

No target persistent binding configuration on HBA instance 1 (WWPN 21-01-00-E0-8
B-23-55-7C).
--------------------------------------------------------------------------------

Selective LUNs Information

--------------------------------------------------------------------------------
HBA Instance 1: 2200 Port 2 WWPN 21-01-00-E0-8B-23-55-7C PortID 11-06-00
--------------------------------------------------------------------------------
   Device Vendor ID : SEAGATE
   Device Product ID: ST136403FC
   Serial Number    : LT06464600001011HGGH
   Device Port Name : 21-00-00-20-37-1A-6B-CF
   Device Port ID   : 11-01-E4
--------------------------------------------------------------------------------
Enable Type     Target/LUN Info         Port Name               LUN ID
------ -------- ---------------------- ---------------------- ------
--------------------------------------------------------------------------------
HBA Instance 1: 2200 Port 2 WWPN 21-01-00-E0-8B-23-55-7C PortID 11-06-00
--------------------------------------------------------------------------------
   Device Vendor ID : SEAGATE
   Device Product ID: ST118273 CLAR18
   Serial Number    : LP60266900001919HQ1K
   Device Port Name : 21-00-00-20-37-11-FF-EF
   Device Port ID   : 11-01-E8
--------------------------------------------------------------------------------
Enable Type     Target/LUN Info         Port Name               LUN ID
------ -------- ---------------------- ---------------------- ------
--------------------------------------------------------------------------------
HBA Instance 1: 2200 Port 2 WWPN 21-01-00-E0-8B-23-55-7C PortID 11-06-00
--------------------------------------------------------------------------------
Boot Device Settings:
-------------------------------------
Selectable Boot: Disabled
-------------------------------------
```

```
(Primary    ) Boot Port Name        LUN
---------------------------     ------
00-00-00-00-00-00-00-00              0
---------------------------     ------
(Alternate 1) Boot Port Name        LUN
---------------------------     ------
00-00-00-00-00-00-00-00              0
---------------------------     ------
(Alternate 2) Boot Port Name        LUN
---------------------------     ------
00-00-00-00-00-00-00-00              0
---------------------------     ------
(Alternate 3) Boot Port Name        LUN
---------------------------     ------
00-00-00-00-00-00-00-00              0
Finish in 1 second(s)...

                  Hit <RETURN> to continue:
```

4.1.3.2
Generate Report (All HBAs)
(Command Line Option -z)

1: General Information ▶ 3: Report ▶ 4_N: All HBAs

The system shows the report information for all HBAs. See section 4.1.3.1, above, in which data repeats for every HBA.

4.1.4
Refresh

1: General Information ▶ 4: Refresh

This selection returns the option to refresh the configuration for the current host.

4.2
HBA Information Menu
(Command Line Option -i)

2: HBA Information

This command shows the **HBA Information Menu** that includes list of all detected HBAs and their ports, as well as the options to view all HBAs and to return to the previous menu.

- HBA Model QLxnnnn
  - 1. Port information
    - Port number
    - WWPN
    - Status

- [additional port(s) as appropriate]
- Additional HBAs (as appropriate)
- All HBAs

Here is an example of a typical **HBA Information Menu** screen. In this example, the host includes three HBAs with two ports each:

```
HBA Model 2200:
  1: Port   1: WWPN: 21-00-00-E0-8B-03-55-7C Online
  2: Port   2: WWPN: 21-01-00-E0-8B-23-55-7C Online
HBA Model QLA2300:
  3: Port   1: WWPN: 21-00-00-E0-8B-05-CB-D8 Online
  4: Port   2: WWPN: 21-01-00-E0-8B-25-CB-D8 Online
HBA Model QLA2462:
  5: Port   1: WWPN: 21-00-00-E0-8B-85-8C-7C Loop down
  6: Port   2: WWPN: 21-01-00-E0-8B-A5-8C-7C Online
  7: All HBAs
  8: Return to Previous Menu
```

4.2.1 HBA General Information (per HBA Port)

2: HBA Information ▶ 1 - n: Port Number

When you select one of the HBAs by number, this option shows the **HBA Information Menu** for that HBA port. The menu includes:

- Information
- HBA Alias
- HBA Port Alias
- VPD

4.2.1.1 HBA Information (Command Line Option -i)

2: HBA Information ▶ n: Port Number ▶ 1: HBA Information

This option produces the same **HBA Information Menu** available from the **General Information, Report** menu. See section 4.1.3.1.

4.2.1.2 HBA Alias (Command Line Option -ha)

2: HBA Information ▶ n: Port Number ▶ 2: HBA Alias

When you select this option, SANsurfer FC HBA CLI shows the following information about the HBA:

- HBA Model
- WWNN
- Serial number
- Alias

With this option you can create, modify, or delete the symbolic name or *alias*, for an HBA.

From the Main Menu, follow these steps:

1. Type the number for the **HBA Information** option and press ENTER.
2. Type the number for the HBA you want to configure and press ENTER.
3. Type the number for the **HBA Alias** option and press ENTER.

   The **HBA Alias** menu appears:

   ```
   N: HBA Model: QLnnnn
      Port n WWPN: nn-nn-nn-nn-nn-nn-nn-nn
      Serial Number: XXXXnnnnnnnnn
      Port Alias:
   ```
   (If the HBA already has an alias, it appears; otherwise, blank.)
4. Type the number for the HBA model and press ENTER.
5. Create, modify, or delete the HBA alias as follows:
   a. To create or modify an the HBA alias, type a symbolic name (maximum 100 characters) at the **HBA Alias** prompt and then press ENTER.
   b. To delete an existing HBA alias, leave the **HBA Alias** field empty and press ENTER.

Here is an example of the **HBA Alias** option.

```
HBA Alias Menu

1: HBA Model: QLA2462
      WWNN: xx-xx-xx-xx-xx-xx-xx-xx
      Serial Number: FFC0519U93213
      HBA Alias: 4G Dual Port HBA

2: Cancel

   Note: 0 to return to the Main Menu
Enter Selection: 1

HBA Alias:
```

4.2.1.3
HBA Port Alias
(Command Line Option -pa)

2: HBA Information ▶ n: Port Number ▶ 3: HBA Port Alias

The HBA Port Alias option allows you to create, modify, or delete a symbolic name (Alias) for the specified HBA port.

Follow these steps to create, modify, or delete an HBA port alias:

1. From the Main Menu, type the number for the **HBA Information** option, and then press ENTER.
2. Type the number for the **HBA Port** for which you want to change the Port Alias, and then press ENTER.
3. Type the number for the **HBA Port Alias** option, and then press ENTER.
4. The **Port Alias Menu** appears. Here is an example:

```
Port Alias Menu
1: HBA Model: QLA2462
WWNN: xx-xx-xx-xx-xx-xx-xx-xx
Serial Number: FFC0519U93213
Port Alias: 4G Port 1
2: Cancel
Enter 0 to return to the Main Menu
Enter Selection:
```

If you select a port number from the **Port Alias Menu**, the screen prompts you to enter a Port Alias as follows:

```
Port Alias: _
```

- To keep the current port alias, enter the number for **Cancel** and press ENTER.
- To change the port alias, type a new name and press ENTER.
- To delete an existing port alias, leave the field blank and press ENTER.

4.2.1.4
HBA VPD Information
(Command Line Option -l and Reserved Word “vpd”)

2: HBA Information ▶ n: Port Number ▶ 4: VPD

With QLA/QLE24*xx* HBAs *only,* if you select option **4**, the Vital Product Data (VPD) information appears:

- HBA instance number, model, port number, HBA port name (WWPN), and port ID
  - ❑ Product Identifier
  - ❑ VPD-R tag (VPD ReadOnly field) (if available)
  - ❑ Part Number (HBA model)
  - ❑ Serial Number
  - ❑ Misc. Information (for example, PCI and PCI-X speeds)
  - ❑ Manufacturing ID

- ❑ EFI Driver Version
- ❑ Firmware Version
- ❑ BIOS Version (Windows and Linux)
- ❑ FCode Version (Solaris)

If the HBA does not support VPD, the following message appears:

```
VPD not supported on current HBA 6!
```

4.2.2 HBA Information (All HBAs)

2: HBA Information ▶ n: All HBAs

Depending on how many HBAs are in the host, the number to select this option varies. When you select that option, the **All HBAs** menu shows the HBA **Information** and **VPD** (Vital Product Data) options.

- Information
- VPD

4.2.2.1 Information

2: HBA Information ▶ n: All HBAs ▶ 3: Information

The Information menu shows the same HBA Information available from the **General Information Menu**. See section 4.1.3.1.

2: HBA Information ▶ n: All HBAs ▶ 3: VPD

The VPD menu shows the same Vital Product Data available from the **HBA Information Menu**. See section 4.2.1.4.

4.3 HBA Parameters Menu

3: HBA Parameters

The HBA Parameters command shows the **HBA Parameters Menu**, which is similar to the **HBA Information Menu**. It also includes list of all detected HBAs and their ports, as well as the options to view all HBAs and to return to the previous menu.

- HBA Model QLxnnnn
  - ❑ 1. Port information
  - ❑ Port number
  - ❑ WWPN
  - ❑ Status
  - ❑ [additional port(s) as appropriate]
- Additional HBAs (as appropriate)

- All HBAs

Here is an example of an **HBA Information Menu** screen. In this example, the host includes three HBAs with two ports each and one HBA with a single port:

```
HBA Model QLA2342:
  1. Port 1 WWPN 21-00-00-EO-8B-01-43-9B Online
  2. Port 2 WWPN 21-01-00-E0-8B-21-43-9B Online
HBA Model QLA2300:
  3. Port 1 WWPN 21-00-00-E0-8B-05-CB-D8 Loop down
  4. Port 2 WWPN 21-01-00-E0-8B-25-CB-D8 Online
HBA Model QLA2462:
  5. Port 1 WWPN 21-00-00-E0-8B-1P-9D-P0 Online
  6. Port 2 WWPN 21-01-00-E0-8B-3P-9D-P0 Loop down
HBA Model QLA21O:
  7. Port 1 WiIPN 21-00-00-E0-8B-1A-3F-E0 Online
  8. All HBAs
  9. Return to Previous Menu
```

Enter the number to select the HBA you want to configure or **All HBAs**.

4.3.1 HBA Parameters (Per HBA Port)

3: HBA Parameters ▶ n: Port Instance

The **HBA Instance** menu has the following options:

- Display HBA Parameters
- Configure HBA Parameters
- Restore Defaults (4Gb and 8Gb HBAs only)
- Return to Previous Menu

4.3.1.1 Display HBA Parameters (Command Line Option -c#)

3: HBA Parameters ▶ n: Port Instance ▶ 1: Display HBA Parameters

When you select this option, the following parameters appear:

- Connection Options
- Data Rate (QLA23*xx*, QLA24*xx*, QLE23*xx*, and QLE24*xx* HBAs)
- Frame Size
- Hard Loop ID
- Loop Reset Delay (seconds)
- Enable Host HBA BIOS
- Enable Hard Loop ID
- Enable FC Tape Support
- Operation Mode
- Interrupt Delay Timer (100 ms)

- Execution Throttle
- Login Retry Count
- Enable LIP Reset
- Port Down Retry Count
- Enable LIP Full Login
- Link Down Timeout (seconds)
- Enable Target Reset
- LUNs Per Target
- Enable Receive Out Of Order Frame

4.3.1.2

Configure HBA Parameters (Command Line Option -n)

3: HBA Parameters ▶ n: Port Number ▶ 2: Configure HBA Parameters

From the **Configure HBA Parameters** menu, you can configure the following HBA parameters:

- Connection Options
- Data Rate
- Frame Size
- Hard Loop ID
- Loop Reset Delay (seconds)
- Enable HBA Port BIOS
- Enable HBA Hard Loop ID
- Enable Fibre Channel Tape Support
- Operation Mode
- Interrupt Delay Timer
- Execution Throttle
- Login Retry Count
- Enable LIP Reset
- Port Down Retry Count
- Enable LIP Full Login (QLA/QLE23*xx* HBAs)
- Link Down Timeout (seconds)
- Enable Target Reset
- LUNs per Target
- Enable Receive Out Of Order Frame
- Commit Changes
- Abort Changes

Table 4-1 lists the configurable HBA parameters alphabetically by name and alias, and provides values and descriptions of each.

Table 4-1. HBA Parameters Settings (NVRAM)

Parameter Name	Alias	Value	Description
ConnectionOption	CO	0–3	See table note 1.
DataRate	DR	0–4	See table note 2.
EnableBIOS	EB	0, 1	See table notes 3, 4.
EnableExtendedLogging	EL	0, 1	See table notes 3, 4.
EnableFCTape	EF	0, 1	See table note 3.
EnableHardLooplD	HL	0, 1	See table note 3.
EnableLIPFullLogin	FL	0, 1	See table note 3.
EnableLipReset	LP	0, 1	See table note 3.
EnableReceiveOutOfOrderFrame	EO	0, 1	See table notes 3, 5.
EnableTargetReset	TR	0, 1	See table note 3.
ExecutionThrottle	ET	1–65535	
FrameSize	FR	512, 1024, 2048	
HardLoopID	HD	0–125	
InterruptDelayTimer	ID	0–255	
LinkDownTimeOut	LT	0–240	
LoginReTryCount	LR	0–255	
MaximumLUNsPerTarget	ML	0, 8, 16, 32, 64, 128, 256	
OperationMode	OM	0, 5, 6	See table note 6.
PortDownRetryCount	PD	0–255	
ResetDelay	RD	0–255	

Table Notes:

1. Connection Options:
   - 0 = Loop Only
   - 1 = Point-to-point Only
   - 2 = Loop preferred, otherwise Point-to-Point
   - 3 = Point-to-Point, otherwise Loop (QLA22xx Only)
2. Data Rate:
   - 0 = 1 Gbs
   - 1 = 2 Gbs
   - 2 = Auto
   - 3 = 4 Gbs
   - 4 = 8 Gbs

3. Others:
   0 = Disable
   1 = Enable
4. Option is *not* available on 4Gb or latest HBAs.
5. Option *is* available on 4Gb or latest HBAs.
6. Operation Modes:
   0 = Interrupt for every I/O completion
   5 = Interrupt when Interrupt Delay Timer expires.
   6 = Interrupt when Interrupt Delay Timer expires or no active I/O.

4.3.1.2.1
Connection Options

3: HBA Parameters ▸ 1: Port Number ▸ 2: Configure HBA Parameters ▸ n. Connection Options

From this menu, you can configure the connection options:

- 0–Loop Only
- 1–Point to Point Only
- 2–Loop Preferred, Otherwise Point-to-Point
- 3–Point-to-Point, Otherwise Loop (QLA22xx HBA only)

Type the number for the connection type you want and press ENTER.

4.3.1.2.2
Data Rate

3: HBA Parameters ▸ N: Port Number ▸ 2: Configure HBA Parameters ▸ n. Data Rate

This option shows the **Data Rate** menu. (Note that data rate configuration is not available for all HBA port instances.) From this menu you can select:

- Auto
- 1 Gbps
- 2 Gbps
- 4 Gbps
- 8 Gbps

NOTE:

The 1 Gbps data rate is not supported with 8G HBAs.

Type the number for the data rate you want and press ENTER.

4.3.1.2.3
Frame Size

3: HBA Parameters ▸ N: Port Number ▸ 2: Configure HBA Parameters ▸ n. Frame Size

This option shows the **Frame Size** menu. From it you can select:

- Frame Size: 512
- Frame Size: 1024
- Frame Size: 2048

Type the number for the frame size you want and press ENTER.

4.3.1.2.4
Hard Loop ID

3: HBA Parameters ▸ N: Port Number ▸ 2: Configure HBA Parameters ▸ n. Hard Loop ID

This option prompts you to enter a valid Hard Loop ID from 0 to 125. Type the number you want and press ENTER.

4.3.1.2.5
Loop Reset Delay

3: HBA Parameters ▸ N: Port Number ▸ 2: Configure HBA Parameters ▸ n. Loop Reset Delay

This option prompts you to enter a Reset Delay from 0 to 255 seconds. Type the number you want for the loop reset delay and press ENTER.

4.3.1.2.6
Enable HBA Port BIOS

3: HBA Parameters ▸ N: Port Number ▸ 2: Configure HBA Parameters ▸ n. Enable HBA Port BIOS

This option allows you to enable or disable the BIOS boot setting. When this setting is disabled, the ROM BIOS on the HBA is disabled. If you are booting from a FC hard disk attached to the HBA, you must enable this setting. The default is disabled.

4.3.1.2.7
Enable HBA Hard Loop ID

3: HBA Parameters ▸ N: Port Number ▸ 2: Configure HBA Parameters ▸ n. Enable HBA Hard Loop ID

This choice gives you the option to enable or disable the Hard Loop ID. Type the number you want and press ENTER.

4.3.1.2.8
Enable Fibre Channel Tape Support

3: HBA Parameters ▸ N: Port Number ▸ 2: Configure HBA Parameters ▸ n. Enable Fibre Channel Tape Support

This choice gives you the option to enable or disable Fibre-Channel Tape support. Type the number you want and press ENTER.

4.3.1.2.9
Operation Mode

3: HBA Parameters ▶ N: Port Number ▶ 2: Configure HBA Parameters ▶ n. Operation Mode

This option shows the **Operation Mode Menu**. From it you can select:

- Interrupt for every I/O Completion
- Interrupt when Interrupt DelayTimer expires
- Interrupt when Interrupt Delay Timer expires or no active I/O

Type the number for the Operation Mode you want and press ENTER.

4.3.1.2.10
Interrupt Delay Timer

3: HBA Parameters ▶ N: Port Number ▶ 2: Configure HBA Parameters ▶ n. Interrupt Delay Timer

This choice gives you the option to set the Interrupt Delay timer to 0 to 255 seconds.

You cannot set the Interrupt Delay timer when the Operation Mode (blue) is set to Interrupt for Every I/O Completion.

4.3.1.2.11
Execution Throttle

3: HBA Parameters ▶ N: Port Number ▶ 2: Configure HBA Parameters ▶ n. Execution throttle

This choice gives you the option to set the Execution Throttle to a value from1 to 65535.

4.3.1.2.12
Login Retry Count

3: HBA Parameters ▶ N: Port Number ▶ 2: Configure HBA Parameters ▶ n. Login Retry Count

This choice gives you the option to set the Login Retry Count to a value from 0 to 255.

4.3.1.2.13
Enable LIP Reset

3: HBA Parameters ▶ N: Port Number ▶ 2: Configure HBA Parameters ▶ n. Enable LIP Reset

This choice gives you the option to Enable or Disable LIP Reset.

4.3.1.2.14
Port Down Retry Count

3: HBA Parameters ▶ N: Port Number ▶ 2: Configure HBA Parameters ▶ n. Port Down Retry Count

This choice gives you the option to set the Port Down Retry Count to a value from 0 to 255.

4.3.1.2.15
Enable LIP Full Login

3: HBA Parameters ▸ N: Port Number ▸ 2: Configure HBA Parameters ▸ n. Enable LIP Full Login

This choice gives you the option to enable or disable LIP Full Login.

4.3.1.2.16
Link Down Timeout

3: HBA Parameters ▸ N: Port Number ▸ 2: Configure HBA Parameters ▸ n. Link Down Timeout

This choice gives you the option to set the Link Down timeout to a value from 0 to 240.

4.3.1.2.17
Enable Target Reset

3: HBA Parameters ▸ N: Port Number ▸ 2: Configure HBA Parameters ▸ n. Enable Target Reset

This choice gives you the option to Enable or Disable Target Reset.

4.3.1.2.18
LUNs per Target

3: HBA Parameters ▸ N: Port Number ▸ 2: Configure HBA Parameters ▸ n. LUNs per Target

This option shows the **LUNs per Target** menu. From it you can select:

- 0 LUN per Target
- 8 LUNs per Target
- 16 LUNs per Target
- 32 LUNs per Target
- 64 LUNs per Target
- 128 LUNs per Target
- 256 LUNs per Target

4.3.1.2.19
Commit Changes

3: HBA Parameters ▸ N: Port Number ▸ 2: Configure HBA Parameters ▸ n. Commit changes

Choose this option to make the changes permanent.

CAUTION!

There is undo after you commit to making changes to the HBA parameters.

4.3.1.2.20
Abort Changes

3: HBA Parameters ▶ N: Port Number ▶ 2: Configure HBA Parameters ▶ n: Abort changes

Choose this option to stop without making any changes.

4.3.1.3
Restore Defaults

3: HBA Parameters ▶ n: Port Number ▶ 3: Restore Defaults

This option is for 4Gb and 8Gb HBAs only. Selecting the **Restore Defaults** option causes the following warning to appear:

```
Warning:

Please update the HBA parameters with extreme care.

Incorrectly updating the HBA parameters may render the HBA
inoperable.

If you currently have boot device information set up in the HBA
parameters, updating the HBA parameters from a file may result in
changing that information.

If you wish to preserve the boot device information, please either
update the file with the correct boot device settings before the
HBA parameters update or re-configure the boot settings after the
update.

   Do you want to proceed with the operation?

1: Yes
2: No
```

If you enter **1** to proceed, the system returns a message similar to the following:

```
Restoring default settings on HBA instance  5 -  QLA2462. Please
wait...

HBA Parameters restore completed. Changes has been saved to HBA
instance 5.

You must reboot in order for the changes to become effective.
```

4.3.2
HBA Parameters (All HBAs)

3: HBA Parameters ▶ n: All HBAs

When you select this option, the parameters listed in “HBA Parameters (Per HBA Port)” on page 4-22 appear for every HBA.

4.4 Target/LUN List Menu (Command Line Options -t and -l)

4: Target/LUN List

This option shows the main **Target List Menu**. which includes a list of all HBAs and port instances detected on the host. You have the option to select:

- Each HBA port individually
- All HBAs

Here is an example of the **Target List Menu**:

```
HBA Model QLA2342:
  1. Port 1 WWPN 21-00-00-EO-8B-01-43-9B Online
  2. Port 2 WWPN 21-01-00-E0-8B-21-43-9B Online
HBA Model QLA2300:
  3. Port 1 WWPN 21-00-00-E0-8B-05-CB-D8 Loop down
  4. Port 2 WWPN 21-01-00-E0-8B-25-CB-D8 Online
HBA Model QLA2462:
  5. Port 1 WWPN 21-00-00-E0-8B-1P-9D-P0 Online
  6. Port 2 WWPN 21-01-00-E0-8B-3P-9D-P0 Loop down
HBA Model QLA21O:
  7. Port 1 WiIPN 21-00-00-E0-8B-1A-3F-E0 Online
  8. All HBAs
  9. Return to Previous Menu
```

Table 4-2 lists the variables and their descriptions for target/LUN information.

Table 4-2. Target/LUN Information

Variable	Description
<address>	IP Address.
<hba instance>	Show Version.
<hba wwnn>	Show usage help text.
<lun id>	Silent mode.
<target id>	Specifies the output in XML format 2.
<target portid>	Specifies the output in XML format 1.
<target wwnn>	Specifies the output to a log file.
<target wwpn>	Specifies command line input from file.

4.4.1
Target/LUN List (Per HBA Port)

4: Target/LUN List ▶ 1 - n Target List Menu - Port n

When you select an HBA Port instance from the Target/LUN List, a list of LUNs (disks) attached to that port instance appears. Technical information for each LUN appears, including:

- Vendor
- Product ID
- Product Revision
- Serial Number
- Node Name
- Port Name
- Port ID

Here is an example of a typical menu item:

```
1:  Disk(Online)
    Vendor           :  SEAGATE
    Product ID       :  ST318453FC
    Product Rev      :  0006
    Serial Number    :  3JA9TN7600007517T6P1
    Node Name        :  20-00-00-11-C6-2D-5B-F9
    Portname         :  22-00-00-11-C6-2D-5B-F9
    Port ID          :  02-0A-DC

2:  Disk (Online)
    Vendor           :  SEAGATE
    Product ID       :  ST318453FC
    Product Rev      :  0006
    Serial Number    :  3JA9TN7600007523T6P1
    Node Name        :  20-00-00-11-C6-2D-5B-FA
    Portname         :  22-00-00-11-C6-2D-5B-FA
    Port ID          :  02-0A-DE
```

And so on.

You can select any LUN and view additional information by entering its number at the prompt and then pressing ENTER.

4.4.1.1
Per Target/LUN

4: Target/LUN List ▶ 1 - n Target List Menu Port n ▶ 1 - n: Target

When you enter the number for an individual target, the LUN list for that target appears. It includes a list of all LUNs on that target and the following information for each LUN:

- LUN Number
  - Vendor
  - Product ID
  - Port Name
  - Port ID
- All LUN(s)

Here is an example of the **LUN List Menu**:

```
1:  LUN 0
      Vendor               :  SEAGATE
      Product ID           :  ST318453FC
      Port Name            :  22-00-00-11-C6-2D-5B-F9
      Port ID              :  02-0A-DC
```

And so on.

```
M: All LUN(s)
N: Return to Previous Menu
```

4.4.1.2
Per Target/All LUNs

4: Target/LUN List ▸ 1 - n Target List Menu Port n ▸ 1 - n: Target ▸ 1 - n: LUN (Number)

When you select a particular LUN from the LUN list, the following information for that LUN appears:

- Product Vendor
- Product ID
- Product Revision
- LUN
- Size
- Type
- WWULN
- OS LUN Name (on Solaris and Linux)

Here is an example of the LUN information.

```
Product Vendor       : SEAGATE
Product ID           : ST318453FC
Product Revision     : 0006
LUN                  : 0
Size                 : SBC-2 Direct Access block device
                       (e.g. magnetic disk)
WWULN                : 20-00-00-11-C6-2D-5A-3F
----------------------------------------------------------------
Hit <Return> to continue:
```

4.4.1.3
All Targets

4: Target/LUN List ▶ 1 - n Target List Menu Port n ▶ 1 - n: Target ▶ m: All LUNs

When you select a particular LUN from the LUN list, the following information for all LUNs appears:

- Product Vendor
- Product ID
- Product Revision
- LUN
- Size
- Type
- WWULN
- OS LUN Name (on Solaris and Linux)

(Repeats for each LUN)

Here is an example of the LUN information.

```
Product Vendor       : SEAGATE
Product ID           : ST318453FC
Product Revision     : 0006
LUN                  : 0
Size                 : SBC-2 Direct Access block device
                       (e.g. magnetic disk)
WWULN                : 20-00-00-11-C6-2D-5A-3F
------------------------------------------------------------------
Hit <Return> to continue:
```

And so on. Repeats for each LUN.

4.4.2
Target/LUN List (All HBAs)

4: Target/LUN List ▶ N: All HBAs

This choice shows the **Target List Menu** for **All HBAs**:

- Individual Target
- Individual LUN
- All Target(s)
- All LUN(s)

4.4.2.1
Individual Target

4: Target/LUN List ▶ N: All HBAs ▶ 1: Individual Target

This choice shows the **Target List Menu** for **All HBAs**. Information for each individual target includes:

- (Target type) on QLAxxxx (HBA Instance n)
  - Vendor
  - Product ID
  - Product Revision
  - Serial Number
  - Port Name
  - Port ID
- Repeats for each target

Here is an example of the **Target List Menu** for **All HBAs**:

```
1: Disk 0 on QLA2462 (HBA Instance 0)
   Vendor               : SEAGATE
   Product ID           : ST336607FC
   Product Rev          : 0006
   Serial Number        : 3JA9TN7600007517T6P1
   Port Name            : 22-00-00-11-C6-2D-5B-F9
   Port ID              : 02-0A-DC

1: Disk 1 on QLA2462 (HBA Instance 0)
   Vendor               : SEAGATE
   Product ID           : ST336607FC
   Product Rev          : 0006
   Serial Number        : 3JA9TN7600007517FK7W
   Port Name            : 22-00-00-11-C6-2D-5A-B8
   Port ID              : 02-0A-EO
```

And so on.

4.4.2.2
Individual LUN

4: Target/LUN List ▶ n: Port Number ▶ 1: Individual LUN ▶ 1 - n: Target

When you select an individual target, the following target information appears:

- Path
- Target
- Device ID
- Product Vendor
- Product ID
- Product Revision
- Node Name
- Port Name
- Product Type
- LUN Count(s)

- Status

Here is an example of the Target information:

```
Path                : 0
Target              : 3
Device ID           : 0x87
Product Vendor      : SEAGATE
Product ID          : ST336607FC
Product Revision    : 0006
Serial Number       : 3JA9TN7600007517T6P1
Node Name           : 20-00-00-11-C6-2D-5B-F9
Port Name           : 22-00-00-11-C6-2D-5B-F9
Port ID             : 02-0A-DC
Product Type        : Disk
LUN Count(s)        : 1
Status              : Online
```

4.4.2.3
All Targets

4: Target/LUN List ▸ n: Port Number ▸ 1: Individual LUNs

When you select this option, SANsurfer FC HBA CLI shows the **LUN List Menu** containing:

- Product Vendor
- Product ID
- Port Name
- Port ID
- LUN ID
- OS LUN Name (on Solaris and Linux)

NOTE:

- In the Solaris OS, the QLA HBA driver supports a maximum of 256 LUNs.
- In the Solaris OS, the QLC HBA driver supports a maximum of 16K LUNs.

Here is an example of the LUN information:

```
Product Vendor      : SEAGATE
Product ID          : ST336607FC
Product Revision    : 0006
LUN                 : 0
Size                : 34.18 GB
Type                : SBC-2 Direct access block device
                      (e.g., magnetic disk)
```

```
WWULN                : 20-00-00-0C-50-68-1E-9A
------------------------------------------------
Hit (RETURN) to continue:
```

4.4.2.4

All Target(s)

4: Target/LUN List ▶ n: Port Number ▶ 3: All Target(s)

This choice shows information for all targets connected to the system, including:

- Path
- Target
- Device ID
- Product Vendor
- Product ID
- Product Revision
- Serial Number
- Node Name
- Port Name
- Port ID
- Product Type
- LUN Count(s)
- Status

Here is an example of the **All Targets** option.

```
   Note: 0 to return to Main Menu
   Enter Selection: 3
------------------------------------------------------------------
HBA Instance 5: QLA2300 Port 2 WWPN 21-01-00-E0-8B-25-CB-D8 PortID 11-05-EF
------------------------------------------------------------------
Path                 : 0
Target               : 0
Device ID            : 0x85
Product Vendor       : SEAGATE
Product ID           : ST136403FC
Product Revision     : FF5F
Serial Number        : LT06464600001011HGGH
Node Name            : 20-00-00-20-37-1A-6B-CF
Port Name            : 21-00-00-20-37-1A-6B-CF
Port ID              : 11-01-E4
Product Type         : Disk
LUN Count(s)         : 1
Status               : Online
------------------------------------------------------------------
```

And so forth.

4.4.2.5
All LUN(s)

4: Target/LUN List ▶ n: Port Number ▶ 3: All LUN(s)

When you select this option, SANsurfer FC HBA CLI shows the following information about all LUNs for all HBA Port Instances:

- Product Vendor
- Product ID
- Product Revision
- LUN
- Size (in GB or MB)
- Type (for example, magnetic disk)
- WWULN (world-wide unique LUN name)
- OS LUN Name (on Solaris and Linux)

NOTE:

- In the Solaris OS, the QLA HBA driver supports a maximum of 256 LUNs.
- In the Solaris OS, the QLC HBA driver supports a maximum of 16K LUNs.

Here is an example of the All LUNs information:

```
------------------------------------------------------------
HBA Instance 0: QLA2462 Port 1 WWPN 21-00-00-E0-8B-1F-9D-F0 Port
ID 02-00-00
------------------------------------------------------------
Target WWPN (22-00-00-04-CF-9C-24-CA)
------------------------------------------------------------
Product Vendor       : SEAGATE
Product ID           : ST318203FC
Product Revision     : 0006
LUN                  : 0
Size                 : 34.18 GB
Type                 : SBC-2 Direct access block device
                         (e.g., magnetic disk)
WWULN                : 20-00-00-20-37-38-73-BC
         Press <Enter> to continue:
```

Target information repeats for each target.

Here is an example of the All LUNs information for Linux:

```
Product Vendor       : HITACHI
Product ID           : HUS103073FLF210
Product Revision     : FA16
```

```
LUN                  : 0
Size                 : 68.37 GB
Type                 : SBC-2 Direct access block device
                         (e.g., magnetic disk)
WWULN                : 20-00-00-00-87-72-85-B2
OS LUN Name          : /dev/sda
```

Here is an example of the All LUNs information on Solaris with a QLA driver:

```
Product Vendor       : SUN
Product ID           : StorEdge 3510
Product Revision     : 415F
LUN                  : 15
Size                 : 4.88 GB
Type                 : SBC-2 Direct access block device
                         (e.g., magnetic disk)
WWULN                : 60-0C-0F-F0-00-00-00-00-09-8B-68-37-E0-B1-
9B-04
OS LUN Name          : /dev/rdsk/c1t0d0s15
```

4.5 Target Link Speed or iiDMA Settings Menu (Command Line Option -q)

5: Target Link Speed or 5: iiDMA Settings

NOTE:

Depending on your system, the SANsurfer FC HBA CLI **Main Menu** may show either the **Target Link Speed** option or the **iiDMA Settings** option.

This option shows the **Target Link Speed Menu** or **iiDMA Menu** that includes a list of all HBAs and port instances detected, including the options to select:

- Each HBA port instance, individually
- All HBAs

Here is an example of the **Target Link Speed Menu** or **iiDMA Settings Menu**:

```
HBA Model QLA2342:
  1. Port 1 WWPN 21-00-00-EO-8B-01-43-9B Online
  2. Port 2 WWPN 21-01-00-E0-8B-21-43-9B Online
HBA Model QLA2300:
  3. Port 1 WWPN 21-00-00-E0-8B-05-CB-D8 Loop down
  4. Port 2 WWPN 21-01-00-E0-8B-25-CB-D8 Online
HBA Model QLA2462:
  5. Port 1 WWPN 21-00-00-E0-8B-1P-9D-P0 Online
  6. Port 2 WWPN 21-01-00-E0-8B-3P-9D-P0 Loop down
HBA Model QLA21O:
  7. Port 1 WiIPN 21-00-00-E0-8B-1A-3F-E0 Online
```

```
8. All HBAs
9. Return to Previous Menu
```

Table 4-3 lists the target link speed settings and descriptions.

Table 4-3. Target Link Speed Settings

Target Link Speed Settings	Description
<address>	IP Address.
<hba instance>	HBA number (HBA instance number).
<hba wwnn>	HBA World Wide Port Name, format xx-xx-xx-xx-xx-xx-xx-xx or xxxxxxxx.
<lun id>	Logical Unit Number (0–255),
<speed>	Target Link Speed (iiDMA) - (1, 2, or 4 Gbs).
<target id>	Target ID.
<target portid>	Target World Wide Port Name, format xx-xx-xx or xxxxxx.
<target wwnn>	Target World Wide Node Name, format xx-xx-xx-xx-xx-xx-xx-xx or xxxxxxxx.
<target wwpn>	Target World Wide Port Name, format xx-xx-xx-xx-xx-xx-xx-xx or xxxxxxxx.
-targets | -t	All targets.

4.5.1 Configuring the iiDMA Settings

Use the Intelligent Interleave Factor Selection (iiDMA) menu to select the intelligent interleave factor settings per HBA type and device.

To configure iiDMA settings:

1. From the SANsurfer FC HBA CLI main menu, select **iiDMA Settings**.
2. Select the HBA that you want to apply the Intelligent Interleave factor update.
3. Select one of the following options:
   - ❑ **Basic Configuration** if you want to apply the Intelligent Interleave factor update to all devices attached to this adapter.
   - ❑ **Advanced Configuration** if you want to select an apply different Intelligent Interleave factor update to each device attached to this adapter.

4. To use **Basic Configuration**:
   a. Select the HBA.
   b. Select the intelligent interleave factor from the intelligent interleave factor speed list (**1 Gbps**, **2 Gbps**, **4 Gbps**, or **8 Gbps**) to all attached devices.
   c. Choose one of the following options:
      - ❑ To apply the new settings to all attached devices, select **Yes**. The following is returned:

        `iiDMA settings have been saved to selected target(s) on HBA instance` *n*.

      - ❑ To exit **iiDMA Settings** without making any changes, select **No**.
5. To use **Advanced Configuration**:
   a. Select the HBA.
   b. From the device list, select a device (disk) that is currently attached to this HBA.
   c. From the intelligent interleave factor speed list, select the intelligent interleave factor (**1 Gbps**, **2 Gbps**, **4 Gbps**, or **8 Gbps**) that you want to set for this device.
   d. Repeat the previous step for additional devices.
   e. Choose one of the following options:
      - ❑ To proceed, select **Select the Apply changes to selected target(s)**. The following is returned:

        `The iiDMA settings have been saved to selected target(s).`

      - ❑ To exit without making any changes, select **Return to Previous Menu**.

4.5.2 HBA Port Instance

5: Target Link Speed ▸ Target Link Speed Menu for HBA instance 1-n

This option shows the **Target Link Speed Menu** or **iiDMA Settings Menu** for a specific Port Instance.This menu looks like the Target List Menu shown in section 4.4.1.1. It includes a list of all targets attached to the selected port instance and specific information about each target, including:

- Target Type (for example, Disk)
  - ❑ Product Vendor
  - ❑ Product ID

- Product Revision
- Serial Number
- Port Name
- Port ID
- Max Target Link Rate

- Next Target Type (for example, Disk)
- Apply Changes to Selected Targets

Here is an example of the **Target Link Speed Menu** for all HBA Instances:

```
Target Link Speed Menu
HBA Instance 0 (QLA2463 Port 1) : Online

Desc: QLA2462 PCI-X 2.0 to 4Gb PC Dual Channel

1: Disk
   Vendor               : SEAGATE
   Product ID           : ST318453FC
   Product Rev          : DF12
   Serial Number        : 3EV0NYSG000072496DYD
   Port Name            : 22-00-00-04-CF-9C-24-CA
   Port ID              : 02-00-E1
   Max Target Link Rate : 4 Gbps

