



SANsurfer FC HBA Manager User's Guide

Management Tool for QLogic
Fibre Channel Host Bus Adapters

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Document Revision History

Rev. A release, February 2008

Initial release



Table of Contents

- 1 Introduction**
 - What's in this Guide 1-1
 - Documentation Conventions 1-2
 - Related Documents 1-3
 - Intended Audience 1-3
 - License Agreements 1-3
 - Technical Support 1-4
 - Availability 1-4
 - Training 1-4
 - Contact Information 1-5

- 2 SANsurfer FC HBA Manager Overview**
 - Features 2-2

- 3 System Overview**
 - Configurations 3-1
 - Single-Ported (Non-failover) Configuration 3-2
 - Simple Failover Configuration 3-3
 - SAN or Cluster Configuration 3-4
 - RAID Configuration and LUN Masking 3-5
 - Installation Checklist 3-6
 - Step 1: Collect the Hardware and Software 3-6
 - Required Hardware 3-6
 - Required Software 3-7
 - Step 2: Install the Hardware 3-8
 - Step 3: Install the Enhanced Driver 3-8
 - Step 4: Install any RAID Filter Drivers 3-9
 - Step 5: Install and Run the SANsurfer FC HBA Manager 3-10
 - Step 6: Configure the Disks in the Operating System 3-10
 - Step 7: Install the IP Communications Driver 3-11
 - Non-Windows Configuration Parameters 3-11
 - Linux Enhanced Driver Parameters 3-11
 - Macintosh Basic Parameters 3-11
 - NetWare Enhanced Driver Configuration Parameters 3-11

4	System Requirements	
	Hardware Requirements	4-1
	Software Requirements	4-2
	Supported QLogic HBAs	4-3
5	Installing SANsurfer FC HBA Manager	
	Initial Installation	5-1
	Installation Options	5-2
	Installation Instructions	5-3
	Installation Instructions Using CLI	5-18
	Combo Installer Command Lines	5-19
	Stand-alone Installer Command Lines	5-20
	Web- and CD-Based Installation Updates	5-21
	Updating SANsurfer by Web Update	5-21
	Network Does Not Use Proxy Settings	5-22
	Network Requires Proxy Settings	5-22
	Updating SANsurfer by Package Update	5-25
	Uninstalling SANsurfer	5-28
6	Getting Started	
	Starting SANsurfer FC HBA Manager	6-1
	Starting SANsurfer FC HBA Manager on Windows	6-2
	Starting SANsurfer FC HBA Manager on Linux or Solaris	6-3
	Starting SANsurfer FC HBA Manager on Macintosh	6-3
	Connecting to Hosts Automatically (Windows CLI)	6-4
	Connecting to Hosts Automatically (Linux, Solaris, or Macintosh CLI)	6-4
	SANsurfer FC HBA Manager Main Window	6-5
	Toolbar Buttons	6-7
	Host Icons and Text	6-8
	HBA Icons and Text	6-9
	HBA Port Icons and Text	6-10
	Device Icons and Text	6-10
	LUN Icons and Text	6-11
	Exiting SANsurfer FC HBA Manager	6-11
	Getting Help	6-12
	Viewing the Help System	6-12
	Specifying the Help Browser	6-12
	Viewing SANsurfer FC HBA Manager Tool Information	6-13
	Setting SANsurfer FC HBA Manager Security	6-14
	Setting the Warning Display Option	6-16

	Setting the Configuration Change Option	6-17
	Setting Event Log Options	6-18
	Setting the HBA Event Log Option	6-19
	Setting Up Automatic Notification by E-mail	6-21
	Setting the Configuration Policies	6-22
	Forbidden Sharing of Devices or LUNs	6-26
	Specifying the HBA Driver Settings	6-27
	Refreshing the Host Configuration	6-30
7	Reports	
	Report Options	7-1
	Report Formats	7-2
	Generating a Report	7-2
	Viewing Reports	7-4
8	Diagnostics	
	Introduction	8-1
	Running Loopback and Read/Write Buffer Diagnostic Tests	8-1
	Preparing for Diagnostic Testing	8-2
	Finding the HBA Port You Want to Test	8-2
	Preparing for the Loopback Test	8-3
	Preparing for the Read/Write Buffer Test	8-4
	Running the Loopback Test	8-5
	Running the Read/Write Buffer Test	8-6
	Viewing HBA Port Transceiver Details	8-7
	General Page	8-7
	Media Information	8-8
	Diagnostic Data	8-9
	Details Page	8-9
9	Troubleshooting	
	Troubleshooting Tools	9-1
	Windows Event Log	9-1
	Linux Messages File	9-2
	Solaris Messages File	9-3
	SANsurfer FC HBA Manager	9-3
	Troubleshooting Problems and Solutions	9-3
	Installation Issues	9-4
	User Interface and Remote Agent Issues	9-5
	Functional Issues	9-8

Verifying that the HBA Driver is Installed	9-10
Verifying that qlremote is Installed and Running	9-12
Tracing SANsurfer FC HBA Manager and Agent Activity (Debug).	9-14
Tracing SANsurfer FC HBA Manager User Interface Activity	9-14
Exporting or Saving Agent Activity Logs	9-19
Agent Logs by Operating System.	9-19
Exporting or Saving the Agent Logs.	9-19

A **Frequently Asked Questions**

B **Shortcut Keys**

Glossary

Index

List of Figures

Figure		Page
3-1	Single-Ported (Non-failover) Configuration	3-2
3-2	Simple Failover Configuration	3-3
3-3	SAN or Cluster Configuration	3-4
3-4	RAID Configuration and LUN Masking	3-5
5-1	SANsurfer Download Selections (Example)	5-4
5-2	Install SANsurfer: Introduction	5-5
5-3	Install SANsurfer: Important Information	5-6
5-4	Install SANsurfer: Choose Product Features	5-7
5-5	Macintosh Installation: Choose Product Features	5-9
5-6	Install SANsurfer: Choose Install Folder	5-9
5-7	Previous SANsurfer Install Detected Message	5-10
5-8	Install SANsurfer: Select Shortcut Profile (Windows Only)	5-11
5-9	Install SANsurfer: Create Desktop Icon Selection (Windows Only)	5-12
5-10	Install SANsurfer: Pre-Installation Summary	5-13
5-11	Install SANsurfer: Installing SANsurfer	5-14
5-12	Install SANsurfer: Novell NetWare Disk Selection	5-14
5-13	Install SANsurfer: Default QLogic Failover Enable/Disable	5-16
5-14	Install SANsurfer: Launch SANsurfer Application	5-17
5-15	Install SANsurfer: Install Complete	5-18
5-16	Update SANsurfer: Select Update Dialog Box	5-22
5-17	Update SANsurfer: Server Proxy Settings Dialog Box	5-23
5-18	Update SANsurfer: Update Dialog Box	5-24
5-19	Update SANsurfer: Select Update Dialog Box	5-25
5-20	Update SANsurfer: Open Dialog Box	5-26
5-21	Update SANsurfer: Update Dialog Box	5-27
5-22	Uninstall SANsurfer: Add/Remove Programs (Windows 2000)	5-29
5-23	Uninstall SANsurfer: Uninstall SANsurfer	5-30
5-24	Uninstall SANsurfer: Uninstall Options	5-31
5-25	Uninstall SANsurfer: Choose Product Features	5-32
5-26	Uninstall SANsurfer: Uninstall SANsurfer	5-33
5-27	Uninstall SANsurfer: Uninstall Complete	5-34
6-1	SANsurfer Icon	6-2
6-2	SANsurfer FC HBA Manager Main Window	6-7
6-3	Browser Location Dialog Box	6-12
6-4	About SANsurfer FC HBA Manager Window	6-13
6-5	Security Tabbed Page	6-15
6-6	Options Dialog Box: Warning Displays	6-16
6-7	Options Dialog Box: Configuration Change	6-17
6-8	Options Dialog Box: App Event Log	6-19
6-9	Options Dialog Box: HBA Event Log	6-20
6-10	Email Settings Dialog Box	6-21
6-11	Policy Settings Dialog Box	6-23
6-12	Shared Device Found Dialog Box	6-26

6-13	Shared Components Dialog Box	6-27
6-14	HBA Driver Settings Tabbed Page	6-28
6-15	HBA Driver Settings Tabbed Page (Linux Only).	6-29
7-1	Generate Reports Dialog Box	7-3
7-2	Generated Report in Embedded Viewer	7-4
7-3	Embedded Viewer Toolbar	7-4
8-1	Transceiver Details Tabbed Page: General Page	8-8
8-2	Transceiver Details Tabbed Page: Details Page	8-10
9-1	Windows: Services.	9-12
9-2	Local.properties File: Example 1	9-14
9-3	Local.properties File: Example 2	9-15
9-4	SANsurfer.lax File Example	9-17
9-5	“Command Prompt” Properties Dialog Box	9-18

List of Tables

Table	Page	
1-1	Related Documents	1-3
3-1	Required Software by Operating System.	3-7
5-1	Configuration Option Installation Requirements.	5-2
6-1	Traffic Signals.	6-6
6-2	Toolbar Buttons	6-7
7-1	Report Viewer Toolbar Buttons	7-5
8-1	Driver Versions That Do Not Require a Loopback Connector	8-3
9-1	Troubleshooting: Installation Issues.	9-4
9-2	Troubleshooting: User Interface and Remote Agent Issues.	9-5
9-3	Troubleshooting: Functional Issues	9-8
A-1	Frequently Asked Questions	A-1
B-1	Shortcut Keys.	B-1

1 Introduction

The *SANsurfer FC HBA Manager User's Guide* describes the SANsurfer FC HBA Manager tool, a comprehensive tool for configuration and management of QLogic SANsurfer Fibre Channel (FC) host bus adapters (HBAs) used in storage area networks (SANs).

NOTE:

Throughout this guide, *HBA* and *adapter* are used interchangeably, as are the terms *target* and *device*.

What's in this Guide

This guide contains the basic information you need to get started with the SANsurfer FC HBA Manager user interface (UI). For detailed information about the features and functionality not covered in this guide, refer to the help system (see [“Getting Help” on page 6-12](#)).

This introductory section explains the typographic conventions used in this guide, lists related documents, specifies the intended audience, refers you to the QLogic license agreements, and provides technical support and contact information.

The remainder of the user's guide contains the following sections and appendices:

- [Section 2 SANsurfer FC HBA Manager Overview](#) describes the features of SANsurfer FC HBA Manager.
- [Section 3 System Overview](#) outlines the hardware and software installation of devices controlled by SANsurfer FC HBA Manager.
- [Section 4 System Requirements](#) lists the hardware and software requirements needed for optimum SANsurfer FC HBA Manager performance.
- [Section 5 Installing SANsurfer FC HBA Manager](#) describes how to install and uninstall SANsurfer FC HBA Manager.
- [Section 6 Getting Started](#) describes how to customize SANsurfer FC HBA Manager. It includes starting and exiting the SANsurfer FC HBA Manager user interface, getting help, setting security, and setting the options that activate each time you start SANsurfer FC HBA Manager.

- [Section 7 Reports](#) describes the report options and formats, and shows you how to generate and view reports.
- [Section 8 Diagnostics](#) provides details for setting up, running, and interpreting loopback and read/write buffer tests, as well as viewing HBA port SFF-DMI information.
- [Section 9 Troubleshooting](#) presents common troubleshooting questions and answers. It also provides the procedures for tracing the SANsurfer FC HBA Manager user interface and agent activity, if directed to do so by your authorized service provider.
- [Appendix A Frequently Asked Questions](#) lists and provides the answers to frequently asked questions about SANsurfer FC HBA Manager.
- [Appendix B Shortcut Keys](#) lists keyboard combinations used to perform tasks in SANsurfer FC HBA Manager.
- [Glossary](#) lists common hardware, software, and FC terms that are used in SANsurfer FC HBA Manager.

In addition, at the end of this guide is a index to help you easily locate information.

Documentation Conventions

This guide uses the following documentation conventions:

NOTE:

Notes provide additional information.

CAUTION!

Cautions indicate that failure to follow instructions might result in damage to data or equipment.

- Text in **blue** font indicates a hyperlink (jump) to a figure, table, or section in this guide, and links to Web sites are shown in **underlined blue**. For example
 - ❑ [Table 9-2](#) lists problems related to the SANsurfer FC HBA Manager user interface and remote agent.
 - ❑ See “[Viewing Reports](#)” on page 7-4.
 - ❑ For more information, visit www.qlogic.com.
- Text in **bold** font indicates SANsurfer FC HBA Manager user interface elements such as a menu items, buttons, check boxes, or column headings. For example:

- ❑ Click the **Start** button, point to **Programs**, point to **Accessories**, and then click **Command Prompt**.
- ❑ Under **Notification Options**, select the **Warning Alarms** check box.
- Text in `sans serif` font indicates a file name, directory path, keyboard key, or command line text. For example:
 - ❑ To connect to a group of hosts listed in a host group file (`.hst`), type `SANsurfer -g path` and then press ENTER.
 - ❑ Press CTRL+SHIFT+T.
- Text in *italics* indicates emphasis, terms, document titles, or help topic titles. For example:
 - ❑ For a complete listing of license agreements, refer to the *QLogic Software End User License Agreement*.
 - ❑ For details, see *Displaying HBA Information* in the help system.

Related Documents

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

Table 1-1. Related Documents

Part Number or Name	Title
FC0054505-00	<i>QLogic 2Gb–8Gb FC HBA Quick Start Guide</i>
<code>readme.txt</code>	SANsurfer notes included with SANsurfer FC HBA Manager
Release notes	<i>SANsurfer FC HBA Manager release notes</i> provide details about the modifications since the previous version. There are separate release notes based on the operating system.

Intended Audience

This guide is intended for network administrators who use SANsurfer FC HBA Manager to configure and manage QLogic SANsurfer FC HBAs used in SANs.

License Agreements

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

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

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

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Notes

2 SANsurfer FC HBA Manager Overview

QLogic SANsurfer FC HBA Manager is a collection of device drivers and user interface based management tools for controlling, configuring, and managing devices in a SAN that uses QLogic FC HBAs. Note the following:

- SANsurfer FC HBA Manager allows control of heterogeneous environments by supporting multiple operating systems, including:
 - Windows® XP Professional, Windows 2000, Windows Server® 2003, Windows Vista®, Windows Server 2008
 - Red Hat® Linux® Advance Server, SuSE® Linux Enterprise Server (SLES)
 - Solaris® SPARC®, Solaris x86
 - Novell® NetWare®
 - Mac OS® X
- SANsurfer FC HBA Manager is a client/server tool. The networking capability of the tool allows for centralized management and configuration of QLogic FC HBAs within the entire SAN.

NOTE:

Throughout this guide, the term *Windows* refers to all supported versions of the Microsoft Windows operating system, including Windows XP Professional, Windows 2000, Windows Server 2003, Windows Vista, and Windows Server 2008, unless otherwise specified.

Features

SANsurfer FC HBA Manager provides the following features:

- **Update management.** To easily keep SANsurfer FC HBA Manager up to date at all times by monitoring the tool version number, enable the **Application Version Check** feature on the Schedule Task dialog box (see *Scheduling Tasks* in the help system). You can perform tool updates (apply updates) from the Web, as well as from an external media location (CD). Java™ Web Start is also available, which automatically downloads, caches, and runs the given updates for the SANsurfer FC HBA Manager tool.
- **HBA asset management.** SANsurfer FC HBA Manager allows you to connect to and disconnect from local and remote hosts. It also provides information about connected hosts and their attached QLogic HBAs with connected storage devices. Also, the current SAN configuration is rendered in an easy-to-view two-dimensional drawing for a specific host.
- **SAN configuration management.** SANsurfer FC HBA Manager allows you to configure local and remote systems. With SANsurfer FC HBA Manager you can:
 - ❑ Configure QLogic FC HBAs.
 - ❑ Configure FC devices.
 - ❑ Compare hosts—This feature allows you to view the differences between the current host and any saved host configuration, so you know what has changed in the SAN.
 - ❑ Configure LUNs for a device (load balancing)—For a list of HBAs that support LUN load balancing, see the *HBA Support Matrix (Fibre Channel)* on the SANsurfer CD-ROM.
 - ❑ Configure LUN path failover—For a list of HBAs that support LUN path failover, see the *HBA Support Matrix (Fibre Channel)* on the SANsurfer CD-ROM.
 - ❑ Persistently bind targets.
 - ❑ Update the HBA Parameters, Flash BIOS, and HBA driver.

NOTE:

You can install the HBA driver before you install the HBA hardware.

- **HBA statistics.** SANsurfer FC HBA Manager provides statistics for each host and HBA port. These statistics can be collected automatically or on request. They can be reset at any time. In addition, you can export the statistics to a comma separated values (CSV) file that can be imported into other applications; for example, Microsoft Excel®.
- **HBA diagnostics.** SANsurfer FC HBA Manager provides end-to-end diagnostics that enable you to test the HBAs and the devices to which they are connected. SANsurfer FC HBA Manager diagnostics allow you to do the following:
 - ❑ Test the link status of each HBA and its attached devices.
 - ❑ Perform a loopback test, which is external to the HBA, to evaluate the ports (transmit and receive transceivers) on the HBA and the error rate.
 - ❑ Perform a read/write buffer test, which tests the link between the HBA and its attached devices.
 - ❑ View transceiver details.
- **Event notifications.** SANsurfer FC HBA Manager provides asynchronous notification of various conditions and problems through alarms and events. Alarm information includes severity, time, host, HBA, application, and description. Event information includes severity, time, and message. In addition, the alarm and event information can be exported to a CSV file that can be imported into other applications; for example, Microsoft Excel. Alarm information can also be sent automatically by e-mail to a distribution list.

Notes

3 System Overview

SANsurfer FC HBA Manager is a collection of device drivers and management tools for controlling, configuring, and managing devices in a SAN environment that uses QLogic FC HBAs.

This section provides the following information:

- [“Configurations” on page 3-1](#) shows examples of several different configurations.
- [“Installation Checklist” on page 3-6](#) contains a checklist to help you properly install all hardware and software in the correct order.
- [“Non-Windows Configuration Parameters” on page 3-11](#) lists configuration and tuning parameters.

This information is intended for OEMs, field service personnel, and customers who are installing QLogic hardware and the SANsurfer FC HBA Manager tool. This section assumes that you are familiar with the hardware installation and operating systems where you are installing the HBAs.

Configurations

This section illustrates and describes the following system configurations:

- [“Single-Ported \(Non-failover\) Configuration” on page 3-2](#)
- [“Simple Failover Configuration” on page 3-3](#)
- [“SAN or Cluster Configuration” on page 3-4](#)
- [“RAID Configuration and LUN Masking” on page 3-5](#)

Single-Ported (Non-failover) Configuration

Figure 3-1 shows a simple single-ported (non-failover) configuration consisting of one host (X), two HBAs (A and B), and ten target devices (0–9). This configuration assumes that the host has access to all connected devices; therefore, it requires an HBA operating system driver, but does not require the rest of SANsurfer FC HBA Manager. Other SANsurfer FC HBA Manager components help manage devices more easily.

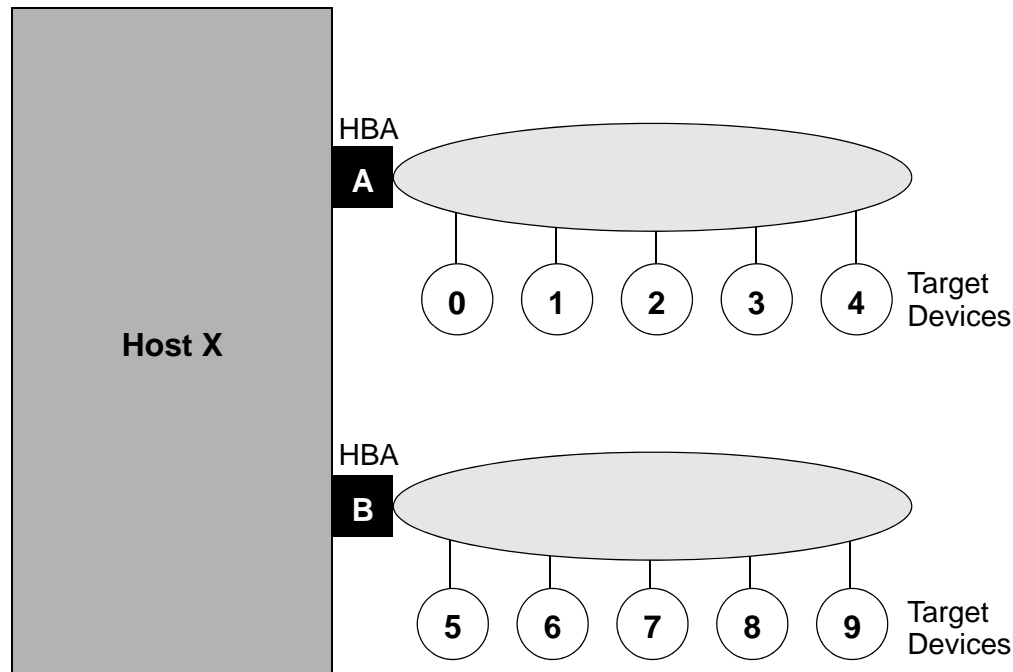


Figure 3-1 Single-Ported (Non-failover) Configuration

This illustration simplifies hardware connections: target devices connect through a local loop, FC hub, FC switch, or any combination of those. FC topology is useful in troubleshooting situations; however, a basic configuration requires only this simple diagram showing which hosts and HBAs are connected to which target devices. This is not a failover configuration; each target device is accessible through only one HBA.

Simple Failover Configuration

Figure 3-2 shows a simple failover configuration consisting of one host (X), two HBAs (A and B), three dual-ported devices (0–2), and two single-ported devices (3 and 4).

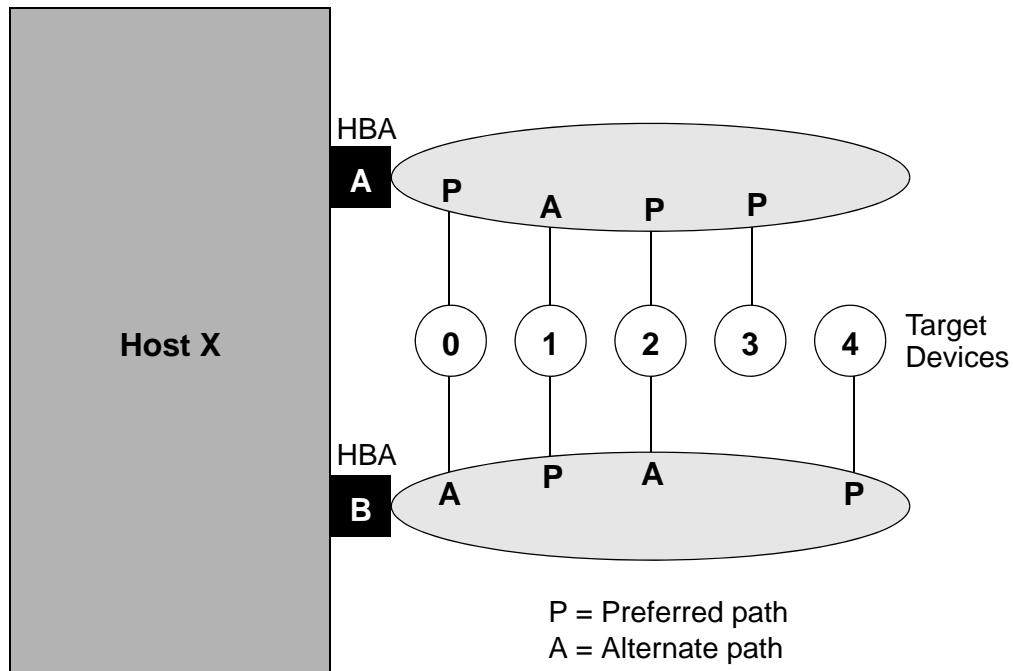


Figure 3-2 Simple Failover Configuration

In this configuration, connections marked **P** are preferred paths to a device, and connections marked **A** are alternate paths. Alternate paths to devices are typically hidden from the operating system and file system layers to keep them from being interpreted as two distinct devices.

SAN or Cluster Configuration

Figure 3-3 shows a simple storage area network (SAN) configuration consisting of two hosts (**X** and **Y**). Each host has an HBA that connects to a common set of five target devices (**0–4**).

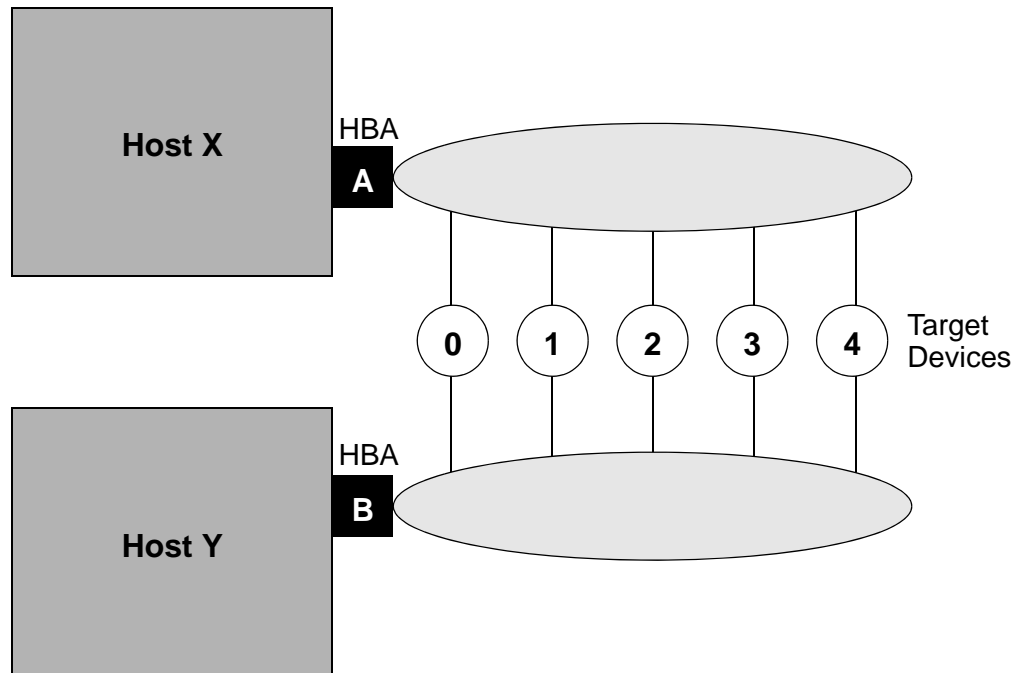


Figure 3-3 SAN or Cluster Configuration

If Figure 3-3 represents a SAN of unrelated hosts, then each host is configured to recognize a different set of devices. This configuration can be made at the target device level (called *target masking*) where host **X** is configured to see devices **0–1** and mask devices **2–4**, and host **Y** is configured to see devices **2–4** and mask devices **0–1**. Alternatively, this configuration can be made at the logical unit number (LUN) level (called *LUN masking*), where hosts **X** and **Y** recognize the devices but each has a different set of LUNs masked on the device.

If Figure 3-3 represents a cluster of two hosts, then the hardware setup is the same; however, for the software configuration, each host is configured to recognize the same set of devices. Cluster software must determine (arbitrate) which host accesses which devices at any time. For example, both hosts can be configured to recognize all targets, but cluster software determines that host **X** is the preferred host and owns the devices (unless cluster software determines that host **X** is down and host **Y** takes over).

RAID Configuration and LUN Masking

Figure 3-4 illustrates the interaction of an HBA alternate with a LUN alternate in a RAID subsystem. Two hosts (**X** and **Y**) connect to a fabric, which is simplified for this diagram. Also on the fabric is a RAID subsystem with dual controllers (left and right) containing eight LUNs.

