# SANsurfer iSCSI HBA CLI
# User's Guide

Command Line Interface for
QLogic iSCSI Host Bus Adapters

SN0054621-00 E

## Document Revision History

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| Changes | Sections Affected |
|---|---|
| **Revision E Changes:** | |
| Applied new user's guide template. | All |
| Updated guide title and subtitle. | Title page, page headers |
| Enhanced and edited all content, including index. | All |
| Removed all references to obsolete features related to DNS and SLP. | All |
| Expanded *Introduction* chapter to include new information. | Intended Audience, How This Guide is Organized (Typographic Conventions, Related Documents), License Agreements |
| Added supported operating systems Windows Server 2008 and Windows PE. | "Supported Operating Systems" on page 1-4 |
| Removed obsolete Linux attended installation section. | "Installing on Red Hat/SUSE Linux/PPC" on page 2-10 |
| Removed Table 2-1. | "Starting Non-interactive Mode" on page 3-2 |
| Updated map of interactive menus and options. | Table 4-1 on page 4-2 |
| Added new firmware update option to **Host Level Info & Operations** menu. | "Update Firmware, Multiple Adapters" on page 4-11 |
| Added new **Port Link Settings Menu** and menu items. | "Port Link Settings Menu" on page 4-19 |
| Updated **Display Network Settings** example. | Display Network Settings (CLI Options -netconf) |

| | |
|---|---|
| Updated (added and removed parameters) the list of device settings. | "Configure Device Settings" on page 4-25 |
| Updated (added and removed parameters) the list of basic settings. | "Configure Basic Settings" on page 4-26 |
| Updated (added and removed parameters) the list of advanced settings. | "Configure Advanced Settings" on page 4-26 |
| Changed **Bootcode Settings Menu** to new **BIOS/UEFI (or FCode) Settings Menu**. | "BIOS/UEFI [or FCode] Settings Menu" on page 4-34 |
| Removed **Unbind Target** option from **Target Level Info & Operations** menu. | "Target Level Info & Operations" on page 4-36 |
| Added more detail for **Display Target Information** option. | "Display Target Information (CLI Option -t)" on page 4-37 |
| Added new **Target Discovery Menu** and its options. | "Target Discovery Menu" on page 4-44 |
| Removed subheadings referencing non-existent interactive mode commands. | 5 Non-Interactive Mode Commands |
| Added new miscellaneous command line options. | "-acb" on page 5-3, "-dce" on page 5-7, "-dp" on page 5-8, |
| Added new discovered target command line options. | "-dtdsp (Display Discovered Targets)" on page 5-9 through "-dtrema (Remove Discovered Target)" on page 5-11 |
| Added new link configuration command line options. | "-lc (Configure Link Configuration)" on page 5-18 and "-lcd (Display Configured Link Configuration)" on page 5-18 |
| Added other new target command line options. | "-pad" on page 5-24, "-pdt" on page 5-24 and "-pet" on page 5-24 |
| Added unbind persistent target command line options. | "-pu" on page 5-25 and "-px" on page 5-26 |
| Added new send target and statistics command line options. | "-stadd" on page 5-29 through "-strema" on page 5-30 |
| Added new port and HBA configuration parameters (each in a separate table).<br>Added missing descriptions for parameters.<br>Deleted obsolete parameters. | Appendix A Port- and HBA-level Parameters |

| | |
|---|---|
| Added missing descriptions for IPv4TOS and IPv4TTL parameters.<br>Deleted obsolete Primary_DNS and SLP_Address parameters. | Appendix C Target Parameters |
| Moved trace information from 5 Non-Interactive Mode Commands to a new appendix. | Appendix F Using Trace |

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# 1 Introduction

The command line interface (CLI) application is a simplified, condensed version of the SANsurfer iSCSI HBA Manager graphical user interface (GUI). SANsurfer iSCSI HBA CLI does not provide any features that require a GUI.

This introductory chapter covers the following:


- "Intended Audience" on page 1-1
- "How This Guide is Organized" on page 1-1
- "Supported QLogic HBAs" on page 1-4
- "Supported Operating Systems" on page 1-4
- "License Agreements" on page 1-5
- "Technical Support" on page 1-5


## Intended Audience

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

## How This Guide is Organized

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

- 1 Introduction provides a general overview of the product, lists the supported QLogic HBAs and operating systems, and provides contact information for technical support.
- 2 Installation and Removal provides step-by-step instructions for installing and uninstalling SANsurfer iSCSI HBA CLI on Windows, Linux, and Solaris.
- 3 Getting Started describes the two modes used in SANsurfer iSCSI HBA CLI: *interactive* and *non-interactive*.
- 4 Interactive Mode Commands provides detailed explanations and examples of the command line options used in the menu-driven interactive mode.
- 5 Non-Interactive Mode Commands provides detailed explanations and examples of the command line options used in non-interactive mode.

- Appendix A Port- and HBA-level Parameters provides an alphabetic list of the HBA port firmware parameters and their values.
- Appendix B HBA Statistics provides an alphabetic list of the HBA statistics shown when you select either the interactive mode **Display HBA Statistics** option or the non-interactive mode `-stat` command.
- Appendix C Target Parameters provides an alphabetic list of target parameters, both fixed and configurable.
- Appendix D Error Codes provides an alphabetic list of the error codes that can occur while running SANsurfer iSCSI HBA CLI in both interactive mode and non-interactive mode.
- Appendix E Downloadable File Names lists, by file type and HBA, the typical file names of downloadable files for QLogic iSCSI HBAs.
- Appendix F Using Trace provides information for using trace to identify application, HBA, and networking issues.

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

## Typographic Conventions

This guide uses the following typographic conventions:

- Text in **bold font** indicates a menu or menu item. For example:

  From the **HBA Import Menu**, type the number for the **Import** option, and then press `ENTER`.

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

  ```
  Enter an IP Address:
  ```

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

  Type **`y`** for the `Stop on error[Y]?` option.

- Text in `ALL CAPITALS` and sans serif font 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:

  The *HBA port alias* is a symbolic name you assign.

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

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

  `-arp <hba_port_inst>`

- Text within square brackets indicates optional parameters. For example

  `iscli [optional parameters] [Command Variable]`

- 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 a list of target parameters, see Table C-1.

## Related Documents

Table 1-1 lists other documents you may find helpful when installing or using SANsurfer iSCSI HBA CLI.

***Table 1-1. Related Documents***

| Part Number or Name | Title |
|---|---|
| IS0054501-00 Rev C | *Quick Start Guide: iSCSI HBA Installation* (PDF). |
| `readme.txt` | SANsurfer notes included with SANsurfer iSCSI HBA CLI. |
| Release notes | *SANsurfer iSCSI HBA CLI Release Notes* provide details about modifications made since the previous version. Separate release notes are provided for each operating system. |
| IS0054602-00 Rev. B | *SANsurfer iSCSI HBA Manager User's Guide* provides details for using the graphical user interface tool to manage QLogic iSCSI HBAs. |

# Supported QLogic HBAs

SANsurfer iSCSI HBA CLI is supported on the following QLogic HBAs:

***Table 1-2. Supported HBAs***

| HBA | Ports | Media |
|---|---|---|
| QLA4010 | 1 | Optical |
| QLA4010C | 1 | Copper |
| QLA4050 | 1 | Optical |
| QLA4050C | 1 | Copper |
| QLA4052C | 2 | Copper |
| QLE4060C | 1 | Copper |
| QLE4062C | 2 | Copper |
| QMC4052 (IBM) | 2 | Copper |
| QMH4062 (HP) | 2 | Copper |

# Supported Operating Systems

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

- Windows® 2000 Server SP4+ (IA32, x64)
- Windows Server™ 2003, Standard or Enterprise Edition SP1 (IA32, x64)
- Windows Server 2003, Standard or Enterprise Edition, SP2 (IA32, x64)
- Windows Server 2008, Standard or Enterprise Edition (IA32, x64)
- Windows XP Professional, SP2 (IA32, x64)
- Windows Vista (IA32, x64) (Business and Enterprise editions)
- Windows Preinstallation Environment (PE) 2.0, 2.1, PE 2004, PE 2005
- Red Hat® Enterprise Linux® (RHEL) 3.0, 4.0, 5.0 (IA32, x64)
- Red Hat® Enterprise Linux® (RHEL) 4.0, 5.0 (PPC)
- Novell® SUSE® Linux Enterprise Server (SLES) 8.0, 9.0, 10.0 (IA32, x64, PPC)
- Solaris® SPARC 9, 10
- Solaris x86 9, 10 (IA32, x64)

***NOTE:***

Throughout this guide, *HBA* may be shortened to *adapter*. The term *device* often refers to *targets*.

# License Agreements

Refer to the *QLogic Software End User License Agreement* for a complete listing of all license agreements affecting this product.

# Technical Support

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

For the latest firmware and software updates, visit the QLogic support Web site listed in Contact Information.

## Availability

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

## Training

QLogic offers certification training for the technical professional for both the QLogic iSCSI 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.

## Contact Information

Please feel free to contact your QLogic approved reseller or QLogic Technical Support at any phase of integration for assistance. QLogic Technical Support can be reached by the following methods:

**Web** http://support.qlogic.com

**North America Contact Information**

E-mail support@qlogic.com

Phone (952) 932-4040

Support contact information for other regions of the world is available at the QLogic Web site: http://support.qlogic.com

The QLogic knowledge database contains troubleshooting information for the QLogic HBAs. Access the database from the QLogic Web site, www.qlogic.com. Click the **Support** tab, and then use the search engine at the top of the page to look for specific troubleshooting information.

# 2 Installation and Removal

This section provides procedures for the following:

- “Installing SANsurfer iSCSI HBA CLI” on page 2-1
- “Removing SANsurfer iSCSI HBA CLI” on page 2-12

Before you can run SANsurfer iSCSI HBA CLI, ensure that your system meets the following requirements:

- HBAs are installed.
- HBA drivers are installed.
- To install SANsurfer iSCSI HBA CLI, the PC hard disk must have about 1 MB free space.

***NOTE:***

SANsurfer iSCSI HBA CLI is designed to configure QLogic HBAs on the local machine (where it is installed). It cannot configure HBAs on remote machines.

## Installing SANsurfer iSCSI HBA CLI

This section on SANsurfer iSCSI HBA CLI installation includes the following information:


- “Downloading the Installation Package” on page 2-1
- “Installing on Microsoft Windows” on page 2-4
- “Installing on Red Hat/SUSE Linux/PPC” on page 2-10
- “Installing on Solaris SPARC/Solaris x86” on page 2-10


### Downloading the Installation Package

Follow the procedure in this section to download the SANsurfer iSCSI HBA CLI installation package from the QLogic Web site.

**To download the installation package:**

1. From the QLogic home page (www.qlogic.com), click **Downloads**.
2. Select your HBA.

3. Under **Drivers, Management Tools, and API Libraries:** click the appropriate operating system.
4. In the SANsurfer iSCSI row of the **Management Tools** table, in the **Download** column, click **Download.**

   SANsurfer iSCSI HBA CLI shows the **End User License Agreement** box.
5. Scroll to the bottom, and then click **Agree**.

   SANsurfer iSCSI HBA CLI shows the File Download dialog box.
6. Click **Save**. Select a directory on your system and download the file.

   The installation package has the following naming convention:

   `iscli-AA.BB.CC-DD_<OS Type>_<Subtype>.<Install Type>`

   Where:

   AA.BB.CC-DD = Version number

   *OS Type* = One of the following:
   - win
   - linux
   - solaris

   *Subtype* = One of the following:
   - i386
   - PPC 64 (Power PC)
   - sparc_x86

   (There is no *Subtype* in the Windows package name.)

   *Install Type* = One of the following:
   - rpm (Linux)
   - exe (Windows)
   - Z (Solaris)

   For example, a package for the Linux operating system can be named:

   `iscli-1.0.35-0_linux_i386.rpm`
7. Follow the installation instructions in the section for your operating system (OS):
   - Microsoft® Windows® (see “Installing on Microsoft Windows” on page 2-4)
     - ❑ Windows 2000 Server SP4+ (IA32, x64)
     - ❑ Windows Server 2003, Standard or Enterprise Edition SP1 (IA32, x64)

- Windows Server 2003, Standard or Enterprise Edition, SP2 (IA32, x64)
- Windows XP Professional (IA32, x64) SP2
- Windows Vista (IA32, x64) (Business and Enterprise editions)
- Windows Preinstalled Environment (PE) 2.0, PE 2004, PE 2005

- Red Hat/SUSE Linux/Power PC (PPC) (see “Installing on Red Hat/SUSE Linux/PPC” on page 2-10)
- Solaris SPARC/Solaris x86 (see “Installing on Solaris SPARC/Solaris x86” on page 2-10)

# Installing on Microsoft Windows

Choose one of the following options for installing SANsurfer iSCSI HBA CLI:

- "Windows Standard (GUI) Installation" on page 2-4
- "Windows Command Line Installation" on page 2-9

## Windows Standard (GUI) Installation

Follow these steps to install SANsurfer iSCSI HBA CLI on a Windows operating system.

**To install using the GUI installation:**

1. Locate and double-click the install package on the CD or Web site.

   InstallShield Wizard opens, and shows the welcome window (Figure 2-1).

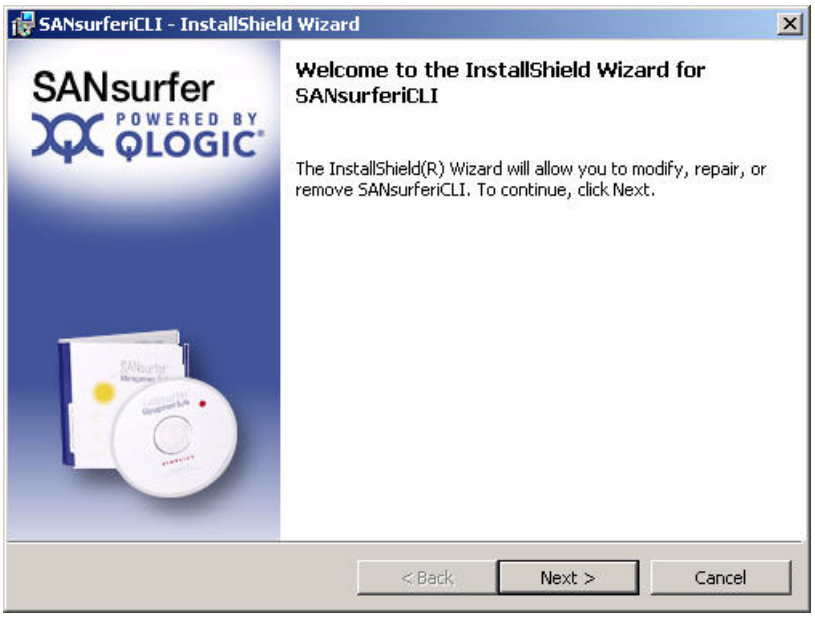


***Figure 2-1 Install Wizard: Welcome***

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

The Select Which Users window appears, as shown in Figure 2-2.

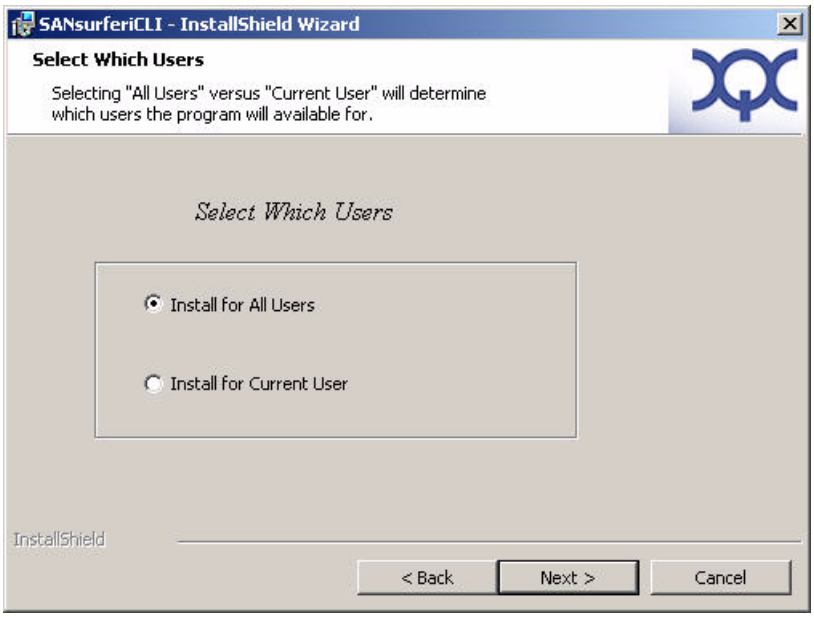


***Figure 2-2 Install Wizard: Select Which Users***

3. Choose whether you want SANsurfer iSCSI HBA CLI available for all users or only the current user, and then click **Next.**

   The Destination Folder window appears, as shown in Figure 2-3.

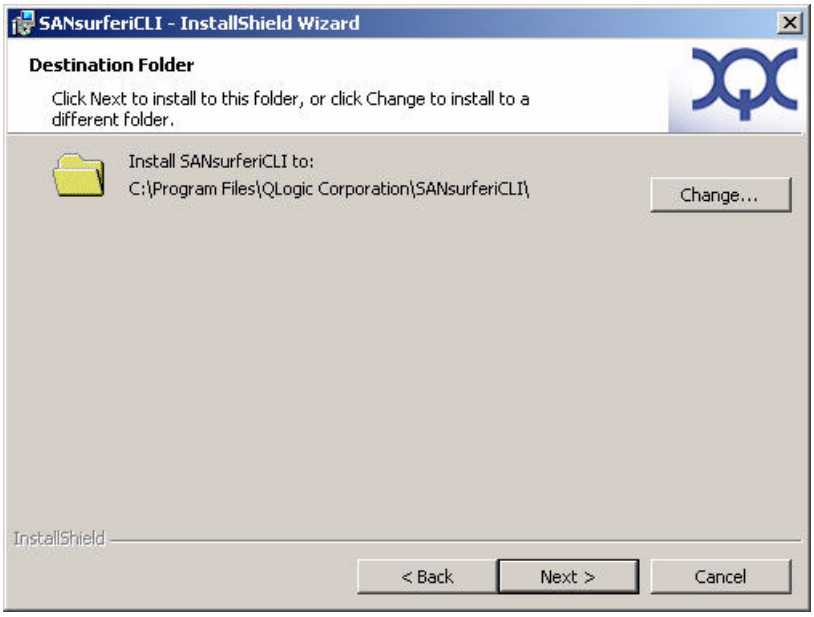


***Figure 2-3 Install Wizard: Destination Folder***

4. Choose one of the following options:

   - To select the destination in the dialog box, click **Next** (recommended).

     The default location for a Microsoft Windows system is:

     ```
     Program Files\QLogic Corporation\SANsurferiCLI
     ```

   - To select a different location, click **Change**, select the location you want, and then click **Next**.

   The Ready to Install window appears as shown in Figure 2-4.

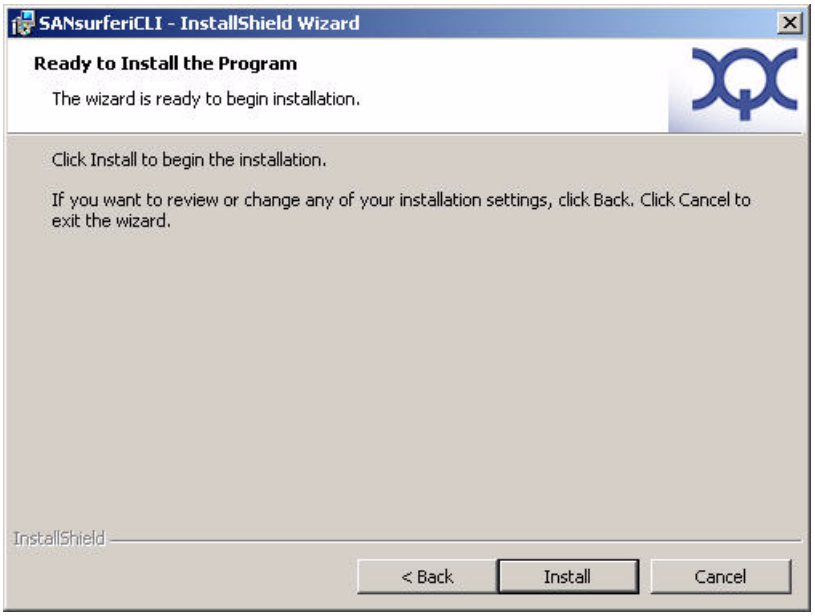


***Figure 2-4 Install Wizard: Ready to Install***

5. To begin installation, click **Install**.

The installer shows the progress of file copying, as shown in Figure 2-5.

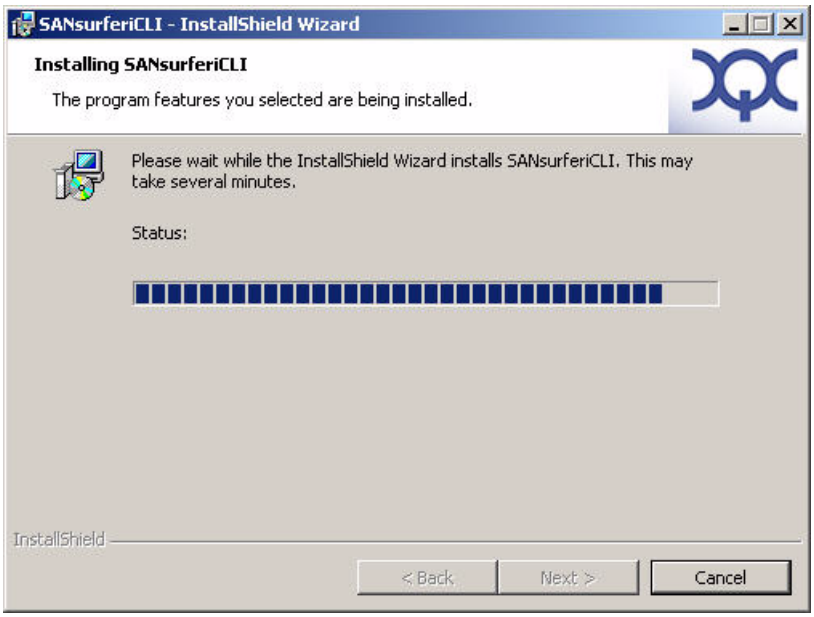


***Figure 2-5 Install Wizard: Installing SANsurferiCLI***

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

When finished, the installer shows the InstallShield Wizard Completed window, as shown in Figure 2-6.

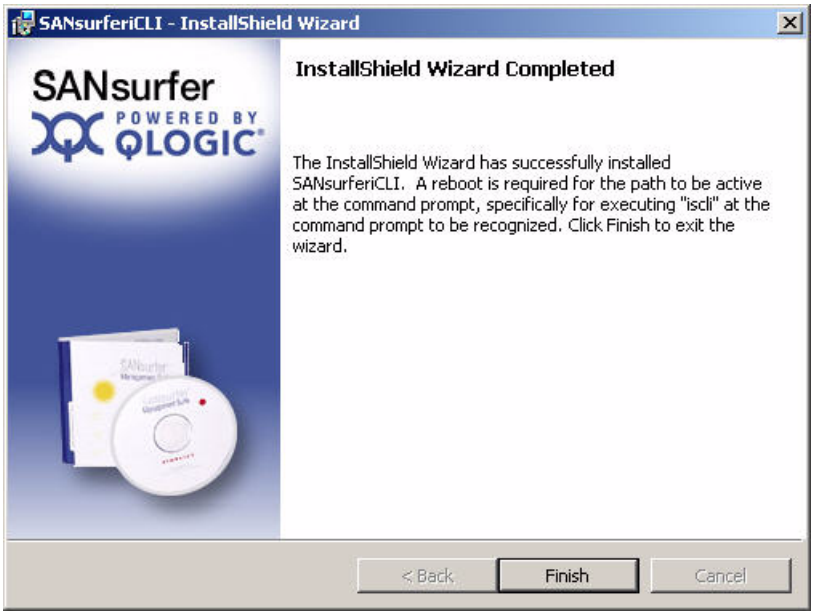


***Figure 2-6 Install Wizard: Complete***

7. Click **Finish**.
8. Restart your computer.

## Windows Command Line Installation

You can install SANsurfer iSCSI HBA CLI from the command prompt using the Microsoft Windows Installer (MSI). Use one of the following methods:


- "Standard Windows Interactive (CLI) Installation" on page 2-9
- "Quiet or Unattended Windows Installation" on page 2-9
- "Passive Windows Installation" on page 2-9
- "Overwrite Previous Windows Installations" on page 2-10


***NOTE:***

You can also configure the installation using MSI commands. To see a summary of MSI commands, at the command prompt, type: **msiexec**.

To obtain more information about MSI, visit the Microsoft Web site.

### Standard Windows Interactive (CLI) Installation

To begin a standard installation of SANsurfer iSCSI HBA CLI on a Microsoft Windows operating system, at a command line, type one of the following:

```
SANsurferCLI.msi
msiexec /i SANsurferCLI.msi
```

The default directory for SANsurfer iSCSI HBA CLI application is:

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

If you want a different directory, type it in the command line. For example:

```
SANsurferCLI.msi INSTALLDIR="directory"
```

The preceding command installs SANsurfer iSCSI HBA CLI in the directory named `directory`. Use full path names.

### Quiet or Unattended Windows Installation

Type the following for a quiet (silent) installation using default values. For example, the following command installs silently using defaults and does not show any errors:

```
SANsurferCLI.msi /q
```

### Passive Windows Installation

Type the following for a passive installation using default values. For example:

```
SANsurferCLI.msi /passive
```

Installs with minimum interaction, showing only the progress bar and any errors.

### Overwrite Previous Windows Installations

Type the following for an installation that overwrites any previous installations *without* asking for confirmation. Type:

```
SANsurferX-AgentOnly.msi /i FORCEINSTALL=TRUE
```

## Installing on Red Hat/SUSE Linux/PPC

SANsurfer iSCSI HBA CLI installation on a Linux system requires that you use the "quiet" installation method. This method ensures that, if needed, the Linux driver interface module (ioctl module) is also installed.

**To install quietly on Linux:**

1. Unzip and untar the iSCSI CLI gzipped tar bundle as follows:

   ```
   tar -xvzf
   ```

2. To start the installation, type:

   ```
   ./iscli.dkms.install.sh install
   ```

## Installing on Solaris SPARC/Solaris x86

You can install SANsurfer iSCSI HBA CLI on a Solaris SPARC or x86 system with one of the following methods:

- "Solaris Attended Installation" on page 2-10
- "Solaris Silent Installation" on page 2-11

### Solaris Attended Installation

Follow this procedure from the command prompt to install SANsurfer iSCSI HBA CLI on a Solaris SPARC/Solaris x86 operating system.