2: Disk
   Vendor               : SEAGATE
   Product ID           : ST318453FC
   Product Rev          : 00006
   Serial Number        : 3JA9AYSG000072496FBJ
   Port Name            : 22-00-00-0C-50-68-1E-9A
   Port ID              : 11-0A-E2
   Max Target Link Rate : 4 Gbps

m: Disk
   Vendor               : SEAGATE
   Product ID           : ST318453FC
   Product Rev          : 0006
   Serial Number        : 3JA9TQE0000724966ZK
   Port Name            : 22-00-00-11-C6-2D-5A-3F
   Port ID              : 02-0A-E4
   Max Target Link Rate : 4 Gbps

n: Apply Changes to Selected Target(s)
```

4.5.3 HBA Port

5: iiDMA Settings ▶ 1 - n: HBA Port n

If you select a port for HBA model QLA2462, the following information appears:

```
iiDMA Menu

 HBA Instance 3 (QLA2462 Port 2) : Online
     WWPN: 21-01-00-E0-8B-A5-8C-7C
     Desc: QLA2462 PCI-X 2.0 to 4Gb FC Dual Channel

 1:  Disk
        Vendor                       : SEAGATE
        Product ID                   : ST136403FC
        Product Rev                  : FF5F
        Serial Number                : LT06464600001011HGGH
        Port Name                    : 21-00-00-20-37-1A-6B-CF
        Port ID                      : 11-01-E4
        Intelligent Interleave Factor: 4 Gbps

 2:  Disk
        Vendor                       : SEAGATE
        Product ID                   : ST118273 CLAR18
        Product Rev                  : SG1D
        Serial Number                : LP60266900001919HQ1K
        Port Name                    : 21-00-00-20-37-11-FF-EF
        Port ID                      : 11-01-E8
        Intelligent Interleave Factor: 4 Gbps

 3:  Apply Changes to selected Target(s)

 4:  Return to Previous Menu

     Note: 0 to return to Main Menu
     Enter Selection:
```

4.5.3.1
Advanced Configuration

5: Target Link Speed ▶ n: Port Number ▶ 2: Advanced Configuration

When you select a Port Instance from the **Target Link Menu**, the **Target Link Speed Menu (Advanced)** appears. It includes the link speed options. The options vary according to the HBA in use. For example:

- 1 Gbps
- 2 Gbps
- 4Gbps
- 8 Gbps

Type the number for the link speed you want for the HBA Port Instance selected and then press ENTER.

The same menu reappears, allowing you to set the link speed for every port instance you want.

When you have set the speed for all the links you want, type the number for **Apply changes to Selected Target(s)** and then press ENTER.

4.5.4 Target Link Speed – All HBAs

5: Target Link Speed ▶ 2: All HBAs

When you select this option, the Target Link Speed Menu for All HBAs appears. It offers two options:

- Basic configuration
- Advanced Configuration

4.5.4.1 Target Link Speed – All HBAs – Basic Configuration

5: Target Link Speed ▶ 2: All HBAs ▶ 1: Basic Configuration

When you select this option, the **Target Link Speed Menu (Basic)** for All HBAs appears. It offers the link speed options. The options vary according to the HBA in use. For example:

- 1 Gbps
- 2 Gbps
- 4Gbps
- 8 Gbps

Respond **Yes** to the **Proceed?** prompt to apply the change to all Port Instances on all HBAs.

4.5.4.2 Target Link Speed – All HBAs – Advanced Configuration

5: Target Link Speed ▶ 2: All HBAs ▶ 1: Advanced Configuration

This option displays the **Target Link Speed Menu (Advanced) for All HBAs**. This menu lists all targets on all HBAs and shows information about each target:

- Target Type, Target number, HBA model, and Instance
  - Product vendor
  - Product ID
  - Product revision
  - Serial Number
  - Port Name
  - Port ID
  - Max Target Link Rate
- Next Target Type, Target number, HBA model and Instance

- Apply Changes to Selected Targets

Here is an example of the **Target Link Speed Menu (Advanced) for All HBAs**:

```
Target Link Speed Menu (Advanced)
All HBAs

1:  Disk 0 on QLA2462 (HBA Instance 0)
   Vendor               : SEAGATE
   Product ID           : ST318453FC
   Product Rev          : DF12
   Serial Number        : 3EV0NYSG000072496DYD
   Port Name            : 22-00-00-04-CF-9C-24-CA
   Port ID              : 02-00-E1
   Max Target Link Rate : 4 Gbps

2:  Disk 1 on QLA2462 (HBA Instance 0)
   Vendor               : SEAGATE
   Product ID           : ST318453FC
   Product Rev          : 00006
   Serial Number        : 3JA9AYSG000072496FBJ
   Port Name            : 22-00-00-0C-50-68-1E-9A
   Port ID              : 11-0A-E2
   Max Target Link Rate : 4 Gbps
...
m:  Disk 2 on QLA2462 (HBA Instance 1)
   Vendor               : SEAGATE
   Product ID           : ST318453FC
   Product Rev          : 00006
   Serial Number        : 3AJA9ALAG0000724966ZK
   Port Name            : 22-00-00-11-C6-2D-5A-3F
   Port ID              : 11-0A-E2
   Max Target Link Rate : 4 Gbps
...
n:  Disk
   Vendor               : SEAGATE
   Product ID           : ST318453FC
   Product Rev          : 0006
   Serial Number        : 3JA9TQE0000724966ZK
   Port Name            : 22-00-00-11-C6-2D-5A-3F
   Port ID              : 02-0A-E4
   Max Target Link Rate : 4 Gbps

p:  Apply Changes to Selected Target(s)
```

4.5.4.2.1

Target Link Speed – All HBAs – Advanced Configuration

5: Target Link Speed ▶ 2: All HBAs ▶ 1: Advanced Configuration ▶ 1 - n: Link speed

When you select an HBA to set its link speed, the **Target Link Speed Menu (Advanced)** menu for a particular HBA instance appears. It shows the link speed options you can choose from. The options vary according to the HBA in use. For example:

- 1 Gbps
- 2 Gbps
- 4Gbps
- 8 Gbps

When you set a Link Speed option for a particular (target) device the **Target Link Speed Menu (Advanced) for All HBAs** reappears, allowing you to set the link speed for another HBA Instance.

When you have set the link speed for all the instances you want to, type the number for **Apply changes to Selected Target(s)** and press ENTER.

The system returns a message indicating the changes have been saved. For example:

```
New iiDMA setting has been saved to seleted target(s) on HBA
instance 0.
```

4.5.4.3
iiDMA Settings – Disk

5: iiDMA Settings ▶ 1 - n: HBA Port n ▶ n: Disk n

When you select a specific disk on the HBA port, the following options are available on the **iiDMA Menu (Advanced)**:

- 1 Gps
- 2 Gps
- 4 Gps

4.5.5
iiDMA – All HBAs

5: iiDMA Settings ▶ n: All HBAs

When you select All HBAs to configure, the options for **Basic Configuration** and **Advance Configuration** appear on the menu. See 4.5.1 Configuring the iiDMA Settings.

4.6
Target Persistent Bindings Menu (Command Line Option -p)

6: Target Persistent Bindings

When you select this option, SANsurfer FC HBA CLI shows the **Target Persistent Binding** menu listing standard HBA port instances (see 4.5.2), where you can select an individual HBA port or **All HBAs**.

The following sections describe how to view, set, and delete the HBA's target persistent binding in interactive and non-interactive modes.

NOTES:

- In a Solaris OS, QLA/QLE24*xx* and QEM2462 HBAs with a QLA driver allow up to 2048 targets with target IDs in the range of 0–2047.
- In a Solaris OS, QLA/QLE23*xx* HBAs with a QLA driver allow up to 256 targets with target IDs in the range of 0–2047.
- Under Solaris, this feature is disabled if you are using the driver from the OS installation CDs (QLC driver). Under Linux, this feature is disabled if you are using the ioctl or sysfs (inbox) driver.

Whether you select a particular HBA Port Instance or **All HBAs**, the **Target Persistent Bindings Menu** appears.

4.6.1 Target Persistent Bindings (Per HBA Port) (Command Line Option -p)

6: Target Persistent Bindings ▸ 1 - n: Target Persistent Bindings HBA Instance n

When you select an HBA Instance to view or change its binding, this menu the **Target Persistent Bindings Menu** for a particular HBA instance appears. It shows the binding options you can choose from:

- Display Configuration
- Bind Target(s)
- Unbind Target(s)

Type the number for the option you want and press ENTER.

4.6.1.1 Display Target Persistent Binding (Command Line Option -p)

6: Target Persistent Binding ▸ 1 - n: Target Persistent Binding HBA Instance n ▸ 1: Display Configuration

When you select the **Display Configuration** option, the following information appears. (Or, the message, *No target persistent binding configuration on HBA instance n* appears instead):

- Bind status (**Yes**)
- Device type (**Disk**, for example)

- Target information (model name and number, for example)
- Port Name
- Port ID
- Target ID

4.6.1.2

Target Persistent Bindings – Bind Target(s) (Command Line Option -p)

6: Target Persistent Bindings ▸ 1 - n: Target Persistent Bindings HBA Instance n ▸ 2: Bind Target(s)

When you select the **Bind Targets** option, the **Target Persistent Binding Menu for HBA Instance n** appears. This menu lists all targets on the selected HBA Instance and shows information about each target:

- Target Type
  - Product Vendor
  - Product ID
  - Port Name
  - Port ID
  - Bind
  - Target ID
- Next Target (repeats)
- All Targets

Here is an example of the **Target Persistent Binding Menu for HBA Instance n**:

```
Target Persistent binding Menu
HBA Instance 0

1:  Disk
   Vendor               : SEAGATE
   Product ID           : ST318453FC
   Port Name            : 22-00-00-04-CF-9C-24-CA
   Port ID              : 02-00-E1
   Bind                 :   No
   Target ID            :

2:  Disk
   Vendor               : SEAGATE
   Product ID           : ST318453FC
   Port Name            : 22-00-00-0C-50-68-1E-9A
   Port ID              : 11-0A-E2
   Bind                 :   No
   Target ID            :
...
m:  Disk 2 on QLA2462 (HBA Instance 1)
   Vendor               : SEAGATE
```

```
   Product ID           : ST318453FC
   Port Name            : 22-00-00-11-C6-2D-5A-3F
   Port ID              : 11-0A-E2
   Bind                 :  No
   Target ID            :
...
n:  Disk
   Vendor               : SEAGATE
   Product ID           : ST318453FC
   Port Name            : 22-00-00-11-C6-2D-5A-3F
   Port ID              : 02-0A-E4
   Bind                 :  No
   Target ID            :

p:  All Target(s)
```

4.6.1.2.1
Target Persistent Binding - FC Port Configuration (Command Line Option -p)

6: Target Persistent Binding ▶ 1 - n: Target Persistent Binding ▶ 2: Bind Target(s) ▶ 1-n: Port configuration

When you select this menu, you are prompted to enter a Target ID. The **Target Persistent Binding - FC Port configuration** Menu appears and lists these options:

- Select More
- Commit Changes
- Cancel

Type the number for the option you want and press ENTER.

4.6.1.3
Target Persistent Binding – Unbind Targets (Command Line Option -p)

6: Target Persistent Binding ▶ 1 - n: Target Persistent Binding HBA Instance n ▶ 3: Unbind Target(s)

The **Unbind Targets** option is like the **Bind Targets** option (see section 4.6.1.2).

4.6.2
Target Persistent Binding (All HBAs)

6: Target Persistent Binding ▶ p: All HBAs

When you select this option, SANsurfer FC HBA CLI shows the following options:

- Display Configuration
- Bind Target(s)
- Unbind Target(s)

4.6.2.1
Display Target Persistent Binding

6: Target Persistent Binding ▶ p: All HBAs ▶ 1: Display Configuration

When you select the **Display Configuration** option, the following information appears. (Or, the message, *No target persistent binding configuration on HBA instance n* appears instead):

- Bind status (**Yes**)
- Device type (**Disk**, for example)
- Target information (model name and number, for example)
- Port Name
- Port ID
- Target ID

4.6.2.2
Target Persistent Binding – Bind Targets

6: Target Persistent Binding ▶ p: All HBAs ▶ 2: Bind Targets

See 4.6.1.2 Target Persistent Bindings – Bind Target(s) (Command Line Option -p).

4.6.2.3
Target Persistent Binding – Unbind Targets

6: Target Persistent Binding ▶ p: All HBAs ▶ 3: Unbind Targets

See 4.6.1.3 Target Persistent Binding – Unbind Targets (Command Line Option -p).

4.7
Selective LUNs Menu
(Command Line Option -m)

7: Selective LUNs

When you select this option, SANsurfer FC HBA CLI shows the **Selective LUNs Menu** (see 4.5.2), allowing you to select an individual HBA port or **All HBAs**.

4.7.1
Selective LUNs (Per HBA Port)

7: Selective LUNs ▶ 1: - m: HBA Port Instance

When you select this option, SANsurfer FC HBA CLI shows the following options for the HBA:

- Display LUN Configuration
- Manual Configure LUNs

- Auto Configure LUNs

If this option is not available for the selected LUN, the following message appears:

```
Configuration not permitted.  Device(s) either not present or not
persistently bound (HBA n)!
```

4.7.2 Selective LUNs (All HBAs)

7: Selective LUNs ▸ 1: All HBAs

When you select this option, SANsurfer FC HBA CLI shows the following options for all HBAs:

- Display LUN Configuration
- Manual Configure LUNs
- Auto Configure LUNs

4.7.2.1 Display LUN Configuration

7: Selective LUNs ▸ 1-m: Port Number ▸ 1: Display LUN Configuration

When you select the **Display LUN Configuration** menu, you can choose to show either:

- Details View
- General View

The detailed view shows:

```
Selective LUN Menu (Display)

HBA Instance 5 (QLA2300 Port 2) : Online
     WWPN: 21-01-00-E0-8B-25-CB-D8
     Desc: QLA2302 VA-CPQ (PCI to FC dual channel) HP Appliance

1:  Disk
        Vendor                        : SEAGATE
        Product ID                    : ST136403FC
        Port Name                     : 21-00-00-20-37-1A-6B-CF
        Port ID                       : 11-01-E4
        Bind                : Yes
        Target ID           : 0
 2:  Disk
        Vendor                        : SEAGATE
        Product ID                    : ST118273 CLAR18
        Port Name                     : 21-00-00-20-37-11-FF-EF
        Port ID                       : 11-01-E8
        Bind                : Yes
        Target ID           : 1
```

```
 3:  Return to Previous Menu
```

The general view shows:

```
-------------------------------------------------------------------------------
HBA Instance 5: QLA2300 Port 2 WWPN 21-01-00-E0-8B-25-CB-D8 PortID 11-05-EF
-------------------------------------------------------------------------------
Enable Type     Target/LUN Info         Port Name               LUN ID
------ -------- ----------------------- ----------------------- ------
  Yes    Disk   SEAGATE ST136403FC      21-00-00-20-37-1A-6B-CF 0
  Yes    Disk   SEAGATE ST118273 CLAR18 21-00-00-20-37-11-FF-EF 0
```

4.7.2.2
Manual Configure LUNs

7: Selective LUNs ▸ 1-m: Port Number ▸ 2: Manual Configure LUNs

When you select this option, SANsurfer FC HBA CLI lists the disks on the selected HBA port and shows the current configuration of each. Select the number for the disk you want to configure and press ENTER to continue.

You can then select either an individual LUN to configure, or **All LUNs**. Select option **1: Enable** to enable the LUN(s), or option **2: Disable** to disable the LUN(s).

You are prompted to choose either **1: Select More** to configure additional LUNs or **2: Commit Changes** to confirm your configuration changes.

4.7.2.3
Auto Configure LUNs

7: Selective LUNs ▸ 1-m: Port Number ▸ 3: Auto Configure LUNs

When you select this option, SANsurfer FC HBA CLI provides the options **1: Enable** to enable all targets and all LUN(s), or **2: Disable** to disable all targets and all LUN(s). When you select either option, the changes are saved immediately and you are prompted to reboot:

```
Configuration saved on HBA instance 5 (WWPN
21-01-00-E0-8B-25-CB-D8). LUN persistent data saved successfully.
Please reboot the system for the saved configuration to become
effective.
```

4.8
Boot Device Menu
(Command Line Option -e)

8: Boot Device

When you select this option, SANsurfer FC HBA CLI shows the standard HBA Port Instance menu (see section 4.5.2) allowing you to select an individual HBA port or All HBAs.

4.8.1
HBA Port Instance

8: Boot Device ▸ 1 - m: HBA Port Instance

When you select this option, SANsurfer FC HBA CLI shows the **Boot Device Settings** menu for HBA Instance m. You can choose to:

- Display Boot Device(s)
- Configure Boot Device(s)

4.8.1.1
Boot Device(s) (Per HBA Port)

8: Boot Device ▸ n: Port Number ▸ 1: Display Boot Device(s)

When you select this option, SANsurfer FC HBA CLI shows the following information about the boot devices for this HBA Instance:

- HBA Instance Number
- HBA Model Number (QLAxxxx)
- Port Number (on that HBA)
- WWPN
- Port ID
- Boot Device Settings
- Selectable Boot (Enabled/Disabled)
- Primary Boot Port Name (WWPN) and LUN
- Alternate 1 Boot Port Name and LUN
- Alternate 2 Boot Port Name and LUN
- Alternate 3 Boot Port Name and LUN

For example:

```
-------------------------------------------------------------------------------
HBA Instance 0: 2200 Port 1 WWPN 21-00-00-E0-8B-03-55-7C PortID 00-00-EF
-------------------------------------------------------------------------------
Boot Device Settings:
--------------------------------------
Selectable Boot: Disabled
--------------------------------------
(Primary    ) Boot Port Name        LUN
---------------------------     ------
00-00-00-00-00-00-00-00               0
---------------------------     ------
(Alternate 1) Boot Port Name        LUN
---------------------------     ------
00-00-00-00-00-00-00-00               0
---------------------------     ------
(Alternate 2) Boot Port Name        LUN
---------------------------     ------
```

```
00-00-00-00-00-00-00-00                0
----------------------------      ------
(Alternate 3) Boot Port Name         LUN
----------------------------      ------
00-00-00-00-00-00-00-00                0
```

4.8.1.2
Configure Boot Device(s)

8: Boot Device ▶ n: Port Number ▶ 2: Configure Boot Device(s)

When you select this option, SANsurfer FC HBA CLI shows the **Boot Device Settings** menu for HBA Instance m, including the HBA model number, and details about its specifications. You can choose to configure the following:

- Primary Boot Device
- Alternate 1 Boot Device
- Alternate 2 Boot Device
- Alternate 3 Boot Device

4.8.1.2.1
Boot Device Settings

8: Boot Device ▶ n: Port Number ▶ 2: Configure Boot Device ▶ 2: Boot Device Settings

When you select this option, SANsurfer FC HBA CLI shows the **Boot Device Settings** menu with information about each one including:

- Device type (for example, Disk)
  - Order (Primary, secondary, and so forth)
  - Boot Port Name (WWPN)
- BIOS Boot Default

4.8.1.2.2
LUN List Menu

8: Boot Device ▶ n: Port Number ▶ 2: Configure Boot Device ▶ 2: Boot Device Settings ▶ 1: LUN List Menu

When you select this option, SANsurfer FC HBA CLI shows the **LUN List Menu** which includes a list of LUNs on the selected device. You can select any of the lUNs as the boot device:

- LUN: 0
- LUN: 1

And so on.

4.8.1.2.3
Save Configuration

8: Boot Device ▶ n: Port Number ▶ 2: Config.Boot Device ▶ 2: Device Settings ▶ 1: LUN List ▶ 1: Save Configuration

When you select this option, the CLI shows the **Save Configuration** menu:

- Proceed
- Cancel

4.8.2
Boot Device(s) (All HBAs)

8: Boot Device ▶ 1: All HBAs

When you select this option, SANsurfer FC HBA CLI shows information about all boot devices for all HBAs. For details, see “Boot Device(s) (Per HBA Port)” on page 4-52.

- Product vendor
- Product ID
- Product revision

4.9
Driver Settings Menu (Command Line Option -fg)

9: Driver Settings

When you select this option, SANsurfer FC HBA CLI shows the **Driver Settings Menu** that lists the ports on each HBA. Select the number corresponding to the port that you want, and then press ENTER to view the **Target: Display Options** and **Target: Binding Options**.

NOTE:

Options on the **Driver Settings** menu differ according to the driver type: failover, non-failover, Windows, Solaris, or Macintosh:

- **Present persistently bound target(s) plus any new target(s) with driver default** (option available for all drivers)
- **Present persistently bound target(s) Only** (option available for all drivers)
- **Present targets with driver default** (option available for failover driver only)
- **Bind by World Wide Port Name** (option available for all drivers *except* Macintosh driver)
- **Bind by Port ID** (option available for all drivers *except* Macintosh driver)
- **Commit Changes**

The current settings for the **Present persistently bound target(s)...** and **Bind by...** are indicated by the word *Current* in parentheses after the selection. To change these settings, select the menu number corresponding to the other option.

NOTE:

If you select a QLA22xx HBA, all QLA22xx HBAs on the host will use the same settings. If you select a 23xx HBA, all 2G/4G HBAs on the host will also use the same settings.

To save your changes, select **Commit Changes**.

Table 4-4 shows the driver settings.

Table 4-4. Driver Settings

Parameter Name <param name>	Alias <param alias>	Value <param value>	Description
PersistentOnly	PO	0,1	Present persistently bound target(s) only.
Persistent-PlusNew	PN	0,1	Present persistently bound target(s) plus any new target(s) with driver default.
NewOnly[a]	NO	0, 1	Present targets with driver default.
BindWWPN	BW	0,1	Bind devices by WWPNs.

Table 4-4. Driver Settings (Continued)

Parameter Name <param name>	Alias <param alias>	Value <param value>	Description
BindPortID	BP	0,1	Bind devices by Port IDs.

[a] Driver Parameter NewOnly (NO) is supported only with the failover driver.

4.10 Utilities Menu

10: Utilities

When you select this option, SANsurfer FC HBA CLI shows the following utilities options:

- Flash Update
- Flash Save
- HBA Parameters Update
- HBA Parameters Save
- HBA Parameters Templates
- Driver Update (Windows only)
- Driver Rescan (Solaris with QLA driver only)

4.10.1 Flash Update (Per HBA Port or All HBAs) (Command Line Option -b)

10: Utilities ▸ 1: Flash Update

When you select **Flash Update**, you are prompted to select either one of your HBA port instances or **All HBAs** to update. SANsurfer FC HBA CLI then provides the following update options and prompts you to enter a file name for the flash update file:

- Update Entire Image
- Update Boot Code Only
- Update FW Only
- Flash Update

4.10.2 Flash Save (Per HBA Port) (Command Line Option -b and Reserved Word “save”)

10: Utilities ▸ 2: Flash Save

When you select this option, SANsurfer FC HBA CLI opens the **Flash Save Menu**, where you select an HBA port and then enter a file name to save.

4.10.3
HBA Parameters Update (Per HBA Port or All HBAs)
(Command Line Option -r)

10: Utilities ▶ 3: HBA Parameters Update

When you select **HBA Parameters Update**, you are prompted to select either one of your HBA port instances or **All HBAs** to update. SANsurfer FC HBA CLI then displays the following warning message:

```
Warning:

   Please update the HBA parameters with extreme care.
   Incorrectly updating the HBA parameters may render the HBA inoperable.
   If you currently have boot device information set up in the HBA
   parameters, updating the HBA parameters from a file may result in
   changing that information.

   If you wish to preserve the boot device information, please either
   update the file with the correct boot device settings before the
   HBA parameters update or re-configure the boot settings after
   the update.

   Do you want to proceed with the operation?

1:  Yes
2:  No

      Enter Selection:
```

If you select **1: Yes**, you are prompted to enter the name of a file from which to update the HBA parameters.

4.10.4
HBA Parameters Save (Per HBA Port)
(Command Line Option -r and Reserved Word “save”)

10: Utilities ▶ 4: HBA Parameters Save

When you select the **HBA Parameters Save** option, SANsurfer FC HBA CLI prompts you to select an HBA. You then enter a file name to save the parameters for that HBA.

4.10.5
HBA Parameters Template (Per HBA or All HBAs)
(Command Line Option -n and OEM Name)

10: Utilities ▶ 5: HBA Parameters Template

When you select the **HBA Parameters Template** option, SANsurfer FC HBA CLI prompts you to select an HBA port (or **All HBAs**), and then offers some or all of the following template types:

- **EMC** (EMC-specific settings)
- **HP** (HP-specific settings)
- **HPQ** (HP-specific settings – 2Gb HP HBAs)
- **IBM** (IBM-specific settings)
- **QLGC** (QLogic-specific settings)
- **SUN** (SUN-specific settings)

Select one of the templates to apply it immediately to the HBA port instance (or **All HBAs**.) The following is returned:

```
Updating HBA Parameters on HBA instance n -  QLA2nnn. Please
wait...
HBA Parameters update complete. Changes have been saved and
applied to the HBA instance n.
```

4.10.5.1
Using HBA Parameter Templates

Use templates to set OEM-specific storage qualified HBA parameters to a pre-determined value without using a specific `DAT/DEF` file for each HBA type that you might be using.

NOTE:

Settings that are effected by the template apply only to the ISP 2300/2310/23x2 2Gb HBAs and the ISP2422/2432 4Gb HBAs.

The following ISP2422/2432 parameters are subject to the template feature:

- **Execution Throttle** specifies the maximum number of commands executing on any one port. When a port's execution throttle is reached, no new commands are executed until the current command finishes executing
- **Descending Loop ID Search** specifies in what order the firmware assigns the AL_PA (**A**rbitrated**L**oop_**P**hysical**A**ddress). The firmware searches all the nodes in a loop topology and assigns the AL_PA in a descending order if you select 0, ascending order if you select 1.
- **Maximum LUNs Per Target** specifies the maximum number of LUNs per target. Multiple LUN support is typically for RAID boxes that use LUNs to map drives.
- **Port Down Retry Count** specifies the number of times SANsurfer FC HBA CLI retries a command to a port returning port down status.

- **Link Down Timeout** specifies the time the driver waits for the link to come up after link down before returning the I/Os. This is analogous to the **Port Down Retry Count** setting, which is used when the port is down.

The following tables list the parameter settings supported by templates for the specified HBAs.

Table 4-5. Template Supported Parameter Settings for QLA246x/QLE246x and QLE256x HBAs

Setting	QLogic	HP	IBM	SUN
Execution Throttle	65535	65535	65535	65535
Descending Loop ID Search	0	0	0	0
Maximum LUNs Per Target	128	128	256	128
Port Down Retry Count	30	16	30	30
Link Down Timeout	30	8	30	30

Table 4-6. Template Supported Parameter Settings for QLA23xx HBAs (ISP2312)

Setting	QLogic	EMC	HP	HPQ	IBM	SUN
Execution Throttle	16	256	16	16	256	16
Descending Loop ID Search	0	1	0	0	0	0
Maximum LUNs Per Target	128	256	128	128	256	8
Port Down Retry Count	30	45	16	16	30	30
Link Down Timeout	30	45	8	8	30	0

Table 4-7. Template Supported Parameter Settings for QLA23xx HBAs (ISP2300/2310)

Setting	QLogic	EMC	IBM	SUN
Execution Throttle	16	256	256	16
Descending Loop ID Search	0	1	0	0
Maximum LUNs Per Target	128	256	0	8
Port Down Retry Count	30	45	30	30
Link Down Timeout	30	45	30	0

Table 4-8. Template Supported Parameter Settings for QLA23xx HBAs (ISP2322)

Setting	QLogic	EMC
Execution Throttle	16	256
Descending Loop ID Search	0	1
Maximum LUNs Per Target	128	256
Port Down Retry Count	30	45
Link Down Timeout	30	45

4.10.6
Driver Update
(Command Line Option -d)

10: Utilities ▶ 6: Driver Update

The **Driver Update** option is available on Windows systems only. When you select **Driver Update** from the **Utilities** menu, SANsurfer FC HBA CLI prompts you to select an HBA port, and then enter a file name (`INF`, `ZIP`, or `EXE`) with which to update the driver for that port.

4.10.7
Driver Rescan
(Command Line Option -rs)

10: Utilities ▶ 6: Driver Rescan

The **Driver Rescan** option is available only on Solaris systems with the QLA driver. When you select **Driver Rescan** from the **Utilities** menu, SANsurfer FC HBA CLI prompts you to select an HBA port to rescan.

4.11 Beacon Menu

11: Beacon

When you select the **Beacon** option, SANsurfer FC HBA CLI shows the **Beacon Menu** containing these options:

- Locate HBA
- Locate Target(s)

4.11.1 Locate HBA – HBA Beacon (Command Line Option -a)

11: Beacon ▸ 1: Locate HBA

When you select this option, SANsurfer FC HBA CLI shows the **HBA Beacon Menu** that lists all HBA ports. Select any port and press ENTER to toggle the Beacon LED for that port:

4.11.2 Locate Target(s) – Target Beacon (Command Line Option -tb)

11: Beacon ▸ 2: Locate Target(s)

When you select this option, SANsurfer FC HBA CLI shows the **Target Beacon Menu** that lists all HBA ports. Select any port and press ENTER to view the disk details of that port, including the current beacon status:

```
HBA Instance 1 (2200 Port 2) : Online
      WWPN: 21-01-00-E0-8B-23-55-7C
      Desc: QLA2200 /02/12/04 QLA2202FS QCP2202

  1:  Disk
         Vendor                        : SEAGATE
         Product ID                    : ST136403FC
         Port Name                     : 21-00-00-20-37-1A-6B-CF
         Port ID                       : 11-01-E4
         Beacon                : No
  2:  Disk
         Vendor                        : SEAGATE
         Product ID                    : ST118273 CLAR18
         Port Name                     : 21-00-00-20-37-11-FF-EF
         Port ID                       : 11-01-E8
         Beacon                : No
  3:  Beacon Selected Target(s)
  4:  Return to Previous Menu
```

You can select a disk number to blink the LED on that target. The blinking asterisk (*) below the `Device Port Name` line shows that the target beacon is active.

```
-------------------------------------------------------------------------------
HBA Instance 1: 2200 Port 2 WWPN 21-01-00-E0-8B-23-55-7C PortID 11-06-00
-------------------------------------------------------------------------------
Target Beacon
------------------------------------------------
Hit <RETURN> to abort
------------------------------------------------
Device Port Name           Beacon Status
-------------------------  -------------
21-00-00-20-37-11-FF-EF    On - Active
*
```

4.11.2.1
Beacon Selected Target(s)

11: Beacon ▶ 2: Locate Target(s) ▶ 3: Beacon Selected Target(s)

When you select the **Beacon Selected Target(s)** option, SANsurfer FC HBA CLI shows a list of the targets associated with the HBA. You can select any target to toggle the Beacon LED for that target:

4.12
Diagnostics Menu
(Command Line Options -kl, -kr, and -dm)

12: Diagnostics

When you select this option from the Main Menu, SANsurfer FC HBA CLI shows **Diagnostics Menu** with the standard list of HBA ports. Select the port you want to run diagnostic tests on, type its number, and then press ENTER.

NOTE:

`–exclude | –ex` ignores this device in a read/write buffer test.

Table 4-9 shows the diagnostics configuration settings.

Table 4-9. HBA Diagnostics Configuration Settings

Parameter Name <param name>	Alias <param alias>	Value <param value>	Description
`DataPattern`	`DP`	00–FF	See table note 1
		CRPAT	See table note 1
		CSPAT	See table note 1

Table 4-9. HBA Diagnostics Configuration Settings (Continued)

Parameter Name <param name>	Alias <param alias>	Value <param value>	Description
		CJTPAT	See table note 1
DataSize	DS	8, 16, 32, 64, 128, 256, 512, 1024, 2048	See table note 2
TestCount	TC	0–65535 (Loopback)	See table note 3
		0–10000 (R/W Buffer)	See table note 3
TestIncrement	TI	1–65535 (Loopback)	See table note 4
	TI	1–10000 (R/W Buffer)	See table note 4
OnError	OE	0	Ignore
		1	Stop
		2 Loop on error	See table note 5

Table Notes:

1. DataPattern is the test pattern in hexadecimal format.

Hex	Binary
00	00000000
55	01010101
5A	01011010
A5	10100101
AA	10101010
FF	11111111

User Defined Pattern (Hex).
Random Pattern.
CRPAT - Loopback test only.
CSPAT - Loopback test only.
CJTPAT - Loopback test only.

2. DataSize specifies the data (frame payload) size in bytes. Actual data that is transferred during any given pass of the test. For R/W buffer test, the maximum data size is 128 bytes.

3. TestCount:
   0: Test continuously
   1–Max: Total number of tests that will be executed.

4. TestIncrement must be less than the number of test count specified.

5. OnError specifies the action if an error occurs during any given pass.

4.12.1 Diagnostics Loopback Test (Command Line Option -kl)

12: Diagnostics ▶ n: Port Number

When you select an HBA port from the **Diagnostics** menu, SANsurfer FC HBA CLI shows the list of diagnostic tests you can run for that port, including:

- Loopback Test
- Read/Write Buffer Test
- Transceiver Details (available on 4Gb and 8Gb only)

Test results for loopback and read/write buffer tests may include these test results:

- Loopback test results:
  - Test Status
  - CRC Error
  - Disparity Error
  - Frame Length Error
- Read/Write buffer test results:
  - Loop ID/Status
  - Data Miscompare
  - Link Failure
  - Loss of Sync
  - Loss of Signal
  - Invalid CRC

4.12.1.1
Configure Loopback Test Parameters

12: Diagnostics ▸ n: Port Number ▸ 1: Loopback Test

When you select the **Loopback Test** option, SANsurfer FC HBA CLI shows the **Loopback Test Menu** containing the following options:

- Display Test Parameters
- Reset Test Parameters
- Configure Test Parameters
- Start Diagnostics Test

Diagnostic tests interrupt normal HBA operations. At the completion of the testing, the HBA's state before the tests are restored. Note the following:

- Run these tests when no other activities are required of the HBA.
- Tests read and write to sensitive areas on the HBA.
- Disruption of some diagnostic tests may require a complete update of the HBA's critical memory areas.

NOTE:

Although SANsurfer FC CLI protects against normal operation interruption and testing disruption, it is your responsibility to ensure that the diagnostics are run without causing interruptions to other processes and disruptions to the actual testing process.

The loopback test is external to the HBA. If the HBA port is in loop mode, you can run the loopback test with a loopback connector. If the HBA port is in point-to-point mode and attached to a switch, an echo test is run instead (no loopback connector is used). In addition, some driver versions do not require a loopback connector.

The test evaluates the ports (transmit and receive transceivers) on the HBA. More specifically, the loopback test transmits and receives (loopback) the specified data and checks for the frame CRC, disparity, and length errors.

NOTE:

Under Solaris, this feature is disabled if you are using the driver from the OS installation CDs (QLC driver).

To prepare for a loopback test, follow these steps:

1. In interactive mode, type the number for the **Configure HBA Settings** option, and then press ENTER.
2. From the **Connections Options** menu (interactive mode) or the -n command (non-interactive mode), do one of the following:
   - If the HBA port is not connected to the fabric through a point-to-point connection (F-port) and is not connected to a switch, change the setting to *loop only*, if not currently set to this option.

   – Or –

   - If the HBA port is connected to the fabric through a point-to-point connection (F-port) and is connected to a switch, change the setting to *point-to-point only,* if not currently set to this option.

   After completing the loopback test, change the connection option back to its original value.
3. Attach a loopback connector to the FC connector on the HBA port, unless your system meets the criteria in section 4.17.1.2.6 (in this case, an echo test is done).

   The loopback connector must be appropriate for the type of FC HBA connector. Be sure to select the appropriate HBA connector for testing.

   To install a loopback connector, do the following:

   a. Disconnect the cable from the appropriate HBA connector.

   b. Install the loopback connector on the HBA connector.
4. Follow the steps in either section 4.17.1.1 (interactive mode) or section 4.17.1.2.6 (non-interactive mode).

After completing the loopback test, do the following steps to prepare for normal HBA operations:

1. Remove the loopback connector from the HBA connector.
2. Reconnect the cable that you disconnected before installing the loopback connector.
3. From the **Connections Options** menu (interactive mode) or the -N command (non-interactive mode), change the setting back to its previous setting.

4.12.1.2
Run Loopback Test

When you select **Start Diagnostics Test** for the loopback test, the following is returned (example):

```
--------------------------------------------------------------------------------
HBA Instance 4: QLE2562 Port 2 WWPN 21-01-00-1B-32-36-18-EE PortID 01-0F-00
--------------------------------------------------------------------------------

------------------
Test Configuration
------------------
Data Pattern                : Random
Data Size (Bytes)           : 512
Number of test(s)(1-65535)  : 65535
Test Increment(1-65535)     : 1
On Error                    : Ignore
Test Continuous             : OFF
--------------------------------------------------------------------------
---------------------------------
Diagnostics - Loopback Test Result
---------------------------------
Hit <RETURN> to abort
-----------------------------------------
HBA Test Data Pattern          Status    CRC       Disparity FrameLength
--- ----------------------  ----------- --------- --------- -----------
 4  BB-54-01-BD-AC-24-DD-80    Success         0         0           0  |

Finished 6376 iterations in 1 second(s)...
```

4.12.2
Diagnostics Read/Write Buffer Test

12: Diagnostics ▶ n: Port Number ▶ 2: Read/Write Buffer Test

When you select this option, SANsurfer FC HBA CLI shows the **Read/Write Buffer Test Menu** containing the following options:

- Display Test Parameters
- Reset Test Parameters
- Configure Test Parameters
- Start Diagnostics Test

The read/write buffer test sends specified data through the SCSI Write Buffer command to a target device (disk). It then reads the data back through the SCSI Read Buffer command and compares the data for errors. The test also compares the link status of the target before and after the read/write buffer test. If errors occur, the test indicates a broken or unreliable link between the HBA port and the target.

NOTE:

- Under Solaris, this feature is disabled if you are using the driver from the OS installation CDs (QLC driver).
- Some targets may not support read/write buffer commands. Check with your hardware vendors or manufacturer.

4.12.2.1

Configure Read/Write Test Parameters

To prepare for a read/write buffer test, follow these steps:

1. The read/write buffer test must be run on a disk device. Before running the read/write buffer test, verify that the HBA port is connected to at least one target by viewing the host configuration information. In interactive mode, from the **Show System Information** option, type the number for the **Host Configuration** option, and then press ENTER.

To run a loopback test or a read/write buffer test:

1. Select the number for the **Diagnostics** option, and then press ENTER.
2. From the **Diagnostics Tests Menu**, type the number that corresponds to the test you want to run, and then press ENTER:
   - 1 = loopback test
   - 2 = read/write buffer test
3. The **Diagnostics Menu** appears. Type the number that corresponds to the HBA port you want to test, and then press ENTER.

4. The **Configure Diagnostic Loopback Test Parameters** or **Configure Diagnostic Read/Write Buffer Test Parameters** submenu appears. Select one of the following options:
    1. **Show Test Configuration.** Type **1** to show the current parameter values.
    2. **Restore Test Configuration to Default.** Type **2** to return all parameters to their default values.
    3. **Customize Test Configuration.** Type **3** to customize any or all of the parameter values. Continue with Step 5.
    4. **Run Diagnostic Test.** Type **4** to run the loopback or read/write buffer test with the current parameter values. To see these values, type **1** (**Show Test Configuration**).
    5. **Return to the Diagnostics Test Menu.** Type **5** to go back to the **Diagnostics Test Menu**.
6. If you selected **Customize Test Configuration** in Step 4, the **Diagnostic Test Configuration Menu** appears. See sections 4.17.1.2.1 through 4.17.1.2.5 for a description of the parameters and their values. For each parameter you want to change, follow these steps:
    a. Type the number associated with the parameter you want to change.
    b. Enter the parameter value.
    c. To return to the previous menu, type **7** from the Read/Write area, or type **7** from the Loopback area.
7. Type the number to run the loopback or read/write buffer test.
8. The following warning message appears:

```
Warning: The Diagnostic Loopback and Read/Write Buffer tests
require that the HBA has no outstanding input and output
operations. Please make sure there is no active I/O before
starting the test(s).
Do you want to do the test(s)?
1. Yes
2. No
Type 1 to proceed or 2 to cancel the operation.
```

Here is an example of using the **Diagnostics** option to run a loopback test.