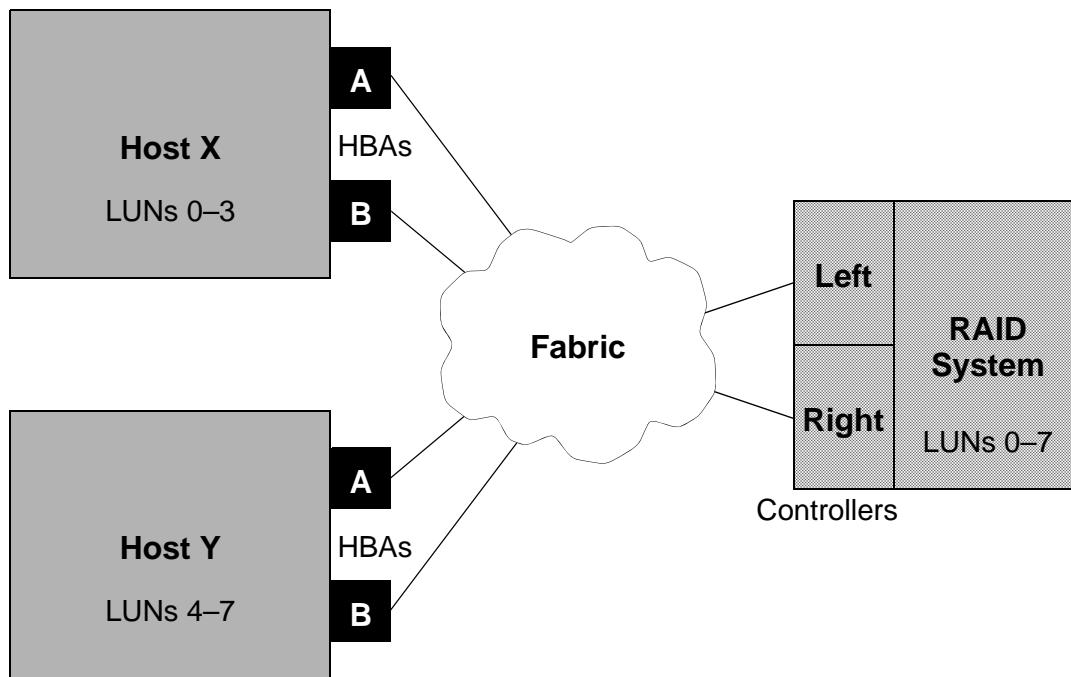


Figure 3-4 RAID Configuration and LUN Masking

Figure 3-4 is a generic example of a RAID configuration. Many, but not all, RAID systems operate in this manner. The following paragraphs describe this configuration:

- All hosts and storage devices are connected to a common fabric. Details of fabric configuration are not important, except to note that all hosts and HBAs can connect to all storage devices. Depending on the fabric, some devices may appear on the local loop and as fabric devices.
- Hosts **X** and **Y** must be configured to recognize different target devices or else risk overwriting each other's data. SANsurfer FC HBA Manager must be run on each host to configure devices as enabled (with a preferred and alternate path assigned to each device) or disabled.
- If hosts **X** and **Y** are cooperating in a cluster, they can be configured so that both recognize a specific device. In this case, clustering software and the clustered application must determine which host is permitted to write to the device.

- Host **Z** (not shown) can be added to this configuration. SANsurfer FC HBA Manager supports up to 30 hosts. The only limiting factor is that SANsurfer FC HBA Manager must be run on each host in turn.
- The RAID system offers eight LUNs, numbered **0–7**. The RAID system typically has its left and right controllers operating in an active/active manner, with half the LUNs available on each controller.
- Both hosts **X** and **Y** can recognize both targets on both HBAs. In SANsurfer FC HBA Manager, each target device is configured with one HBA as its preferred path and (optionally) one HBA as its alternate path. Ensure that both controllers are configured as enabled and not masked on a target level.
- On host **X**, the LUN mask for both controllers is set to enable LUNs **0–3** and disable all other LUNs. This LUN mask must be consistent for both the left and right controllers so that LUN alternates in the RAID system function correctly. On host **Y**, the LUN mask for both controllers is set to enable LUNs **4–7** and disable all other LUNs.
- The two alternate systems function independently, based on the configuration, operation of the RAID subsystem’s LUN alternate, and type of failure that occurs. If access to a target controller is lost, RAID subsystem LUN failover handles the recovery. If access to a target controller is available on an alternate path, HBA failover handles the recovery.

Installation Checklist

Depending on the features you require, this section describes the installation process step-by-step. Note that your configuration may not require all steps.

- [Step 1: Collect the Hardware and Software](#)
- [Step 2: Install the Hardware](#)
- [Step 3: Install the Enhanced Driver](#)
- [Step 4: Install any RAID Filter Drivers](#)
- [Step 5: Install and Run the SANsurfer FC HBA Manager](#)
- [Step 6: Configure the Disks in the Operating System](#)
- [Step 7: Install the IP Communications Driver](#)

Step 1: Collect the Hardware and Software

Collect the required hardware and software as listed in these sections.

Required Hardware

Collect the required hardware (see also [“Hardware Requirements” on page 4-1](#)). In all cases, some combination of the following is required:

- QLogic HBAs
- Target devices such as disks and RAID subsystems. Tape devices appear as part of the configuration, but SANsurfer only supports LUN masking and diagnostics on them.
- Connectivity hardware such as cables, hubs, and fabric switches.

Required Software

Collect the required software (see also [“Software Requirements” on page 4-2](#)). [Table 3-1](#) lists QLogic software products required for the features you want to enable.

Table 3-1. Required Software by Operating System

	Windows		Linux, Solaris	Macintosh	NetWare	Windows, Linux, Solaris, NetWare
Function	Miniport	Storport	Enhanced Driver	Enhanced Driver	Enhanced Driver	SANsurfer FC HBA Manager
Basic operation	X	X	X	X	X	
Fabric support	X	X	X	X	X	
Optimized operation (filtering)	X		X		X	X
Alternate path	X		X		X	X
Device selection and masking	X	X	X	X	X	X
Static load balancing	X		X		X	X
Device hot replacement	X	X				X
Secure device access						X
Heterogeneous support						X
IP support	X					
Device SAN management		X				X

NOTE:

The Storport driver does not support QLdirect. The SANsurfer FC HBA Manager has the following features disabled:

- Failover
- Load balancing
- Failover watcher (current path)

Step 2: Install the Hardware

Refer to hardware installation guides to install HBAs in host systems (see “[Related Documents](#)” on page 1-3). Cable target devices through the combination of local loops, hubs, and switches in your configuration.

Verification: On Windows/Linux (IA32, x64) systems, before installing the device driver, verify the presence of HBAs at power-up using the QLogic *Fast!UTIL* FC HBA BIOS utility. To access *Fast!UTIL*, type ALT+Q or CTRL+Q during power-up. *Fast!UTIL* allows you to perform basic HBA configuration. *Fast!UTIL* can verify device connectivity for loop and hub topologies, but does not find devices on fabric configurations.

Verification: On Windows/Linux IA64 systems, before installing the device driver, verify the presence of HBAs at power-up using EFI-UTIL.

Verification: On Solaris SPARC/Linux ppc64 systems, before installing the device driver, verify the presence of HBAs at power-up using FCode utility.

Step 3: Install the Enhanced Driver

Refer to the appropriate software installation guide (see “[Related Documents](#)” on page 1-3) and `readme.txt` file to install an enhanced device driver on host systems.

NOTE:

- Some operating systems, such as Windows, come from the operating system manufacturer with a QLogic miniport device driver. This device driver is a standard driver and does not contain the extended features required to run with SANsurfer FC HBA Manager. You must install the most current device driver to support features such as LUN masking and failover. To download the most current device driver versions, go to the QLogic Support Center Web page, support.qlogic.com.
- Macintosh systems do not utilize failover.

CAUTION!

At this stage, a dual-ported device may appear under the operating system as two distinct devices. This situation is normal; you can resolve this later by configuring one path to the device as an alternate path. If one device is configured as two devices, do not write data to this device because it can confuse the file system.

Verification: Verify that HBAs recognize target devices by using operating system device configuration utilities, or use SANsurfer FC HBA Manager to display target devices found on an HBA.

To mask devices or LUNs—or if devices appear twice because you plan to configure them later as preferred and alternate paths—do not format devices, assign drive letters, nor save this disk configuration.

In Windows, use the computer management utility to view which target devices are configured on which HBAs, and to view and format devices and LUNs that are found.

In NetWare, use the `Scan all LUNs` and `List Storage Adapters` commands to view which target devices are configured on which HBAs. You can use the `nwconfig` or `hdetect` utility to view the devices and LUNs found.

In Linux, open `/var/log/messages` to view which target devices are configured on which HBAs. Entries are also created for each HBA recognized by the driver. Each entry contains information about target devices and LUNs that are found.

In Solaris, open `/var/adm/messages` to view which target devices are configured on which HBAs.

Step 4: Install any RAID Filter Drivers

Some RAID subsystems (including some CLARiiON®, EMC®, and LSI subsystems) provide redundancy by using the subsystem to provide the same LUNs through two separate controllers in the subsystem. These controllers appear as unrelated target devices to HBAs and miniport drivers. They are tied together in the driver stack through a filter driver that understands the relationship between these target devices and can move LUNs back and forth between controllers.

To install and verify RAID filter drivers, see your RAID subsystem installation documentation or associated software documentation.

If you do not have any such drivers to install, skip to [Step 5: Install and Run the SANsurfer FC HBA Manager](#).

Step 5: Install and Run the SANsurfer FC HBA Manager

SANsurfer FC HBA Manager is a management tool used to view, manage, and diagnose QLogic HBAs. SANsurfer FC HBA Manager also configures HBAs, target devices on the HBAs, and LUNs on target devices. To use target masking, LUN masking, or device hot replacement features of SANsurfer FC HBA Manager, you must install SANsurfer FC HBA Manager. See [“Installing SANsurfer FC HBA Manager” on page 5-1](#) for complete installation instructions.

NOTE:

Macintosh systems do not use failover.

If you are installing SANsurfer FC HBA Manager on a NetWare 6.x operating system, you must also install IPX/SPX on the server.

SANsurfer FC HBA Manager runs as a client/server tool, with the client running on a hardware platform that supports Java and agents running on each system that has QLogic HBAs. If you are using SANsurfer FC HBA Manager on a host system where HBAs are installed, install the SANsurfer FC HBA Manager (user interface) on the local host. If you are installing on a Red Hat/SuSE Linux (IA64) or Solaris SPARC/x86 system, also install the SANsurfer FC HBA Manager agent on the local host.

NOTE:

SANsurfer FC HBA Manager uses remote procedure calls (RPCs) as follows:

- For Windows, SANsurfer FC HBA Manager automatically installs the required RPC service (ONC/RPC portmapper).
- For Linux, the Linux distribution must install the appropriate RPC libraries. See the Linux distribution documentation for information about installing RPC services before installing SANsurfer FC HBA Manager.
- For NetWare, RPC support requires loading `tirpc.nlm` and associated files. The SANsurfer FC HBA Manager installation adds these files automatically to the `autoexec.ncf` file.

Verification: When using SANsurfer FC HBA Manager to configure any alternate paths to devices, it treats these paths as unconfigured paths until it installs the Failover driver.

Step 6: Configure the Disks in the Operating System

After completing all hardware and configuration for FC subsystems, use the appropriate operating system utilities to enable devices, assign drive letters or logical names, and initialize file systems for each device or LUN on the system.

Step 7: Install the IP Communications Driver

As an option, you can install the IP communications driver. To use the NDIS driver to enable IP traffic over FC, install that device driver and its configuration utility.

Non-Windows Configuration Parameters

This section lists specific configuration parameters for Linux, Macintosh, and NetWare.

Linux Enhanced Driver Parameters

QLogic configuration parameters are stored in the `modules.conf` file in the `/etc` subdirectory. For parameter values, see the `readme.txt` file for the enhanced driver.

To maintain backward compatibility, if it cannot read the configuration from persistent storage, the enhanced driver defaults to the previous operation of configuring and enabling all devices found. Some OEMs indicate that this is an unacceptable risk when adding a new host to a SAN system; they would rather configure no devices instead of all devices. The parameter value is `ConfigRequired=1 (TRUE)` in Linux.

Macintosh Basic Parameters

QLogic configuration parameters are stored in two files:

```
/etc/QLogicHBA23xx.conf  
/System/Library/Extensions/QLogicHBA23xxConfig.kext/Contents/  
QLogicHBA23xxConfig
```

This is a `config` module binary.

The `qla_opts` utility in the source code of Failover API can read the `config` file and write to the `config` module.

NetWare Enhanced Driver Configuration Parameters

NetWare stores QLogic configuration parameters in the `QL2x00.cfg` file in the default DOS directory, `C:\Nwserver`. The NetWare agent creates and saves parameter values in the file; this file is not intended for modification nor editing.

NOTE:

If you are using the IOCTL module with the inbox driver or if you are using `sysfs/IOCTL` module based drivers in Red Hat 4.0, persistent configuration is not saved. Additionally, persistent configuration is not saved if you are using inbox drivers with SLES 10.0.

Notes

4 System Requirements

For optimum performance, SANsurfer FC HBA Manager requires the hardware and software listed in this section:

- “Hardware Requirements” on page 4-1
- “Software Requirements” on page 4-2
- “Supported QLogic HBAs” on page 4-3

Hardware Requirements

The minimum hardware requirements are as follows:

- QLogic QLx2xxx PCI to FC HBAs (see “Supported QLogic HBAs” on page 4-3).
- Single-processor or multiprocessor server or workstation:
 - Pentium® III with 450 MHz or greater for Windows XP Professional, Windows 2000, Windows Server 2003, Windows Vista, Windows Server 2008, Red Hat/SuSE Linux, Solaris x86, or NetWare.
 - Sun™ Ultra™ 60 for Solaris SPARC.
 - Power Mac® G5 1.8 MHz or greater with 512 MB of memory, or Mac with Intel processor 2.0 GHz or greater with 1 GB of memory.
- FC devices, such as disks and RAID subsystems. SANsurfer FC HBA Manager supports most FC devices. For a complete list of devices that support failover, see the *QLogic SAN Interoperability Guide*, which can be downloaded from the QLogic Web site (you will be asked to provide your e-mail address):

<http://connect.qlogic.com/interopguide/Interoperability.asp>

NOTE:

Tape devices are displayed as part of the configuration, but are not fully supported by SANsurfer (only LUN masking).

- 256 MB of physical RAM is required to run SANsurfer FC HBA Manager; 512 MB is recommended. Running with less memory can cause disk swapping, which severely effects performance.
- Video card capable of 256 colors and a screen resolution of 800x600 pixels are required; 16K colors and 1024x768 pixels are recommended.
- About 150 MB of disk space.

Software Requirements

The minimum software requirements are as follows:

- Common desktop environment (CDE) to run SANsurfer FC HBA Manager user interface.
- QLogic QLA2xxx drivers, as appropriate:
 - Windows XP Professional
 - Windows 2000
 - Windows Server 2003
 - Windows Vista
 - Windows Server 2008
 - NetWare
 - Linux
 - Solaris
 - Mac OS X
- TCP/IP protocol for Windows 2000/Windows Server 2003 remote management.
- TCP/IP protocol for NetWare remote management.
- Java SE Development Kit (JDK™) 1.5.0 on all platforms, except Linux PPC-64, Linux IA64, and Solaris SPARC.
- Administrative privileges to perform management functions.
- To view the help system, one of the following Web browsers: Internet Explorer® (version 5.0 or later), Netscape® Communicator (version 5.0 or later), Firefox® (version 1.0 or greater), or Safari™ (version 1.3 or greater).
- One of the following operating systems:
 - Windows 2000/SP4 Server and Advanced Server
 - Windows 2003 SP2 IA-32/IA-64/x64 Server and Enterprise Server (SP2)
 - Windows XP IA-32/x64 (SP1,2)
 - Windows Vista IA-32/x64
 - Windows 2008 Server IA-32/IA-64/x64

- ❑ Red Hat Linux AS 3.0 IA-32, IA-64, and x86_64 Update 8, 9. (no 8G support)
- ❑ Red Hat Linux AS 4.0 IA-32, IA-64, and x86_64 Update 5, 6
- ❑ Red Hat Linux AS 5.0 IA-32, IA-64, and x86_64 Update 0, 1 (including inbox sysfs support)
- ❑ SuSE Linux ES 8 IA-32, IA64, and x86_64 versions SP 3, 4. (no 8G support)
- ❑ SuSE Linux ES 9 IA-32, IA64, and x86_64 versions SP 3, 4
- ❑ SuSE Linux ES 10 IA-32, IA64, and x86_64 versions SP 0, 1 (including inbox sysfs support)
- ❑ Solaris SPARC 2.8/9/10 (with latest patches)
- ❑ Solaris x86 9/10 (with latest patches)
- ❑ Apple Mac OS X 10.3.x (PPC) and 10.4.x (PPC/Intel) and 10.5.x (PPC/Intel) (No 8G support)
- ❑ VMware ESX Server 3.5 (No 8G support)

NOTE:

For specific OS service packs (SPs) and updates, refer to the descriptions where this tool version is posted on the QLogic Web site:

http://support.qlogic.com/support/drivers_software.aspx

Supported QLogic HBAs

The following supported QLogic HBAs are collectively referred to as the QLA2xxx HBAs throughout this guide (unless otherwise noted). A list of supported HBAs can also be found in the *SANsurfer HBA Support Matrix* (FC and iSCSI) on the SANsurfer CD-ROM.

QCP2340	QLA2340	QLE220	QLE2540
QCP2342	QLA2342	QLE2360	QLE2560
QEM2462	QLA2344	QLE2362	QLE2562
QLA200	QLA2344-P	QLE2440	QSB2340
QLA210	QLA2440	QLE2460	
QLA2310	QLA2460	QLE2462	
QLA2310F	QLA2462	QLE2464	

Notes

5 Installing SANsurfer FC HBA Manager

Installing SANsurfer FC HBA Manager consists of installing the SANsurfer FC HBA Manager user interface, a platform-specific agent, and help components, as appropriate.

NOTE:

Before installing SANsurfer FC HBA Manager, read and follow the instructions in the documents listed in [“Related Documents” on page 1-3](#), as applicable.

This section provides the following information:

- [“Initial Installation” on page 5-1](#)
- [“Web- and CD-Based Installation Updates” on page 5-21](#)
- [“Uninstalling SANsurfer” on page 5-28](#)

Initial Installation

You can install the SANsurfer tool (which includes SANsurfer FC HBA Manager) using the management tools from the QLogic Web site or from the SANsurfer CD-ROM.

- Be sure to install the same version of the SANsurfer tool on all systems in the network.
- (Optional) If you have a previous version of SANsurfer FC HBA Manager, uninstall these tools before installing SANsurfer FC HBA Manager.

On a JS20 or JS21 blade that has a previous version of SANsurfer FC HBA Manager installed, ensure that the previous version of SANsurfer has been completely uninstalled before installing this new version. If you attempt to re-install this update prior to uninstalling, the system prompts you to remove the current tool. If the display has been exported using the `DISPLAY=` method, a hidden window with no focus appears behind the main installation window. The installer appears to hang; however, it is waiting for an action to be taken on the hidden window.

Installation Options

SANsurfer FC HBA Manager supports both stand-alone and networked configurations, as shown in [Table 5-1](#). Install the management tools appropriate for your configuration.

Table 5-1. Configuration Option Installation Requirements

Configuration	Management Tool Requirements
Stand-alone System:	
This Windows XP Professional/Windows 2000/Windows Server 2003/Windows Vista/Windows Server 2008 (IA32, IA64 or X64) or Red Hat/SuSE Linux (IA32) system locally monitors QLA2xxx HBAs.	SANsurfer FC HBA Manager user interface
This Red Hat/SuSE Linux (IA64, x64) or Solaris SPARC/x86 or Macintosh system locally monitors QLA2xxx HBAs.	SANsurfer FC HBA Manager user interface, plus one of the following: <ul style="list-style-type: none"> ■ SANsurfer FC Linux Agent ■ SANsurfer FC Solaris Agent ■ SANsurfer Mac OS X FC Agent
Networked System:	
This system locally monitors QLA2xxx HBAs and remote systems on the same network.	SANsurfer FC HBA Manager user interface, plus one of the following: <ul style="list-style-type: none"> ■ SANsurfer FC Windows Agent ■ SANsurfer FC Linux Agent ■ SANsurfer FC Solaris Agent ■ SANsurfer Mac OS X FC Agent
This system monitors QLA2xxx HBAs only on remote systems on the same network.	SANsurfer FC HBA Manager user interface
The QLA2xxx HBAs on this system are remotely monitored only from other systems on the same network.	One of the following: <ul style="list-style-type: none"> ■ SANsurfer FC Windows Agent ■ SANsurfer FC Linux Agent ■ SANsurfer FC Solaris Agent ■ SANsurfer Mac OS X FC Agent

Installation Instructions

The SANsurfer installer is a self-extracting utility that installs SANsurfer FC HBA Manager and related files.

NOTE:

If you are installing SANsurfer on a Macintosh, download the StuffIt® file and expand the contents. After the contents are expanded, double-click the Install icon using the Finder™.

If the utility is already installed, you may want to perform routine Web/CD based updates.

If you are installing the SANsurfer FC HBA Manager agent on a NetWare server, note the following:

- You cannot install the SANsurfer FC HBA Manager agent directly on a NetWare server; you must install the agent from a Windows system connected to the NetWare server.
- The prerequisites for each NetWare server are as follows:
 - A Windows system must be connected to the NetWare server through the TCP/IP network.
 - The Windows system must have a drive mapped to the NetWare server system volume (`sys:\`).

Perform the following steps to install SANsurfer FC HBA Manager on your system or on the NetWare server connected to this system.

To install SANsurfer FC HBA Manager:

1. To access the SANsurfer installer, do one of the following:
 - If you are installing SANsurfer FC HBA Manager from the SANsurfer CD-ROM, follow these steps:
 - a. On the CD-ROM home page, click the button that indicates your operating system.
 - b. Read the license agreement and click **I ACCEPT**.
 - c. Click the link to your OS platform.
 - d. Click the link to the **Management Tools**.
 - e. Under **Name**, select the **SANsurfer FC HBA Manager** link for your OS platform.
 - f. On the File Download dialog box, click **Save**. Select a directory on your system and download the file.

- If you are installing SANsurfer FC HBA Manager from the QLogic Web site, follow these steps:
 - a. On the QLogic home page (<http://www.qlogic.com>), click the **Downloads** tab.
 - b. In the selection box (Figure 5-1), click **Fibre Channel HBAs** in the left column, your HBA model number in the middle column, and your operating system in the right column. For example:

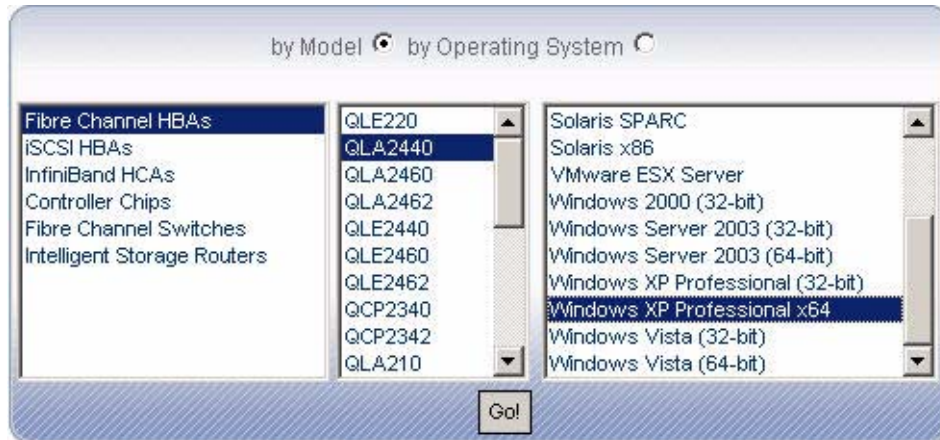


Figure 5-1 SANsurfer Download Selections (Example)

- c. Click **Go!**.
 - d. Scroll down to the **Management Tools** table and click the appropriate version of SANsurfer FC HBA Manager for your operating system.
 - e. On the End User Software License Agreement page, read this important information, and then click **Agree** to continue.
 - f. On the File Download dialog box, click **Save**. Select a directory on your system and then click **Save As** to download the file.
 - g. (Optional) In the **Management Tools** table, select and download the *Readme* and *Release Notes* files for the appropriate version of SANsurfer FC HBA Manager.
2. Start the installer, as described for your operating system:
 - For a Windows system, locate the folder where you downloaded the install file and double-click the file.

- For a Red Hat/SuSE Linux or Solaris SPARC/x86 system, follow these steps:
 - a. Open a shell.
 - b. Change to the directory where you downloaded the SANsurfer installer.
 - c. To ensure that the SANsurfer installer file is executable and start the installer, type the following, and then press `ENTER`:

```
sh ./install.bin
```

The InstallAnywhere® window prepares to install SANsurfer and opens the installation Introduction dialog box (Figure 5-2).

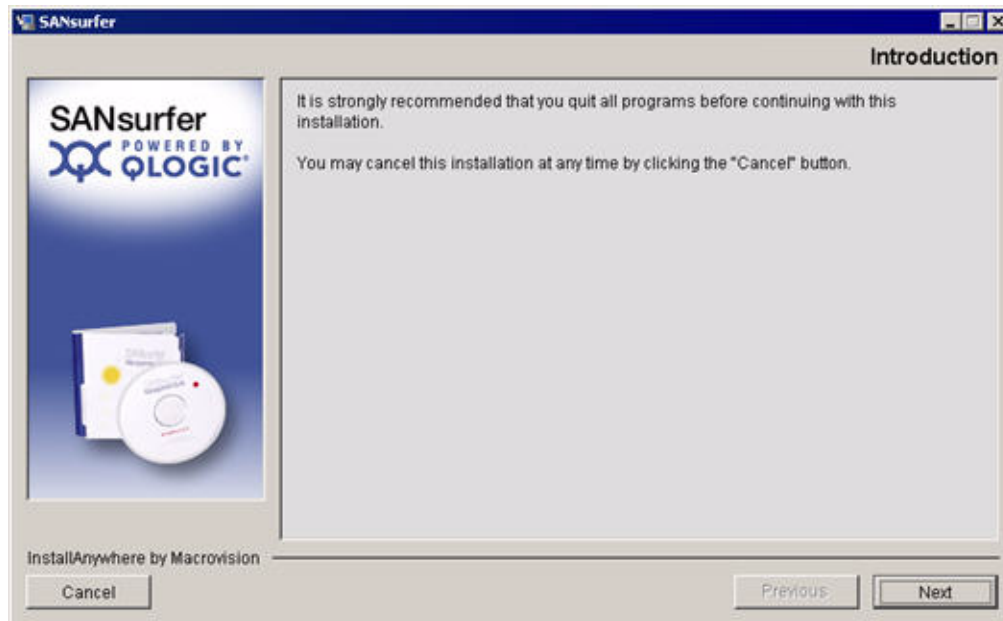


Figure 5-2 Install SANsurfer: Introduction

3. Click **Next**.

The Important Information dialog box opens (Figure 5-3).

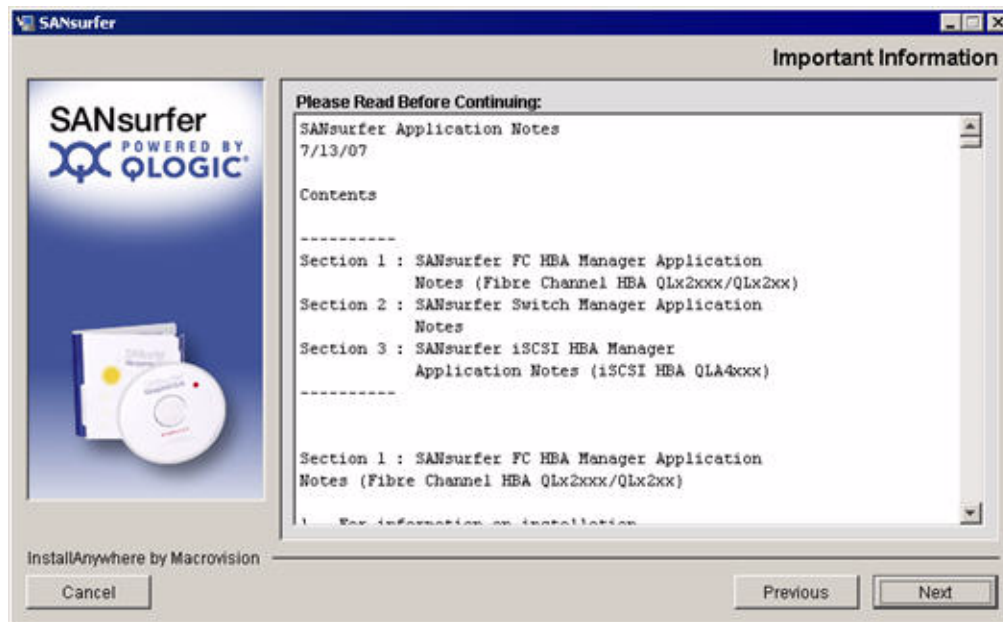


Figure 5-3 Install SANsurfer: Important Information

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

You can also find this information in the `readme.txt` file in the following locations:

- On Windows:
Program Files\QLogic Management Suite
- On Red Hat/SuSE Linux and Solaris SPARC/x86:
`opt/QLogic_Corporation/SANsurfer`

The Choose Product Features dialog box opens (Figure 5-4).