**To install attended on Solaris:**

1. To uncompress the package you downloaded in "Downloading the Installation Package" on page 2-1, type the following:

   ```
   uncompress iscli-AA.BB.CC-DD_solaris_sparc_x86.Z
   ```

2. To install iSANsurfer iSCSI HBA CLI on a Solaris SPARC/Solaris x86 operating system, type the following:

   ```
   pkgadd -d iscli-AA.BB.CC-DD_solaris_sparc_x86
   ```

Solaris puts the files in the following directory:

```
/opt/QLogic_Corporation/SANsurferiCLI
```

It also adds this directory to the execution path.

## Solaris Silent Installation

This section contains a **pkgadd** (SOLARIS) example for silent installation.

**To install silently on Solaris:**

1. Create the following two files:

   ```
   response.txt
   noask_pkgadd.txt
   ```

2. Run the **pkgadd** command.
3. Create the `response.txt` file with contents of first question of arch, for example:

   ```
   <BOF> 1 <EOF>
   ```

4. Create the `noask_pkgadd.txt` file with contents:

   ```
   <BOF> action=nocheck <EOF>
   ```

5. Type the command to Install with the two additional (required) files:

   ```
   pkgadd -d ./<Install Package Filename> -n -a
   ./noask_pkgadd.txt < ./response.txt
   ```

   For example:

   ```
   pkgadd -d ./iscli-1.1.00-11_solaris_sparc_x86 -n -a
   ./noask_pkgadd.txt < ./response.txt
   ```

   Available packages include:

   - `QLSisclisparc`—QLogic SANsurfer iSCSI CLI (HBA Configuration Utility) (SPARC) 1.1.00 Build 11 (Solaris 8-11)
   - `QLSisclix86`—QLogic SANsurfer iSCSI CLI (HBA Configuration Utility) (x86) 1.1.00 Build 11 (Solaris 9-11)

6. Select the package(s) you want to process (or **all** to process all packages).

   ```
   (default: all) [x,xx,q]:
   ```

# Removing SANsurfer iSCSI HBA CLI

To remove SANsurfer iSCSI HBA CLI from your system, follow the instructions that that correspond to your OS:


- "Microsoft Windows Uninstall" on page 2-12
- "Red Hat/SUSE Linux/PPC Uninstall" on page 2-13
- "Solaris SPARC/Solaris x86 Uninstall" on page 2-13


## Microsoft Windows Uninstall

The Windows OS offers the following methods of uninstalling SANsurfer iSCSI HBA CLI:


- "Start Menu Uninstall" on page 2-12
- "Control Panel Uninstall" on page 2-12
- "Command Line Uninstall" on page 2-12


### Start Menu Uninstall

On the Windows **Start** menu, point to **All Programs** > **QLogic Management Suite** > **SANsurferiCLI**, and then click **Uninstall SANsurferiCLI**.

### Control Panel Uninstall

Follow these steps to uninstall SANsurfer iSCSI HBA CLI using the Windows Control Panel.

**To uninstall from the Control Panel:**

1. On the **Start** menu, click **Control Panel**.
2. Click **Add/Remove Programs**.
3. Select **SANsurferiCLI**.
4. Click **Change/Remove**.

### Command Line Uninstall

You can uninstall SANsurfer iSCSI HBA CLI from the command line. Select interactive, passive, or silent uninstall.

**To uninstall interactively from the command line:**

Enter the following from a command prompt:

```
SANsurferiCLI.msi
```

**To uninstall passively from the command line:**

Enter the following from a command prompt:

```
msiexec /x SANsurferiCLI.msi
```

**To uninstall quietly from the command line:**

Enter the following from a command prompt:

```
msiexec /q /x SANsurferiCLI.msi
```

## Red Hat/SUSE Linux/PPC Uninstall

To uninstall SANsurfer iSCSI HBA CLI on a Red Hat/SUSE Linux/PPC operating system, enter the following from a command prompt:

**`rpm -e iscli-AA.BB.CC-DD`** (be sure to omit the rest of the package name)

## Solaris SPARC/Solaris x86 Uninstall

To uninstall SANsurfer iSCSI HBA CLI on a Solaris SPARC/Solaris x86 operating system, enter one of the following commands:

**`pkgrm QLisclix86`** (Solaris x86)

**`pkgrm QLisclisparc`** (Solaris SPARC)

## Notes

# 3 Getting Started

## Introduction

SANsurfer iSCSI HBA CLI operates in the two following modes:

- **Interactive mode.** SANsurfer iSCSI HBA CLI starts and prompts for user input. Based on the input, the CLI executes the specified commands until terminated by the user. Use this mode to perform multiple operations. 4 Interactive Mode Commands covers this interface.
- **Non-interactive (command line) mode.** SANsurfer iSCSI HBA CLI starts, performs the functions defined by the list of parameters provided, and then terminates. Use this mode to run SANsurfer iSCSI HBA CLI from a script file or when you want to perform a single operation. 5 Non-interactive Mode Commands covers this interface.

In both modes, SANsurfer iSCSI HBA CLI *is* case sensitive. In addition, file names in some operating systems are case sensitive; in this case, SANsurfer iSCSI HBA CLI *is* case sensitive for that particular file.

## Starting Interactive Mode

To start SANsurfer iSCSI HBA CLI in interactive mode, choose one of the following options:

- Type the following in a command window:

```
iscli
```

- For Windows, click the iSCLI icon (shown in Figure 3-1):


***Figure 3-1 Windows iSCSI icon***

The Windows system displays the **Main Menu**. For example:

```
main Interactive Menu

-------------------------------------------------------
Program Version: 1.2.00.xx Driver Version: 2.1.x.x (STOR w32) IC: 1
Current HBA/Port Information:  HBA Alias: qlogic
HBA: 0 Port: 0 HBA Port Index: 1 Model: QLA4050C
IP Address: 192.168.104.129    Link: Up
Port iSCSI Name: iqn.2000-04.com.qlogic:qla4050C.fs10506a02810.1
Port iSCSI Alias:
-------------------------------------------------------

 1. Display Program Version Information
 2. Host Level Info & Operations
 3. HBA Level Info & Operations
 4. Port Level Info & Operations
 5. List All QLogic iSCSI HBA Ports detected
 6. Help
 7. Select HBA Port
 8. Refresh
 9. Exit
enter selection:
```

Depending on the menu selection, SANsurfer iSCSI HBA CLI prompts for more input as needed. For example, if you select **Select HBA Port**, SANsurfer iSCSI HBA CLI lists the current HBAs and prompts you to select an HBA whose settings you want to view or change.

# Starting Non-interactive Mode

Type the following in a command window to start SANsurfer iSCSI HBA CLI in non-interactive mode:

**iscli** <*Parameters*>

SANsurfer iSCSI HBA CLI executes the command options, and then terminates.

To list all of the available command line parameters, type the following:

**iscli** -h

All command line options must be preceded by the dash (–) notation. Most options have a corresponding menu selection in interactive mode.

# 4 Interactive Mode Commands

This chapter provides an explanation of each menu and menu option in the SANsurfer iSCSI interactive command line interface (CLI).

The command line interface commands are nested and some selections from the main menu open new menus. For example, if you click item **2. Host Level Info & Operations** on the main menu, SANsurfer iSCSI HBA CLI displays a new menu, the **Host Level Info & Operations Menu**. From this menu you have several choices, including **1. Display General System Information**, **2. Import HBA Menu, Multiple Adapters**, and so forth.

On every menu, to move to the next higher level (parent) menu, type the number for **Exit**.

Table 4-1 shows a map of the iSCSI CLI that will help you understand and navigate the menu hierarchy. The numbers in the left column (Level 1) represent the items on the main interactive menu.

*Table 4-1. Command Line Interface Menu*

| Level 1 | Level 2 | Level 3 | Level 4 |
|---|---|---|---|
| (Shown in **Bold Black**) | (Shown in Black) | (Shown in Brown) | (Shown in Green) |
| **1. Display Program Version Information** (see page 4-8) | | | |
| **2. Host Level Info & Operations** (see page 4-8) | | | |
| | 1. DIsplay General System Information (see page 4-9) | | |
| | 2. Import HBA Menu, Multiple Adapters (see page 4-9) | | |
| | | 1. Save Host Configuration (see page 4-9) | |
| | | 2. Import HBA Configuration (see page 4-10) | |
| | | 3. Select HBA Port (see page 4-49) | |
| | | 4. Refresh (see page 4-49) | |
| | | 5. Exit (see page 4-50) | |
| | 3. Update Firmware, Multiple Adapters (see page 4-11) | | |
| | 4. Install HBA Driver, All Adapters (see page 4-11) | | |
| | 5. Select HBA Port (see page 4-11) | | |
| | 6. Refresh (see page 4-49) | | |
| | 7. Exit (see page 4-50) | | |
| **3. HBA Level Info & Operations** (see page 4-12) | | | |
| | 1. HBA Information (see page 4-12) | | |
| | 2. HBA Options Menu (see page 4-13) | | |
| | | 1. Update BIOS/UEFI [or FCode] Code Image (see page 4-13) | |
| | | 2. Update Firmware Image (see page 4-13) | |
| | | 3. Update ROM Image (see page 4-14) | |
| | | 4. Select HBA Port (see page 4-49) | |
| | | 5. Refresh (see page 4-49) | |
| | | 6. Exit (see page 4-50) | |
| | 3. HBA Reset (see page 4-14) | | |

***Table 4-1. Command Line Interface Menu (Continued)***

| Level 1 | Level 2 | Level 3 | Level 4 |
|---|---|---|---|
| | 4. HBA Diagnostic Menu (see page 4-15) | | |
| | | 1. Retrieve FW Crash Record (see page 4-15) | |
| | | 2. Retrieve FW Flash & NVRAM Record (see page 4-15) | |
| | | 3. Retrieve FW Coredump Record (see page 4-16) | |
| | | 4. Display HBA Level Statistics (see page 4-16) | |
| | | 5. Select HBA Port (see page 4-49) | |
| | | 6. Refresh (see page 4-49) | |
| | | 7. Exit (see page 4-50) | |
| | 5. HBA Level Parameters Menu (see page 4-17) | | |
| | | 1. Display HBA Level Parameters (see page 4-17) | |
| | | 2. Configure HBA Level Parameters (see page 4-18) | |
| | | 3. Select HBA Port (see page 4-49) | |
| | | 4. Save Changes and Reset HBA (see page 4-18) | |
| | | 5. Refresh (see page 4-49) | |
| | | 6. Exit (see page 4-50) | |
| | 6. Display VPD Information (see page 4-18) | | |
| | 7. Select HBA Port (see page 4-11) | | |
| | 8. Refresh (see page 4-49) | | |
| | 9. Exit (see page 4-50) | | |
| **4. Port Level Info & Operations** (see page 4-19) | | | |
| | 1. Port Link Settings Menu (see page 4-19) | | |
| | | 1. Display Active Link Configuration (see page 4-19) | |
| | | 2. Display Configured Link Configuration (see page 4-20) | |
| | | 3. Configure Link Configuration (see page 4-20) | |
| | | 4. Save Changes and Reset HBA (if necessary) (see page 4-18) | |
| | | 5. Select HBA Port (see page 4-49) | |
| | | 6. Refresh (see page 4-49) | |
| | | 7. Exit (see page 4-50) | |

***Table 4-1. Command Line Interface Menu (Continued)***

| Level 1 | Level 2 | Level 3 | Level 4 |
|---|---|---|---|
| | 2. Port Network Settings Menu (see page 4-20) | | |
| | | 1. Display Network Settings (see page 4-20) | |
| | | 2. Configure IP Settings (see page 4-21) | |
| | | 3. iSNS Settings (see page 4-21) | |
| | | 4. Select HBA Port (see page 4-49) | |
| | | 5. Save Changes and Reset HBA (see page 4-18) | |
| | | 6. Refresh (see page 4-49) | |
| | | 7. Exit (see page 4-50) | |
| | 3. Edit Configured Port Settings Menu (see page 4-22) | | |
| | | 1. Display Configured Port Settings (see page 4-22) | |
| | | 2. Change Port iSCSI Alias Name (see page 4-22) | |
| | | 3. Port Firmware Settings Menu (see page 4-23) | |
| | | | 1. Display Configured Port Settings (see page 4-23) |
| | | | 2. Edit a Specific Port Setting (see page 4-24) |
| | | | 3. Configure iSCSI Settings (see page 4-24) |
| | | | 4. Configure Firmware Settings (see page 4-25) |
| | | | 5. Configure Device Settings (see page 4-25) |
| | | | 6. Configure Basic Settings (see page 4-26) |
| | | | 7. Configure Advanced Settings (see page 4-26) |
| | | | 8. Configure IPv6 Settings (see page 4-27) |
| | | | 9. Configure IPv6 TCP Settings (see page 4-28) |
| | | | 10. Save Changes and Reset HBA (see page 4-18) |
| | | | 11. Select HBA Port (see page 4-49) |
| | | | 12. Refresh (see page 4-49) |
| | | | 13. Exit (see page 4-50) |
| | | 4. Legacy QLA4010 Restore Default Port Settings (see page 4-28) | |
| | | 5. Select HBA Port (see page 4-49) | |
| | | 6. Save Changes and Reset HBA (if necessary) (see page 4-18) | |
| | | 7. Refresh (see page 4-49) | |
| | | 8. Exit (see page 4-50) | |
| | 4. Port Restore Factory Defaults (see page 4-28) | | |

***Table 4-1. Command Line Interface Menu (Continued)***

| Level 1 | Level 2 | Level 3 | Level 4 |
|---|---|---|---|
| | 5. Port Diagnostic Menu (see page 4-29) | | |
| | | 1. Ping Target (see page 4-30) | |
| | | 2. Perform Loopback Test (see page 4-31) | |
| | | 3. Perform Read/Write Buffer Test (see page 4-31) | |
| | | 4. Display Port Statistics (see page 4-32) | |
| | | 5. Reset Statistics (see page 4-32) | |
| | | 6. Display ARP Table (see page 4-32) | |
| | | 7. Display Connection Error Log (see page 4-32) | |
| | | 8. Export Connection Error Log (see page 4-33) | |
| | | 9. Display Neighbor Cache (IPv6) (see page 4-33) | |
| | | 10. Display Destination Cache (IPv6) (see page 4-33) | |
| | | 11. Display Default Router List (IPv6) (see page 4-33) | |
| | | 12. Display Local Prefix List (IPv6) (see page 4-33) | |
| | | 13. Select HBA Port (see page 4-49) | |
| | | 14. Refresh (see page 4-49) | |
| | | 15. Exit (see page 4-50) | |
| | 6. BIOS/UEFI [or FCode] Settings Menu (see page 4-34) | | |
| | | 1. Display BIOS/UEFI [or FCode] Information (see page 4-35) | |
| | | 2. Set BIOS/UEFI Mode (see page 4-35) | |
| | | 3. Set Primary Boot Target Information (see page 4-35) | |
| | | 4. Set Secondary Boot Target Information (see page 4-35) | |
| | | 5. Clear Primary Boot Target Information (see page 4-36) | |
| | | 6. Clear Secondary Boot Target Information (see page 4-36) | |
| | | 7. Set Alternative Client ID (see page 4-36) | |
| | | 8. Save Changes and Reset HBA (see page 4-18) | |
| | | 9. Select HBA Port (see page 4-49) | |
| | | 10. Refresh (see page 4-49) | |
| | | 11. Exit (see page 4-50) | |

***Table 4-1. Command Line Interface Menu (Continued)***

| Level 1 | Level 2 | Level 3 | Level 4 |
|---|---|---|---|
| | 7. Target Level Info & Operations (see page 4-36) | | |
| | | 1. List Targets (see page 4-37) | |
| | | 2. Display Target Information (see page 4-37) | |
| | | 3. Bind Target (see page 4-39) | |
| | | 4. Delete Target (see page 4-39) | |
| | | 5. Configure Target Parameters (see page 4-39) | |
| | | 6. Add a Target (see page 4-40) | |
| | | 7. Disable a Target (see page 4-40) | |
| | | 8. Enable a Target (see page 4-40) | |
| | | 9. Configure Target Authentication Menu (see page 4-40) | |
| | | | 1. Display CHAP Table (see page 4-41) |
| | | | 2. Display Targets Using CHAP Entries (see page 4-41) |
| | | | 3. Assign a CHAP Entry to a Target (see page 4-42) |
| | | | 4. Add a CHAP Entry (see page 4-42) |
| | | | 5. Add a Default BIDI CHAP (see page 4-43) |
| | | | 6. Edit a CHAP Entry (see page 4-43) |
| | | | 7. Delete a CHAP Entry (see page 4-44) |
| | | | 8. Select HBA Port (see page 4-49) |
| | | | 9. Save Target/CHAP Changes (see page 4-44) |
| | | | 10. Refresh (see page 4-49) |
| | | | 11. Exit (see page 4-50) |

***Table 4-1. Command Line Interface Menu (Continued)***

| Level 1 | Level 2 | Level 3 | Level 4 |
|---|---|---|---|
| | | 10. Target Discovery Menu (see page 4-44) | |
| | | | 1. Display Send Targets (see page 4-45) |
| | | | 2. Display Discovered Targets (see page 4-45) |
| | | | 3. Add a Send Target (see page 4-45) |
| | | | 4. Mark Send Target for Re-discovery (see page 4-45) |
| | | | 5. Remove a Send Target (see page 4-46) |
| | | | 6. Login and persist a discovered target (see page 4-46) |
| | | | 7. Duplicate a Persistent Target (see page 4-46) |
| | | | 8. Duplicate a Discovered Target (see page 4-46) |
| | | | 9. Remove Discovered Target (see page 4-46) |
| | | | 10. Display iSNS Settings (see page 4-46) |
| | | | 11. Configure iSNS (see page 4-46) |
| | | | 12. Save changes and reset HBA (see page 4-18) |
| | | | 13. Select HBA Port (see page 4-50) |
| | | | 14. Refresh (see page 4-50) |
| | | | 15. Exit (see page 4-50) |
| | | 11. List LUN Information (see page 4-47) | |
| | | 12. Save Target/CHAP Changes (see page 4-47) | |
| | | 13. Select HBA Port (see page 4-49) | |
| | | 14. Refresh (see page 4-49) | |
| | | 15. Exit (see page 4-50) | |
| | 8. Select HBA Port (see page 4-49) | | |
| | 9. Refresh (see page 4-49) | | |
| | 10. Exit (see page 4-50) | | |
| **5. List All QLogic iSCSI HBA Ports Detected** (see page 4-48) | | | |
| **6. Help** (see page 4-49) | | | |
| **7. Select HBA Port** (see page 4-49) | | | |
| **8. Refresh** (see page 4-49) | | | |
| **9. Exit** (see page 4-50) | | | |

# Display Program Version Information
## (CLI Option -ver)

When you select this option, SANsurfer iSCSI HBA CLI displays the following information:

```
SANsurfer iSCSI HBA CLI
Program version : x.x.xx.xx
iSDMAPI (iSCSI SAN device manager API) xx.xx.xx.xx QLSDM.DLL 06
IOCTL
Copyright 1999-2008 QLogic Corp.
```

# Host Level Info & Operations Menu

Before making a selection from the **Host Level Info & Operations Menu**, you must select an HBA.

**To choose an HBA:**

1. Type the number for the **Select HBA Port** option, and then press ENTER.
2. A list of HBA port instances appears.
3. Type the number for the HBA port instance you want to change, and then press ENTER.
4. Make changes in the following submenus:

   1. Display General System Information (see page 4-9)
   2. Import HBA Menu, Multiple Adapters (see page 4-9)
   3. Update Firmware, Multiple Adapters (see page 4-11)
   4. Install HBA Driver, All Adapters (see page 4-11)
   5. Select HBA Port (see page 4-49)
   6. Refresh (see page 4-49)
   7. Exit (see page 4-50)

5. For each submenu, save the changes by typing the number for **Save changes and reset HBA**, and then pressing ENTER. This saves your changes and resets all ports on the HBA.
6. To update the firmware with these changes, type the number for **Refresh**, and then press ENTER. If you do not select this option, your changes will not be visible in SANsurfer iSCSI HBA CLI.

# Display General System Information
## (CLI Option -g)

Choose the **Display General System Information** option to show information about SANsurfer iSCSI HBA CLI; for example:

```
Host Name    : (name)
Host Version: Service Pack n (Build xxxx)
Host Type    : Microsoft Windows Server 2003 Enterprise Edition x64
User Type    : Privileged; HBA setup allowed
```

# Import HBA Menu, Multiple Adapters
## (CLI Options -import and -save)

From the **Import HBA Menu**, choose one of the following options:

1. `Save Host Configuration` (to an XML file) (see page 4-9)
2. `Import HBA Configuration` (see page 4-10)
3. `Select HBA Port` (see page 4-49)
4. `Refresh` (see page 4-49)
5. `Exit` (see page 4-50)

Before making a selection from the **Import HBA Menu**, specify the HBA port whose settings you want to view or change by typing the number for **Select HBA Port**, and then press `ENTER`. A list of all iSCSI HBA ports is displayed. Type the number for the HBA port whose settings you want to change, and then press `ENTER`.

Make changes in the submenus, as described in the following sections.

### Save Host Configuration
#### (CLI Option -save)

**To save the current host configuration to an XML file:**

1. From the **HBA Import Menu**, type the number for the **Save** option, and then press `ENTER`.

   SANsurfer iSCSI HBA CLI prompts you to enter a file name to save the host.

2. Type a file name or a path to a file. If you do not specify a path, the file is saved in the current directory:

   ```
   Program Files\QLogic Corporation\SANsurfer
   ```

## Import HBA Configuration
**(CLI Option -import)**

**To import a single HBA configuration:**

1. From the **HBA Import Menu**, type the number for the **Import** option, and then press ENTER.

   SANsurfer iSCSI HBA CLI prompts you to enter a file name containing the HBA configuration.

2. Type the path and file name of the saved HBA configuration you want to import, and then press ENTER.

   SANsurfer iSCSI HBA CLI reads the file, shows the HBAs whose configurations are in the file, and prompts you to select one to import.

3. Type the number of the HBA whose configuration you want to import, and then press ENTER.

   The following appears:

```
You will now specify the target HBA to import the
configuration to.
Please select a method for identifying the destination
port(s):
        1) Import to ALL ports.
        2) Import to a list of ports (comma delimited).
        3) Import to the currently selected port.
Please select an option:
```

4. Select a configuration import option, and then press ENTER.

```
You are now ready to choose which parameter sets to import.
Please respond yes (y) or no (n) to each parameter set.
```

5. Select from the following parameter sets to import:

```
HBA Level Settings
Network Settings
iSCSI Name
Firmware Settings
CHAP Table
Target Settings (required if you Boot Settings is needed)
Boot Settings
```

***NOTE:***

Because the default is **n** (no), if you press ENTER after the prompt without typing **y** or **n**, you have essentially declined to import that setting.

After you have selected the parameter sets to import, the following message is displayed:

```
Resetting HBA This may take a few minutes.
```

After the HBA is reset, the **HBA Import Menu** reappears.

## Update Firmware, Multiple Adapters

When you select the **Update Firmware, Multiple Adapters** option, SANsurfer iSCSI HBA CLI prompts you to enter the file name of the new firmware. Be sure to use full path names when specifying the new firmware file.

When finished typing the firmware file name and path, press ENTER.

## Install HBA Driver, All Adapters
### (CLI Option -d)

When you select the **Install HBA Driver, All Adapters** option, SANsurfer iSCSI HBA CLI shows the current driver version and prompts you to enter the name of a new driver. Be sure to use full path names when entering a new driver name.

```
Current driver version n.n.n.n for HBA Port: 0
Enter a driver file name or press <Enter> to return to Main Menu
Driver file:
```

When finished typing the driver name and path, press ENTER.

## Select HBA Port

For information regarding this option, see “Select HBA Port (No CLI Option)” on page 4-49.

# HBA Level Info & Operations Menu
## (CLI Option -i)

The **HBA Level Info & Operations Menu** provides the following options for each HBA port instance:

1. `HBA Information` (see page 4-12)
2. `HBA Options Menu` (see page 4-13)
3. `HBA Reset` (see page 4-14)
4. `HBA Diagnostic Menu` (see page 4-15)
5. `HBA Level Parameters Menu` (see page 4-17)
6. `Display VPD Information` (see page 4-18)
7. `Select HBA Port` (see page 4-49)
8. `Refresh` (see page 4-49)
9. `Exit` (see page 4-50)

On each submenu, save the changes by typing the number for **Save changes and reset HBA**, and then pressing `ENTER`. This saves your changes and resets all ports on the HBA.

To update the firmware with these changes, type the number for **Refresh**, and then press `ENTER`. If you do not select this option, your changes will not be visible in SANsurfer iSCSI HBA CLI.

## HBA Information
### (CLI Option -ch)

When you select the **HBA Information** option, information is listed for the working adapter; for example:

```
Board Type              : QLE4060C
Chip Model              : ISP4032
Chip Version            : 0
Serial Number           : QS40620A00034
MAC Address             : 00-C0-DD-08-97-40
Driver Version          : 2.1.4.18 (STOR w32)
Firmware Version        : 3.0.1.45
ROM Version             : 1.0.0.0
iSCSI Version           : 0.20
BIOS/UEFI Version       : 1.00
BIOS/UEFI Full Version  : 1.00
```

# HBA Options Menu
**(No CLI Option)**

The **HBA Options Menu** provides the following selections:

1. `Update BIOS/UEFI [or FCode] Code Image` (see page 4-13)
2. `Update Firmware Image` (see page 4-13)
3. `Update ROM Image` (see page 4-14)
4. `Select HBA Port` (see page 4-49)
5. `Refresh` (see page 4-49)
6. `Exit` (see page 4-50)

On each submenu, save the changes by typing the number for **Save changes and reset HBA**, and then pressing `ENTER`. This saves your changes and resets all ports on the HBA.

To update the firmware with these changes, type the number for **Refresh**, and then press `ENTER`. If you do not select this option, your changes will not be visible in SANsurfer iSCSI HBA CLI

## Update BIOS/UEFI [or FCode] Code Image
**(CLI Option -bootcode)**

This menu option varies, depending on your system architecture (automatically detected by SANsurfer iSCSI HBA CLI). Bootcode (that is, the bootable code image) is either BIOS, FCode, or EFI that allows system boot from an iSCSI drive.

Select the **Update BIOS/UEFI Image** or **Update FCode Code Image** option to update the bootcode code image, which should be done when QLogic releases a new bootcode with bug fixes or enhancements. At the prompt, type the name of the file containing the bootcode code image to upload to the HBA.

For information on bootcode file names, see Appendix E Downloadable File Names.

## Update Firmware Image
**(CLI Option -f)**

The firmware is the code running on the HBA to perform the tasks involved in data management, the iSCSI protocol, and general HBA functioning.

Select the **Update Firmware Image** option to update the firmware image. At the prompt, type the name of the file containing the firmware image to upload to the HBA.