```
From the Main Menu (link)

      Enter Selection: 13

      SANsurfer FC HBA CLI
      v1.x.x Build x
```

```
Diagnostics Menu

1:  Loopback Test
2:  Read/Write Buffer Test
3:  Transceiver details

      Note: 0 to return to Main Menu
      Enter Selection: 1

      SANsurfer FC HBA CLI
      v1.x.x Build x

Diagnostics Menu

HBA Model QLA2300/2310:
      1: Port 1: WWPN: xx-xx-xx-xx-xx-xx-xx-xx Loop down
HBA Model QEM2462:
      2: Port 1: WWPN: xx-xx-xx-xx-xx-xx-xx-xx Online
      3: Port 2: WWPN: xx-xx-xx-xx-xx-xx-xx-xx Online
    HBA Model QLA210:
      4: Port 1: WWPN: xx-xx-xx-xx-xx-xx-xx-xx Online

      Note: 0 to return to Main Menu
      Enter Selection: 2

      SANsurfer FC HBA CLI
      v1.x.x Build x

Configure Loopback Test Parameters

1:  Show Test Configuration
2:  Restore Test Configuration to Default
3:  Customize Test Configuration
4:  Run Diagnostic Test
5:  Return to Diagnostics Test Menu

      Note: 0 to return to Main Menu
      Enter Selection: 1

-----------------------------------------------------------------------
HBA 1: QEM2462  Port 1 WWPN xx-xx-xx-xx-xx-xx-xx-xx Port ID 02-0E-00
------------------
Test Configuration
------------------
Data Pattern                          : Random
Data Size (Bytes)                     : 512
Number of test(s)(1-65535)            : 500
Test Increment(1-65535)               : 1
On Error                              : Ignore
```

```
Test Continuous                         : OFF
-------------------------------------------------------------
      Press <Enter> to continue:

      SANsurfer FC HBA CLI
      v1.x.x Build x

Configure Loopback Test Parameters

1:  Show Test Configuration
2:  Restore Test Configuration to Default
3:  Customize Test Configuration
4:  Run Diagnostic Test
5:  Return to Diagnostics Test Menu

      Note: 0 to return to Main Menu
      Enter Selection: 3

      SANsurfer FC HBA CLI
      v1.x.x Build x

Diagnostic Test Configuration Menu

1:  Data Pattern
2:  Data Size
3:  Number of Test(s) (1-65535)
4:  Test Increment(s) (1-65535)
5:  On Error Policy
6:  Enable/Disable Test Continuously
7:  Return to Previous Menu

      Note: 0 to return to Main Menu
      Enter Selection:  7

      SANsurfer FC HBA CLI
      v1.x.x Build x

Configure Loopback Test Parameters

1:  Show Test Configuration
2:  Restore Test Configuration to Default
3:  Customize Test Configuration
4:  Run Diagnostic Test
5:  Return to Diagnostics Test Menu

      Note: 0 to return to Main Menu
      Enter Selection: 4

      SANsurfer FC HBA CLI
```

```
      v1.x.x Build x

Warning: The Diagnostic Loopback and Read/Write Buffer Tests require that the
HBA has no outstanding input and output operations. Please make sure there is
no active I/O before starting the test(s).
      Do you want to proceed with the test(s)?

      1:  Yes
      2:  No

      Note: 0 to return to Main Menu
      Enter Selection: 1

-----------------------------------------------------------------
HBA 1: QEM2462 Port 1 WWPN xx-xx-xx-xx-xx-xx-xx-xx Port ID 02-0E-00
------------------
Test Configuration
------------------
Data Pattern                      : Random
Data Size (Bytes)                 : 512
Number of test(s)(1-65535)        : 500
Test Increment(1-65535)           : 1
On Error                          : Ignore
Test Continuous                   : OFF
-------------------------------------------------------------
Diagnostics - Loopback Test Result
---------------------------------
Note: Press <Enter> to stop the test any time
-----------------------------------------
HBA  Test Data Pattern        Status   CRC   Disparity  FrameLength  Active
---  -----------------------  ------   ----  ---------  -----------  ------
1    B4-31-0E-AA-AD-CF-D5-B0  Success  0     0          0            \
```

4.12.2.2

Run Read/Write Buffer Test

When you select **Start Diagnostics Test** for the read/write buffer test, the following is returned (example):

```
-------------------------------------------------------------------------------
HBA Instance 4: QLE2562 Port 2 WWPN 21-01-00-1B-32-36-18-EE PortID 01-0F-00
-------------------------------------------------------------------------------

------------------
Test Configuration
------------------
Data Pattern                : Random
Data Size (Bytes)           : 128
Number of test(s)(1-10000)  : 10000
Test Increment(1-10000)     : 1
```

```
On Error                    : Ignore
Test Continuous             : OFF
-------------------------------------------------------------------------
Diagnostics - Read/Write Buffer Test Result
-------------------------------------------------------------
Hit <RETURN> to abort
-----------------------------------------
Iter No Data Pattern             Status
------- -----------------------  --------------------------
    263 5B-57-4B-E5-29-D2-6A-1E  Success
```

4.12.3

Diagnostics Transceiver Details – DMI (Command Line Option -dm)

12: Diagnostics ▸ n: Port Number ▸ 3: Transceiver Details

The **Transceiver Details** options is displayed only for 4Gb and 8Gb. When you select this option, SANsurfer FC HBA CLI shows the **Transceiver Details Menu** containing the following options:

- General
- Details

Select either **General** or **Details** and press ENTER to retrieve the transceiver information for this port instance.

4.12.3.1

Transceiver Details – General

Select the **General** option on the **Transceiver Details** menu to view general information for the selected HBA port. The following shows an example:

```
-------------------------------------------------------------------------------
HBA Instance 4: QLE2562 Port 2 WWPN 21-01-00-1B-32-36-18-EE PortID 01-0F-00
-------------------------------------------------------------------------------

-------------------------------------------------------------------------------
Media Information
-------------------------------------------------------------------------------


       Vendor: Intel Corp.
         Type: 800-M6-SN-I
  Part Number: TXN31118D100000
        Speed: 200 MBytes/Sec, 400 MBytes/Sec, 800 MBytes/Sec
     Revision:
Serial Number: AZ8P72890H23
-------------------------------------------------------------------------------
```

	Temperature (C)	Voltage (V)	Tx Bias (mA)	Tx Power (mW)	Rx Power (mW)
Value	34.17	3.33	5.86	0.498	1.174
Status	Normal	Normal	Normal	Normal	Normal
High Alarm	95.00	3.63	9.00	0.676	4.000
High Warning	85.00	3.56	8.50	0.646	2.832
Low Warning	-5.00	3.04	2.00	0.186	0.200
Low Alarm	-10.00	2.97	2.00	0.100	0.100

4.12.3.2

Transceiver Details – Details

Select the **Details** option on the **Transceiver Details** menu to view detailed information for the selected HBA port. The following shows an example:

```
-------------------------------------------------------------------------------
HBA Instance 4: QLE2562 Port 2 WWPN 21-01-00-1B-32-36-18-EE PortID 01-0F-00
-------------------------------------------------------------------------------

Optical Transceiver Digital Diagnostic Data:

Address A0
           Identifier: SFP
      Ext. Identifier: GBIC/SFP defined by serial ID only
            Connector: LC
   Transceiver Data
           Compliance: 0x00 0x00 0x00 0x00
       FC Link Length: Intermediate Distance (I)
  FC Transmitter Tech: Shortwave Laser w/o OFC (SN)
FC Transmission Media: Multi-mode 50m (M5), Multi-mode 62.5m (M6)
             FC Speed: 200 MBytes/Sec, 400 MBytes/Sec, 800 MBytes/Sec
             Encoding: 8B10B
          BR, Nominal: 0x55
    Length (9um) - km: 0x00
         Length (9um): 0x00
        Length (50um): 0x05
      Length (62.5um): 0x02
      Length (Copper): 0x00
          Vendor name: Intel Corp.
           Vendor OUI: 0x00 0x02 0xb3
            Vendor PN: TXN31118D100000
           Vendor Rev:
          Wave Length: 0x0352
              CC_BASE: 0xc1
              Options:-Signal Loss, as defined in SFP MSA: 0x1
                      -Signal Loss, inverted from SFP MSA: 0x0
                      -TX_FAULT signal implemented: 0x1
                      -TX_DISABLE implemented & disables serial o/p: 0x1
                      -RATE_SELECT implemented: 0x1
```

```
              BR, max: 0x00
              BR, min: 0x00
           Vendor SN: AZ8P72890H23
           Date code: 070709
 Diag Monitoring Type:-Address change required: 0x0
                      -Power Measurement: 0x1
                      -Externally Calibrated: 0x0
                      -Internally Calibrated: 0x1
                      -Digital diag monitoring: 0x1
                      -Legacy diagnostic: 0x0
     Enhanced Options:-Soft RATE_SELECT ctrl & monitoring: 0x0
                      -Soft RX_LOS monitoring: 0x1
                      -Soft TX_FAULT monitoring: 0x1
                      -Soft TX_DISABLE ctrl & monitoring: 0x0
                      -Alarm/warning flags: 0x1
  SFF-8472 Compliance: TBD
              CC_EXT: 0x26
      Vendor Specific: 0xff 0xff 0xff 0xff 0xff 0xff 0xff 0xff
                       0xff 0xff 0xff 0xff 0xff 0xff 0xff 0xff
                       0xff 0xff 0xff 0xff 0xff 0xff 0xff 0xff
                       0xff 0xff 0xff 0xff 0xff 0xff 0xff 0xff

Address A2
      Temp High Alarm: 0x5f00
       Temp Low Alarm: 0xf601
    Temp High Warning: 0x5500
     Temp Low Warning: 0xfb01
   Voltage High Alarm: 0x8dcc
    Voltage Low Alarm: 0x7404
 Voltage High Warning: 0x8b10
  Voltage Low Warning: 0x76c0
      Bias High Alarm: 0x1194
       Bias Low Alarm: 0x03e8
    Bias High Warning: 0x109a
     Bias Low Warning: 0x03e8
TX Signal Power High Alarm: 0x1a68
TX Signal Power Low Alarm: 0x03e8
TX Signal Power High Warning: 0x1938
TX Signal Power Low Warning: 0x0746
RX Signal Power High Alarm: 0x2710
RX Signal Power Low Alarm: 0x00fb
RX Signal Power High Warning: 0x1ba7
RX Signal Power Low Warning: 0x01f5
            Rx_PWR(4): 0x00000000
            Rx_PWR(3): 0x00000000
            Rx_PWR(2): 0x00000000
            Rx_PWR(1): 0x00000000
            Rx_PWR(0): 0x00000000
          Tx_I(Slope): 0x0000
```

```
        Tx_I(Offset): 0x0000
       Tx_PWR(Slope): 0x0000
      Tx_PWR(Offset): 0x0000
             T(Slope): 0x0000
            T(Offset): 0x0000
             V(Slope): 0x0000
            V(Offset): 0x0000
             Checksum: 0x63
    Temperature MSB: 0x22
    Temperature LSB: 0x2c
             Vcc MSB: 0x82
             Vcc LSB: 0x21
          TX Bias MSB: 0x0b
          TX Bias LSB: 0x76
         TX Power MSB: 0x13
         TX Power LSB: 0x77
         RX Power MSB: 0x0b
         RX Power LSB: 0x7b
         Reserved MSB: 0x00
         Reserved LSB: 0x00
         Reserved MSB: 0x00
         Reserved LSB: 0x00
Status/Control Bits:-Data_Ready_Bar: 0x0
                    -LOS: 0x0
                    -TX Fault: 0x0
                    -Soft RX Rate Select: 0x0
                    -RX Rate Select State: 0x0
                    -Soft TX Disable: 0x0
                    -TX Disable State: 0x0
                    -TX Signal Power Low Alarm: 0x0
                    -TX Signal Power High Alarm: 0x0
                    -TX Bias Low Alarm: 0x0
                    -TX Bias High Alarm: 0x0
                    -Vcc Low Alarm: 0x0
                    -Vcc High Alarm: 0x0
                    -Temp Low Alarm: 0x0
                    -Temp High Alarm: 0x0
                    -RX Signal Power Low Alarm: 0x0
                    -RX Signal Power High Alarm: 0x0
                    -TX Signal Power Low Warning: 0x0
                    -TX Signal Power High Warning: 0x0
                    -TX Bias Low Warning: 0x0
                    -TX Bias High Warning: 0x0
                    -Vcc Low Warning: 0x0
                    -Vcc High Warning: 0x0
                    -Temp Low Warning: 0x0
                    -Temp High Warning: 0x0
                    -Reserved Warning: 0x0
                    -Reserved Warning: 0x0
```

```
                    -Reserved Warning: 0x0
                    -Reserved Warning: 0x0
                    -Reserved Warning: 0x0
                    -Reserved Warning: 0x0
                    -RX Power Low Warning: 0x0
                    -RX Power High Warning: 0x0
      Vendor Specific: 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
```

4.13 Statistics Menu (Command Line Options -gs and -ls)

13: Statistics

The **Statistics** option allows you to view and change HBA and link statistics. When you select this option, SANsurfer FC HBA CLI shows the **Statistics Menu** containing:

- HBA Statistics
- Link Status

NOTE:

- Under Solaris, HBA statistics are disabled if you are using the driver from the OS installation CDs (QLC driver). Under Linux, this feature is disabled if you are using the ioctl or sysfs (inbox) driver.
- Under Solaris, link statistics are disabled if you are using the driver from the OS installation CDs (QLC driver).

4.13.1 HBA Statistics – Monitoring (Command Line Option -gs)

13: Statistics ▸ 1: HBA Statistics

When you select this option, SANsurfer FC HBA CLI shows the **HBA Statistics Menu** including the following options:

- Configuration
- Show HBA Statistics

4.13.1.1 Configuration

13: Statistics ▸ 1: HBA Statistics ▸ 1: Configuration

To change the HBA statistics:

1. From the **Main Menu**, type the number for the **Statistics** option, and then press ENTER.
2. From the **Statistics Menu**, type the number for the **HBA Statistics** option, and then press ENTER.
3. From the **HBA Statistics Menu**, type the number for the **Configuration** option, and then press ENTER.

   The **HBA Statistics Settings Menu** contains the following options:

   - Current Settings
   - Restore Default
   - Auto Poll
   - Set Rate
   - Log to File

4. To see the current port statistics, select **Current Settings** and then press ENTER. For example:

```
-------------------------------------
HBA Port Statistics Settings
-------------------------------------
AutoPoll (AP): 10
SetRate (SR): 5
LogToFile (LF): null.csv
```

5. To restore the HBA defaults, select **Restore Default** and then press ENTER. The following message appears:

```
Resetting to default settings..., done.
```

6. To change the polling, select **Auto Poll** and then press ENTER. Then select either **Auto Poll** or **Manual Poll** and press ENTER to enable that selection.
7. To change the sampling rate, select **Set Rate** and then press ENTER. You are prompted to enter a rate value between 5 and 30 seconds; the current rate is shown in parentheses. Type a new rate and then press ENTER to update the sampling rate.
8. To save the HBA statistics to a file, select **Log to File** and then press ENTER. Type the name of a `.csv` file to save to, and then press ENTER.

Table 4-10 shows the values for the HBA port statistics options.

Table 4-10. HBA Port Statistics Options

Parameter Name	Alias	Value	Description
`AutoPoll`	AP	0	Turn on automatic updates of the HBA port statistics.
		1–256	Turn on automatic updates of the HBA port statistics at a specified interval.
`SetRate`	SR	5–30	Set the polling interval during automatic update (seconds).
`LogToFile`	LF	Log File Name	Export the statistics to a file (CSV format).

4.13.1.1.1
Current Settings

13: Statistics ▸ 1: HBA Statistics ▸ 1: Configuration ▸ 1: Current Settings

The system displays the current settings for:

- AutoPoll (AP)
- SetRate (SR)
- LogToFile (LF)

4.13.1.1.2
Restore Defaults

13: Statistics ▸ 1: HBA Statistics ▸ 1: Configuration ▸ 2: Restore Default

The system restores the default settings and returns a message:

```
Resetting to default settings..., done.
```

4.13.1.1.3
Auto Poll

13: Statistics ▸ 1: HBA Statistics ▸ 1: Configuration ▸ 3: Auto Poll

SANsurfer FC HBA CLI displays two polling options:

- AutoPoll
- Manual Poll

If you select the **Auto Poll** option, the system enables Auto Poll and returns a message:

```
Auto Poll enabled.
```

If you select the **Manual Poll** option, the system prompts you to enter a value for Manual Poll iteration:

```
Manual Poll iteration (1-256)
```

Enter a value from 1 to 256 and press ENTER. The system updates the Manual Poll iteration value and returns the following message:

```
Manual Poll updated.
```

4.13.1.1.4
Set Rate

13: Statistics ▶ 1: HBA Statistics ▶ 1: Configuration ▶ 4: Set Rate

The system prompts you to enter a value for the sampling rate (the current rate is shown in parentheses):

```
Sampling Rate Seconds [5-30](n):
```

Enter a value from 5 to 30 and press ENTER. The system updates the sampling rate and returns a message:

```
Sampling rate updated.
```

4.13.1.1.5
Log to File

13: Statistics ▶ 1: HBA Statistics ▶ 1: Configuration ▶ 5: Log To file

When you select the **Log to File** option, the system prompts you to enter a file name or press RETURN to cancel.

If you press the ENTER key, the **HBA Statistics Settings Menu** reappears.

If you enter a file name, for example, *MyFile*, the system saves the log to that file and returns a message:

```
Save to file option enabled (MyFile.csv).
```

The file name extension `.csv` indicates a Comma Separated Value file type.

4.13.1.2
Show HBA Statistics

13: Statistics ▶ 1: HBA Statistics ▶ 1: Show HBA Statistics

To view the HBA port statistics:

1. From the **Main Menu**, type the number for the **Statistics** option, and then press ENTER.
2. From the **Statistics Menu**, type the number for the **HBA Statistics** option, and then press ENTER.

3. From the **HBA Statistics Menu**, type the number for the **Show HBA Statistics** option, and then press ENTER.
4. The **Statistics Menu** appears and prompts you to select an HBA port. Type the number for the port, and then press ENTER.

   The HBA statistics for that port are shown. For example:

```
-------------------------------------------------------------------------------
HBA Instance 0: 2200 Port 1 WWPN 21-00-00-E0-8B-03-55-7C PortID 00-00-EF
-------------------------------------------------------------------------------
HBA Port Statistics
----------------------------------------
The following keys are in use during test:
      <R> | <r> - Reset All Counters
      <RETURN>  - Abort Test
----------------------------------------
HBA Port Errors Device Errors Reset I/O Count  IOPS  BPS        Time
--- ----------- ------------- ----- ---------- ----- ---------- -----------
  0           0             0 30568          0     0          0 09:43:43 AM
```

4.13.2
Link Status
(Command Line Option -ls)

13: Statistics ▸ 2: Link Status

The following sections describe how to view and change the HBA's link status.

NOTE:

Under Solaris, link status is disabled if you are using drivers from the OS installation CDs (QLC driver).

From the **Main Menu**, select **Statistics** and then select **Link Status**. When you select the **Link Status** option, SANsurfer FC HBA CLI shows the following options:

- Configuration
- Show Link Status

4.13.2.1
Configuration

13: Statistics ▸ 2: Link Status ▸ 1: Configuration

When you select the **Configuration** option, the **Link Status Settings Menu** appears and allows you to view and configure the following:

- Current Settings
- Restore Default

- Auto Poll
- Set Rate
- Log to file

Table 4-11 shows the statistics and link status options.

Table 4-11. Statistics/Link Status Options

Parameter Name	Alias	Value	Description
`AutoPoll`	AP	0	Update the link statistics automatically.
		1–256	Update the link statistics up to a specified interval.
`SetRate`	SR	5–30	Set the Statistics Sampling Rate (seconds).
`LogToFile`	LF	Log File Name	Export the link statistics to a file (CSV format).

4.13.2.1.1
Current Settings

13: Statistics ▶ 2: Link Status ▶ 1: Configuration ▶ 1: Current Settings

Select the **Current Settings** option to have the system display the current link status settings for:

- AutoPoll (AP)
- SetRate (SR)
- LogToFile (LF)

4.13.2.1.2
Restore Default

13: Statistics ▶ 2: Link Status ▶ 1: Configuration ▶ 2: Restore Default

The **Restore Default** option causes the system to restore the default settings and return the following message:

```
Resetting to default settings..., done.
```

4.13.2.1.3
Auto Poll Menu

13: Statistics ▶ 2: Link Status ▶ 1: Configuration ▶ 3: Auto Poll

SANsurfer FC HBA CLI displays two polling options:

- Auto Poll
- Manual Poll

If you select the **Auto Poll** option, the system enables Auto Poll and returns a message:

```
Auto Poll enabled.
```

If you select the **Manual Poll** option, the system prompts you to enter a value for Manual Poll iteration:

```
Manual Poll iteration (1-256)
```

Enter a value from 1 to 256 and press ENTER. The system updates the Manual Poll iteration value and returns the following message:

```
Manual Poll updated.
```

4.13.2.1.4
Set Rate

13: Statistics ▸ 2: Link Status ▸ 1: Configuration ▸ 4: Set Rate

The system prompts you to enter a value for the sampling rate (the current rate is shown in parentheses):

```
Sampling Rate Seconds [5-30](n):
```

Enter a value from 5 to 30 and press ENTER. The system updates the sampling rate and returns a message:

```
Sampling rate updated.
```

4.13.2.1.5
Log to File

13: Statistics ▸ 2: Link Status ▸ 1: Configuration ▸ 5: Log to File

When you select the **Log to File** option, the system prompts you to enter a file name or press RETURN to cancel.

If you press the ENTER key, the **Link Status Settings Menu** reappears.

If you enter a file name, for example, *MyFile*, the system saves the log to that file and returns a message:

```
Save to file option enabled (MyFile.csv).
```

The file name extension `.csv` indicates a Comma Separated Value file type.

4.13.2.2
Show Link Status

13: Statistics ▸ 2: Link Status ▸ 2: Show Link Status

The **Show Link Status** option shows a menu of port numbers from which you can select the port for which you want the link status.

To view the link status:

1. Type the number for the **Statistics** option, and then press ENTER.
2. The **Statistics Menu** appears. Type the number for the **Link Status** option, and then press ENTER.
3. The **Link Status Menu** appears. Type the number for the **Show Link Status** option, and then press ENTER.
4. You are prompted to select an HBA port. Type the number for the port, and then press ENTER. The HBA link status for that port appears.

```
-------------------------------------
Link Status
-------------------------------------
The following keys are in use during test:
<R> | <r> - Reset Current
<C> | <c> - Refresh Current
<T> | <t> - Refresh Total
<RETURN>  - Abort Test
-------------------------------------------------------------------
Port Name   Link Failure   Sync Loss   Signal Loss   Invalid CRC
-------------------------------------------------------------------
Port(WWPN)  0              0           0             0
Disk(WWPN)  0              0           0             0
Disk(WWPN)  0              0           0             0
Disk(WWPN)  0              0           0             0
Disk(WWPN)  0              0           0             0
Disk(WWPN)  0              0           0             0

      Press <Enter> to continue:
```

4.14 Virtual Menu (Command Line Option -vp)

14: Virtual Menu

NOTE:

The option to use N_Port ID Virtualization (NPIV) only appears on the **Main Menu** if the HBAs and system support it. NPIV requires a Windows system running with a driver that supports NPIV.

QLogic's SANsurfer FC HBA CLI for Windows works in conjunction with QLogic's N_Port ID Virtualization (NPIV)-capable Windows driver. NPIV is an ANSI T11 standard that describes how multiple unique fabric addresses (N_Port IDs) can share a single FC HBA physical port (N_Port) in SAN fabric topology. NPIV allows a physical HBA port to obtain N_Port IDs. The SANsurfer FC HBA CLI refers to these N_Port IDs as “virtual ports” (VPorts).

QLogic 4Gb FC HBAs (QLx24xx) support the NPIV standard. Using NPIV requires software tools or applications to create, delete, manage, deploy, and migrate virtual ports. Microsoft’s Windows Virtual Server 2005 R2, along with Windows Server 2003, provides a virtualization platform that can run guest operating systems in an x86 environment. Use the QLogic NPIV-capable Windows driver with QLogic’s SANsurfer FC HBA CLI to create, delete, and manage virtual ports. You can deploy and migrate virtual ports in conjunction with virtual machines (VMs) in your Windows Virtual Server environment using Microsoft System Center Virtual Machine CLI 2007.

For more information about QLogic and Microsoft solutions, see the following documents:

- *HBA Virtualization Technologies for Windows Environments*
- *Microsoft System Center Virtual Machine Manager*

The **Virtual Menu** options allow you to view, create, and delete virtual HBA ports.

To see a complete list of NPIV options, add the flag `-h` to the `vp` command. For example:

```
scli -vp -h
```

When you select the Virtual Menu option from the main menu, the **Virtual Menu** appears.

- HBA Model
  - Port Number
  - WWPN
  - Status (Online/Loop down)
- (Additional HBAs)
  - (Additional Ports)

Virtual port options include the following:

- `<vport wwpn>` is the World Wide Port Name of a virtual port.
- `<vport hex>` is a single hex digit that will be part of the virtual port’s WWPN (Second byte). (0-4 is reserved for physical HBA port. Note that this feature is supported only with NPIV-enabled driver.

4.14.1
Virtual Menu for HBA Instance

14: Virtual ▶ 1: Virtual Menu

When you select this option, the **Virtual Port Menu** appears with the following options:

- List Virtual Ports
- Delete a Virtual port
- Create a Virtual port

Enter the number for the option you want, and then press ENTER.

With a virtual HBA, the following SANsurfer FC HBA CLI features are *not* available:

- HBA Parameters Display
- HBA Parameters Settings
- HBA Parameters Restore Default
- Flash Update from file
- Flash Save to file
- HBA Parameters Update from file
- HBA Parameters Save to file
- HBA Parameters Templates
- Driver Update
- Target Link Speed
- Boot Device Settings
- Driver Settings

In addition, the following notes apply:

- The maximum number of virtual HBAs that can be created of a physical HBA is 15.
- *VPort* means Virtual Port in all the displays.
- In command line mode, you must use the WWPN instead of HBA instance number to select a virtual port.
- After you create or delete a virtual HBA, you should refresh the configuration to see the changes.

4.14.1.1
List Virtual Port(s)

14: Virtual ▶ 1: Virtual Menu ▶ 3: List Virtual Ports

When you select this option, the menu of virtual ports on this physical HBA port appears showing:

- List Virtual Ports including for each:
  - Instance Number
  - Virtual Port Number
  - WWPN
  - Status (Online or Loop Down)

Here is an example:

```
Virtual Menu
HBA Model QLA2462:
  0: VPort 3:   WWPN: 21-00-7B-E0-8B-14-5A-CF Online
  1: VPort 2:   WWPN: 21-00-67-E0-8B-14-5A-CF Online
  4: Return to Previous Menu
```

4.14.1.2
Delete Virtual Port(s)

14: Virtual ▸ 1: Virtual Menu ▸ 3: Delete a Virtual Port

To delete a virtual port, select a virtual port number from the **Delete a Virtual Port** menu. To see the change, you must manually refresh the virtual port configuration.

4.14.1.3
Create Virtual Port(s)

14: Virtual ▸ 1: Virtual Menu ▸ 3: Create a Virtual Port

When you select this option, the **Create Virtual Port Menu** for this HBA Instance appears showing:

- HBA Instance n
  - HBA Model Port Number
  - Status
  - Description

- Followed by the menu:
  - Auto Generate
  - User Generate

Here is an example:

```
Create Virtual Port Menu

HBA Instance 4 (QLA2462 Port 1) : Online

Desc: QLA2462 PCI-X 2.0 to 4Gb FD Dual Channel

  1: Auto Generate
  2: User Generate
  3: Return to Previous Menu
```

4.14.1.3.1
Auto Generate

14: Virtual ▶ 1: Virtual Menu ▶ 3: Create a Virtual Port ▶ 1: Auto Generate

When you select this option, the system creates a Virtual Port on this HBA physical port and reports the WWPN of the virtual port. For example:

```
Virtual Port 21-00-25-E0-8B-14-5A-CF created successfully on HBA
instance 4.
```

To see the change to the virtual ports, you must manually refresh the configuration. Note that the second hexadecimal digit changes on the newly created virtual port.

4.14.1.3.2
User Generate

14: Virtual ▶ 1: Virtual Menu ▶ 3: Create a Virtual Port ▶ 2: User Generate

When you select this option, you are prompted to enter a hex digit for the new virtual port WWPN. This new hex number is assigned to the second field of the physical HBA port WWPN.

```
    Enter Hex Pattern (xx) :
```

Type two hexadecimal digits. The system creates the new Virtual Port, for example:

```
(Create Virtual Port Menu)
  Enter Selection: 2
  Enter Hex Pattern <xx>: EF
```

The system returns:

```
Virtual Port 21-00-EF-8B-14-5A-CF created successfully on HBA
instance 4.
```

Note that the entered hex digits, **EF**, now appear in byte 2 of the new Virtual Port WWPN.

To see the change to the virtual ports, you must manually refresh the configuration.

4.15
Help Menu
(Command Line Option -h)

14 (or 15): Help

When you enter this option the **Help Menu** appears with the following options:

- Contents
- Exit Codes

- About

Type the number for the option you want and press ENTER.

4.15.1 Contents

14 (or 15): Help ▶ 1: Contents

When you select the **Contents** option, SANsurfer FC HBA CLI shows the entire **Help** menu. You can see the help menu options rearranged into alphabetical order in Appendix E.

4.15.2 Exit Codes

14 (or 15): Help ▶ 2: Exit Codes

When you select the **Exit Codes** option, SANsurfer FC HBA CLI shows the entire list of exit codes. You can see the exit codes in Appendix D.

4.15.3 About

14 (or 15): Help ▶ 3: About

When you select the **About** option, SANsurfer FC HBA CLI shows the following information about this tool:

- Product name
- Version and Build number
- Copyright information
- All rights reserved
- Full Name
- Build Type
- Build Date

Section 5

Non-interactive Commands

5.1

Introduction

This section contains the information in the help (to view help, enter the command `-h`), plus additional explanation and examples. Each command line option is listed, followed by a command description and examples of the command in use and typical responses from the system.

5.2

Display System Information (Command Line Options -g, -z, and -tp)

When you enter one of these options, general information appears in various formats. For example:

- # **`scli -g`** shows Host Information (see section 5.2.1).
- # **`scli -z`** shows Host Configuration (see section 5.2.2).
- # **`scli -tp`** shows Host Topology (see section 5.2.3).

5.2.1

Host Information (Command Line Option -g)

The command format to show host information is:

```
# scli -g
```

When you enter this option, the following information about the local machine appears:

- Host Name
- OS type
- OS version (patches where applicable)
- SAN target management (SDM) API version
- List of HBAs: HBA model, port number, WWPN, serial number (SN), HBA number (HBA 0–n), and status (online/offline)
- Total number of QLogic FC HBAs detected

NOTE:

The failover and SAN device management APIs are QLogic-specific libraries required for SANsurfer FC HBA CLI. The versions of these libraries are useful for debugging purposes.

5.2.2 Host Configuration (Command Line Option -z)

The command line option `-z` shows all of the HBA's information in a single command. The command format is:

```
# scli -z
```

The SANsurfer FC HBA CLI tool shows the information in section 5.2.1, as well as the following additional information:

- HBA General information
- HBA Vital Product Data (VPD)
- HBA Parameter Settings
- Driver Settings Information:
  - Group: Persistent
  - Group: Binding
- Devices/LUNs Information
- Selective LUNs Information
  - Boot Device Settings

To show the information for a single HBA, type the following command:

```
# scli -z (<HBA Instance> | <HBA WWPN>)
```

Where:

HBA Instance = HBA number (use -g command to find)

HBA WWPN = World wide port name of the HBA

To show the information for all HBAs, type:

```
# scli -z all
```

5.2.3
Host Topology
(Command Line Option -tp)

NOTE:

Under Linux, host topology (`-tp`) is disabled if you are using the ioctl or sysfs (inbox) driver.

The command format for Host Topology is:

```
# scli -tp
```

When you select this option, the SANsurfer FC HBA CLI tool shows the information in section 5.2.2, as well as the following additional information:

- Interconnect Element (switch or HBA)
  - Type (Switch or HBA)
  - World wide name
  - Domain ID
  - Management ID
  - IP address
  - Model
  - Symbolic name
  - Serial number
  - MAC address
  - Firmware version
  - Port count
  - Beacon status
- Interconnect element (HBA):
  - Type
  - World wide node name
  - World wide port name
  - Vendor ID
  - HBA Model
  - HBA Serial Number
  - HBA Alias
  - Port Alias
  - Driver Version
  - Firmware Version
  - Total Number of Devices
  - Host
  - Number of Port
  - Beacon status
  - Port Type

- Port State

- Port Information
  - Physical Port Number (switch port number), including:
    - Port state
    - Port type
    - TX port type
    - Port module type
  - Attached Port (QLogic HBA, tape device, or disk device connected to the switch physical port), including:
    - Target/initiator
    - Node name
    - Port name
    - Vendor ID
    - Product ID (if applicable)
    - Product revision (if applicable)
    - Product serial number (if applicable)
    - HBA model (if applicable)
    - HBA serial number (if applicable)
    - HBA alias (if applicable)
    - Port alias (if applicable)
    - Driver version
    - Firmware version
    - Total number of devices (if applicable)
    - Host (if applicable)

5.2.4 Host Configuration

Use these options to show the information for one or all of the HBA ports in the system. The `-z` option shows the combination of the commands listed in Table 5-1. The commands are listed in alphabetical order.

Table 5-1. Options Shown by -z

CLI	Description	See Section
`-c`	Show HBA settings	5.3.3
`-e`	Configure boot device	5.3.6
`-fg`	View driver settings	5.3.9
`-g`	Show system information	5.3.11

Table 5-1. Options Shown by -z (Continued)

CLI	Description	See Section
`-i`	Show HBA information (VPD information for QLA/QLE24*xx* only)	5.3.15
`-l`	Show LUN list	5.3.19
`-m`	Configure selective LUNs	5.3.21
`-p`	Configure target persistent binding	5.3.24
`-t`	Show target list	5.3.29

5.3 Command Summary

The command format for non-interactive mode is:

```
# scli -(Cmd) (<HBA Instance> | <HBA WWPN>) (view | ?)
```

Where:

HBA Instance = HBA port instance (use -g command to find)
HBA WWPN = HBA World wide port name

You can combine the commands `-o`, `-s` and `-x` with other options. However, they *must* be at the beginning or at the end of the command line. Use these commands as follows:

- `-o` = Output the results to a file (see section 5.3.23). For example:

  ```
  # scli -l -o
  ```

- `-s` = Silent mode (see section 5.3.28). For example:

  ```
  # scli -i all -s -o output.txt
  ```

- `-x` = Outputs the results in XML format (see 5.3.34). For example:

  ```
  # scli -i all -x -o output.xml
  ```

You cannot combine the command `-f` with any other options:

- `-f` = Input Parameter Options from a Text File (see section 5.3.8). For example:

  ```
  # scli -f command.txt
  ```

In addition, the following general rules for commands apply:

- Only *one* command line option per input file is valid.

- You can use either the hyphen (-) character or the forward slash (/) character. For example, both of these commands are valid:

```
scli -g
scli /g
```

Table 5-2 defines the command variables.

Table 5-2. Command Variables

Variable	Definition	Format
<*HBA Instance*> or <*Instance number*>	HBA number[a]	
<*HBA WWPN*>	HBA world wide port name	xx-xx-xx-xx-xx-xx-xx-xx *or* xxxxxxxxxxxxxx
<*Alias*>	HBA Alias	Symbolic HBA[b] name
<*Target WWNN*>	Target world wide node name	xx-xx-xx-xx-xx-xx-xx-xx *or* xxxxxxxxxxxxxx
<*Target WWPN*>	Target world wide port name	xx-xx-xx-xx-xx-xx-xx-xx *or* xxxxxxxxxxxxxx
<*Target Port ID*>	Target port ID	xx-xx-xx *or* xxxxxx
<*Target ID*>	Target ID	
<*LUN ID*>	Logical unit number	(0–255)
<*Address*>	IP Address	xxx.xxx.xxx.xxx
(speed)	Target link speed	1.2 or 4 GHz

[a] You can use the -g command to find HBA numbers.

[b] You assign the symbolic name. It is limited to 100 characters in length.

5.3.1
-a
(View or Toggle Beacon Status)

Use the -a command to either view (1) or change (2) the status of a beacon.

NOTES:

- HBA must not be in silent mode. See section 5.3.28 to issue a response to this command.
- The -a feature is not supported on QLA22xx HBAs.

To view the HBA port's LED Beacon state, type:

```
# scli -a (<HBA Instance> | <HBA WWPN>)(view | ?)
```

When the HBA's LED is flashing, the following message appears:

```
HBA Port x - LED Flashing is ON.
```

When the HBA's LED is not flashing, the following message appears:

```
HBA Port x - LED Flashing is OFF.
```

In Solaris SPARC, include double quotes around the question mark (?) if the system is running with a *csh* or *tsch* shell. For example:

```
# scli -a <HBA> "?"
```

To start or stop flashing the HBA's LED beacon, type:

```
# scli -a (<HBA Instance> | <HBA WWPN>)
```

SANsurfer FC HBA CLI toggles the LED's state. If the LED is flashing, the flashing stops. If the LED is not flashing, the flashing begins.

If SANsurfer FC HBA CLI is not in silent mode (see section 5.3.28), one of the following messages appears to indicate the LED's current state:

```
The LED Flashing for <HBA Instance> <HBA WWPN> has been turned
ON
The LED Flashing for <HBA Instance> <HBA WWPN> has been turned
OFF
```

The <*HBA Instance*> or <*HBA WWPN*> must match the command input parameter.

5.3.2 -b (Save or Update the Flash BIOS or Fcode)

Use the `-b` command to:

- Update the BIOS or Fcode from a file (1).
- Save the BIOS or Fcode to a file (2).

To update one or all HBA's Flash with new BIOS or FCode, type:

```
# scli -b (all | <HBA Instance> | <HBA WWPN>) [(<-rg> <fw | boot>|
all)] <BIOS/FCode File Name>
```

Where:

all = All HBAs of the same type in the system are updated with the new BIOS/FCode

HBA Instance = HBA number (use -g command to find)

HBA WWPN = World wide port name

-rg = Flash region update mode (4GB HBAs only[a]):

- fw = Update firmware only
- boot = Update bootcode only (BIOS/FCode/EFI image)
- all = Update all regions (BIOS/FCode/EFI) depending on the Flash image.

BIOS/FCode File Name = Name or path of file continuing update BIOS/FCode

[a]Region update only supported on QLA/QLE/QMC246x HBAs.

To save the BIOS/FCode to a file, type:

```
# scli -b (<HBA Instance> | <HBA WWPN>) SAVE <BIOS/FCode File Name>
```

Where:

HBA Instance = HBA number (use -g command to find)

HBA WWPN = World wide port name of the HBA

BIOS/FCode File Name = File name or a path to a file in which to save BIOS/FCode

5.3.3 -c (Show Parameter Settings)

Use the -c command to show the parameter settings for all HBAs in the system:

```
# scli -c [ <all> ]
```

To show the parameter settings for a specific HBA, type:

```
# scli -c (<HBA Instance> | <HBA WWPN>)
```

Where:

HBA Instance = HBA number (use -g command to find)

HBA WWPN = World wide port name of the HBA

5.3.4 -d (Update Device Driver)

Use the -d command to update the HBA's device driver:

```
scli -d <File Name>
```

Where:

File Name = Absolute or full path name of the setup INF file or the compressed driver file in ZIP or EXE format. The binary image of the device driver must reside in the same absolute or full path location. For example:

```
scli -d c:\temp\ql2300\qlxxx.inf
```

5.3.5
-dm
(Display Diagnostics Monitoring Info)

This option allows you to show general or detailed Digital Diagnostic Monitoring Interface for optical transceivers.

NOTES:

- This option is supported only for QLA/QLE/QEM24*xx* (4GB) HBAs.
- Under Solaris, this option is disabled if you are using Linux inbox drivers (SLES 10.0/RHEL 5.0 or latest).

To show Transceiver monitoring *general* information, type:

```
# scli -dm (<HBA Instance> | <HBA WWPN> | <all>)general | gen
```

To show Transceiver monitoring *detailed* information, type:

```
# scli -dm (<HBA Instance> | <HBA WWPN> | all)details | det
```

Where:

HBA Instance = HBA number (use `-g` command to find)
HBA WWPN = World wide port name of the HBA
all = All HBAs in the system

5.3.6
-e
(Boot Device View | Select | Disable)

Use the `-e` command to:

- Show the current boot-device selection for all HBAs (1).
- Show the current boot-device selection for a specific HBA (2).
- Set a target device as the boot device for an HBA (3).
- Selectable boot—The OS boots from the first target the BIOS finds (4).
- Delete the boot device from an HBA (5).

In these commands:

HBA Instance = HBA number (use -g command to find)
HBA WWPN = World wide port name of the HBA
Target WWNN = World wide node name of the target
Target WWPN = World wide port name of the target
Target ID = ID to which the target is bound
LUN ID = ID of the LUN

To view the current boot device selection on all HBAs:

```
# scli -e (view | ?)
```

To view the current boot device selection for a specific HBA:

```
# scli -e (<HBA Instance> | <HBA WWPN>) (view | ?)
```

In Solaris SPARC, if the system is running with a csh or tsch shell, include double quotes around the question mark (?). For example:

```
# scli -e <HBA> "?"
```

In Windows and Linux, each HBA's currently selected boot device is shown in the following format:

```
<HBA Number> <HBA WWPN> <Target WWNN> <Target WWPN> <LUN ID>
```

Solaris shows each HBA's currently selected boot device in the following format:

```
<HBA Number> <HBA WWPN> <Target WWNN> <Target WWPN> <Target
ID> <LUN ID>
```

If the system does not have an HBA with a boot device selected, the following message appears:

```
There is no boot device selected for any HBA in the system.
```

Following is an example of the Boot Device option when viewing the boot device for a single HBA. In this example, no boot device is configured (selectable boot is disabled; the boot port name is all zeroes).

```
-------------------------------------------------------------
HBA 1: QLA2340  WWPN xx-xx-xx-xx-xx-xx-xx-xx Port ID 00-00-00
-------------------------------------------------------------
Boot Device Settings:
-------------------------------------
Selectable Boot: Disabled
-------------------------------------
(Primary) Boot Port Name  LUN
-----------------------   -----------------------  ------
00-00-00-00-00-00-00-00   00-00-00-00-00-00-00-00       0
Press <Enter> to continue:
```

To cause the OS to boot from the first target it finds with a LUN, select a boot port name of `00-00-…00` (selectable boot); this applies only if the boot BIOS is enabled.

To set a particular target as the boot device for a specific HBA, type the following command:

```
# scli -e (<HBA Instance> | <HBA WWPN>) <Target WWNN> <Target
WWPN> <Target ID> <LUN ID>
```

NOTE:

Because x86 Solaris does not require the Target ID, the Solaris command is:

```
# scli -e (<HBA Instance> | <HBA WWPN>) <Target WWNN> <Target
WWPN> <LUN ID>
```

SANsurfer FC HBA CLI checks all parameters to verify that the HBA, targets, and LUNs are valid.

If you select an HBA with no target or a target with no LUN, SANsurfer FC HBA CLI shows an error message and aborts.

In Solaris SPARC, setting the target ID to the target of the boot-selected LUN is equivalent to persistently binding the target (see 5.3.24). Therefore, if the target is persistently bound, its boot device entry must have the same target ID.

For all operating systems, if the HBA already has boot devices defined and they are different from the ones in the command parameter or menu selection, you are prompted to confirm the boot device selection:

```
The HBA already has a boot device(s) selected. Do you want to
replace it with the new one?
```

For all operating systems, if the HBA already has boot devices selected and they are the same as the ones in the command parameter or menu selection, the following message appears:

```
The HBA already has that device selected as boot device.
```

To use selectable boot (the OS boots from the first target the BIOS finds) set the <*Target WWPN*>, <*Target WWNN*> and <*LUN ID*> inputs to all zeroes. For example type:

```
# scli -e (<HBA Instance> | <HBA WWPN>) (enable | 0 0 0)
```

To disable (delete) the boot device for a specific HBA, type:

```
# scli -e (<HBA Instance> | <HBA WWPN>) disable
```

5.3.7
-ei
(List SANsurfer FC HBA CLI Error Codes)

This command lists the SANsurfer FC HBA CLI error codes as shown in Appendix D.

5.3.8
-f
(Input Parameter Options from a Text File)

NOTE:

The `-f` option is valid only in non-interactive mode, and cannot be combined with any other options. Only one command line parameter per file is valid. This option is used when it is run as a script file.

To input parameter options to SANsurfer FC HBA CLI through a text file, type `-f`, followed by the file name. For example:

```
# scli -f command.txt
```

The text file must be formatted as follows:

- The file must contain a single line.
- The file must contain only parameters.
- The file cannot contain another `-f` option.

The following example shows how to set the connection option of a HBA to default (loop preferred, otherwise point-to-point) and the data rate to auto through a command file that is invoked by the `-f` option:

1. Create a text file (for example, sethba0.txt) and enter the following command in the text file:

   ```
   -n 0 co 2 dr 2
   ```

2. Save and close the file.

3. Issue the `scli` command with the `-f` option (input from command file):

   ```
   # scli -f sethba0.txt
   # scli -f <File Name>
   ```

SANsurfer FC HBA CLI specifies command line input from file.

5.3.9
-fg
(Show Driver Settings)

NOTE:

The `-fg` option is valid only in non-interactive mode.

To show the driver settings, type:

```
# scli -fg (<HBA Instance> | <HBA WWPN>) (view | ?)
```

Where:

HBA Instance = HBA number (use `-g` command to find)
HBA WWPN = World wide port name of the HBA

5.3.10
-fs
(Configure Driver Settings)

Type the following command to configure the driver settings:

```
# scli -fs (<HBA Instance> | <HBA WWPN>) {(<Parameter Name> |
<Parameter Alias>) <Param Value>}
```

Where:

HBA Instance = HBA instance number of an HBA port (use `-g` command to find)
HBA WWPN = World wide port name of the HBA
Parameter Name = Name of the parameters
Parameter Alias = Alias of the parameters
Parameter Value = New value of the parameters

The pairs <*Parameter Name*> <*Parameter Value*> and <*Parameter Alias*> <*Parameter Value*> can be repeated to set multiple parameters in a single command.

Table 5-3 lists the driver configuration parameter names and aliases.

Table 5-3. Driver Settings Parameters

Description	Parameter Name <param name>	Alias <param alias>	Value[a] <param value>
Persistently bound target(s) only	`PersistentOnly`	`PO`	0, 1

Table 5-3. Driver Settings Parameters (Continued)

Description	Parameter Name <param name>	Alias <param alias>	Value[a] <param value>
Present persistently bound target(s) plus any new target(s) with driver default	PersistentPlusNew	PN	0, 1
Present targets with driver default	NewOnly[b]	NO	0, 1
Bind devices by WWPN	BindWWPN	BW	0, 1
Bind devices by port ID	BindPortID	BP	0, 1

Table Notes

[a] 0 = Disabled, 1 = Enabled

[b] Driver parameter NewOnly (NO) is supported only with the failover driver. If you select a QLA22*xx* HBA, all QLA22*xx* HBAs on the host will use the same settings. If you select a 23*xx* HBA, all 2G/4G HBAs on the host will also use the same settings.

The following restrictions apply:

- Under Solaris, the driver configuration feature is disabled if you are using the driver from the OS installation CDs (QLC driver).
- Under Linux, this feature is disabled if you are using the ioctl or sysfs (inbox) driver.
- Under Macintosh, the BindWWPN and BindPortID parameters are not changeable; Mac supports only the BindWWPN parameter.

5.3.11
-g
(Display System Information)

To view system information, type:

```
# scli -g
```

For details of this command, see section 5.2.

5.3.12
-gs
(Show HBA Statistics)

To view the HBA statistics, type:

```
# scli -gs (<HBA Instance> | <HBA WWPN>) [(<Parameter Name> |
<Parameter Alias>) <Parameter Value>]
```

Where:

HBA Instance = HBA number (use `-g` command to find)
HBA WWPN = World wide port name of the HBA
`Parameter Name` = Name of the parameter (see table 4-7)
Parameter Alias = Alias of the parameter (see table 4-7)
Parameter Value = New value of the parameter (see table 4-7)

Table 5-4 lists the HBA statistics parameter names, aliases, and values.

Table 5-4. HBA Statistics Parameters

Description	Name	Alias	Value
Sets how often statistics are retrieved	AutoPoll	AP	0–256[a]
Set the polling interval when retrieving statistics (seconds)	PollRate	SR	5–30
Saves the HBA's statistics to a CVS log file	LogToFile	LF	Log file name

Table Notes

When the AutoPoll parameter is 0, statistics are retrieved automatically until the user aborts the operation. When the AutoPoll parameter is in the range of 1–256, statistics are retrieved for the number of cycles specified by this value.

Under Solaris, this feature is disabled if you are using the driver from the OS installation CDs (QLC driver). Under Linux, this feature is disabled if you are using the ioctl or sysfs (inbox) driver.

5.3.13 -h (Help)

Type the following text to view the help file:

```
# scli (-h | ?)
```

Type the following text to view help information for an individual command:

```
# scli <Command Line Parameter> (-h | ?)
```

For example, typing **`scli -l -h`** shows:

```
SANsurfer FC HBA CLI
v1.x.x Build x
Copyright 2003-2007 QLogic Corp.
All rights reserved.
```

```
Command Line QLogic FC Host Bus Adapters

scli -l (<hba no> | <hba wwpn>)
    - shows LUN information for all HBAs.
scli -l (<hba no> | <hba wwpn>) (<target wwpn>|   <target
portid>)
    - shows LUN information for a specific target
scli -l (<hba no> | <hba wwpn>) (<target wwpn>| <target
  portid>) <lun id>     - shows LUN information for a specific
LUN on a       specific target
```

NOTE:

To view the current version information for SANsurfer FC HBA CLI, use the `-v` option section 5.3.32.

5.3.14

-ha
(Set | Delete HBA Alias)

With this command you can view, set or delete the alias of a specific HBA.

To view the alias of a specified HBA, type:

```
# scli -ha (<HBA Instance> | <HBA WWPN>) view | ?
```

To set an alias for a specified HBA, type:

```
# scli -ha (<HBA Instance> | <HBA WWPN>) <Alias>
```

To delete an alias of a specified HBA, type:

```
# scli -ha (<HBA Instance> | <HBA WWPN>) delete
```

Where:

HBA Instance = HBA number (use `-g` command to find)
HBA WWPN = World wide port name of the HBA
Alias = Symbolic HBA name. (100 characters, maximum)

To set an alias for the selected HBA:

```
# scli -ha (<HBA Instance> | <HBA WWPN>) <Alias>
```

To delete the current alias of the selected HBA:

```
# scli -ha (<HBA Instance> | <HBA WWPN>) delete
```

To view the current alias of the selected HBA:

```
# scli -ha (<HBA Instance> | <HBA WWPN>) view | ?
```

5.3.15
-i
(Display HBA General Information or VPD Information for One or All HBAs)

To show general HBA information or VPD information for all HBA ports in the system, type the following command:

```
# scli -i [ <all> ] [ <VPD> ]
```

Where:

all = All HBAs in the system
VPD = Vital Product Data

To show general or VPD information for a specific HBA, type:

```
# scli -I (<HBA Instance> | <HBA WWPN>) [ VPD ]
```

To show VPD (QLA/QLE24xx only) for all HBA ports in the system, type:

```
# scli -i VPD
# scli -i all VPD
```

Where:

all = VPD information for all HBAs in the system

5.3.16
-kl
(Loopback Test)

Use the `-kl` command to perform the loopback test.

Use the `-kr` command to perform the read/write buffer test (see section 5.3.18.1).

To do a loopback test with the default parameters, type:

```
# scli -kl (<HBA Instance> | <HBA WWPN>)
```

To do a loopback test with customized parameters, type:

```
# scli -kl (<HBA Instance> | <HBA WWPN>) [(<Parameter Name> |
<Parameter Alias>) <Parameter Value>]
```

Where:

HBA Instance = HBA number (use `-g` command to find)
HBA WWPN = World wide port name of the HBA
-ex or -exclude *Target WWPN* = World wide port name of the target device to be excluded from the read/write test

Parameter Name = One of the following:

- DataPattern (see 5.3.16.1)
- DataSize (see 5.3.16.2)
- TestCount (see 5.3.16.3)
- TestIncrement (see 5.3.16.4)
- OnError (see 5.3.16.5)

Parameter Alias = One of the following:

- DP (see 5.3.16.1)
- DS (see 5.3.16.2)
- TC (see 5.3.16.3)
- TI (see 5.3.16.4)
- OE (see 5.3.16.5)

Parameter Value = Value for selected parameter

Sections 5.3.16.1 through 5.3.16.5 describe how to change the default parameters for both of these tests. Section 5.3.16.6 contains command line examples and test results for a loopback test. Section 5.3.18.1 contains command line examples and test results for a read/write buffer test.

5.3.16.1 DataPattern (DP)

For the loopback test, the data pattern is either:

```
DP <Parameter Value>
DataPattern <Parameter Value>
```

The data pattern must be in a two-character hexadecimal pattern in the range of 00–FF. The hexadecimal letters can be uppercase or lowercase. The default pattern is random, for example:

```
# scli -kl(<HBA Instance> | <HBA WWPN>) DP Random
```

To enter a customized value (in the range of 00–FF), type:

```
# scli -kl (<HBA Instance> | <HBA WWPN>) DP <Parameter Value>
```

In addition to a hex pattern, you can enter a compliant random data pattern (CRPAT), jitter tolerance pattern (CJTPAT), or supply noise test sequence (CSPAT) for a loopback test. For example:

```
# scli -kl (<HBA Instance> | <HBA WWPN>) DP CJTPAT
```

Table 5-5 lists all valid data patterns:

Table 5-5. Data Pattern Values

Hex	Binary
00h	00000000
55h	01010101
5Ah	01011010
A5h	10100101
AAh	10101010
FFh	11111111
Random	
Customized (00–FF)	
CRPAT (loopback test only)	
CJTPAT (loopback test only)	
CSPAT (loopback test only)	

Table Notes

Complaint random data pattern in a valid FC frame, as defined by the ANSI document *Methodologies for Jitter and Signal Quality Specification - MJSQ Annex A - Test bit sequences*.

Complaint jitter tolerance pattern in an FC frame, as defined by the ASIC document listed above.

Supply noise test sequence in a valid FC frame, as defined by the ASIC document listed above.

5.3.16.2
DataSize (DS)

For the loopback test, the data size is either:

```
DS <Parameter Value>
DataSize <Parameter Value>
```

The valid data sizes are as follows:

- **Read/write buffer test.** The data size can be 8, 16, 32, 64, or 128 bytes. The default value is 128 bytes.
- **Echo test.** The data size can be 8, 16, 32, 64, 128, 256, 512, 1024, or 2048. The default size is 512.
- **Loopback test (Windows, Solaris, and Macintosh systems).** The data size can be 8, 16, 32, 64, 128, 256, 512, 1024, or 2048. The default value is 512 bytes.

- **Loopback test (Linux systems).** The data size can be 8, 16, 32, 64, 128, 256, 512, 1024, 2048, 4096, 8192, 16384, 32768, or 65535. The default value is 512 bytes.

5.3.16.3
TestCount (TC)

The number of loopback tests is either:

```
TC <Parameter Value>
TestCount <Parameter Value>
```

For a read/write buffer test, the number of tests run must be in the range of 0–10000.

For a loopback test, the number of tests run must be in the range of 0–65535.

For both tests, a value of 0 indicates that the test runs continuously (it stops when you press ENTER). The default number of tests run is 500.

5.3.16.4
Test Increment (TI)

The Test Increment for the loopback test is either of the following:

```
TI <Parameter Value>
Test Increment <Parameter Value>
```

For a read/write buffer test, the test increment must be in the range of 1–10000.

For a loopback test, the test increment must be in the range of 1–65535.

If the number of tests is continuous (see section 5.3.16.3), the test increment is automatically set to one of the following:

- 12 (Windows)
- 25 (Solaris)
- 2 (Linux and Macintosh)

The default test increment is 1. The test increment cannot be larger than the number of tests run (see section 5.3.16.3).

5.3.16.5
OnError (OE)

For the loopback test, OnError is either:

```
OE <Parameter Value>
OnError <Parameter Value>
```

This parameter determines how errors are handled. Table 5-6 lists the valid values.

Table 5-6. OnError Values

Value	Description
0	The error is ignored. This is the default value.
1	The test stops on error.
2	On error, the data pattern and test repeat until the error is cleared.

5.3.16.6

Run a Loopback Test

The loopback test sends and receives messages, through a loopback or through an echo command, to the switch.

NOTE:

The loopback test is disabled if you are using the drivers from the OS installation.

NOTES:

Run an echo test instead of a loopback test under the following conditions:

- You have a QLA23*xx*, QLA24*xx*, QLE23*xx*, or QLE24*xx* HBA that is connected to the fabric through a point-to-point connection (F-port).
- The HBA is connected to a switch.
- Your operating system has one of the driver versions listed in Table 5-7.

Table 5-7 lists the operating system driver versions that do not require a loopback connector.

Table 5-7. Driver Versions Not Requiring a Loopback Connector

Operating System	Driver Version
Windows XP, Windows 2000, or Windows Server 2003 with SCSI miniport driver	9.0.0.12
Windows Server 2003 with STORport miniport driver	9.0.0.12
Solaris SPARC	4.12

Table Notes

All subsequent versions also apply.

To do a loopback test using the current parameters, type:

```
# scli --kl (<HBA Instance> | <HBA WWPN>)
```

To do a loopback test with custom parameters, type:

```
# scli --kl (<HBA Instance> | <HBA WWPN>) [(<Parameter Name> |
<Parameter Alias>) <Parameter Value>]
```

Section 5.3.16 describes the parameters and their default values.

The following examples do 500 loopback tests with a test increment of 10, a data pattern of FFh, and a data size of 8 bytes. The test stops if an error occurs.

```
# scli -kl <HBA WWPN> DP FF DS 8 TC 500 TI 10 OE 1
# scli -kl <HBA Instance> DP FF DS 8 TC 500 TI 10 OE 1
```

You do not have to set each parameter for the loopback test. If you do not specify a parameter in the command line, the current parameter value is used. For example, the following command sets the data pattern to FFh and uses the current values for the other parameters:

```
# scli -kl <HBA Instance> DP FF
```

The following example sets the data size to 16 bytes and has the test loop if an error occurs. The other parameters use the current values:

```
# scli -kl <HBA WWPN> DS 16 OE 2
```

An example of a successful loopback test follows:

```
------------------
Test Configuration
------------------
Data Pattern                = Random
Data Size (Bytes)           = 512
Number of test(s) (0-65535) = N/A
Test Increment (1-65535)    = 125
On Error                    = Ignore
Test Continuous             = ON
-------------------------------------------------------------------------------
Diagnostics - Loopback Test Result
----------------------------------
Note: Press <Enter> to stop the test any time
------------------------------------------

HBA   Test Data Pattern         Status    CRC   Disparity   FrameLength   Active
-------------------------------------------------------------------------------
0     B1-3B-6A-A5-11-28-C1-8C  Success   0     0           0             /
```

The test results are described in the following paragraphs.

- **Status** – Test result. The possible values are:
  - **Success** – The test passed.

- **Error** – CRC, disparity, or frame length errors occurred.
- **Failed** – An error occurred when attempting to issue a command.
- **Loop down** – The loop is down.

- **CRC** – Number of CRC errors.
- **Disparity** – Number of disparity errors.
- **Frame Length** – Number of frame length errors.

```
-kl (<HBA Instance> | <HBA WWPN>) [{(<Parameter Name> |
<Parameter Alias>) <Parameter Value>}]
```

5.3.17
-kl
(Run HBA Diagnostics Loopback Test)

NOTE:

Under Solaris, this feature is disabled if you are using the driver from the OS installation CDs (QLC driver).

The <*Parameter Name*>, <*Parameter Alias*>, and <*Parameter Value*> options are described in Table 5-8.

The system shows the following information after a loopback test completes:

- Test status
- CRC error
- Disparity error
- Frame length error

5.3.18
-kr
(Run Read/Write Buffer Test)

Use the `-kr` command to do read/write buffer test. (To run the loopback test, use the `-kl` command—see section 5.3.16.)

To do a read/write test using the default parameters, type:

```
# scli -kr (<HBA Instance> | <HBA WWPN>)
```

To do a read/write test with customized parameters, type:

```
# scli -kr (<HBA Instance> | <HBA WWPN>) [(-EX | -EXCLUDE)
<Target WWPN>] (<Parameter Name> | <Parameter Alias>)
<Parameter Value>
```

Where:

HBA Instance = HBA number (use -g command to find)

HBA WWPN = World wide port name of the HBA

-EX or -EXCLUDE *Target WWPN* = World wide port name of the target device that is excluded from the read/write test

Parameter Name = One of the following:

- DataPattern (see section 5.3.16.1)
- DataSize (see section 5.3.16.2)
- TestCount (see section 5.3.16.3)
- TestIncrement (see section 5.3.16.4)
- OnError (see section 5.3.16.5)

Parameter Alias = One of the following:

- DP (see section 5.3.16.1)
- DS (see section 5.3.16.2)
- TC (see section 5.3.16.3)
- TI (see section 5.3.16.4)
- OE (see section 5.3.16.5)

Parameter Value = Value for selected parameter

Sections 5.3.16.1 through 5.3.16.5 describe how to change the default parameters for both of these tests. Section 5.3.16.6 contains command line examples and test results for a loopback test. Section 5.3.18.1 contains command line examples and test results for a read/write buffer test.

5.3.18.1

Run a Read/Write Buffer Test

This test runs on all devices or on the devices you select on the HBA you select. This test sends the SCSI Write Buffer command to the target devices and uses the SCSI Read Buffer command to read the returned data and do a data comparison.

NOTE:

All devices attached to the HBA must support SCSI Read/Write Buffer commands.

To do a read/write buffer test using the current parameters, type:

```
# scli -kr (<HBA Instance> | <HBA WWPN>)
```

To exclude a device or devices on the selected HBA port, type:

```
# scli -kr (<HBA Instance>|<HBA WWPN>) [(-EX | -EXCLUDE)
<Target WWPN>] [(<Parameter Name> | <Parameter Alias>)
<Parameter Value>]
```

Sections 6.17.0.0.1 through 6.17.0.0.5 describe the parameters and their default values.

The following examples do 500 read/write buffer tests with a test increment of 10, a data pattern of FFh, and a data size of 8 bytes. The test stops if an error occurs.

```
# scli -kr <HBA Instance> DP FF DS 8 TC 500 TI 10 OE 1
# scli -kr <HBA WWPN> DP FF DS 8 TC 500 TI 10 OE 1
```

You do not have to set each parameter for the read/write buffer test. If you do not specify a parameter in the command line, the current parameter value is used. For example, the following command sets the data pattern to FFh and uses the current values for the other parameters:

```
# scli -kr <HBA Instance> DP FF
```

The following example sets the data size to 16 bytes and has the test loop if an error occurs. The other parameters use the current values.

```
# scli -kr <HBA WWPN> DS 16 OE 2
```

An example of a successful read/write buffer test follows:

```
HBA 1: QEM2462 Port 1 WWPN xx-xx-xx-xx-xx-xx-xx-xx Port ID 02-0E-00
------------------
Test Configuration
------------------
Data Pattern                : Random
Data Size (Bytes)           : 512
Number of test(s) (0-65535) : 500
Test Increment (1-65535)    : 1
On Error                    : Ignore
Test Continuous             : OFF
-------------------------------------------------------------------------------
Diagnostics - Loopback Test Result
-------------------------------------------
Note: Press <Enter> to stop the test any time
-------------------------------------------

HBA  Test Data Pattern       Status    CRC   Disparity   FrameLength   Active
-------------------------------------------------------------------------------
1    B4-31-0E-AA-AD-CF-D5-B0 Success   0     0           0             \

-kr (<HBA Instance> | <HBA WWPN>) [{(-EX | -EXCLUDE) <Target WWPN>}]
[(<Parameter Name>| <Parameter Alias>) <Parameter Value>
```

5.3.18.2
Run HBA Diagnostics Read-write Buffer Test

The {(-ex | exclude) <*Target WWPN*>} parameters specify a device that will be excluded from the read/write buffer test.

The system shows the following information after a read/write buffer test completes:

- Loop ID/status
- Data miscompare
- Link failure
- Loss of sync
- Loss of signal
- Invalid CRC

Table 5-8 lists the <*Parameter Name*>, <*Parameter Alias*>, and <*Parameter Value*> options.

Table 5-8. Diagnostics Parameters

Name	Alias	Value	Description
DataPattern	DP	Test pattern in hex format[a] Customized (00–FF) Random pattern CRPAT[b] CJTPAT[c] CSPAT[d]	00, 55, 5A, A5, AA, FF (see Table 5-9) — — Loopback test only Loopback test only Loopback test only
DataSize[e]	DS	8, 16, 32, 64, 128, 256, 512, 1024, 2048	Actual data transferred during any given pass of the test
TestCount[f]	TC	0–65535 0–10,000	Loopback test only Read/write buffer test only
TestIncre-ment[g]	TI	1–65535 1–10,000	Loopback test only Read/write buffer test only
OnError	OE	0–2	0 = ignore 1 = stop 2 = loop on error

Table Notes

[a] Valid two-character case-insensitive hexadecimal patterns.

[b] Complaint random data pattern in a valid FC frame, as defined by the ANSI document *Methodologies for Jitter and Signal Quality Specification - MJSQ Annex A - Test bit sequences.*

[c] Complaint jitter tolerance pattern in a FC frame, as defined by the ASIC document listed above.

[d] Supply noise test sequence in a valid FC frame, as defined by the ASIC document listed above.

[e] For read/write buffer test, the maximum size is 128; this is also the default. For an echo test, the maximum size is 2048; the default size is 512. For a loopback test on Windows, Solaris, and Macintosh systems, the maximum size is 2048; the default size is 512. For a loopback test on Linux OSs, the maximum size is 65535; the default size is 512.

[f] 0=test continuously. 1–10,000 and 1–65535=total number of tests that will be executed.

[g] Must be less than the TestCount value.

Table 5-9. Data Pattern (DP) Test Patterns

Hex	Binary
00	00000000
55	01010101
5A	01011010
A5	10100101
AA	10101010
FF	11111111

If the read/write buffer test fails, the system shows the following information:

- **Loop/port ID** (the loop ID of the HBA when operating in loop mode).
- **Status**:
  - **Success** – The test passed.
  - **Error** – A data miscompare or link status firmware error occurred.
  - **Failed** – A link status error, SCSI write buffer error, or SCSI read buffer error occurred.
  - **Unknown** – The target was not present.
  - **Unsupported** – The device does not support this test.
- **Data Miscompare.** The possible values are:
  - 0 (no data miscompares)
  - Device not present
  - Get link status failed
  - Read buffer failed
  - R/W buffer not supported

- ❑ Write buffer failed

- **Link Failure** – Number of link failures
- **Loss of sync** – Number of sync loss errors
- **Loss of signal** – Number of signal loss errors
- **Invalid CRC** – Number of invalid CRCs

5.3.19
-l
(Display LUN Info)

This command shows LUN information for:

- All HBAs
- A specific target
- A specific LUN *on* a specific target

To show the LUN information for *all target* devices for a *specific* `HBA Instance`, type:

```
# scli -l (<HBA Instance> | <HBA WWPN>)
```

To show the LUN information for a specific device for a specific HBA port, type:

```
# scli -l (<HBA Instance> | <HBA WWPN>) (<Target Port ID> |
<Target WWPN>)
```

To show the LUN information for a *specific LUN* on a *specific target* device for a *specific HBA* port instance, type:

```
# scli -l (<HBA Instance> | <HBA WWPN>) (<Target Port ID> |
<Target WWPN>) <LUN ID>
```

Where:

HBA Instance = HBA number (use -g command to find)
HBA WWPN = World wide port name of the HBA
Target Port ID = Port ID of the target
Target WWPN = World wide port name of the target
LUN ID = ID of the LUN

5.3.20
-ls
(Display Link Status)

To view the link status, type:

```
# scli -ls (<HBA Instance> | <HBA WWPN>) [(<Parameter Name> |
<Parameter Alias>) <Parameter Value>]
```

Where:

HBA Instance = HBA number (use `-g` command to find)
HBA WWPN = World wide port name of the HBA
Parameter Name = Name of the parameter (see Table 5-10)
Parameter Alias = Alias of the parameter (see Table 5-10)
Parameter Value = New value of the parameter (see Table 5-10)

Table 5-10 defines the link status parameter names, aliases, and values.

Table 5-10. Link Status Parameters

Description	Name	Alias	Value
Sets link-status retrieval period	`AutoPoll`	AP	0–256[a] cycles
Sets link-status retrieval polling interval	`PollRate`	SR	5–30 seconds
Save link status to CVS log file	`LogToFile`	LF	Log file name

[a] When the AutoPoll parameter is 0, the link status is retrieved automatically until the user aborts the operation. When the AutoPoll parameter is in the range of 1–256, the link status is retrieved for the number of cycles specified by this value.

5.3.21
-m
(View, Enable, or Disable LUNs)

NOTES:

- If the current driver setting is Bind by Port ID, this option is not available.
- Under Solaris, if you use the driver from the OS installation CDs (QLC driver), this feature is disabled.
- Under Linux, if you use the ioctl or sysfs (inbox) driver, this feature is disabled.
- Under Solaris, the QLA HBA driver supports a maximum of 256 LUNs.
- Under Solaris, the QLC HBA driver supports a maximum of 16K LUNs.
- You must persistently bind the targets before configuring selective LUNs, (link).

Use the `-m` command to:

- View all selective LUNs for all HBA ports (1)
- View an HBA's selective LUN list (2)
- View the current selective state of a LUN on a specific target (3)
- Enable (select) a LUN on a specific target on a specific HBA (4)

- Disable (deselect) a LUN on a specific target on a specific HBA (5)
- Enable all LUNs on a specific target on a specific HBA (6)
- Disable (deselect) all LUNs on a specific target on a specific HBA (7)
- Enable (select) all LUNs of all targets on a specific HBA (8)
- Disable (deselect) all LUNs of all targets on a specific HBA (9)

For these commands:

HBA Instance = HBA number (use -g command to find)
HBA WWPN = World wide port name of the HBA
Target WWNN = World wide node name of the target
Target WWPN = World wide port name of the target
LUN ID = ID of the LUN

To view all selective LUNs for all HBA ports, type:

```
# scli -m all (view | ?)
```

To view an HBA's selective LUN list, type:

```
# scli -m (<HBA Instance> | <HBA WWPN> | all) (view | ?)
```

In Solaris SPARC, include double quotes around the question mark (?) if the system is running with a csh or tsch shell. For example:

```
# scli -m <HBA> "?"
```

SANsurfer FC HBA CLI shows the HBA's enabled LUN list in the following format:

```
<Target WWNN> <Target WWPN> <LUN ID>
```

To view the current select state of a specific LUN, type:

```
# scli -m (<HBA Instance> | <HBA WWPN>) (<Target WWNN> <Target
WWPN> <LUN ID>) (view | ?)
```

If the input represents a valid LUN, SANsurfer FC HBA CLI shows that LUN's current state as selected or deselected for that HBA.

To enable (select) a LUN on a specific target on a specific HBA, type:

```
# scli -m (<HBA Instance> | <HBA WWPN>) {<Target WWNN> <Target
WWPN> <LUN ID> ( 1 | enable | select )}
```

NOTE:

You can repeat the sequence <*Target WWNN*> <*Target WWPN*> <*LUN ID*> 1 to select multiple LUNs in the same command.

To disable (deselect) a LUN on a specific target on a specific HBA, type:

```
# scli -m (<HBA Instance> | <HBA WWPN>) {<Target WWNN> <Target
WWPN> <LUN ID> (0 | disable | deselect)}
```

NOTE:

To select multiple LUNs in the same command, repeat the following sequence:

```
<Target WWNN> <Target WWPN> <LUN ID> 0
```

To enable (select) all LUNs for a specific target on a specific HBA, type:

```
# scli -m (<HBA Instance> | <HBA WWPN>) select | enable
<Target WWNN> <Target WWPN>
```

To disable (deselect) all LUNs for a specific target on a specific HBA, type:

```
# scli -m (<HBA Instance> | <HBA WWPN>) deselect | disable
<Target WWNN> <Target WWPN>
```

To enable (select) all LUNs of all targets on a specific HBA:

```
# scli -m (<HBA Instance> | <HBA WWPN>) select all
```

To disable (deselect) all LUNs of all targets on a specific HBA:

```
# scli -m (<HBA Instance> | <HBA WWPN>) deselect all
```

5.3.22

-n (Set Selected HBA Parameter)

To set a specific parameter on a specific HBA, type:

```
# scli -n (<HBA Instance> | <HBA WWPN>) { (<Parameter Name> |
<Parameter Alias>) <Parameter Value> }
```

To restore the default BIOS (4G HBAs only), type:

```
# scli -n (<HBA Instance> | <HBA WWPN>) default
```

Where:

HBA Instance	=	HBA number (use -g command to find)
HBA WWPN	=	World wide port name of the HBA
Parameter Name	=	Name of the parameters
Parameter Alias	=	Alias of the parameters
Parameter Value	=	New value of the parameters

The pairs <*Parameter Name*> <*Parameter Value*> and <*Parameter Alias*> <*Parameter Value*> can be repeated to set multiple parameters with a single command.

Table 5-11 lists the HBA parameter names and aliases.

Table 5-11. HBA Parameters

Description	Name	Alias	Value
Connection options	ConnectionOption	CO	See table note, below[a]
Data rate	DataRate	DR	See table note, below[b]
Enable BIOS	EnableBIOS[c]	EB	1=Enable, 0=Disable
Enable extended logging	EnableExtendedLog-ging[d]	EL	1=Enable, 0=Disable
Enable FC tape	EnableFCTape	EF	1=Enable, 0=Disable
Enable hard loop ID	EnableHardLoopID	HL	1=Enable, 0=Disable
Enable LIP full login	EnableLIPFullLogin	FL	1=Enable, 0=Disable
Enable LIP reset	EnableLipReset	LP	1=Enable, 0=Disable
Enable target reset	EnableTargetReset	TR	1=Enable, 0=Disable
Execution throttle	ExecutionThrottle	ET	1–65535
Frame size	FrameSize	FR	512, 1024, 2048
Hard loop ID	HardLoopID	HD	0–125
Interrupt delay timer	InterruptDelay-Timer	ID	0–255
Login retry count	LoginRetryCount	LR	0–255
Link down timeout	LinkDownTimeOut	LT	0–240
Maximum LUNs per target	MaximumLUNsPerTar-get	ML	0, 8, 16, 32, 64, 128, 256
Operation mode	OperationMode	OM	See table note, below[e]
Port down retry count	PortDownRetryCount	PD	0–255
Reset Delay	ResetDelay	RD	0-255

Table Notes:

[a] Connection Options:
0 – Loop only
1 – Point-to-point only
2 – Loop preferred, otherwise point-to-point
3 – Point-to-point preferred, otherwise loop (QLA22*xx* HBAs only)

[b] Data Rate (QLA23*xx*/QLA24*xx*/QLE23*xx*/QLE24*xx* HBAs):
0 – 1 Gbs
1 – 2Gbs
2 – Auto
3 – 4 Gbs

[c] EnableBIOS option not available on 4Gb HBA.

[d] EnableExtendedLogging option not available on PPC64 or SPARC.

[e] Operation mode (QLA/QLE23*xx* and QLA/QLE24*xx* HBAs):
0 = interrupt for every I/O completion
5 = interrupt when interrupt delay timer expires
6=interrupt when interrupt delay timer expires or no active I/O

NOTE:

See the HBA Manager Index Adapter setting for QLA200/210 parameters.

5.3.23
-o
(Output to a File)

NOTES:

- The `-o` option is valid only in non-interactive mode.
- This option can be used with all non-interactive mode options that have a corresponding interactive mode option (see Table 5-1). The option must be the first or last command in the command line.
- If the file already exists, new data are appended to the current file.

To output result and status messages into a file, type `-o`, followed by the file name. For example, to save LUN information to a file named *systemLUNinfo*:

```
# scli -l -o systemLUNinfo
```

Where the file name is *systemLUNinfo*, all messages are located in the directory indicated for the system platform:

Windows: **syslog.log** in the current directory

Linux: **/var/log/messages**

Macintosh: **/var/log/system.log**

Solaris: **/var/adm/messages**

5.3.24
-p
(Display Persistent Target Binding Info)

With this command you can:

- Show binding information for one or on all HBAs (1)
- Bind a specific target to a selected HBA (2)
- Bind all targets on a specific HBA or on all HBAs (3)
- Unbind a specific target (4)
- Unbind all targets on a specific HBA or on all HBAs (5)

NOTES:

- Under Solaris, if you use the driver from the OS installation CDs (QLC driver), these features are disabled.
- Under Linux, if you use the ioctl or sysfs (inbox) driver these features are disabled.

To show target persistent binding information for a specific HBA port, type:

```
# scli -p (<HBA Instance> | <HBA WWPN>) (view | ?)
```

To show persistent binding information for all HBAs, type:

```
# scli -p all (view | ?)
```

Where:

HBA Instance = HBA number (use -g command to find)
HBA WWPN = World wide port name of the HBA

NOTE:

In Solaris SPARC using a csh or tsch shell, include double quotes around the question mark (?). For example:

```
# scli -p <HBA> "?"
```

The following example is a typical SANsurfer FC HBA CLI screen showing all targets currently bound to an HBA:

```
-------------------------------------------------------------------------
HBA 0: QLA2462 Port 1 WWPN xx-xx-xx-xx-xx-xx-xx-xx Port ID 11-06-EF
-------------------------------------------------------------------------
Bind  Type  Device Node Name         Device Port Name         Port ID   ID
----  ----  ---------------         ---------------          -------   --
No    Disk  xx-xx-xx-xx-xx-xx-xx-xx  xx-xx-xx-xx-xx-xx-xx-xx  10-02-E1
Yes   Disk  xx-xx-xx-xx-xx-xx-xx-xx  xx-xx-xx-xx-xx-xx-xx-xx  10-02-E2   0
```

```
Yes   Disk  xx-xx-xx-xx-xx-xx-xx-xx  xx-xx-xx-xx-xx-xx-xx-xx  10-02-E4   1
Yes   Disk  xx-xx-xx-xx-xx-xx-xx-xx  xx-xx-xx-xx-xx-xx-xx-xx  10-02-E8   2
    Press <Enter> to continue:
```

To bind a selected target to a specific HBA, type:

```
# scli -p (<HBA Instance> | <HBA WWPN>) (<Target WWNN> <Target
WWPN> <Target Port ID> <Target ID>)
```

Where:

HBA Instance = HBA number (use -g command to find)
HBA WWNN = Word wide node name of the HBA
HBA WWPN = World wide port name of the HBA
Target WWNN = World wide node name of the target
Target WWPN = World wide port name of the target
Target Port ID = Port ID of the target
Target ID = ID to which the target is bound

To bind multiple targets with a single command, repeat the following group:

<Target WWNN> <Target WWPN> <Target Port ID> <Target ID>

To bind all targets on a specific HBA or to bind all targets on all HBAs, type:

```
# scli -p (<HBA Instance> | <HBA WWPN> | all) bind all
```

Where:

HBA Instance = HBA number (use -g command to find)
HBA WWPN = World wide port name of the HBA

To unbind a specific target, type:

```
# scli -p (<HBA Instance> | <HBA WWPN>) (remove <target WWNN>
| unbind <target WWNN>)
```

Where:

HBA Instance = HBA number (use -g command to find)
HBA WWPN = World wide port name of the HBA
Target WWNN = World wide node name of the target

To unbind all targets on a specific HBA port or on all HBA ports, type:

```
# scli -p (<HBA Instance> | <HBA WWPN> | all) (remove all |
unbind all)
```

Where:

HBA Instance = HBA number (use -g command to find)
HBA WWPN = World wide port name of the HBA

5.3.25

-pa
(Define Port Alias)

With this command you can:

- Define the port alias for a specific HBA port (1)
- Delete the port alias from a specific HBA port (2)
- View the port alias for a specific HBA port (3)

To define a port alias for the specified HBA, type:

```
# scli -pa (<HBA Instance> | <HBA WWPN>) <alias>
```

Where:

HBA Instance = HBA number (use -g command to find)
HBA WWPN = World wide port name of the HBA
Alias = Symbolic name you assign to the HBA port

To delete a port alias for the specified HBA port, type:

```
# scli -pa (<HBA Instance> | <HBA WWPN>) delete
```

To view a port alias for the specified HBA port, type:

```
# scli -pa (<HBA Instance> | <HBA WWPN>) view | ?
```

5.3.26

-q
(View or Set Target Link Speed)

NOTE:

The -q option is supported only on 4GB HBAs.

Type the following command to view the link speed of all Targets attached to one HBA or all HBA's:

```
# scli -q (<HBA Instance> | <HBA WWPN> | <all>) [-targets | -t ]
```

Where:

HBA Instance = HBA number (use -g command to find)
HBA WWPN = World wide port name of the HBA
all = Reports link speed for all targets on all HBAs in the system
-targets = All Targets
-t all targets

To view the link speed of a specific Target attached to an HBA, type the following command:

scli -q (<*HBA Instance*> | <*HBA WWPN*> | <*Target WWPN*>

Where:

HBA Instance = HBA number (use -g command to find)
HBA WWPN = World wide port name of the HBA
Target WWPN = World wide port name of the Target

Type the following command to set the link speed of all Targets attached to one HBA or all HBA's to the designated speed:

scli -q (<*HBA Instance*> | <*HBA WWPN*> | <*all*>) <-*targets* | -*t*><*speed*>

Where:

HBA Instance = HBA number (use -g command to find)
HBA WWPN = World wide port name of the HBA
all = Reports link speed for all targets on all HBAs in the system
-targets = All Targets
-t all targets
speed link speed (

To set the link speed of selected Target(s) attached to one HBA to the designated speed, type the following command:

scli -q (<*HBA Instance*> | <*HBA WWPN*> | <all>) <*Target WWPN*><speed>

Where:

HBA Instance = HBA number (use -g command to find)
HBA WWPN = World wide port name of the HBA
all = Reports link speed for all targets on all HBAs in the system
Target WWPN = World wide port name of the Target
speed link speed (

5.3.27
-r
(Update HBA Parameters)

To update the HBA Parameters, type:

```
# scli -r (<HBA Instance> | <HBA WWPN> | all) <File Name>
```

Where:

HBA Instance	=	HBA number (use -g command to find)
HBA WWPN	=	World wide port name of the HBA
all	=	All HBA ports in the system are updated with the new HBA parameters
HBA Parameters File Name	=	File name or a path to a file that contains the updated HBA parameters

To save the HBA parameters to a file, type:

```
# scli -r (<HBA Instance> | <HBA WWPN>) save <File Name>
```

Where:

HBA Instance	=	HBA number (use -g command to find)
HBA WWPN	=	World wide port name of the HBA
HBA Parameters File Name	=	File name or a path to a file to save the HBA parameters

5.3.28
-s
(Silent Mode)

NOTES:

- The -s option is valid only in non-interactive mode.
- You can use this option with all non-interactive mode options that have a corresponding interactive mode option (see Table 5-1). This option must be the first or last command in the command line.

In non-interactive mode, the system shows result and status messages generated by SANsurfer FC HBA CLI (by default) unless suppressed by silent mode. You can combine this option with the -o option (see section 5.3.23) so the output is saved in a file and does not appear on screen. For example:

```
# scli -I all -s -o output.txt
```

5.3.29
-t
(Display Target Information)

To show the target information for *all* HBAs in the system, type:

```
# scli -t [ <all> ]
```

To show the target information for a *specific* HBA, type:

```
# scli -t (<HBA Instance> | <HBA WWPN>)
```

To show specific target information for a *specific target* on an HBA, type:

```
# scli -t (<HBA Instance> | <HBA WWPN>) (<Target WWPN> |
<Target Port ID>)
```

Where:

HBA Instance = HBA number (use -g command to find)
HBA WWPN = World wide port name of the HBA
Target WWPN = World wide port name of the target
Target Port ID = Port ID of the target

To show the target information on all HBAs, type:

```
-t [<all>]
```

To show the target information on a specific HBA, type:

```
-t (<HBA Instance> | <HBA WWPN>)
```

To show the target information for a specific target on a specific HBA, type:

```
-t (<HBA Instance> | <HBA WWPN>) (<Target WWPN> | <Target Port
ID>)
```

iiDMA (Intelligent Interleave Factor) settings include:

- `–targets | –t` applies to all targets.
- `<speed>` indicates the supported intelligent interleave factor: 1, 2, 4, or 8 Gbps.

5.3.30
-tb
(Target Beacon On/Off)

To start or stop flashing a target's LED, type:

```
# scli -tb (<HBA Instance> | <HBA WWPN>) (<Target WWPN>) (<0 |
ON> | <1 | PRESET>)
```

NOTES:

- The <0 | ON> option flashes the LED until interrupted. The <1 | PRESET> option flashes the LED 12 times.
- This feature is supported only on JBOD devices.

5.3.31
-tp
(Display Host Topology)

Use the -tp option to show the topology configuration of the host:

```
# scli -tp | topology
```

Under Linux, this feature is disabled if you are using the ioctl or sysfs (inbox) driver.

Section 5.2.3 covers this command.

5.3.32
-v
(Display Version)

NOTE:

This option is valid only in non-interactive mode.

To show the version number of the SANsurfer FC HBA CLI tool, type:

```
# scli -v
```

The system shows the following information:

```
SANsurfer FC HBA CLI
v1.x.x Build x
Copyright 2003-2007 QLogic Corp.
All rights reserved.
Command Line QLogic FC Host Bus Adapters.
Build Type: Release
Build Date: xx/xx/xxxx xx:xx:xx AM
```

5.3.33
-vp
(Virtual Port)

To list all virtual ports on a physical HBA port, type:

```
# scli -vp (<HBA Instance> : <HBA WWPN>) list all
```

Where:

HBA Instance = HBA number (use -g command to find)
HBA WWPN = World wide port name of the HBA
vport WWPN = World wide port name of the virtual port
vport hex = World wide port name of the virtual port with the two hex digits in byte three supplied by the user

To list a specific virtual port on a physical HBA port, type:

```
# scli -vp (<HBA Instance> : <HBA WWPN>) list <vport wwpn>
```

To create a virtual port with an automatic WWPN, type:

```
# scli -vp (<HBA Instance> : <HBA WWPN>) create auto
```

To create a virtual port with a specific WWPN, type:

```
# scli -vp (<HBA Instance> : <HBA WWPN>) create <vport hex>
```

When prompted, enter two hexadecimal digits. The system checks these digits to be sure they are unique and, if they are, puts them into byte 3 of the WWPN.

To delete all virtual ports on a physical HBA port, type:

```
# scli -vp (<HBA Instance> : <HBA WWPN>) delete all
```

To delete a particular virtual port on a physical HBA port, type:

```
# scli -vp (<HBA Instance> : <HBA WWPN>) delete <vport wwpn>
```

5.3.34
-x
(Output in XML Format 1)

NOTE:

This option is valid only in non-interactive mode.

You can use this option with all non-interactive mode options that have a corresponding interactive mode option (see Table 5-1). This option must be the first or last command in the command line.

When you use this option, the system shows all result and status messages in XML format 1, a legacy format. These formats are described in Appendix A. This option is usually combined with the -o option (see section 5.3.23) to create a text file with XML output so that it can be parsed by an XML-compliant utility. For example to show HBA general information and output it to an XML file named *output.xml*:

```
# scli -i all -x -o output.xml
```

5.3.35
-x2
(Output in XML Format 2)

NOTE:

This option is valid only in non-interactive mode.

You can use this option with all non-interactive mode options that have a corresponding interactive mode option (see Table 5-1). This option must be the first or last command in the command line.

When you use this option, the system shows all result and status messages in XML format 2, standard XML format. These formats are described in *Appendix B*. This option is usually combined with the -o option (see section 5.3.23) to create a text file with XML output so that it can be parsed by an XML-compliant utility. For example, to show HBA general information and output it to an XML file named *output.xml*:

```
# scli -i all -x2 -o output.xml
```

5.3.36
-z
(Display All HBA information for One or All HBAs)

To show all information for one specific HBA or for all HBAs in the system, type:

```
# scli -z (<HBA Instance> | <HBA WWPN>) | <all>)
```

Section 5.2.2 covers this command.

Appendix A
XML Format 1

A.1 Introduction

NOTE:

XML files created using the `-x1` command line option *do not* match standard output. They are designed for backward compatibility with customized legacy scripts. For new scripts, we strongly recommend using the `-x2` command line option, which generates standard output XML files (see Appendix B).

The `-x1` command line option (see section 5.3.34) displays all output in XML format 1. This section defines the XML format 1 output, which consists of the following parts:

- Main tag
- Utility header
- Status message
- Error message
- Reboot message

A.1.1 Main Tag

When SANsurfer FC HBA CLI is in XML mode, all outputs are within the main tag:

```
<QLogic>
...
</QLogic>
```

A.1.2 Utility Header

The following header information is displayed after the main tag:

```
<AppName> SANsurfer Command Line Utility </AppName>
<AppVersion> X.YY.ZZ Build XX</AppVersion>
```

A.1.3
Status Message

Before the closing main tag `</QLogic>`, SANsurfer FC HBA CLI displays returning status from the execution of the command line parameters and the error messages.

Successful execution of the command line parameters returns the following status:

```
<Status> 0 </Status>
```

When the execution of the command line parameters fails, the status value of non-zero is displayed, followed by an error message that provides additional details:

```
<Status> 1 </Status>
<ErrorMsg> Details of the failure </ErrorMsg>
```

A.1.4
Reboot Message

When the execution of the command line parameters is successful and the system must be restarted for the change to take effect, the following message is displayed:

```
<Reboot> 1 </Reboot>
```

When the execution of the command line parameters is successful and the system does not need to be restarted, the following message is displayed:

```
<Reboot> 0 </Reboot>
```

A.1.5
Error Message

Before the closing main tag `</QLogic>`, but following the Status message SANsurfer FC HBA CLI displays error information if the status is non-zero (indicating a failure).

```
<ErrorMsg> Details of the failure </ErrorMsg>
```

A.2
XML Format 1 Tags for Each Option

The following sections describe the XML format 1 for each command line option. In these sections, the term *number* refers to the adapter number displayed with the HBA general information (command line option `-I`).

A.2.1
Display System Information
(Command Line Option -g)

The XML format 1 for system information output is as follows:

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<QLogic>
   <AppName>SANsurfer FC HBA CLI</AppName>
   <AppVersion>vn.nn.nn Build nn</AppVersion>
      <Host>
         <Name> Host Name </Name>
         <OSType> OS Type </OSType>
         <OSVersion> OS Version (and patches) </OSVersion>
         <HBA Port="value" WWNN="value" WWPN="value" />
         <NumOfHBA> Number of QLogic FC HBA(s) </NumOfHBA>
      </Host>
   <Status> 0 </Status>
   <Reboot> 0 </Reboot>
</QLogic>
```

The parameter <HBA…/> repeats for each HBA in the system.

A.2.2
Display Adapter Settings
(Command Line Option -c)

The XML Format 1 for adapter settings information is as follows:

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<QLogic>
   <AppName>SANsurfer FC HBA CLI</AppName>
   <AppVersion>vn.nn.nn Build nn</AppVersion>
      <HBA>
         <HBA Port="value" WWNN="value" WWPN="value" />
<Param
      ConnectionOption="value"
      DataRate="value"
      FrameSize="value"
      HardLoopID="value"
      LoopResetDelay="value"
      EnableHostAdapterBIOS="value"
      EnableHardLoopId="value"
      FibreChannelTapeSupport="value"
      OperationMode="value"
      IntDelayTimer="value"
      ExecutionThrottle="value"
      EnableExtendedLogging="value"
      LoginRetryCount="value"
      EnableLipReset="value"
```

```
      PortDownRetryCount="value"
      EnableLipFulllogin="value"
      LinkDownTimeout="value"
      EnableTargetReset="value"
      LUNsPerTarget="value" />
         </HBA>
   <Status> 0 </Status>
   <Reboot> 0 </Reboot>
</QLogic>
```

For clarity, each parameter is listed on a separate line; however, multiple parameters can be on the same line.

For multiple adapters, repeat the above sequence with the ID number `(ID Number="value")` of the next adapter.

A.2.3 Display HBA Information (Command Line Option -i)

NOTE:

4G HBAs include VPD information as an option to the `-I` command.

The XML Format 1 for adapter general information is as follows:

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<QLogic>
    <AppName>SANsurfer FC HBA CLI</AppName>
    <AppVersion>vn.nn.nn Build nn</AppVersion>
   <HBA>
      <GeneralInfo Port="value"
         Model="value"
         HBAID="value"
         HBAAlias="value"
         HBAPort="value"
         PortAlias="value"
         WWNN="value"
         WWPN="value"
         PortID="value"
         SerialNumber="value"
         DriverVersion="value"
         BIOSVersion="value"
         FirmwareVersion="value"
         TargetCount="value"
         PCIBus="value"
         PCIDevice="value"
         ActualConnectionMode="value"
         ActualDataRate="value"
```

```
         PortType="value"
         Status="value"
   </HBA>
<Status> 0 </Status>
<Reboot> 0 </Reboot>
</QLogic>
```

Here is the information for the 4G HBAs:

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<QLogic>
   <AppName>SANsurfer FC CLI</AppName>
   <AppVersion>vn.nn.nn Build n.nn</AppVersion>
      <HBA>
         <GeneralInfo Port="value"
         Model="value"
         HBAID="value"
         HBAALias=""
         HBAPort=""
         PortAlias=""
         WWNN="value"
         WWPN="value"
         PortID="value"
         SerialNumber="value"
         DriverVersion="value"
         BIOSVersion="value"
         FirmwareVersion="value"
         OptionROMBIOSVersion="value"
         OptionROMCodeVersion="value"
         OptionROMEFIVersion="value"
         OptionROMFirmwareVersion="value"
         TargetCount="value"
         PCIBus="value"
         PCIDevice="value"
         ActualConnectionMode="value"
         ActualDataRate="value"
         PortType="value"
         Status="value"
      </HBA>
   <Status> 0 </Status>
   <Reboot> 0 </Reboot>
</QLogic>
```

Here is the VPD information:

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<QLogic>
   <AppName>SANsurfer FC CLI</AppName>
   <AppVersion>vn.nn.nn Build n.nn</AppVersion>
      <HBA>
         <HBA Port="value" WWNN="value" WWPN="value" />
```

```
<VPD>
         <VPDProductIdentifier="value"
         VPD-RTAG=""
         PartNumber="value"
         SerialNumber="value"
         MiscInformation="value"
         ManufacturingID="value"
         EFIDriverVersion="value"
         FirmwareVersion="value"
         BIOSVersion="value"
         FCodeVersion="value"
         AssetTag="value" />
</VPD>
      </HBA>
   <Status> 0 </Status>
   <Reboot> 0 </Reboot>
</QLogic>
```

A.2.4 Display Device List (Command Line Option -t)

The XML Format 1 for adapter device information is as follows:

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<QLogic>
   <AppName>SANsurfer FC HBA CLI</AppName>
   <AppVersion>vn.nn.nn Build nn</AppVersion>
<HBA>
   <HBAPort="value" WWNN="value" WWPN="value" />
      <Target>
         <WWNN> Target WWNN </WWNN>
         <WWPN> Target WWPN </WWPN>
         <Info Path="value"
         ID="value"
         Vendor="value" ProductID="value"
            Revision="value"
            SerialNumber="value"
            DeviceID="value"
            PortID="value" LunCount="value" Type="value"
            DeviceStatus="value" />
      </Target>
</HBA>
   <Status> 0 </Status>
   <Reboot> 0 </Reboot>
</QLogic>
```

The <Target>…</Target> sequence is repeated for each HBA target.

A.2.5
Display LUN List
(Command Line Option -l)

The XML Format 1 for the adapter LUN list information is as follows:

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<QLogic>
   <AppName>SANsurfer FC HBA CLI</AppName>
   <AppVersion>vn.nn.nn Build nn</AppVersion>
<HBA>
   <HBAPort="value" WWNN="value" WWPN="value" />
   <Target>
      <WWNN> Target WWNN </WWNN>
      <WWPN> Target WWPN </WWPN>
   <LUN ID="value"
      WWULN="value"
      Vendor ="value"
      Product ="value"
      Revision ="value"
      Size="value">
      Type="value" />
   </Target>
</HBA>
   <Status> 0 </Status>
   <Reboot> 0 </Reboot>
</QLogic>
```

The `<LUN … />` sequence is repeated for each LUN attached to the target. The LUN list is listed under the target, not the adapter.

The `<Target>...</Target>` sequence is repeated for each LUN attached to the target.

A.2.6
Target Persistent Binding
(Command Line Option -p)

The XML Format 1 for the adapter target persistent binding information is as follows:

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<QLogic>
   <AppName>SANsurfer FC HBA CLI</AppName>
   <AppVersion>vn.nn.nn Build nn</AppVersion>
<HBA>
   <HBA Port="value" WWNN="value" WWPN="value" />
<TargetBinding TargetWWNN="value" TargetWWPN="value"
TargetPortID="value" TargetID="value" />
</HBA>
```

```
   <Status> 0 </Status>
   <Reboot> 0 </Reboot>
</QLogic>
```

The `<TargetBinding … />` sequence is repeated for each target bound to the adapter.

A.2.7
Selective LUNs
(Command Line Option -m)

The XML Format 1 for the selective LUNs information is as follows:

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<QLogic>
   <AppName>SANsurfer FC HBA CLI</AppName>
   <AppVersion>vn.nn.nn Build nn</AppVersion>
<HBA>
   <HBA Port="value" WWNN="value" WWPN="value" />
<Target>
      <WWNN> Target WWNN </WWNN>
      <WWPN> Target WWPN </WWPN>
      <EnabledLUN ID="value" LUNWWNN="value" LUNWWPN="value"/>
   </Target>
</HBA>
   <Status> 0 </Status>
   <Reboot> 0 </Reboot>
</QLogic>
```

The `<HBA> … </HBA>` sequence repeats for each HBA.

The `<Target> … </Target>` sequence repeats for each Target.

The `<EnabledLUN… />` sequence repeats for each enabled LUN under the target.

A.2.8
Boot Device
(Command Line Option -e)

The XML Format 1 for the boot device information is as follows:

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<QLogic>
   <AppName>SANsurfer FC HBA CLI</AppName>
   <AppVersion>vn.nn.nn Build nn</AppVersion>
<HBA>
   <HBA Port="value" WWNN="value" WWPN="value" />
      <BootDevice TargetWWPN="value" LUNID="value" />
</HBA>
   <Status> 0 </Status>
```

```
   <Reboot> 0 </Reboot>
</QLogic>
```

The <BootDevice…/> sequence is repeated for each boot device of the adapter. In Windows and Linux, the TargetID="value" field is not present.

A.2.9
Diagnostics Results – Loopback Test (Command Line Option -kl)

The XML Format 1 for the loopback test results is as follows:

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<QLogic>
   <AppName>SANsurfer FC HBA CLI</AppName>
   <AppVersion>vn.nn.nn Build nn</AppVersion>
<HBA>
   <HBA Port="value" WWNN="value" WWPN="value" />
         <Loop ID="value"
         CRCError="value"
         DisparityError="value"
         FrameLengthError="value"
         Result="value"/>
</HBA>
   <Status> 0 </Status>
   <Reboot> 0 </Reboot>
</QLogic>
```

A.2.10
Diagnostics Results – Read/Write Buffer Test (Command Line Option -kr)

The XML Format 1 for the read/write buffer test results is as follows:

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<QLogic>
   <AppName>SANsurfer FC HBA CLI</AppName>
   <AppVersion>vn.nn.nn Build nn</AppVersion>
<HBA>
   <HBA Port="value" WWNN="value" WWPN="value" />
         <Target>
               <WWNN> Target WWNN </WWNN>
               <WWPN> Target WWPN </WWPN>
               <Loop ID ="value" DataMiscompare="value"
LinkFailure= "value" LossOfSync="value" LossOfSignal="value"
InvalidCRC="value" Result="value" />
         </Target>
</HBA>
   <Status> 0 </Status>
   <Reboot> 0 </Reboot>
```

```
</QLogic>
```

The <Target> sequence is repeated for each device attached to the adapter.

A.2.11
View Driver Settings
(Command Line Option -fg)

The XML Format 1 for the current driver settings information is as follows:

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<QLogic>
   <AppName>SANsurfer FC HBA CLI</AppName>
   <AppVersion>vn.nn.nn Build nn</AppVersion>
<HBA>
   <HBA Port="value" WWNN="value" WWPN="value" />
      <DriverSettings>
         <Info PersistentPlusNew="value"
         PersistentOnly="value"
         BindbyWWPN="value"
         BindbyPortID="value" />
      /DriverSettings>
</HBA>
   <Status> 0 </Status>
   <Reboot> 0 </Reboot>
</QLogic>
```

A.2.12
Display All Information for One or All HBAs
(Command Line Option -z)

The XML Format 1 for all adapter information is more complicated than its non-XML counterpart because the tags cannot be repeated. In non-XML mode, SANsurfer FC HBA CLI sequentially calls all the options in Table A-1, and each option is displayed in its standard output format. If each option displays its own XML output, the resulting display would have multiple duplicate tags.

Table A-1. Options Displayed by -z

Non-interactive Option	Description	Section
-g	Display system information	4.1
-I	Display HBA information	4.2
-c	Display HBA settings	4.3
-t	Display device list	4.4
-L	Display LUN list	4.4

Table A-1. Options Displayed by -z (Continued)

Non-interactive Option	Description	Section
-p	Target persistent binding	4.6
-m	Selective LUNs	4.7
-E	Boot device	4.8

The XML Format 1 for all adapter information is as follows:

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<QLogic>
   <AppName>SANsurfer FC HBA CLI</AppName>
   <AppVersion>vn.nn.nn Build nn</AppVersion>
<Host>
   <Name> Host Name </Name>
   <OSType> OS Type </OSType>
   <OSVersion> OS Version (and patches where applicable)
</OSVersion>
   <HBA Port="value" WWNN="value" WWPN="value" />
   <NumOfHBA> Number of QLogic Fibre Channel HBA(s) detected
</NumOfHBA>
   </Host> <HBA>
   <HBA PortNumber="value" WWNN="value" WWPN="value" />
   <GeneralInfo Port ="value"
                Model="value"
                HBAID="value"
                HBAAlias="value"
                MHBAPort="value"
                PortAlias="value"
                WWNN="value"
                WWPN="value"
                PortID="value"
                SerialNumber="value"
                DriverVersion="value"
                BIOSVersion="value"
                FirmwareVersion="value"
                TargetCount="value"
                PCIBus="value"
                PCIDevice="value"
                ActualConnectionMode="value"
                ActualDataRate="value"
                PortType="value"
                Status="value" />
<VPD>
   <VPD Product Identifier=""/>
</VPD>
```

```
   <Param
         ConnectionOption="value"
         DataRate="value"
         FrameSize="value"
         HardLoopID="value"
         LoopResetDelay="value"
         EnableHostAdapterBIOS="value"
         EnableHardLoopId="value"
         FibreChannelTapeSupport="value"
         OperationMode="value"
         IntDelayTimer="value"
         ExecutionThrottle="value"
         EnableExtendedLogging="value"
         LoginRetryCount="value"
         EnableLipReset="value"
         PortDownRetryCount="value"
         EnableLipFulllogin="value"
         LinkDownTimeout="value"
         EnableTargetReset="value"
         LUNsPerTarget="value" />
   <Target>
      <WWNN> Target WWNN </WWNN>
      <WWPN> Target WWPN </WWPN>
      <Info Path= "value"
      Vendor ="value"
      ProductID= "value"
      Revision= "value"
      SerialNumber= "value"
      DeviceID= "value"
      PortID= "value"
      LunCount= "value"
      Type= "value"
      DeviceStatus= "value" />
<LUN ID="value"
         WWULN="value"
         Vendor ="value"
         Product= "value"
         Revision= "value"
         Size= "value"
         Type="value" />
      <EnabledLUN ID="value" LUNWWNN="value"LUNWWPN="value" />
   </Target>
   <TargetBinding TargetWWNN="value" TargetWWPN="value"
TargetPortID="value" TargetID="value" />
<BootDevice TargetWWNN="value" TargetWWPN="value" LUNID="value" />
   <DriverSettings>
      <Info PersistentPlusNew="value"
         PersistentOnly="value"
         BindbyWWPN="value"
```

```
         BindbyPortID="value" />
   </DriverSettings>
</HBA>
   <Status> 0 </Status>
   <Reboot> 0 </Reboot>
</QLogic>
```

NOTES:

- The <HBA>…</HBA> sequence is repeated for each HBA.
- The <Target>…</Target> sequence is repeated for each target.
- The <LUN… /> parameter is repeated for each LUN.
- The <EnabledLUN ID.… /> parameter is repeated for each enabled LUN.
- The <TargetBinding…/> parameter is repeated for each target persistent binding entry.
- The <BootDevice…/> parameter is repeated for each boot device selection entry.

A.2.13
Link Statistics
(Command Line Option -ls)

The XML Format 1 for the link statistics option is as follows:

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<QLogic>
   <AppName>SANsurfer FC HBA CLI</AppName>
   <AppVersion>vn.nn.nn Build nn</AppVersion>
<HBA>
    <HBA Port="value" WWPN="value" WWNN="value" />
    <LinkStatus PortName="value"
            LinkFailure="value"
            SyncLoss="value"
            SignalLoss="value"
            InvalidCRC="value"
            TimeStamp="value" />
   <Status> 0 </Status>
   <Reboot> 0 </Reboot>
</QLogic>
```

A.2.14
HBA Statistics
(Command Line Option -gs)

The XML Format 1 for the HBA statistics option is as follows:

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<QLogic>
   <AppName>SANsurfer FC HBA CLI</AppName>
   <AppVersion>vn.nn.nn Build nn</AppVersion>
   <HBA>
      <HBA Port="value" WWPN="value" WWNN="value" />
      <Statistics LoopID="value"
         PortError="value"
         DeviceError="value"
         Reset="value"
         IOCount="value"
         IOPS="value"
         BPS="value"
         TimeStamp="value" />
   </HBA>
   <Status> 0 </Status>
   <Reboot> 0 </Reboot>
</QLogic>
```

A.2.15
HBA Alias
(Command Line Option -ha)

The XML Format 1 for the HBA alias option is as follows:

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<QLogic>
   <AppName>SANsurfer FC HBA CLI</AppName>
   <AppVersion>vn.nn.nn Build nn</AppVersion>
<HBA>
   <HBA Port="value" WWNN="value" WWPN="value" />
      <HBAAlias>
         <Alias Name="value" />
      </HBAAlias>
   </HBA>
   <Status> 0 </Status>
   <Reboot> 0 </Reboot>
</QLogic>
```

A.2.16
HBA Port Alias
(Command Line Option -pa)

The XML Format 1 for the HBA port alias option is as follows:

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<QLogic>
   <AppName>SANsurfer FC HBA CLI</AppName>
   <AppVersion>vn.nn.nn Build nn</AppVersion>
<HBA>
```