NOTE:

Except for the agents that are installed, the feature options are the same for all operating systems: Windows, Red Hat/SuSE Linux, Solaris SPARC/x86, and Macintosh.



Figure 5-4 Install SANsurfer: Choose Product Features

SANsurfer FC HBA Manager supports both stand-alone and network configurations (see “Installation Options” on page 5-2).

5. Select one of the following installation sets, and then click **Next**.
 - For a Windows system:
 - SANsurfer FC HBA Manager** includes the SANsurfer FC HBA Manager user interface only.
 - All GUIs and ALL Agents** includes all user interfaces (including SANsurfer FC HBA Manager and its agents).
 - SANsurfer HBA NetWare 5/6.x** includes the SANsurfer FC HBA Manager Novell NetWare 5/6.x (and above) agent.
 - Custom** includes a modified installation set that you create.

- For a Red Hat/SuSE Linux system:
 - ❑ **SANsurfer FC HBA Manager** includes the SANsurfer FC HBA Manager user interface only.
 - ❑ **All GUIs and ALL Agents** includes all user interfaces (including SANsurfer FC HBA Manager and its agents).
 - ❑ **Custom** includes a modified installation set that you create.
- For a Solaris SPARC/x86 system:
 - ❑ **SANsurfer FC HBA Manager** includes the SANsurfer FC HBA Manager user interface only.
 - ❑ **All GUIs and ALL Agents** includes all user interfaces (including SANsurfer FC HBA Manager and its agents).
 - ❑ **Custom** includes a modified installation set that you create.
- For a Macintosh system ([Figure 5-5](#)):
 - ❑ **FC HBA GUI and Agent** includes the SANsurfer FC HBA Manager user interface and the FC Power Mac OS X agent.
 - ❑ **SANsurfer FC Mac OSx Agent** includes SANsurfer FC HBA Manager for the Power Mac OS X agent.
 - ❑ **SANsurfer FC HBA Manager** includes the SANsurfer FC HBA Manager user interface only.
 - ❑ **All GUIs and ALL Agents** includes all user interfaces (including SANsurfer FC HBA Manager and its agents).
 - ❑ **Custom** includes a modified installation set that you create.



Figure 5-5 Macintosh Installation: Choose Product Features

The Choose Install Folder dialog box opens (Figure 5-6).

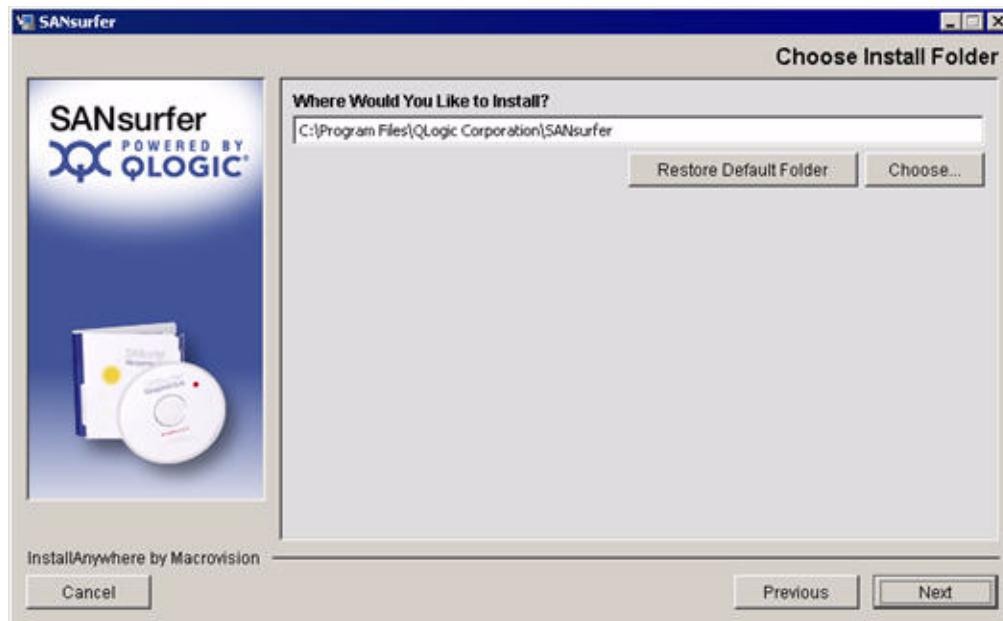


Figure 5-6 Install SANsurfer: Choose Install Folder

6. Select an install location using one of the following methods:

NOTE:

For NetWare, select the drive mapped to the NetWare server (always select a location other than the default).

- To accept the destination location shown in the dialog box and continue, click **Next** (recommended).

The default location for a Windows system is:

```
C:\Program Files\QLogic Corporation\SANsurfer
```

The default location for a Red Hat/SuSE Linux and Solaris SPARC/x86 system is:

```
/opt/QLogic_Corporation/SANsurfer
```

- To select a different location:
 - a. Click **Choose**, and then select an installation location.
 - b. On the Choose Install Folder dialog box, click **Next**.
- If you selected a different location and want to reselect the default location:
 - a. Click **Restore Default Folder**.
 - b. Click **Next**.

If there is a previous version of the SANsurfer tool on the system, the Previous SANsurfer Install Detected message box appears (Figure 5-7).

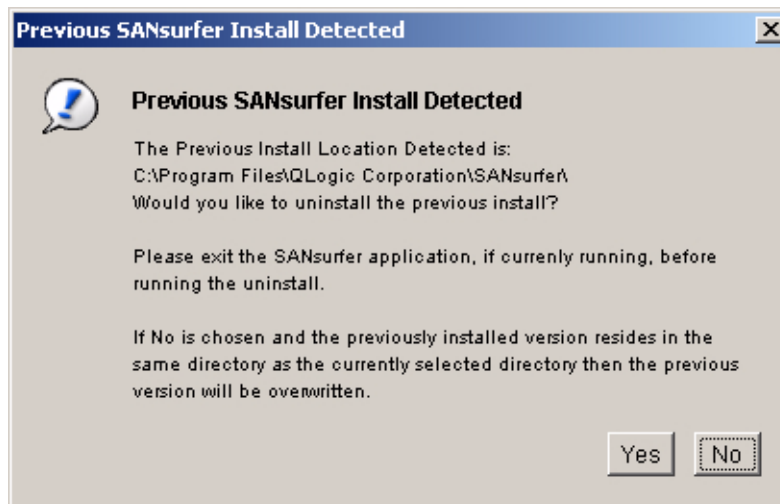


Figure 5-7 Previous SANsurfer Install Detected Message

7. Respond to the previous installation message:
 - a. If the SANsurfer tool is currently running, exit SANsurfer before proceeding with the installation.
 - b. Choose one of the following options:
 - If you want to uninstall the previous version, click **Yes**. The previous version is uninstalled.

NOTE:

If you are installing on a Windows system and you are prompted to reboot the system after the uninstall is complete, be sure to reboot before installing in the same directory as the currently selected directory. Otherwise, the newly installed tool will not operate properly.

- If you do not want to uninstall the previous version, click **No**. If the previously installed version resides in the same directory as the currently selected directory, the previous version is overwritten.

If you are installing the SANsurfer FC HBA Manager user interface on a Windows system, the Select Shortcut Profile dialog box opens ([Figure 5-8](#)).

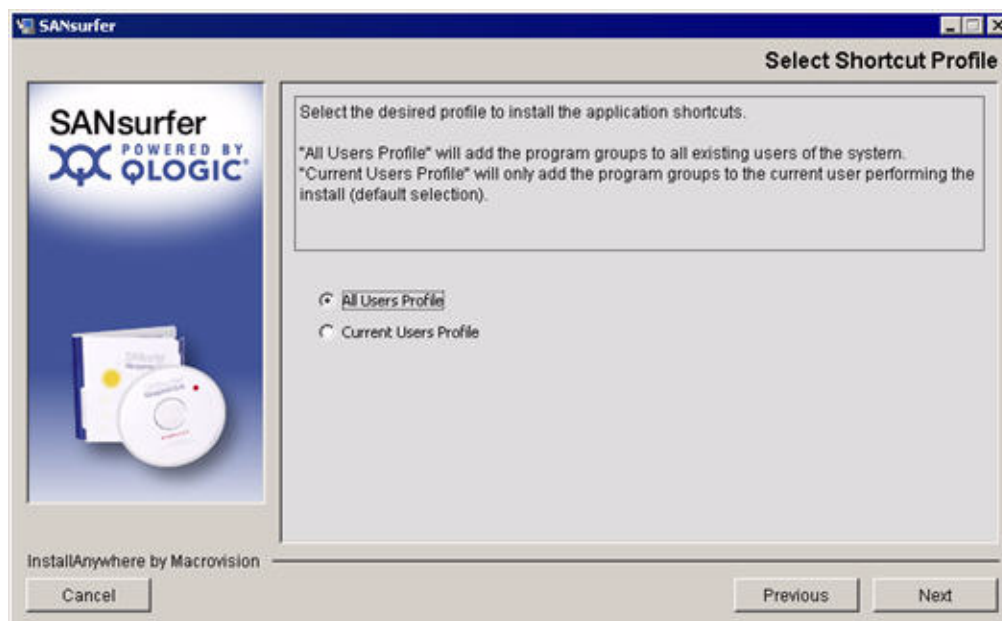


Figure 5-8 Install SANsurfer: Select Shortcut Profile (Windows Only)

Shortcuts consist of the following:

- The SANsurfer icon on the desktop (if you select it in [Step 9](#)).
 - QLogic Management Suite (SANsurfer and SANsurfer Uninstaller), which is accessible when you click the **Start** button and point to **Programs**.
8. To specify the shortcut profile, choose one of the following, and then click **Next**:
- If you want the SANsurfer shortcuts available to all users, click **All Users Profile**.
 - If you want the SANsurfer shortcuts available only to the current user, click **Current Users Profile** (default).

If you are installing the SANsurfer FC HBA Manager user interface on a Windows system, the Create Desktop Icon Selection dialog box opens ([Figure 5-9](#)).

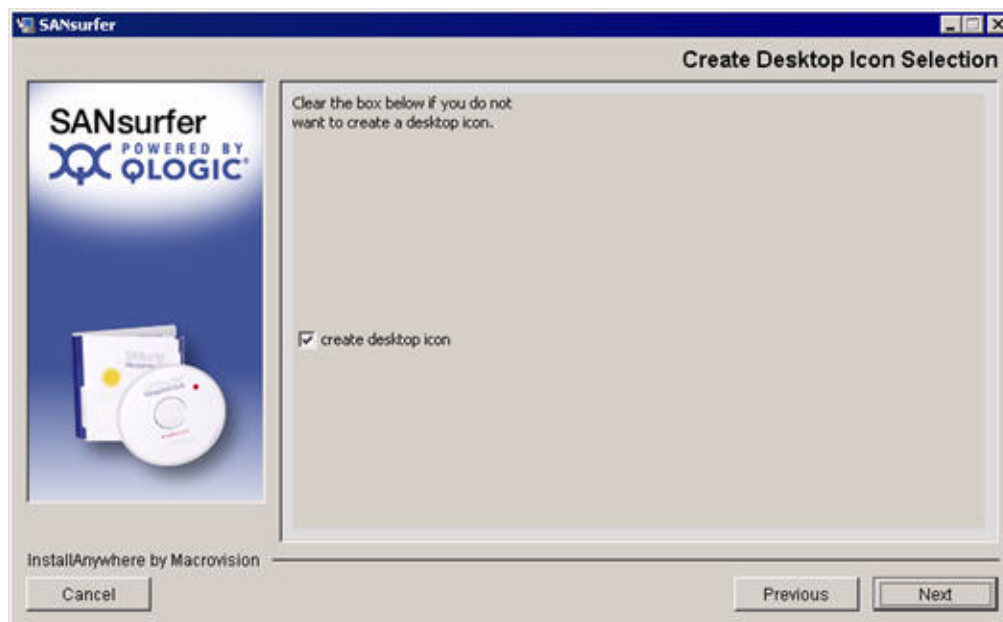


Figure 5-9 Install SANsurfer: Create Desktop Icon Selection (Windows Only)

9. (Windows only) If you want the installer to place the SANsurfer icon on the desktop, select the **create desktop icon** check box (default), and then click **Next**.

NOTE:

If you select the **create desktop icon** check box, the SANsurfer icon opens for the current user profile or all user profiles, depending upon your previous selection in [Step 8](#).

The Pre-Installation Summary dialog box ([Figure 5-10](#)) opens.

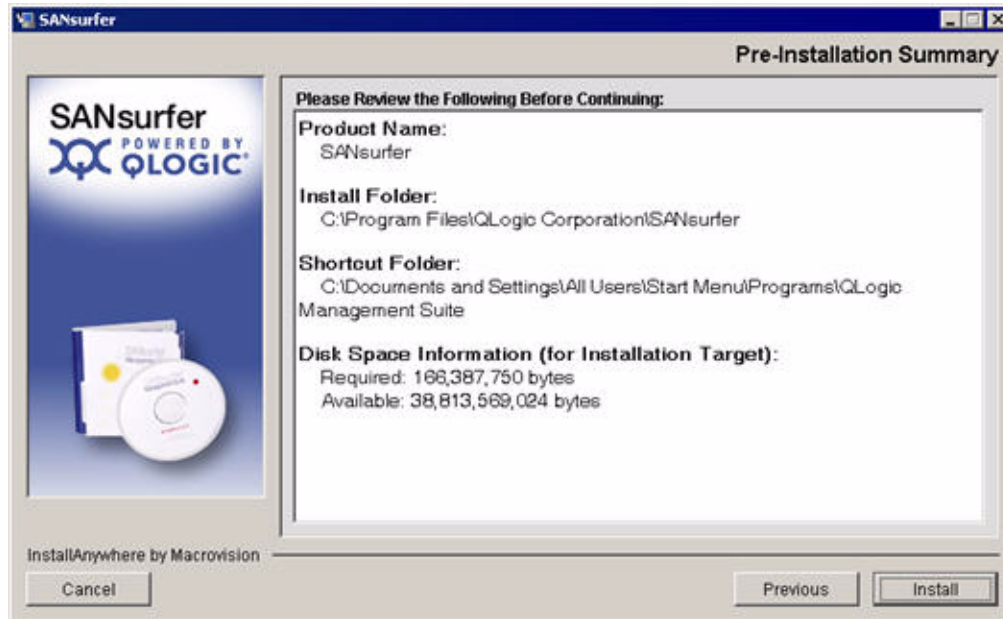


Figure 5-10 Install SANsurfer: Pre-Installation Summary

10. Review your installation selections. To change your selections, click **Previous** to return to other installation windows. To continue, click **Install**.
The Installing SANsurfer dialog box opens ([Figure 5-11](#)). Various messages inform you that the installation is progressing.

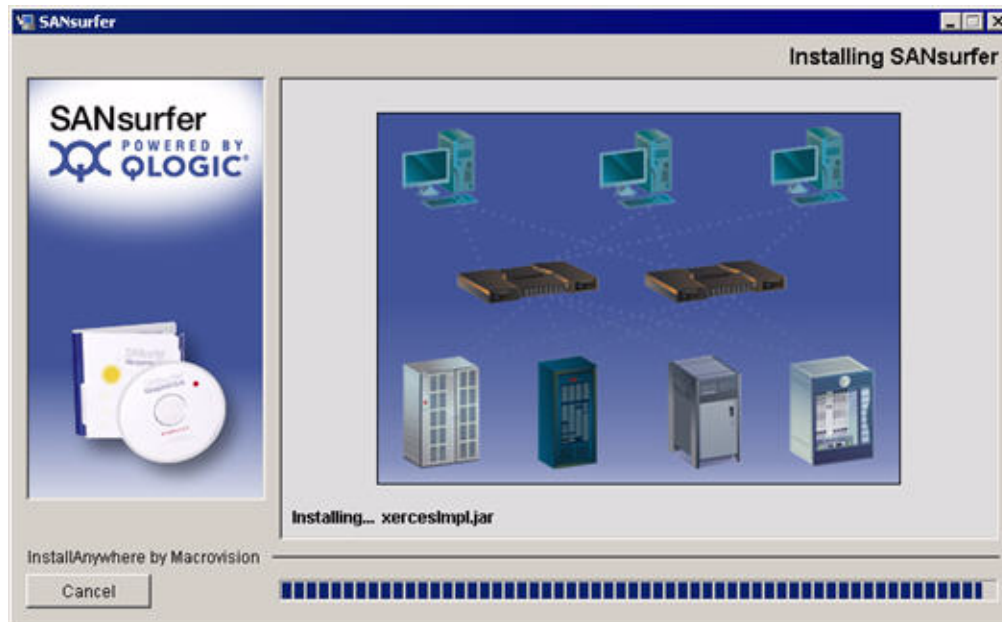


Figure 5-11 Install SANsurfer: Installing SANsurfer

If you are installing NetWare, the Novell NetWare Disk Selection dialog box opens (Figure 5-12).

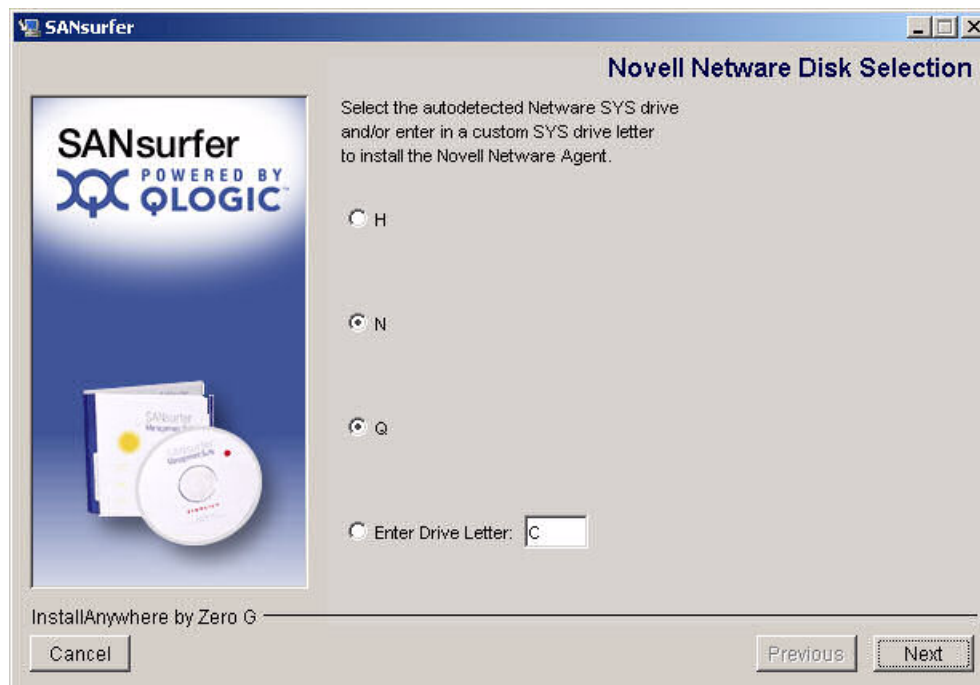


Figure 5-12 Install SANsurfer: Novell NetWare Disk Selection

The Novell NetWare Disk Selection dialog box lists the auto-detected Windows drives mapped to NetWare server system volumes (`sys:\`).

11. Select the Windows drives on which to install the NetWare agent. Each drive must be mapped to a NetWare server system volume (`sys:\`).
 - a. As appropriate, select one or more auto-detected drives. In [Figure 5-12](#), for example, **H**, **N**, and **Q** can be selected; **N** and **Q** are selected.
 - b. If a Windows drive that you want to select has not been mapped to the NetWare server system volume, do the following:
 - Leave the Novell NetWare Disk Selection dialog box open. To map the Windows drive to the NetWare Server system volume (`sys:\`), open Windows Explorer, point to **Tools**, and then click **Map Network Drive**.
 - On the Novell NetWare Disk Selection dialog box, type the drive letter in the **Enter Drive Letter** box and then click **Enter Drive Letter**. In [Figure 5-12](#), for example, you could type **C** in the **Enter Drive Letter** box and then click **Enter Drive Letter**.
 - c. Click **Next**.

If you are installing SANsurfer FC HBA Manager on a Windows 2000/Windows Server 2003, Novell NetWare, Red Hat/SuSE Linux, or Sun Solaris system, the Default QLogic Failover Enable/Disable dialog box opens ([Figure 5-13](#)).

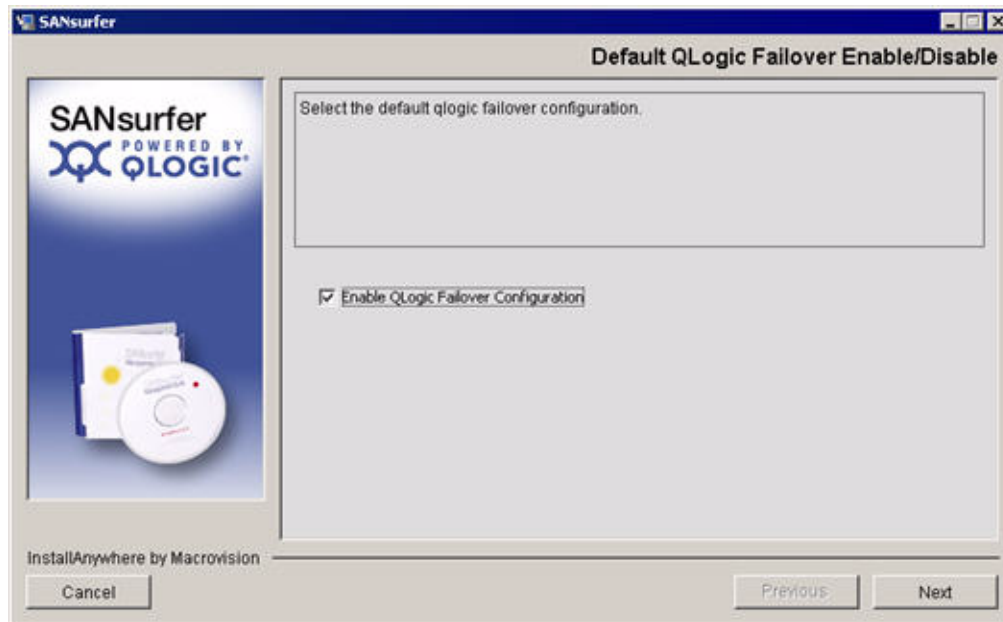


Figure 5-13 Install SANsurfer: Default QLogic Failover Enable/Disable

The failover path feature ensures data availability and system reliability by assigning alternate path and automatic HBA failover for device resources.

12. To enable failover, select the **Enable QLogic Failover Configuration** check box, and then click **Next**.

The Launch SANsurfer Application dialog box opens ([Figure 5-14](#)).

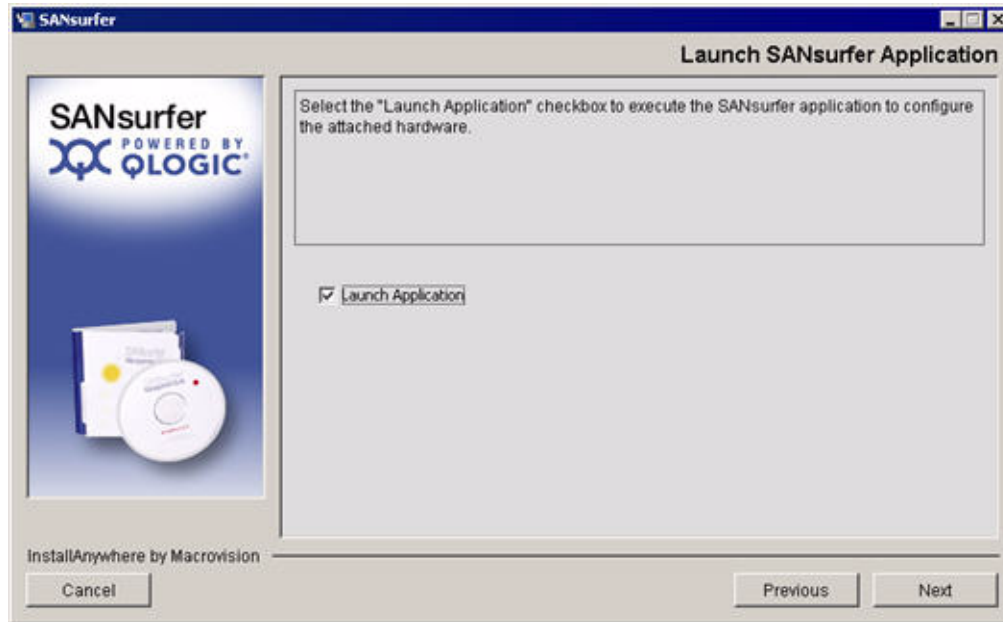


Figure 5-14 Install SANsurfer: Launch SANsurfer Application

13. To automatically start SANsurfer FC HBA Manager when installation is complete, select the **Launch Application** check box, and then click **Next**. To start the tool later, clear the check box and then click **Next**.

The Install Complete dialog box appears ([Figure 5-15](#)).

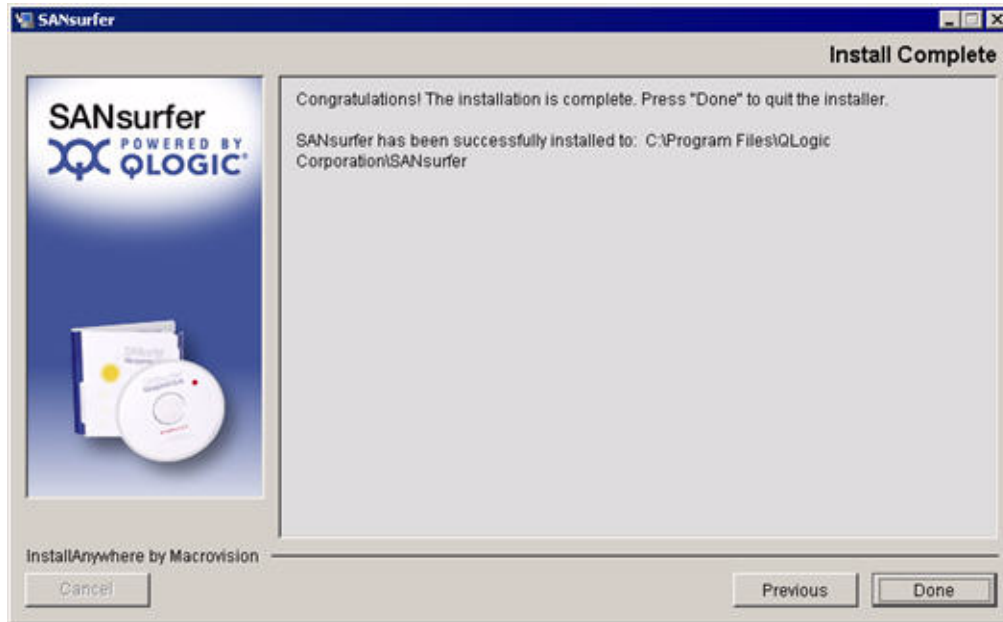


Figure 5-15 Install SANsurfer: Install Complete

14. To exit the installer, click **Done**.

Now you are ready to customize SANsurfer FC HBA Manager and set your security parameters (see [“Getting Started” on page 6-1](#)).

Installation Instructions Using CLI

SANsurfer provides the ability to install the tool and its components by means of a command line interface (CLI).

The following installation options are available (tied to existing install sets):

- [“Combo Installer Command Lines” on page 5-19](#) lists the commands for Windows, Linux, and Solaris installation combinations.
- [“Stand-alone Installer Command Lines” on page 5-20](#) lists the commands for Windows, Linux, and Solaris stand-alone installation options.