For information on firmware file names, see Appendix E Downloadable File Names.

***CAUTION!***

- Before updating the firmware image, be sure that no I/O processes are running.
- An administrator *must* take necessary actions to ensure changes will be fully recognized by the operating system (reboot, flush cache, sync disk, and so forth.)
- A firmware update and reset will be performed that requires all applications accessing impacted LUNs to be shut down.
- Any impacted systems must be unmounted.
- Following firmware update, be sure to select **Save changes and reset HBA**; otherwise, the change will not take effect.

### Update ROM Image
**(CLI Option -r)**

Select the **Update ROM Image** option to update the ROM image. At the prompt, type the name of the file containing the ROM image to upload to the HBA.

For information on ROM Image file names, see Appendix E Downloadable File Names.

***CAUTION!***

- Before attempting to update the ROM image, contact QLogic Customer Support (support@qlogic.com).
- Before updating the ROM image, ensure that no I/O processes are running.
- An administrator *must* take necessary actions to ensure changes will be fully recognized by the operating system (reboot, flush cache, sync disk, and so forth).
- A ROM update and reset will be performed that requires all applications accessing impacted LUNs to be shut down.
- Any impacted systems must be unmounted.
- To ensure your changes take effect, be sure to select **Save changes and reset HBA**.

## HBA Reset
## (CLI Option -b)

Select the **HBA Reset** option to reset the HBA after making configuration changes.

***NOTE:***

- Issuing this command resets both ports (0 and 1) on the HBA.
- You must disable bootcode mode (see "-bootcodemode (Set BIOS/UEFI [or FCode] Mode)" on page 5-4) to reset the HBA.

# HBA Diagnostic Menu
## (No CLI Option)

The **HBA Diagnostic Menu** provides the following options:

1. `Retrieve FW Crash Record` (see page 4-15)
2. `Retrieve FW Flash & NVRAM Record` (see page 4-15)
3. `Retrieve FW Coredump Record` (see page 4-16)
4. `Display HBA Level Statistics` (see page 4-16)
5. `Select HBA Port` (see page 4-49)
6. `Refresh` (see page 4-49)
7. `Exit` (see page 4-50)

Before making a selection from the **HBA Diagnostic Menu**, specify the HBA port you want to view or change by typing the number for **Select HBA Port**, and then pressing `ENTER`. A list of all iSCSI HBA ports is shown. Type the number for the HBA port whose settings you want to change, and then press `ENTER`.

Make changes in the submenus, as described in the following sections.

After making changes, refresh the HBA to show these changes by typing the number for (**Refresh**), and then pressing `ENTER`. If you do not select this option, your changes will not be visible in SANsurfer iSCSI HBA CLI.

### Retrieve FW Crash Record
**(CLI Option -gcr)**

Select the **Retrieve FW Crash Record** option to get crash record information for the HBA. At the prompt, type a name and location for the crash file, and then press `ENTER`. Be sure to use full path names. For example:

```
Crash File Name: c:\QLogic_Corporation\iscli\crash_record
```

### Retrieve FW Flash & NVRAM Record
**(CLI Option -dumpnvram)**

When you select the **Retrieve FW Flash & NVRAM Record** option, SANsurfer iSCSI HBA CLI queries you for the name of a file in which to dump the Flash and NVRAM contents. Be sure to use full path names. For example:

```
What is the filename you would like to save this Host NVRAM to:
c:\QLogic_Corporation\iscli\NVRAM_dump
```

## Retrieve FW Coredump Record
**(CLI Option -dumpcore)**

When you select the **Retrieve FW Coredump Record** option, SANsurfer iSCSI HBA CLI queries you for the name of a file in which to dump the Flash and core contents. Be sure to use full path names. For example:

```
What is the filename you would like to save this Host CoreDump to:
c:\QLogic_Corporation\iscli\NVRAM_dump
```

## Display HBA Level Statistics
**(CLI Option -stathba)**

When you select the **Display HBA Level Statistics** option, SANsurfer iSCSI HBA CLI lists statistics for the selected HBA. For example:

```
MACTxFramesCount           : 118
MACTxBytesCount            : 26705
MACTxMulticast             : 4
MACTxBroadcast             : 11
MACTxPauseFrames           : 0
MACTxControlFrames         : 0
MACTxDeferrals             : 0
MACTxExcessDeferrals       : 0
MACTxLateCollisions        : 0
MACTxAborts                : 0
MACTxSingleCollisions      : 0
MACTxMultipleCollisions    : 0
MACTxCollisions            : 0
MACTxFramesDropped         : 0
MACTxJumboFrames           : 0
MACRxFramesCount           : 673
MACRxBytesCount            : 173161
MACRxUnknownControlFrames  : 0
MACRxPauseFrames           : 0
MACRxControlFrames         : 0
MACRxDribble               : 0
MACRxFrameLengthError      : 0
MACRxJabber                : 0
MACRxCarrierSenseError     : 0
MACRxFramesDiscarded       : 0
MACRxFramesDropped         : 0
MACCRCErrorCount           : 0
MACEncodingErrorCount      : 0
```

```
MACRxLengthErrorCountLarge : 0
MACRxLengthErrorCountSmall : 0
MACRxMulticast             : 402
MACRxBroadcast             : 177
```

# HBA Level Parameters Menu
## (No CLI Option)

**To make changes to the HBA level parameters:**

1. Specify the HBA port whose settings you want to view or change by typing the number for **Select HBA Port**, and then press ENTER.

   SANsurfer iSCSI HBA CLI lists all iSCSI HBA ports.

2. Type the number for the HBA port whose settings you want to change, and then press ENTER.

3. Make changes in the submenus, as described in the following sections:

   1. Display HBA Level Parameters (see page 4-17)
   2. Configure HBA Level Parameters (see page 4-18)
   3. Select HBA Port (see page 4-49)
   4. Save changes and reset HBA (see page 4-17)
   5. Refresh (see page 4-49)
   6. Exit (see page 4-50)

4. For each submenu, save the changes by typing the number for the **Save changes and reset HBA** option, and then press ENTER. This saves your changes and resets all ports on the HBA.

5. To update the firmware with these changes, type the number for **Refresh**, and then press ENTER. If you do not select this option, your changes will not be visible in SANsurfer iSCSI HBA CLI.

***NOTE:***

The parameters available vary with the type of HBA.

## Display HBA Level Parameters
### (CLI Option -i)

Select the **Display HBA Level Parameters** option to view information about the HBA. For example:

```
HBA_Alias                          :  hba3
HBA_TCP_Max_Window_Size            :  32768
HBA_Default_Fragment_Reass_Timeout :  40
```

```
HBA_Reserved_TCP_Config            :  0x0001314c
HBA_Delayed_ACK                    :  on
```

Note that not all parameters are available for all HBA models.

### Configure HBA Level Parameters
**(CLI Option -n)**

Select the **Configure HBA Level Parameters** option to configure a single port on any HBA, whether it has only one port or more than one. Be sure to select the working adapter you want to configure. (For details, see “Select HBA Port (No CLI Option)” on page 4-49.)

When you enter this option, SANsurfer iSCSI HBA CLI queries you for each HBA parameter in sequence. It shows the current value of that parameter in brackets [*value*]. Type a new value for each parameter, and then press ENTER. To leave a parameter set to the current value, just press ENTER.

### Save Changes and Reset HBA

Before resetting the HBA, ensure no connections are active. Select the **Save Changes and Reset HBA** option to save your changes and reset all ports on the HBA.

## Display VPD Information
**(CLI Option -vpd)**

When you select the **Display VPD Information** option, the vital product data (VPD) information is displayed for the current working adapter. Information varies by manufacturer, or may not be provided by the manufacturer at all. For example, the adapter’s manufacturer may choose to show the following:

- Product description
- Part number
- EC (European community) level
- Manufacture ID
- FRU (field replaceable unit) number
- CCIN (customer card identification number)
- Brand Field

# Port Level Info & Operations Menu

The **Port Level Info & Operations Menu** provides the following options:

1. `Port Link Settings` (see page 4-19)
2. `Port Network Settings Menu` (see page 4-20)
3. `Edit Configured Port Settings Menu` (see page 4-22)
4. `Port Restore Factory Defaults` (see page 4-28)
5. `Port Diagnostic Menu` (see page 4-29)
6. `BIOS/UEFI Settings Menu` (see page 4-34)
7. `---> Target Level Info & Operations` (see page 4-36)
8. `Select HBA Port` (see page 4-49)
9. `Refresh` (see page 4-49)
10. `Exit` (see page 4-50)

On each submenu, save the changes by typing the number for the **Save changes and reset HBA** option, and then pressing `ENTER`. This saves your changes and resets all ports on the HBA.

To update the firmware with these changes, type the number for the **Refresh** option, and then press `ENTER`. If you do not select this option, your changes will not be visible in SANsurfer iSCSI HBA CLI.

## Port Link Settings Menu

Select the **Port Link Settings Menu** option to open the **Port Link Configuration Menu** containing the following options:

1. `Display Active Link Configuration` (see page 4-19)
2. `Display Configured Link Configuration` (see page 4-20)
3. `Configure Link Configuration` (see page 4-20)
4. `Save changes and reset HBA (if necessary)` (see page 4-20)
5. `Select HBA Port` (see page 4-49)
6. `Refresh` (see page 4-49)
7. `Exit` (see page 4-50)

### Display Active Link Configuration

Select the **Display Active Link Configuration** option to view the following information about the active link:

`Connection type` : (`Copper` or `Fiber`)
`Portal Duplex` : (`Half-duplex`, `Full-duplex`, or `Disabled`)
`Portal Flow Control` : (`on` or `off`)
`Portal Link speed` : (in `Mbs`)

### Display Configured Link Configuration
**(CLI Option -lcd)**

Select the **Display Configured Link Configuration** option to view the following information about the configured link:

```
Portal Flow Control       : (on or off)
Auto-negotiate link speed: (on or off)
Link Speed                : (in Mbs)
```

### Configure Link Configuration
**(CLI Option -lc)**

Select the **Configure Link Configuration** option to view and modify each of the configurable link settings, including:

- Auto-negotiate link speed
- Flow Control

The current setting (`on` or `off`) is shown in brackets. To change a setting, type **`on`** or **`off`**, and then press `ENTER`.

### Save Changes and Reset HBA (if necessary)

Before resetting the HBA, ensure no connections are active. Select the **Save Changes and Reset HBA** option to save your changes and reset all ports on the HBA.

## Port Network Settings Menu

The **Port Network Settings Menu** options include the following:

1. `Display Network Settings` (see page 4-20)
2. `Configure IP Settings` (see page 4-21)
3. `iSNS Settings` (see page 4-21)
4. `Select HBA Port` (see page 4-49)
5. `Save Changes and Reset HBA` (see page 4-18)
6. `Refresh` (see page 4-49)
7. `Exit` (see page 4-50)

### Display Network Settings
**(CLI Options -netconf)**

Select the **Display Network Settings** option to view the settings for dynamic host configuration protocol (DHCP), link local address, IPv6, and iSNS. For example:

```
Using DHCP to obtain an IP Addresses.
IPv4 Address              : 10.14.65.19
Gateway                   : 10.14.64.1
Subnet Mask               : 255.255.254.0
```

```
Link Local Address       : fe80::2c0:ddff:fe08:5a13
IPv6 Local Address State : Valid (0x5)
IPv6 Address 0           : Source Address Not Valid
IPv6 Address 1           : Source Address Not Valid
IPv6 Default Router      : Router Address Not Valid
IPv6 Port Number         : 3260
IPv6 Router Adv Link MTU : 0 bytes

iSNS                     : Disabled.
```

## Configure IP Settings
**(CLI Option -ipdhcp)**

Select the **Configure IP Settings** menu to enable or disable the following features:

- Enable IPv4
- DHCP to obtain IPv4 Network Information
- Enable IPv6
- Obtain Link Local Auto
- Obtain Routable Address Auto
- Obtain Router Address Auto
- IPv6 Default Router IP Address

You are prompted to turn on or off each feature; the current state is shown at the end of the prompt. For example, the following prompt indicates that the router address is not obtained automatically:

```
Obtain Router Addr Auto [off] :
```

To change this setting, type **on**, and then press ENTER (be sure to turn off the CAPS LOCK key; entries are case sensitive). If you do not want to change this setting, press ENTER.

## iSNS Settings
**(CLI Option -isns)**

By default, iSNS is disabled. Use iSNS when extended discovery management capabilities (for example, notifications, access management, and configuration) are required, such as in larger storage networks.

To enable iSNS, type **on** at the `Use iSNS: [off]` prompt, and then press ENTER. You are prompted to enter an iSNS IP address.

# Edit Configured Port Settings Menu

**To edit the configured HBA settings:**

1. Specify the HBA port whose settings you want to view or change by typing the number for **Select HBA Port**, and then pressing ENTER.

   SANsurfer iSCSI HBA CLI lists all iSCSI HBA ports.

2. Type the number for the HBA port whose settings you want to change, and then press ENTER.

3. For the selected HBA port, select from the following options:

   1. Display Configured Port Settings (see page 4-22)
   2. Change Port iSCSI Alias Name (see page 4-18)
   3. Port Firmware Settings Menu (see page 4-18)
   4. Legacy 4010 Restore Default Port Settings (see page 4-28)
   5. Select HBA Port (see page 4-49)
   6. Save changes and reset HBA (if necessary) (see page 4-18)
   7. Refresh (see page 4-49)
   8. Exit (see page 4-50)

4. For each submenu, save the changes by typing the number for the **Save changes and reset HBA** option, and then pressing ENTER. This saves your changes and resets all ports on the HBA.

5. To update the firmware with these changes, type the number for the **Refresh** option, and then press ENTER. If you do not select this option, your changes will not be visible in SANsurfer iSCSI HBA CLI.

## Display Configured Port Settings
**(CLI Option -c)**

When you select this option, all of the firmware parameters and their values are displayed for the HBA port. For a description of the firmware settings, refer to Appendix A Port- and HBA-level Parameters.

## Change Port ISCSI Alias Name
**(No CLI Option)**

***NOTE:***

This command is only available in interactive mode.

The *HBA port alias* is a symbolic name you assign to the HBA for identification. To assign an alias, type the name at the prompt. The name can have between 0 and 255 characters, and must be terminated with at least one NULL character.

HBA port aliases are communicated between the initiator and target at login, and can be displayed on the PC monitor on both sides, making it easy to see if the initiators and targets are correct. Do not use the alias to identify, address, or authenticate initiators or targets.

## Port Firmware Settings Menu

**To make changes to the HBA firmware settings:**

1. Specify the HBA port whose settings you want to view or change by typing the number for **Select HBA Port**, and then pressing `ENTER`.

   A list of all iSCSI HBA ports is displayed.

2. Type the number for the HBA port whose settings you want to change, and then press `ENTER`.

3. Make changes in the following submenus:

   1. `Display Configured Port Settings` (see page 4-23)
   2. `Edit A Specific Port Setting` (see page 4-24)
   3. `Configure ISCSI Settings` (see page 4-24)
   4. `Configure Firmware Settings` (see page 4-25)
   5. `Configure Device Settings` (see page 4-25)
   6. `Configure Basic Settings` (see page 4-26)
   7. `Configure Advanced Settings` (see page 4-26)
   8. `Configure IPv6 Settings` (see page 4-27)
   9. `Configure IPv6 TCP Settings` (see page 4-28)
   10. `Save changes and reset HBA (if necessary)` (see page 4-18)
   11. `Select HBA Port` (see page 4-49)
   12. `Refresh` (see page 4-49)
   13. `Exit` (see page 4-50)

4. For each submenu, save the changes by typing the number for the **Save changes and reset HBA** option, and then pressing `ENTER`. This saves your changes and resets all ports on the HBA.

5. To update the firmware with these changes, type the number for the **Refresh** option, and then press `ENTER`. If you do not select this option, your changes will not be visible in SANsurfer iSCSI HBA CLI.

### Display Configured Port Settings

When you select the **Display Configured Port Settings** option, SANsurfer iSCSI HBA CLI displays a list of port settings, including:

- iSCSI settings for instance 0
- Firmware settings for instance 0
- Device settings for instance 0

- Basic settings for instance 0
- Advanced settings for instance 0

### Edit a Specific Port Setting

Use the **Edit a Specific Port Setting** option when you know the name and parameters of the settings you want to change. For a list of parameter names and values, refer to Appendix A Port- and HBA-level Parameters. All of these parameters are also available in the following options from the **Port Firmware Settings Menu**:

- “Configure iSCSI Settings (CLI Options -n and -nh)” on page 4-24
- “Configure Firmware Settings” on page 4-25
- “Configure Device Settings” on page 4-25
- “Configure Basic Settings” on page 4-26
- “Configure Advanced Settings” on page 4-26

**To edit specific HBA settings:**

1. At the following prompt, type the name of the parameter you want to change:

   ```
   Enter the HBA parameter to modify:
   ```

2. At the following prompt, type the new value:

   ```
   Enter the HBA parameter value:
   ```

   The following prompt re-displays:

   ```
   Enter the HBA parameter to modify:
   ```

3. To modify another parameter, repeat the preceding steps 1 and 2.
4. When you are done, press `ENTER` to return to the **Port Firmware Settings Menu**.

### Configure iSCSI Settings
**(CLI Options -n and -nh)**

Use the **Configure iSCSI Settings** menu to modify the following HBA iSCSI settings:

- Force_Negotiate_Main_iSCSI_Keys
- iSCSI_Header_Digests
- iSCSI_Data_Digests
- iSCSI_Immediate_Data
- iSCSI_Initial_R2T
- iSCSI_Snack
- iSCSI_Discovery_Logout
- iSCSI_Strict_Login
- iSCSI_Alias

Each setting is displayed with the current value in brackets, for example:

```
iSCSI_Snack [off] :
```

To change the value, type the new value after the prompt. To keep the current value, press ENTER at the prompt. The next iSCSI setting appears. The settings are shown one by one, in the order shown in the preceding list.

Table A-1 on page A-1 describes these settings.

### Configure Firmware Settings

Use the **Configure Firmware Settings** option to modify the following firmware settings:

- FW_ZIO_Enable_Mode
- AFW_Device_Timeout
- AFW_Delayed_Ack
- AFW_AutoConnect

Each setting is displayed with the current value in brackets, for example:

```
AFW_Device_Timeout [on] :
```

To change the value, type the new value after the prompt. To keep the current value, press ENTER at the prompt. The next firmware setting appears. The settings are displayed one-by-one, in the order shown in the preceding list.

Table A-1 on page A-1 describes these settings.

### Configure Device Settings

Select the **Configure Device Settings** option to modify the following device settings:

- Large_Frames
- ExeThrottle
- FirstBurstLen
- KeepAliveTO
- MAXBurstLen
- MAXOutstandingR2T
- IPv4TOS
- IPv4TTL

Each setting is displayed with the current value in brackets, for example:

```
FirstBurstLen [256] :
```

To change the value, type the new value after the prompt. To keep the current value, press ENTER at the prompt. SANsurfer iSCSI HBA CLI displays the next device setting. The settings are displayed one by one, in the order shown in the preceding list.

Table A-1 on page A-1 describes these settings.

### Configure Basic Settings

Select the **Configure Basic Settings** option to modify the following settings (listed here in alphabetic order):

- ENABLE_4022IPv4
- ENABLE_IPv4
- ENABLE_IPv6
- IP_Address
- IP_Gateway
- IP_Subnet_Mask
- IPv6_Addr_Local_Link
- iSCSI_Alias
- iSCSI_Discovery_Logout
- iSCSI_Strict_Login
- LDROUTER_AUTO
- LOC_LINK_AUTO
- ROUTABLE_AUTO
- Task_Management_Timeout
- TCP_DHCP
- TCP_Nagle

Each setting is displayed with the current value in brackets, for example:

```
Task_Management_Timeout [10] :
```

To change the value, type the new value after the prompt. To keep the current value, press `ENTER` at the prompt. SANsurfer iSCSI HBA CLI displays the next device setting. The settings are displayed one by one (but not alphabetically, as in the preceding bullet list).

Table A-1 on page A-1 describes these settings.

### Configure Advanced Settings

Select the **Configure Advanced Settings** option to modify the following settings (listed here in alphabetic order):

- AFW_AutoConnect
- AFW_Delayed_Ack
- AFW_Device_Timeout
- AFW_Serlz_Task_Mngmt
- ExeThrottle
- FirstBurstLen
- Force_Negotiate_Main_iSCSI_Keys
- FW_ZIO_Enable_Mode
- IP_ARP_Redirect
- IPv4_TOS_Enable
- IPv4TOS
- IPv4TTL

- IPv6_DAD_Count
- IPv6_Hop_Limit
- IPv6_MCast_Listnr_Disco_Enable
- IPv6_ND_Reachable_Timer
- IPv6_ND_Retransmit_Timer
- IPv6_ND_Stale_Timeout
- IPv6_TCP_Time_Stamp
- IPv6_TCP_Window_Scale
- IPv6_Traffic_Class
- IPv6_VLAN_Enable
- IPv6_VLAN_ID
- IPv6_VLAN_User_Priority
- iSCSI_Data_Digests
- iSCSI_Header_Digests
- iSCSI_Immediate_Data
- iSCSI_Initial_R2T
- iSCSI_Name
- KeepAliveTO
- Large_Frames
- MaxBurstLen
- MaxOutstandingR2T
- TCP_Time_Stamp
- TCP_Window_Scale
- VLAN_Enable
- VLAN_ID
- VLAN_User_Priority
- ZIO

Each setting is displayed with the current value in brackets, for example:

```
KeepAliveTO [30] :
```

To change the value, type the new value after the prompt. To keep the current value, press ENTER at the prompt. The next setting appears. The settings are displayed one by one (but not alphabetically, as in the preceding bullet list).

Table A-1 on page A-1 describes these settings.

### Configure IPv6 Settings
**(CLI Options -netconf, -netconf6, -isns, -isns6, -ip, and -nc)**

When you select the **Configure IPv6 Settings** option, SANsurfer iSCSI HBA CLI shows each current IPv6 setting and gives you the option of entering another:

```
IPv6_Addr_Local_Link [fe80:2c0:ddff:fe08:e6f6] :_
IPv6_Addr_Routable0 [3ffe:4032:1077:2006:2c0:ddff:fe08:e6f6} :_
IPv6_Addr_Routable1 [::] :_
Default_IPv6_Router [fe80:20d:29ff:fe24:713f] :_
```

```
IPv6_Port [3260] :_
IPv6_Gratuitious_Neighbor_Ad_Enable [off] :_
IPv6_Redirect_Enable [off] :_
```

### Configure IPv6 TCP Settings

Select the **Configure IPv6 TCP Settings** option to view each current IPv6 TCP setting and, optionally, changing a setting. For example:

```
IPv6_Nagle [off] :_
IPv6_TCP_Time_Stamp [on] :_
```

### Legacy QLA4010 Restore Default Port Settings

Select the **Legacy QLA4010 Restore Default Port Settings** option to reinstate default port settings to any QLA4010 HBAs in the system. When you enter this option, the following warning appears:

```
Warning: This function is resetting the firmware to its default
configuration. These changes will not become permanent until the
HBA settings are saved.
Press the enter key to continue.
```

## Port Restore Factory Defaults (CLI Option -rdh)

***NOTE:***

This option is not supported in the QLA4010 HBA.

Use the **Port Restore Factory Defaults** option to reset the firmware for a single port to the factory default values. Be sure to select both **Save changes and reset HBA** and then **Refresh** afterwards; otherwise, the changes will not take effect.

This option updates the HBA factory default settings for the following HBA modules:

- Firmware parameters
- Network settings (IP, netmask, and so on)
- iSCSI name
- Target settings
- CHAP settings
- NVRAM settings
- IPsec settings

After selecting this option, you are asked if you want to restore all of the factory defaults in the preceding list. Do one of the following:

- If you want to restore all the defaults, press ENTER.
- If you want to restore some of the defaults, type **no**, and then press ENTER. Each setting appears one-by-one, in the order listed in the preceding. To restore the factory default for that setting, type **yes**, and then press ENTER. If you do not want to restore this setting, type **no**, and then press ENTER.

The HBA is reset after the parameters are restored.

***CAUTION!***

These new settings do not apply to currently configured targets, unless you delete the targets, and then configure them again after resetting the HBA.

# Port Diagnostic Menu

The **Port Diagnostic Menu** contains the following options:

1. Ping Target (see page 4-30)
2. Perform Loopback Test (see page 4-31)
3. Perform Read/Write Buffer Test (see page 4-31)
4. Display Port Statistics (see page 4-32)
5. Reset Statistics (see page 4-32)
6. Display ARP Table (see page 4-32)
7. Display Connection Error Log (see page 4-32)
8. Export Connection Error Log (see page 4-33)
9. Display Neighbor Cache (IPv6) (see page 4-33)
10. Display Destination Cache (IPv6) (see page 4-33)
11. Display Default Router List (IPv6) (see page 4-33)
12. Display Local Prefix List (IPv6) (see page 4-33)
13. Select HBA Port (see page 4-49)
14. Refresh (see page 4-49)
15. Exit (see page 4-50)

**To use port diagnostics:**

1. Before making a selection on the **Port Diagnostic Menu**, specify the HBA port whose settings you want to view or change by typing the number for **Select HBA Port**, and then pressing ENTER.

   SANsurfer iSCSI HBA CLI lists all iSCSI HBA ports.

2. Type the number for the HBA port whose settings you want to change, and then press ENTER.
3. Make changes in the submenus, as described in the following sections.

4. After making changes, refresh the HBA to show these changes by typing **6** (**Refresh**), and then pressing ENTER. If you do not select this option, your changes will not be visible in SANsurfer iSCSI HBA CLI.

## Ping Target
**(CLI Option -ping)**

**To ping a target:**

1. On the **Port Diagnostic Menu**, type the number for the **Ping** option, and then press ENTER.

   SANsurfer iSCSI HBA CLI prompts you as follows:

   ```
   Enter an IP Address:
   ```

2. Type the target IP address, and then press ENTER.

   SANsurfer iSCSI HBA CLI prompts you as follows:

   ```
   Enter the number of PING attempts to make:
   ```

3. Type a number between 1 and 2147483648 (2^31), and then press ENTER.

   SANsurfer iSCSI HBA CLI prompts you as follows:

   ```
   Enter the packet size in bytes for the PING [32]:
   ```

4. Type the number you want.

   For IPv6 networks, SANsurfer iSCSI HBA CLI prompts you as follows:

   ```
   Which IPv6 address should be used as the source:
         0 = Don't Care
         1 = Link Local
         2 = Address 0
         3 = Address 1
         Enter Choice:1
   Type the number you want.
   ```

Here is an example of a successful ping attempt:

```
Ping to 10.14.64.153 successful <1 of 2>
Ping to 10.14.64.153 successful <2 of 2>
Press the Enter key to continue.
```

Here is an example of a ping on an IPv6 network:

```
Enter an IP Address:fe80::2a0:98ff:fe03:c98e
Enter the number of PING attempts to make:1
Enter the packet size in bytes for the PING [32]:
Which IPv6 address should be used as the source:
0 = Don't Care
1 = Link Local
2 = Address 0
3 = Address 1
```

```
Enter Choice:1
Ping to fe80::2a0:98ff:fe03:c98e successful (1 of 1).
Press the Enter key to continue.
```

## Perform Loopback Test
**(CLI Option -lb)**

***CAUTION!***

Before doing a loopback test, ensure that the HBA does not have any outstanding I/O operations.