```
   <HBA Port="value" WWNN="value" WWPN="value" />
      <PortAlias>
         <Alias Name="value" />
      </PortAlias>
</HBA>
   <Status> 0 </Status>
   <Reboot> 0 </Reboot>
</QLogic>
```

A.2.17
SFF DMI
(Command Line Option -dm)

The XML Format 1 for SFF DMI (general information) is as follows:

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<QLogic>
   <AppName>SANsurfer FC HBA CLI</AppName>
   <AppVersion>vn.nn.nn Build nn</AppVersion>
<HBA>
   <HBA Port="value" WWNN="value" WWPN="value" />
   <MediaInformation>
         <Vendor>"value"</Vendor>
         <Type>"value"</Type>
         <PartNumber>"value"</PartNumber>
         <Speed>"value"</Speed>
         <Revision>"value"</Revision>
         <SerialNumber>"value" </SerialNumber>
   </MediaInformation>
   <Diagnostics>
      <Temperature>
         <MeasuredTemperature>(C)</MeasuredTemperature>
         <Value>"value"</Value>
         <Status>"value"</Status>
         <HighAlarm>"value"</HighAlarm>
         <HighWarning>"value"</HighWarning>
         <LowWarning>"value"</LowWarning>
         <LowAlarm>"value"</LowAlarm>
      </Temperature>
      <Voltage>
         <MeasuredVoltage>(Vdc)</MeasuredVoltage>
         <Value>"value"</Value>
         <Status>"value"</Status>
         <HighAlarm>"value"</HighAlarm>
         <HighWarning>"value"</HighWarning>
         <LowWarning>"value"</LowWarning>
         <LowAlarm>"value"</LowAlarm>
      </Voltage>
      <TxBias>
```

```
            <MeasuredTxBiasUnit>(mA)</MeasuredTxBiasUnit>
            <Value>"value"</Value>
            <Status>"value"</Status>
            <HighAlarm>"value"</HighAlarm>
            <HighWarning>"value"</HighWarning>
            <LowWarning>"value"</LowWarning>
            <LowAlarm>"value"</LowAlarm>
         </TxBias>
         <TxPower>
            <MeasuredTxPowerUnit>(mW)</MeasuredTxPowerUnit>
            <Value>"value"</Value>
            <Status>"value"</Status>
            <HighAlarm>"value"</HighAlarm>
            <HighWarning>"value"</HighWarning>
            <LowWarning>"value"</LowWarning>
            <LowAlarm>"value"</LowAlarm>
         </TxPower>
         <RxPower>
            <MeasuredRxPowerUnit>(mW)</MeasuredRxPowerUnit>
            <Value>"value"</Value>
            <Status>"value"</Status>
            <HighAlarm>"value"</HighAlarm>
            <HighWarning>"value"</HighWarning>
            <LowWarning>"value"</LowWarning>
            <LowAlarm>"value"</LowAlarm>
         </RxPower>
      </Diagnostics>
   </HBA>
      <Status> 0 </Status>
      <Reboot> 0 </Reboot>
   </QLogic>

   The XML Format 1 for SFF DMI (detailed information) is as follows:
   <?xml version="1.0" encoding="ISO-8859-1"?>
   <QLogic>
      <AppName>SANsurfer FC HBA CLI</AppName>
      <AppVersion>vn.nn.nn Build nn</AppVersion>
      <HBA>
      <HBA Port="value" WWNN="value" WWPN="value" />

   <OpticalTransceiverDigitalDiagnosticData></OpticalTransceiverDigit
   alDiagnosticData>
            <Address_A0>
               <Identifier>"value" </Identifier>
               <Ext.Identifier>"value"</Ext.Identifier>
         <Connector>"value"</Connector>
         <TransceiverData>
            <Compliance> "value" </Compliance>
            <FCLinkLength>"value" </FCLinkLength>
```

```
                <FCTransmitterTech>"value"</FCTransmitterTech>
                <FCTransmissionMedia>"value"</FCTransmissionMedia>
             <FCSpeed>"value"</FCSpeed>
          </TransceiverData>
          <Encoding>"value"</Encoding>
          <BR-Nominal> "value" </BR-Nominal>
          <Length-9um-km> "value" </Length-9um-km>
          <Length-9um> "value" </Length-9um>
          <Length-50um> "value" </Length-50um>
          <Length-62.5um> "value" </Length-62.5um>
          <Length-Copper> "value" </Length-Copper>
          <VendorName>"value"</VendorName>
          <VendorOUI> "value" </VendorOUI>
          <VendorPN>"value" </VendorPN>
          <VendorRev>"value" </VendorRev>
          <WaveLength>"value" </WaveLength>
          <CC_BASE> "value" </CC_BASE>
          <Options>
             <SignalLossAsDefinedInSFPMSA> "value"
</SignalLossAsDefinedInSFPMSA>
          <SignalLossInvertedFromSFPMSA>"value"
</SignalLossInvertedFromSFPMSA>
             <TX_Fault_SignalImplemented> "value"
</TX_Fault_SignalImplemented>
             <TX_DisableImplementedAndDisablesSerialOP>
"value"</TX_DisableImplementedAndDisablesSerialOP>
             <RATE_SelectImplemented> "value"
</RATE_SelectImplemented>
          </Options>
          <BR-Max> "value" </BR-Max>
          <BR-Min> "value" </BR-Min>
          <VendorSN>"value" </VendorSN>
          <DateCode>"value" </DateCode>
          <DiagMonitoringType>
          <AddressChangeRequired> "value" </AddressChangeRequired>
             <PowerMeasurement> "value" </PowerMeasurement>
             <ExternallyCalibrated> "value" </ExternallyCalibrated>
          <InternallyCalibrated> "value" </InternallyCalibrated>
          <DigitalDiagMonitoring> "value" </DigitalDiagMonitoring>
          <LegacyDiagnostic> "value" </LegacyDiagnostic>
          </DiagMonitoringType>
          <EnhancedOptions>
             <SoftRateSelectCtrlAndMonitoring> "value"
</SoftRateSelectCtrlAndMonitoring>
             <SoftRXLOSMonitoring> "value"</SoftRXLOSMonitoring>
             <SoftTXFaultMonitoring> "value" </SoftTXFaultMonitoring>
             <SoftTXDisableCtrlAndMonitoring> "value"
</SoftTXDisableCtrlAndMonitoring>
             <Alarm-WarningFlags> "value" </Alarm-WarningFlags>
```

```
            </EnhancedOptions>
         <SFF-8472-Compliance>"value"</SFF-8472-Compliance>
         <CC_EXT> 0x7d </CC_EXT>
         <VendorSpecific> "value" </VendorSpecific>
      </Address_A0>
         <Address_A2>
            <TempHighAlarm>"value"</TempHighAlarm>
            <TempLowAlarm>"value"</TempLowAlarm>
            <TempHighWarning>"value"</TempHighWarning>
            <TempLowWarning>"value" </TempLowWarning>
            <VoltageHighAlarm>"value"</VoltageHighAlarm>
            <VoltageLowAlarm>"value"</VoltageLowAlarm>
            <VoltageHighWarning>"value"</VoltageHighWarning>
            <VoltageLowWarning>"value" </VoltageLowWarning>
            <BiasHighAlarm>"value"</BiasHighAlarm>
            <BiasLowAlarm>"value" </BiasLowAlarm>
            <BiasHighWarning>"value" </BiasHighWarning>
            <BiasLowWarning>"value" </BiasLowWarning>
            <TXPowerHighAlarm>"value" </TXPowerHighAlarm>
            <TXPowerLowAlarm>"value" </TXPowerLowAlarm>
            <TXPowerHighWarning>"value"</TXPowerHighWarning>
            <TXPowerLowWarning>"value"</TXPowerLowWarning>
            <RXPowerHighAlarm>"value" </RXPowerHighAlarm>
            <RXPowerLowAlarm>"value" </RXPowerLowAlarm>
            <RXPowerHighWarning>"value"</RXPowerHighWarning>
            <RXPowerLowWarning>"value"</RXPowerLowWarning>
            <Rx_PWR-4>"value"</Rx_PWR-4>
            <Rx_PWR-3>"value"</Rx_PWR-3>
            <Rx_PWR-2>"value"</Rx_PWR-2>
            <Rx_PWR-1>"value"</Rx_PWR-1>
            <Rx_PWR-0>"value"</Rx_PWR-0>
            <Tx_I_Slope>"value"</Tx_I_Slope>
            <Tx_I_Offset>"value"</Tx_I_Offset>
            <Tx_PWR_Offset>"value"</Tx_PWR_Offset>
            <T_Slope>"value"</T_Slope>
            <T_Offset>"value"</T_Offset>
            <V_Slope>"value"</V_Slope>
            <V_Offset>"value"</V_Offset>
            <Checksum> "value" </Checksum>
            <Temperature_MSB> "value" </Temperature_MSB>
            <Temperature_LSB> "value" </Temperature_LSB>
            <Vcc_MSB> "value"</Vcc_MSB>
            <Vcc_LSB> "value"</Vcc_LSB>
            <TX_Bias_MSB> "value" </TX_Bias_MSB>
            <TX_Bias_LSB> "value" </TX_Bias_LSB>
            <TX_Power_MSB>"value" </TX_Power_MSB>
            <TX_Power_LSB> "value" </TX_Power_LSB>
            <RX_Power_MSB> "value" </RX_Power_MSB>
            <RX_Power_LSB> "value" </RX_Power_LSB>
```

```
            <Reserved_MSB> "value" </Reserved_MSB>
            <Reserved_LSB> "value" </Reserved_LSB>
            <Reserved_MSB> "value" </Reserved_MSB>
            <Reserved_LSB> "value" </Reserved_LSB>
            <StatusControlBits>
               <DataReadyBar> "value" </DataReadyBar>
               <LOS> "value" </LOS>
               <TXFault> "value" </TXFault>
               <SoftRXRateSelect> "value" </SoftRXRateSelect>
               <RXRateSelectState> "value" </RXRateSelectState>
               <SoftTXDisable> "value"</SoftTXDisable>
               <TXDisableState> "value" </TXDisableState>
            </StatusControlBits>
            <TXPowerLowAlarm>"value" </TXPowerLowAlarm>
            <TXPowerHighAlarm> "value" </TXPowerHighAlarm>
            <TXBiasLowAlarm> "value" </TXBiasLowAlarm>
            <TXBiasHighAlarm> "value" </TXBiasHighAlarm>
            <VccLowAlarm> "value" </VccLowAlarm>
            <VccHighAlarm> "value" </VccHighAlarm>
            <TempLowAlarm> "value" </TempLowAlarm>
            <TempHighAlarm> "value" </TempHighAlarm>
            <RXPowerLowAlarm> "value" </RXPowerLowAlarm>
            <RXPowerHighAlarm>"value" </RXPowerHighAlarm>
            <TXPowerLowWarning> "value" </TXPowerLowWarning>
            <TXPowerHighWarning> "value" </TXPowerHighWarning>
            <TXBiasLowWarning> "value" </TXBiasLowWarning>
            <TXBiasHighWarning> "value" </TXBiasHighWarning>
            <VccLowWarning> "value" </VccLowWarning>
            <VccHighWarning> "value" </VccHighWarning>
            <TempLowWarning> "value" </TempLowWarning>
            <TempHighWarning> "value" </TempHighWarning>
            <ReservedWarning> "value" </ReservedWarning>
            <ReservedWarning> "value" </ReservedWarning>
            <ReservedWarning> "value" </ReservedWarning>
            <ReservedWarning> "value" </ReservedWarning>
            <ReservedWarning> "value" </ReservedWarning>
            <ReservedWarning> "value" </ReservedWarning>
            <RXPowerLowWarning> "value" </RXPowerLowWarning>
            <RXPowerLowWarning> "value" </RXPowerLowWarning>
            <VendorSpecific> "value" </VendorSpecific>
         </Address_A2>
      </HBA>
         <Status> 0 </Status>
         <Reboot> 0 </Reboot>
      </QLogic>
```

A.2.18
Host Topology
(Command Line Option -tp)

The XML Format 1 for an HBA type interconnect element is as follows:

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<QLogic>
   <AppName>SANsurfer FC HBA CLI</AppName>
   <AppVersion>vn.nn.nn Build nn</AppVersion>
<InterConnectElement Type="HBA">
   <HBA WWNN="value"
      WWPN="value"
      VendorId="value"
      Model="value"
      SerialNumber="value"
      Alias="value"
      PortAlias="value"
      DriverVersion="value"
      FirmwareVersion="value"
      Host="value"
      TotalNumberOfDevices="value"
      NumberofPort="value"
      BeaconStatus="value"
      PortType="value"
      PortState="value"/>
   <Status> 0 </Status>
   <Reboot> 0 </Reboot>
</QLogic>
```

The XML Format 1 for a switch type interconnect element is as follows:

```
<InterConnectElement Type="Switch">
   <Switch WWPN="value" DomainID="value" ManagementID="value"
IPAddress="value"
      Model="value" SymbolicName="value" SerialNumber="value"
      MACAddress="value" FirmwareVersion="value" PortCount="value"
   BeaconStatus="value"/>
      <PhysicalPortInformation>
         <PhysicalPort Number="value">
            <Port WWPN="value" State="value" Type="value"
TXPortType="value" ModuleType="value"/>
            <AttachedPort Type="Initiator">
               <HBA NodeName="value"
                  PortName="value"
                  VendorId="value"
                  Model="value"
                  SerialNumber="value"
                  Alias="value"
                  PortAlias="value"
```

```
                  DriverVersion="value"
                  FirmwareVersion="value"
                  TotalNumberOfDevices="value"
                  Host="value"/>
            </AttachedPort>
         </PhysicalPort>
...
...
         <PhysicalPort Number="value">
               <Port WWPN="value" State="value" Type="value"
TXPortType="value" ModuleType="value"/>
               <AttachedPort Type="Initiator">
               <HBA PortName="value"
               Host="DataUnavailable"/>
            </AttachedPort>
         </PhysicalPort>
...
...
         </PhysicalPort>
         <PhysicalPort Number="value">
            <Port WWPN="value" State="value" Type="value"
TXPortType="value" ModuleType="value"/>
         </PhysicalPort>
...
...
         <PhysicalPort Number="value">
            <Port WWPN="20-0A-00-C0-DD-00-B9-09"
            <Port WWPN="value" State="value" Type="value"
TXPortType="value" ModuleType="value"/>
            <AttachedPort Type="Target">
               <Target NodeName="value"
                  PortName="value"
                  VendorId="value"
                  ProductId="value"
                  ProductRevision="value"
                  ProductSerialNumber="value"/>
            </AttachedPort>
...
...
            <AttachedPort Type="Target">
               <Target NodeName="value"
                  PortName="value"
                  VendorId="value"
                  ProductId="value"
                  ProductRevision="value"
                  ProductSerialNumber="value"/>
            </AttachedPort>
         </PhysicalPort>
      </PhysicalPortInformation>
```

```
            </InterConnectElement>


               <Status> 0 </Status>
               <Reboot> 0 </Reboot>
            </QLogic>
```

Appendix B
XML Format 2

B.1 Introduction

NOTE:

XML files created using the `-x2` command line option match standard output. They do not match the X1 files which are designed for backward compatibility with customized legacy scripts. If you are developing new scripts, we strongly recommend using the `-x2` command line option which generates standard output XML files (see Appendix A).

The `-x2` command line option (see section 5.3.35) displays all output in XML Format 2. This section defines the XML2 output format, which consists of the following parts:

- Main tag
- Utility header
- Status message
- XML2 message (one for each option)

B.2 Main Tag

When SANsurfer FC HBA CLI is in XML2 mode, all outputs are between the main tags:

```
<QLogic>
...
</QLogic>
```

B.3 Utility Header

The following header information is displayed after the main tag:

```
<AppName> SANsurfer FC HBA CLI </AppName>
<AppVersion> X.YY.ZZ Build XX</AppVersion>
<AppXMLVersion> X.YY </AppXMLVersion>
```

B.4 Status Message

Before the closing main tag `</QLogic>`, SANsurfer FC HBA CLI displays any returning status from the execution of the command line parameters and the error messages.

When the execution of the command line parameters is successful, the following status is displayed:

```
<Status> 0 </Status>
```

When the execution of the command line parameters fails, the following status is displayed, followed by an error message that provides additional details:

```
<Status> 1 </Status>
```

B.5 Error Message

When the execution of the command line parameters is fails an Error message appears between the Status and Reboot tags. d the system must be restarted for the change to take effect, the following message is displayed:

```
<ErrorMsg> "Details of the failure "</ErrorMsg>
```

B.6 Reboot Message

When the execution of the command line parameters is successful and the system must be restarted for the change to take effect, the following message is displayed:

```
<Reboot> 1 </Reboot>
```

When the execution of the command line parameters is successful and the system does not need to be restarted, the following message is displayed:

```
<Reboot> 0 </Reboot>
```

B.7 XML2 Tags for Each Option

The following sections describe the XML Format 2 for each command line option. In these sections, the term *number* refers to the adapter number displayed with the HBA general information (command line option `-I`).

B.7.1 Display Adapter Settings (Command Line Option -c)

The command format is:

scli -c 0 -x2

The XML Format 2 for adapter settings information is as follows:

```
<?xml version="value" encoding="value"?>
<QLogic>
   <AppName>SANsurfer FC HBA CLI</AppName>
   <AppVersion>vn.n.nn Build nn</AppVersion
   <AppXmlVersion>n.nn</AppXmlVersion>
<HBA>
   <HBA Instance="value" HBAModel="value" HBAPort="value"
WWNN="value" WWPN="value" />
   <Param
         ConnectionOption="value"
         DataRate="value"
         FrameSize="value"
         HardLoopId="value"
         LoopResetDelay="value"
         EnableHostAdapterBIOS="value"
         EnableHardLoopId="value"
         FibreChannelTapeSupport="value"
         OperationMode="value"
         IntDelayTimer="value"
         ExecutionThrottle="value"
         LoginRetryCount="value"
         EnableLipReset="value"
         PortDownRetryCount="value"
         EnableLipFulllogin="value"
         LinkDownTimeout="value"
         EnableTargetReset="value"
         LUNsPerTarget="value" />
   </HBA>
   <Status> n </Status>
   <Reboot> n /Reboot>
</QLogic>
```

The <HBA> …</HBA> sequence repeats for each HBA

Each parameter is listed on a separate line for clarity; however, multiple parameters can be on the same line.

For multiple adapters, repeat the above sequence with the ID number (ID Number="value") of the next adapter.

B.7.2
SFF DMI
(Command Line Option -dm)

The XML Format 2 for SFF DMI (general information) is as follows:

```
# scli -dm (<HBA Instance> | <HBA WWPN> | <all>) (general |
gen) -x2
```

The XML Format 2 for the boot device information is as follows:

```
<?xml version="value" encoding="value"?>
<QLogic>
   <AppName>SANsurfer FC HBA CLI</AppName>
   <AppVersion>vn.n.nn Build nn</AppVersion
   <AppXmlVersion>n.nn</AppXmlVersion>
<HBA>
   <HBA Instance="value" HBA Model="value" WWNN="value"
WWPN="value" />
   <MediaInformation>
         <Vendor>"value"</Vendor>
         <Type>"value"</Type>
         <PartNumber>"value"</PartNumber>
         <Speed>"value"</Speed>
         <Revision>"value"</Revision>
         <SerialNumber>"value" </SerialNumber>
   </MediaInformation>
   <Diagnostics>
      <Temperature>
         <MeasuredTemperature>(C)</MeasuredTemperature>
         <Value>"value"</Value>
         <Status>"value"</Status>
         <HighAlarm>"value"</HighAlarm>
         <HighWarning>"value"</HighWarning>
         <LowWarning>"value"</LowWarning>
         <LowAlarm>"value"</LowAlarm>
      </Temperature>
      <Voltage>
         <MeasuredVoltage>(V)</MeasuredVoltage>
         <Value>"value"</Value>
         <Status>"value"</Status>
         <HighAlarm>"value"</HighAlarm>
         <HighWarning>"value"</HighWarning>
         <LowWarning>"value"</LowWarning>
         <LowAlarm>"value"</LowAlarm>
      </Voltage>
      <TxBias>
         <MeasuredTxBiasUnit>(mA)</MeasuredTxBiasUnit>
         <Value>"value"</Value>
         <Status>"value"</Status>
         <HighAlarm>"value"</HighAlarm>
         <HighWarning>"value"</HighWarning>
         <LowWarning>"value"</LowWarning>
         <LowAlarm>"value"</LowAlarm>
      </TxBias>
      <TxPower>
```

```
            <MeasuredTxPowerUnit>(mW)</MeasuredTxPowerUnit>
            <Value>"value"</Value>
            <Status>"value"</Status>
            <HighAlarm>"value"</HighAlarm>
            <HighWarning>"value"</HighWarning>
            <LowWarning>"value"</LowWarning>
            <LowAlarm>"value"</LowAlarm>
         </TxPower>
         <RxPower>
            <MeasuredRxPowerUnit>(mW)</MeasuredRxPowerUnit>
            <Value>"value"</Value>
            <Status>"value"</Status>
            <HighAlarm>"value"</HighAlarm>
            <HighWarning>"value"</HighWarning>
            <LowWarning>"value"</LowWarning>
            <LowAlarm>"value"</LowAlarm>
         </RxPower>
      </Diagnostics>
</HBA>
```

The XML Format 2 for SFF DMI (general information) is as follows:

```
# scli -dm (<HBA Instance> | <HBA WWPN> | all) (details | det) -x2
```

The XML Format 2 for SFF DMI (detailed information) is as follows:

```
<?xml version="value" encoding="value"?>
<QLogic>
   <AppName>SANsurfer FC HBA CLI</AppName>
   <AppVersion>vn.n.nn Build nn</AppVersion
   <AppXmlVersion>n.nn</AppXmlVersion>
<HBA>
   <HBA Instance="value" HBAModel="value" HBAPort="value"
WWNN="value" WWPN="value" />

<OpticalTransceiverDigitalDiagnosticData></OpticalTransceiverDigit
alDiagnosticData>
      <Address_A0>
         <Identifier>"value" </Identifier>
         <Ext.Identifier>"value"</Ext.Identifier>
   <Connector>"value"</Connector>
   <TransceiverData>
         <Compliance> "value" </Compliance>
         <FCLinkLength>"value" </FCLinkLength>
            <FCTransmitterTech>"value"</FCTransmitterTech>
            <FCTransmissionMedia>"value"</FCTransmissionMedia>
         <FCSpeed>"value"</FCSpeed>
   </TransceiverData>
      <Encoding>"value"</Encoding>
      <BR-Nominal> "value" </BR-Nominal>
      <Length-9um-km> "value" </Length-9um-km>
```

```
      <Length-9um> "value" </Length-9um>
      <Length-50um> "value" </Length-50um>
      <Length-62.5um> "value" </Length-62.5um>
      <Length-Copper> "value" </Length-Copper>
      <VendorName>"value"</VendorName>
      <VendorOUI> "value" </VendorOUI>
      <VendorPN>"value" </VendorPN>
      <VendorRev>"value" </VendorRev>
      <WaveLength>"value" </WaveLength>
      <CC_BASE> "value" </CC_BASE>
   <Options>
      <SignalLossAsDefinedInSFPMSA> "value"
</SignalLossAsDefinedInSFPMSA>
      <SignalLossInvertedFromSFPMSA>"value"
</SignalLossInvertedFromSFPMSA>
      <TX_Fault_SignalImplemented> "value"
</TX_Fault_SignalImplemented>
         <TX_DisableImplementedAndDisablesSerialOP>
"value"</TX_DisableImplementedAndDisablesSerialOP>
      <RATE_SelectImplemented> "value" </RATE_SelectImplemented>
      </Options>
      <BR-Max> "value" </BR-Max>
      <BR-Min> "value" </BR-Min>
      <VendorSN>"value" </VendorSN>
      <DateCode>"value" </DateCode>
   <DiagMonitoringType>
      <AddressChangeRequired> "value" </AddressChangeRequired>
         <PowerMeasurement> "value" </PowerMeasurement>
         <ExternallyCalibrated> "value" </ExternallyCalibrated>
      <InternallyCalibrated> "value" </InternallyCalibrated>
      <DigitalDiagMonitoring> "value" </DigitalDiagMonitoring>
      <LegacyDiagnostic> "value" </LegacyDiagnostic>
   </DiagMonitoringType>
      <EnhancedOptions>
         <SoftRateSelectCtrlAndMonitoring> "value"
</SoftRateSelectCtrlAndMonitoring>
         <SoftRXLOSMonitoring> "value"</SoftRXLOSMonitoring>
         <SoftTXFaultMonitoring> "value" </SoftTXFaultMonitoring>
         <SoftTXDisableCtrlAndMonitoring> "value"
</SoftTXDisableCtrlAndMonitoring>
         <Alarm-WarningFlags> "value" </Alarm-WarningFlags>
      </EnhancedOptions>
   <SFF-8472-Compliance>"value"</SFF-8472-Compliance>
   <CC_EXT> 0x7d </CC_EXT>
   <VendorSpecific> "value" </VendorSpecific>
</Address_A0>
   <Address_A2>
      <TempHighAlarm>"value"</TempHighAlarm>
      <TempLowAlarm>"value"</TempLowAlarm>
```

```
<TempHighWarning>"value"</TempHighWarning>
<TempLowWarning>"value" </TempLowWarning>
<VoltageHighAlarm>"value"</VoltageHighAlarm>
<VoltageLowAlarm>"value"</VoltageLowAlarm>
<VoltageHighWarning>"value"</VoltageHighWarning>
<VoltageLowWarning>"value" </VoltageLowWarning>
<BiasHighAlarm>"value"</BiasHighAlarm>
<BiasLowAlarm>"value" </BiasLowAlarm>
<BiasHighWarning>"value" </BiasHighWarning>
<BiasLowWarning>"value" </BiasLowWarning>
<TXPowerHighAlarm>"value" </TXPowerHighAlarm>
<TXPowerLowAlarm>"value" </TXPowerLowAlarm>
<TXPowerHighWarning>"value"</TXPowerHighWarning>
<TXPowerLowWarning>"value"</TXPowerLowWarning>
<RXPowerHighAlarm>"value" </RXPowerHighAlarm>
<RXPowerLowAlarm>"value" </RXPowerLowAlarm>
<RXPowerHighWarning>"value"</RXPowerHighWarning>
<RXPowerLowWarning>"value"</RXPowerLowWarning>
<Rx_PWR-4>"value"</Rx_PWR-4>
<Rx_PWR-3>"value"</Rx_PWR-3>
<Rx_PWR-2>"value"</Rx_PWR-2>
<Rx_PWR-1>"value"</Rx_PWR-1>
<Rx_PWR-0>"value"</Rx_PWR-0>
<Tx_I_Slope>"value"</Tx_I_Slope>
<Tx_I_Offset>"value"</Tx_I_Offset>
<Tx_PWR_Slope>"value"</Tx_PWR_Slope>
<Tx_PWR_Offset>"value"</Tx_PWR_Offset>
<T_Slope>"value"</T_Slope>
<T_Offset>"value"</T_Offset>
<V_Slope>"value"</V_Slope>
<V_Offset>"value"</V_Offset>
<Checksum> "value" </Checksum>
<Temperature_MSB> "value" </Temperature_MSB>
<Temperature_LSB> "value" </Temperature_LSB>
<Vcc_MSB> "value"</Vcc_MSB>
<Vcc_LSB> "value"</Vcc_LSB>
<TX_Bias_MSB> "value" </TX_Bias_MSB>
<TX_Bias_LSB> "value" </TX_Bias_LSB>
<TX_Power_MSB>"value" </TX_Power_MSB>
<TX_Power_LSB> "value" </TX_Power_LSB>
<RX_Power_MSB> "value" </RX_Power_MSB>
<RX_Power_LSB> "value" </RX_Power_LSB>
<Reserved_MSB> "value" </Reserved_MSB>
<Reserved_LSB> "value" </Reserved_LSB>
<Reserved_MSB> "value" </Reserved_MSB>
<Reserved_LSB> "value" </Reserved_LSB>
<StatusControlBits>
   <DataReadyBar> "value" </DataReadyBar>
   <LOS> "value" </LOS>
```

```
            <TXFault> "value" </TXFault>
            <SoftRXRateSelect> "value" </SoftRXRateSelect>
            <RXRateSelectState> "value" </RXRateSelectState>
            <SoftTXDisable> "value"</SoftTXDisable>
            <TXDisableState> "value" </TXDisableState>
         </StatusControlBits>
         <TXPowerLowAlarm>"value" </TXPowerLowAlarm>
         <TXPowerHighAlarm> "value" </TXPowerHighAlarm>
         <TXBiasLowAlarm> "value" </TXBiasLowAlarm>
         <TXBiasHighAlarm> "value" </TXBiasHighAlarm>
         <VccLowAlarm> "value" </VccLowAlarm>
         <VccHighAlarm> "value" </VccHighAlarm>
         <TempLowAlarm> "value" </TempLowAlarm>
         <TempHighAlarm> "value" </TempHighAlarm>
         <RXPowerLowAlarm> "value" </RXPowerLowAlarm>
         <RXPowerHighAlarm>"value" </RXPowerHighAlarm>
         <TXPowerLowWarning> "value" </TXPowerLowWarning>
         <TXPowerHighWarning> "value" </TXPowerHighWarning>
         <TXBiasLowWarning> "value" </TXBiasLowWarning>
         <TXBiasHighWarning> "value" </TXBiasHighWarning>
         <VccLowWarning> "value" </VccLowWarning>
         <VccHighWarning> "value" </VccHighWarning>
         <TempLowWarning> "value" </TempLowWarning>
         <TempHighWarning> "value" </TempHighWarning>
         <ReservedWarning> "value" </ReservedWarning>
         <ReservedWarning> "value" </ReservedWarning>
         <ReservedWarning> "value" </ReservedWarning>
         <ReservedWarning> "value" </ReservedWarning>
         <ReservedWarning> "value" </ReservedWarning>
         <ReservedWarning> "value" </ReservedWarning>
         <RXPowerLowWarning> "value" </RXPowerLowWarning>
         <RXPowerLowWarning> "value" </RXPowerLowWarning>
         <VendorSpecific> "value" </VendorSpecific>
      </Address_A2>
   </HBA>
      <Status> n </Status>
      <?ErrorMsg> "message" </ErrorMsg?>
      <Reboot> n /Reboot>
   </QLogic>
```

B.7.3 Boot Device (Command Line Option -e)

The command format for all HBAs is:

`-e (view | ?) -x2`

The command format for a single HBAs is:

-e (<*HBA Instance*> | <*HBA WWPN*>) (view | ?) -x2

The XML Format 2 for the boot device information is as follows:

```
<?xml version="value" encoding="value"?>
<QLogic>
   <AppName>SANsurfer FC HBA CLI</AppName>
   <AppVersion>vn.n.nn Build nn</AppVersion
   <AppXmlVersion>n.nn</AppXmlVersion>
      <HBA>
         <HBA Instance="value" HBAModel="value" HBAPort="value"
WWNN="value" WWPN="value" />
<BootDeviceInfo>
         <BootParam EnableSelectableBoot="value" />
         <BootDevice TargetWWPN="value" LUNID="value"/>
</BootDeviceInfo>
      </HBA>
      <HBA>
   <HBA Instance="value" HBAModel="value" HBAPort="value"
WWNN="value" WWPN="value" />

<BootDeviceInfo>
               <BootParam EnableSelectableBoot="0" />
               <BootDevice TargetWWPN="value" LUNID="value"
EnableSelectableBoot="0"/>
</BootDeviceInfo>
      </HBA>
   <Status> n </Status>
   <?ErrorMsg> "message" </ErrorMsg?>
   <Reboot> n /Reboot>
</QLogic>
```

The <HBA> …</HBA> sequence repeats for each HBA.

NOTE:

If Enable Selectable Boot is set to 1 in the Boot Param Enable Selectable Boot tag, it does not appear in the Boot Device Target WWPN tag:

```
<BootParam EnableSelectableBoot="1" />
<BootDevice TargetWWPN="value" LUNID="value"
```

However, if Enable Selectable Boot is set to 0 in the Boot Param Enable Selectable Boot tag, it appears in the Boot Device Target WWPN tag:

```
<BootParam EnableSelectableBoot="0" />
<BootDevice TargetWWPN="value" LUNID="value"
EnableSelectableBoot="0"/>
```

B.7.4
View Driver Settings
(Command Line Option -fg)

The command format is:

scli -fg (<*HBA Instance*> | <*HBA WWPN*>) (VIEW | ?) -x2

The XML Format 2 for the current driver settings information is as follows:

```
<?xml version="value" encoding="value"?>
<QLogic>
   <AppName>SANsurfer FC HBA CLI</AppName>
   <AppVersion>vn.n.nn Build nn</AppVersion
   <AppXmlVersion>n.nn</AppXmlVersion>
      <HBA>
   <HBA Instance="value" HBAModel="value" HBAPort="value"
WWNN="value" WWPN="value" />
   <DriverSettings>
      <Info PersistentPlusNew="value"
      PersistentOnly="value"
      BindbyWWPN="value"
      BindbyPortID="value" />
   </DriverSettings>
</HBA>
   <Status> n </Status>
   <?ErrorMsg> "message" </ErrorMsg?>
   <Reboot> n /Reboot>
</QLogic>
```

B.8
Display System Information
(Command Line Option -g)

The command format is:

scli -g -x2

The XML Format 2 for system information output is as follows:

```
<?xml version="value" encoding="value"?>
<QLogic>
   <AppName>SANsurfer FC HBA CLISANsurfer FC HBA CLI</AppName>
   <AppVersion>vn.n.nn Build nn</AppVersion
   <AppXmlVersion>n.nn</AppXmlVersion>
   <Host>
      <Name> Host Name </Name>
         <OSType> OS Type </OSType>
         <OSVersion> OS Version <Build="value"</OSVersion>
         <SDMAPIVersion>n.nn.nn.nn</SDMAPIVersion>
```

```
   <HBA Instance="value" HBAModel="value" HBAPort="value"
WWNN="value" WWPN="value" />
   <NumOfHBA>n</NumOfHBA>
</Host>
   <Status> n </Status>
   <?ErrorMsg> "message" </ErrorMsg?>
   <Reboot> n /Reboot>
</QLogic>
```

The parameter <HBA…/> repeats for each HBA in the system.

B.8.1

Display HBA Information
(Command Line Option -I)

The command format is:

scli -i (<*HBA Instance*> | <*HBA WWPN*> | all) -x2

Another version of the command displays all information or VPD information:

scli -i [all] [vpd] -x2

The XML Format 2 for adapter general information is as follows:

```
<?xml version="value" encoding="value"?>
<QLogic>
   <AppName>SANsurfer FC HBA CLI</AppName>
   <AppVersion>vn.n.nn Build nn</AppVersion
   <AppXmlVersion>n.nn</AppXmlVersion>
   <HBA>
      <GeneralInfo Instance="value"
         HBAModel="value"
         HBAID="value"
         HBAAlias="value"
         HBAPort="value"
         PortAlias="value"
         WWNN="value"
         WWPN="value"
         PortID="value"
         SerialNumber="value"
         DriverVersion="value"
         BIOSVersion="value"
         FirmwareVersion="value"
         PCIbus="value"
         PCIDevice="value"
         ActualConnectionMode="value"
         ActualDataRate="value"
         TargetCount="value"
         PortType="value"
         Status="value"
```

```
      </HBA>
   <Status> n </Status>
   <Reboot> n /Reboot>
</QLogic>
```

The XML Format 2 for 4G HBAs is as follows:

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<QLogic>
   <AppName>SANsurfer FC HBA CLI</AppName>
   <AppVersion>vn.n.n Build n</AppVersion>
   <AppXmlVersion>2.0</AppXmlVersion>
      <HBA>
         <GeneralInfo Instance="value"
         HBAModel="value"
         HBAID="value"
         HBAAlias=""
         HBAPort="value"
         PortAlias=""
         WWNN="value"
         WWPN="value"
         PortID="value"
         SerialNumber="value"
         DriverVersion="value"
         BIOSVersion="value"
         FirmwareVersion="value"
         OptionROMBIOSVersion="value"
         OptionROMCodeVersion="value"
         OptionROMEFIVersion="value"
         OptionROMFirmwareVersion="value"
         PCIBus="value"
         PCIDevice="value"
         ActualConnectionMode="value"
         ActualDataRate="value"
         PortType="value"
         Status="value"
      </HBA>
   <Status> 0 </Status>
   <Reboot> 0 </Reboot>
</QLogic>

Here is the VPD information:

<?xml version="1.0" encoding="ISO-8859-1"?>
<QLogic>
   <AppName>SANsurfer FC CLI</AppName>
   <AppVersion>vn.nn.nn Build n.nn</AppVersion>
      <HBA>
         <HBAInstance="value" HBAModel="value"HBAPort="value"
WWNN="value" WWPN="value" />
```

```
<VPD>
         <VPD ProductIdentifier="value"
         PartNumber="value"
         SerialNumber="value"
         MiscInformation="value"
         ManufacturingID="value"
         EFIDriverVersion="value"
         FirmwareVersion="value"
         BIOSVersion="value"
         FCodeVersion="value"
</VPD>
      </HBA>
   <Status> 0 </Status>
   <Reboot> 0 </Reboot>
</QLogic>
```

B.8.2 Diagnostics Results – Loopback Test (Command Line Option -kl)

The command format is:

scli -kl (*<HBA Instance>* | *<HBA WWPN>*) [(*<Parameter Name>* | *<Parameter Alias>*) *<Parameter Value>*] -x2

The XML Format 2 for the loopback test results is as follows:

```
<?xml version="value" encoding="value"?>
<QLogic>
   <AppName>SANsurfer FC HBA CLI</AppName>
   <AppVersion>vn.n.nn Build nn</AppVersion
   <AppXmlVersion>n.nn</AppXmlVersion>
<HBA>
   <HBA Instance="value" HBAModel="value" HBAPort="value"
WWNN="value" WWPN="value" />
         <Loop ID="value"
         CRCError="value"
         DisparityError="value"
         FrameLengthError="value"
         Result="Success"/>
</HBA>
   <Status> n </Status>
   <Reboot> n /Reboot>
</QLogic>
```

B.8.3 Diagnostics Results – Read/Write Buffer Test (Command Line Option -kr)

The command format is:

scli -kr (<*HBA Instance*> | <*HBA WWPN*>) [(-EX | -EXCLUDE) <*Target WWPN*>] (<*Parameter Name*> | <*Parameter Alias*>) <*Parameter Value*> -x2

The XML Format 2 for the read/write buffer test results is as follows:

```
<?xml version="value" encoding="value"?>
<QLogic>
   <AppName>SANsurfer FC HBA CLI</AppName>
   <AppVersion>vn.n.nn Build nn</AppVersion
   <AppXmlVersion>n.nn</AppXmlVersion>
<HBA>
   <HBA Instance="value" HBAModel="value" HBAPort="value"
WWNN="value" WWPN="value" />
<Target>
      <WWNN> Target WWNN </WWNN>
      <WWPN> Target WWPN </WWPN>
      <Loop ID ="value" DataMiscompare="value" LinkFailure=
"value" LossOfSync="value" LossOfSignal="value" InvalidCRC="value"
      Result="value" />
</Target>
</HBA>
   <Status> n </Status>
   <Reboot> n /Reboot>
</QLogic>
```

The `<Target>... </Target>` sequence repeats for each target.

B.8.4 Display LUN List (Command Line Option -l)

The command format is:

scli -l <*HBA Instance*> | <*HBA WWPN*> -x2

The XML Format 2 for the adapter LUN list information is as follows:

```
<?xml version="value" encoding="value"?>
<QLogic>
   <AppName>SANsurfer FC HBA CLI</AppName>
   <AppVersion>vn.n.nn Build nn</AppVersion
   <AppXmlVersion>n.nn</AppXmlVersion>
      <HBA>
         <HBA Instance="value" HBAModel="value" HBAPort="value"
WWNN="value" WWPN="value" />
         <Target>
            <WWNN>value</WWNN>
            <WWPN>value</WWPN>
         <LUN ID="value"
            WWULN="value"
```

```
            Vendor="value"
            Product="value"
            Revision="value"
            Size="value"
            Type="value" />
         </Target>
      </HBA>
   <Status> n </Status>
   <Reboot> n /Reboot>
</QLogic>
```

The <Target> sequence repeats for each LUN attached to the target. The LUN list is listed under the target, not under the adapter.

B.8.5
Selective LUNs
(Command Line Option -m)

The command format is:

`scli -m all (view | ?) -x2`

The XML Format 2 for the selective LUNs information is as follows:

```
<?xml version="value" encoding="value"?>
<QLogic>
   <AppName>SANsurfer FC HBA CLI</AppName>
   <AppVersion>vn.n.nn Build nn</AppVersion
   <AppXmlVersion>n.nn</AppXmlVersion>
<HBA>
   <HBA Instance="value" HBAModel="value" HBAPort="value"
WWNN="value" WWPN="value" />
   <Target>
      <WWNN> Target WWNN </WWNN>
      <WWPN> Target WWPN </WWPN>
      <EnabledLUN ID="value" LUNWWNN="value" LUNWWPN="value"/>
   </Target>
</HBA>
   <Status> n </Status>
   <Reboot> n /Reboot>
</QLogic>
```

The <Target> … </Target> sequence repeats for each enabled LUN on the target.

B.8.6
Target Persistent Binding
(Command Line Option -p)

The command format is:

scli -p (<*HBA Instance*> | <*HBA WWPN*> | all) (view | ?) -x2

The XML Format 2 for the adapter target persistent binding information is as follows:

```
<?xml version="value" encoding="value"?>
<QLogic>
   <AppName>SANsurfer FC HBA CLI</AppName>
   <AppVersion>vn.n.nn Build nn</AppVersion
   <AppXmlVersion>n.nn</AppXmlVersion>
   <HBA>
      <HBA Instance="value" HBAModel="value" HBAPort="value"
WWNN="value" WWPN="value" />

<TargetBinding TargetWWNN="value" TargetWWPN="value"
TargetPortID="value" TargetID="value" />
      </HBA>
   <Status> n </Status>
   <Reboot> n /Reboot>
</QLogic>
```

The <HBA> … </HBA> sequence repeats for each HBA.