NOTES:

- To change the destination folder, add the `-D` parameter to the command lines as follows:

```
-DUSER_INSTALL_DIR="d:\Apps\SANsurfer" ** you may need  
to escape the \ here \\ **
```

- To prevent installation of the desktop icon, enter the following command:

```
-DINSTALL_DESKTOP_ICON="false"
```

Combo Installer Command Lines

Windows combo installer command lines include the following:

- Windows— To install SANsurfer FC HBA Manager user interface only (HBA); no agent:

```
sansurfer_windows_install.exe -i silent  
-DSILENT_INSTALL_SET="QMSJ_G"
```

- Windows—To install SANsurfer Switch Manager user interface only:

```
sansurfer_windows_install.exe -i silent  
-DSILENT_INSTALL_SET="SBM"
```

- Windows—To install SANsurfer iSCSI HBA Manager user interface only (HBA); no agent:

```
sansurfer_windows_install.exe -i silent  
-DSILENT_INSTALL_SET="SB_iX"
```

- Windows—To install all user interfaces and all agents:

```
sansurfer_windows_install.exe -i silent  
-DSILENT_INSTALL_SET="QMSJ_G_N_IX"
```

Linux combo installer command lines include the following:

- Linux—To install SANsurfer FC HBA Manager user interface only (HBA); no agent:

```
sansurfer_linux_install.bin -i silent  
-DSILENT_INSTALL_SET="QMSJ_G"
```

- Linux—To install SANsurfer Switch Manager user interface only:

```
sansurfer_linux_install.bin -i silent  
-DSILENT_INSTALL_SET="SBM"
```

- Linux—To install SANsurfer iSCSI HBA Manager user interface only (HBA); no agent:

```
sansurfer_linux_install.bin -i silent  
-DSILENT_INSTALL_SET="SB_iX"
```

- Linux—To install all user interfaces and all agents:

```
sansurfer_linux_install.bin -i silent  
-DSILENT_INSTALL_SET="QMSJ_G_L_IX"
```

- Linux IA64—To install all user interfaces and all agents:

```
sansurfer_linux_install_ia64.bin -i silent  
-DSILENT_INSTALL_SET="QMSJ_G_L_IA64"
```

- Linux PPC—To install all user interfaces and all agents:

```
sansurfer_linux_install_ppc.bin -i silent  
-DSILENT_INSTALL_SET="QMSJ_G_L_PPC"
```

Solaris combo installer command lines include the following:

- Solaris—To install SANsurfer FC HBA Manager user interface only (HBA); no agent:

```
sansurfer_solaris_install.bin -i silent  
-DSILENT_INSTALL_SET="QMSJ_G"
```

- Solaris—To install SANsurfer Switch Manager user interface only:

```
sansurfer_solaris_install.bin -i silent  
-DSILENT_INSTALL_SET="SBM"
```

- Solaris—To install SANsurfer iSCSI HBA Manager user interface only (HBA); no agent:

```
sansurfer_solaris_install.bin -i silent  
-DSILENT_INSTALL_SET="SB_iX"
```

- Solaris—To install all user interfaces and all agents:

```
sansurfer_solaris_install.bin -i silent  
-DSILENT_INSTALL_SET="QMSJ_G_S_IX"
```

Stand-alone Installer Command Lines

Windows stand-alone installer command lines include the following:

- Windows—To install SANsurfer FC HBA Manager interface only (HBA); no agent:

```
standalone_sansurfer_windows_install.exe -i silent  
-DSILENT_INSTALL_SET="QMSJ_G"
```

- Windows—To install all user interfaces and all agents:

```
standalone_sansurfer_windows_install.exe -i silent  
-DSILENT_INSTALL_SET="QMSJ_G_NT"
```

Linux stand-alone installer command lines include the following:

- Linux—To install SANsurfer FC HBA Manager user interface only (HBA); no agent:

```
standalone_sansurfer_linux_install.bin -i silent  
-DSILENT_INSTALL_SET="QMSJ_G"
```

- Linux—To install all user interfaces and all agents:

```
standalone_sansurfer_linux_install.bin -i silent  
-DSILENT_INSTALL_SET="QMSJ_G_LA"
```

- Linux IA64—To install all user interfaces and all agents:

```
standalone_sansurfer_linux_install_ia64.bin -i silent  
-DSILENT_INSTALL_SET="QMSJ_G_L_IA64"
```

- Linux PPC—To install all user interfaces and all agents:

```
standalone_sansurfer_linux_install_ppc.bin -i silent  
-DSILENT_INSTALL_SET="QMSJ_G_L_PPC"
```

Solaris stand-alone installer command lines include the following:

- Solaris—To install SANsurfer FC HBA Manager user interface only (HBA); no agent:

```
standalone_sansurfer_solaris_install.bin -i silent  
-DSILENT_INSTALL_SET="QMSJ_G"
```

- Solaris—To install all user interfaces and all agents:

```
standalone_sansurfer_solaris_install.bin -i silent  
-DSILENT_INSTALL_SET="QMSJ_G_SA"
```

Web- and CD-Based Installation Updates

To always keep SANsurfer FC HBA Manager up to date with the latest version, SANsurfer provides two possible ways to update an existing installation:

- You can download and install an update directly from the Web.
- You can browse to an existing update package on some form of external media; for example, a CD-ROM, DVD, or other portable storage.

This section provides the steps for both update methods:

- [“Updating SANsurfer by Web Update” on page 5-21](#)
- [“Updating SANsurfer by Package Update” on page 5-25](#)

NOTE:

To use the Web update feature of SANsurfer FC HBA Manager requires an Internet connection because files are downloaded from the QLogic Web site.

Updating SANsurfer by Web Update

Obtain SANsurfer updates from the QLogic Web site or from service personnel.

CAUTION!

You must exit SANsurfer to avoid locked files during the update process.

To check for tool updates:

1. On the SANsurfer FC HBA Manager main menu, select **Help** and then click **Check for Updates Now**. The Select Update dialog box opens (Figure 5-16).

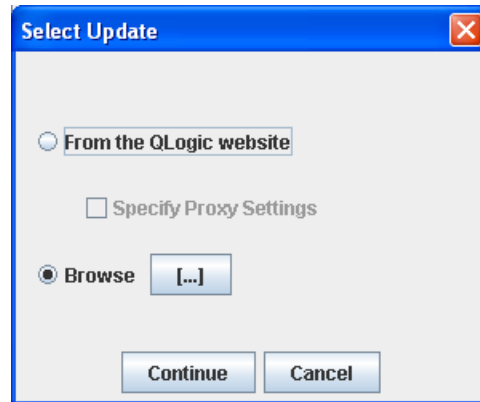


Figure 5-16 Update SANsurfer: Select Update Dialog Box

2. Depending on whether your network requires proxy settings or not, follow the appropriate procedure.

Network Does Not Use Proxy Settings

Follow these steps to update SANsurfer from the QLogic Web site when your network does not use proxy settings to access the Internet:

To update SANsurfer (network does not use proxy settings):

1. On the Select Update dialog box (Figure 5-16), click **From the QLogic website**.
2. Clear the **Specify Proxy Settings** check box.
3. Click **Continue**. If updates are available, the Update dialog box opens (Figure 5-18). Otherwise, a message box informs you that there are no updates.

Network Requires Proxy Settings

Follow these steps to update SANsurfer from the QLogic Web site when your network requires proxy settings to access the Internet.

To update SANsurfer (network requires proxy settings):

1. On the Select Update dialog box (Figure 5-16), click **From the QLogic website**.
2. Select the **Specify Proxy Settings** check box.
3. Click **Continue**. The Server Proxy Settings dialog box opens (Figure 5-17).



Figure 5-17 Update SANsurfer: Server Proxy Settings Dialog Box

4. If you want the HTTP proxy setting to be detected automatically, leave the dialog box as is, and then click **OK** to continue.

If you want to specify the server proxy settings, complete the following:

- a. Select the **Use the following HTTP proxy setting** check box.
- b. In the **Address** box, type the http address.
- c. In the **Port** box, type the port ID of the proxy server.
- d. In the **Login** and **Password** boxes, type your login and password for the proxy servers that require authentication.
- e. To continue, click **OK**. To exit the dialog box and return to the main SANsurfer FC HBA Manager window, click **Cancel**.

When your computer accesses the Internet, the Update dialog box appears (Figure 5-18) showing available update information.

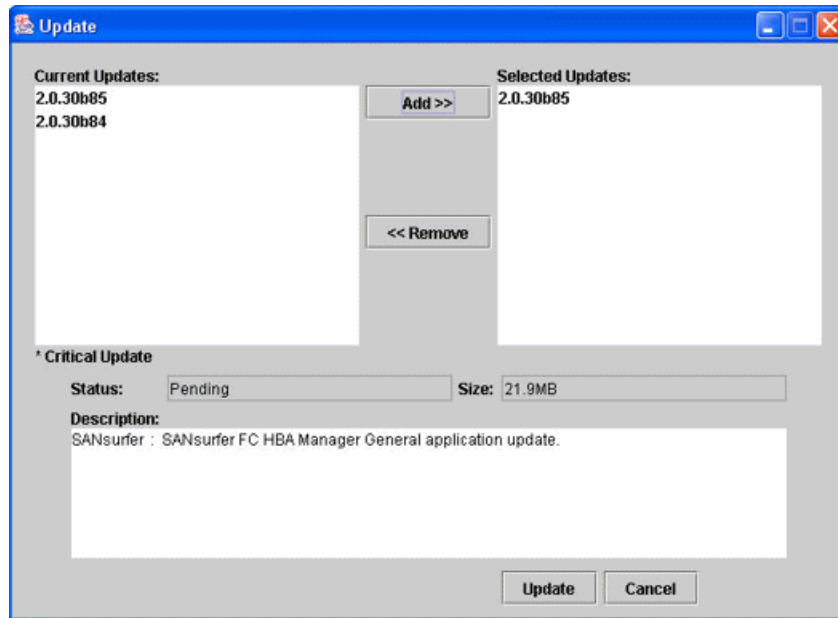


Figure 5-18 Update SANsurfer: Update Dialog Box

The available update information includes:

- **Current Updates** column lists product updates available for the current tool version.
- **Selected Updates** column lists product updates that you select for installation.

5. To use the Update dialog box, select the current product update packages:
 - To select a package, select its entry in the **Current Updates** list and then click **Add>>**. The update moves to the **Selected Updates** list.
 - To remove a package in the **Selected Updates** list, select it and click **<<Remove**. The selected package returns to the **Current Updates** list.

For each update selected, the following information is shown:

- **Status** describes the current status of the selected update.
- **Size** indicates the size of the selected update in MBs.
- **Description** provides a general description of the update.

6. When you finish selecting updates, click **Update** to start the download and installation process. Follow the instructions to install the selected product update. Or, to discontinue the update process and stop the installation, click **Cancel**.

Updating SANsurfer by Package Update

You can update SANsurfer FC HBA Manager by browsing to an existing update package on your hard drive or some form of external media, such as a CD-ROM, DVD, or portable storage device.

CAUTION!

You must exit SANsurfer to avoid locked files during the update process.

To update the existing tool:

1. On the SANsurfer FC HBA Manager main menu, click **Help** and then click **Check for Updates Now**.

The Select Update dialog box opens (Figure 5-19).

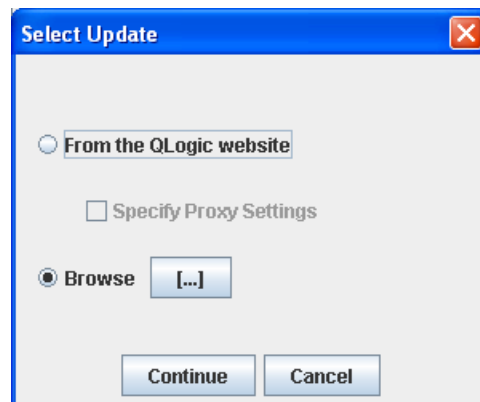


Figure 5-19 Update SANsurfer: Select Update Dialog Box

2. To select a file, click **Browse**, and then click . To exit the Select Update dialog box and return to the main SANsurfer FC HBA Manager window, click **Cancel**.

The Open dialog box appears (Figure 5-20).

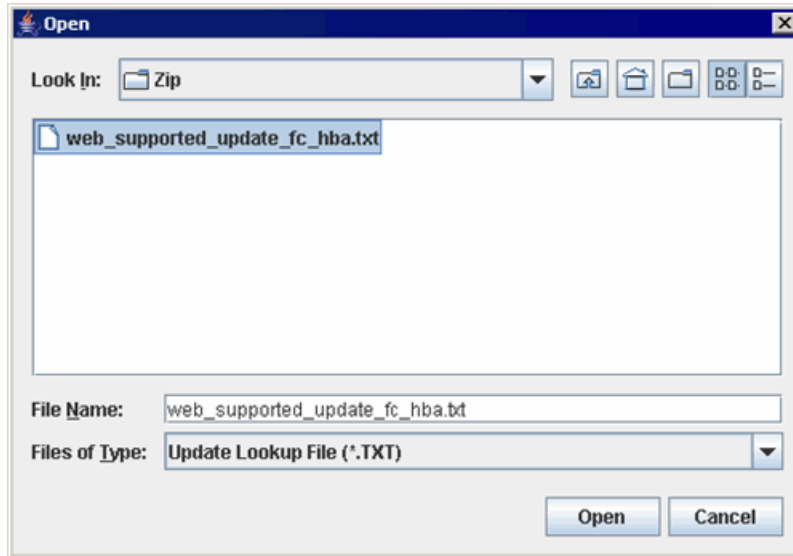


Figure 5-20 Update SANsurfer: Open Dialog Box

3. Select the SANsurfer FC HBA Manager patch update file, `web_supported_update_fc_hba.txt`, which can be located on a local file system or on a CD, DVD, or portable storage device, and then click **Open**. To exit the Open dialog box and return to the Select Update dialog box, click **Cancel**.

After you open the patch update file, the Update dialog box opens (Figure 5-21), showing available update information.

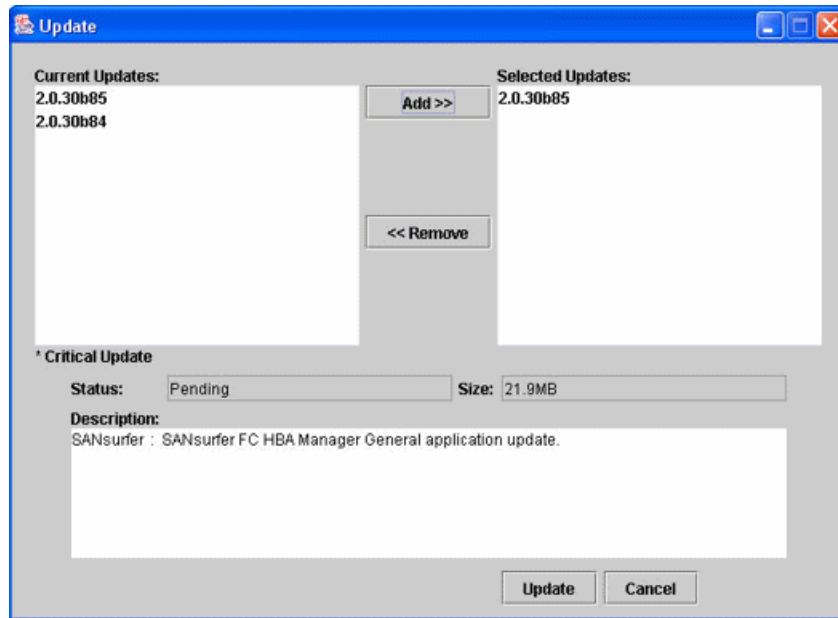


Figure 5-21 Update SANsurfer: Update Dialog Box

The available update information includes:

- **Current Updates** column lists product updates available for the current program version.
 - **Selected Updates** column lists product updates that you select for installation.
4. To use the Update dialog box, select the current product update packages:
- To select a package, select its entry in the **Current Updates** list and then click **Add>>**. The update moves to the **Selected Updates** list.
 - To remove a package in the **Selected Updates** list, select it and click **<<Remove**. The selected package returns to the **Current Updates** list.

For each update selected, the following information is shown:

- **Status** describes the current status of the selected update.
 - **Size** indicates the size of the selected update in MBs.
 - **Description** provides a general description of the update.
5. When you finish selecting updates, click **Update** to start the download and installation process. Follow the instructions to install the selected product update. Or, to discontinue the update process and stop the installation, click **Cancel**.

Uninstalling SANsurfer

Perform the following steps to uninstall from this system either the entire SANsurfer management toolset (including SANsurfer FC HBA Manager) or specific features. Be sure to exit all SANsurfer tools before you uninstall any SANsurfer tools.

NOTES:

- While uninstalling SANsurfer FC HBA Manager from a NetWare server, the server's prompt displays the message: `Cannot start sys:etc/rpcnet.cfg`. This does not affect the operation of the NetWare server and can be ignored.
- The uninstall process leaves behind some files and directories. Ensure that you manually delete these files.

To uninstall SANsurfer FC HBA Manager:

1. To start the SANsurfer uninstaller from a Windows system, choose one of the following methods:
 - On the Windows **Start** menu, point to **Programs**, point to **QLogic Management Suite**, and then click **SANsurfer Uninstaller**.
 - To use Add/Remove Programs, follow these steps:
 - a. On the Windows **Start** menu, point to **Settings**, and then click **Control Panel**.
 - b. Double-click the **Add/Remove Programs** icon to open the Add/Remove Programs dialog box ([Figure 5-22](#)).

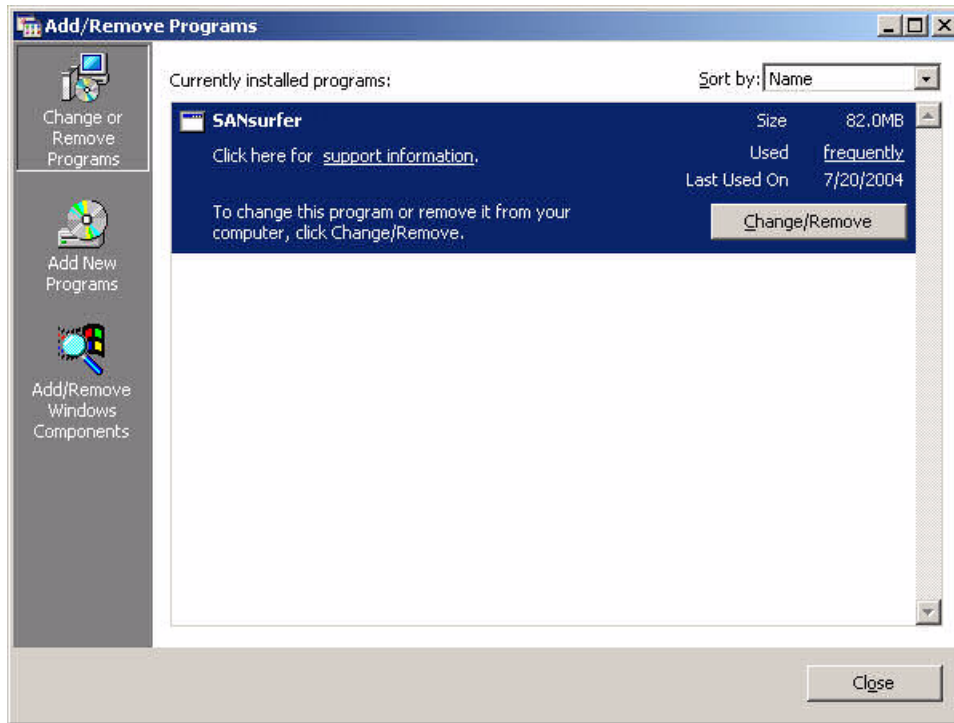


Figure 5-22 Uninstall SANsurfer: Add/Remove Programs (Windows 2000)

- c. In the left column, click **Change or Remove Programs** (default).
- d. Under **Currently Installed Programs**, select **SANsurfer x.x**.
- e. Click **Change/Remove**.

To start the SANsurfer uninstaller from a Red Hat/SuSE Linux or Solaris SPARC/x86 system, do one of the following, and then press ENTER:

- On a Red Hat/SuSE Linux system, if `/usr/local/bin` is in the path, type `SANsurferUninstaller`.
- On a Solaris SPARC/x86 system, if `/usr/bin` is in the path, type `SANsurferUninstaller`.
- On a Red Hat/SuSE Linux or Solaris SPARC/x86 system, if neither of the preceding are in the path, change to the directory where the SANsurfer tool is installed. The default location is:

```
/opt/QLogic_Corporation/SANsurfer/UninstallDat
```

Type:

```
./SANsurferUninstaller
```

2. The Uninstall SANsurfer dialog box (Figure 5-23) opens with SANsurfer x.x as the program to be uninstalled.

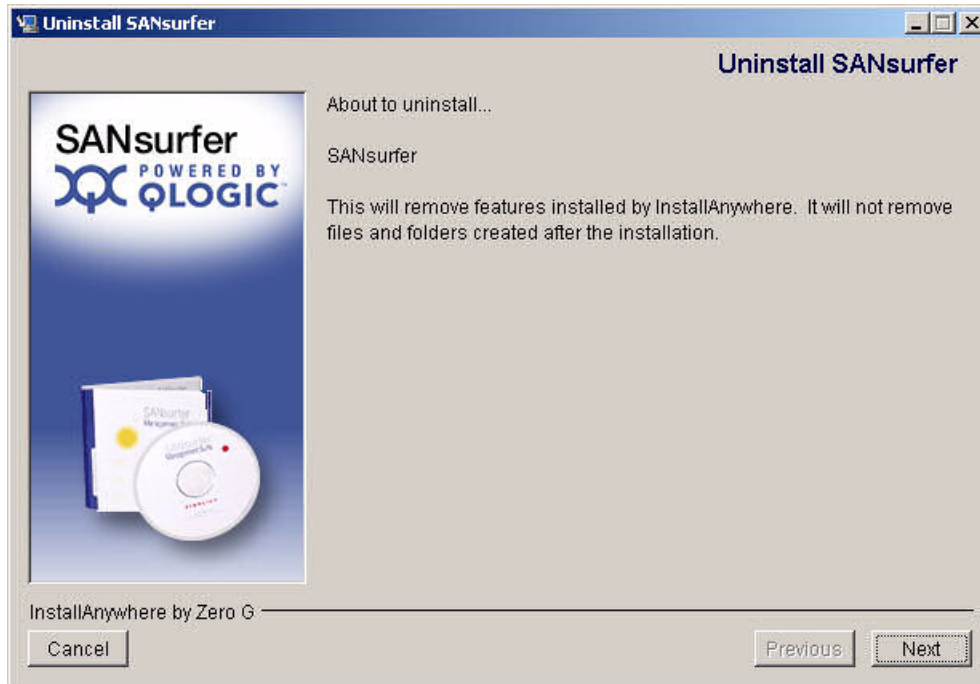


Figure 5-23 Uninstall SANsurfer: Uninstall SANsurfer

3. Click **Next** to continue.
The Uninstall Options dialog box opens (Figure 5-24).

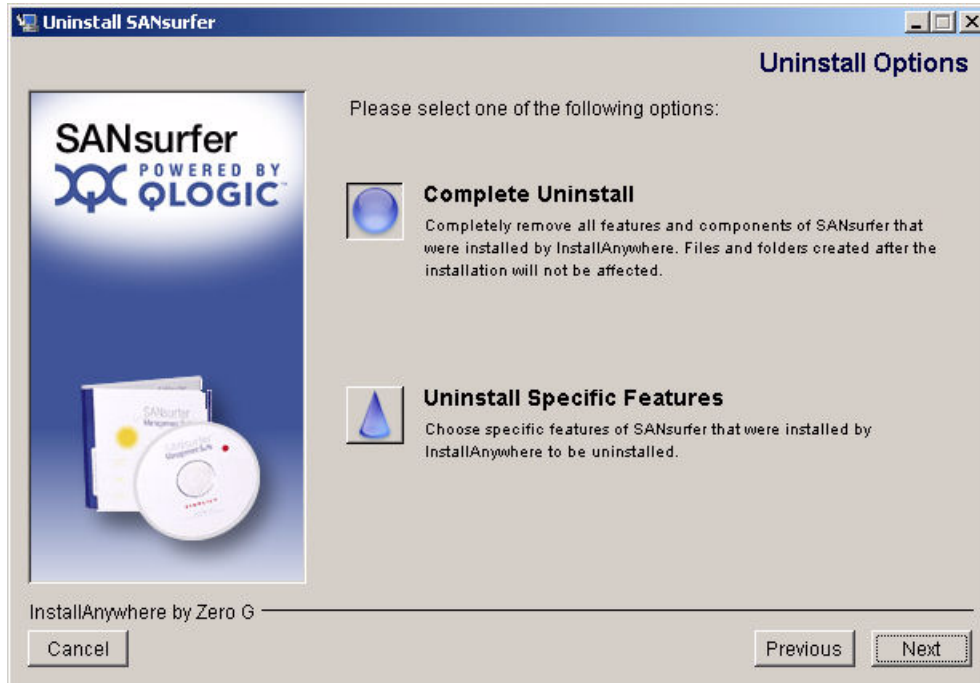


Figure 5-24 Uninstall SANsurfer: Uninstall Options

4. Use this dialog box to uninstall the entire SANsurfer tool or specific features as follows:
 - Click **Complete Uninstall** to remove all features and components of the SANsurfer tool that were installed by InstallAnywhere. This will not affect files and folders created after the installation.
 - Click **Uninstall Specific Features** to remove specific features of the SANsurfer tool that were installed by InstallAnywhere. The Choose Product Features dialog box opens ([Figure 5-25](#)).

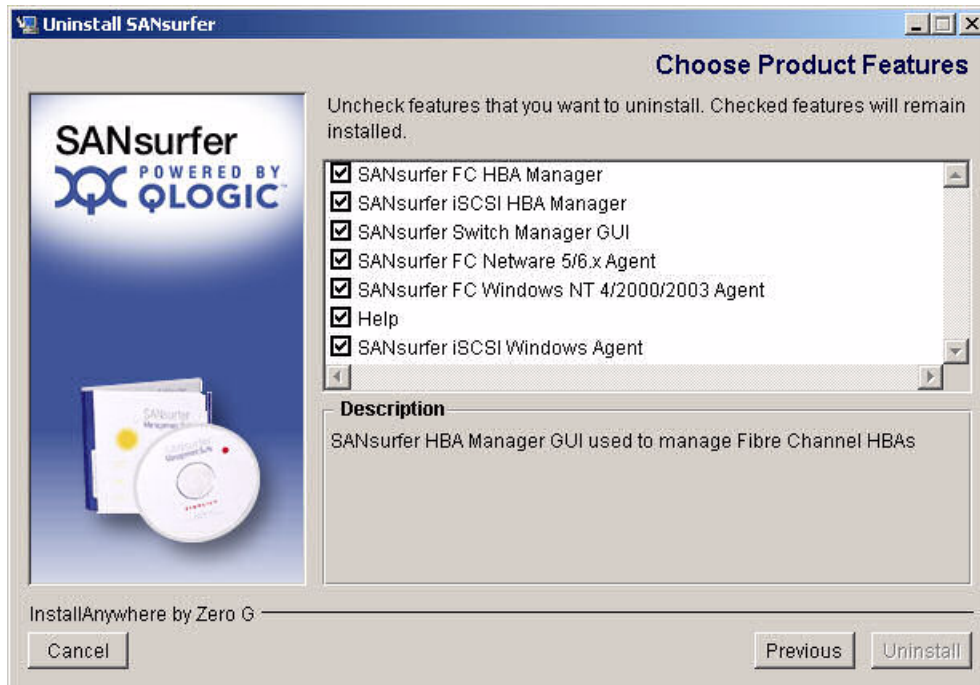


Figure 5-25 Uninstall SANsurfer: Choose Product Features

The uninstaller's Choose Product Features dialog box differs, depending on whether you are installing on a Windows, Red Hat/SuSE Linux, or Solaris SPARC/x86 system.

5. Clear the check boxes for features that you want to uninstall. (Check boxes that are selected remain installed). Select from the following components (all components may not display and the order of the components may vary):
 - For a Windows system:
 - SANsurfer FC HBA Manager**
 - SANsurfer iSCSI HBA Manager**
 - SANsurfer Switch Manager GUI**
 - SANsurfer FC NetWare 5/6.x Agent**
 - SANsurfer FC Windows 2000/2003/XP/Vista Agent**
 - SANsurfer iSCSI Windows Agent**
 - Help**
 - For a Red Hat/SuSE Linux system:
 - SANsurfer FC HBA Manager**
 - SANsurfer iSCSI HBA Manager**
 - SANsurfer Switch Manager GUI**
 - SANsurfer FC Linux Agent**

- SANsurfer iSCSI Linux Agent
- Help
- For a Solaris SPARC/x86 system:
 - SANsurfer FC HBA Manager
 - SANsurfer iSCSI HBA Manager
 - SANsurfer Switch Manager GUI
 - SANsurfer FC Solaris Agent
 - SANsurfer iSCSI Solaris Agent
 - Help

6. Click **Uninstall**.

The Uninstall SANsurfer dialog box (Figure 5-26) lists the components to be uninstalled.