**To start a loopback test:**

1. On the **Port Diagnostic Menu**, type the number for the **Perform Loopback Test** option, and then press ENTER.
2. At the prompt, type the quantity of loopback tests to run. Valid values are in the range of 1–2147483648 (2^31). By default, one loopback test is run.
3. Select the loopback test type:
   - ❑ 1 (internal)
   - ❑ 2 (external)

   The default is an internal loopback test.
4. If you want to stop the loopback test should an error occur, type **y** for the `Stop on error[Y]?` option.

   After the test is complete, SANsurfer iSCSI HBA CLI displays the number of failed tests and successful tests.

## Perform Read/Write Buffer Test
**(CLI Option -rwt)**

***CAUTION!***

Before running a read/write buffer test, make sure that the HBA does not have any outstanding I/O operations.

**To start a read/write buffer test:**

1. On the **HBA Diagnostic Menu**, type the number for the **Read/Write buffer test** option, and then press ENTER.
2. At the prompt, type the number of read/write tests to run. Valid values are in the range 1–2147483648 (2^31). By default, one test is done.

   SANsurfer iSCSI HBA CLI lists the data patterns.

3. Type the number corresponding to the data pattern you want, and then press `ENTER`.
4. If you want to stop the loopback test if an error occurs, type **`y`** for the `Stop on error[Y]?` option.

   After the test is done, the number of failed tests and successful tests are shown.

### Display Port Statistics
**(CLI Option -stat)**

When you select the **Display Port Statistics** option, the HBA statistical information is displayed for the current HBA. For a list of the HBA statistics, see Appendix B HBA Statistics.

### Reset Statistics
**(CLI Option -sreset)**

When you select the **Reset Statistics** option, the HBA port statistics counters are immediately reset.

### Display ARP Table
**(CLI Option -arp)**

Select the **Display ARP Table** option to view the Address Resolution Protocol (ARP) cache, which keeps a record of host port connections with other hardware (such as targets) on the network. The IP address/MAC address pairs are dynamic entries that are removed after 10 minutes.

### Display Connection Error Log

Select the **Display Connection Error Log** to view the error log for each HBA connection. For example:

```
inst 0 Number of entries = 0xd (13)
=======================
inst 0 Entry Index: 0
=======================
Delta Time (in seconds) : 0.000
Timestamp (or seconds)  : Wed May 28, 2008 11:05:41 AM
Target ID               : 2
Original State          : Logged in (0x25)
Entry Type              : Sense data (0x4)
Error Type              : Removable medium changed or the target has been reset
                          (0x6)
Detail Code             : power on, reset, or bus device reset occurred (0x2900)
Number Consecutive Errors: 1
```

and so on.

## Export Connection Error Log

When you select the **Export Connection Error Log** option, SANsurfer iSCSI HBA CLI prompts you for a file name with which to save the log of connection errors. Enter a file name and then press ENTER.

## Display Neighbor Cache (IPv6)
**(CLI Option -nc)**

Select the **Display Neighbor Cache (IPv6)** option to view the IPv6 neighbor cache. Similar to the ARP table in IPv4, the neighbor cache is a set of entries about individual neighbors to which traffic has been sent recently. Entries contain such information as its link-layer address, a flag indicating whether the neighbor is a router or a host, a pointer to any queued packets waiting for address resolution to complete, and so forth.

## Display Destination Cache (IPv6)
**(CLI Option -dc)**

Select the **Display Destination Cache (IPv6)** option to view the IPv6 destination cache containing the IP address, next-hop IP address, and path MTU information about both local and remote destinations. For multicast and on-link unicast destinations, the next-hop IP address always matches the destination IP address. For unicast destinations that are off-link, the next hop IP address is the IP address of the router.

## Display Default Router List (IPv6)
**(CLI Option -dr)**

Select the **Display Default Router List (IPv6)** option to view the IPv6 default router list, which includes both the active default router and a short list of other routers that advertised themselves as being able to act as a default router. The active default router always appears first in the list.

## Display Local Prefix List (IPv6)
**(CLI Option -lp)**

Select the **Display Local Prefix List (IPv6)** to view the IPv6 local-prefix list created by the HBA from prefix information in router advertisements. The HBA can reach destination IP addresses containing these prefixes directly, without going through an intermediate router.

The following shows how a typical list may look:

```
Local Prefix Entry number 0
   Preferred Lifetime <secs> - 604669
   Valid Lifetime <secs> = 2591869
   Prefix = 3ffe:4032:1077:2006
   Update time <from FW boot> = 514 seconds, 0 milliseconds
   Update time <from FW boot> = 8 mins 34 secs 0 millisecs
   Update time    = Mon Apr 23 17:17:30 2007
```

```
FW Boot time       = Mon Apr 23 17:08:56 2007
```

# BIOS/UEFI [or FCode] Settings Menu

SANsurfer iSCSI HBA CLI detects the system architecture and shows this menu as either **BIOS/UEFI Settings Menu** or **FCode Settings Menu**, depending on your system. On Intel type machines, the **BIOS/UEFI Settings Menu** appears; on PPC and SPARC, the **FCode Settings Menu** appears.

***NOTE:***

If the BIOS version is less than 1.04, the **Set BIOS/UEFI Mode** option is not supported (an error message is shown).

**To edit the HBA BIOS/UEFI or FCode settings:**

1. From the **PORT BIOS/UEFI Settings Menu or PORT FCode Settings Menu**, specify the HBA port whose settings you want to view or change by typing the number for **Select HBA Port**, and then pressing `ENTER`.

   SANsurfer iSCSI HBA CLI lists all iSCSI HBA ports.

2. Type the number for the HBA port whose settings you want to change, and then press `ENTER`.

3. Select the following submenus to view or make changes to the HBA bootcode settings:

   1. `Display BIOS/UEFI [or FCode] Information` (see page 4-35)
   2. `Set BIOS/UEFI [or FCode] Mode` (see page 4-35)
   3. `Set Primary Boot Target Information` (see page 4-35)
   4. `Set Secondary Boot Target Information` (see page 4-35)
   5. `Clear Primary Boot Target Information` (see page 4-36)
   6. `Clear Secondary Boot Target Information` (see page 4-36)
   7. `Set Alternative Client ID` (see page 4-36)
   8. `Save changes` (see page 4-18)
   9. `Select HBA Port` (see page 4-49)
   10. `Refresh` (see page 4-49)
   11. `Exit` (see page 4-50)

4. For each submenu, save the changes by selecting **Save changes** option. This saves your changes and resets all ports on the HBA.

5. You must select **Refresh** to update the firmware with these changes and make them visible in SANsurfer iSCSI HBA CLI.

## Display BIOS/UEFI [or FCode] Information
**(CLI Option -binfo)**

Select the **Display BIOS/UEFI Information** or **Display FCode Information** option (this menu option varies depending on your system architecture) to view information about the bootcode. For example:

```
BIOS Mode: Disabled (0x1)
BIOS Primary Target ID:   2     LUN: 0
BIOS Secondary Target ID: 2     LUN: 0
BIOS Vendor ID =
BIOS Alt Client ID = testod
BIOS Version: 1.14
BIOS Full Version: 1.14
```

## Set BIOS/UEFI [or FCode] Mode
**(CLI Option -bootcodemode)**

***NOTE:***

If the BIOS version is less than 1.04, this option is not supported (it displays an error message).

Select the **Set BIOS/UEFI Mode** or **Set FCode Mode** option (depending on your system architecture) to select the bootcode mode. For example:

```
Choose from one of the following modes:
1) BIOS/UEFI [or FCode] Boot Disabled
2) BIOS/UEFI [or FCode] Boot Manual Mode
3) BIOS/UEFI [or FCode] Boot DHCP-Root Path
```

For more information, refer to the parameters listed in C Target Parameters.

## Set Primary Boot Target Information
**(CLI Option -pbootcode)**

Select the **Set Primary Boot Target Information** option to select the primary target to boot from. At the prompt, type a target ID and associated LUN.

## Set Secondary Boot Target Information
**(CLI Option -sbootcode)**

Select the **Set Secondary Boot Target Information** option to select the secondary target to boot from. At the prompt, type a target ID and associated LUN.

### Clear Primary Boot Target Information
**(CLI Option -cpbootcode)**

Select the **Clear Primary Boot Target Information** option to disable the primary boot target. At the prompt, type a target ID and associated LUN.

### Clear Secondary Boot Target Information
**(CLI Option -csbootcode)**

Select the **Clear Secondary Boot Target Information** option to disable the secondary boot target. At the prompt, type a target ID and associated LUN.

### Set Alternative Client ID
**(CLI Option -sbootcodecid)**

Select the **Set Alternative Client ID** option to assign an optional alternative client ID, which can be used in boot DHCP mode. The ID can be seven characters maximum.

## Target Level Info & Operations

Before making a selection from the **HBA Target Menu**, follow these steps:

1. Specify the HBA port whose settings you want to view or change by typing the number for **Select HBA Port**, and then press `ENTER`.

   A list of HBA ports is displayed.

2. Type the number for the HBA port whose settings you want to change, and then press `ENTER`.

3. To make changes, select options from the following submenus:

   1. `List Targets` (see page 4-37)
   2. `Display Target Information` (see page 4-37)
   3. `Bind Target` (see page 4-39)
   4. `Delete Target` (see page 4-39)
   5. `Configure Target Parameters` (see page 4-39)
   6. `Add a Target` (see page 4-40)
   7. `Disable a Target` (see page 4-40)
   8. `Enable a Target` (see page 4-40)
   9. `Configure Target Authentication Menu (CHAP)` (see page 4-40)
   10. `Target Discovery Menu` (see page 4-44)
   11. `List LUN Information` (see page 4-47)
   12. `Save Target/CHAP Changes` (see page 4-47)
   13. `Select HBA Port` (see page 4-49)
   14. `Refresh` (see page 4-49)
   15. `Exit` (see page 4-50)

4. For each submenu, save the changes by typing the number for the **Save Target/CHAP changes** option, and then pressing ENTER.
5. Type the number for the **Refresh** option, and then press ENTER. If you do not select this option, your changes will not be visible in SANsurfer iSCSI HBA CLI.

## List Targets
**(CLI Option -t)**

To list all targets connected to the current working adapter, type the number for the **List Targets** option, and then press ENTER. The following information is displayed for each target:

- Target ID (target ID of this device as assigned by the QLogic tool)
- HBA number
- IP (IP address of the target)
- Port instance (port ID for iSCSI devices, as defined by the iSCSI standard)
- iSCSI name (target iSCSI name, as defined by the iSCSI standard)
- Alias (target iSCSI alias name, as defined by the manufacturer software)
- State (of the target session connection). Session states include:
  - Unassigned
  - No Connection
  - Discovering
  - Not Saved
  - No Session
  - Session Active
  - Logged out
  - Session Failed
  - Unknown

## Display Target Information
**(CLI Option -t)**

Select the **Display Target Information** option to view the same information shown for the **List Targets** option. At the Enter a Target ID: prompt, type the ID of the target for which you want to see more detailed information, and then press ENTER.

The following shows an example of target information:

```
Target ID: 2  hba_no: 5 IP: 10.14.64.154 Port: 3260 TGT Instance #: 2
    ISCSI Name: iqn.1987-05.com.cisco:00.28182218624e.chap4
    Alias: chap4
    State: Session Active
TGT_iSCSI_Name                        :
iqn.1987-05.com.cisco:00.28182218624e.chap4
TGT_Target_ID                         :  2(*)
```

```
TGTO_Active                          :  off(*)
TGTO_Access_Granted                  :  off(*)
TGTO_Target_Entry                    :  on(*)
TGTO_Initiator_Entry                 :  off(*)
TGT_RetryCount                       :  0(*)
TGT_RetryDelay                       :  0(*)
TGT_DevType                          :  0(*)
TGT_ExeThrottle                      :  64
TGT_FirstBurstLen                    :  128
TGTIPO_Fragmentation                 :  on(*)
TGTISCSIO_Force_Neg_Main_Keys        :  off
TGTISCSIO_Send_Markers               :  off(*)
TGTISCSIO_Header_Digests             :  off
TGTISCSIO_Data_Digests               :  off
TGTISCSIO_Immediate_Data             :  on
TGTISCSIO_Initial_R2T                :  on
TGTISCSIO_Data_Sequence_In_Order     :  on(*)
TGTISCSIO_Data_PDU_In_Order          :  on(*)
TGTISCSIO_CHAP_Authentication        :  on
TGTISCSIO_Bidi_CHAP_Authentication   :  off
TGTISCSIO_Snack                      :  off
TGTISCSIO_Discovery_Logout           :  on
TGTISCSIO_Strict_Login               :  off
TGTISCSIO_Error_Recovery_Level       :  0(*)
TGT_KeepAliveTimeout                 :  30
TGT_DefaultTimeout                   :  2
TGT_DefaultTime2Retain               :  20(*)
TGT_MaxBurstLen                      :  512
TGT_MaxOutstandingR2T                :  1
TGT_MaxRxDataSegmentLen              :  128(*)
TGT_MaxTxDataSegmentLen              :  0(*)
TGT_Port                             :  3260
TGTTCPO_Nagle                        :  off
TGTTCPO_Timer_Scale                  :  3(*)
TGTTCPO_Timestamp                    :  on
TGT_TaskManagementTimeout            :  10
TGT_ExeCount                         :  0(*)
TGT_TargetPortalGroupID              :  1(*)
TGT_InitiatorSessID                  :  0x00c0dd085a39
```

```
TGT_TargetSessID                    :  5(*)
TGT_TargetIPAddress                 :  10.14.64.154
TGT_Window_Scale_Enable             :  on
TGT_Rx_Window_Scale                 :  0
TGT_Tx_Window_Scale                 :  2(*)
TGT_TimeStamp_Enable                :  64(*)
TGT_DDB_IPv6                        :  off
TGT_IPv6_Address                    :  a0e:409a::
TGT_Local_TCP_Port                  :  29251(*)
TGT_Type_of_Service                 :  0
TGT_Traffic_Class                   :  0(*)
TGT_Local_IPv6_Address              :  ::(*)
TGT_4022_Deleyed_ACK                :  off
TGT_Redirect_IPAddr                 :  10.14.64.154
Values noted with (*) are read only.
Press the Enter key to continue.
```

For a complete list of target parameters, their aliases, functions, and values, see Appendix C Target Parameters.

## Bind Target
**(CLI Option -pb)**

Select the **Bind Target** option to persistently bind a specific target to the HBA port by saving it in the HBA flash. Targets that are not persistently bound will not persist across firmware resets or HBA power cycles.

When you select this option, SANsurfer iSCSI HBA CLI lists available targets. At the `Enter a Target ID:` prompt, type the target ID of the target you want to bind.

## Delete Target

Select the **Delete Target** option to remove a target from the HBA database.

## Configure Target Parameters
**(CLI Option -tc)**

Select the **Configure Target Parameters** option to configure various target parameters. For a list of target parameters by their configuration names, configuration aliases and possible values, refer to Appendix C Target Parameters.

Each setting is displayed with the current value in brackets, for example:

```
TGT_DefaultTimeout [120] :
```

To change the value, type the new value after the prompt. To keep the current value, press `ENTER` at the prompt. SANsurfer iSCSI HBA CLI automatically displays the next target parameter.

## Add a Target
**(CLI Option -pa)**

Select the **Add a Target** option to add a new target to the current working adapter.

When prompted, type the following information for the new target; the parameters are displayed one at a time:

- TGT_iSCSI_Name (target iSCSI name)
- TGT_Port (target port)
- TGT_TargetIPAddress (target IP address)

If you do not enter the TGT_iSCSI_Name, the default is an empty string. If you do not enter the TGT_Port number, the default is 3260.

## Disable a Target

Select the **Disable a Target** option to disconnect the target and disable future connections until you re-enable it. The target remains in the HBA database.

## Enable a Target

Select the **Enable a Target** option to re-enable the target and re-establish the connection, if possible.

## Configure Target Authentication Menu

The iSCSI HBA firmware uses the challenge handshake authentication protocol (CHAP) as an authentication mechanism between the iSCSI initiators (QLA4*xxx* HBA ports) and the targets to which they are attached. Authentication can be disabled or enabled for a specific target or for all targets attached to the QLA4*xxx* HBA port.

**To configure target authentication (CHAP):**

1. If you have not already, specify the HBA port whose settings you want to view or change by typing the number for **Select HBA Port**, and then pressing ENTER.

   SANsurfer iSCSI HBA CLI lists all iSCSI HBA ports.

2. Type the number for the HBA port whose settings you want to change, and then press ENTER.

3. From the **HBA CHAP Menu**, make changes as needed by selecting from the following options:

   1. `Display CHAP table` (see page 4-41)
   2. `Display Targets Using CHAP Entries` (see page 4-41)
   3. `Assign a CHAP Entry to a Target` (see page 4-42)
   4. `Add a CHAP Entry` (see page 4-42)
   5. `Add a Default BIDI CHAP` (see page 4-43)
   6. `Edit a CHAP Entry` (see page 4-43)
   7. `Delete a CHAP Entry` (see page 4-44)
   8. `Select HBA Port` (see page 4-49)
   9. `Save Target/CHAP Changes` (see page 4-44)
   10. `Refresh` (see page 4-49)
   11. `Exit` (see page 4-50)

## Display CHAP Table
**(CLI Option -dspchap)**

Select the **Display CHAP Table** option to view the CHAP table, which is an array of records containing CHAP names and secrets used by the HBA during CHAP authentication. For example:

```
CHAP TABLE
Entry: 1 <DEFAULT BIDI CHAP entry>
   Name:
   Secret: jonathan
   This is a BIDI Chap entry
Entry: 2
   Name: tyler
   Secret: qlogic
Entry: 4
   Name: randy
   Secret: qlogic
Press the Enter key to continue.
```

## Display Targets Using CHAP Entries
**(CLI Option -chapmap)**

Select the **Display Targets Using CHAP Entries** option to view the following information about each target that has a CHAP:

- Target ID (target ID of this target as assigned by QLogic software)
- IP address (IP address of the target)
- Port (port ID for iSCSI targets as defined by the iSCSI standard)
- iSCSI name (target iSCSI name as defined by the iSCSI standard)
- Alias (target iSCSI alias name as defined by the manufacturer software)

- Name (CHAP name)
- Secret (CHAP secret)

### Assign a CHAP Entry to a Target
**(CLI Option -linkchap)**

**To assign a CHAP entry to a target:**

1. On the **HBA CHAP Menu**, type `3` (**Assign a CHAP Entry to a Target**).

   SANsurfer iSCSI HBA CLI lists available targets.

2. Type the target ID of the target you want, and then press `ENTER`.

   The CHAP table is displayed.

3. At the prompt `CHAP Entry Number <0 for no CHAP>`, do one of the following:

   - ❑ Type the entry number for one of the entries in the displayed CHAP table, and then press `ENTER`.
   - ❑ Type `0` if you do not want to assign a CHAP entry to this target, and then press `ENTER`.

### Add a CHAP Entry
**(CLI Option -addchap)**

**To add an entry to the CHAP table:**

1. On the **HBA CHAP Menu**, type **`4`** (**Add a CHAP entry**), and then press `ENTER`.
2. At the `CHAPName` prompt, type a name for the CHAP entry, and then press `ENTER`. The CHAP name can be up to 256 bytes long.
3. At the `CHAPSecret` prompt, type a secret for the CHAP entry, and then press `ENTER`. The CHAP secret can be up to 100 bytes long.
4. The `CHAPBidi [off]` prompt displays. Do one of the following:

   - ❑ If you want the HBA to authenticate the target (bidirectional CHAP), type **`yes`**, and then press `ENTER`.
   - ❑ If you do not want the HBA to authenticate the target, either press `ENTER` (the default) or type **`off`**, and then press `ENTER`. You can also add a BIDI CHAP entry with the `-defbidi` command. See “-defbidi (Add a Default BIDI CHAP)” on page 5-7.

To view a map of targets to CHAP table entries, use the **`-chapmap`** command. See “-chapmap (Display Targets Using CHAP Entries)” on page 5-6.

## Add a Default BIDI CHAP
**(CLI Option -defbidi)**

A default bidirectional (BIDI) CHAP causes the HBA to authenticate only the CHAP secrets of all targets with CHAP (the CHAP names are ignored). In addition, the CHAP names of any bidirectional CHAP entries are ignored.

**To add a default BIDI CHAP:**

1. On the **HBA CHAP Menu**, type `5` (**Add a Default BIDI CHAP**), and then press `ENTER`.
2. At the `CHAPSecret [default secret]` prompt, do one of the following:
   - ❑ Type the name of an existing CHAP secret you want to use, and then press `ENTER`.
   - ❑ To use the default secret displayed in the prompt, press `ENTER`.
3. At the `Press the Enter key to continue` prompt, press `ENTER`.

You can add a BIDI CHAP entry with the -defbibi command. See “-defbidi (Add a Default BIDI CHAP)” on page 5-7.

## Edit a CHAP Entry
**(CLI Option -edchap)**

**To edit a CHAP entry:**

1. On the **HBA CHAP Menu**, type `6` (**Edit a CHAP entry**), and then press `ENTER`.

   The CHAP table is displayed.
2. Press `ENTER`.
3. At the prompt, type the number of the CHAP entry you want to change, and then press `ENTER`.
4. At the `CHAPName [default name]` prompt, do one of the following:
   - ❑ Type a new CHAP name, and then press `ENTER`.
   - ❑ To use the default CHAP name shown in the prompt, press `ENTER`.
5. At the `CHAPSecret [default name]` prompt, do one of the following:
   - ❑ Type a new CHAP secret, and then press `ENTER`.
   - ❑ To use the default CHAP secret shown in the prompt, and then press `ENTER`.
6. At the `CHAPBidi [off` or `on]` prompt, do one of the following:
   - ❑ If you want the HBA to authenticate the target (bidirectional CHAP) and the prompt is `CHAPBidi [off]`, type **`on`**, and then press `ENTER`. If the prompt is `CHAPBidi [on]`, press `ENTER`.

- ❑ If you do not want the HBA to authenticate the target and the prompt is `CHAPBidi [off]`, press `ENTER`. If the prompt is `CHAPBidi [on]`, type **`off`**, and then press `ENTER`.

You can also edit a CHAP entry with the **`-edchap`** command. See "-edchap (Edit a CHAP Entry)" on page 5-11.

### Delete a CHAP Entry
**(CLI Option -delchap)**

**To delete an entry from the CHAP table:**

1. Type `7` (**Delete a CHAP entry**), and then press `ENTER`.

   The CHAP table is displayed.

2. Press `ENTER`.
3. At the prompt, type the entry number of the CHAP you want to delete, and then press `ENTER`.
4. Press `ENTER` again.

You can also delete a CHAP entry with the **`-delchap`** command. See "-delchap (Delete a CHAP Entry)" on page 5-7.

### Save Target/CHAP Changes
**(No CLI Option)**

Save any changes you made in sections "Assign a CHAP Entry to a Target (CLI Option -linkchap)" on page 4-42 through "Delete a CHAP Entry (CLI Option -delchap)" on page 4-44.

## Target Discovery Menu

The **Target Discovery Menu** provides options that enable you to:

- Discover targets without logging in.
- Login a selected target and persist, if desired.
- Duplicate a target login using a new ISID to enable multi-pathing and failover.

***NOTE:***

Targets entered and discovered using this set of menu options are kept in a database local to SANsurfer iSCSI HBA CLI. Because discovered targets are not kept in the HBA, they do not transport across applications. Targets entered and discovered using options on the main target menu (see "Target Level Info & Operations" on page 4-36) are also listed here, but those targets are kept in the HBA database and so are considered persistent.

Select the **Target Discovery Menu** option to view the **HBA Target Discovery Menu** containing the following options:

1. `Display Send Targets` (see page 4-45)
2. `Display Discovered Targets` (see page 4-45)
3. `Add a Send Target` (see page 4-45)
4. `Mark Send Target for re-discovery` (see page 4-45)
5. `Remove a Send Target` (see page 4-46)
6. `Login and persist a discovered target` (see page 4-46)
7. `Duplicate a Persistent Target` (see page 4-46)
8. `Duplicate a Discovered Target` (see page 4-46)
9. `Remove Discovered Target` (see page 4-46)
10. `Display iSNS Settings` (see page 4-46)
11. `Configure iSNS` (see page 4-46)
12. `Save changes and reset HBA (if necessary)` (see page 4-18)
13. `Select HBA Port` (see page 4-49)
14. `Refresh` (see page 4-49)
15. `Exit` (see page 4-50)

### Display Send Targets

Select the **Display Send Targets** option to view a list of send targets in the SANsurfer iSCSI HBA CLI database, as well as the persistent send targets in the HBA database.

### Display Discovered Targets

Select the **Display Discovered Targets** option to view a list of discovered targets in the SANsurfer iSCSI HBA CLI database.

### Add a Send Target

Select the **Add a Send Target** option to add a new send target to either the SANsurfer iSCSI HBA CLI database or the HBA database. You must save your changes before send targets are discovered. When you are prompted to make the target persistent, respond **`yes`** to add the target to the HBA database and log in the targets. For the added target to be discovered, you must use the **Save Target/CHAP Settings** option (see page 4-47).

### Mark Send Target for Re-discovery

Select the **Mark Send Target for Re-discovery** option to have SANsurfer iSCSI HBA CLI discover send targets when you select the **Save Target/CHAP Settings** option (see page 4-47).

### Remove a Send Target

Select the **Remove a Send Target** option to remove only non-persistent or send targets local to the SANsurfer iSCSI HBA CLI database. To remove targets stored in the HBA database, use the **Delete Target** option instead (see page 4-39). The **Remove a Send Target** option does not require a save to take effect.

### Login and Persist a Discovered Target

Select the **Login and Persist a Discovered Target** option to log in and persist a target that has been discovered but not yet logged in. Before this option can take effect, you must select the **Save Target/CHAP Settings** option (see page 4-47).

### Duplicate a Persistent Target

Select the **Duplicate a Persistent Target** option to copy a target in the HBA database and assign a new ISID to the new target. You can use the duplicate target for multi-pathing/failover. Before this option can take effect, you must select the **Save Target/CHAP Settings** option (see page 4-47).