The <Target binding … /> sequence repeats for each bound target.

B.8.7 Display Device List (Command Line Option -t)

The command format is:

scli -t (<*HBA Instance*> | <*HBA WWPN*> | all) -x2

The XML Format 2 for adapter device information is as follows:

```
<?xml version="value" encoding="value"?>
<QLogic>
   <AppName>SANsurfer FC HBA CLI</AppName>
   <AppVersion>vn.n.nn Build nn</AppVersion
   <AppXmlVersion>n.nn</AppXmlVersion>
   <HBA>
   <HBA Instance="value" HBAModel="value" HBAPort="value"
WWNN="value" WWPN="value" />
   <Target>
         <WWNN> Target WWNN </WWNN>
         <WWPN> Target WWPN </WWPN>
         <Info Path="value"
          ID="value"
          Vendor="value"
          ProcuctID="value"
          Revision="value"
          SerialNumber="value"
```

```
            DeviceID= "value"
            PortID= "value"
            LunCount= "value"
            Type= "value"
            DeviceStatus= "value" />
         </Target>
      </HBA>
      <Status> n </Status>
      <Reboot> n /Reboot>
</QLogic>
```

The <Target>…</Target> sequence repeats for each target.

The <HBA>…</HBA> sequence repeats for each HBA.

B.8.8
Display All Information for One or All HBAs
(Command Line Option -z)

The XML Format 2 for all adapter information is more complicated than its non-XML counterpart because the tags cannot be repeated. In non-XML mode, SANsurfer FC HBA CLI sequentially calls all the options in Table B-1, and each option is displayed in its standard output format. If each option displays its own XML2 output, the resulting display would have multiple duplicate tags.

Table B-1. Options Displayed by -z

Non-interactive Option	Setting	Section
-g	Display system information	5.3.11
-c	Display HBA settings	5.3.3
-I	Display HBA information	5.3.19
-t	Display device list	5.3.29<
-L	Display LUN list	5.3.19
-P	Target persistent binding	5.3.24
-m	Selective LUNs	5.3.21
-E	Boot device	5.3.6

The command format is:

scli -z (<*HBA Instance*> | <*HBA WWPN*> | all) -x2

The XML Format 2 for all adapter information is as follows:

```
<?xml version="value" encoding="value"?>
```

```
<QLogic>
   <AppName>SANsurfer FC HBA CLI</AppName>
   <AppVersion>vn.n.nn Build nn</AppVersion
   <AppXmlVersion>n.nn</AppXmlVersion>
<Host>
   <Name> Host Name </Name>
   <OSType> OS Type </OSType>
   <OSVersion> OS Version (BUILD) (patches)</OSVersion>
   <SDMAPIVersion> SDMAPI version </SDMAPIVersion>
   <HBA Instance="value" HBAModel="value" HBAPort="value"
WWNN="value" WWPN="value" />
      <NumOfHBA> Number of HBA(s) detected </NumOfHBA>
   </Host> <HBA>
   <HBA Instance="value" HBAModel="value" HBAPort="value"
WWNN="value" WWPN="value" />

   <GeneralInfo Instance="value"
    HBAModel="value"
    HBAID="value"
    HBAAlias="value"
    HBAPort="value"
    PortAlias="value"
    WWNN="value"
    WWPN="value"
    PortID="value"
    SerialNumber="value"
    DriverVersion="value"
    BIOSVersion="value"
    FirmwareVersion="value"
    PCIBus="value"
    PCIDevice="value"
    ActualConnectionMode="value"
    ActualDataRate="value"
    TargetCount="value"
    PortType="value"
    Status="value" />
   <Param ConnectionOption="value"
<VPD>
      <VPD ProductIdentifier=""/>
</VPD>
<Param
   ConnectionOption="value"
   DataRate="value"
   FrameSize="value"
   HardLoopID="value"
   LoopResetDelay="value"
   EnableHostAdapterBIOS="value"
   EnableHardLoopId="value"
   FibreChannelTapeSupport="value"
```

```
   OperationMode="value"
   IntDelayTimer="value"
   ExecutionThrottle="value"
   LoginRetryCount="value"
   EnableLipReset="value"
   PortDownRetryCount="value"
   EnableLipFullogin="value"
   LinkDownTimeout="value"
   EnableTargetReset="value"
   LUNsPerTarget="value" />
   <Target>
      <WWNN> Target WWNN </WWNN>
      <WWPN> Target WWPN </WWPN>
      <Info Path= "value"
      ID="value"
      Vendor ="value"
      ProductID= "value"
      Revision= "value"
      SerialNumber="value"
      DeviceID="value"
      PortID="value"
      LunCount="value"
      Type="value"
      DeviceStatus="value" />
   <LUN ID="value"
      WWULN="value"
      Vendor ="value"
      Product="value"
      Revision="value"
      Size="value"
      Type="value" />
      <EnabledLUN ID="value" LUNWWNN="value" LUNWWPN="value" />
   </Target>
<TargetBinding TargetWWNN="value" TargetWWPN="value"
TargetPortID="value" TargetID="value" />
>  <BootDeviceInfo>
      <BootParam EnableSelectableBoot="value" />
      <BootDevice TargetWWPN="value" LUNID="value" />
>  </BootDeviceInfo> <DriverSettings>
      <Info PersistentPlusNew="value"
         PersistentOnly="value"
         BindbyWWPN="value"
         BindbyPortID="value" />
   </DriverSettings>
</HBA>
   <Status> n </Status>
   <Reboot> n /Reboot>
</QLogic>
```

NOTES:

- The <HBA>…</HBA> sequence repeats for each HBA.
- The <DriverSettings…/> sequence repeats for each HBA.
- The <VPD Product Identifier…/> sequence repeats for each HBA.
- The <Target>…</Target> sequence repeats for each target.
- The <LUN… /> sequence repeats for each LUN.
- The <EnabledLUN ID.… /> sequence repeats for each enabled LUN.
- The <TargetBinding…/> sequence repeats for each target persistent binding entry.
- The <BootDevice…/> sequence repeats for each boot device selection entry.

B.8.9

Link Statistics
(Command Line Option -ls)

The command format is:

scli -ls (<*HBA Instance*> | <*HBA WWPN*>) [(<*Parameter Name*> | <*Parameter Alias*>) <*Parameter Value*>] -x2

The XML Format 2 for the link statistics option is as follows:

```
<?xml version="value" encoding="value"?>
<QLogic>
   <AppName>SANsurfer FC HBA CLI</AppName>
   <AppVersion>vn.n.nn Build nn</AppVersion
   <AppXmlVersion>n.nn</AppXmlVersion>
<HBA>
   <HBA Instance="value" HBAModel="value" HBAPort="value"
WWNN="value" WWPN="value" />
   <LinkStatus PortName="value"
         LinkFailure="value"
         SyncLoss="value"
         SignalLoss="value"
         InvalidCRC="value"
         TimeStamp="value"/>
</HBA>
   <Status> n </Status>
   <Reboot> n /Reboot>
</QLogic>
```

The <HBA>…</HBA> sequence repeats for each HBA.

The <LinkStatus…/> parameter repeats for each link.

B.8.10
HBA Statistics
(Command Line Option -gs)

The command format is:

scli -gs (<*HBA Instance*> | <*HBA WWPN*>) [(<*Parameter Name*> | <*Parameter Alias*>) <*Parameter Value*>] -x2

The XML Format 2 for the HBA statistics option is as follows:

```
<?xml version="value" encoding="value"?>
<QLogic>
   <AppName>SANsurfer FC HBA CLI</AppName>
   <AppVersion>vn.n.nn Build nn</AppVersion
   <AppXmlVersion>n.nn</AppXmlVersion>
<HBA>
   <HBA Instance="value" HBAModel="value" HBAPort="value"
WWNN="value" WWPN="value" />
         <Statistics LoopID="value"
         PortError="value"
         DeviceError="value"
         Reset="value"
         IOCount="value"
         IOPS="value"
         BPS="value"
         TimeStamp="value" />
   </HBA>
<Status> n </Status>
<Reboot> n /Reboot>
</QLogic>
```

The <Statistics.../> sequence repeats for each HBA.

B.8.11
View HBA Alias
(Command Line Option -ha)

The command format is:

scli -ha (<*HBA Instance*> | <*HBA WWPN*>) view | ? -x2

The XML Format 2 for the HBA alias option is as follows:

```
<?xml version="value" encoding="value"?>
<QLogic>
   <AppName>SANsurfer FC HBA CLI</AppName>
   <AppVersion>vn.n.nn Build nn</AppVersion
   <AppXmlVersion>n.nn</AppXmlVersion>
<HBA>
```

```
   <HBA Instance="value" HBAModel="value" HBAPort="value"
WWNN="value" WWPN="value" />
      <HBAAlias>
         <AliasName="value" />
      </HBAAlias>
   </HBA>
<Status> n </Status>
<Reboot> n /Reboot>
</QLogic>
```

B.8.12

HBA Port Alias
(Command Line Option -pa)

The command format is:

scli -pa (<*HBA Instance*> | <*HBA WWPN*>) view | ? -x2

The XML Format 2 for the HBA port alias option is as follows:

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<QLogic>
      <AppName>SANsurfer FC HBA CLI</AppName>
      <AppVersion>vn.nn.nn Build nn</AppVersion>
      <AppXmlVersion>2.0</AppXmlVersion>
   <HBA>
      <HBA Instance="value" HBAModel="value" HBAPort="value"
WWNN="value" WWPN="value" />
   <PortAlias>
      <Alias Name="value" />
   </PortAlias>
   </HBA>
   <Status> 0 </Status>
   <Reboot> 0 </Reboot>
</QLogic>
```

The XML Format 2 for SFF DMI (detailed information) is as follows:

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<QLogic>
    <AppName>SANsurfer FC HBA CLI</AppName>
    <AppVersion>v1.7.0 Build 15</AppVersion>
    <AppXmlVersion>2.0</AppXmlVersion>

     <HBA>
         <HBA Instance="value" HBAModel="value" HBAPort="value"
WWNN="value" WWPN="value" />
        <MediaInformation>
                <Vendor>"value"</Vendor>
                <Type>"value"</Type>
                <PartNumber>"value"</PartNumber>
```

```
            <Speed>"value"</Speed>
            <Revision>"value"</Revision>
            <SerialNumber>"value" </SerialNumber>
</MediaInformation>
<Diagnostics>
  <Temperature>
     <MeasuredTemperature>(C)</MeasuredTemperature>
     <Value>"value"</Value>
     <Status>"value"</Status>
     <HighAlarm>"value"</HighAlarm>
     <HighWarning>"value"</HighWarning>
     <LowWarning>"value"</LowWarning>
     <LowAlarm>"value"</LowAlarm>
  </Temperature>
  <Voltage>
     <MeasuredVoltage>(V)</MeasuredVoltage>
     <Value>"value"</Value>
     <Status>"value"</Status>
     <HighAlarm>"value"</HighAlarm>
     <HighWarning>"value"</HighWarning>
     <LowWarning>"value"</LowWarning>
     <LowAlarm>"value"</LowAlarm>
  </Voltage>
  <TxBias>
     <MeasuredTxBiasUnit>(mA)</MeasuredTxBiasUnit>
     <Value>"value"</Value>
     <Status>"value"</Status>
     <HighAlarm>"value"</HighAlarm>
     <HighWarning>"value"</HighWarning>
     <LowWarning>"value"</LowWarning>
     <LowAlarm>"value"</LowAlarm>
  </TxBias>
  <TxPower>
     <MeasuredTxPowerUnit>(mW)</MeasuredTxPowerUnit>
     <Value>"value"</Value>
     <Status>"value"</Status>
     <HighAlarm>"value"</HighAlarm>
     <HighWarning>"value"</HighWarning>
     <LowWarning>"value"</LowWarning>
     <LowAlarm>"value"</LowAlarm>
  </TxPower>
  <RxPower>
     <MeasuredRxPowerUnit>(mW)</MeasuredRxPowerUnit>
     <Value>"value"</Value>
     <Status>"value"</Status>
     <HighAlarm>"value"</HighAlarm>
     <HighWarning>"value"</HighWarning>
     <LowWarning>"value"</LowWarning>
     <LowAlarm>"value"</LowAlarm>
```

```
            </RxPower>
          </Diagnostics>
       </HBA>
      <Status> 0 </Status>
      <Reboot> 0 </Reboot>
</QLogic>
```

B.8.13

Host Topology
(Command Line Option -tp)

The command format is:

`scli -tp -x2`

The XML Format 2 for an HBA type interconnect element is as follows (this example shows a switch):

```
<?xml version="value" encoding="value"?>
<QLogic>
   <AppName>SANsurfer FC HBA CLI</AppName>
   <AppVersion>vn.n.nn Build nn</AppVersion
   <AppXmlVersion>n.nn</AppXmlVersion>
<InterConnectElement Type="Switch">
   <SwitchWWPN="value"
   DomainID="value"
   ManagementID="value"
   IPAddress="value"
   Model="value"
   SymbolicName="value"
   SerialNumber="value"
   MACAddress="value"
      FirmwareVersion="value"
   PortCount="value"

   BeaconStatus="value"
         <PhysicalPortInformation>
         <PhysicalPortNumber="value">
         <Port WWPN="value"
         State="value"
         Type="value"
         TXPortType="value"
         ModuleType="value"
         <AttachedPort Type="value">
         <HBANodeName="value"
         PortName="value"
         VendorID="value"
         Model="value"
         SerialNumber="value"
         Alias="value"
```

```
            PortAlias="value"
            DriverVersion="value"
            FirmwareVersion="value"
            Host="value"/>
      </AttachPort>
      </PhysicalPort>
...
      </PhysicalPortInformation>
</InterconnectElements>
<InterconnectElementType="HBA">
      <HBA WWNN="value"
      WWPN="value"
      VendorID="value"
         Model="value"
         SerialNumber="value"
         Alias="value"
         PortAlias="value"
         DriverVersion="value"
         FirmwareVersion="value"
         Host="value"
         TotalNumberOfDevices="value"
NumberofPort="value"
BeaconStatus="value"
PortType="value"
PortState="value"/>
</InterconnectElement>
      <Status> n </Status>
      <Reboot> n /Reboot>
</QLogic>
```

The `<InterconnectElement>…</InterconnectElement>` sequence repeats for each interconnect element.

Notes

Appendix C
Interactive Exit Codes

To list the exit codes while running SANsurfer FC HBA CLI in interactive mode:

1. From the **Main Menu**, select the **Help** option and then press ENTER.
2. On the **Help Menu**, select **Exit Codes** and then press ENTER.

The CLI lists the exit code numbers, names, and descriptions as shown in Table C-1. (To see non-interactive error codes, see Appendix D.)

NOTE:

Exit codes are continually being updated. Although Table C-1 was accurate at the time this document was written, you should check for the latest exit codes in the file, `Fcscli-exicodes.txt`, located in the SANsurfer FC HBA CLI installation directory.

Table C-1. Exit Code Descriptions – Interactive Mode

Return Code	Name	Description
0	SUCCESS	Command executed with no error
1	ERROR_OPEN_FILE	Failed to open file
2	ERROR_READ_FILE	Failed to read file
3	ERROR_WRITE_FILE	Failed to write to a file
4	ERROR_CLOSE_FILE	Failed to close a file
5	ERROR_INCORRECT_FILE	Selected file is incorrect
6	ERROR_INCORRECT_FILE_SIZE	File size is incorrect
7	ERROR_UNSUPPORTED_HBA	HBA is unsupported
8	ERROR_NO_HBA	Unable to open the HBA handle
9	ERROR_UNKNOWN_HBA	HBA is unknown to SANsurfer FC HBA CLI
10	ERROR_INVALID_SSID	HBA has invalid SSDID/SSVID
11	ERROR_MISMATCH_SSID	The specified flash/NVRAM file does not have the SSDID/SSVID that match with the HBA

Table C-1. Exit Code Descriptions – Interactive Mode (Continued)

Return Code	Name	Description
12	ERROR_MISMATCH_CHECKSUM	File checksum does not match
13	ERROR_CORRUPTED_FILE	File appears to be corrupted
14	ERROR_FILE_CHKSUM_ERROR	File checksum returns error
15	ERROR_FILE_INVALID_DATA	File has invalid data
16	ERROR_FLASH_UPDATE_IGNORE	HBA does not need to be updated
17	Reserved	Not used
18	Reserved	Not used
19	ERROR_FLASH_UPDATE_UNSUPPORTED	Flash update is not supported with this HBA
20	ERROR_FLASH_OPTION_DISABLED_HBA	Flash update is disabled with this HBA
21	ERROR_FLASH_OPTION_DISABLED_OS	Flash update is disabled with this OS
22	ERROR_FLASH_HEADER_SIGNATURE	Flash file has invalid header signature
23	ERROR_FLASH_DATA_SIGNATURE	Flash file has invalid data signature
24	Reserved	Internal used
25	ERROR_FLASH_CSUM_ERROR	Flash file checksum test failed
26	ERROR_FLASH_NO_FW_REGION_VALID	HBA does not have valid firmware region
27	ERROR_FLASH_INVALID_FW_FILE	Firmware file does not match with HBA
28	Reserved	Internal used
29	ERROR_FLASH_CSUM_MISMATCH	Flash file has checksum mismatched.
30	ERROR_INCORRECT_RISC_CODE_FILE	Incorrect RISC image
31	ERROR_INCORRECT_BOOT_CODE_FILE	Incorrect BIOS/FCode boot image
32	ERROR_INCORRECT_FULL_IMAGE_FILE	Incorrect 1M Flash image
33	ERROR_CORRUPTED_FLASH_IMAGE_FILE	Flash image file is corrupted
34	ERROR_FLASH_UPDATE_FAILURE	Failed to update flash
35	ERROR_FLASH_GET_REGION_FAILURE	Failed to read flash update region from HBA
36	ERROR_FLASH_UPDATE_NO_VALID_ REGION	Failed to validate flash update region read from HBA

Table C-1. Exit Code Descriptions – Interactive Mode (Continued)

Return Code	Name	Description
37	ERROR_FLASH_UPDATE_NO_REGION_ LAYOUT	HBA does not have flash update region lay-out
38	Reserved	Not used
39	Reserved	Not used
40	ERROR_DIAGNOSTICS_PARAM_ERROR	Diagnostics test returns invalid parameters
41	ERROR_DIAGNOSTICS_LOOP_DOWN	Unable to run diagnostics because the loop is down
42	ERROR_DIAGNOSTICS_FAILURE	Diagnostics test failed with errors
43	ERROR_DIAGNOSTICS_DATA_ MISCOM-PARE	Diagnostics test failed with data miscompare
44	ERROR_DIAGNOSTICS_UNKNOWN_ STATUS	Unknown diagnostics test status
45	ERROR_DIAGNOSTICS_NO_AVAIL_ TARGET	Unable to run R/W buffer test because there are no attached devices
46	ERROR_DIAGNOSTICS_NOT_FOUND_ TARGET	Unable to run R/W buffer test because the excluded device is not available
47	ERROR_DIAGNOSTICS_MAX_FRAME_ SETTING	Unable to run diagnostics because of the HBA current frame size setting
48	ERROR_INVALID_DIAGNOSTICS_ SETTINGS	Invalid diagnostics test parameter settings
49	Reserved	Not used
50	ERROR_FC_LINK_UNKNOWN_STATUS	Error getting FC link status
51	ERROR_RESET_LINK_STATUS	Unable to reset HBA link status
52	ERROR_INVALIDE_STATISTICS_PARAMS	Invalid link status/statistics parameter set-tings
53	Reserved	Not used
54	Reserved	Not used
55	Reserved	Not used
56	Reserved	Not used
57	Reserved	Not used

Table C-1. Exit Code Descriptions – Interactive Mode (Continued)

Return Code	Name	Description
58	Reserved	Not used
59	Reserved	Not used
60	ERROR_INVALID_PARAM_SETTINGS	Invalid HBA parameter value/key
61	ERROR_PARAM_UNSUPPORTED_HBA	Specified HBA parameters is not supported
62	ERROR_PARAM_UNSUPPORTED_DRIVER	Unable to update HBA parameters - Driver unsupported
63	ERROR_RESTORE_NVRAM_DEFAULT	Failed to restore HBA parameters to default settings
64	Reserved	Not used
65	Reserved	Not used
66	Reserved	Not used
67	Reserved	Not used
68	Reserved	Not used
69	Reserved	Not used
70	ERROR_SAVE_HBA_FLASH_TO_FILE	Failed to save HBA flash image to a file
71	ERROR_READ_HBA_FLASH_HBA	Failed to read HBA flash
72	ERROR_NO_SPACE_LEFT	Command failed because no space left on the drive
73	Reserved	Not used
74	Reserved	Not used
75	Reserved	Not used
76	Reserved	Not used
77	Reserved	Not used
78	Reserved	Not used
79	Reserved	Not used
80	ERROR_INVALID_SERIAL_NO	Invalid HBA serial number
81	ERROR_GET_NVRAM_DATA	Unable to read NVRAM from HBA
82	ERROR_UPDATE_NVRAM_DATA	Failed to update HBA parameters

Table C-1. Exit Code Descriptions – Interactive Mode (Continued)

Return Code	Name	Description
83	ERROR_PRESERVE_NVRAM_DATA	Failed to preserve HBA parameters
84	ERROR_MISSING_NVRAM_TEMPLATE_ FILE	Unable to find the NVRAM template for the HBA
85	ERROR_INVALID_NVRAM_PROG_OPTION	Specified key/value to program NVRAM are invalid
86	Reserved	Not used
87	Reserved	Not used
88	Reserved	Not used
89	Reserved	Not used
90	ERROR_READING_BOOT_DEVICE	Failed to read boot device settings of the HBA
91	ERROR_SAVING_BOOT_DEVICE	Failed to save boot device settings to the HBA
92	ERROR_BOOT_CONFIG_DISABLED_ DRIVER	Boot device settings is disabled with running driver
93	ERROR_BOOT_TARGET_NO_LUN	Boot device settings aborted because boot target has no LUN
94	ERROR_TARGET_NO_DIRECT_ACCESS	Boot device settings failed because the boot target is not a direct access device
95	ERROR_INVALID_BOOT_SETTINGS	Boot device parameters is invalid/incorrect
96	ERROR_UNSUPPORTED_BOOT_ SETTINGS	Unsupported boot device settings
97	Reserved	Not used
98	Reserved	Not used
99	Reserved	Not used
100	ERROR_INVALID_DRIVER_PARAM	Driver parameter settings is invalid
101	ERROR_READ_DRIVER_PARAM	Failed to read current driver settings of the HBA
102	ERROR_DRIVER_PARAM_NOT_FOUND	Unknown driver parameter settings
103	Reserved	Not used

Table C-1. Exit Code Descriptions – Interactive Mode (Continued)

Return Code	Name	Description
104	Reserved	Not used
105	Reserved	Not used
106	Reserved	Not used
107	Reserved	Not used
108	Reserved	Not used
109	Reserved	Not used
110	ERROR_DUPLICATE_TARGET_ID	Target has duplicate ID
111	ERROR_INVALID_TARGET_ID	Target has invalid ID
112	ERROR_MISMATCH_TARGET_ID	Target has mismatch ID
113	ERROR_READ_FROM_DRIVER	Failed to read persistent binding data from driver database
114	ERROR_READ_FROM_PERSISTENT_ STORAGE	Failed to read persistent binding data from persistent database
115	ERROR_MEMORY_ALLOC_FAILURE	Unable to allocate memory
116	ERROR_TARGET_ENTRY_NOT_FOUND	Unable to find the binding entry of the specified target
117	ERROR_DELETE_TARGET_PERSISTENT_ ENTRY	Failed to delete target persistent binding
118	ERROR_LUN_NOT_FOUND	The specified LUN ID not available
119	ERROR_NO_DEVICE_FOUND	HBA does not have attached devices
120	ERROR_OPTION_UNSUPPORTED_DRV	Option is not available with running driver
121	ERROR_OPTION_UNSUPPORTED_HBA	Option is not available with HBA
122	ERROR_OPTION_UNSUPPORTED_OS	Option is not available on this OS platform
123	ERROR_OPTION_DISABLED_GUI_CONFIG	Target persistent binding is not allowed because of existing configuration saved by the SANsurfer manager
124	ERROR_OPTION_DISABLED_DRV	Target persistent binding is disabled because of current driver
125	ERROR_UPDATE_LUN_DATA_PERSIST_ BINDING	Failed to update LUN data during persistent binding configuration

Table C-1. Exit Code Descriptions – Interactive Mode (Continued)

Return Code	Name	Description
126	ERROR_FAILOVER_DRIVER_LOADED	Feature is not support with failover driver
127	Reserved	Not used
128	Reserved	Not used
129	Reserved	Not used
130	ERROR_INVALID_HBA_WWID	HBA WWPN/WWNN specified is invalid
131	ERROR_INVALID_HBA_PID	HBA instance specified is invalid
132	ERROR_INVALID_TARGET_WWID	Target WWPN/WWNN specified is invalid
133	ERROR_INVALID_LUN_ID	LUN ID specified is invalid
134	ERROR_MISSING_INPUT	Incomplete command line option
135	ERROR_INVALID_INPUT	Invalid command line option
136	ERROR_CMD_UNSUPPORTED	Specified command line option is unsupported
137	Reserved	Not used
138	Reserved	Not used
139	Reserved	Not used
140	ERROR_UNKNOWN_FILE_FORMAT	Unable to determine file format
141	ERROR_READ_DRV_VER_SYS_FILE	Failed to read driver version from sys file
142	ERROR_INIT_SECURITY_DESCRIPTOR	Failed to init security descriptor during driver update
143	ERROR_SET_SECURITY_DESCRIPTOR	Failed to set security descriptor during driver update
144	ERROR_FAIL_UPDATE_DRIVER	Failed to update driver
145	ERROR_HARDWARE_ID_NO_MATCH	HBA hardware ID does not match with the driver config file
146	ERROR_DRIVER_UPDATE_UNSUPPORTED	Driver update is not allowed with this HBA
147	ERROR_NO_DRV_INF_FILE	Driver inf file is missing in the driver package
148	ERROR_CREATE_TEMP_DIR	Failed to create temporary directory
149	ERROR_OPEN_ZIP_FILE	Failed to open zip file

Table C-1. Exit Code Descriptions – Interactive Mode (Continued)

Return Code	Name	Description
150	ERROR_CLOSE_ZIP_FILE	Failed to close zip file
151	ERROR_READ_ZIP_FILE	Failed to read zip file
152	ERROR_EXTRACT_ZIP_FILE	Failed to extract zip file
153	ERROR_CORRUPTED_ZIP_FILE	The zip file appears to be corrupted
154	ERROR_CREATE_ZIP_FILE	Failed to create zip file
155	ERROR_MISSING_DRV_FILE	Driver sys file is missing in the driver package
156	ERROR_EMPTY_FOLDER	Driver folder is empty
157	ERROR_GET_REGISTRY_KEY	Failed to get a registry key
158	ERROR_SET_REGISTRY_KEY	Failed to set a registry key
159	ERROR_STORPORT_NOT_SUPPORTED	Operation failed with Stor miniport driver
160	ERROR_INVALID_VPD_DATA	HBA has invalid VPD data
161	Reserved	Not used
162	Reserved	Not used
163	Reserved	Not used
164	Reserved	Not used
165	Reserved	Not used
166	Reserved	Not used
167	Reserved	Not used
168	Reserved	Not used
169	Reserved	Not used
170	Reserved	Not used
171	IBM Reserved	Blocked
172	IBM Reserved	Blocked
173	IBM Reserved	Blocked
174	IBM Reserved	Blocked
175	IBM Reserved	Blocked
176	IBM Reserved	Blocked

Table C-1. Exit Code Descriptions – Interactive Mode (Continued)

Return Code	Name	Description
177	IBM Reserved	Blocked
178	IBM Reserved	Blocked
179	IBM Reserved	Blocked
180	IBM Reserved	Blocked
181	IBM Reserved	Blocked
182	IBM Reserved	Blocked
183	IBM Reserved	Blocked
184	IBM Reserved	Blocked
185	IBM Reserved	Blocked
186	IBM Reserved	Blocked
187	IBM Reserved	Blocked
188	IBM Reserved	Blocked
189	IBM Reserved	Blocked
190	IBM Reserved	Blocked
191	IBM Reserved	Blocked
192	IBM Reserved	Blocked
193	Reserved	Not used
194	Reserved	Not used
195	Reserved	Not used
196	Reserved	Not used
197	Reserved	Not used
198	Reserved	Not used
199	Reserved	Not used
200	ERROR_SAVE_SEL_LUN_CONFIG	Failed to save selective LUN configuration
201	Reserved	Not used
202	Reserved	Not used
203	Reserved	Not used

Table C-1. Exit Code Descriptions – Interactive Mode (Continued)

Return Code	Name	Description
204	Reserved	Not used
205	Reserved	Not used
206	Reserved	Not used
207	Reserved	Not used
208	Reserved	Not used
209	Reserved	Not used
210	ERROR_MISSING_IP_ADDRESS	IP address is required
211	ERROR_MISSING_NETMASK_ADDRESS	Netmask address is required
212	ERROR_MISSING_GATEWAY_ADDRESS	Gateway address is required
213	ERROR_INVALID_IP_ADDRESS	Invalid IP address
214	ERROR_INVALID_NET_MASK	Invalid netmask address
215	ERROR_GET_SWITCH_INFO	Failed to get switch information
216	ERROR_SET_SWITCH_IP_ADDRESS	Failed to set switch IP address
217	ERROR_INVALID_SWITCH_INPUT	Invalid switch parameters settings
218	ERROR_INVALID_ADMIN_ACCOUNT	Admin account is required
219	ERROR_INVALID_ADMIN_PASSWORD	Admin password is incorrect
220	ERROR_INVALID_OPTION	Switch input is invalid
221	Reserved	Not used
222	Reserved	Not used
223	Reserved	Not used
224	Reserved	Not used
225	Reserved	Not used
226	Reserved	Not used
227	Reserved	Not used
228	Reserved	Not used
229	Reserved	Not used
230	ERROR_GET_TARGET_IIDMA_SETTINGS	Failed to read target link speed

Table C-1. Exit Code Descriptions – Interactive Mode (Continued)

Return Code	Name	Description
231	ERROR_SAVE_TARGET_IIDMA_SETTINGS	Failed to set target link speed
232	ERROR_SET_TARGET_IIDMA_ UNSUPPORTED	Target link speed option is not supported with current HBA
233	ERROR_INVALID_IIDMA_SETTINGS	Selected target link speed rate not supported with current HBA
234	Reserved	Not used
235	Reserved	Not used
236	Reserved	Not used
237	Reserved	Not used
238	Reserved	Not used
239	Reserved	Not used
240	ERROR_NO_TARGET_SELECTED	Unable to run target beacon because no device is selected
241	ERROR_GET_BEACON_STATE	Unable to get the beacon status
242	ERROR_SET_BEACON_STATE	Unable to set the beacon status
243	ERROR_BEACON_UNSUPPORTED	Beacon operation is unsupported
244	ERROR_INVALID_BEACON_PARAMETERS	Beacon settings is invalid
245	Reserved	Not used
246	Reserved	Not used
247	Reserved	Not used
248	Reserved	Not used
249	Reserved	Not used
250	ERROR_GET_HBA_ALIAS	Failed to retrieve HBA alias of the HBA
251	ERROR_UPDATE_HBA_ALIAS	Failed to update HBA alias of the HBA
252	ERROR_GET_PORT_ALIAS	Failed to retried port alias of the HBA
253	ERROR_UPDATE_PORT_ALIAS	Failed to update port alias of the HBA
254	Reserved	Not used
255	Reserved	Not used

Table C-1. Exit Code Descriptions – Interactive Mode (Continued)

Return Code	Name	Description
256	Reserved	Not used
257	Reserved	Not used
258	Reserved	Not used
259	Reserved	Not used
260	ERROR_DRIVER_RESCAN	Driver rescan operation failed (Solaris)
261	Reserved	Not used
262	Reserved	Not used
263	Reserved	Not used
264	Reserved	Not used
265	Reserved	Not used
266	Reserved	Not used
267	Reserved	Not used
268	Reserved	Not used
269	Reserved	Not used
270	ERROR_ADAPTER_PROP_MISSING	Adapter property file is missing
280	ERROR_CREATE_VIRTUAL_PORT	Failed to create a virtual port of the HBA
281	ERROR_DELETE_VIRTUAL_PORT	Failed to delete a virtual port of the HBA
282	ERROR_INVALID_VIRTUAL_PORT_WWN	Virtual port WWPN is invalid
283	ERROR_VIRTUAL_PORT_NOT_FOUND	Unable to find the specific virtual port
284	ERROR_NO_VIRTUAL_PORT_EXIST	This HBA does not have any virtual ports
285	ERROR_DELETE_ALL_VIRTUAL_PORTS	Failed to delete all virtual ports of the HBA

Appendix D
Non-interactive Error Codes

To list the SANsurfer FC HBA CLI non-interactive error codes from the command line, type:

```
scli -ei
```

(To see the interactive exit codes, see Appendix C.)