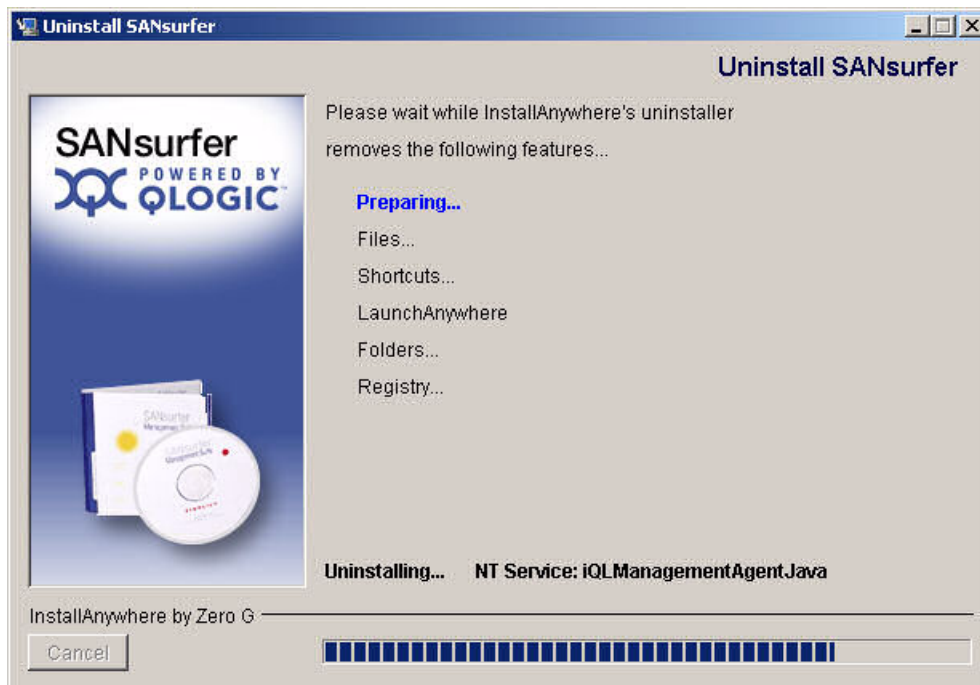


Figure 5-26 Uninstall SANsurfer: Uninstall SANsurfer

A message asks you to wait the while the uninstaller removes the components.

The Uninstall Complete dialog box informs you when the uninstall is complete (Figure 5-27).

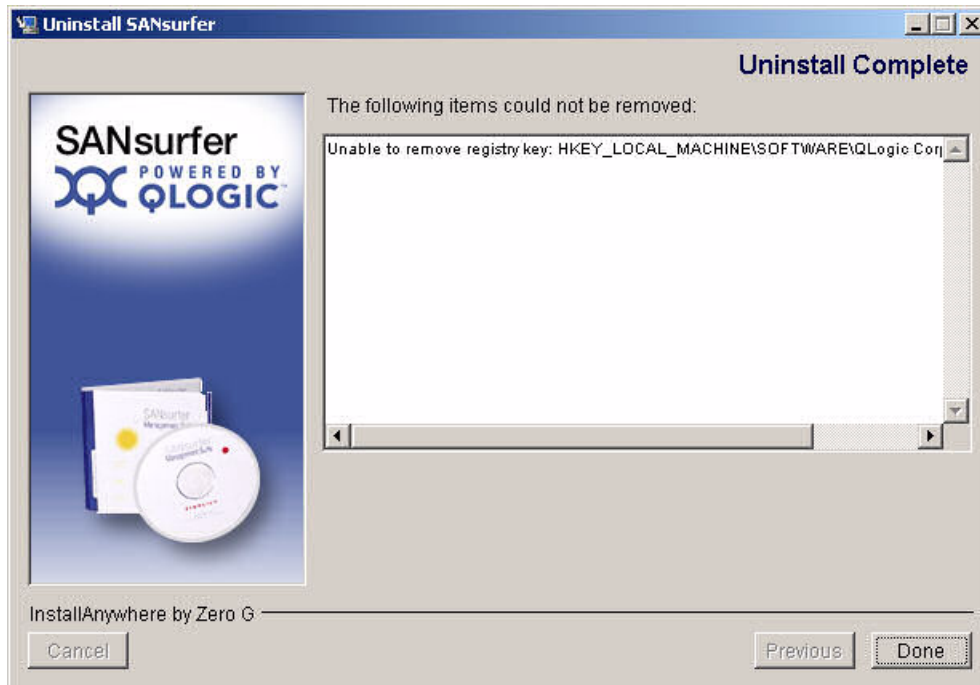


Figure 5-27 Uninstall SANsurfer: Uninstall Complete

7. Click **Done**.
8. If any items were not successfully uninstalled, manually remove them.
Some files and directories remain after uninstalling SANsurfer. These components must be deleted manually from the computer's hard disk where SANsurfer was installed. The default locations are:
 - For Windows:
`Program Files\QLogic_Corporation\SANsurfer`
 - For Red Hat/SuSE Linux and Solaris SPARC/x86:
`/opt/QLogic_Corporation/SANsurfer`
9. If you selected **Add/Remove Programs** in [Step 1](#) to uninstall SANsurfer HBA Manager from a Windows system, follow these steps:
 - a. To exit the Add/Remove Programs dialog box, click **Cancel**.
 - b. To exit the Control Panel, click **Close**.
10. If prompted, reboot the system.

6 Getting Started

This section includes the procedures for starting and exiting the SANsurfer FC HBA Manager user interface, and customizing the tool options and policies. It provides information on:

- “Starting SANsurfer FC HBA Manager” on page 6-1
- “SANsurfer FC HBA Manager Main Window” on page 6-5
- “Exiting SANsurfer FC HBA Manager” on page 6-11
- “Getting Help” on page 6-12
- “Setting SANsurfer FC HBA Manager Security” on page 6-14
- “Setting the Warning Display Option” on page 6-16
- “Setting the Configuration Change Option” on page 6-17
- “Setting Event Log Options” on page 6-18
- “Setting the HBA Event Log Option” on page 6-19
- “Setting Up Automatic Notification by E-mail” on page 6-21
- “Setting the Configuration Policies” on page 6-22
- “Specifying the HBA Driver Settings” on page 6-27
- “Refreshing the Host Configuration” on page 6-30

Starting SANsurfer FC HBA Manager

The SANsurfer FC HBA Manager startup procedures differ depending upon the operating system:

- Windows (see [page 6-2](#))
- Red Hat/SuSE Linux or Solaris SPARC/x86 (see [page 6-3](#))
- Macintosh OS X (see [page 6-3](#))

For details about automatically connecting to specified hosts when you start SANsurfer FC HBA Manager from a command line, see the SANsurfer FC HBA Manager help system.

Starting SANsurfer FC HBA Manager on Windows

NOTE:

If you want to connect to one or more specified hosts automatically when starting SANsurfer FC HBA Manager, see [“Connecting to Hosts Automatically \(Windows CLI\)”](#) on page 6-4.

On a Windows system, do one of the following to start the SANsurfer tool, which includes the SANsurfer FC HBA Manager user interface.

To start SANsurfer FC HBA Manager on Windows:

- Double-click the **SANsurfer** icon ([Figure 6-1](#)) on your desktop (if the icon was created during installation). (If you have an older version of SANsurfer FC HBA Manager and are upgrading to the current version, the old icon image appears.)

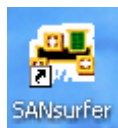


Figure 6-1 SANsurfer Icon

- On the Windows **Start** menu, point to **Programs**, point to **QLogic Management Suite**, and then click **SANsurfer**.
- On the Windows **Start** menu, click **Run**, and then do one of the following:
 - Type in the SANsurfer program file name (`SANsurfer.EXE`), including all the paths. Click **OK**.
 - Click **Browse**, find and select the program in the Browse dialog box, and then click **Open**.

SANsurfer FC HBA Manager opens (see [“SANsurfer FC HBA Manager Main Window”](#) on page 6-5).

Starting SANsurfer FC HBA Manager on Linux or Solaris

NOTE:

If you want to connect to one or more specified hosts automatically when starting SANsurfer FC HBA Manager, see [“Connecting to Hosts Automatically \(Linux, Solaris, or Macintosh CLI\)”](#) on page 6-4.

On Red Hat/SuSE Linux and Solaris SPARC/x86 systems, follow these steps to start the SANsurfer tool, which includes SANsurfer FC HBA Manager.

To start SANsurfer FC HBA Manager on Linux or Solaris:

1. Ensure that you are in a graphical user environment.
2. Open a command terminal.
3. Type `SANsurfer`, and then press `ENTER`.

SANsurfer FC HBA Manager opens (see [“SANsurfer FC HBA Manager Main Window”](#) on page 6-5).

Starting SANsurfer FC HBA Manager on Macintosh

NOTE:

If you want to connect to one or more specified hosts automatically when starting SANsurfer FC HBA Manager, see [“Connecting to Hosts Automatically \(Linux, Solaris, or Macintosh CLI\)”](#) on page 6-4.

On Macintosh systems, follow these steps to start the SANsurfer tool, which includes SANsurfer FC HBA Manager.

To start SANsurfer FC HBA Manager on Macintosh:

1. Open **Finder**.
2. Browse to the folder containing the installed SANsurfer tool.
3. Double-click the **SANsurfer** icon.

SANsurfer FC HBA Manager opens (see [“SANsurfer FC HBA Manager Main Window”](#) on page 6-5).

Connecting to Hosts Automatically (Windows CLI)

On a Windows system, follow these steps to connect automatically to one or more specified hosts when starting the SANsurfer FC HBA Manager user interface from the command line. When done, the SANsurfer FC HBA Manager main window appears with the specified hosts.

To connect to a host automatically on Windows:

1. From a Windows system, click the **Start** button, point to **Programs**, point to **Accessories**, and then click **Command Prompt**. The Command Prompt window opens.
2. Change to the directory where the SANsurfer tool is installed.
3. Do one of the following:

- To connect to the local host, type the following and then press **ENTER**:

```
SANsurfer -l (the letter L for local)
```

- To connect to a single host, type the following and then press **ENTER**:

```
SANsurfer -h hostname (hostname is the host name or IP address)
```

For example:

```
SANsurfer -h adsw2ksys2
```

- To connect to a group of hosts listed in a host group file (*.hst*), type the following and then press **ENTER**:

```
SANsurfer -g path (path is the path of the host group file)
```

For example:

```
SANsurfer -g c:\Program Files\QLogic Corporation\  
SANsurfer\hostfiles\group1.hst
```

Connecting to Hosts Automatically (Linux, Solaris, or Macintosh CLI)

On a Red Hat/SuSE Linux, Solaris SPARC/x86, or Macintosh system, follow these steps to connect automatically to specified hosts when starting the SANsurfer FC HBA Manager user interface from the command line. When done, the SANsurfer FC HBA Manager main window opens with the specified hosts.

To connect to a host automatically on Linux, Solaris, or Macintosh:

1. Ensure that you are in a graphical user environment.
2. Open a command terminal.
3. Change to the directory where the SANsurfer tool is installed.

NOTE:

On Macintosh navigate to the following additional path:
SANsurfer.app/Contents/MacOS

4. Do one of the following:

- To connect to the local host, type the following and then press ENTER:
`./SANsurfer -l` (the letter *L* for local)

- To connect to a single host at startup, type the following and then press ENTER:

`./SANsurfer -h hostname` (*hostname* is the host name or IP address)

For example:

`/SANsurfer -h adsw2ksys2`

- To connect to the hosts listed in a group file (`.hst`) at startup, type the following and then press ENTER:

`./SANsurfer -g path` (*path* is the path of the host group file)

For example:

`./SANsurfer -g /opt/QLogic Corporation/SANsurfer/hostfiles/group1.hst`




SANsurfer FC HBA Manager Main Window

The main window gives you access to the features of SANsurfer FC HBA Manager, including:

- [“Toolbar Buttons” on page 6-7](#)
- [“Host Icons and Text” on page 6-8](#)
- [“HBA Icons and Text” on page 6-9](#)
- [“HBA Port Icons and Text” on page 6-10](#)
- [“Device Icons and Text” on page 6-10](#)
- [“LUN Icons and Text” on page 6-11](#)

When the main window first opens, it displays the **Topology** tabbed page, which shows a traffic signal. The traffic signal indicates the status of the hosts, as shown in [Table 6-1](#).

Table 6-1. Traffic Signals

Signal	Indicates
 Good	All hosts in the system are up and running.
 Warning	One or more hosts in the system are in a warning state. For instance, a loop may be down on an HBA in one of the hosts in the system.
 Bad	All hosts in the system are down.

The SANsurfer FC HBA Manager window contains an HBA tree, tool tabs, a title bar, menu bar, toolbar, tabbed pages, and a status line. The toolbar conveniently provides buttons for commonly used functionality.

The HBA tree lists all hosts—including IP addresses—with their connected HBAs, HBA ports, devices, and LUNs. When you click an item in the HBA tree, the status line shows additional information about the selection. When you hold your cursor over an HBA in the HBA tree for a few seconds, information about the HBA model appears. The HBA tree contains icons and text as visual indicators for the hosts, HBAs, ports, devices, and LUNs.

To view the SANsurfer FC HBA Manager main window:

1. In the left frame of the main window, click the **FC HBA** tab. SANsurfer FC HBA Manager shows in the title bar.
2. Connect to the host (for details, see the SANsurfer FC HBA Manager help system). The SANsurfer FC HBA Manager main window opens. [Figure 6-2](#) shows the elements contained on the main window.

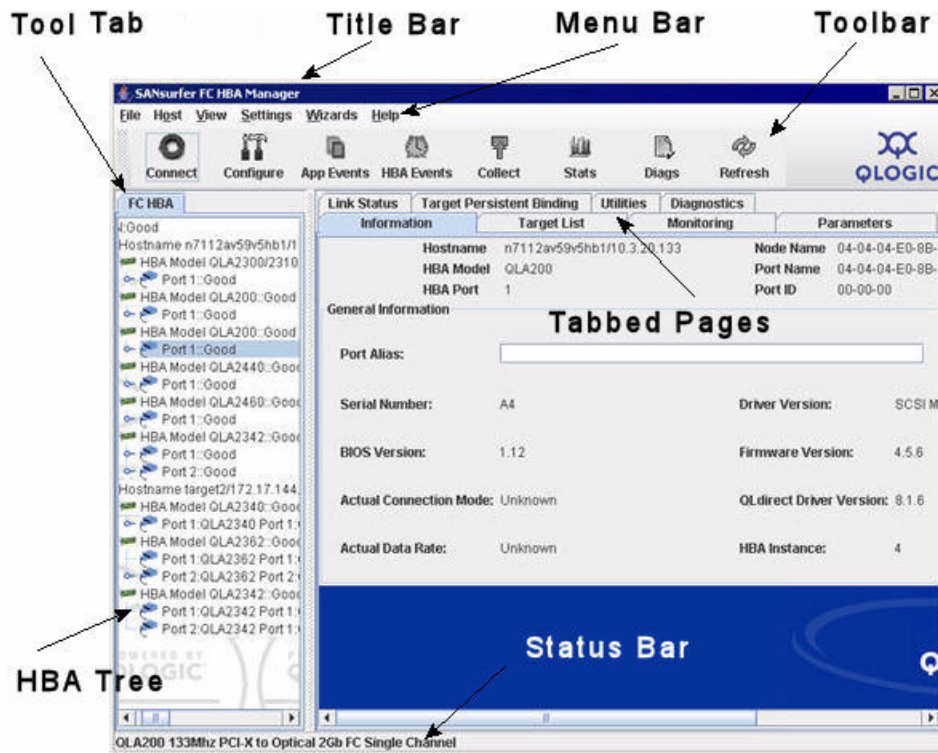


Figure 6-2 SANSurfer FC HBA Manager Main Window

Toolbar Buttons

The toolbar buttons in [Table 6-2](#) provide easy access to frequently used functions.

Table 6-2. Toolbar Buttons









Button	Purpose
	Click the Connect button to attach the SANSurfer FC HBA Manager to a specific host or IP address. See <i>Connecting to Hosts</i> in the help system.
	Click the Configure button to open the Fibre Channel Port Configuration dialog box where you can configure the HBAs on your host. See <i>Configuring Fibre Channel Devices</i> in the help system.
	Click the App Events button to open the App Events log, where you can review the events that occur on your host and manage the App Events log information. See <i>Viewing and Managing the App Event Log</i> in the help system.

Table 6-2. Toolbar Buttons (Continued)

Button	Purpose
	Click the HBA Events button to open the HBA Events log, where you can review the HBA events that occur on your host and manage the HBA Events log information. See <i>Viewing and Managing the HBA Events Log</i> in the help system.
	Click the Collect button to automatically save the following files in one zip file: <ul style="list-style-type: none"> ■ Host to a text file ■ Host to a .qlc file ■ App Event log to a text file ■ HBA Event log to a text file See <i>Using Collect</i> in the help system.
	Click the Stats button to open the HBA Statistics dialog box and monitor the various functions of the HBA. See <i>Viewing and Updating HBA Port Monitoring</i> in the help system.
	Click the Diags button to open the HBA Diagnostics dialog box, which provides access to the diagnostics tests: loopback and read/write. See “Diagnostics” on page 8-1 .
	Click the Refresh button to query the host and update any information on the HBAs connected to the host. See “Refreshing the Host Configuration” on page 6-30 .

NOTE:

You can hide the toolbar by pointing to the **View** menu and clicking **Toolbar**. The check mark next to **Toolbar** clears and the toolbar becomes hidden. To restore the toolbar, click **Toolbar** again. The check mark next to **Toolbar** appears and the toolbar itself reappears.

Host Icons and Text





The HBA tree shows the following information about hosts:

- **Host status:** Live or offline.
- **Host name:** Host name or IP address.

For example:

 hostname 10.3.13.90

■ **Host icons:**


-  **Online host.** The blinking heart on the host icon indicates that the connection between the user interface and the agent is active for this host. An online host can be remote or local.
 -  Indicates a remote host.
 -  Indicates a local host.
-  **Offline host.** The connection between the user interface and the agent is inactive for this host. The configuration for this host can be loaded from a QLC file (see *Viewing a Saved Host Configuration from a File* in the help system) or a text file (see *Viewing a Saved Host Configuration from a Text File* in the help system).

HBA Icons and Text

The HBA tree shows the following information about HBAs:






- **HBA model:** For example, QLA2xxx or QLA2xxx/2xxx.
- **HBA alias:** User-defined alias name, if assigned. For more information, see *Displaying HBA Information* in the help system.
- **Loop down:** Indicates that the HBA does not have synchronization (cable disconnected, connection mode set incorrectly, and so on).
- **HBA status:** Indicates status such as bad alarm, loop down, warning alarm, or good (no alarm). For information about alarms, see *Viewing and Managing the HBA Event Log* in the help system.

Examples:

 HBA QLA2342:QLogic's HBA:Warning

 HBA QLA2342:Good

■ **HBA icons:**

-  **Good.** No alarm.
-  **Warning.** Warning alarm.
-  **Loop Down.** No synchronization.
-  **Bad.** Bad alarm.
-  **Offline.** HBA on offline host.


HBA Port Icons and Text

The HBA tree lists the following information about HBA ports:








- **HBA port number:** For example, Port *n*.
- **HBA port alias:** User-defined alias name (if assigned). For more information, see *Displaying HBA Port Information* in the help system)
- **Beacon flashing–Flash HBA Port Beacon:** Port LED flashing is enabled. For more information, see *Finding an HBA Port* in the help system.
- **HBA status:** Indicates status such as bad alarm, loop down, warning alarm, or good (no alarm). For information about alarms, see *Viewing and Managing the HBA Event Log* in the help system.

Examples:

 Port 0:Marketing’s HBA port:Good, Beacon Flashing

 Port 3:Loop Down

- **HBA Port Icons:**


- | | |
|--|--|
| <input type="checkbox"/>  Good | <input type="checkbox"/>  Beacon Flashing, Good |
| <input type="checkbox"/>  Warning. Warning alarm | <input type="checkbox"/>  Beacon Flashing, Warning |
| <input type="checkbox"/>  Loop Down | <input type="checkbox"/>  Loop Down, Beacon Flashing |
| <input type="checkbox"/>  Bad. Bad alarm | <input type="checkbox"/>  Beacon Flashing, Bad |
| <input type="checkbox"/>  Offline. HBA port on offline host | |


Device Icons and Text


The HBA tree shows the following information about disks, tapes, and SAFTE devices:

- **Device type:** Disk, tape, or SAFTE (used for enclosure information).
- **Device port ID:** Port ID of the disk, tape, or SAFTE device.
- **Online/Inactive Status:** A circled red X on the icon indicates an inactive device (either the device is down, the port on device is down or inactive, or the device is not responding properly to SCSI commands).
- **Diagnostics enabled/disabled for read/write buffer test:** A green check mark on the icon and the text **Diag Enabled** indicate enabled. For more information, see [“Preparing for Diagnostic Testing” on page 8-2.](#)
- **Beacon Flashing: Flash Beacon:** LED beacon flashing function is enabled (see *Finding a Target* in the help system)

Examples:





 Disk (50-06-0E-83-00-00-2B-21):Online, Diag Disabled

 Disk (21-00-00-04-CF-92-7A-B1):Online, Diag Enabled





 Tape (10-00-00-04-32-72-06-64):Inactive, Diag Disabled

■ Device Icons



The disk icons are:

-  Disk Online, Diag Enabled
-  Disk Online, Diag Disabled
-  Disk Inactive, Diag Enabled
-  Disk Inactive, Diag Disabled
-  Offline. Disk on offline host

The tape icons are:

-  Tape, Diag Enabled
-  Tape, Diag Disabled
-  Tape Inactive, Diag Enabled
-  Tape Inactive, Diag Disabled
-  Offline. Tape on offline host

The SAFTE device icons are:



-  SAFTE device
-  Offline. SAFTE device on offline host

LUN Icons and Text

The HBA tree indicates the LUN number (LUN *n*). For example:


 LUN (0)

LUN icons indicate the following:

-  LUN online.
-  LUN on offline host.

Exiting SANsurfer FC HBA Manager

To exit the SANsurfer FC HBA Manager user interface, choose one of the following options:

- On the SANsurfer FC HBA Manager main window, open the **File** menu and then click **Exit**.
- On the SANsurfer FC HBA Manager main window, click the **Close** button  in the upper right corner.
- Press **ALT+X**.

Getting Help

This section provides information about:

- “Viewing the Help System” on page 6-12
- “Specifying the Help Browser” on page 6-12
- “Viewing SANsurfer FC HBA Manager Tool Information” on page 6-13

Viewing the Help System

To view the help system from the SANsurfer FC HBA Manager main window, open the **Help** menu and then click **Browse Contents**. The help window opens.

Specifying the Help Browser

Follow these steps to specify the Web browser (Internet Explorer or Firefox, for example) that SANsurfer FC HBA Manager launches when you open the help system (see “Viewing the Help System” on page 6-12):

To specify a browser:

1. On the SANsurfer FC HBA Manager main window, open the **Help** menu, and then click **Set Browser Location**. The Browser Location dialog box opens (Figure 6-3).

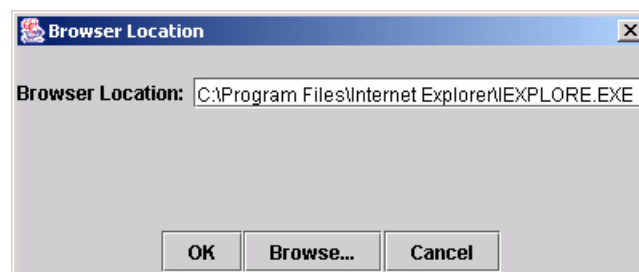


Figure 6-3 Browser Location Dialog Box

2. In the **Browser Location** box, type the location of the browser program file. Be sure to specify the path and file name.
If you do not know the location, click **Browse** to open a file selection dialog box and select the browser program file. The Browser Location dialog box shows the new browser path and file name.
3. When you finish choosing your browser, do one of the following:
 - To save the browser location to the SANsurfer FC HBA Manager configuration file, click **OK**.
 - To close the Browser Location dialog box without making changes, click **Cancel**.

Viewing SANsurfer FC HBA Manager Tool Information

The About box shows the product version number and QLogic copyright information.

To view information about SANsurfer FC HBA Manager:

1. On the SANsurfer FC HBA Manager main window **Help** menu, click **About**.
The About SANsurfer FC HBA Manager window opens ([Figure 6-4](#)).

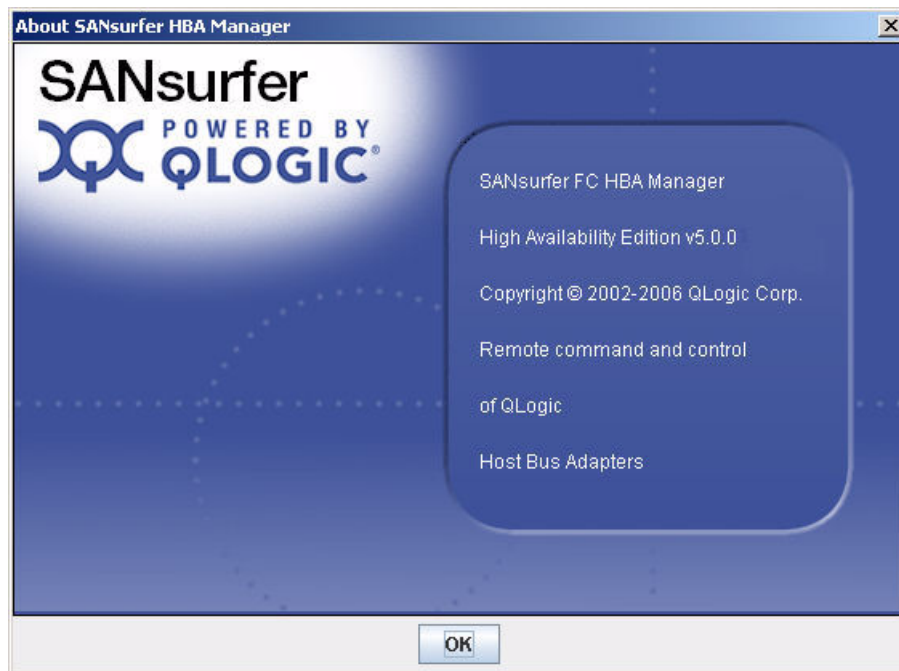


Figure 6-4 About SANsurfer FC HBA Manager Window

This window provides the following information:

- High Availability Edition version number.
 - Copyright information.
2. To close the About window and return to the SANsurfer FC HBA Manager main window, click **OK**.

Setting SANsurfer FC HBA Manager Security

SANsurfer FC HBA Manager security ensures that HBA configuration changes require password authorization. SANsurfer FC HBA Manager prompts for the password when you change the following:

- HBA parameters
- Flash BIOS
- HBA driver
- Failover configuration
- Persistent configuration data
- Port configuration
- LUN configuration
- Device replacement
- Password (when you want it changed)

You can change the SANsurfer FC HBA Manager access password for any host connected to your system for which you have administrator or root privileges.

NOTE:

The default SANsurfer FC HBA Manager access password is located in the `readme.txt` file. To ensure that security is not compromised, change this password after installation.

To set the tool access password for a host:

1. In the SANsurfer FC HBA Manager main window HBA tree, select the host for which you want to set the tool access password.
2. Click the **Security** tab. The **Security** tabbed page opens ([Figure 6-5](#)). The host name appears at the top of the tabbed page.