### Duplicate a Discovered Target

Select the **Duplicate a Discovered Target** option to copy a discovered target that is not logged in. This option does not require a save to take effect.

### Remove Discovered Target

Select the **Remove Discovered Target** option to remove a target that is discovered and persisted. To remove targets stored in the HBA database, use the **Delete Target** option instead (see page 4-39). The **Remove Discovered Target** option does not require a save to take effect.

### Display iSNS Settings

Select the **Display iSNS Settings** option to view the settings for the currently configured iSNS. This option functions the same as “Display Network Settings (CLI Options -netconf)” on page 4-20.

### Configure iSNS

Select the **Configure iSNS** option to set up iSNS. This option functions the same as “Display Network Settings (CLI Options -netconf)” on page 4-20. iSNS discovered targets are shown with the other discovered targets. You can also log in those targets using the **Configure iSNS** option.

## List LUN Information
**(CLI Option -l)**

Select the **List LUN Information** option to view the following information about LUNs attached to the selected target:

- HBA/Target/LUN Number
- Vendor name
- Product ID
- Product revision
- LUN size

You can view this information for a specific LUN or for all LUNs attached to the selected target. For example:

```
iSCSI HBA Target Menu
HBA Target Menu
…
Enter selection: 7
Target ID: 64              IP: 192.166.1.41              Port:
3260
   iSCSI Name: iqn.1992-08.com.netapp:sn.51403494
   Alias:drive4
   State:Session Active
…
Enter a Target ID:64
Enter a LUN Number[60.64,65,63,66,100,103,105,104,50,<ALL>]:63
   Vend           = NETAPP
   ProdID         = LUN
   ProdRv         =  0.2
   LunSize        =  4.999 GB
Press the Enter key to continue.
```

You can also view this information with the `-l` command. See “-l (List LUN Information)” on page 5-17.

## Save Target/CHAP Changes
**(No CLI Option)**

Select the **Save Target/CHAP Changes** option to save any changes you made to the target or CHAP settings.

# List All QLogic iSCSI HBA Ports Detected (CLI Option -i)

Select the **List All QLogic iSCSI HBA Ports Detected** option to view the following information for all HBA ports in the system:

- HBA model (HBA name, for example, QLA4010)
- HBA serial number
- HBA port number
- Firmware (FW) version
- Type (Connection medium: copper or fiber)
- iSCSI name (HBA port iSCSI name). Manufacturer's default or name you assign.)
- Alias (HBA port iSCSI alias name. Symbolic name you assign to the HBA.)
- IP address (IP address of the HBA port)
- Instance (driver ID number)

For example:

```
1. HBA: 0   Port: 0   HBA Port Index: 1   HBA Model: QLA4050C
   HBA Serial Number: (FS10506A02810)   FW Version: 2.2.4.45   Type: Copper
   IP Address: 192.168.104.129
   Alias:
   iSCSI name: iqn.2000-04.com.qlogic.qla4050c.fs10506a02810.1
2. HBA: 1   Port: 0   HBA Port Index: 2   HBA Model: QLA4062C
   HBA Serial Number: (AS40637A00081)    FW Version: 3.0.1.18   Type: Copper
   IP Address: 192.168.104.139
   Alias:
   iSCSI name: iqn.2000-04.com.qlogic.qle4062c.as40637a00081.1
3. HBA: 1   Port: 1   HBA Port Index: 3   HBA Model: QLA4062C
   HBA Serial Number: (AS40637A00081)   FW Version: 3.0.1.18   Type: Copper
   IP Address: 192.168.104.140
   Alias:
   iSCSI name: iqn.2000-04.com.qlogic.qle4062c.as40637a00081.2
4. HBA: 2   Port: 0   HBA Port Index: 4   HBA Model: QLA4010
   HBA Serial Number: (FS10506A02810)   FW Version: 2.2.4.45   Type: Copper
   IP Address: 0.0.0.0
   Alias:
   iSCSI name: iqn.1991-05.com.microsoft:steinway.qlogic.org
```

You can also list this information with the `-i` command. See "-i (List All QLogic iSCSI HBA Ports Detected)" on page 5-14.

# Help
## (CLI Option -h)

Select the **Help** option to view the SANsurfer iSCSI HBA CLI help file, which contains a list of non-interactive mode commands and the syntax of each.

You can also obtain assistance by entering the **-h** command; see "-h (Help)" on page 5-13.

# Select HBA Port
## (No CLI Option)

Select the **Select HBA Port** option to get a list of all installed HBAs and their parameters, including the following information:

- HBA number (in this system)
- HBA Port Index (which port this is in the list of all system iSCSI ports)
- HBA model (for example, QLA4052C)
- HBA serial number
- Firmware version
- Type of connection (Copper or Optical)
- IP Address
- Alias
- iSCSI Name

The display looks similar to the following:

```
1. HBA: 0 Port: 0    HBA Port Index: 1 HBA Model: QLA4050C
   HBA Serial Number: (FS10506A02810)FW Version: 2.2.4.45 Type: Copper
   IP Address: 192.168.104.129
   Alias:
   iSCSI name: iqn.2000-04.com.qlogic.qla4050c.fs10506a02810.1
```

Type the **Port Index** number for the **HBA Port Instance** you want to view or change, and then press ENTER.

# Refresh
## (No CLI Option)

To update the firmware with the changes made on this menu, and to be sure you can see your changes in the CLI, type the number for the **Refresh** option, and then press ENTER.

# Exit
## (No CLI Option)

To return to the next higher level (parent) menu, type the number for **Exit**, and then press ENTER. If you are at the top-level of the interactive menu, the CLI offers you the option to save or discard any changes you made, and then closes.

# 5 Non-Interactive Mode Commands

Use non-interactive commands in scripts and similar applications to configure QLogic QLA4xxx iSCSI HBAs and the storage connected to them. If you prefer to work with the HBA from a menu-based system, use Interactive mode commands instead (for details, see Section 4 Interactive Mode Commands).

The command format for non-interactive mode is:

```
iscli [optional parameters] <Command Option> [Command Variable] |
[Command Variable]
```

Where:

| | |
|---|---|
| <> | = Parameters in angled brackets are required. |
| [] | = Parameters in square brackets are optional. |
| \| | = OR operator. |
| *Italicized text* | = Placeholder describing the command variable. |

Table 5-1 defines the command variables. The command section to which they apply. describes command-specific variables.

***Table 5-1. Non-interactive Command Variables***

| Variable | Definition |
|---|---|
| *hba_port_inst* | The system port (formerly HBA number) |
| *Target ID* | Target ID |
| *LUN ID* | Logical unit number (0–255) |
| *CHAP Number* | Challange handshake authentication protocol (CHAP) number |
| *CHAP Name* | Null-terminated CHAP name, which is sent by the port instance when responding to the CHAP challenge |
| *CHAP Secret* | CHAP secret, which is used by the port instance when generating the CHAP response |
| *Boot Target* | The target ID of the target device from which to boot |
| *Boot LUN* | The LUN of the boot device |

***NOTE:***

- The commands are case sensitive. For example, `-g` is not the same as `-G`.
- Only one command line option per input file is valid.
- *<hba_port_inst>* is an instance number from the list of all iSCSI HBA ports in the system. You can see this list with the command `-i`.

The positional parameters vary, depending on the command option specified. For example, to display an HBA's configured settings, use the command option `-C`, followed by the port instance number (positional parameter). In contrast, the command for providing general information, `-g`, has no positional parameters.

In non-interactive mode, most changes made to the port instance become effective immediately. This sometimes will cause the HBA to reset, as specified in the command description. Be sure the system is prepared for a HBA reset before making changes.

# Non-interactive Commands

This section contains an alphabetical list of the SANsurfer iSCSI HBA CLI commands used in non-interactive mode.

## -acb

To inquire whether the ACB (access method control block) firmware functions are supported, enter the `-acb` command. In general, up-to-date firmware and driver are required for ACB to be supported.

## -addchap
### (Add a CHAP Entry)

To add a CHAP entry to the persistent CHAP table, enter the `-addchap` command as follows:

`-addchap [-BIDI] <hba_port_inst> <CHAP Name> <CHAP Secret>`

The optional parameter `[-BIDI]` shows that the CHAP entry is BIDI (bidirectional). When this parameter is not specified (default), the CHAP entry is local.

Issuing this command resets the HBA. For more information on CHAP and the interactive version of this command, see “Add a CHAP Entry (CLI Option -addchap)” on page 4-42.

## -arp
### (Display ARP Table)

The Address Resolution Protocol (ARP) cache keeps a record of host port connections with other hardware (such as targets) on the network. The IP address/MAC address pairs are dynamic entries that are removed after 10 minutes. To view the ARP table, enter the `-arp` command as follows:

`-arp <hba_port_inst>`

For information on the interactive version of this command, see “Display ARP Table (CLI Option -arp)” on page 4-32.

## -b
### (HBA Reset)

To reset the specified HBA after making configuration changes, enter the `-b` command as follows:

`-b <hba_port_inst>`

***NOTES:***

- Issuing this command resets both ports (0 and 1) on two-port HBAs.
- You must disable bootcode mode to reset the HBA (see "-bootcodemode (Set BIOS/UEFI [or FCode] Mode)" on page 5-4).

For information on the interactive version of this command "HBA Reset (CLI Option -b)" on page 4-14.

# -binfo
## (Display BIOS/UEFI [or FCode] Information)

To display the bootcode settings for the specified HBA port, enter the `-binfo` command as follows:

`-binfo <hba_port_inst>`

For information on the interactive version of this command, see "Display BIOS/UEFI [or FCode] Information (CLI Option -binfo)" on page 4-35.

# -bootcode
## (Update BIOS/UEFI [or FCode] Mode)

Bootcode (that is, the bootable code image) is code that allows system boot from an iSCSI drive.

The `-bootcode` command updates the bootcode code image, which should be done when QLogic releases a new bootcode with bug fixes or enhancements. At the prompt, type the name of the file containing the bootcode code image to upload to the HBA.

For information on bootcode file names, see Appendix E Downloadable File Names.

To update the bootcode code image, enter the `-bootcode` command as follows:

`-bootcode <hba_port_inst> <Bootcode Code Image File Name>`

For information on the interactive version of this command, see "Update BIOS/UEFI [or FCode] Code Image (CLI Option -bootcode)" on page 4-13.

# -bootcodemode
## (Set BIOS/UEFI [or FCode] Mode)

To set the bootmode mode for QLA4050, QLA4050C, QLE4060C, QLE4062, and QMC4052 HBAs, enter the `-bootcodemode` command as follows:

`-bootcodemode <hba_port_inst> <1>|<2>|<3>`

Where:

1 = Disabled
2 = Manual mode
3 = DHCP–Root path

If HBA DHCP is enabled (see “-ipdhcp (Configure IP Settings)” on page 5-16), modes 1–3 are allowed. If HBA DHCP is not enabled, bootcode DHCP is not allowed. This mode is not supported for QLA4010 HBAs. This mode is not active for the PPC.

For IBM cards, the following modes are available:

4 = DHCP Vendor ID
5 = DHCP-Auto
6 = Auto
7 = System Mode

For information on the interactive version of this command, see “Set BIOS/UEFI [or FCode] Mode (CLI Option -bootcodemode)” on page 4-35.

***NOTE:***

Bootcode DHCP is not allowed for QLA4010 HBAs.

## -c
### (Display Configured Port Settings)

To view the configured settings for the port, enter the `-c` command as follows:

`-c [hba_port_inst]`

When you specify a port instance, information for only that HBA is shown. When you do not specify a port instance, information for all HBA ports in the system is shown.

For a list of HBA settings, see “Display Configured Port Settings (CLI Option -c)” on page 4-22 and Appendix C Target Parameters.

## -ch
### (HBA Information)

To display the HBA’s configured settings, enter the `-ch` command as follows:

`-ch [hba_port_inst]`

When you specify a port instance, information for only that HBA is shown. When you do not specify a port instance, information for all HBA ports in the system is shown.

For a list of HBA settings, see Table 5-3 on page 5-19. For a complete list of HBA parameters, see Appendix C Target Parameters.

For information on the interactive version of this command, see "HBA Information (CLI Option -ch)" on page 4-12.

# -chapmap
## (Display Targets Using CHAP Entries)

To display the map of targets to CHAP table entries, enter the `-chapmap` command as follows:

`-chapmap <hba_port_inst>`

For information on the interactive version of this command, see "Display Targets Using CHAP Entries (CLI Option -chapmap)" on page 4-41.

# -cpbootcode
## (Clear Primary Boot Target Information)

To clear the primary boot target and LUN, enter the `-cpbootcode` command as follows:

`-cpbootcode <hba_port_inst>`

For information on the interactive version of this command, see "Clear Primary Boot Target Information (CLI Option -cpbootcode)" on page 4-36.

***NOTE:***

This command is not active for the PPC.

# -csbootcode
## (Clear Secondary Boot Target Information)

To clear the secondary boot target and LUN, enter the `-csbootcode` command as follows:

`-csbootcode <hba_port_inst>`

For information on the interactive version of this command, see "Clear Secondary Boot Target Information (CLI Option -csbootcode)" on page 4-36.

# -d
## (Install HBA Driver, All Adapters)

To install an HBA driver for all iSCSI HBAs on the system from a `.zip` or `.inf` file, enter the `-d` command as follows:

`-d <File Name>`

A system reboot may be required; see the log file for details.

For information on the interactive version of this command, see “Install HBA Driver, All Adapters (CLI Option -d)” on page 4-11.

## -dc
### (Display Destination Cache [IPv6 only])

The IPv6 destination cache contains the IP address, next-hop IP address, and path MTU information about both local and remote destinations. For multicast and on-link unicast destinations, the next-hop IP address always matches the destination IP address. For unicast destinations that are off-link, the next hop IP address is the IP address of the router.

To display the destination cache, enter the `-dc` command as follows:

`-dc <hba_port_inst>`

For information on the interactive version of this command, see “Display Destination Cache (IPv6) (CLI Option -dc)” on page 4-33.

## -dce

To display the connection error logs for up to 100 latest connections, enter the -dce command as follows:

`-dce <hba_port_inst> <target_id> <filename>`

If *<hba_port_inst>* and *<target_id>* are not specified, all entries for all HBA ports will be displayed. If *<filename>* is specified, then the log will be written to that file.

## -defbidi
### (Add a Default BIDI CHAP)

To add a default BIDI (bidirectional) CHAP entry to the specified HBA port, enter the `-defbidi` command as follows:

`-defbidi <hba_port_inst> <CHAP Secret>`

Issuing this command resets the HBA.

For information on the interactive version of this command, see “Add a Default BIDI CHAP (CLI Option -defbidi)” on page 4-43.

## -delchap
### (Delete a CHAP Entry)

To delete the specified CHAP entry, enter the `-delchap` command as follows:

`-delchap <hba_port_inst> <CHAP>`

Issuing this command resets the HBA.

For information on the interactive version of this command, “Delete a CHAP Entry (CLI Option -delchap)” on page 4-44.

## -df

To view the firmware properties, enter the `-df` command as follows:

`-df <hba_port_inst>`

SANsurfer iSCSI HBA CLI displays information about the HBA: model, serial number, port number, iSCSI name, alias, IP address, instance number, and the following firmware information:

- FW information for instance
- FW version
- FW attribute
- FW version 2
- FW attribute 2

There is no corresponding command in the interactive menu.

## -dp

Use the `-dp` command to pre-install an HBA driver specified from a `.zip` or `.inf` file. This operation may be performed without an HBA installed in the system.

You can specify the following actions:

- **`p`** — Pre-install driver package (default)
- **`i`** — Install driver package
- **`u`** — Uninstall driver package
- **`g`** — Get driver package path

You may also specify the following flags:

- `DRIVER_PACKAGE_FORCE`
- `DRIVER_PACKAGE_LEGACY_MODE`
- `DRIVER_PACKAGE_ONLY_IF_DEVICE_PRESENT`
- `DRIVER_PACKAGE_REPAIR`
- `DRIVER_PACKAGE_SILENT`

You may need to reboot the system following this command. For details about the success or failure of the driver update operation, view the trace log file (see Appendix F Using Trace).

## -dr
### (Display Default Router List [IPv6 only])

The IPv6 default router list includes both the active default router and a short list of other routers that advertised themselves as capable of acting as a default router. The active default router always appears first in the list.

To view the default router list, enter the `-dr` command as follows:

```
-dr <hba_port_inst>
```

For information on the interactive version of this command, “Display Default Router List (IPv6) (CLI Option -dr)” on page 4-33.

## -dspchap
### (Display a CHAP Table)

To view the CHAP table, enter the `-dspchap` command as follows:

```
-dspchap <hba_port_inst>
```

For information on the interactive version of this command, see “Display CHAP Table (CLI Option -dspchap)” on page 4-41.

## -dtdsp
### (Display Discovered Targets)

To view the discovered targets that are not persistent, enter the `-dtdsp` command as follows:

```
-dtdsp <hba_port_inst>
```

For information on the interactive version of this command, “Display Discovered Targets” on page 4-45.

## -dtdspa
### (List Targets)

To view discovered targets, including persistent and non-persistent, enter the `-dtspa` command as follows:

```
-dtspa <hba_port_inst>
```

For information on the interactive version of this command, “List Targets (CLI Option -t)” on page 4-37.

## -dtdupd
### (Duplicate a Discovered Target)

To duplicate a discovered target that is not persistent, enter the `-dtdupd` command as follows:

```
-dtupd <hba_port_inst> <target_instance>
```

To obtain the target instance, use the command “-dtdsp (Display Discovered Targets)” on page 5-9.

A duplicate target is assigned a new iSCSI initiator ID (ISID) and can then be used to create a redundant path.

For information on the interactive version of this command, “Duplicate a Discovered Target” on page 4-46.

# -dtdupd
## (Duplicate a Persistent Target)

To duplicate a discovered target that is persistent, enter the `-dtdupd` command as follows:

`-dtdupd <hba_port_inst> <target_id>`

A duplicate target is assigned a new iSCSI initiator ID (ISID) and can then be used to create a redundant path.

For information on the interactive version of this command, "Duplicate a Persistent Target" on page 4-46.

# -dtli
## (Login and Persist a Discovered Target)

To log in a specific discovered target, enter the `-dtli` command as follows:

`-dtli <hba_port_inst> <target_instance>`

To obtain the target instance, use the command "-dtdsp (Display Discovered Targets)" on page 5-9.

For information on the interactive version of this command, "Login and Persist a Discovered Target" on page 4-46.

# -dtlia
## (Login and Persist a Discovered Target)

To log in all discovered targets, enter the `-dtlia` command as follows:

`-dtlia <hba_port_inst>`

For information on the interactive version of this command, "Login and Persist a Discovered Target" on page 4-46.

# -dtrem
## (Remove Discovered Target)

To remove a non-persistent discovered target, enter the `-dtrem` command as follows:

`-dtrem <hba_port_inst> <target_instance>`

To obtain the target instance, use the command "-dtdsp (Display Discovered Targets)" on page 5-9.

For information on the interactive version of this command, "Remove Discovered Target" on page 4-46.

## -dtrema
### (Remove Discovered Target)

To remove all non-persistent discovered targets, enter the `-dtrema` command as follows:

```
-dtrema <hba_port_inst>
```

For information on the interactive version of this command, “Remove Discovered Target” on page 4-46.

## -dumpcore
### (Retrieve FW Coredump Record)

To dump the RAM memory to a file name of your choice, enter the `-dumpcore` command as follows:

```
-dumpcore <hba_port_inst> [File name]
```

For information on the interactive version of this command, see “Retrieve FW Coredump Record (CLI Option -dumpcore)” on page 4-16.

## -dumpnvram
### (Retrieve FW Flash & NVRAM Record)

To dump the NVRAM to a file name of your choice, enter the `-dumpnvram` command as follows:

```
-dumpnvram <hba_port_inst> [File name]
```

For information on the interactive version of this command, “Retrieve FW Flash & NVRAM Record (CLI Option -dumpnvram)” on page 4-15.

## -dv

To see the version of the iSCSI HBA driver(s) installed, enter the `-dv` command as follows.

```
-dv
```

There is no corresponding command in the interactive menu; however, you can use this interactive option to view the current driver version: “Install HBA Driver, All Adapters (CLI Option -d)” on page 4-11.

## -edchap
### (Edit a CHAP Entry)

To change the value of the specified CHAP entry, enter the `-edchap` command as follows:

```
-edchap <hba_port_inst> <CHAP> <Parameter> | <Parameter Alias>
<Value> [<Parameter> | <Parameter Alias> <Value> ...]
```

You can repeat the <*Parameter*>|<*Parameter Alias*> <*Value*> parameter pair to change multiple values as shown in Table 5-2. Press ENTER after each entry.

***Table 5-2. CHAP Parameters***

| Parameter | Parameter Alias | Value |
|---|---|---|
| CHAPName | CNAME | character string |
| CHAPSecret | CSECRET | character string |
| CHAPBidi | CBIDI | on or off |

Issuing this command resets the HBA. For information on the interactive version of this command, "Edit a CHAP Entry (CLI Option -edchap)" on page 4-43.

## -ei)

To get information about errors and exit codes for non-interactive mode, enter the -ei command as follows (no parameters are required):

```
-ei
```

To view a list of non-interactive mode errors, see "Non-interactive Mode Error Codes" on page D-5.

## -f
## (Update Firmware Image—Specific HBA)

The firmware runs the tasks involved in data management, the iSCSI protocol, and general HBA functioning. Use the -f command to update the firmware image. For information on firmware file names, see Appendix E Downloadable File Names.

To update the HBA firmware from a specified file, enter the -f command as follows:

```
-f <hba_port_inst> <file name>
```

Both parameters are required. The <*hba_port_inst*> is the HBA to update. The <*file name*> is the file containing the firmware image to upload to the HBA. Be sure to use full path names. Issuing this command resets the HBA.

For information on the interactive version of this command, see "Update Firmware Image (CLI Option -f)" on page 4-13.

## -fa
## (Update Firmware Image—All HBAs)

To update the firmware for all HBAs for which the image is appropriate, enter the -fa command as follows:

```
-fa <Filename>
```

For example if the image is for a QLA4010, all QLA4010s are updated, and no other HBAs. (Newer images may be appropriate for both QLA405x and QLA406x type HBAs.) Issuing this command resets all updated HBAs.

For information on the interactive version of this command, see "Update Firmware Image (CLI Option -f)" on page 4-13.

## -g
### (Display General System Information)

To view general system information, enter the `-g` command as follows:

```
-g
```

SANsurfer iSCSI HBA CLI shows the following:

- Host name
- Host version
- Host type
- User type

For information on the interactive version of this command, see "Display General System Information (CLI Option -g)" on page 4-9.

## -gcr
### (Retrieve FW Crash Record)

To get crash record information for the specified HBA port, enter the `-gcr` command as follows:

```
-gcr <hba_port_inst> <Crash Output File>
```

For information on the interactive version of this command, see "Retrieve FW Crash Record (CLI Option -gcr)" on page 4-15.

## -h
### (Help)

To view the SANsurfer iSCSI HBA CLI help file, enter the `-h` command as follows:

```
-h
```

For convenience, you can send the output to a file for easier viewing or printing as follows:

```
Iscli -h >file.txt
```

For information on the interactive version of this command, see "Help (CLI Option -h)" on page 4-49.

## -i
## (List All QLogic iSCSI HBA Ports Detected)

Use the `-i` command to view a list of all detected HBA port instances (“ports”) in the system. Each port instance *(hba_port_inst*) is identified by its number.

To view general HBA information, enter the `-i` command as follows:

`-i [hba_port_inst]`

When you use *`hba_port_inst`*, information for only that HBA port instance is shown. When you do not use *`hba_port_inst`*, information for all ports in the system is shown.

The following HBA (port) information is shown:

- Item number (order in which ports were detected)
- HBA number, that is, the number of this HBA in the detection process
- HBA port number (0 or 1) for this HBA
- Port instance number in the system (two-port HBAs appear twice)
- Port Instance on the HBA
- HBA model number (for example, QLA4010)
- HBA serial number (for example, TFC0105C51704)
- Firmware version (for example, 3.0.1.45)
- Connection medium
- IP address (IP address of the HBA port instance)
- iSCSI name (HBA port iSCSI name; the QLogic default name or one you assign)
- Alias (HBA port instance iSCSI alias name that you assign)

Figure 5-1 shows how to read the display.

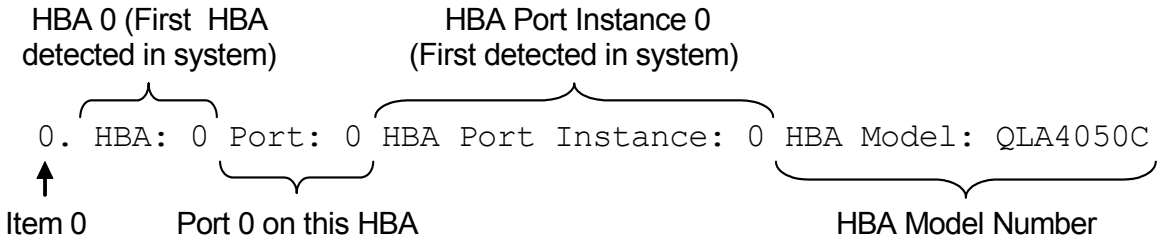


***Figure 5-1 HBA Port Information***

The following shows an example of how the HBA port information might appear:

```
0.    HBA 0 Port: 0 HBA Port Instance: 0 HBA Model: QLA4050C
      HBA Serial Number: FS20525B03135    FW Version: 2.2.4.45   Type: Copper
      IP Address: 192.168.3.7
      Alias:
      iSCSI name: iqn.2000-04.com.qlogic.fs10506a02810.1

1.    HBA 1 Port: 0 HBA Port Instance: 1 HBA Model: QLA4062C
      HBA Serial Number: AS40637A04673    FW Version: 3.0.1.18   Type: Copper
      IP Address: 192.168.3.22
      Alias:
      iSCSI name: iqn.2000-04.com.qlogic.as10506a02810.1

2.    HBA 1 Port: 1 HBA Port Instance: 2 HBA Model: QLA4062C
      HBA Serial Number: AS40637A04673    FW Version: 3.0.1.18   Type: Copper
      IP Address: 192.168.3.38
      Alias:
      iSCSI name: iqn.2000-04.com.qlogic.as10506a02810.1

3.    HBA 2 Port: 0 HBA Port Instance: 3 HBA Model: QLA4010
      HBA Serial Number: FS20407B03135    FW Version: 3.0.1.17   Type: Copper
      IP Address: 192.168.3.72
      Alias:
      iSCSI name: iqn.1991-05.com.microsoft.steinway.qlogic.org
```

For information on the interactive version of this command, see "List All QLogic iSCSI HBA Ports Detected (CLI Option -i)" on page 4-48.