Table D-1. Error Code Descriptions – Non-interactive Mode

Code	Name	Description
0	SUCCESS	Command executed with no error
1	ERROR_OPEN_FILE	Failed to open file
2	ERROR_READ_FILE	Failed to read file
3	ERROR_WRITE_FILE	Failed to write to a file
4	ERROR_CLOSE_FILE	Failed to close a file
5	ERROR_INCORRECT_FILE	Selected file is incorrect
6	ERROR_INCORRECT_FILE_SIZE	File size is incorrect
7	ERROR_UNSUPPORTED_HBA	HBA is unsupported
8	ERROR_NO_HBA	Unable to open the HBA handle
9	ERROR_UNKNOWN_HBA	HBA is unknown to SANsurfer FC HBA CLI
10	ERROR_INVALID_SSID	HBA has invalid SSDID/SSVID
11	ERROR_MISMATCH_SSID	The specified flash/NVRAM file does not have the SSDID/SSVID that match HBA
12	ERROR_MISMATCH_CHECKSUM	File checksum does not match
13	ERROR_CORRUPTED_FILE	File appears to be corrupted
14	ERROR_FILE_CHKSUM_ERROR	File checksum returns error
15	ERROR_FILE_INVALID_DATA	File has invalid data
16	ERROR_FLASH_UPDATE_IGNORE	HBA does not need to be updated
17	Reserved	Not used

Table D-1. Error Code Descriptions – Non-interactive Mode (Continued)

Code	Name	Description
18	Reserved	Not used
19	ERROR_FLASH_UPDATE_UNSUPPORTED	Flash update is not supported with this HBA
20	ERROR_FLASH_OPTION_DISABLED_HBA	Flash update is disabled with this HBA
21	ERROR_FLASH_OPTION_DISABLED_OS	Flash update is disabled with this OS
22	ERROR_FLASH_HEADER_SIGNATURE	Flash file has invalid header signature
23	ERROR_FLASH_DATA_SIGNATURE	Flash file has invalid data signature
24	Reserved	Internal used
25	ERROR_FLASH_CSUM_ERROR	Flash file checksum test failed
26	ERROR_FLASH_NO_FW_REGION_VALID	HBA does not have valid firmware region
27	ERROR_FLASH_INVALID_FW_FILE	Firmware file does not match with HBA
28	Reserved	Internal used
29	ERROR_FLASH_CSUM_MISMATCH	Flash file has checksum mismatched
30	ERROR_INCORRECT_RISC_CODE_FILE	Incorrect RISC image
31	ERROR_INCORRECT_BOOT_CODE_FILE	Incorrect BIOS/FCode boot image
32	ERROR_INCORRECT_FULL_IMAGE_FILE	Incorrect 1M Flash image
33	ERROR_CORRUPTED_FLASH_IMAGE_FILE	Flash image file is corrupted
34	ERROR_FLASH_UPDATE_FAILURE	Failed to update flash
35	ERROR_FLASH_GET_REGION_FAILURE	Failed to read flash update region from HBA
36	ERROR_FLASH_UPDATE_NO_VALID_REGION	Failed to validate flash update region read from HBA
37	ERROR_FLASH_UPDATE_NO_REGION_LAYOUT	HBA does not have flash update region layout
38	Reserved	Not used
39	Reserved	Not used
40	ERROR_DIAGNOSTICS_PARAM_ERROR	Diagnostics test returns invalid parameters

Table D-1. Error Code Descriptions – Non-interactive Mode (Continued)

Code	Name	Description
41	ERROR_DIAGNOSTICS_LOOP_DOWN	Unable to run diagnostics because the loop is down
42	ERROR_DIAGNOSTICS_FAILURE	Diagnostics test failed with errors
43	ERROR_DIAGNOSTICS_DATA_MISCOMPARE	Diagnostics test failed with data miscompare
44	ERROR_DIAGNOSTICS_UNKNOWN_STATUS	Unknown diagnostic test status
45	ERROR_DIAGNOSTICS_NO_AVAIL_TARGET	Unable to run R/W buffer test because there are no attached devices
46	ERROR_DIAGNOSTICS_NOT_FOUND_TARGET	Unable to run R/W buffer test because the excluded device is not available
47	ERROR_DIAGNOSTICS_MAX_FRAME_SETTING	Unable to run diagnostics because of the HBA current frame size setting
48	ERROR_INVALID_DIAGNOSTICS_SETTINGS	Invalid diagnostics test parameter settings
49	Reserved	Not used
50	ERROR_FC_LINK_UNKNOWN_STATUS	Error getting FC link status
51	ERROR_RESET_LINK_STATUS	Unable to reset HBA link status
52	ERROR_INVALIDE_STATISTICS_PARAMS	Invalid link status/statistics parameter settings
53	Reserved	Not used
54	Reserved	Not used
55	Reserved	Not used
56	Reserved	Not used
57	Reserved	Not used
58	Reserved	Not used
59	Reserved	Not used
60	ERROR_INVALID_PARAM_SETTINGS	Invalid HBA parameter value/key
61	ERROR_PARAM_UNSUPPORTED_HBA	Specified HBA parameter is not supported
62	ERROR_PARAM_UNSUPPORTED_DRIVER	Unable to update HBA parameters – Driver unsupported

Table D-1. Error Code Descriptions – Non-interactive Mode (Continued)

Code	Name	Description
63	ERROR_RESTORE_NVRAM_DEFAULT	Failed to restore HBA parameters to default settings
64	Reserved	Not used
65	Reserved	Not used
66	Reserved	Not used
67	Reserved	Not used
68	Reserved	Not used
69	Reserved	Not used
70	ERROR_SAVE_HBA_FLASH_TO_FILE	Failed to save HBA flash image to a file
71	ERROR_READ_HBA_FLASH_HBA	Failed to read HBA flash
72	ERROR_NO_SPACE_LEFT	Command failed because no space left on the drive
73	Reserved	Not used
74	Reserved	Not used
75	Reserved	Not used
76	Reserved	Not used
77	Reserved	Not used
78	Reserved	Not used
79	Reserved	Not used
80	ERROR_INVALID_SERIAL_NO	Invalid HBA serial number
81	ERROR_GET_NVRAM_DATA	Unable to read NVRAM from HBA
82	ERROR_UPDATE_NVRAM_DATA	Failed to update HBA parameters
83	ERROR_PRESERVE_NVRAM_DATA	Failed to preserve HBA parameters
84	ERROR_MISSING_NVRAM_TEMPLATE_FILE	Unable to find the NVRAM template for the HBA
85	ERROR_INVALID_HBA Parameters_PROG_OPTION	Specified key/value to program NVRAM are invalid
86	Reserved	Not used

Table D-1. Error Code Descriptions – Non-interactive Mode (Continued)

Code	Name	Description
87	Reserved	Not used
88	Reserved	Not used
89	Reserved	Not used
90	ERROR_READING_BOOT_DEVICE	Failed to read boot device settings of the HBA
91	ERROR_SAVING_BOOT_DEVICE	Failed to save boot device settings to the HBA
92	ERROR_BOOT_CONFIG_DISABLED_DRIVER	Boot device settings is disabled with running driver
93	ERROR_BOOT_TARGET_NO_LUN	Boot device setting aborted because the boot target has no LUN
94	ERROR_TARGET_NO_DIRECT_ACCESS	Boot device settings failed because the boot target not a direct access device
95	ERROR_INVALID_BOOT_SETTINGS	Boot device parameters is invalid/incorrect
96	ERROR_UNSUPPORTED_BOOT_SETTINGS	Unsupported boot device settings
97	Reserved	Not used
98	Reserved	Not used
99	Reserved	Not used
100	ERROR_INVALID_DRIVER_PARAM	Driver parameter settings is invalid
101	ERROR_READ_DRIVER_PARAM	Failed to read current driver settings of the HBA
102	ERROR_DRIVER_PARAM_NOT_FOUND	Unknown driver parameter settings
103	Reserved	Not used
104	Reserved	Not used
105	Reserved	Not used
106	Reserved	Not used
107	Reserved	Not used
108	Reserved	Not used

Table D-1. Error Code Descriptions – Non-interactive Mode (Continued)

Code	Name	Description
109	Reserved	Not used
110	ERROR_DUPLICATE_TARGET_ID	Target has duplicate ID
111	ERROR_INVALID_TARGET_ID	Target has invalid ID
112	ERROR_MISMATCH_TARGET_ID	Target has mismatch ID
113	ERROR_READ_FROM_DRIVER	Failed to read persistent binding data from driver database
114	ERROR_READ_FROM_PERSISTENT_STORAGE	Failed to read persistent binding data from persistent database
115	ERROR_MEMORY_ALLOC_FAILURE	Unable to allocate memory
116	ERROR_TARGET_ENTRY_NOT_FOUND	Unable to find the binding entry of the specified target
117	ERROR_DELETE_TARGET_PERSISTENT_ENTRY	Failed to delete target persistent binding
118	ERROR_LUN_NOT_FOUND	The specified LUN ID not available
119	ERROR_NO_DEVICE_FOUND	HBA does not have attached devices
120	ERROR_OPTION_UNSUPPORTED_DRV	Option is not available with running driver
121	ERROR_OPTION_UNSUPPORTED_HBA	Option is not available with HBA
122	ERROR_OPTION_UNSUPPORTED_OS	Option is not available on this OS platform
123	ERROR_OPTION_DISABLED_GUI_CONFIG	Target persistent binding is not allowed because of existing configuration saved by the SANsurfer manager
124	ERROR_OPTION_DISABLED_DRV	Target persistent binding is disabled because of current driver
125	ERROR_UPDATE_LUN_DATA_PERSIST_BINDING	Failed to update LUN data during persistent binding configuration
126	ERROR_FAILOVER_DRIVER_LOADED	Feature is not supported with failover driver
127	Reserved	Not used
128	Reserved	Not used
129	Reserved	Not used

Table D-1. Error Code Descriptions – Non-interactive Mode (Continued)

Code	Name	Description
130	ERROR_INUALID_HBA_WWID	HBA WWPN/WWNN specified is invalid
131	ERROR_INVALID_HBA_PID	HBA instance specified is invalid
132	ERROR_INUALID_TARGET_WWID	Target WWPN/WWNN specified is invalid
133	ERROR_INUALID_LUN_ID	LUN ID specified is invalid
134	ERROR_MISSING_INPUT	Incomplete command line option
135	ERROR_INVALID_INPUT	Invalid command line option
136	ERROR_CMD_UNSUPPORTED	Specified command line option is unsupported
137	Reserved	Not used
138	Reserved	Not used
139	Reserved	Not used
140	ERROR_UNKNOWN_FILE_FORMAT	Unable to determine file format
141	ERROR_READ_DRV_VER_SYS_FILE	Failed to read driver version from sys file
142	ERROR_INIT_SECURITY_DESCRIPTOR	Failed to init security descriptor during driver update
143	ERROR_SET_SECURITY_DESCRIPTOR	Failed to set security descriptor during driver update
144	ERROR_FAIL_UPDATE_DRIVER	Failed to update driver
145	ERROR_HARDWARE_ID_NO_MATCH	HBA hardware ID does not match with the driver config file
146	ERROR_DRIVER_UPDATE_UNSUPPORTED	Driver update is not allowed with this HBA
147	ERROR_NO_DRV_INF_FILE	Driver inf file is missing in the driver package
148	ERROR_CREATE_TEMP_DIR	Failed to create temporary directory
149	ERROR_OPEN_ZIP_FILE	Failed to open zip file
150	ERROR_CLOSE_ZIP_FILE	Failed to close zip file
151	ERROR_READ_ZIP_FILE	Failed to read zip file

Table D-1. Error Code Descriptions – Non-interactive Mode (Continued)

Code	Name	Description
152	ERROR_EXTRACT_ZIP_FILE	Failed to extract zip file
153	ERROR_CORRUPTED_ZIP_FILE	The zip file appears to be corrupted
154	ERROR_CREATE_ZIP_FILE	Failed to create zip file
155	ERROR_MISSING_DRV_FILE	Driver sys file is missing in the driver package
156	ERROR_EMPTY_FOLDER	Driver folder is empty
157	ERROR_GET_REGISTRY_KEY	Failed to get a registry key
158	ERROR_SET_REGISTRY_KEY	Failed to set a registry key
159	ERROR_STORPORT_NOT_SUPPORTED	Operation failed with Stor miniport driver
160	ERROR_INVALID_VPD_DATA	HBA had invalid VPD data
161	Reserved	Not used
162	Reserved	Not used
163	Reserved	Not used
164	Reserved	Not used
165	Reserved	Not used
166	Reserved	Not used
167	Reserved	Not used
168	Reserved	Not used
169	Reserved	Not used
170	Reserved	Not used
171	IBM Reserved	Blocked
172	IBM Reserved	Blocked
173	IBM Reserved	Blocked
174	IBM Reserved	Blocked
175	IBM Reserved	Blocked
176	IBM Reserved	Blocked
177	IBM Reserved	Blocked

Table D-1. Error Code Descriptions – Non-interactive Mode (Continued)

Code	Name	Description
178	IBM Reserved	Blocked
179	IBM Reserved	Blocked
180	IBM Reserved	Blocked
181	IBM Reserved	Blocked
182	IBM Reserved	Blocked
183	IBM Reserved	Blocked
184	IBM Reserved	Blocked
185	IBM Reserved	Blocked
186	IBM Reserved	Blocked
187	IBM Reserved	Blocked
188	IBM Reserved	Blocked
189	IBM Reserved	Blocked
190	IBM Reserved	Blocked
191	IBM Reserved	Blocked
192	IBM Reserved	Blocked
193	Reserved	Not used
194	Reserved	Not used
195	Reserved	Not used
196	Reserved	Not used
197	Reserved	Not used
198	Reserved	Not used
199	Reserved	Not used
200	ERROR_SAVE_SEL_LUN_CONFIG	Failed to save selective LUN configuration
201	Reserved	Not used
202	Reserved	Not used
203	Reserved	Not used
204	Reserved	Not used

Table D-1. Error Code Descriptions – Non-interactive Mode (Continued)

Code	Name	Description
205	Reserved	Not used
206	Reserved	Not used
207	Reserved	Not used
208	Reserved	Not used
209	Reserved	Not used
210	ERROR_MISSING_IP_ADDRESS	IP address is required
211	ERROR_MISSING_NETMASK_ADDRESS	Netmask address is required
212	ERROR_MISSING_GATEWAY_ADDRESS	Gateway address is required
213	ERROR_INVALID_IP_ADDRESS	Invalid IP address
214	ERROR_INVALID_NET_MASK	Invalid netmask address
215	ERROR_GET_SWITCH_INFO	Failed to get switch information
216	ERROR_SET_SWITCH_IP_ADDRESS	Failed to set switch IP address
217	ERROR_INVALID_SWITCH_INPUT	Invalid switch parameters settings
218	ERROR_INVALID_ADMIN_ACCOUNT	Admin account is required
219	ERROR_INVALID_ADMIN_PASSWORD	Admin password is incorrect
220	ERROR_INVALID_OPTION	Switch input is invalid
221	Reserved	Not used
222	Reserved	Not used
223	Reserved	Not used
224	Reserved	Not used
225	Reserved	Not used
226	Reserved	Not used
227	Reserved	Not used
228	Reserved	Not used
229	Reserved	Not used
230	ERROR_GET_TARGET_IIDMA_SETTINGS	Failed to read target link speed
231	ERROR_SAVE_TARGET_IIDMA_SETTINGS	Failed to set target link speed

Table D-1. Error Code Descriptions – Non-interactive Mode (Continued)

Code	Name	Description
232	ERROR_SET_TARGET_IIDMA_UNSUPPORTED	Target link speed operation is unsupported with current HBA
233	ERROR_INVALID_IIDMA_SETTINGS	Selected target link speed rate not supported with current HBA
234	Reserved	Not used
235	Reserved	Not used
236	Reserved	Not used
237	Reserved	Not used
238	Reserved	Not used
239	Reserved	Not used
240	ERROR_NO_TARGET_SELECTED	Unable to run target beacon because no device is selected
241	ERROR_GET_BEACON_STATE	Unable to get the beacon status
242	ERROR_SET_BEACON_STATE	Unable to set the beacon status
243	ERROR_BEACON_UNSUPPORTED	Beacon operation is unsupported
244	ERROR_INVALID_BEACON_PARAMETERS	Beacon settings is invalid
245	Reserved	Not used
246	Reserved	Not used
247	Reserved	Not used
248	Reserved	Not used
249	Reserved	Not used
250	ERROR_GET_HBA_ALIAS	Failed to retrieve HBA alias of the HBA
251	ERROR_UPDATE_HBA_ALIAS	Failed to update HBA alias of the HBA
252	ERROR_GET_PORT_ALIAS	Failed to retried port alias of the HBA
253	ERROR_UPDATE_PORT_ALIAS	Failed to update port alias of the HBA
254	Reserved	Not used
255	Reserved	Not used
256	Reserved	Not used

Table D-1. Error Code Descriptions – Non-interactive Mode (Continued)

Code	Name	Description
257	Reserved	Not used
258	Reserved	Not used
259	Reserved	Not used
260	ERROR_DRIVER_RESCAN	Driver rescan operation failed (Solaris)
261	Reserved	Not used
262	Reserved	Not used
263	Reserved	Not used
264	Reserved	Not used
265	Reserved	Not used
266	Reserved	Not used
267	Reserved	Not used
268	Reserved	Not used
269	Reserved	Not used
270	ERROR_ADAPTER_PROP_MISSING	Adapter property file is missing
280	ERROR_CREATE_VIRTUAL_PORT	Failed to create a virtual port of the HBA
281	ERROR_DELETE_VIRTUAL_PORT	Failed to delete a virtual port of the HBA
282	ERROR_INVALID_VIRTUAL_PORT_WWN	Virtual port WWPN is invalid
283	ERROR_VIRTUAL_PORT_NOT_FOUND	Unable to find the specific virtual port
284	ERROR_NO_VIRTUAL_PORT_EXIST	This HBA does not have any virtual ports
285	ERROR_DELETE_ALL_VIRTUAL_PORTS	Failed to delete all virtual ports of the HBA

Appendix E
Help Commands

Table E-1 is an alphabetic listing of the Help commands. Unless otherwise noted, only one command line option per input file is valid. The hyphen (`-`) and slash (`/`) characters are equivalent. That is, `scli -g` and `scli /g` are both valid commands.

Table E-1 uses the following variables:

`<hba instance>`	HBA instance number of an HBA port.
`<hba wwpn>`	World Wide Port Name of an HBA port. (`xx-xx-xx-xx-xx-xx-xx-xx` or `xxxxxxxxxxxxxxx`).
`<target wwnn>`	World Wide Node Name of a target device. (`xx-xx-xx-xx-xx-xx-xx-xx` or `xxxxxxxxxxxxxxx`).
`<target wwpn>`	World Wide Port Name of a target device. (`xx-xx-xx-xx-xx-xx-xx-xx` or `xxxxxxxxxxxxxxx`).
`<target portid>`	Port ID of a target device. (`xx-xx-xx` or `xxxxxx`).
`<target id>`	ID of a target device.
`<lun id>`	Logical Unit Number of a LUN.
`<address>`	IP address.

Table E-1. Help Commands

Command Line Action	Arguments	Function
`–`	`[ int ]`	Starts interactive mode.
`–a`	`( <hba instance> | <hba wwpn> )`	Flashes the HBA port LED to locate it in the host. This feature is not supported on QLA22*xx* series HBAs.
`–a`	`( <hba instance> | <hba wwpn> ) ( view | ?)`	Displays the current LED state on an HBA port.

Table E-1. Help Commands (Continued)

Command Line Action	Arguments	Function
–b	(<all> | <hba instance> | <hba wwpn>) [(<–rg> <fw | boot| all>)] <file name>	Updates the HBA boot code from a file, where: ■ <–rg> Specifies Option ROM region update mode. ■ <all> Updates the flash from a full image file (1MB image file). ■ <fw> Updates the firmware image only from a firmware file. ■ <boot> Updates the boot code (BIOS/Fcode/EFI) image only from a boot code file. ■ <file name> Flash image file name. Note: Region update is not available on 2Gb HBAs. Flash update is not supported on 2Gb HBAs in Macintosh. If selected multiple HBAs, only HBAs that are compatible with the provided flash image will be updated.
–b	(<hba instance> | <hba wwpn>) save <file name>	Saves the HBA boot code to a file.
–c	(<hba instance> | <hba wwpn>)	Views the HBA Parameters settings of an HBA port.
–c	[<all>]	Views the HBA Parameters settings of all HBAs.
–d	<file name >	Performs a driver update to the HBAs. <file name> is the full path of the driver file in inf/zip or exe format.
–dm	(<hba instance> | <hba wwpn> | <all>) general | gen | details | det	Runs a transceiver (SFF/SFP) diagnostics on an HBA port and displays the result in general or detail view. This feature is supported only with 4Gb HBA or latest. This feature is not available with inbox driver (SLES 10.0 / RHEL 5.0 or latest).
–e	(<hba instance> | <hba wwpn>) (enable | 0 0 0)	Selectable Boot: Configure the operating system to boot from the first target the BIOS finds.
–e	(<hba instance> | <hba wwpn>) (enable | 0 0 0)	Selectable Boot: Configure the operating system to boot from the first target the BIOS finds.

Table E-1. Help Commands (Continued)

Command Line Action	Arguments	Function
-e	(<hba instance> | <hba wwpn>) (view | ?)	Shows the current boot device information on an HBA port.
-e	(<hba instance> | <hba wwpn>) (view | ?)	Shows the current boot device information on an HBA port.
-e	(<hba instance> | <hba wwpn>) disable [prim | alt1 | alt2 | alt3]	Clears the selected current boot device settings on an HBA port (prim/alt1/alt2 or alt3 Boot Port Name). Configures all LUNs of all devices attached to an HBA port (Disable).
-e	(<hba instance> | <hba wwpn>) disable [prim | alt1 | alt2 | alt3]	Clears the selected current boot device settings on an HBA port (prim/alt1/alt2 or alt3 Boot Port Name).
-e	(<hba instance> | <hba wwpn> <target wwnn> <target wwpn> <lun id> [prim | alt1 | alt2 | alt3]	Configures the operating system to boot from a specific target: ■ prim: Primary Boot Port Name ■ alt1: Alternate 1 Boot Port Name ■ alt2: Alternate 2 Boot Port Name ■ alt3: Alternate 3 Boot Port Name
-e	(<hba instance> | <hba wwpn> <target wwnn> <target wwpn> <lun id> [prim | alt1 | alt2 | alt3]	Configures the operating system to boot from a specific target: ■ prim: Primary Boot Port Name ■ alt1: Alternate 1 Boot Port Name ■ alt2: Alternate 2 Boot Port Name ■ alt3: Alternate 3 Boot Port Name
-e	(view | ?)	Shows the current boot device information on all HBAs.
-e	(view | ?)	Shows the current boot device information on all HBAs.
-ei	-	Lists the exit codes.
-f	<file name>	Executes from a command input file. Option -f cannot be combined with any other options.
-fg	(<hba instance> | <hba wwpn>) (view | ?)	Shows the current driver settings.

Table E-1. Help Commands (Continued)

Command Line Action	Arguments	Function
–fs	(<hba instance> | <hba wwpn>) { (<param name> | <param alias>) <param value> }	Configures the driver settings.
–gs	(<hba instance> | <hba wwpn>) { (<param name> | <param alias>) <param value> }	Shows the current statistics on an HBA port.
–h | –?	–	Lists all the command options and syntax. Option –h can be combined with a command line option to display the usage of that individual command.
–ha	(<hba instance> | <hba wwpn>) <alias>	Sets an alias to an HBA.
–ha	(<hba instance> | <hba wwpn>) delete	Deletes the current alias of an HBA.
–ha	(<hba instance> | <hba wwpn>) view | ?	Displays the current alias of an HBA.
–i	(<hba instance> | <hba wwpn>) [vpd]	Views the general or VPD information of an HBA port.
–i	[<all>] [vpd]	Views the general or VPD information of all HBAs.
–kl	(<hba instance> | <hba wwpn>) [{ (<param name> | <param alias>) <param value> }]	Runs a diagnostics loopback test on an HBA port.
–kr	(<hba instance> | <hba wwpn>) [{ (–ex | –exclude) <target wwpn> }] [(<param name>| <param alias>) <param value>]	Runs a diagnostics read/write buffer test to all target device(s) attached to an HBA port.
–l	(<hba instance> | <hba wwpn>)	Displays the information about LUNs attached to an HBA port.
–l	(<hba instance> | <hba wwpn>) (<target wwpn> | <target portid>)	Displays the information about LUNs of a target device attached to an HBA port.
–l	(<hba instance> | <hba wwpn>) (<target wwpn> | <target portid>) <lun id>	Displays the information about a specific LUN of a target device attached to an HBA port.

Table E-1. Help Commands (Continued)

Command Line Action	Arguments	Function
-ls	(<hba instance> | <hba wwpn>) { (<param name> | <param alias>) <param value> }	Shows the current link status on an HBA port.
-m	(<hba instance> | <hba wwpn>) (view | ?)	Views selective LUN information of all devices attached to an HBA port.
-m	(<hba instance> | <hba wwpn>) <target wwnn> <target wwpn> <lun id> (view | ?)	Views selective LUN information of a single device attached to an HBA port.
-m	(<hba instance> | <hba wwpn>) select | enable <target wwnn> <target wwpn>	Configures all LUNs of a device attached to an HBA port (Enable).
-m	(<hba instance> | <hba wwpn>) select all	Configures all LUNs of all devices attached to an HBA port (Enable).
-m	(<hba instance> | <hba wwpn>) unselect | disable <target wwnn> <target wwpn>	Configures all LUNs of all devices attached to an HBA port (Disable).
-m	(<hba instance> | <hba wwpn>) unselect all	Configures all LUNs of all devices attached to an HBA port (Disable).
-m	(<hba instance> | <hba wwpn>) { <target wwnn> <target wwpn> <lun id> (0 | 1 | enable | | select | unselect) }	Configures individual LUN of a device attached to an HBA port.
-n	(<hba instance> | <hba wwpn>) { (<param name> | <param alias>) <param value> }	Modifies the HBA Parameters of an HBA port.
-n	(<hba instance> | <hba wwpn> | <all>) <OEM name>	Sets the HBA Parameters of an HBA port with a pre-defined OEM default templates.
-n	(<hba instance> | <hba wwpn> | <all>) default	Restores the HBA Parameters of an HBA port to factory default settings (4Gb HBAs or latest).
-o	<file name>	Writes the output to a named file. This option can be combined with other options. However, this option must be at the beginning or at the end of the command line.

Table E-1. Help Commands (Continued)

Command Line Action	Arguments	Function
–p	(<hba instance> | <hba wwpn>) { <target wwnn> <target wwpn> <target portid> <target id> }	Binds the selected device(s) attached to an HBA port.
–p	(<hba instance> | <hba wwpn>) remove <target wwnn> | unbind <target wwnn>	Unbinds a specific device attached to an HBA port.
–p	(<hba instance> | <hba wwpn> | <all>) (view | ?)	Displays the current persistent binding configuration on an HBA port or all HBAs.
–p	(<hba instance> | <hba wwpn> | <all>) bind all	Binds all device(s) attached to an HBA port or all HBAs.
–p	(<hba instance> | <hba wwpn> | <all>) remove all | unbind all	Unbinds all device(s) attached to an HBA port or all HBAs.
–pa	(<hba instance> | <hba wwpn>) <alias>	Sets an alias to an HBA port.
–pa	(<hba instance> | <hba wwpn>) delete	Deletes the current alias of an HBA port.
–pa	(<hba instance> | <hba wwpn>) view | ?	Displays the current alias of an HBA port.
–q	(<hba instance> | <hba wwpn>) { <target wwpn> <speed> }	Modifies the iiDMA settings of selected target(s) on an HBA port. This feature is supported only on 4Gb or latest HBAs.
–q	(<hba instance> | <hba wwpn>) <target wwpn>	Displays the current iiDMA settings of a specific target on an HBA port.
–q	(<hba instance> | <hba wwpn> | <all>) (–targets | –t) <speed>	Modifies the iiDMA settings of all targets on an HBA port or all HBAs.
–q	(<hba instance> | <hba wwpn> | <all>) [–targets | –t]	Displays the current iiDMA settings of all targets on an HBA port or all HBAs.
–r	(<hba instance> | <hba wwpn>) save <file name>	Saves the current HBA parameters of an HBA port to a file.
–r	(<hba instance> | <hba wwpn> | <all>) <file name>	Updates the HBA parameters of an HBA port or all HBAs from a file.

Table E-1. Help Commands (Continued)

Command Line Action	Arguments	Function
–s	–	Suppresses the output. This option can be combined with other options. However, this option must be at the beginning or at the end of the command line.
–t	(<hba instance> | <hba wwpn>)	Displays the information about devices (disks or tapes) attached to an HBA port.
–t	(<hba instance> | <hba wwpn>) (<target wwpn> | <target portid>)	Displays the information about a device (disk or tape) attached to an HBA port.
–t	[<all>]	Displays the information about devices (disks or tapes) attached to all HBAs.
–tb	(<hba instance> | <hba wwpn>){ (<target wwpn>) } <beacon mode>	Locates a specific device or multiple devices in a JBOD. This feature is supported only by devices within a JBOD.
–tp | –topol-ogy]	–	Displays the current topology (Host view).
–v	–	Shows the current version.
–vp	(<hba instance> | <hba wwpn>) create <vport hex>.	Creates a virtual port with your own WWPN.
–vp	(<hba instance> | <hba wwpn>) create auto	Creates a virtual port with default WWPN (auto generate).
–vp	(<hba instance> | <hba wwpn>) delete <vport wwpn>	Deletes a virtual port on a physical HBA port.
–vp	(<hba instance> | <hba wwpn>) delete all	Deletes all virtual port(s) on a physical HBA port.
–vp	(<hba instance> | <hba wwpn>) list <vport wwpn>	Lists a specific virtual port on a physical HBA port.
–vp	(<hba instance> | <hba wwpn>) list all	Lists all virtual ports on a physical HBA port.

Table E-1. Help Commands (Continued)

Command Line Action	Arguments	Function
`-x`	—	Writes the output in XML format 1. Option `-x` can be used to generate an old-style format that is compatible with previous releases (XML format 1). This option can be combined with other options; however, this option must be at the beginning or at the end of the command line.
`-x2`	—	Writes the output in XML format 2. Option `-x2` can be used to generate a new-style format that is matched with standard text output (XML format 2). This option can be combined with other options; however, this option must be at the beginning or at the end of the command line.
`-z`	`( <hba instance> | <hba wwpn> | <all> )`	Creates a summary report of individual HBA or all HBAs in the current host.

Glossary

adapter

See HBA.

AL_PA

Arbitrated Loop_Physical Address. A low-level address on the FC loop.

arbitrated loop

A circular (ring) topology (versus point-to-point) where two or more ports can be interconnected, but only two ports can communicate at a time. All communication passes through all ports connected to the loop.

BIOS

Basic Input Output System (typically in Flash PROM) - The program (or utility) that serves as an interface between the hardware and the operating system and allows booting from the HBA at startup.

boot code

The program that initializes a system or an HBA.

Boot code is the first program to run when a system or a devices within a system, such as an HBAs. FCode, BIOS, and EFI (enhanced firmware interface) are all forms of boot code for specific hardware/operating system environments.

Boot code for QLogic FC HBAs is required if the computer system is booting from a storage device (disk drive) attached to the HBA. The primary function of the boot code is communication with the external boot device before the operating system is up and running. There are also secondary functions that can be performed by the boot code, including managing the setup for the HBA and initializing and testing the HBA's ISP.

boot device

The device, usually a the hard disk, that contains the operating system the BIOS uses to boot from when the computer is started.

cache

A temporary high-speed storage (memory) area where recently used or frequently accessed data is stored for rapid access, thus increasing the efficiency of processor operations.

Cache contents duplicate recently-used values stored on disk or elsewhere. Cache is quick to access relative to the original data which either takes more time due to slow disc-access time, or is slow to compute. Once data is stored in the cache, future use can be made by accessing the cached copy rather than re-finding or recomputing the original data, so that the average access time is lower.

- **L1 cache**—Primary (smallest) cache on the same chip as the processor.
- **L2 cache**—Secondary (larger) cache. Either on the processor chip or external to the processor.

CSV file

A comma separated values (CSV) file

device

A target, typically a disk drive. Hardware such as a disk drive, tape drive, printer, or keyboard that is installed in or connected to a system. In FC, a *target* device.

driver

The software that interfaces between the file system and a physical data storage device or network media.

The level structure for Windows XP Professional/2000/Windows Server 2003 drivers is as follows:

- *Class Driver*. The highest driver level. There is a separate class for disk, Ethernet, and so forth. This level handles all generic aspects of operations for that class.
- *Port Driver*. The middle driver level, which handles aspects of the operation specific to the port type; for example, there is a port driver for SCSI.

In Red Hat/SuSE Linux, the driver layers include:

- *SCSI Upper Layer.* This is the device management layer. It handles device-dependent tasks for devices, such as disks and tapes.
- *SCSI Middle Layer.* This is the SCSI traffic handling layer. It directs requests between the kernel and the SCSI.
- *SCSI Lower Layer.* This is the SCSI HBA driver. It communications directly to the SCSI HBA.

The structure for Solaris SPARC drivers includes:

- *Nexus Drivers.* Nexus drivers provide bus mapping and translation services to subordinate nexus and leaf devices. These include drivers for PCI-to-PCI bridges, PCMCIA adapters, and SCSI HBAs.
- *Leaf Drivers.* Leaf drivers provide the traditional character and block driver interfaces for reading and writing data to storage and communication devices. These include drivers for peripheral devices, including QLA200/QLA2*xxx* HBAs, disks, tapes, network HBAs, and frame buffers.
- *Miniport Driver*. The lowest driver level and device specific. This level is usually supplied by the manufacturer as a companion to a physical device.
- *Monolithic Driver*. This level combines the functions of different driver levels in the same driver to increase performance.
- A*djunct Driver*. This level works along side a driver at the same level to increase performance.

In NetWare, the required drivers include:

- *Host Adapter Module (HAM)*. HAM is the driver component associated with the host adapter hardware. It provides the functionality to route requests to the bus where a specified device is attached.
- *Custom Device Module (CDM)*. The drive component associated with storage devices. It provides the functionality to build device-specific commands from I/O messages received from NetWare's Media Manager.

E_Port (Expansion Port)

A port in an FC switch that connects to another FC switch or bridge device by an inter-switch link. E_ports are used to link FC switches to form a multi-switch fabric.

echo diagnostic test

Transmits a received signal back to the sender to verify the integrity of the device.

F_Port

The "Fabric" port in a FC fabric switch provides a point-to-point link attachment to a single N_Port. F_Ports are intermediate ports in virtual point-to-point links between end ports, for example N_Port to F_Port to F_Port to N_Port using a single FC fabric switch.

fabric

A fabric consists of cross-connected FC devices and switches.

fabric switch

Also, Switched Fabric. A fabric switch connects multiple devices from independent FC-arbitrated loops (FC-ALs) and point-to-point topologies into a fabric using FC switches.

Fast!UTIL

QLogic *Fast!*UTIL FC HBA BIOS utility.

FCode

A type of boot code for Sun's SPARC platforms. See boot code and Flash.

F_Port (Fabric Port)

A port in a fabric where an N_Port can attach.

FL_Port (Fabric Loop Port)

In an FC, the fabric switch is capable of FC Arbitrated Loop operations and is connected to one or more NL_Ports by an FC Arbitrated Loop. An FL_Port becomes a shared entry point for public NL_Port devices to an FC fabric. FL_Ports are intermediate ports in virtual point-to-point links between end ports that do not reside on the same loop, for example NL_Port to FL_Port to F_Port to N_Port through a single FC fabric switch.

Flash

Nonvolatile memory holding the boot code. At times, Flash and boot code are used interchangeably. (See boot code)

Flash BIOS

A flash PROM contains the BIOS code for the HBA.

G_Port (Generic Port)

A port that can operate as either an E_Port or an F_Port. A G_Port can determine operating mode at switch port initialization, F_Port when an N_Port attachment is determined, E_Port when an E_Port attachment is determined. See E_Port (Expansion Port), F_Port, FL_Port (Fabric Loop Port), L_Port (Loop Port), N_Port (Node Port), NL_Port (Node Loop Port)

HBA (host bus adapter)

The board that interfaces between the host system and the target devices. HBA is synonymous with adapter, host adapter, and adapter board.

host bus adapter (HBA)

The board that interfaces between the host system and device. Also called: HBA, adapter, host adapter, and adapter board.

HBA alias

A user-defined name for an HBA.

HBA port

A port on the HBA board.

HBA port alias

A user-defined name for an HBA port.

HBA port beacon

An LED on the HBA. Flashing it enables you to locate the HBA.

IOCB

I/O control block. An IOCB is a command structure in QLogic ISP architecture.

ioctl (input/output control)

A system call in Unix/Linux systems. Allows an application to control or communicate with a device driver outside usual read/write operations.

JBOD (Just a Bunch of Disks)

As opposed to a SAN. See SAN (Storage Area Network).

L_Port (Loop Port)

Does arbitrated loop functions and protocols. NL_Ports and FL_Ports are examples of loop-capable ports. See E_Port (Expansion Port), F_Port, FL_Port (Fabric Loop Port), G_Port (Generic Port), N_Port (Node Port), NL_Port (Node Loop Port).

LIP (Loop Initialization Process)

The initialization process in an arbitrated loop that occurs when the loop is powered up or a new device is added. One function of a LIP is to assign addresses. All data transmission on the loop is suspended during a LIP.

load balancing

A software feature that improves system performance by balancing device access between multiple HBAs for maximum resource efficiency. Available in Windows 2000/Windows Server 2003, Novell NetWare, and Red Hat/SuSE Linux.

loopback

Diagnostic tool that routes transmit data through a loopback connector back to the same HBA.

loop ID

The device's AL_PA on the loop.

LUN

Logical Unit Number, a subdivision of a SCSI target. It is the small integer handle that differentiates an individual disk drive or partition (volume) within a common SCSI target device such as a disk array.

Technically, a LUN can be a single physical disk drive, multiple physical disk drives, or a portion (volume) of a single physical disk drive. However, LUNs are typically not entire disk drives but rather virtual partitions (volumes) of a RAID set.

Using LUNs, the FC host can address multiple peripheral devices that may share a common controller.

LUN masking

A software feature that assigns LUNs to specific servers or hides LUNs from specific servers for maximum access and availability control.

media

Physical-layer information carriers. FC supports several different physical media: copper, multimode optical, and single-mode optical. All FC protocols are supported on all media.

NPIV

N_Port ID Virtualization.

N_Port (Node Port)

A port that connects by a point-to-point link to either a single N_Port or a single F_Port. N_Ports handle creation, detection, and flow of message units to and from the connected systems. N_Ports are end ports in virtual point-to-point links through a fabric, for example N_Port to F_Port to F_Port to N_Port using a single FC fabric switch. See F_Port (Fabric Port).

N_Port ID Virtualization

The ability for a single physical FC end point (N_Port) to support multiple, uniquely addressable, logical end points. With NPIV, a host FC adapter is shared in such a way that each virtual adapter is assigned to a virtual server and is separately identifiable within the fabric. Connectivity and access privileges within the fabric are controlled by identification of each virtual adapter and, hence, the virtual server using each virtual adapter.

NL_Port (Node Loop Port)

A port capable of arbitrated loop functions and protocols. An NL_Port connects through an arbitrated loop to other NL_Port and at most a single FL_Port. NL_Ports handle creation, detection, and flow of message units to and from the connected systems. NL_Ports are end ports in virtual point-to-point links through a fabric, for example NL_Port to F_Port to F_Port to N_Port using a single FC fabric switch. In the absence of a fabric switch FL_Port, NL_Ports can communicate with other NL_Ports in virtual point-to-point links through a FC_AL open loop circuit often through FC_AL (Arbitrated Loop) hub or loop switch devices. See: E_Port (Expansion Port), F_Port, FL_Port (Fabric Loop Port), G_Port (Generic Port), N_Port (Node Port).

NIC

Network Interface Controller.

NVRAM (Non-Volatile Random Access Memory)

A type of memory that retains data even when power is removed. Holds configuration settings. You can configure NVRAM settings manually or restore them from a file. These settings are retained when power is removed. NVRAM settings are called *HBA Parameters* in this guide.

network adapter

A chip that provides network capabilities. A computer may include a network adapter on its system board, or on an adapter card. Also a *NIC* (network interface card or controller).

ONC (Open Network Computing)

A remote procedure call developed by Sun Microsystems.

path

A path to a device is a combination of a HBA port instance and a target port as distinct from internal paths in the fabric network. A fabric network appears to the operating system as an opaque network between the HBA (initiator) and the target.

Since a path is a combination of an HBA and a target port, it is distinct from another path if it is accessed through a different HBA and/or it is accessing a different target port. Consequently, when switching from one path to another, the driver might be selecting a different HBA (initiator), a different target port, or both.

This is important to the driver when selecting the proper method of failover notification. It can make a difference to the target device, which might have to take different actions when receiving retries of the request from another initiator or on a different port.

point-to-point

Also FC-P2P. Two FC nodes directly connected (not in a loop).

port

Access points in a device where a link attaches. There are four types of ports, as follows:

- N_Port (Node Port)—an FC port that supports point-to-point topology.
- NL_Port (Node Loop Port)—an FC port that supports loop topology.
- F_Port (Fabric Port)—a port in a fabric where an N_Port can attach.
- FL_Port (Fabric Loop Port)—a port in a fabric where an NL_Port can attach.

port instance

The number of the port in the system. Each HBA may have one or multiple ports, identified with regard to the HBA as port 0, port 1 and so forth. to avoid confusion when dealing with a system containing numerous ports, each port is assigned a port instance number when the system boots up. So Port 0 on an HBA might have a port instance number of, for example, 8 if it is the eighth port discovered by the system.

SAN (Storage Area Network)

Multiple storage units (disk drives) and servers connected by networking topology.

SCSI (Small Computer System Interface)

A high-speed interface used to connect devices, such as hard drives, CD drives, printers, and scanners, to a computer. The SCSI can connect many devices using a single controller. Each device is accessed by an individual identification number on the SCSI controller bus.

target

The storage-device endpoint of a SCSI session. Initiators request data from targets. Targets are typically disk-drives, tape-drives, or other media devices. Typically a SCSI peripheral device is the target but an HBA may, in some cases, be a target. A target can contain many LUNs.

A target is a device that responds to a requested by an initiator (the host system). Peripherals are targets, but for some commands (for example, a SCSI COPY command), the peripheral may act as an initiator

target binding

The process in which the HBA driver binds a target ID using a target's world wide port name (WWPN) or port ID. This enables the target ID to always connect to the WWPN or port ID across reboots regardless of SAN reconfigurations.

Index

A

B

C

D

E

F

G

H

I

J

K

L

M

N

O

P

Q

R

S

T

U

V

W

X

Z