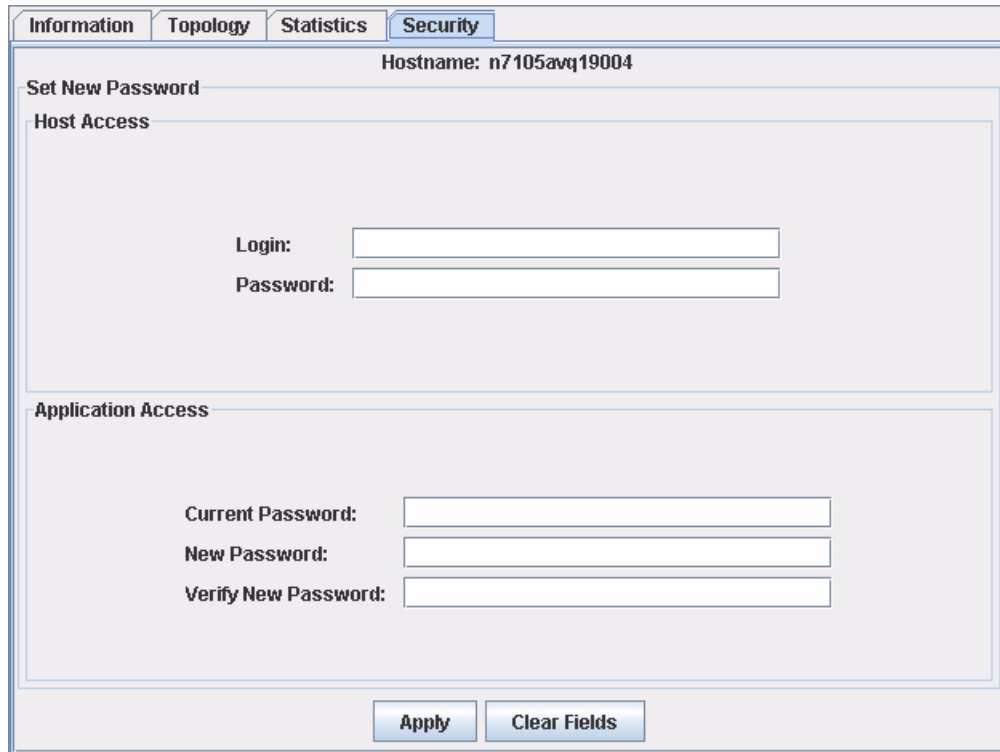


Figure 6-5 Security Tabbed Page

3. Under **Host Access**, verify that you have administrator or root privileges for the selected host by entering the system login and password you use to access the machine:
 - a. In the **Login** box, type the login name that has administrator or root privileges on the host you selected.
 - b. In the **Password** box, type the login password associated with the login name.
4. Under **Application Access**, modify the SANsurfer FC HBA Manager access password:
 - a. In the **Current Password** box, type the current password.
 - b. In the **New Password** box, type the new password.
 - c. In the **Verify New Password** box, type the new password again to confirm the new password.
5. Do one of the following:
 - To update the tool access password, click **Apply**.
 - To delete the typed entries on the **Security** page, click **Clear Fields**.

Setting the Warning Display Option

You can configure SANsurfer FC HBA Manager to display warning messages when specific conditions occur.

To set the warning display option:

1. To access the Options dialog box, choose one of the following methods:
 - On the SANsurfer FC HBA Manager main window, open the **Settings** menu, and then click **Options**.
 - Right-click the HBA tree, and then on the shortcut menu, click **Options**.
 - Press CTRL+SHIFT+T.

The Options dialog box opens ([Figure 6-6](#)).

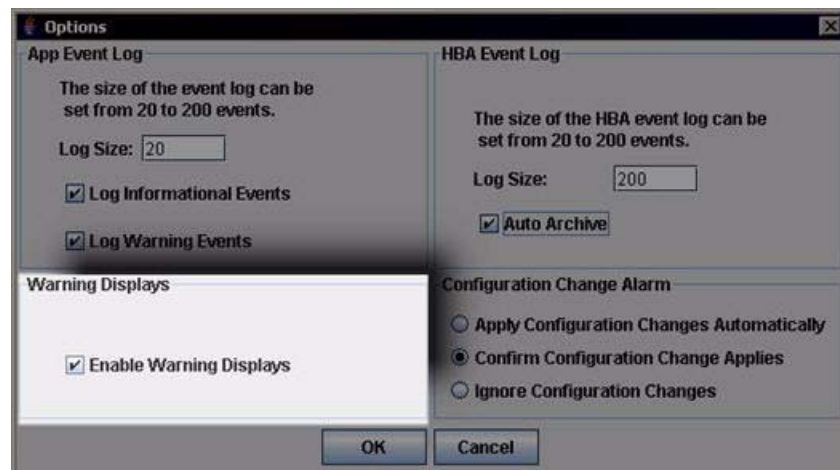


Figure 6-6 Options Dialog Box: Warning Displays

2. Under **Warning Displays**, do one of the following:
 - If you want the warning dialog boxes to appear, select the **Enable Warning Displays** check box. Enabled is the default.
 - If you do not want the warning dialog boxes to appear, clear the **Enable Warning Displays** check box.
3. When you finish making selections, do one of the following:
 - To save the changes and close the Options dialog box, click **OK**.
 - To close the Options dialog box without saving any changes, click **Cancel**.

Setting the Configuration Change Option

SANsurfer FC HBA Manager tries to keep current the devices and the LUNs that the HBA shows. When cables are pulled, devices are hot-plugged into the SAN, or devices are removed, SANsurfer FC HBA Manager generates a configuration event in the HBA Event Log.

To set how SANsurfer FC HBA Manager handles configuration changes:

1. To access the Options dialog box, choose one of the following methods:
 - On the SANsurfer FC HBA Manager main window, open the **Settings** menu, and then click **Options**.
 - Right-click the HBA tree, and then on the shortcut menu, click **Options**.
 - Press **CTRL+SHIFT+T**.

The Options dialog box opens ([Figure 6-7](#)).

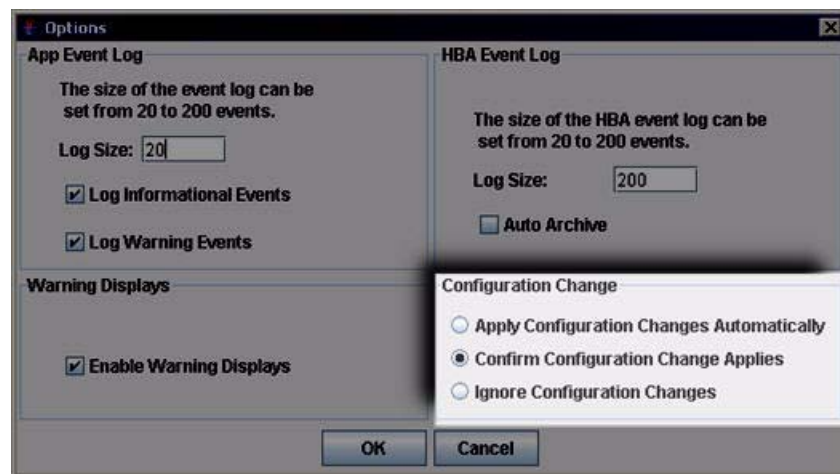


Figure 6-7 Options Dialog Box: Configuration Change

2. Under **Configuration Change**, do one of the following:
 - To have SANsurfer FC HBA Manager automatically update to the new configuration, click **Apply Configuration Changes Automatically**.
If another host has made configuration changes that need to be updated in this configuration, the "configuration change - reloading message" appears. Click **OK**.
 - If you want to decide whether to update to the new configuration, click **Confirm Configuration Change Applies**.

If a configuration change occurs, the “configuration change – refresh confirmation” message appears. Do one of the following:

- To refresh the configuration, click **Yes**.
- To not update to the new configuration, click **No**. The old configuration remains unchanged. To update to the current configuration, manually connect and disconnect the host.
- If you want to ignore the configuration change, click **Ignore Configuration Changes**. The old configuration remains unchanged. To update to the current configuration, manually connect and disconnect the host.

NOTE:

Selecting **Ignore Configuration Changes** disables the **Refresh** button on the main window.

3. When you finish making selections, do one of the following:
 - To save the changes and close the Options dialog box, click **OK**.
 - To close the Options dialog box without saving any changes, click **Cancel**.

Setting Event Log Options

Follow these steps to set the maximum number of events the Application Event Log can list and the types of logging events recorded.

NOTE:

See the SANsurfer FC HBA Manager help system for information about viewing the Application Event Log.

To set event log options:

1. To access the Options dialog box, choose one of the following methods:
 - On the SANsurfer FC HBA Manager main window, open the **Settings** menu, and then click **Options**.
 - Right-click the HBA tree, and then on the shortcut menu, click **Options**.
 - Press CTRL+SHIFT+T.

The Options dialog box opens ([Figure 6-8](#)).



Figure 6-8 Options Dialog Box: App Event Log

2. Under **App Event Log**, type the number of events that the event log can list in the **Log Size** box. The range is 20 to 200 events; the default is 20 events.
3. If you want to enable logging of informational events, select the **Log Informational Events** check box.
4. If you want to enable logging of warning events, select the **Log Warning Events** check box.
5. When you finish making selections, do one of the following:
 - To save the changes and close the Options dialog box, click **OK**.
 - To close the Options dialog box without saving any changes, click **Cancel**.

Setting the HBA Event Log Option

Follow these steps to set the number of events the HBA Event Log can list.

NOTE:

For information about viewing the HBA event log, see *Viewing and Managing the HBA Event Log* in the help system.

To set HBA event log options:

1. To access the Options dialog box, choose one of the following methods:
 - On the SANsurfer FC HBA Manager main window, open the **Settings** menu, and then click **Options**.

- Right-click the HBA tree, and then on the shortcut menu, click **Options**.
- Press CTRL+SHIFT+T.

The Options dialog box opens (Figure 6-9).

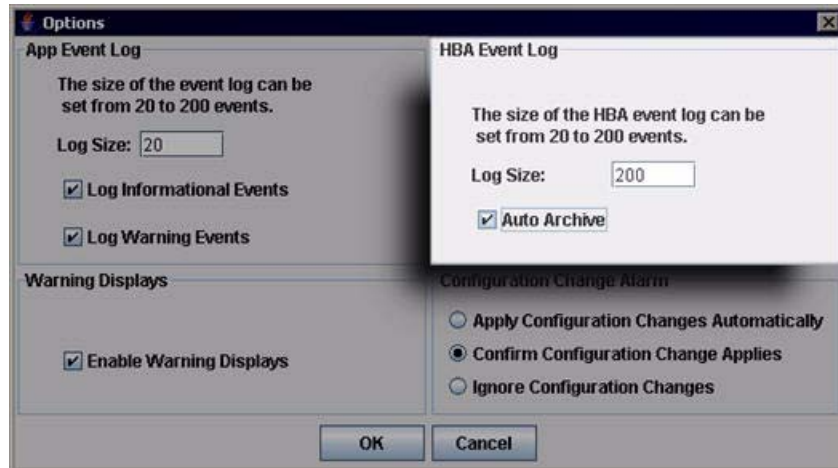


Figure 6-9 Options Dialog Box: HBA Event Log

2. Under **HBA Event Log**, type the number of HBA events the HBA Event Log can list in **Log Size** box. The range is 20 to 200 events; the default is 200 events.
3. To automatically export the HBA event logs for archiving, select the **Auto Archive** check box.

Auto Archive specifies that when the HBA event log is full, it is exported to the Applications folder as a file named `event_hba_archive.txt`. The text file is an open-ended file that is appended to when the HBA event log size is reached, one entry at a time with the oldest entry first. Supported file formats include Comma Separated Value (CSV) and 8-bit Unicode Transformation Format (UTF-8) text.

The process of archiving events occurs without user intervention as long as the **Auto Archive** check box is selected.

4. When you finish making selections, do one of the following:
 - To save the changes and close the Options dialog box, click **OK**.
 - To close the Options dialog box without saving any changes, click **Cancel**.

Setting Up Automatic Notification by E-mail

You can automatically send event notifications—along with a copy of the current host configuration—by e-mail to a distribution list, thus enabling the information to be opened and analyzed from other locations. HBA event notification is available only with SMTP e-mail servers.

NOTE:

For information about viewing notifications received by e-mail, see *Viewing an HBA Event Notification Received by E-mail* in the help system.

To set up automatic notification by e-mail:

1. To access the Email Settings dialog box, choose one of the following options:
 - On the SANsurfer FC HBA Manager main window, open the **Settings** menu and then click **Email**.
 - Press CTRL+SHIFT+M.

The Email Settings dialog box opens (Figure 6-10).

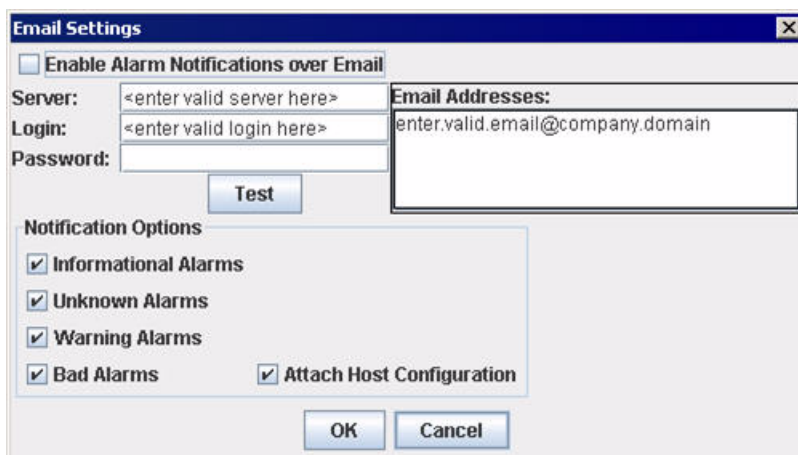


Figure 6-10 Email Settings Dialog Box

2. To enable e-mail notification, select the **Enable Alarm Notifications over Email** check box.
3. In the **Server** box, type the host name or an IP address of the SMTP server accessible on the local network.
4. In the **Login** box, type the login information.
5. In the **Password** box, type the password.

6. In the **Email Addresses** list, type one or more e-mail addresses to be notified. Enter one e-mail address for each line.
7. Under **Notification Options**, select the check boxes for the notifications that you want to send:
 - **Information Alarms**
 - **Unknown Alarms**
 - **Warning Alarms**
 - **Bad Alarms**
 - **Attach Host Configuration** (sends the current host configuration)
8. To verify that e-mail notification is operable, click **Test**. If successful, a message states that the e-mail was sent successfully. Check the e-mail addresses for the e-mail.
9. When you finish making selections, do one of the following:
 - To save the changes and close the Email Settings dialog box, click **OK**.
 - To close the Email Settings dialog box without saving any changes, click **Cancel**.

Setting the Configuration Policies

You can set the policies for sharing devices and LUNs among hosts. A device or LUN is shared when more than one host in the HBA tree has access to the device or LUN. Only hosts that appear in the HBA tree are checked for shared access to a device or LUN.

To set the configuration policies:

1. To access the Policy Settings dialog box, choose one of the following options:
 - On the SANsurfer FC HBA Manager main window, open the **Settings** menu, and then click **Policies**.
 - Press **CTRL+SHIFT+P**.

The Policy Settings dialog box opens ([Figure 6-11](#)).

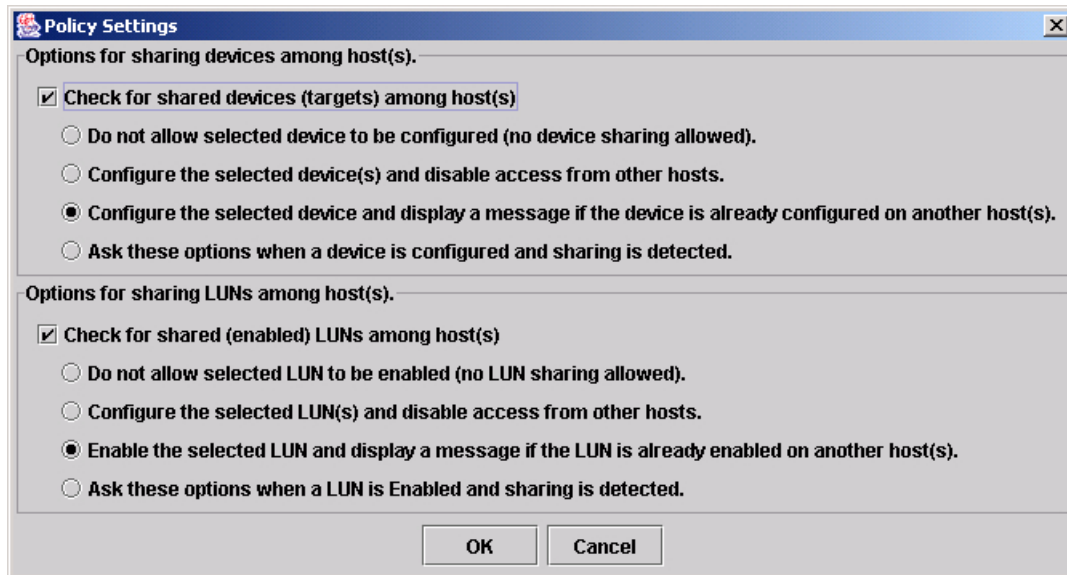


Figure 6-11 Policy Settings Dialog Box

2. Device sharing checking occurs each time a configuration change is made to a device. Under **Options for sharing devices among host(s)**, complete the following:
 - To disable device sharing checking, clear the **Check for shared devices (targets) among host(s)** check box.
 - To enable device sharing checking, select the **Check for shared devices (targets) among host(s)** check box, and then select one of the following policies:
 - **Do not allow selected device to be configured (no device sharing allowed).**
This policy does not allow the selected device to be configured. If you select this policy and this type of sharing is detected, a warning appears. Do one of the following:
 - For your system to unconfigure or not configure the device, click **OK**.
 - To view which devices are being shared with hosts that are conflicting with this policy, click **More**.
 - **Configure the selected device(s) and disable access from other hosts.**
This policy configures the selected device and disables access to the device from other hosts.

If you select this policy and this type of sharing is detected, a warning appears. Do one of the following:

- To disable access to these devices from other hosts that display in the HBA tree, click **OK**.
- To disable this policy for this instance, click **Cancel**.
- To view which devices are being shared with hosts that are conflicting with this policy, click **More**.

Configure the selected device and display a message if the device is already configured on another host(s).

This policy configures the selected device and shows a message if the device is configured on another host.

If you select this policy and this type of sharing is detected, a warning appears. Do one of the following:

- To disable access to these devices from other hosts, click **OK**.
- To disable this policy for this instance, click **Cancel**.
- To view which devices are being shared with hosts that are conflicting with this policy, click **More**.

Ask these options when a device is configured and sharing is detected.

If you select this policy and sharing is detected, the Shared Device Found dialog box (Figure 6-12) opens. Click one of the following options:

- Do not configure device.**
- Configure and disable access from other hosts.**
- Proceed with device configuration.**

To accept your selection, click **OK**. To not configure the device, click **Cancel**.

3. LUN sharing checking occurs each time a configuration change is made to a LUN. On the Policy Settings dialog box (Figure 6-11) under **Options for sharing LUNs among host(s)**, complete the following:

- To disable LUN sharing checking, clear the **Check for shared (enabled) LUNs among host(s)** check box.
- To enable device sharing checking, select the **Check for shared (enabled) LUNs among host(s)** check box, and then select one of the following policies:

Do not allow selected LUN to be enabled (no LUN sharing allowed)

This policy does not enable the selected LUN.

If you select this policy and this type of sharing is detected, a warning appears. Do one of the following:

- For your system to unconfigure the LUN, click **OK**.
- To view which LUNs are being shared with hosts that are conflicting with this policy, click **More**.

Configure the selected LUN(s) and disable access from other hosts.

This policy configures the selected LUN and disables access to the LUN from other hosts.

If you select this policy and this type of sharing is detected, a warning appears. Do one of the following:

- To disable access to these LUNs from other hosts that display in the HBA tree, click **OK**.
- To disable this policy for this instance, click **Cancel**.
- To view which LUNs are being shared with hosts that are conflicting with this policy, click **More**.

Enable the selected LUN and display a message if the LUN is already enabled on another host(s).

This policy enables the selected LUN and shows a message if the LUN is enabled on another host.

If you select this policy and this type of sharing is detected, a warning appears. Do one of the following:

- To disable access to these LUNs from other hosts, click **OK**.
- To disable this policy for this instance, click **Cancel**.
- To view which LUNs are being shared with hosts that are conflicting with this policy, click **More**.

Ask these options when a LUN is enabled and sharing is detected.

If you select this policy and sharing is detected, the Shared Device Found dialog box opens ([Figure 6-12](#)). Click one of the following options:

- Do not configure device.**
- Configure and disable access from other hosts.**

- Proceed with LUN configuration.**

To accept your selection, click **OK**. To close the Shared Device Found dialog box without configuring the device, click **Cancel**.

4. To save your settings and close the Policy Settings dialog box, click **OK**.

Forbidden Sharing of Devices or LUNs

If you set a policy in which the sharing of devices or LUNs among hosts is not permitted and SANsurfer FC HBA Manager detects sharing, the Shared Device Found dialog box opens (Figure 6-12).



Figure 6-12 Shared Device Found Dialog Box

To configure shared devices:

1. Select one of the following options:
 - Click **Do not configure device** to prevent device configuration.
 - Click **Configure and disable access from other hosts** to configure the device for this host only.
 - Click **Proceed with device configuration** to continue configuring the device.
2. Click **More** to view the Shared Components dialog box, as in [Figure 6-13](#).

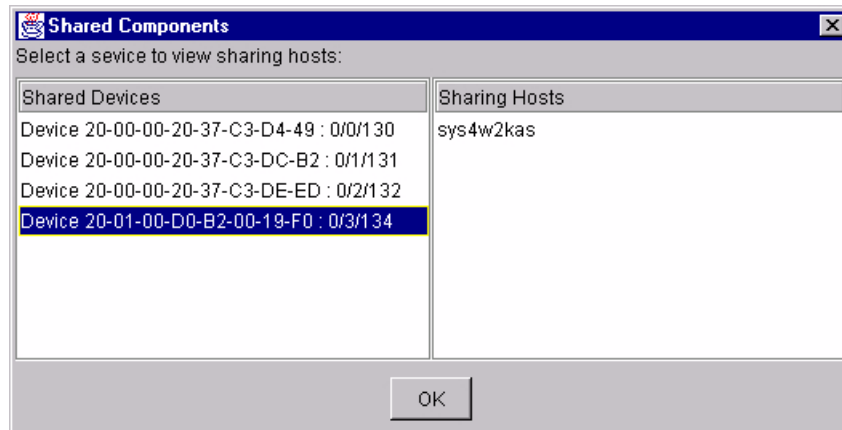


Figure 6-13 Shared Components Dialog Box

3. Click the shared device or LUN in the left column to view the shared hosts in the right column.
4. To close the Shared Components dialog box and return to the Shared Device Found dialog box, click **OK**.
5. To close the Shared Device Found dialog box, click **OK**.

When SANsurfer FC HBA Manager updates the configuration to reflect configuration changes made by another host, the "configuration change - reloading" message appears. Click **OK**.

Specifying the HBA Driver Settings

NOTE:

If you are using the IOCTL module with inbox drivers in Red Hat 4.0, the driver settings are disabled. The driver settings are also disabled if you are using sysfs supported inbox drivers with SLES 10.0.

When you set HBA driver parameters, you specify the following:

- **Target: Display Options.** Only targets configured using SANsurfer FC HBA Manager are seen by the system.
- **Target Binding Options.** Whether the driver binds the target ID using the target's world wide port name (WWPN) or port ID.

To set the HBA driver parameters:

1. In the SANsurfer FC HBA Manager main window HBA tree, select the HBA.
2. Click the **Settings** tab to open the HBA driver **Settings** tabbed page (Figure 6-14). (Figure 6-15 shows the same page for Linux only.)

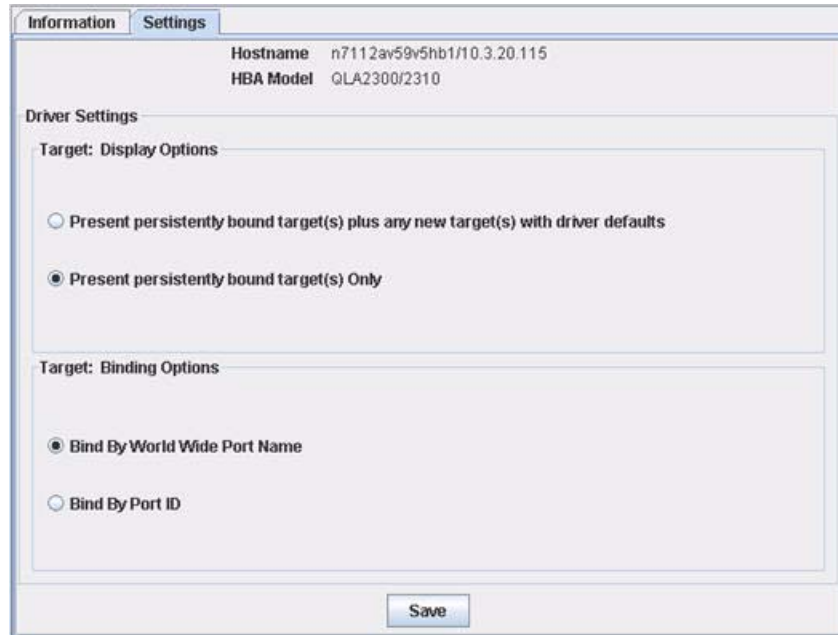


Figure 6-14 HBA Driver Settings Tabbed Page

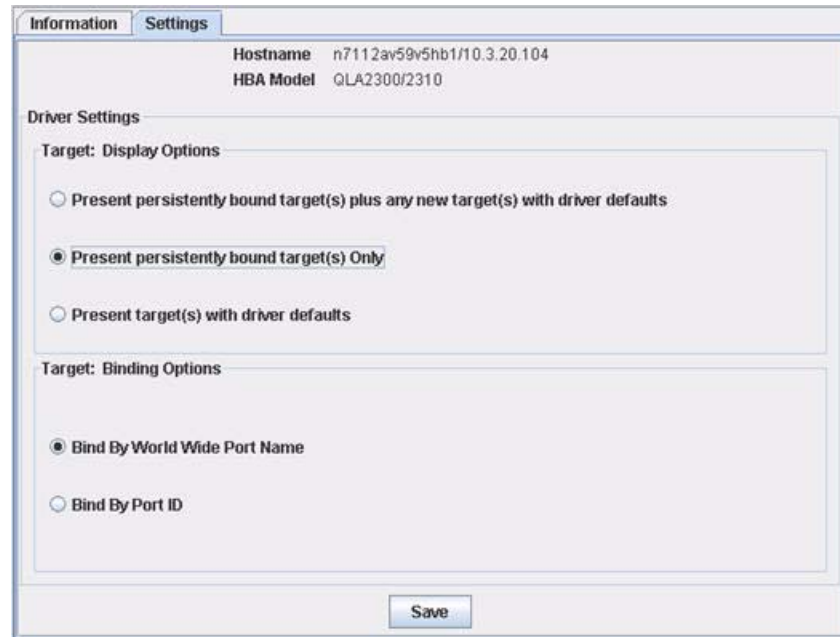


Figure 6-15 HBA Driver Settings Tabbed Page (Linux Only)

The identifying information includes:

- **Hostname** is the name or IP address of the host connected to the HBA.
 - **HBA Model** is the QLA2xxx HBA model number.
3. Under **Target: Display Options**, click one of the following to specify whether only targets configured using SANsurfer FC HBA Manager are seen by the system:
- If you want the system to see all targets at all times whether or not the target was configured with SANsurfer FC HBA Manager, click **Present targets that are persistently bound plus any new target(s) with driver defaults**.
 - If you want the system to see only targets configured using SANsurfer FC HBA Manager, click **Present persistently bound target(s) Only**.
 - (Linux only) If you want the system to see only targets with driver defaults, click **Present target(s) with driver defaults**. This option is available only for Linux operating systems.

NOTE:

If you select the Linux option **Present target(s) with driver defaults**, the system ignores persistent data.

4. Under **Target: Binding Options**, select one of the following binding options:
 - If you want the driver to bind the target ID using the target's WWPN, click **Bind by World Wide Port Name**.
 - If you want the driver to bind the target using the target's port ID, click **Bind by Port ID**. Failover and LUN masking are disabled. If the target port ID changes, this target is considered a newly-added target; all existing persistent data is deleted and specific features disabled.
5. Click **Save** to preserve these HBA driver settings.

Refreshing the Host Configuration

The host configuration (including the HBA tree) shown in the SANsurfer FC HBA Manager interface refreshes automatically based on the polling interval. If you want to refresh the configuration immediately (you changed the configuration, for example), choose one of the following options:

- On the toolbar, click the **Refresh** button.
- On the SANsurfer FC HBA Manager main window, open the **Host** menu, and then click **Refresh**.
- Right-click the HBA tree, and on the shortcut menu, click **Refresh**.
- Press F5.