# -import
## (Import HBA Configuration)

To import an HBA configuration from a file (see "-save (Save Host Configuration)" on page 5-28), enter the `-import` command as follows:

`-import <hba_no_target> <hba_no_Source> [A] [F N I T C B] <File Name>`

Where:

- `<hba_port_inst>` = The specific HBA to which the data is written
- `<hba_port_inst_source>` = The file with the HBA configuration you want.
- `A` = Configure all imported parameters (F, N, I, T, C, B).
- `F` = Configure the firmware.
- `N` = Configure the network parameters.

I = Configure the iSCSI name.

T = Configure the targets.

C = Configure the CHAP table.

B = Configure the boot parameters. (only valid when T [targets] parameter is also specified).

Filename = The XML file with the HBA configuration. See "-save (Save Host Configuration)" on page 5-28).

For information on the interactive version of this command, see "Import HBA Configuration (CLI Option -import)" on page 4-10.

# -ipdhcp
## (Configure IP Settings)

To set the HBA to get its IP address, subnet mask, and gateway from the DHCP server, enter the `-ipdhcp` command as follows:

`-ipdhcp <hba_port_inst> [-option]`

If the HBA port had prior values set manually, the DHCP values replace them.

Where `[option]` includes:

-DISN4 = Disable IPv4 network

-IPV4DHCP = Set DHCP ON

-IP = Set IP Address

-IPNM = Set IP Netmask

-IPGW = Set IP Gateway

-DISN6 = Disable IPv6 Network Setup

-IPLLA = Set Local link Address Automatically

-IPLL = Set Local link Address Manually

-IPRA = Set IPR0 and IPR1 Automatically

-IPR0 = Set Routable Address 0 Manually

-IPR1 = Set Routable Address 1 Manually

-IPRAA = Set Router Address Automatically

-IPRR = Set Router Address Manually

For information on the interactive version of this command, see "Configure IP Settings (CLI Option -ipdhcp)" on page 4-21.

# -isns
## (Configure iSNS Settings)

To configure the iSNS settings for QLA4010 and QLA405*x*, enter the `-isns` command as follows:

```
-isns <hba_port_inst> [iSNS IP Address] [iSNSPORT <port_number>]
```

If you do not specify the `[iSNS IP Address]` parameter, the command disables the iSNS client on the specified HBA port.

Issuing this command resets the HBA.

For information on the interactive version of this command, see "iSNS Settings (CLI Option -isns)" on page 4-21.

## -isns6
### (iSNS Settings)

To configure the iSNS settings for IPv6 (QLE406*x* and newer), enter the `-isns6` command as follows:

```
-isns <hba_port_inst> [iSNS IPv6-or-IPv4 Address] [-iSNSPORT
<port_number>]
```

If you do not specify the `[iSNS IP Address]` parameter, this command disables the iSNS client on the specified HBA port.

Issuing this command resets the HBA.

For information on the interactive version of this command, see "iSNS Settings (CLI Option -isns)" on page 4-21.

## -l
### (List LUN Information)

Use the `-l` command to view the following information about LUNs attached to the selected target:

- HBA/Target/LUN number
- Vendor name
- Product ID
- Product revision
- LUN size

You can view this information for a specific LUN or for all LUNs attached to the selected target.

To list the LUN information, enter the `-l` command as follows:

```
-l <hba_port_inst> <Target ID [LUN ID]>
```

If you do not include the *`LUN ID`* parameter, all the LUNs on the specified target are shown.

For information on the interactive version of this command, see "List LUN Information (CLI Option -l)" on page 4-47.

# -lb
## (Perform Loopback Test)

***CAUTION!***

Before doing a loopback test, ensure that the HBA does not have any outstanding I/O operations.

To run a loopback test, enter the `-lb` command as follows:

`-lb <hba_port_inst> [-STOP] [-EXTLB] [-CNT <Test Count>]`

Where:

| | | |
|---|---|---|
| *hba_port_inst* | = | The HBA port where you do the loopback test. |
| -STOP | = | The loopback test stops if a failure occurs. |
| -EXTLB | = | Runs an external loopback test. By default, runs an internal loopback test. |
| -CNT | = | Used with *Test Count* to say how many loopback tests to run. Default is 1. |
| *Test Count* | = | The number of loopback tests to run. One is the default. To run more than one test, enter a number between 2–(2^31). |

For information on the interactive version of this command, see “Perform Loopback Test (CLI Option -lb)” on page 4-31.

# -lc
## (Configure Link Configuration)

To configure the link settings, enter the `-lc` command as follows:

`-lc <hba_port_inst>`

The optional parameters are auto-negotiate `[-AUTONEG]`, link speed `[-LNKSPD]`, and flow control `[-FLOW]`. With auto-negotiate on, no entries should be provided for link speed. For a copper connection and auto-negotiate off, a link speed of 100 or 10 must be provided. For a fiber connection, the link speed is always 1000 Mbs. The optional parameter `[-FLOW]` will turn on or off flow control.

# -lcd
## (Display Configured Link Configuration)

To display the configured link settings, enter the -lcd command. Note that because a system reset is required for changes in link configuration to take effect, the settings shown here may be different than the operating link configuration.

# -linkchap
## (Assign a CHAP Entry to a Target)

To link a CHAP entry to a target, enter the `-linkchap` command as follows:

```
-linkchap <hba_port_inst> <CHAP No.> <Target ID>
```

This command does *not* reset the HBA.

For information on the interactive version of this command "Assign a CHAP Entry to a Target (CLI Option -linkchap)" on page 4-42.

# -lp

The IPv6 local prefix list is created based on prefix information from router advertisements. Destination IP addresses containing these prefixes can be reached directly, without going through an intermediate router.

To display the local prefix list, enter the `-lp` command as follows:

```
-lp <hba_port_inst>
```

There is no corresponding interactive mode option for this command.

# -model

To view the HBA "model(s)" (board type[s]) in the system, enter the `-model` command as follows:

```
-model
```

There is no corresponding interactive mode option for this command.

# -n
## (Configure iSCSI Settings)

To set to HBA iSCSI parameters for single port HBAs, enter the `-n` command as follows:

```
-n <HBA No.> <Config Name|Config Alias> <Value>
[<Config Name|Config Alias> <Value> ...]
```

After you issue this command, the HBA is reset.

You can repeat the `<Config Name|Config Alias> <Value>` parameter set for as many parameters as you want to configure. Table 5-3 lists these parameters and their ranges of values.

***Table 5-3. HBA Parameters***

| Configuration Name | Configuration Alias | Value |
|---|---|---|
| **Add Firmware Options** | | |
| AFW_AutoConnect | AFWAC | on or off |

*Table 5-3. HBA Parameters (Continued)*

| Configuration Name | Configuration Alias | Value |
|---|---|---|
| AFW_Device_Timeout | AFWDT | on or off |
| AFW_Delayed_Ack | AFWDACK | on or off |
| ExeThrottle | ET | 0–32767 |
| FirstBurstLen | FB | 0–32767 |
| **IP Options** | | |
| IP_ARP_Redirect | IPARP | on or off |
| IP_Address | IPAD | IP address format |
| IP_Subnet_Mask | IPSM | IP address format |
| IP_Gateway | IPGW | IP address format |
| **iSCSI Options** | | |
| Force_Negotiate_Main_iSCSI_Keys | | |
| iSCSI_Alias | IALS | on or off |
| iSCSI_Data_Digests | IDD | on or off |
| iSCSI_Discovery_Logout | ID | on or off |
| iSCSI_Header_Digests | IHD | on or off |
| iSCSI_Immediate_Data | IID | on or off |
| iSCSI_Initial_R2T | IIR2T | on or off |
| iSCSI_Snack | ISNACK | on or off |
| iSCSI_Strict_Login | IS | on or off |
| **TCP Options** | | |
| TCP_Auto_Discovery | SLPADIS | on or off |
| TCP_DHCP | TCPDHCP | on or off |
| TCP_Nagle | TCPN | on or off |
| TCPMaxWindowSize | TCPMWS | 1000h–FFFFh |
| TCP_Time_Stamp | TCPTMS | on or off |
| **Miscellaneous Options** | | |

*Table 5-3. HBA Parameters (Continued)*

| Configuration Name | Configuration Alias | Value |
|---|---|---|
| KeepAliveTO | KATO | 0–65535 |
| Large_Frames | LRGFRM | on or off[a] |
| MaxBurstLen | MBL | 0–65535 |
| MaxOutstandingR2T | MOR2T | 0–65535 |

[a] Not for QLA4010

For information on the interactive version of this command, see "Configure iSCSI Settings (CLI Options -n and -nh)" on page 4-24.

## -nc
### (Display Neighbor Cache)

To display the neighbor cache (IPv6 only), enter the `-nc` command as follows:

```
-nc <hba_port_inst>
```

For information on the interactive version of this command, see "Display Neighbor Cache (IPv6) (CLI Option -nc)" on page 4-33.

## -netconf
### (Configure IPv6 Settings)

To configure the network settings, enter the `-netconf` command as follows:

```
-netconf <hba_port_inst> [-IP <IP Address>] [-IPNM <Subnet Mask>]
[-IPGW <Gateway IP Address>]
```

Where:

`IP <IP Address>` = Sets the IP address of the HBA.
`IPNM <Subnet Mask>` = Sets the subnet mask of the HBA.
`-IPGW <Gateway Address>` = Sets the gateway.
`-DISN4` = Disables IPv4 network setup.
`-IPv4DHCP` = Sets DHCP on.

Setting the IP address, subnet mask, or gateway turns off DHCP address resolution for the IP configuration, if it is on.

For information on the interactive version of this command, see "Configure IPv6 Settings (CLI Options -netconf, -netconf6, -isns, -isns6, -ip, and -nc)" on page 4-27.

# -netconf6
## (Configure IPv6 Settings)

To manually configure the IPv6 network settings, enter the `-netconf6` command as follows:

`-netconf6 <hba_port_inst> [-IP <IPv6 Address>] [-IPNM <Subnet Mask><IPv6>] [-IPGW <Gateway Address>]`

Where `[option]` includes the following:

`IP <IP Address>` = Sets the IP address of the HBA.

`-IPNM <Subnet Mask>` = Sets the subnet mask of the HBA.

`-IPGW <Gateway Address>` = Sets the gateway.

`-DISN4` = Disables IPv4 network setup [a]

`-IPV4DHCP` = Set DHCP ON [b]

`-IP` = Set IP Address

`-IPNM` = Set IP Netmask

`-IPGW` = Set IP Gateway

`-DISN6` = Disable IPv6 Network Setup [c]

`-IPLLA` = Set Local link Address Automatically [d]

`-IPLL` = Set Local link Address Manually [d]

`-IPR01A` = Set IPR0 and IPR1 Automatically [e]

`-IPR0` = Set Routable Address 0 Manually [e]

`-IPR1` = Set Routable Address 1 Manually [e]

`-IPRRA` = Set Router Address Automatically [f]

`-IPRR` = Set Router Address Manually [f]

Table Footnotes

[a] Mutually exclusive with the other IPv4 commands

[b] Mutually exclusive with -IP/-IPNM/IPGW

[c] Mutually exclusive with -IPLLA/-IPLL

[d] Manual or automatic—mutually exclusive

[e] Manual or automatic—mutually exclusive

[f] Manual or automatic—mutually exclusive

Setting the IP address, subnet mask, or gateway turns off DHCP address resolution for the IP configuration, if it is on. Some examples of usage follow.

To set only the local link address, enter the following:

```
-netconf6 0 -IPLL fe80::1
```

To set everything automatically, enter the following:

```
-netconf6 0 -IPLLA -IPR01A -IPRRA
```

To disable the IPv4 network, enter the following:

```
-netconf6 0 -DISN4
```

To disables the IPv4 and IPv6 networks:

```
-netconf6 0 -DISN4 DISN6
```

For information on the interactive version of this command, see “Configure IPv6 Settings (CLI Options -netconf, -netconf6, -isns, -isns6, -ip, and -nc)” on page 4-27.

## -nh
### (Configure iSCSI Settings)

To set the HBA level parameters for multiport HBAs, enter the `-nh` command as follows:

```
-nh <hba_port_inst> <Config name | Config alias> <Value>
[<<Config name | Config alias>> <Value> ...]
```

The valid parameters and their values are shown in Table 5-3. For a complete list of HBA parameters, see Appendix C Target Parameters.

For information on the interactive version of this command, see “Configure iSCSI Settings (CLI Options -n and -nh)” on page 4-24.

## -pa
### (Add a Target)

To add persistent targets, enter the `-pa` command as follows:

```
-pa <hba_port_inst> <IP Address> [-PORT port number] [-INAME iSCSI
Name]
```

If you do not specify a port number `[-PORT port number]`, SANsurfer iSCSI HBA CLI uses the default number 3260. If you do not specify an iSCSI name, `[-INAME iSCSI Name]` SANsurfer iSCSI HBA CLI uses the default value, an empty string.

For information on the interactive version of this command, see “Add a Target (CLI Option -pa)” on page 4-40.

## -pad

To view all targets for a port, enter the `-pad` commands as follows:

`-pad <hba_port_inst>`

## -pb
### (Bind Target)

Enter the `-pb` command to bind a target (make it persistent):

`-pb <hba_port_inst> <Target ID>`

For information on the interactive version of this command, see “Bind Target (CLI Option -pb)” on page 4-39.

## -pbootcode
### (Set Primary Boot Target Information)

To set the primary bootcode boot target and LUN, enter the `-pbootcode` command as follows:

`-pbootcode <hba_port_inst> <tgt> <lun>`

This command is not active for the PPC.

For information on the interactive version of this command see “Set Primary Boot Target Information (CLI Option -pbootcode)” on page 4-35.

For information on secondary boot code, see “-sbootcode (Set Secondary Boot Target Information)” on page 5-29.

## -pdt

To disable a target, enter the `-pdt` command as follows:

`-pdt <hba_port_inst> <targetId>`

## -pet

To enable a target, enter the `-pet` command as follows:

`-pet <hba_port_inst> <targetId>`

## -pinfo
### (Port Information)

To view port information for the specified HBA, enter the `-pinfo` command as follows:

`-pinfo <hba_port_inst>`

For information on the interactive version of this command see “Port Link Settings Menu” on page 4-19.

# -ping
## (Ping Target)

To ping the target device specified IP address, enter the `-ping` command as follows:

`-ping <hba_port_inst> <IP Address> <Ping Count> <Packet size> <IPv6 source address>`

The following provides the *IPv6 source address* values:

0 = Do Not Care
1 = Local Link
2 = Address 0
3 = Address 1

Where:

*hba_port_inst* = The HBA port that sends the ping.
*IP Address* = The IP address to pin.
*Ping Count* = The number of ping packets you want (1–[2^31]).
*Packet Size* = The size of the ping packet 0-64kB
*IPv6 Source Address* = Origin device

For information on the interactive version of this command, see "Ping Target (CLI Option -ping)" on page 4-30.

# -ps

To view persistent targets for the HBA port, enter the `-ps` command as follows:

`-ps <hba_port_inst> [Target ID]`

If you do not specify the *[Target ID]*, SANsurfer iSCSI HBA CLI displays all targets for the specified HBA port number. If you do not specify the port instance *[hba_port_inst]* nor the Target ID, *[Target ID]*, SANsurfer iSCSI HBA CLI displays all target IDs for all HBA ports in the system.

There is no interactive command for this function.

# -pu

To unbind a persistent target, enter the `-pu` command as follows:

`-pu <hba_port_inst> <Target ID>`

## -px

To unbind all persistent targets on the HBA, enter the `-px` command as follows:

```
-px <hba_port_inst>
```

## -r
## (Update ROM Image)

For information on ROM image file names, refer to Appendix E Downloadable File Names.

***CAUTION!***

- Before attempting to update the ROM image contact QLogic Customer Support.
- Before updating the ROM image, ensure that no I/O processes are running.
- An administrator must take necessary actions to ensure changes will be fully recognized by the operating system (reboot, flush cache, sync disk, and so forth).
- A ROM update and reset will be performed that requires that all applications accessing impacted LUNs must be shut down.
- Any impacted systems must be unmounted.

Be sure to select **Save changes and reset HBA** afterwards; otherwise, the change will not take effect.

Type the following command to update the specified HBA's ROM:

```
-r <hba_port_inst> <File Name>
```

The <*hba_port_inst*> parameter is the HBA instance to update. The <*File Name*> parameter indicates the file containing the ROM image to upload.

For information on the interactive version of this command, see "Update ROM Image (CLI Option -r)" on page 4-14.

## -rdf

Enter the `-rdf` command to restore the specified HBA port's firmware values to the factory default values:

```
-rdf <hba_port_inst>
```

Issuing this command resets the HBA.

There is no interactive command for this function.

# -rdh
## (Port Restore Factory Defaults)

***NOTE:***

The `-rdh` command is not supported in the QLA4010 HBA.

Type the following command to restore the specified HBA port's settings to their factory defaults:

`-rdh <hba_port_inst> [A] [F N I T C V]`

Where:

`hba_port_inst` = HBA port whose factory settings you want to restore.

`A` = Restores the factory settings for the entire HBA (firmware parameters, network parameters, iSCSI name, targets, CHAP table, NVARAM, and IPSec).

Issuing this command resets the HBA. If you use this option, no others are necessary.

`F` = Restores firmware parameters to the factory default values.

Issuing this command resets the HBA.

`N` = Restores network parameters to the factory default values.

Issuing this command resets the HBA.

`I` = Restores the iSCSI name to the factory default value.

Issuing this command resets the HBA.

`T` = Restores the targets to the factory default values.

`C` = Restores the CHAP table to the factory default values.

`V` = Restores the NVRAM to the factory default values.

If you want to restore all areas of the HBA port, either use the `A` parameter, or use no parameter. Otherwise, specify which areas to restore. For example, the following command restores the firmware and NVRAM to the factory defaults:

`-rdh <hba_port_inst> F N`

For information on the interactive version of this command, see "Port Restore Factory Defaults (CLI Option -rdh)" on page 4-28.

# -rwt
## (Perform Read/Write Buffer Test)

***CAUTION!***

Before doing a read/write buffer test, make sure that the HBA does not have any outstanding I/O operations.

The read/write buffer test writes an 8- or 16-byte pattern to the disk's buffer and reads the written buffer back. It is non-destructive to disk data.

To do a read/write buffer test, enter the `-rwt` command as follows:

`-rwt <hba_port_inst> [-STOP] [-RWPAT n] [-CNT <Test Count>]`

Where:

| | | |
|---|---|---|
| `-STOP` | = | Stops the test if a failure occurs. |
| `-RWPAT n` | = | Sets the pattern to write to the buffer, one of the following:<br>*n* = 1 (8 bytes of 0x55h) (default)<br>*n* = 2 (8 bytes of 0x5Ah)<br>*n* = 3 (16 bytes of 0xAAh)<br>*n* = 4 (16 bytes of 0xFFh) |
| *hba_port_inst* | = | The HBA port tested. |
| `-CNT` | = | Used with *Test Count* to set the number of tests, with one test as default. |
| *Test Count* | = | The number of tests to do, with one as default. Enter a number between 2–(2^31) for more than one test. |

To continue, press `ENTER`.

For information on the interactive version of this command see "Perform Read/Write Buffer Test (CLI Option -rwt)" on page 4-31.

# -save
## (Save Host Configuration)

To save the configuration (in XML) of all HBAs detected, enter the `-save` command as follows:

`-save <File Name>`

For information on the interactive version of this command, see "Save Host Configuration (CLI Option -save)" on page 4-9.

# -sbootcode
## (Set Secondary Boot Target Information)

To set the secondary boot target and LUN, enter the `-sbootcode` command as follows:

`-sbootcode <hba_port_inst> <Boot Target> <Boot LUN>`

Issuing this command saves the configuration data to an XML file portable to all platforms supported by iSCSI. This command is not active for PPC.

For information on the interactive version of this command, see “Set Secondary Boot Target Information (CLI Option -sbootcode)” on page 4-35.

For primary boot code, see “-pbootcode (Set Primary Boot Target Information)” on page 5-24.

# -sbootcodecid
## (Set Alternative Client ID)

To set the alternative client ID (seven characters maximum), enter the `-sbootcodecid` command as follows:

`-sbootcodecid <hba_port_inst> <Alternative Client ID>`
This command is not active for the Power PC (PPC).

For information on the interactive version of this command, see “Set Alternative Client ID (CLI Option -sbootcodecid)” on page 4-36.

# -sdmrc

To return the SDM library return code, enter the `-sdmrc` command as follows:

`-sdmrc [Simple_Pattern]`

When `[simple pattern]` is given, only the lines containing that string are printed.

There is no corresponding interactive command for this function.

# -sreset
## (Reset Statistics)

To reset statistics to zero and count from this point forward, enter the `-sreset` command.

# -stadd

To add a send target for discovery, enter the `-stadd` command as follows:

`-stadd <hba_port_inst> <ip address> [chapIndex] [<TGBCA> <value>]`

Where `<value>` can be **`on`** or **`off`**; **`on`** causes the send target login to require bi-directional CHAP.

## -stat
### (Display Port Statistics)

To view the port statistics for the specified HBA, enter the `-stat` command as follows:

```
-stat <hba_port_inst>
```

For a list of the statistics that are displayed and information on the interactive version of this command, see “Display Port Statistics (CLI Option -stat)” on page 4-32.

## -stathba

To displays HBA level statistics, enter the `-stathba` command as follows:

```
-stathba <hba_port_inst>
```

## -stdsp

To view the send targets, enter the `-stdsp` command as follows:

```
-stdsp <hba_port_inst>
```

## -strd

To execute a rediscovery of targets for the specified send target, enter the `-strd` command as follows:

```
-strd <hba_port_inst> <target_instance>
```

To obtain the target instance, use the `-dtdsp` command.

## -strem

To remove the specified send target, enter the `-strem` command as follows:

```
-strem <hba_port_inst> <target_instance>
```

To obtain the target instance, use the `-dtdsp` command.

## -strema

To removes all send targets, enter the `-strema` command as follows:

```
-strema <hba_port_inst> <target_instance>
```

## -t
### (Display Target Information)

To view target information, enter the `-t` command as follows:

```
-t <hba_port_inst> [Target ID]
```

If you only specify the <hba_port_inst> parameter, SANsurfer iSCSI HBA CLI displays target information for all targets on the specified HBA port. If you specify the optional parameter [Target ID], SANsurfer iSCSI HBA CLI displays information on the specified target only. This includes both persistent and dynamic targets.

For information on the interactive version of this command, see "Display Target Information (CLI Option -t)" on page 4-37.

## -tc
### (Configure Target Parameters)

To set target parameter settings, use the -tc command. For a list of target parameters you can configure, enter the following:

```
-tc <hba_port_inst> < Target_ID > <config_name | config_alias>
<value> <config_name | config_alias> <value>
```

For information on the interactive version of this command, see "Configure Target Parameters (CLI Option -tc)" on page 4-39.

## -tp

To see information stored in Flash memory about persistent targets, enter the -tp command. If you enter only the HBA port instance number, SANsurfer iSCSI HBA CLI returns information for all targets of that HBA port instance. If you enter the optional Target ID, SANsurfer iSCSI HBA CLI returns information for that target only, for example:

```
-tc <hba_port_inst> <Target_ID>
```

There is no corresponding interactive command for this function.

For a list of target parameters, see Appendix C Target Parameters.

## -ts

To see summary information about both persistent and non-persistent targets, enter the -ts command as follows:

```
-ts [hba_port_inst] [Target_ID]
```

There is no corresponding interactive command for this function.

## -ver
### (Display Program Version Information)

To view the SANsurfer iSCSI HBA CLI program version, enter the -ver command as follows:

```
-ver
```

For information on the interactive version of this command “Display Program Version Information (CLI Option -ver)” on page 4-8.

## -vpd
### (Display VPD Information)

To view Vital Product Data (VPD), enter the `-vpd` command as follows:

```
-vpd <hba_port_inst>
```

(No parameters) = Displays all targets on all HBAs

[*hba_port_inst*] = Displays info for all targets on HBA

[*Target ID*] = Displays info for that target only.

Available VPD information varies by HBA manufacturer. For information on the interactive version of this command, see “Display VPD Information (CLI Option -vpd)” on page 4-18.

## -z

To export all useful data to file for use by QLogic Technical Support, enter the `-z` command.

# A Port- and HBA-level Parameters

The tables in this appendix list the following types of SANsurfer iSCSI HBA CLI parameters:

- Port-level Parameters
- HBA-level Parameters (see page A-10)

## Port-level Parameters

Table A-1 lists the HBA port firmware parameters and their values. To view all parameters, both configurable and non-configurable (read-only), use the `-c` option in non-interactive mode. To edit configurable parameters, use the `-n` option in non-interactive mode.

***NOTE:***

The parameters in this table are sorted alphabetically for ease of use.