7 Reports

This section describes the SANsurfer FC HBA Manager's report facility.

After reports are generated, you can view them and save them to several file formats, allowing you to create a hard copy record of your system assets. For details, see the following sections:

- [“Report Options” on page 7-1](#)
- [“Report Formats” on page 7-2](#)
- [“Generating a Report” on page 7-2](#)
- [“Viewing Reports” on page 7-4](#)

Report Options

The report facility provides the following report options:

- **Host centric SAN report** generates a host list of all SAN assets: HBAs, Devices, and LUNs.
- **Device centric SAN report** generates a device list of all SAN assets: HBAs, devices, and LUNs.
- **Host asset report** generates a host asset list of all host names, O/S types, and O/S versions.
- **Flash version asset by host and HBA report** generates an HBA Flash asset list of all version attributes grouped by host name and HBA.
- **HBA asset by host report** generates an HBA asset list of all HBA attributes grouped by host name.
- **HBA asset by type report** generates an HBA asset list of all HBA attributes grouped by HBA type.
- **HBA asset by DataRate report** generates an HBA asset list of all HBA attributes grouped by HBA DataRate.
- **Transceiver vendor asset by HBA report** generates a transceiver asset list of all attributes grouped by HBA.
- **LUN asset by attached HBA report** generates a LUN asset list of all HBA attributes grouped by attachment.

Report Formats

After a report is generated, a copy appears in an embedded viewer for your inspection. From the viewer, you can save generated reports in the following formats:

- JasperReports™ (requires JasperReports software)
- PDF
- RTF
- HTML
- Single sheet XLS
- Multiple sheet XLS
- CSV
- SML
- Embedded images

For more information on JasperReports, visit the following URL:

<http://jasperforge.org/sf/projects/jasperreports>

NOTE:

The software required to view the available report file formats is not packaged with SANsurfer FC HBA Manager.

Generating a Report

SANsurfer FC HBA Manager allows you to create reports that describe:

- SAN assets
- Host names
- HBA Flash assets
- HBA assets
- LUN assets
- Transceiver assets

To generate a report:

1. Open the Generate Reports dialog box using one of the following methods:
 - On the **View** menu, click **Generate Reports**.
 - Press CTRL+SHIFT+R.

The Generate Reports dialog box opens ([Figure 7-1](#)).

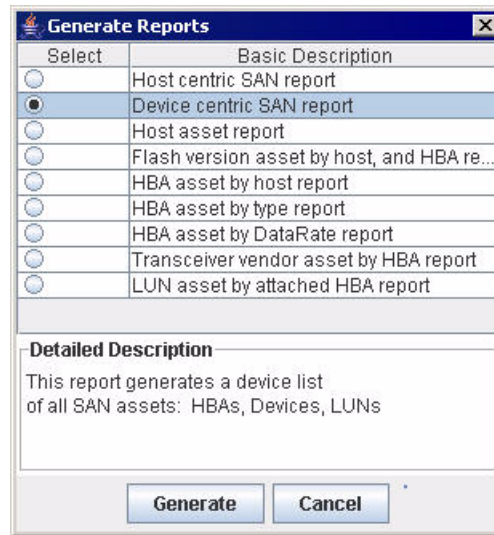


Figure 7-1 Generate Reports Dialog Box

2. Click one of the report options (see [“Report Options”](#) on page 7-1).
3. After selecting a report option, do one of the following:
 - To create the selected report type, click **Generate**. After the report is generated, it appears in an embedded viewer ([Figure 7-2](#)).
 - To close the Generate Reports dialog box without creating a report, click **Cancel**.

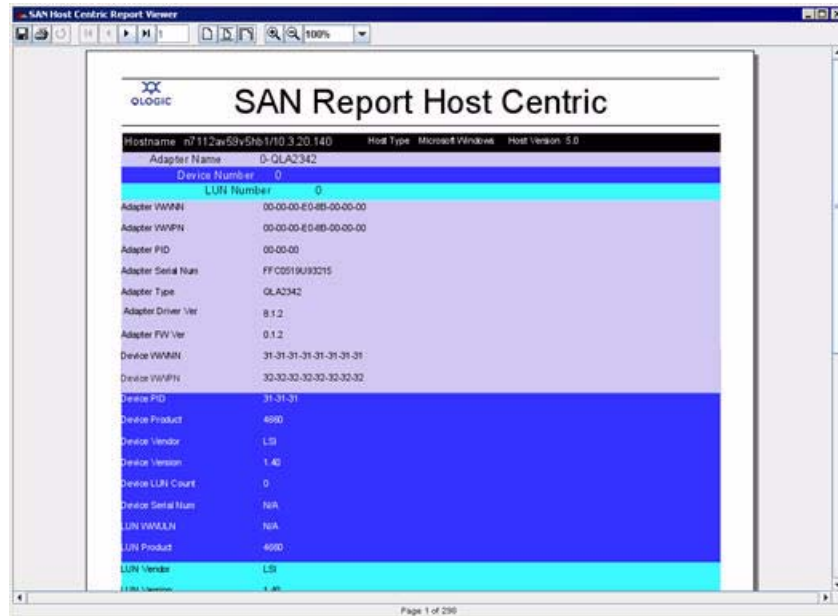


Figure 7-2 Generated Report in Embedded Viewer

4. After reviewing the report, you can save it in several different formats (see “Report Formats” on page 7-2).

Viewing Reports

After you generate the specified report, an embedded viewer opens (Figure 7-2) and shows the report for you to read. You can also save the report in several file formats.

The embedded viewer toolbar (Figure 7-3) provides navigation functionality for the report viewer.

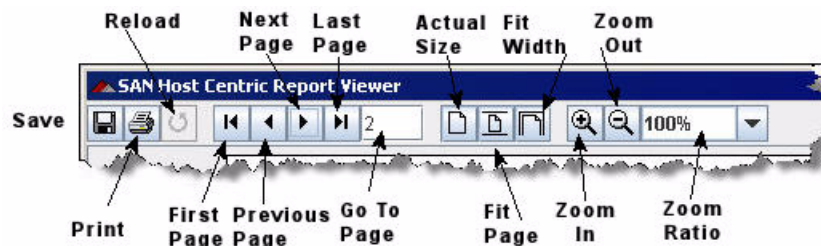


Figure 7-3 Embedded Viewer Toolbar

Table 7-1 describes each of the buttons on the embedded viewer toolbar.

Table 7-1. Report Viewer Toolbar Buttons

Button Name	Purpose
Save	Preserves the report in several file formats (see “Report Formats” on page 7-2).
Print	Sends the report, as it appears in the viewer, to a network printer.
Reload	Refreshes the file if required. This option is available only if you are using an HTML file format.
First Page	Takes you to the first page in the report.
Previous Page	Takes you to the preceding page in the report.
Next Page	Takes you to the following page in the report.
Last Page	Takes you to the last page in the report.
Go To Page	Takes you to the page you specify in the Go to Page box.
Actual Size	Expands the page to the actual size of the page in the viewer.
Fit Page	Adjusts the page to the size of the viewer.
Fit Width	Adjusts the width of the page to the width of the viewer.
Zoom In	Increases the magnification view of the report with each click of the button.
Zoom Out	Decreases the magnification view of the report with each click of the button.
Zoom Ratio	Selects specific magnification ratios from the provided list.

Notes

8 Diagnostics

Introduction

This section contains the following diagnostic information:

- [“Running Loopback and Read/Write Buffer Diagnostic Tests” on page 8-1](#)
- [“Viewing HBA Port Transceiver Details” on page 8-7](#)

Running Loopback and Read/Write Buffer Diagnostic Tests

SANsurfer FC HBA Manager offers two diagnostic tests: loopback and read/write. You can access the diagnostic testing facility from the **Diagnostics** tabbed page or by clicking the **Diags** button on the toolbar.

Before running a diagnostic test, consider the following:

- Because diagnostic testing interrupts normal HBA operations, you should run these tests when no other activities are required of the HBA.
- The HBA state reverts to pre-test conditions at the end of the testing process.
- Diagnostic tests read and write to sensitive areas on the HBA.
- Disruption of some diagnostic tests may require a complete update of the HBA's critical memory areas.

CAUTION!

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

The following sections provide information on these diagnostic tests:

- [“Preparing for Diagnostic Testing” on page 8-2](#)
- [“Running the Loopback Test” on page 8-5](#)
- [“Running the Read/Write Buffer Test” on page 8-6](#)

Preparing for Diagnostic Testing

Preparation differs for the loopback and read/write buffer tests. In addition, you can use SANsurfer FC HBA Manager to locate the HBA you want to test.

NOTE:

The loopback test is disabled if you are using inbox drivers with SLES 10.0.

The following sections provide information about how to prepare for diagnostic testing:

- [“Finding the HBA Port You Want to Test” on page 8-2](#)
- [“Preparing for the Loopback Test” on page 8-3](#)
- [“Preparing for the Read/Write Buffer Test” on page 8-4](#)

Finding the HBA Port You Want to Test

You can find the location of a port by the way the hardware flashes. SANsurfer FC HBA Manager allows you to activate a flash beacon on a port. This flash beacon can be toggled on and off. Flash the 23xx/24xx HBA port's LED to locate the HBA port in your computer.

NOTE:

This feature is not supported on QLA22xx series or older HBAs.

To flash the HBA port's LED:

1. In the HBA tree, right-click an HBA port.

NOTE:

If you are using a Macintosh mouse (one button), press `CTRL` while clicking on the tree.

2. On the shortcut menu, click **Flash Beacon**. The 23xx/24xx HBA port's LED begins to flash.

To stop the LED from flashing:

1. In the HBA tree, right-click the HBA port.
2. On the shortcut menu, click **Flash Beacon**.

Preparing for the Loopback Test

Perform the steps in this section before running the loopback test.

NOTE:

The loopback test is disabled if you are using inbox drivers with SLES 10.0.

To prepare to run the loopback test:

1. Modify the **Connection Options** setting (see *Modifying the HBA Settings Connection Options Setting* in the help system).
2. Attach a loopback connector to the FC connector on the HBA port (see [“Installing a Loopback Connector” on page 8-4](#)).

Skip this step under the following conditions (an echo test will be run instead):

- You have a 2xxx HBA that is connected to the fabric through a point-to-point connection (F_Port).
- The HBA is connected to a switch.
- Your operating system has one of the driver versions listed in [Table 8-1](#).

Table 8-1. Driver Versions That Do Not Require a Loopback Connector

Operating System	Driver Version
Windows 2000/Windows Server 2003 with SCSI miniport driver	8.2.3.11 and above
Windows XP Professional/Windows Server 2003/Windows Vista with Storport miniport driver	8.2.3.16 and above
Red Hat/SuSE Linux	6.06.00 and above
Solaris SPARC	4.12 and above
Solaris x86	4.15 and above
Novell NetWare	6.80 and above

3. If the HBA port is connected to the fabric through a point-to-point connection (F_Port) and is connected to a switch, make sure the Connection Options setting is **1 - Point-to-Point Only**. See *HBA Parameters* in the help system for information about viewing and modifying the setting.
4. Prepare for normal operations (see [“Preparing for Normal HBA Operations” on page 8-4](#)).

Installing a Loopback Connector

Before running the loopback test, you must install a loopback connector on the HBA port. Note the following about the loopback connector:

- The loopback connector must be appropriate for the type of FC HBA connector.
- Be sure to select the appropriate HBA connector for testing. Each HBA connector appears in the SANsurfer FC HBA Manager main window HBA tree as an HBA port.

NOTE:

Installing the connector stops normal HBA operations.

To install a loopback connector:

1. Disconnect the cable from the appropriate HBA connector.
2. Install the loopback connector on the HBA connector.

Preparing for Normal HBA Operations

When you complete loopback testing, follow these steps to resume normal HBA operations.

To resume normal HBA operations:

1. Remove the loopback connector from the HBA connector.
2. Reconnect the cable that you disconnected in [“Installing a Loopback Connector” on page 8-4](#).
3. Modify the HBA settings **Connection Options** back to its previous setting (see *Modifying the HBA Settings Connection Options Setting* in the help system).

Preparing for the Read/Write Buffer Test

The read/write buffer test must be run on a device (disk or tape). Before running the read/write buffer test, verify that the HBA port is connected to at least one device by viewing the SANsurfer FC HBA Manager HBA tree.

NOTE:

Some devices may not support Read/Write Buffer commands. Check with your hardware vendors or manufacturer.

You can run the read/write test on all devices attached to the HBA port or to specific devices attached to the HBA port.

To prepare for the read/write buffer test for all devices attached to an HBA port:

1. In the SANsurfer FC HBA Manager HBA tree, right-click an HBA port.
2. On the shortcut menu, point to **Device Diagnostics**, and then click **Enable All Devices**. A check mark appears next to all the device icons attached to the selected HBA port.

To prepare for the read/write buffer test for specific devices attached to an HBA port:

1. In the SANsurfer FC HBA Manager HBA tree, right-click a device.
2. On the shortcut menu, point to **Device Diagnostics**, and then click **Enable on Device**. A check mark appears next to the device icon.
3. Repeat for each device you want to test.

Running the Loopback Test

The loopback test is external to the HBA. If the HBA port is in loop mode, you can run the loopback test with a loopback connector. If the HBA port is in point-to-point mode and attached to a switch, an echo test is run instead (no loopback connector is used). In addition, some driver versions do not require a loopback connector. See [“Preparing for the Loopback Test” on page 8-3](#) for information.

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

To run a loopback test:

1. Prepare for the test (see [“Preparing for Diagnostic Testing” on page 8-2](#)).
2. Set the diagnostic test parameters (see *Setting the Diagnostic Test Parameters* in the help system).
3. Run the diagnostic test (see *Running Diagnostic Tests* in the help system).
4. View the diagnostic test results (see *Viewing the Diagnostic Test Results* in the help system).
5. Prepare for normal HBA operations (see [“Preparing for Normal HBA Operations” on page 8-4](#)).

NOTE:

The loopback test must be run with the loopback connector (unless the operating system uses one of the driver versions listed in the [Table 8-1](#)).

NOTE:

The loopback test is disabled if you are using inbox drivers with SLES 10.0.

Running the Read/Write Buffer Test

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

NOTE:

Link status is disabled if you are using inbox drivers with SLES 10.0.

To run a read/write buffer test:

1. Prepare for the test (see [“Preparing for Diagnostic Testing”](#) on page 8-2).
2. Set the diagnostic test parameters (see *Setting the Diagnostic Test Parameters* in the help system).
3. Run the diagnostic test (see *Running Diagnostic Tests* in the help system).
4. View the diagnostic test results (see *Viewing the Diagnostic Test Results* in the help system).

NOTE:

The read/write buffer test must be run without the loopback connector on a device (disk or tape) that supports the `SCSI Read Buffer` and `SCSI Write Buffer` commands.

Viewing HBA Port Transceiver Details

The **Transceiver Details** tabbed page, located in the **Diagnostics** tabbed page, shows the Digital Diagnostics Monitoring Interface (DDMI) for optical transceivers, allowing access to device operating parameters. The **Transceiver Details** tabbed page consists of two nested tabbed pages, **General** and **Details**:

- The **General** tabbed page ([Figure 8-1](#)) shows an overview of the status data from the optical transceiver device.
- The **Details** tabbed page ([Figure 8-2](#)) shows detailed digital diagnostic data from the optical transceiver device.

NOTE:

- The **Transceiver Details** tabbed page is available only for 4Gb or greater HBA devices.
- The **Transceiver Details** function is unavailable if you are using inbox drivers with Red Hat 5.0 or SLES 10.0.

The following identifying information appears above the nested tabbed pages:

- **Hostname** is the name or IP address of the host connected to the HBA.
- **HBA Model** specifies the model number for the HBA (any ISP2422/2432 based HBA).
- **HBA Port** indicates the HBA port number.
- **Node Name** indicates the World wide HBA node name.
- **Port Name** indicates the World wide HBA port name.
- **Port ID** indicates the Port ID of the HBA port.

General Page

The **General** page ([Figure 8-1](#)) of **Transceiver Details** contains two sections: **Media Information** and **Diagnostic Data**.

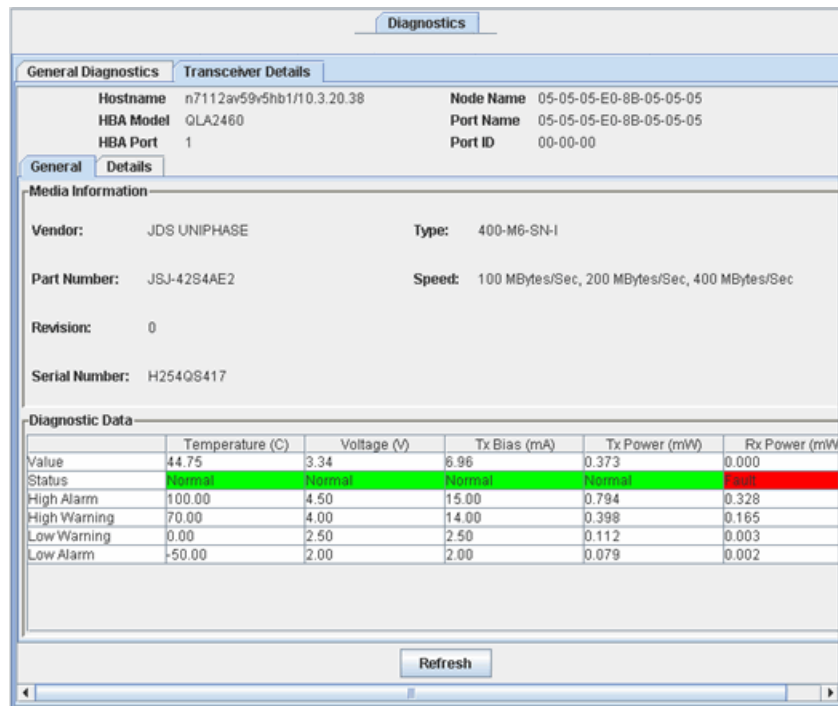


Figure 8-1 Transceiver Details Tabbed Page: General Page

Media Information

On the **General** tab, the **Media Information** section lists the following information:

- **Vendor.** Indicates the name, commonly accepted abbreviation, SCSI company code, or the stock exchange code for the company that provides the transceiver device.
- **Part Number.** Indicates the vendor part number or product name of the transceiver device. A value of zero indicates that the part number is unknown.
- **Revision.** Indicates the vendor product revision number of the transceiver device. A value of zero indicates that the revision number is unspecified.
- **Serial Number.** Indicates the vendor serial number for the transceiver device.
- **Type.** Describes the transceiver device based on information that SANsurfer FC HBA Manager reads from the device.

For instance, the type 400-M6-SN-I describes a transceiver device that has a speed of 400 MBps (400), uses a multimode 62.5 m (M6) laser, which is a shortwave laser without OCF (SN) for an intermediate distance (I).

- **Speed.** Indicates the data transfer rate for the transceiver device in Mbytes/sec.

Diagnostic Data

The **Diagnostic Data** section shows the existing **Value**, **Status**, **High Alarm** value, **High Warning** value, **Low Warning** value, and **Low Alarm** value for the following data:

- **Temperature (C).** Temperature of the transceiver device in degrees centigrade
- **Voltage (V).** Voltage of the transceiver device power supply in volts
- **Tx Bias (mA).** Transmitting laser bias current in mA
- **Tx Power (mW).** Coupled transmitter output power of the laser in mW
- **Rx Power (mW).** Received optical power in mW

The **Value** shows the existing number value for the datum. The **Status** shows its rank as **Normal**, **Warning**, or **Fault**. Normal status appears in a **green** cell in the **Diagnostic Data** section. Fault status appears in a **red** cell, and warning status appears in a **yellow** cell. A fault status requires immediate action.

Each datum has a **High Alarm** and a **Low Alarm** value. If a datum exceeds the **High Alarm** value or falls below the **Low Alarm** value, the conditions are likely to cause an inoperable link and require immediate action.

Additionally, each datum has a **High Warning** value and **Low Warning** value. Warnings indicate conditions outside the normally guaranteed bounds, but are not necessarily causes for immediate link failures.

NOTE:

Specific warning flags may represent the manufacture's end of life indicators.

Details Page

The **Details** page ([Figure 8-2](#)) of **Transceiver Details** shows detailed digital diagnostic data from the optical transceiver device.

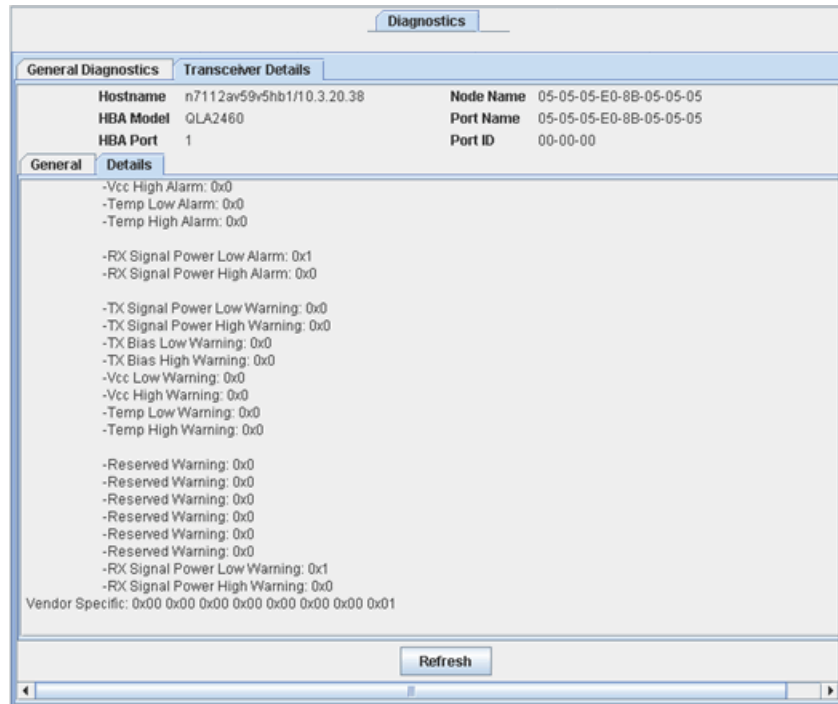


Figure 8-2 Transceiver Details Tabbed Page: Details Page

For a detailed explanation of the diagnostic data displayed on the **Details** page, refer to *SFF-8472 Specification for Diagnostic Monitoring Interface for Optical Xcvrs*, Revision 9.3 August 1, 2002.

9 Troubleshooting

Problems can occur when installing and using SANsurfer FC HBA Manager. This section provides troubleshooting information, including:

- [“Troubleshooting Tools” on page 9-1](#)
- [“Troubleshooting Problems and Solutions” on page 9-3](#)
- [“Verifying that the HBA Driver is Installed” on page 9-10](#)
- [“Verifying that qlremote is Installed and Running” on page 9-12](#)
- [“Tracing SANsurfer FC HBA Manager and Agent Activity \(Debug\)” on page 9-14, as directed by your authorized service provider](#)

NOTE:

The qlremote agent refers to the SANsurfer FC HBA Manager server agent (SANsurfer FC Windows agent, SANsurfer FC Linux agent, SANsurfer FC Solaris agent, SANsurfer FC NetWare 5/6.x agent, or SANsurfer FC Mac OS X agent) with which the SANsurfer FC HBA Manager user interface (client) connects to manage QLogic QLA2xxx FC HBAs.

Troubleshooting Tools

The following sections explain how to use the Windows event log, Linux messages file, Solaris messages file, and SANsurfer FC HBA Manager to solve hardware problems.

Windows Event Log

The Windows event log is the main source of information for device driver problems and events. Device drivers usually indicate only status by logging events in the system event Log. SANsurfer FC HBA Manager agents also use the Application Event Log to report service errors, and so on.

For more information, see the SANsurfer FC HBA Manager help system.

In addition, you can search the QLogic Support knowledge base and user forums to help determine if the event is generated by the QLogic driver, Microsoft, or other source. Go to <http://support.qlogic.com> and in the Search input box, do one of the following, and then click **Search**:

- Type `Event ID` to search for all events in the knowledge base.
- Type a specific Event ID number.
- Type `6389719` to find and open the document, *Interpretation of the QLA2xxx Windows Event Log Error Codes (Driver version 9.00.00 and above)*.
- Type `3346764` to find and open the document, *Interpretation of the QLA2xxx Windows Event Log Error Codes (For driver versions prior to 9.00.00)*.

Miniport driver logs. The miniport driver logs events for significant driver errors. Due to a limitation of the Windows miniport driver interface, the miniport can log only two 32-bit values for any event. Information about interpreting these event codes is in the `eventlog.txt` file, which is shipped with the miniport driver.

In addition, the miniport driver can be configured to perform extended event logging for an HBA, which causes it to log all loop transitions and many minor events. Extended Application Event Logging uses extra overhead and is enabled only in troubleshooting situations. The extended Application Event Logging flag is stored in the HBA NVRAM and can be modified using *Fast!UTIL* or SANsurfer FC HBA Manager.

Linux Messages File

For Red Hat/SuSE Linux systems, the Linux messages file is the main source of information for device driver problems and events. Device drivers usually indicate only status by logging events in the Linux messages file. SANsurfer FC HBA Manager agents also use the Linux messages file to report service errors, and so on. For more information, see the SANsurfer FC HBA Manager help system.

The Linux agent logs events for significant driver errors. In addition, the Linux agent can be configured to perform extended event logging for an HBA, which causes it to log all loop transitions and many minor events. Extended Application Event Logging uses extra overhead and is enabled only in troubleshooting situations. The extended event logging flag is stored in the HBA parameters and can be modified using *Fast!UTIL* or SANsurfer FC HBA Manager.

The path for the Linux messages file is `/var/log/messages`.

Solaris Messages File

For Solaris SPARC/x86 systems, the Solaris messages file is the main source of information for device driver problems and events. Device drivers usually indicate only status by logging events in the Solaris messages file. SANsurfer FC HBA Manager agents also use the Solaris messages file to report service errors, and so on. For more information, see the SANsurfer FC HBA Manager help system.

The Solaris agent logs events for significant driver errors. In addition, the Solaris agent can be configured to perform extended event logging for an HBA, which causes it to log all loop transitions and many minor events. Extended Application Event Logging uses extra overhead and is enabled only in troubleshooting situations. The extended event logging flag is stored in the HBA parameters and can be modified using *Fast!UTIL* (Solaris SPARC), *FCode* (Solaris x86), or SANsurfer FC HBA Manager.

The path for the Solaris messages file is `/var/adm/messages`.

SANsurfer FC HBA Manager

SANsurfer FC HBA Manager lists target devices on an HBA, loop topology information, loop error count information, and so on. SANsurfer FC HBA Manager shows target devices on an HBA and is useful for analyzing system configurations. SANsurfer FC HBA Manager uses a feature of the enhanced miniport driver to find and display information about devices that are not configured on the local host. This feature can display information about all potential target devices on a fabric or all devices on a loop topology, not just those that are configured on the local host.

Troubleshooting Problems and Solutions

This section provides troubleshooting problems and solutions. Refer to the associated `readme.txt` file for the latest problems and solutions (see “[Related Documents](#)” on page 1-3). Problem categories include:

- “[Installation Issues](#)” on page 9-4
- “[User Interface and Remote Agent Issues](#)” on page 9-5
- “[Functional Issues](#)” on page 9-8

Installation Issues

[Table 9-1](#) lists problems that can occur when installing SANsurfer FC HBA Manager, and provides possible causes and solutions.

Table 9-1. Troubleshooting: Installation Issues

Problem	Cause and Solution
Installation does not run.	<p>Cause: You are not using the correct installation program or the downloaded installation file is corrupted.</p> <p>Solution:</p> <ul style="list-style-type: none"> ■ If running from CD-ROM, verify that the installation is run from the start page. If JavaScript™ is turned on in the browser, the CD-ROM automatically detects the operating system and presents the appropriate installation program. ■ If the installation program was downloaded, it may be corrupted. Download the program again, this time to a different directory; perform the installation.
Installation does not complete or terminates before completion.	<p>Cause: There is insufficient disk space or not enough available memory.</p> <p>Solution: The installation detects when there is insufficient disk space. When sufficient disk space is available, continue the installation. For disk space and physical RAM requirements, see “Hardware Requirements” on page 4-1 or the <code>readme.txt</code> file.</p>
Installation does not copy files.	<p>Cause: There is insufficient disk space or not enough available memory.</p> <p>Solution: The installation detects when there is insufficient disk space. When sufficient disk space is available, continue the installation. For disk space and physical RAM requirements, see “Hardware Requirements” on page 4-1 or the <code>readme.txt</code> file.</p>
Installation reports that there is no space available.	<p>Cause: There is insufficient disk space or not enough available memory.</p> <p>Solution: The installation detects when there is insufficient disk space. When sufficient disk space is available, continue the installation. For disk space and physical RAM requirements, see “Hardware Requirements” on page 4-1 or the <code>readme.txt</code> file.</p>

User Interface and Remote Agent Issues

Table 9-2 lists problems related to the SANsurfer FC HBA Manager user interface and remote agent, and provides possible causes and solutions.