***Table A-1. Port Settings***

| Parameter | Value | Alias | Description |
|---|---|---|---|
| AFW_AutoConnect | on, off | AFWC | When on, the HBA will not try to autoconnect to the configured targets at boot time. Instead, the host must issue Set Device Database Entry commands (0063h) to establish connections to targets. |
| AFW_Delayed_Ack | on, off | AFDACK | Determines what occurs when the HBA receives a Data-In PDU with the Final bit set and no status reported. When on, the HBA sends a TCP acknowledgment immediately (this is the default value). When this parameter is off, the HBA delays the acknowledgment and waits for more data. |
| AFW_Device_Timeout | on, off | AFWDT | When on, the HBA firmware ignores the IOCB command timeout values specified by the host. |

*Table A-1. Port Settings (Continued)*

| Parameter | Value | Alias | Description |
|---|---|---|---|
| AFW_Serlz_Task_Mngmt | on, off | AFWSTM | When enabled, the firmware will serialize all Immediate task management function requests (SCSI) such that only one Immediate task management command is outstanding to the target at a time. |
| Default_IPv6_Router | IPv6 address | IPRR | IPv6 address format |
| DefaultTime2Retain[a] | 0–65535 seconds | n/a | This parameter indicates the maximum logout time (in seconds) the HBA uses when negotiating with a target device during login. |
| DefaultTime2Wait[a] | 0–65535 seconds | n/a | This parameter indicates the minimum logout time (in seconds) the HBA uses when negotiating with a target device during login. |
| Enable_4022IPv4 | on, off | E4022IPV4 | Enables use of IPv4 on a 4022 board (applies to 405*x* and 406*x* HBAs). |
| Enable_IPv4 | on, off | EIPV4 | Enables use of IPv4 |
| Enable_IPv6 | on, off | EIPV6 | Enables use of IPv6 |
| ExeThrottle | 0–32767 | ET | Specifies the execution throttle value. The execution throttle is used by the firmware to limit the number of concurrently executing commands. |
| FirstBurstLen | 0–3267 units | FB | Indicates the maximum length for unsolicited data. The HBA uses this information when negotiating with a target device during login. This parameter indicates how many units (512 bytes/unit) of unsolicited data the HBA can send/receive. A value of 0 indicates unlimited data units. |
| Force_Negotiate_Main_iSCSI_Keys | on, off | FNMIK | 405x and 406x only. iSCSI keys (defined in iSCSI spec) that targets are forced to negotiate. |
| FW_Accept_AEN[a] | on, off | n/a | When on and the HBA is a target, generates an asynchronous target device database change when a new connection is accepted. |
| FW_Access_Control[a] | on, off | n/a | When on, the HBA will not enter iSCSI full- feature mode with an initiator until the target driver authorizes the initiator. |

*Table A-1. Port Settings (Continued)*

| Parameter | Value | Alias | Description |
|---|---|---|---|
| FW_Fast_Posting[a] | on, off | n/a | When on, allows posting SCSI command completions for multiple SCSI commands during a single system interrupt. |
| FW_Initiator_Mode[a] | on, off | n/a | When on, the HBA is in initiator mode. |
| FW_Marker[a] | on, off | n/a | When on does not require a marker IOCB to resume IOCB processing after a task management mailbox command. When off, the HBA rejects any IOCB for a target device affected by a task management command until the driver issues a marker IOCB to synchronize the SCSI request queue between the HBA and the driver. |
| FW_Sense_Buffer_Desc[a] | on, off | n/a | When on, the HBA expects the last data segment descriptor of the data descriptor list associated with a Command Type 3 IOCB to be a descriptor of a sense buffer.<br>When off, the HBA passes any sense data from the target in a status IOCB. |
| FW_ZIO_Enable_Mode | on, off | ZIOE | Enables Zero Interrupt Operation (ZIO) mode. When on, the firmware minimizes the number of interrupts it generates to the host driver while it continues to post completions to the queue. When the ZIO count threshold is reached, the firmware interrupts the host driver to notify it that the queue must be drained. When an I/O completes before the ZIO count threshold, the host driver is interrupted so it can drain all the I/O completions from the queue. |
| IP_Address | IPv4 address | IPAD | Target IP address. |
| IP_ARP_Redirect | on, off | IPARP | When on, MAC addresses are discovered and bound to IP addresses for hosts to which the HBA wants to talk. |
| IP_Fragmentation[a] | on, off | n/a | When on, the HBA cannot fragment IP datagrams. When this parameter is off, the HBA fragments IP datagrams as necessary. |
| IP_Gateway | IPv4 address | IPGW | IP address of the gateway available to the HBA. |
| IP_Subnet_Mask | IPv4 address | IPSM | HBA subnet mask *xxx.xxx.xxx.xxx*. |

*Table A-1. Port Settings (Continued)*

| Parameter | Value | Alias | Description |
|---|---|---|---|
| IPv4_TOS_Enable | on, off | TOS_ ENABLE | IPv4 type of service QLA405*x* and QLE406*x* only. |
| IPv4_TOS | 0–255 | IPV4TOS | Controls the value of the type of service (TOS) field of IPv4 headers transmitted by the firmware on iSCSI connections. The firmware uses the value when transmitting IPv4 TCP packets on iSCSI connections. |
| IPv4_TTL | 0–255 | IPV4TTL | Time-to-Live (in hops). Each router decrements TTL before transmitting it. Router discards the datagram when TTL = zero. |
| IPv6_MCast_Listnr_ Disco_Enable | on, off | IPV6MLDEN | When enabled, the firmware supports the IPv6 Multicast Listener Discovery (MLDv1) protocol by sending MLD Listener Report and Listener Done messages. When disabled, the firmware firmware does not support the MLD protocol. |
| IPv6_Addr_Local_Link | IPv6 address | IPLL | Contains the IPv6 link local address. |
| IPv6_Addr_Routable0 | IPv6 address | IPR0 | Contains the IPv6 first manually-configured routable address. |
| IPv6_Addr_Routable1 | IPv6 address | IPR1 | Contains the IPv6 second manually-configured routable address. |
| IPv6_DAD_Count | 0–255 | IPV6DAD | Specifies the count for the IPv6 Duplicate Address Detection (DAD) process. |
| IPv6_Gratuitious_Neighbor _Ad_Enable | on, off | IPv6GNAE | When enabled, the firmware issues a series of gratuitous neighbor advertisement messages for its IP during initialization, when a valid IP address has been configured. |
| IPv6_Hop_Limit | 0–255[b] | IPV6HL | Specifies the IPv6 hop limit value to be used in IPv6 TCP packets transmitted from the firmware on iSCSI connections. Receiving an IPv6 router advertisement with a nonzero value in the current hop field will cause this field to be overwritten with the current hop limit advertised by the router. |

*Table A-1. Port Settings (Continued)*

| Parameter | Value | Alias | Description |
|---|---|---|---|
| IPv6_Nagle | on, off | TCPV6ND | When enabled, the firmware uses the Nagle algorithm. When disabled, the firmware disables the Nagle algorithm. (For a description of the Nagle algorithm, see *RFC 896—Congestion Control in IP/TCP Internetworks*.) |
| IPv6_ND_Reachable_ Timer | 0–4294967295[b] | IPV6NDRT | Specifies the time (in milliseconds) that a node assumes that the neighbor is reachable after confirmation. The configured value will be overwritten if an updated value is received in a router advertisement. |
| IPv6_ND_Retransmit_ Timer | 0–4294967295[b] | IPV6NDRET | Specifies the time (in milliseconds) between retransmitted neighbor solicitation messages. The configured value will be overwritten if an updated value is received in a router advertisement. |
| IPv6_ND_Stale_Timeout | 0–4294967295[b] | IPV6STO | Specifies the time (in milliseconds) after which a stale IPv6 neighbor cache entry is discarded. |
| IPv6_Port | 0–65535 | IPV6PORT | Specifies the default iSCSI target TCP port number for IPv6 connections. |
| IPv6_Redirect_Enable | on, off | PV6RDE | When enabled and neighbor advertisements are received, the connection table is examined and updated if any active connections match the IP address on the neighbor advertisement. This action is required for failover and redirect. A MAC address changed asynchronous event (801Bh) is issued. When disabled, the NCB table is not modified. No asynchronous event is issued. |
| IPv6_TCP_Time_Stamp | on, off | TCPV6TST | When this bit is set, the firmware negotiates to use time stamps in TCP headers. When this bit is cleared, the firmware does not use time stamps in TCP headers. |

*Table A-1. Port Settings (Continued)*

| Parameter | Value | Alias | Description |
|---|---|---|---|
| IPv6_TCP_Timer_Scale | 0–7 | TCPV6TS | Each TCP timer in the firmware is referenced to a local timer and is defined as a number of local timer ticks. The TCP Timer Scale bits are a scale factor that adjusts the time interval between timer ticks on a per connection basis. The scale factor allows for faster time-outs for connections running on a very small network, versus connections running on a very large network. The default value for this field is 3h. |
| IPv6_TCP_Window Scale | 0–14 | IPV6TCPWS | Specifies the TCP window scale factor to be negotiated on IPv6 connections. This field is similar to the IPv4 field, but applies to IPv6 connections. |
| IPv6_Traffic_Class | 0–255 | IPV6TC | Specifies the IPv6 traffic class value to be used in IPv6 TCP packets transmitted from the firmware on iSCSI connections. |
| IPv6_VLAN_Enable | on, off | IPV6VLANEN | When on, VLAN filtering is enabled for the HBA (IPv6 traffic only). |
| IPv6_VLAN_ID | 0–4095 | IP_V6VLANID | When the IPv6_VLAN_Enable parameter is on, this 12-bit ID (appended to inbound Ethernet frames) must match the ID configured for that interface. (IPv6 traffic only). |
| IPv6_VLAN_User_ Priority | 0–7 | IPV6VLANUP | When the IPv6_VLAN_Enable parameter is on, this 16-bit field is appended to outbound Ethernet frames for the TCP connection. (IPv6 traffic only). |
| iSCSI_Alias | string | IALS | Target iSCSI alias name. |
| iSCSI_BIDI_CHAP_ Auth[a] | on, off | n/a | When on, the (initiator) HBA sends a CHAP challenge to any target that has sent a CHAP challenge to the HBA. This bit is ignored if the iSCSI_CHAP_Auth parameter is off. |
| iSCSI_CHAP_Auth[a] | on, off | n/a | When on, the HBA Dos authentication (during the security stage of login). |
| iSCSI_Data_Digests | on, off | IDD | When on, iSCSi data with CRC protection can be transmitted. In addition, incoming iSCSI data is validated and CRC protection is removed. |

*Table A-1. Port Settings (Continued)*

| Parameter | Value | Alias | Description |
|---|---|---|---|
| iSCSI_Data_PDU_In_Order[a] | on, off | n/a | When on, the system driver reports the DataPDUInOrder value negotiated during login to the HBA firmware. |
| iSCSI_Data_Seq_In_Order[a] | on, of | n/a | When on, the system driver reports the DataSequenceInOrder value negotiated during login to the HBA firmware. |
| iSCSI_Discovery_Logout | on, off | ID | When on, the HBA initiates an iSCSI logout on a discovery session when discovery is complete (before closing the connection). When off, the HBA closes the TCP connection when discovery is complete. |
| iSCSI_Error_Recovery_Level[a] | on, off | n/a | When on, the HBA supports iSCSI error recovery level 0. At this level, the HBA closes a connection if it detects any errors. |
| iSCSI_Header_Digests | on, off | IHD | When on, iSCSi headers with CRC protection can be transmitted. In addition, incoming iSCSI headers are validated and CRC protection is removed. |
| iSCSI_Immediate_Data | on, off | IID | When on, the HBA firmware negotiates (during login phase) for Immediate Data=yes. When off, immediate data is disabled and the firmware negotiates for ImmediateData=no. |
| iSCSI_Initial_R2T | on, off | IIR2T | When on, the HBA negotiates (during login) for InitialR2T=yes. When off, initial R2T is disabled and the HBA negotiates for InitialR2T=no. |
| iSCSI_Send_Markers[a] | on, off | n/a | Not supported. |
| iSCSI_Snack | on, off | ISNACK | When on and the FW_Initiator_Mode parameter is on, the HBA firmware sends SNACK requests to the target when it detects missing PDUs. When off and the FW_Initiator_Mode parameter is on, the firmware aborts the command and/or closes the connection when missing PDUs are detected. |
| iSCSI_Strict_Login | on, off | IS | When on, the HBA adheres to the iSCSI login rules, and therefore cannot operate with targets that do not conform to these rules. When off, the iSCSI login rules are relaxed, and the HBA can operate with targets that do not conform to these rules. |

*Table A-1. Port Settings (Continued)*

| Parameter | Value | Alias | Description |
|---|---|---|---|
| KeepAliveTO | 0–65535 seconds | KATO | This parameter indicates the time interval (in seconds) between connection keep-alive pings. When a connection is idle for the connection keep-alive timeout interval, the HBA sends an NOP ping to the other device (target) that is part of the connection. When the (target) device responds to the ping, the connection remains open. If the (target) device fails to respond, the HBA closes the connection and informs the driver that the connection has gone down. The maximum keep-alive time is 18 hours. |
| Large_Frames[a] | on, off | LRGFRM | (Not for QLA4010s) Defines the maximum Ethernet frame length. `On` sets for Jumbo (9kB max) frames. `Off` sets frame length to 1.5 KB. Determines when to fragment IP datagrams; larger frames are discarded. |
| LDROUTER_AUTO | on, off | LDRA | Local default router. Gets router address automatically. |
| LOC_LINK_AUTO | on, off | LOCLA | Local link auto. |
| MaxBurstLen | 0–32767 units[a] | MBL | Tells max length for data sequences the HBA uses when negotiating with a target device during login. Tells how many 512 byte units the HBA can send/receive. 0 means unlimited data units. |
| MaxOutstandingR2T | 1–65535 | MOR2T | Tells maximum number of outstanding R2Ts the HBA uses when negotiating during login. Tells how many R2Ts can be outstanding on a SCSI task. |
| MaxRxDataSegmentLen[a] | 0–65535 | n/a | Tells maximum data segment size (in 512-byte units) that the HBA can receive in one PDU. |
| Port[a] | 0–65535 | n/a | Gives the port number the HBA (as target) listens to for iSCSI connections. Ignored when the HBA is an initiator only. Default port = 3260. |
| ROUTABLE_AUTO | on, off | RAUTO | When on, the firmware will auto-configure routable addresses from the default router (if one is available) |

*Table A-1. Port Settings (Continued)*

| Parameter | Value | Alias | Description |
|---|---|---|---|
| Task_Management_ Timeout | 0–65535 | TMTO | Timeout value for various firmware operations. For example, timeout value is used for PDUs created and transmitted that are not related to IOCB and Task Management commands. |
| TCP_DHCP | on, off | TCPDHCP | When on, the HBA uses DHCP to get its IP address, gateway IP address, and subnet mask. |
| TCP_Nagle | on, off | TCPN | When on, uses Nagle algorithm. |
| TCP_Time_Stamp | on, off | TCPTMS | When on, puts a timestamp in every transmitted TCP segment. Receiver ACKs with timestamp so transmitter can calculate RTT and retransmissions. When off, RTT calculated on one outstanding segment at a time. |
| TCP_Timer_Scale[a] | — | n/a | Each TCP timer is a number of local timer ticks. This is a scale factor that adjusts the interval between timer ticks on each connection allowing faster timeouts on small networks. |
| TCP_Window_Scale | 0–14 | WINSCALE | TCP window scale. |
| VLAN_Enable | on, off | VLAN | When on, VLAN filtering is enabled for the HBA (IPv4 traffic only). |
| VLAN_ID | 0–4095 | VLANID | When the VLAN_Enable parameter is on, this 12-bit ID (appended to inbound Ethernet frames) must match the ID configured for that interface. (IPv4 traffic only). |
| VLAN_User_Priority | 0–7 | VLANUPRIOR | When the VLAN_Enable parameter is on, this 16-bit field is appended to outbound Ethernet frames for the TCP connection. (IPv4 traffic only). |
| ZIO | 2–16 | ZIO | Number of completions the firmware posts to the completion queue before interrupting the host driver to say there are items in the queue. Valid only when FW_ZIO_Enable_Mode is on. |

Table Footnotes

[a] Read-only parameter (alias is not applicable—”n/a”)

[b] Router may override this parameter

# HBA-level Parameters

Table A-2 lists the HBA parameters and their values. To view all HBA parameters, both configurable and non-configurable (read-only), use the `-ch` option in non-interactive mode. To edit configurable parameters, use the `-nh` option in non-interactive mode.

***NOTE:***

The parameters in this table are sorted alphabetically for ease of use.

***Table A-2. HBA Settings***

| Parameter | Value | Alias | Description |
|---|---|---|---|
| HBA_Alias | Character string | HBAALIAS | HBA alias name. Symbolic name you assign to the HBA for identification purposes. |
| HBA_Default_Fragment_Reass_Timeout | 40 to 600 (units are 1/10 secs) | HBADFRT | For QLE406*x* HBAs only. Default value for the IP Fragment Reassembly Timeout. |
| HBA_Delayed_ACK | on or off | HBADELACK | For QLE406*x* HBAs only. Determines what occurs when the HBA receives a Data-In PDU with the final bit set and no status reported. When on, the HBA immediately sends a TCP acknowledgment (this is the default value). When this parameter is off, the HBA delays the acknowledgment and waits for more data. |
| HBA_Reserved_TCP_Config | *(Request assistance from QLogic Support)* | HBARTCPC | For QLE406*x* HBAs only. A parameter with control bits for various TCP algorithms in the firmware. Do not modify without instruction of valid configuration values provided by QLogic. |
| HBA_TCP_MAX_Window_Size | 4096 to 65535 | HBATCPMWS | The maximum TCP Receive Window size in bytes. |

# B HBA Statistics

Table B-1 lists the HBA statistics shown when you select either the interactive mode **Display HBA Statistics** option (see page 4-32), or the non-interactive mode `-stat` command (see page 5-30).

***NOTE:***

The parameters in this table are sorted alphabetically for ease of use.

***Table B-1. HBA Statistics***

| Statistic Abbreviation | Meaning |
|---|---|
| ECCErrorCorrectionCount | ECC (error-correction count) |
| IPDatagramReassemblyCount | IP datagram reassembly count |
| IPFragment ReassemblyTimeout | IP fragment reassembly timeout |
| IPInvalidAddrErrorCount | IP invalid address error count |
| IPRxBytesCount | IP received byte count |
| IPRxFragmentOutOfOrderCount | IP received fragment out-of-order count |
| IPRxFragmentOverlapCount | IP received fragment overlap count |
| IPRxFragmentsCount | IP received fragment count |
| IPRxPacketErrorCount | IP received packet error count |
| IPRxPacketsCount | IP received packet count |
| IPTxBytesCount | IP transmitted byte count |
| IPTxFragmentsCount | IP transmitted fragment count |
| IPTxPacketsCount | IP transmitted packet count |
| IPv6DatagramReassembly | IPv6 datagram reassembly |
| IPv6DatagramreassemblyTO | IPv6 datagram reassembly time-out |
| IPv6ErrorPacketCount | IPv6 error packet count |
| IPv6FragRxOutOfOrderCount | IPv6 fragments received out-of-order count |

*Table B-1. HBA Statistics (Continued)*

| Statistic Abbreviation | Meaning |
|---|---|
| IPv6FragRxOverlapCount | IPv6 fragment received overlap count |
| IPv6InvalidAddressError | IPv6invalid address errors |
| IPv6RxByteCount | IPv6 received byte count |
| IPv6RxFragmentCount | IP v6 received fragments count |
| IPv6RxPacketsCount | IPv6 received packets count |
| IPv6TxByteCount | IPv6 transmitted byte count |
| IPv6TxFragmentCount | IPv6 transmitted fragment count |
| iSCSICompleteIOsCount | iSCSI I/Os completed count |
| iSCSIDataDigestErrorCount | iSCSI data digest error count |
| iSCSIFormatErrorCount | iSCSI format error count |
| iSCSIHeaderDigestCount | iSCSI header digest error count |
| iSCSIRxBytesCount | iSCSI data bytes received count |
| iSCSIRxPDUCount | iSCSI PDU received count |
| iSCSISeqErrorCount | iSCSI sequence error count |
| iSCSITxBytesCount | iSCSI data bytes transmitted count |
| iSCSITxPDUCount | iSCSI PDU transmitted count |
| iSCSIUnexpectedIORxCount | iSCSI unexpected I/O received count |
| MACCRCErrorCount | MAC CRC error count |
| MACEncodingErrorCount | MAC encoding error count |
| MACRxBroadcast | MAC received broadcast |
| MACRxBytesCount | MAC received byte count |
| MACRxCarrierSenseError | MAC received carrier sense errors |
| MACRxControlFrames | MAC received control frames |
| MACRxDribble | MAC received dribble |
| MACRxFrameLengthError | MAC received frame length errors |
| MACRxFramesCount | MAC received frame count |
| MACRxFramesDiscarded | MAC received discarded frames |

*Table B-1. HBA Statistics (Continued)*

| Statistic Abbreviation | Meaning |
|---|---|
| MACRxFramesDropped | MAC received dropped frames |
| MACRxJabber | MAC received jabber |
| MACRxLengthErrorCountLarge | MAC received large length error count |
| MACRxLengthErrorCountSmall | MAC received small length error count |
| MACRxMulticast | MAC received multicast |
| MACRxPauseFrames | MAC received pause frames |
| MACRxUnknownControlFrames | MAC received unknown control frames |
| MACTxAborts | MAC transmitted aborts |
| MACTxBroadcast | MAC transmitted broadcast |
| MACTxBytesCount | MAC transmitted byte count |
| MACTxCollisions | MAC transmitted collisions |
| MACTxControlFrames | MAC transmitted control frames |
| MACTxDeferrals | MAC transmitted deferrals |
| MACTxExcessDeferrals | MAC transmitted excess deferrals |
| MACTxFramesCount | MAC transmitted frame count |
| MACTxFramesDropped | MAC transmitted dropped frames |
| MACTxJumboFrames | MAC transmitted jumbo frames |
| MACTxLateCollisions | MAC transmitted late collisions |
| MACTxMulticast | MAC transmitted multicast |
| MACTxMultipleCollisions | MAC transmitted multiple collisions |
| MACTxPauseFrames | MAC transmitted pause frames |
| MACTxSingleCollisions | MAC transmitted single collisions |
| TCPDuplicateACKRetrans | TCP Duplicate ACK retransmit |
| TCPRetransTimerExpiredCount | TCP re-transmit timer expired count |
| TCPRxBytesCount | TCP received byte count |
| TCPRxDelayedACKCount | TCP Receive Delayed ACK count |
| TCPRxDuplicateACKCount | TCP received duplicate ACK count |

*Table B-1. HBA Statistics (Continued)*

| Statistic Abbreviation | Meaning |
|---|---|
| TCPRxPureACKCount | TCP received pure ACK count |
| TCPRxSegmentErrorCount | TCP received segment error count |
| TCPRxSegmentOutOfOrderCount | TCP received segment out-of-order count |
| TCPRxSegmentsCount | TCP transmitted segment count |
| TCPRxWindowProbeCount | TCP received window probe count |
| TCPRxWindowUpdateCount | TCP received window update count |
| TCPTxBytesCount | TCP transmitted byte count |
| TCPTxPureACKCount | TCP transmitted pure ACK count |
| TCPTxSegmentsCount | TCP transmitted segment count |
| TCPTxWindProbePersistCount | TCP transmit window probe persistent count |

# C Target Parameters

This appendix lists target parameters, both fixed and configurable.

***NOTE:***

The parameters in this table are sorted alphabetically for ease of use.

You can view target information with the **Display Target Information** option. You can configure a target by changing specific parameters.

Table C-1 lists target parameters and their range of values. You can configure the parameters shown in **boldface** type. For details, refer to “Target Level Info & Operations” on page 4-36.

*Table C-1. Target Parameters*

| Parameter | Alias | Function | Value |
|---|---|---|---|
| IPv4TOS | IPV4TOS | When the DDB entry is for an IPv6 device (the IPv6 Device bit—Options field bit 8—is set), this field specifies the IPv6 TC field to be used in the IPv6 TCP packets transmitted from the firmware to the device. When the DDB entry is for an IPv4 device (the IPv6 Device bit is reset), this field specifies the value of the TOS field to be used in the IPv4 TCP packets | 0–255 |
| IIPv4TTL | IPV4TTL | Time-to-Live (in hops). Each router decrements TTL before transmitting it. Router discards the datagram when TTL = zero. | 0–255 |
| TGT_4022_Delayed_Ack | TGT4022DACK | Target QLA4022 delayed acknowledgement | on/off |
| TGT_DDB_IPv6 | TGT_DDB_IPv6 | Target device database IPv6 | on/off |
| **TGT_DefaultTimeout** | TGTDTO | Target default timeout | 2† |
| TGT_DefaultTime2Retain | | Target default time to retain | 20*† |
| TGT_DevType | | Target device type | 0*† |
| TGT_DIF_Enable | TGTDIFFEN_IPv6 | Target DIF enable | on/off |
| TGT_ExeCount | | Target execution count | 0*† |
| TGT_ExeThrottle | TGTET | Target execution throttle | 64† |
| TGT_FirstBurstLen | TGTFB | Target first burst length | 256† |
| TGT_Force_Negotiate_Main_iSCSI_Keys | TGTFNMIK | Target forces negotiation | on/off |
| TGT_InitiatorSessID | TGTISID | Target initiator session ID | ‡ |
| TGT_IPv6_Address | | Target IPv6 address | IPv6 |
| TGT_IPv6_Flow_Label | TGTFLWLBL | Target IPv6 flow label | ‡ |
| TGT_IPv6_iSCSI_Name | TGTINAME_IPv6 | Target IPv6 iSCSI name | ‡ |

*Table C-1. Target Parameters (Continued)*

| Parameter | Alias | Function | Value |
|---|---|---|---|
| TGT_IPv6_Port | TGTPORT_IPv6 | Target IPv6 port | 3260 |
| TGT_IPv6_Source Addr | | Target IPv6 source address | IPv6 |
| TGT_IPv6_Source Addr_Flg | TGTSRCADDRIPv6 | Target IPv6 source address flag | 0-3† |
| TGT_iSCSI_Name | TGTINAME | Target iSCSI name | ‡ |
| TGT_KeepAliveTimeout | TGTKATO | Target keep-alive timeout | 30† |
| TGT_Local_IPv6_Address | | Target local IPv6 address | IPv6 |
| TGT_Local_TCP_Port | | Target local TCP port | 29044* |
| **TGT_MaxBurstLen** | TGTMB | Target maximum burst length | 512† |
| TGT_MaxOutstandingR2T | TGEMOR2T | Target max outstanding ready-to-transmit | 1† |
| TGT_MaxRxDataSegmentLen | | Target max receive data segment length | 128*† |
| TGT_MaxSegmentSize | TGTMSS | Target maximum segment size | 1460 |
| TGT_MaxTxDataSegmentLen | | Target maximum transmit data segment length | 0*† |
| TGT_Perm_Redirect_Option | | Target permanent redirect option | on/off* |
| TGT_Port | TGTPORT | Target port | 3260 |
| TGT_Redirect_IPAddr | | Target redirect IP address | IPv4* |
| TGT_Redirect_IPAddr_State | | Target redirect IP address state | yes/no* |
| TGT_RetryCount | | Target retry count | 0*† |
| TGT_RetryDelay | | Target retry delay | 0*† |
| **TGT_Rx_Window_Scale** | TGTRXWINSCALE | Target receive window scale | 0† |
| TGT_TargetID | | Target ID | 2*† |
| TGT_TargetSessID | | Target session ID | 2x† |
| TGT_TargetIPAddress | TGTIPADD | Target IP address | IPv4 |
| TGT_TargetPortalGroupID | | Target portal group ID | 0*† |

*Table C-1. Target Parameters (Continued)*

| Parameter | Alias | Function | Value |
|---|---|---|---|
| **TGT_TaskManagementTimeout** | TGTTMS | Target task management timeout | 10† |
| TGT_TimeStamp_Enable | | Target time-stamp enable | 64* |
| TGT_Temp_Redirect_Option | | Target temporary redirect option | on/off* |
| TGT_Traffic_Class | | Target traffic class | 0*† |
| TGT_Tx_Window_Scale | | Target transmit window scale | 2*† |
| **TGT_Type_of_Service** | | Target type-of-service | 0† |
| **TGT_Window_Scale_Enable** | TGTWINSCALEEN | Target window scale enable | on/off |
| TGTIPO_Fragmentation | | Target IP Option fragmentation | on* |
| TGTISCSIO_Bidi_CHAP_ Authentication | | Target iSCSI I/O BIDI CHAP authentication | on/off* |
| TGTISCSIO_CHAP_Authentication | | Target iSCSI I/O CHAP authentication | on/off* |
| TGTISCSIO_Data_Digests | TGTIDD | Target iSCSI I/O data digests | on/off |
| TGTISCSIO_Data_PDU_In_Order | | Target iSCSI I/O data PDU-in-order | on/off* |
| TGTISCSIO_Data_Sequence_In_Order | | Target iSCSI I/O data sequence-in-order | on/off* |
| TGTISCSIO_Discovery_Logout | TGTLDS | Target iSCSI I/O discovery logout | on/off |
| TGTISCSIO_Error_Recovery_Level | | Target iSCSI I/O error recovery level | 0*† |
| TGTISCSIO_Header_Digests | TGTIHD | Target ISCSI I/O header digests | on/off |
| TGTISCSIO_Immediate_Data | TGTIID | Target iSCSI I/O immediate data | on/off |
| TGTISCSIO_Initial_R2T | TGTIIR2T | Target iSCSI I/O initial ready to transmit | on/off |
| TGTISCSIO_Receive_Markers | | Target iSCSI I/O receive markers | on/off* |

***Table C-1. Target Parameters (Continued)***

| Parameter | Alias | Function | Value |
|---|---|---|---|
| TGTISCSIO_Send_Markers | | Target iSCSI I/O send markers | on/off* |
| TGTISCSIO_Snack | TGTISNACK | Target iSCSI I/O snack | on/off |
| TGTISCSIO_Strict_Login | TGTIS | Target iSCSI I/O strict login | on/off |
| TGTISCSIO_Strict_Logout | TGTLDS | Target iSCSI I/O strict logout | on/off |
| TGTO_Active | | Target option active | on/off* |
| TGTO_Access_Granted | | Target option access granted | on/off* |
| TGTO_Initiator_Entry | | Target option initiator entry | on/off* |
| TGTO_Target Entry | | Target option target entry | on/off* |
| TGTTCPO_Nagle | TGTTCPN | Target TCP option Nagle | on/off |
| TGTTCPO_Timer_Scale | | Target TCP option timer scale | 3† |
| TGTTCPO_Timestamp | TGTTMS | Target TCP option timestamp | on/off |

Table Footnotes

TGT = target

O = option

TCP = Transmission Control Protocol

IP = Internet Protocol

* Read-only

† Typical value

‡ Varies with each implementation

## Notes

# D Error Codes

This appendix provides the error codes for both CLI modes, interactive and non-interactive.

## Interactive Mode Error Codes

Table D-1 lists the return, name, and description for each interactive mode error code.

***NOTE:***

The return codes in this table are sorted numerically for ease of use.

***Table D-1. Interactive-Mode Error Code Descriptions***

| Return | Name | Description |
|---|---|---|
| 0 | CORE_STATUS_GOOD | Success |
| 100 | CORE_ERR_INV | Invalid parameter: use `-h` switch to see proper usage. |
| 101 | CORE_ERR_MEM_FAIL | Failed to allocate memory error. |
| 102 | CORE_ERR_SDM_FAIL | A call to the SDM Library failed. |
| 103 | CORE_ERR_NO_HBA | HBA instance specified is invalid. |
| 104 | CORE_ERR_HBAOPEN | Failed to open the HBA for an operation. |
| 105 | CORE_ERR_SAVE_INITFW | Failed to save the INITFW settings to the HBA. |
| 106 | CORE_ERR_HBARESET | Failure resetting the HBA. |
| 107 | CORE_ERR_RO_PARAM | Cannot change a read-only parameter. |
| 108 | CORE_ERR_MISSING_PARAM | A required parameter was missing. |
| 109 | CORE_ERR_FWUPD | An error occurred updating the firmware. |
| 110 | CORE_ERR_INVFILE | The file name entered is invalid or does not exist. |

*Table D-1. Interactive-Mode Error Code Descriptions (Continued)*

| Return | Name | Description |
|---|---|---|
| 111 | CORE_ERR_NOSPACE | No space in persistent or dynamic table for this entry. |
| 112 | CORE_ERR_NOCOUNT | A count is required. |
| 113 | CORE_ERR_HBAINV | The specified HBA was invalid. |
| 114 | CORE_ERR_NO_TGT | No TGT to operate on was specified. |
| 115 | CORE_ERR_NO_LUN | No LUN to operate on was specified. |
| 116 | CORE_ERR_NO_PAIR | Operation requires a key/value pair. |
| 117 | CORE_ERR_TGT_INV | Specified TGT invalid for this operation. |
| 118 | CORE_ERR_POSTTOIFW | Error posting information to the InitFW structure. |
| 119 | CORE_ERR_UNKNOWN | Unknown system error. |
| 120 | CORE_ERR_NO_CHAP | No CHAP entry specified. |
| 121 | CORE_ERR_CHAP_SAVE_FAIL | Failed to save the CHAP entry. |
| 122 | CORE_ERR_DDB_SAVE_FAIL | Failed to save DDB. |
| 123 | CORE_ERR_GET_TGTINFO_FAIL | Failed to get target information. |
| 124 | CORE_ERR_STATS_READ_FAILED | Failed to get statistic information. |
| 125 | CORE_ERR_WRITE_FAILED | Failed to write information. |
| 126 | CORE_ERR_READ_DEF_IFW | Failed to read default firmware settings. |
| 127 | CORE_ERR_GET_CRASH_REC | Failed to read crash records. |
| 128 | CORE_ERR_GET_IFW | Failed to read the InitFW structure. |
| 129 | CORE_ERR_INV_CHAP | Invalid CHAP specified. |
| 130 | CORE_ERR_CHAP_TBL_FULL | CHAP Table is full. |
| 131 | CORE_ERR_NOT_SUPPORTED | Function not supported. |
| 132 | CORE_ERR_READ_VPD | Could not read VPD information. |
| 133 | CORE_ERR_RUNNING_LB | Error during Loop Back Test. |
| 134 | CORE_ERR_CHAP_CONV | Cannot display, CHAP conversion needed. |
| 135 | CORE_ERR_GET_STATS | Error getting CORE statistics from the HBA. |
| 136 | CORE_ERR_IP_ADD_INV | Address Format is invalid. |
| 137 | CORE_ERR_DHCP_INV | Cannot enable TCPIP/DHCP for this service. |

*Table D-1. Interactive-Mode Error Code Descriptions (Continued)*

| Return | Name | Description |
|---|---|---|
| 138 | CORE_ERR_INITFW_INVALID | Invalid IP address in InitFW. Correct to save changes. |
| 139 | CORE_ERR_SETBOOTCODE | Bootcode save error. |
| 140 | CORE_ERR_INV_LUN | LUN is invalid. |
| 141 | CORE_ERR_NO_LUN_INFO | Cannot get LUN information for this target. |
| 142 | CORE_ERR_NOT_SUPPORTED_BY_FW | Operation unsupported in current firmware version. |
| 143 | CORE_ERR_BOOTCODE_ENABLED | Operation not allowed with BOOTCODE is enabled. |
| 144 | CORE_ERR_BOOTCODE_INVALID_VENDORID | Vendor ID can only be 8 characters long. |
| 145 | CORE_ERR_BOOTCODE_INVALID_ALTCLIENTID | Alt Client ID can only be 7 characters long. |
| 146 | CORE_ERR_BOOTCODE_MODE_INVALID | Invalid Bootcode Mode.<br>Bootcode Mode not allowed for QLA4010.<br>For other HBAs with HBA DHCP off, allowed modes are 1 and 2, with HBA DHCP on. Mode 3 is also allowed. |
| 147 | CORE_ERR_NO_IMP_HBAS | No HBAs in specified file to import. |
| 148 | CORE_ERR_PARSING_ERROR | Parsing error in the specified file. |
| 149 | CORE_ERR_INVALID_SOURCE_HBA | Invalid source HBA provided for import. |
| 150 | CORE_ERR_BOOTCODE_CHECKSUM_FAILURE | Checksum test failed: corrupt bootcode file or problems during download.<br>Bootcode erased to avoid major HBA failure. |
| 151 | CORE_ERR_BOOT_TARGET | Target is a boot target & bootcode boot is enabled. |
| 152 | CORE_ERR_ZIP_FILE_NOT_FOUND | Driver zip/inf file not found. |
| 153 | CORE_ERR_UNABLE_TO_UNZIP_DRIVER_FILE | Unable to unzip driver file. |
| 154 | CORE_ERR_UNBLE_TO_GET_DRIVER_VERSION_FROM_DRIVER_FILE | Unable to get driver version from the driver file. |
| 155 | CORE_ERR_UNABLE_TO_GET_INFO_FROM_DIRVER_FILE | Unable to get info from driver file. |

*Table D-1. Interactive-Mode Error Code Descriptions (Continued)*

| Return | Name | Description |
|---|---|---|
| 156 | CORE_ERR_SECURITY_DESCRIPTOR_INITIALIZATION_FAILED | Security descriptor initialization failed. |
| 157 | CORE_ERR_UNABLE_SET_SECURITY_DESCRIPTOR_DECL | Unable to set security descriptor decl. |
| 158 | CORE_ERR_DRIVER_UPDATE_FAILED | Driver update failed. |
| 159 | CORE_ERR_DEVICE_NOT_FOUND | Device not found. |
| 160 | CORE_ERR_UNABLE_TO_BUILD_ADAPTER_ID | Unable to build adapter ID. |
| 161 | CORE_ERR_OPERATION_NOT_SUPPORTED | Operation not supported. |
| 162 | CORE_ERR_FAILURE_TO_INSTALL_DRIVERS | Failure to install driver. |
| 163 | CORE_ERR_UNEXPECTED_FILE_TYPE | Unexpected input file type. |
| 164 | ERR_INVALID_CFG_PARAMETER | Invalid configuration parameter. |
| 165 | CORE_ERR_GET_V6_CACHE | Retrieval of IPv6 data failed. |
| 166 | CORE_ERR_GET_ARP_TABLE | Retrieval of ARP table failed. |
| 167 | CORE_ERR_WRONG_FW_IMAGE | Firmware image invalid for this HBA type. |
| 168 | CORE_ERR_NOT_SUPPORTED_FOR_HBA | Operation not supported by this HBA model. |
| 169 | CORE_ERR_USER_NOT_PRIVILEGED_FOR_OPERATION | User not privileged for this operation. |
| 170 | CORE_ERR_NO_APPROPRIATE_HBAS | No appropriate HBAs for this firmware image. |
| 171 | — | Reserved—not used. |
| 172 | CORE_ERR_NO_HBAS | No HBAs detected. |
| 173 | CORE_ERR_NO_DRIVER_FOUND | No driver found. |
| 174 | CORE_ERR_ISNS_NOT_SUPOORTED | ISNS not supported. |
| 175 | CORE_UNKNOWN_ERR_MSG | Error has no message in the catalog. |
| 191 | — | Reserved—not used. |

# Non-interactive Mode Error Codes

Table D-2 lists each command and the non-interactive mode error code associated with each.

***NOTE:***

The commands in this table are sorted alphabetically for ease of use.

***Table D-2. Non-interactive Mode Error Codes***

| Command | Error Codes |
|---|---|
| `-addchap` | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA<br>CORE_ERR_CHAP_CONV<br>CORE_ERR_CHAP_TBL_FULL<br>CORE_ERR_EXT<br>CORE_ERR_CHAP_SAVE_FAIL |
| `-b` | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA<br>CORE_ERR_EXT |
| `-binfo` | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA |
| `-bootcode` | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA<br>CORE_ERR_INV<br>CORE_ERR_BOOTCODE_CHECKSUM_FAILURE |
| `-bootcodemode` | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA<br>CORE_ERR_INV |
| `-bootcode` | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA<br>CORE_ERR_INV<br>CORE_ERR_BOOTCODE_CHECKSUM_FAILURE<br>CORE_ERR_BOOTCODE_MODE_INV<br>CORE_ERR_SETBOOTCODE |

*Table D-2. Non-interactive Mode Error Codes (Continued)*

| Command | Error Codes |
|---|---|
| -bootcodemode | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA |
| -c | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA |
| -chapmap | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA |
| -cpbootcode | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA<br>CORE_ERR_SETBOOTCODE |
| -csbootcode | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA<br>CORE_ERR_SETBOOTCODE |
| -defbidi | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA<br>CORE_ERR_INV<br>CORE_ERR_CHAP_CONV<br>CORE_ERR_CHAP_TBL_FULL<br>CORE_ERR_EXT<br>CORE_ERR_CHAP_SAVE_FAIL |
| -delchap | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA<br>CORE_ERR_INV<br>CORE_ERR_CHAP_CONV<br>CORE_ERR_EXT<br>CORE_ERR_CHAP_SAVE_FAIL |
| -df | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA<br>CORE_ERR_EXT |

***Table D-2. Non-interactive Mode Error Codes (Continued)***

| Command | Error Codes |
|---|---|
| -d | CORE_ERR_ZIP_FILE_NOT_FOUND<br>CORE_ERR_UNABLE_TO_UNZIP_DRIVER_FILE<br>CORE_ERR_UNABLE_TO_GET_INFO_FROM_DIRVER_FILE<br>CORE_ERR_SECURITY_DESCRIPTOR_INITIALIZATION_FAILED<br>CORE_ERR_UNABLE_SET_SECURITY_DESCRIPTOR_DECL<br>CORE_ERR_DRIVER_UPDATE_FAILED<br>CORE_ERR_DEVICE_NOT_FOUND<br>CORE_ERR_UNABLE_TO_BUILD_ADAPTER_ID<br>CORE_ERR_OPERATION_NOT_SUPPORTED<br>CORE_ERR_FAILURE_TO_INSTALL_DRIVERS<br>CORE_ERR_UNEXPECTED_FILE_TYPE |
| -dspchap | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA<br>CORE_ERR_CHAP_CONV |
| -dumpnvram | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA<br>CORE_ERR_MISSING_PARAM<br>CORE_ERR_INVFILE |
| -dv | CORE_ERR_NO_DRIVER_FOUND |
| -edchap | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA<br>CORE_ERR_INV<br>CORE_ERR_CHAP_CONV<br>CORE_ERR_EXT<br>CORE_ERR_CHAP_SAVE_FAIL |
| -ei | — |
| -f | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA<br>CORE_ERR_FWUPD<br>CORE_ERR_INV |
| -g | — |

*Table D-2. Non-interactive Mode Error Codes (Continued)*

| Command | Error Codes |
|---|---|
| `-gcr` | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA<br>CORE_ERR_INV<br>CORE_ERR_GET_CRASH_REC |
| `-i` | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA |
| `-import` | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA<br>CORE_ERR_INV<br>CORE_ERR_INVALID_SOURCE_HBA<br>CORE_ERR_INVFILE<br>CORE_ERR_EXT<br>CORE_ERR_INITFW_INVALID<br>CORE_ERR_SAVE_INITFW<br>CORE_ERR_HBAOPEN<br>CORE_ERR_CHAP_SAVE_FAIL<br>CORE_ERR_DDB_SAVE_FAIL<br>CORE_ERR_SETBOOTCODE |
| `-ipdhcp` | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA<br>CORE_ERR_SAVE_INITFW<br>CORE_ERR_INITFW_INVALID |
| `-isns` | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA<br>CORE_ERR_INV<br>CORE_ERR_NOT_SUPPORTED<br>CORE_ERR_EXT<br>CORE_ERR_ISNS_NOT_SUPOORTED |

***Table D-2. Non-interactive Mode Error Codes (Continued)***

| Command | Error Codes |
|---|---|
| `-isns6` | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA<br>CORE_ERR_INV<br>CORE_ERR_NOT_SUPPORTED<br>CORE_ERR_EXT<br>CORE_ERR_ISNS_NOT_SUPOORTED |
| `-l` | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA<br>CORE_ERR_NO_TGT<br>CORE_ERR_EXT<br>CORE_ERR_INV |
| `-lb` | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA<br>CORE_ERR_INV |
| `-linkchap` | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA<br>CORE_ERR_INV<br>CORE_ERR_CHAP_CONV<br>CORE_STATUS_BAD<br>CORE_ERR_INV_CHAP<br>CORE_ERR_TGT_INV |
| `-model` | CORE_ERR_HBAINV<br>CORE_ERR_HBAINV<br>CORE_ERR_NO_HBAS |

*Table D-2. Non-interactive Mode Error Codes (Continued)*

| Command | Error Codes |
|---|---|
| -n | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA<br>CORE_ERR_NO_PAIR<br>CORE_ERR_POSTTOIFW<br>CORE_ERR_EXT<br>CORE_ERR_INITFW_INVALID<br>CORE_ERR_CHAP_SAVE_FAIL<br>CORE_ERR_DDB_SAVE_FAIL<br>CORE_ERR_HBAOPEN<br>CORE_ERR_HBAOPEN<br>CORE_ERR_SETBOOTCODE<br>CORE_ERR_SAVE_INITFW<br>CORE_ERR_INV |
| -netconf | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA<br>CORE_ERR_INV<br>CORE_ERR_INITFW_INVALID<br>CORE_ERR_SAVE_INITFW |
| -netconf6 | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA<br>CORE_ERR_INV<br>CORE_ERR_INITFW_INVALID<br>CORE_ERR_SAVE_INITFW |
| -ping | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA<br>CORE_ERR_INV<br>CORE_ERR_IP_ADD_INV |
| -pa | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA<br>CORE_ERR_INV<br>CORE_ERR_EXT |

***Table D-2. Non-interactive Mode Error Codes (Continued)***

| Command | Error Codes |
|---|---|
| -pbootcode | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA<br>CORE_ERR_INV<br>CORE_ERR_TGT_INV<br>CORE_ERR_NOT_SUPPORTED<br>CORE_ERR_SETBOOTCODE |
| -pb | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA<br>CORE_ERR_INV<br>CORE_ERR_NOSPACE<br>CORE_ERR_EXT |
| -pinfo | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA<br>CORE_ERR_EXT |
| -ps | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA<br>CORE_ERR_INV<br>CORE_ERR_TGT_INV<br>CORE_ERR_NOCOUNT<br>CORE_ERR_INV |
| -pu | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA<br>CORE_ERR_TGT_INV<br>CORE_ERR_INV |
| -px | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA |
| -r | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA<br>CORE_ERR_INV |

*Table D-2. Non-interactive Mode Error Codes (Continued)*

| Command | Error Codes |
|---|---|
| -rdf | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA<br>CORE_ERR_FWUPD<br>CORE_ERR_READ_DEF_IFW |
| -rdh | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA<br>CORE_ERR_INV<br>CORE_ERR_SDMFAIL<br>CORE_ERR_NOT_SUPPORTED |
| -rwt | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA<br>CORE_ERR_INV |
| -save | CORE_ERR_INV<br>CORE_ERR_INVFILE |
| -sbootcode | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA<br>CORE_ERR_INV<br>CORE_ERR_TGT_INV<br>CORE_ERR_NOT_SUPPORTED<br>CORE_ERR_SETBOOTCODE |
| -sbootcodecid | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA<br>CORE_ERR_INV<br>CORE_ERR_NOT_SUPPORTED<br>CORE_ERR_SETBOOTCODE |
| -sbootcodecid | CORE_ERR_INV |
| -sec | CORE_ERR_INVALID_CFG_PARAMETER |
| -stat | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA<br>CORE_ERR_GET_STATS |

*Table D-2. Non-interactive Mode Error Codes (Continued)*

| Command | Error Codes |
|---|---|
| `-t` | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA<br>CORE_ERR_INV |
| `-ts` | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA<br>CORE_ERR_INV |
| `-ver` | |
| `-vpd` | CORE_ERR_HBAINV<br>CORE_ERR_NO_HBA |

## Notes

# E Downloadable File Names

Table E-1 lists, by file type and HBA, the typical file names of downloadable files for QLogic iSCSI HBAs.

***Table E-1. File Names***

| File Type | HBA | File Name | Description |
|---|---|---|---|
| Boot Code | 405*x* | | BIOS for x86 and x64 processors; FCode or EFI for Solaris—allows system boot from. |
| Boot Code | 406*x* | | BIOS for x86 and x64 processors; FCode or EFI for Solaris—allows system boot from. |
| BIOS | 405*x* | `QL4022RM.bin` | |
| BIOS | 406*x* | `QL4022RM.bin` | |
| BIOS | 4010 | `QL4010RM.bin` | |
| FCode | 405*x* | `isp4022.fc` | |
| FCode | 406*x* | `isp40xx.fc` | |
| FCode | 4010 | `isp4010-01.04.fc` | |
| Firmware | 405*x* | `qla4022.dl` | |
| | 406*x* | `qla4010.dl` | |
| ROM | 405*x* | `ld4022.dl` | Contact Customer Support |
| ROM | 406*x* | `ld4022.dl` | Contact Customer Support |
| ROM | 4010 | `ld4010.dl` | Contact Customer Support |

## Notes

# F Using Trace

Tracing can provide useful information to QLogic developers for identifying application, HBA, and networking issues. For advanced users of SANsurfer iSCSI HBA CLI, tracing may provide useful information about detailed steps that are occurring for various operations.

**To use trace:**

1. To identify the directory in which to place the configuration file, follow these steps:
   a. Right-click the SANsurfer iSCSI HBA CLI Windows desktop icon.
   b. Click **Properties**.
   c. On the Shortcut page, click **Find Target**.
2. Go to the following directory:

   `C:\installed\pre-dvt-1.1.00.09`
3. To activate trace, locate the `iscli.cfg.txt` file and rename it to `iscli.cfg`.
4. Run SANsurfer iSCSI HBA CLI.
5. Modify the trace variables, levels, and data as described in the following sections.
   - “Trace Variables” on page F-2
   - “Trace Level” on page F-2
   - “Trace Data” on page F-4
6. Run SANsurfer iSCSI HBA CLI again.

You can control tracing by putting an `iscli.cfg` file in the location of the SANsurfer iSCSI HBA CLI executable module or in a working directory.

# Trace Variables

You can set the trace variables listed in Table F-1.

***Table F-1. Trace Parameters***

| Variable | Character String |
|---|---|
| Set Level only | True or False |
| Output buffered | True or False |
| Source Line and file | True or False |
| Console | True or False |
| Console Date time Prefix | True or False |
| Dump FW Cmp inst | True or False |
| Dump Mem Portal | True or False |
| Dump Mem node | True or False |
| Dump Mem chip | True or False |
| Dump mem params | True or False |
| Dump mem isns | True or False |
| Dump mem hbaentry | True or False |
| Dump mem bootcode | True or False |
| Dump memtargets | True or False |
| file | True or False |
| datetimeprefix | True or False |
| filename | — |
| archive.filename.extension | — |
| maxsize | — |

# Trace Level

You can select the iSCSI trace level by choosing a number from 0 to 1000. For example:

```
iscsi.cli.trace.level = 0 to 1000
```

Table F-2 shows what trace level each number selects.

***Table F-2. Trace Level Commands***

| Value | Trace Level |
|---|---|
| 0 | No trace data requested |
| 50 | Error level |
| 100 | Warning error |
| 200 | Event level |
| 300 | Spawn level |
| 400 | Trace level |
| 500 | Connection level |
| 600 | Memory level |
| 700 | Config level |
| 900 | Low level |
| 1000 | All levels |

To continue, press `ENTER`.

Table F-3 shows some more information about trace levels.

***Table F-3. Some More Info About Trace Levels***

| Trace Output | Value |
|---|---|
| `iscsi.cli.clear.screen` | true or false |
| `iscsi.cli.trace.output.setlevelonly` | true or false |
| `iscsi.cli.trace.output.buffered` | true or false |
| `iscsi.cli.trace.output.src.line.and.file` | true or false |
| `iscsi.cli.trace.output.console` | true or false |
| `iscsi.cli.trace.output.console.datetimeprefix` | true or false |
| `iscsi.cli.trace.output.dump.mem.fw` | true or false |
| `iscsi.cli.trace.output.dump.mem.fw.cmp.inst` | int (hba instance) |
| `iscsi.cli.trace.output.dump.mem.portal` | true or false |
| `iscsi.cli.trace.output.dump.mem.node` | true or false |
| `iscsi.cli.trace.output.dump.mem.chip` | true or false |

*Table F-3. Some More Info About Trace Levels (Continued)*

| Trace Output | Value |
|---|---|
| iscsi.cli.trace.output.dump.mem.params | true or false |
| iscsi.cli.trace.output.setlevelonly | true or false |
| iscsi.cli.trace.output.dump.mem.isns | true or false |
| iscsi.cli.trace.output.dump.mem.hbaentry | true or false |
| iscsi.cli.trace.output.dump.mem.bootcode | true or false |
| iscsi.cli.trace.output.dump.mem.targets | true or false |
| iscsi.cli.trace.output.file | true or false |
| iscsi.cli.trace.output.file.datetimeprefix | true or false |
| iscsi.cli.trace.output.file.filename | string |
| iscsi.cli.trace.output.file.archive.filename.extension | string |
| iscsi.cli.trace.output.file.maxsize | 0[a]–2147000000 |
| iscsi.sdm.trace.level | 0–1000 |

[a] 0=unlimited

To continue, press ENTER.

# Trace Data

You can select the amount of trace data you want, as shown in Table F-4.

*Table F-4. Trace Data*

| Amount | Data Level |
|---|---|
| 0 | No trace data requested |
| 50 | Error level |
| 100 | Warning error |
| 200 | Event level |
| 400 | Trace level |
| 1000 | All levels |

To continue, press ENTER.

# 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.

**CNA**

Converged network adapters support both data networking (TCP/IP) and storage networking (FC) traffic on a single I/O adapter using two new technologies: Enhanced Ethernet and Fibre Channel over Ethernet (FCoE).

**CoS**

Class of Service (CoS) is a 3 bit field within a layer two Ethernet frame header when using IEEE 802.1Q. It specifies a priority value of between 0 (signifying best-effort) and 7 (signifying priority real-time data) that can be used by Quality of Service disciplines to differentiate traffic.

CoS is a way of managing traffic in a network by grouping similar types of traffic (for example, e-mail, streaming video, voice, large document file transfer) together and treating each type as a class with its own level of service priority.

**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.

**Enhanced Ethernet**

Also called DataCenter Ethernet or Converged Enhanced Ethernet) refers to new enhancements to the existing Ethernet standard that eliminate Ethernet's inherently lossy nature and make 10Gb Ethernet a viable storage networking transport.

**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.

**FC**

Fibre Channel is a high-speed serial interface technology that supports other higher layer protocols such as SCSI and IP.

**FCoE**

Fibre Channel over Ethernet is a new technology defined by the T11 standards body that allows traditional FC storage networking traffic to travel over an Ethernet link by encapsulating FC frames inside Layer 2 Ethernet frames. For more information, visit www.fcoe.com.

**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, F_Port, FL_Port, L_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.

**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.

**L_Port**

Loop port. Does arbitrated loop functions and protocols. NL_Ports and FL_Ports are examples of loop-capable ports. See E_Port, F_Port, FL_Port, G_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 FL_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, F_Port, FL_Port, G_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.
- FL_Port—a port in a fabric where an N_Port can attach.
- FL_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.

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