Table 9-2. Troubleshooting: User Interface and Remote Agent Issues

Problem	Cause and Solution
Unable to start the SANsurfer FC HBA Manager user interface using the desktop shortcut (SANsurfer icon).	<p>Cause: The desktop shortcut has an invalid path or SANsurfer FC HBA Manager was not completely installed.</p> <p>Solution: Verify that the desktop shortcut points to the <code>SANsurfer.exe</code> file. This program is installed by default in the following folder for Windows and NetWare (user interface only): <code>C:\Program Files\QLogic Corporation\SANsurfer</code></p>
SANsurfer FC HBA Manager user interface starts, and then hangs indefinitely.	<p>Cause: There is insufficient memory.</p> <p>Solution: For physical RAM requirements, see “Hardware Requirements” on page 4-1 or the <code>readme.txt</code> file.</p>
SANsurfer FC HBA Manager user interface cannot connect to the local host.	<p>Cause: The HBA driver may not be installed.</p> <p>Solution: Verify that the HBA driver is installed; see “Verifying that the HBA Driver is Installed” on page 9-10.</p>
SANsurfer FC HBA Manager user interface is not connecting to a local host.	<p>Cause: Depending on your network configuration, you may not see all your local hosts respond within the 30 second Broadcast Interval default setting.</p> <p>Solution: In the Broadcast Settings dialog box, increase the Broadcast Interval to the appropriate value above 30 seconds. This allows your network the time to respond.</p>
SANsurfer FC HBA Manager user interface cannot connect to a remote host.	<p>Cause: The qlremote agent is not installed on the remote system or the network protocol is not properly configured.</p> <p>Solution:</p> <ul style="list-style-type: none"> ■ Verify that the qlremote agent is installed on the remote host. See “System Requirements” on page 4-1 and “Initial Installation” on page 5-1 for network requirements. See the SANsurfer FC HBA Manager help system for instructions on how to configure and manage remote hosts. Verify that the appropriate network protocol is running. ■ The DNS or the local host file may contain an incorrect IP address for the host name. Use the <code>ping</code> command to ping the host name, and then verify that the correct IP address is translated from the name.

Table 9-2. Troubleshooting: User Interface and Remote Agent Issues (Continued)

Problem	Cause and Solution
<p>SANsurfer FC HBA Manager user interface cannot disconnect from a remote host.</p>	<p>Cause: The qlremote agent service has stopped or is unable to establish a network link.</p> <p>Solution:</p> <ul style="list-style-type: none"> ■ Verify that the remote host is running the qlremote agent. See “Verifying that qlremote is Installed and Running” on page 9-12. ■ Verify that the remote host can be accessed through the network. Use the <code>ping</code> command to verify communication with the remote host name and IP address.
<p>SANsurfer FC HBA Manager user interface does not find or show any HBAs.</p>	<p>Cause: An incorrect operating system driver is loaded or the qlremote agent is not installed.</p> <p>Solution:</p> <ul style="list-style-type: none"> ■ Verify that the appropriate operating system driver is loaded. Refer to the <code>readme.txt</code> file for supported operating system drivers. ■ Verify that the qlremote agent is running on the local or remote host. Check agent logs for any problems while querying information (see the SANsurfer FC HBA Manager help system).
<p>SANsurfer FC HBA Manager user interface does not find or display any devices.</p>	<p>Cause: The operating system driver did not find devices during the initial load.</p> <p>Solution: Verify that the operating system driver detects the devices. If the operating driver does not detect devices, neither does SANsurfer FC HBA Manager. Check agent logs for any problems while querying information (see the SANsurfer FC HBA Manager help system).</p>
<p>SANsurfer FC HBA Manager user interface reports that the HBA device driver is invalid or incorrect.</p>	<p>Cause: An incorrect or unsupported operating system driver is installed.</p> <p>Solution: Refer to the <code>readme.txt</code> file for a list of supported operating system drivers.</p>
<p>Unable to find SANsurfer FC HBA Manager user interface help system.</p>	<p>Cause: The path to the browser is not correctly specified.</p> <p>Solution: In the SANsurfer FC HBA Manager main window Help menu, click Set Browser Location to specify the path (see “Specifying the Help Browser” on page 6-12). See “Software Requirements” on page 4-2 for supported browsers.</p>
<p>SANsurfer FC HBA Manager user interface does not automatically refresh.</p>	<p>Cause: There is a disconnect with the qlremote agent or network communication has stopped.</p> <p>Solution:</p> <ul style="list-style-type: none"> ■ Verify that the qlremote agent is installed and running (see “Verifying that qlremote is Installed and Running” on page 9-12). ■ For network requirements, see “System Requirements” on page 4-1 and “Installing SANsurfer FC HBA Manager” on page 5-1.

Table 9-2. Troubleshooting: User Interface and Remote Agent Issues (Continued)

Problem	Cause and Solution
SANsurfer FC HBA Manager user interface loses the connection to a host.	<p>Cause: There is a disconnect with the qlremote agent or network communication has stopped.</p> <p>Solution:</p> <ul style="list-style-type: none"> ■ Verify that the qlremote agent is installed and running (see “Verifying that qlremote is Installed and Running” on page 9-12). ■ Verify that the appropriate network protocol is running.
SANsurfer FC HBA Manager user interface crashes.	<p>Cause: SANsurfer FC HBA Manager user interface lost communication with the qlremote agent, another application caused a conflict with SANsurfer FC HBA Manager, or an operating system driver lost communication with the HBA or device.</p> <p>Solution:</p> <ul style="list-style-type: none"> ■ Verify that the qlremote agent is installed and running (see “Verifying that qlremote is Installed and Running” on page 9-12). ■ Verify that no other application is causing SANsurfer FC HBA Manager to crash. ■ Verify that the operating system driver detects the HBA or device.
Host keeps disconnecting from and connecting to the HBA tree.	<p>Cause: FC protocol activity caused the qlremote agent to rescan the configuration.</p> <p>Solution: If SANsurfer FC HBA Manager is managing several hosts and a remote host reboots, or there is activity in the SAN, the qlremote agent and SANsurfer FC HBA Manager refresh the configuration to ensure that no HBA or device was disconnected.</p>

Functional Issues

Table 9-3 lists functional problems that may occur with using SANsurfer FC HBA Manager, and provides possible causes and solutions.

Table 9-3. Troubleshooting: Functional Issues

Problem	Cause and Solution
Unable to create failover configuration.	<p>Cause: An incorrect version of SANsurfer FC HBA Manager is installed or SANsurfer FC HBA Manager detected an invalid configuration.</p> <p>Solution: To create a failover configuration, the following criteria must be met:</p> <ul style="list-style-type: none"> ■ The host system must contain two or more HBAs. ■ The storage subsystem must report the same device node name and separate device port names for each port. ■ The storage subsystem must report the same total number of LUNs down each path. ■ The storage subsystem must report the same LUN numbers for each port.
Unable to create load balance configuration.	<p>Cause: SANsurfer FC HBA Manager detected an invalid configuration.</p> <p>Solution: To enable load balancing, each storage subsystem must report multiple LUNs. If a JBOD is used, each device must be individually configured and manually balanced.</p>
Unable to mask LUNs.	<p>Cause: The LUN path is unconfigured.</p> <p>Solution: In the Fibre Channel Configuration dialog box, set the device path to visible (or hidden, if a failover configuration will be saved).</p>
Unable to set device path as visible, hidden, or unconfigured.	<p>Cause: The SANsurfer FC HBA Manager user interface or qlremote agent did not detect any devices.</p> <p>Solution: Verify that the SANsurfer FC HBA Manager user interface shows the devices under their HBAs in the HBA tree. Each device should show its device port name and its connected LUNs.</p>
Unable to set LUN path as preferred or alternate.	<p>Cause: The LUN path is not configured or the devices were not detected by the SANsurfer FC HBA Manager user interface or qlremote agent.</p> <p>Solution: Verify that the SANsurfer FC HBA Manager user interface shows the devices under their HBAs in the HBA tree. Each device should show its device port name and its connected LUNs.</p>
Unable to get host information.	<p>Cause: The qlremote agent is not running or installed.</p> <p>Solution: Verify that the qlremote agent is installed and running (see “Verifying that qlremote is Installed and Running” on page 9-12).</p>

Table 9-3. Troubleshooting: Functional Issues (Continued)

Problem	Cause and Solution
Unable to display the Host Statistics tabbed page.	<p>Cause: QLdirect driver is not installed.</p> <p>Solution: The Host Statistics tab appears only when the QLdirect driver is installed. This option is available only for Windows 2000 and Windows Server 2003.</p>
Unable to display HBA Information, HBA Port Statistics, Device List, or Link Status.	<p>Cause: The qlremote agent is not running or is not installed.</p> <p>Solution: Verify that the qlremote agent is installed and running (see “Verifying that qlremote is Installed and Running” on page 9-12).</p>
Unable to display or modify the HBA parameters or the Utilities tab is missing.	<p>Cause:</p> <ul style="list-style-type: none"> ■ HBA parameters are corrupted, or ■ HBA Subsystem Identification/Subsystem Vendor Identification (SSID/SSVID) is missing from <code>adapter.properties</code>. <p>Solution: If the HBA parameters are corrupted, use FlashUTIL! to reflash the HBA parameters. If the SSVID/SSDID is missing from <code>adapter.properties</code>, perform a tool update, or manually modify <code>adapter.properties</code>.</p>
Unable to run update flash BIOS.	<p>Cause: This feature is not supported for all operating systems.</p> <p>Solution: The Update Flash utility is available only for Windows XP Professional/Windows 2000/Windows Server 2003/Windows Vista/Windows Server 2008 and Red Hat/SuSE Linux.</p>
Unable to run device replacement.	<p>Cause: Device removal is not detected or a new device was not inserted.</p> <p>Solution: Before running the Device Replacement utility, ensure that you first remove the device to be replaced, and then insert the new device.</p>
Unable to run the loopback test.	<p>Cause: A loopback connector was not attached to the FC connector on the HBA.</p> <p>Solution: A loopback connector must be attached to the FC connector on the HBA. The HBA parameter extended firmware setting Connection Options must be set to 0 - Loop Only. For details, see “Preparing for the Loopback Test” on page 8-3.</p>
Unable to run the read/write buffer test.	<p>Cause: The device does not support SCSI Read/Write Buffer commands.</p> <p>Solution: Not all devices support the SCSI Read/Write Buffer commands. The read/write buffer test reports <code>Unsupported</code> if the device does not support these commands.</p>

Table 9-3. Troubleshooting: Functional Issues (Continued)

Problem	Cause and Solution
Current Path dialog box does not display my saved configuration.	<p>Cause: The saved configuration is not detected by the qlremote agent.</p> <p>Solution: The Current Path dialog box shows the current configuration detected by the qlremote agent. Click the Refresh button to force a manual refresh. Verify that the configuration saved is the current configuration. This includes the following: no failover occurred, no device was removed, and the HBA tree shows the appropriate device port name and LUN information.</p>
Current Path dialog box does not display my storage device port names and LUNs.	<p>Cause: The qlremote agent is unable to detect or communicate with the devices.</p> <p>Solution: Verify that the devices are online and operational. Verify that the operating system driver detects and communicates with the devices. Click the Refresh button to force a manual refresh. Verify that the HBA tree shows the appropriate device port name and LUN information.</p>
When I change the current path in the Current Path dialog box, the HBA tree does not update.	<p>Cause: The qlremote agent is unable to detect or communicate with the devices.</p> <p>Solution:</p> <ul style="list-style-type: none"> ■ Verify that the devices are online and operational. Verify that the operating system driver detects and communicates with the devices. Click the Refresh button to force a manual refresh. Verify that the HBA tree shows the appropriate device port name and LUN information. ■ The DNS or the local host file may contain an incorrect IP address for the host name. Use the <code>ping</code> command to ping the host name, and then verify that the correct IP address is translated from the name.

Verifying that the HBA Driver is Installed

If SANsurfer FC HBA Manager is having trouble connecting to the local host, follow the procedure for your operating system to verify that the HBA driver is installed. If the HBA driver is not installed, then install it (see the SANsurfer FC HBA Manager help system or the *QLogic Quick Start Guide*).

If you determine that the HBA driver is installed, then consider the following:

- If typing the host name in the Connect to Host dialog box, verify that you are typing the correct name. Refer to the system server information to check the system name. On the Connect to Host dialog box, select **localhost**.

- The DNS or the local host file may contain an incorrect IP address for the host name. Use the `ping` command to ping the host name, and then verify that the correct IP address is translated from the name. If necessary, reinstall the HBA driver.

To verify that the HBA driver is installed on Windows:

1. Right-click the **My Computer** desktop icon. On the shortcut menu, click **Manage**.
2. In the left pane of the Computer Management window, click **Device Manager**. In the right pane, click **SCSI and RAID controllers**.
3. Right-click a QLogic FC Adapter. (which is a QLogic FC HBA port). On the shortcut menu, click **Properties**.
4. On the QLogic Fibre Channel Adapter Properties, click the **Driver** tab.
5. On the **Driver** tabbed page, click the **Driver Details** button.
6. On the Driver File Details dialog box, **Driver files** list, select the driver. The file version appears below.
7. Repeat the process for each HBA port, as appropriate.

To verify that the HBA driver is installed on Netware:

1. At the server command prompt, type the following and then press `ENTER`:

```
modules q*
```
2. Verify that the QLogic HBA driver is installed.

To verify that the HBA driver is installed on Red Hat/SuSE Linux:

1. Type the following command and then press `ENTER`:

```
lsmod (the letter L)
```
2. Verify that the QLogic HBA driver is installed.

To verify that the HBA driver is installed on Macintosh:

1. Type the following command and then press `ENTER`:

```
kextstat | grep QLogic
```
2. Verify that the QLogic HBA driver is installed.

To verify that the HBA driver is installed on Solaris SPARC/x86:

1. Type the following command and then press `ENTER`:

```
modinfo | grep qla
```
2. The entries, if they appear, are the installed QLogic HBA drivers.

Verifying that qlremote is Installed and Running

Several problems in SANsurfer FC HBA Manager can be a result of the qlremote agent not being installed, loaded, or running. To determine if qlremote is installed and running, follow the procedure for your operating system.

NOTE:

On Windows and Linux, you can update the qlremote agent using SANsurfer FC HBA Manager. See *Updating the qlremote Agent* in the SANsurfer FC HBA Manager help system.

To verify that qlremote is installed and running on Windows:

1. Open the Computer Management/Services window (Figure 9-1).
2. Verify that the QLogic Management Suite Java agent service (**QLManagementAgentJava**) is running.

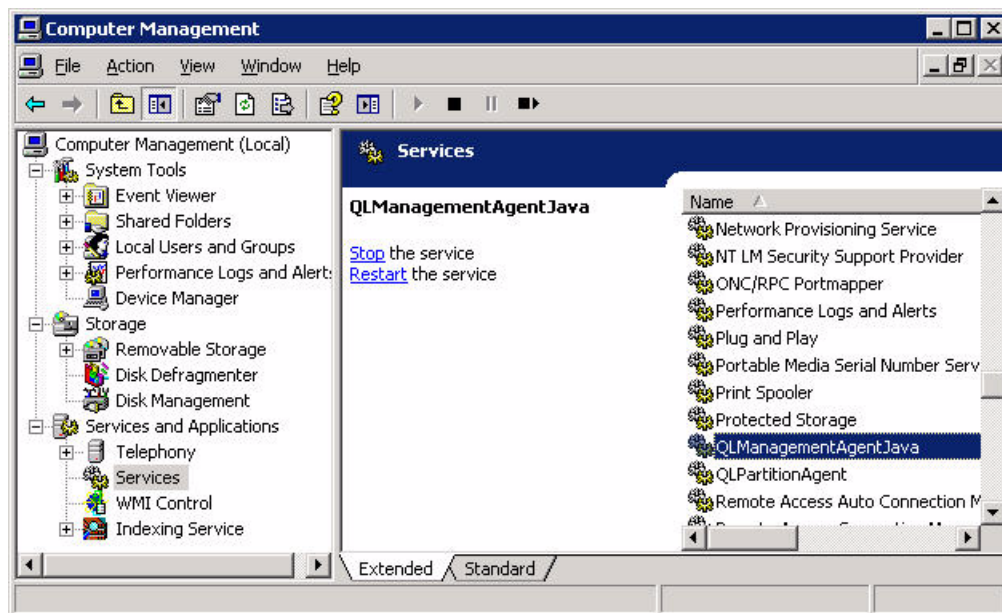


Figure 9-1 Windows: Services

To verify that qlremote is installed and running on NetWare:

1. At the server command prompt, type the following command, and then press ENTER:

```
modules q*
```
2. Verify that `qlremote.nlm` is loaded.

To verify that qlremote is installed and running on Red Hat/SuSE Linux:

1. Type one of the following commands, and then press `ENTER`:

```
# ps ax | grep qlremote
```

```
# ps -ef | grep qlremote
```
2. If entries display, qlremote is loaded.

Alternate Linux procedure:

1. Change to the following directory:

```
cd /usr/local/bin
```
2. Type the following command, and then press `ENTER`.

```
./qlremote -v
```
3. Verify that the appropriate network protocol is running.

To verify that qlremote is installed and running on Solaris SPARC/x86:

1. Type the following command, and then press `ENTER`:

```
ps -e | grep qlremote
```
2. If entries display, qlremote is running.

Alternate Solaris procedure:

1. Go to the SANsurfer installation folder.
2. Type the following command and then press `ENTER`:

```
./qlremote -v
```
3. Verify that the appropriate network protocol is running.

To verify that qlremote is installed and running on Macintosh:

1. Type one of the following commands, and then press `ENTER`:

```
# ps ax | grep qlremote
```

```
# ps -ef | grep qlremote
```
2. If entries display, qlremote is loaded.

Alternate Macintosh procedure:

1. Go to the SANsurfer installation folder.
2. Type the following command and then press `ENTER`:

```
./qlremote -v
```

3. Verify that the appropriate network protocol is running.

Tracing SANsurfer FC HBA Manager and Agent Activity (Debug)

Additional information may be required to help troubleshoot SANsurfer FC HBA Manager problems. After you enable debug following the steps in this section, attempt to reproduce the problem so that SANsurfer FC HBA Manager user interface and agent activity can be captured.

Use the following procedures to trace SANsurfer FC HBA Manager user interface and agent activity (debug), as directed by your authorized service provider.

This section provides procedures for:

- [“Tracing SANsurfer FC HBA Manager User Interface Activity” on page 9-14](#)
- [“Exporting or Saving Agent Activity Logs” on page 9-19](#)

Tracing SANsurfer FC HBA Manager User Interface Activity

To trace SANsurfer FC HBA Manager user interface activity:

1. Edit the `local.properties` file, which is located where SANsurfer is installed. Change the following properties:

```
node.agent.quiet.mode.enable=1
node.trace.level=900
node.trace.output.setlevelonly=false
```

[Figure 9-2](#) and [Figure 9-3](#) show examples.

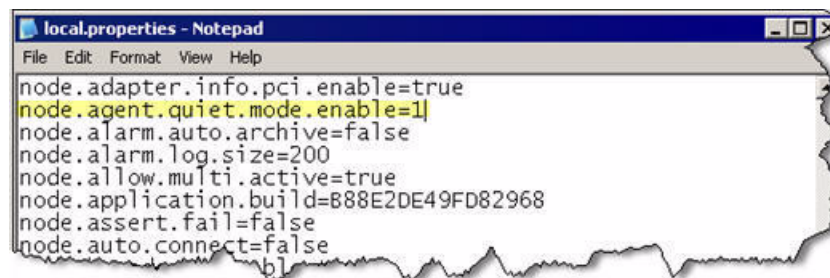
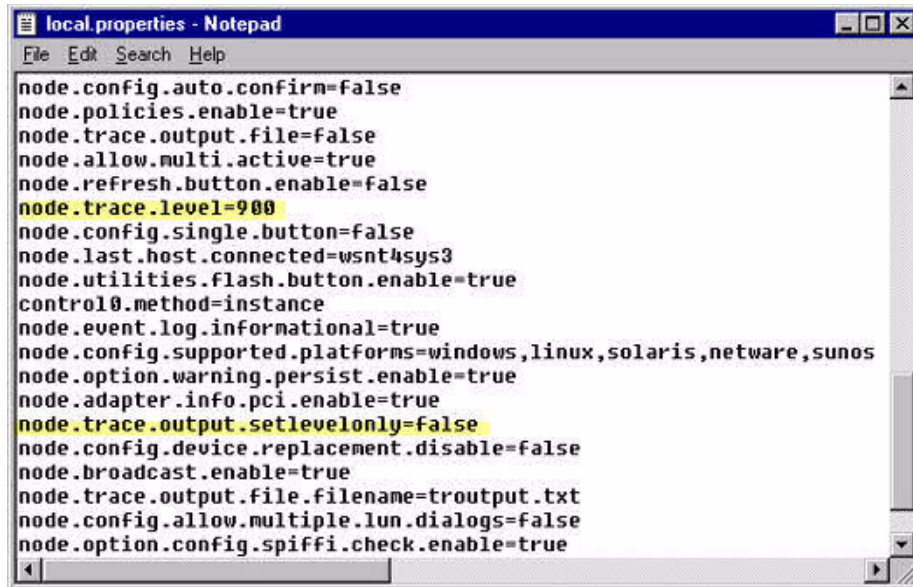


Figure 9-2 Local.properties File: Example 1



```

node.config.auto.confirm=false
node.policies.enable=true
node.trace.output.file=false
node.allow.multi.active=true
node.refresh.button.enable=false
node.trace.level=900
node.config.single.button=false
node.last.host.connected=wsnt4sys3
node.utilities.flash.button.enable=true
control0.method=instance
node.event.log.informational=true
node.config.supported.platforms=windows,linux,solaris,netware,sunos
node.option.warning.persist.enable=true
node.adapter.info.pci.enable=true
node.trace.output.setlevelonly=false
node.config.device.replacement.disable=false
node.broadcast.enable=true
node.trace.output.file.filename=troutput.txt
node.config.allow.multiple.lun.dialogs=false
node.option.config.spiffi.check.enable=true
  
```

Figure 9-3 Local.properties File: Example 2

2. Edit the `SANsurfer.lax` file, which is located where SANsurfer FC HBA Manager is installed. Do one of the following:

NOTE:

Press and hold the `CTRL` key while starting SANsurfer FC HBA Manager to display the messages in the console viewer. You can set the displayed levels by updating the `local.properties` file or by following these procedures.

- Edit the file so that the information appears on the console. Change the following properties:


```

lax.stderr.redirect=console
lax.stdout.redirect=console
lax.stdin.redirect=console
      
```
- Edit the file so that the information is saved to a file as shown for your operating system:
 - For a system, the location could be:

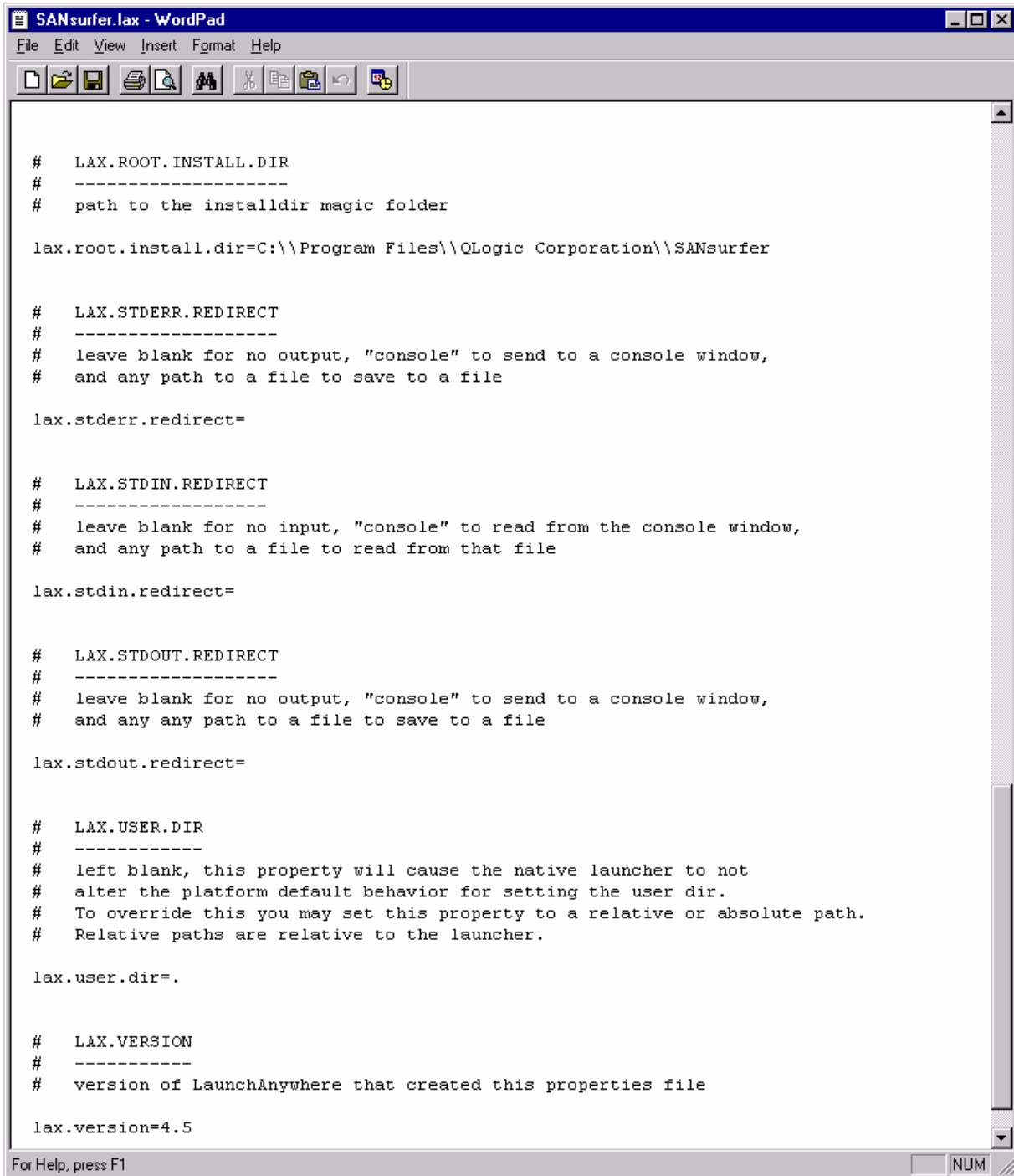

```

lax.stderr.redirect=c:\\trace.txt
lax.stdout.redirect=c:\\trace.txt
lax.stdin.redirect=c:\\trace.txt
          
```

- ❑ For a Red Hat/SuSE Linux or Solaris SPARC/x86 system, the location could be:

```
lax.stderr.redirect=/trace.txt  
lax.stdout.redirect=/trace.txt  
lax.stdin.redirect=/trace.txt
```

Figure 9-4 shows an example.



```

# LAX.ROOT.INSTALL.DIR
# -----
# path to the installdir magic folder

lax.root.install.dir=C:\\Program Files\\QLogic Corporation\\SANsurfer

# LAX.STDERR.REDIRECT
# -----
# leave blank for no output, "console" to send to a console window,
# and any path to a file to save to a file

lax.stderr.redirect=

# LAX.STDIN.REDIRECT
# -----
# leave blank for no input, "console" to read from the console window,
# and any path to a file to read from that file

lax.stdin.redirect=

# LAX.STDOUT.REDIRECT
# -----
# leave blank for no output, "console" to send to a console window,
# and any any path to a file to save to a file

lax.stdout.redirect=

# LAX.USER.DIR
# -----
# left blank, this property will cause the native launcher to not
# alter the platform default behavior for setting the user dir.
# To override this you may set this property to a relative or absolute path.
# Relative paths are relative to the launcher.

lax.user.dir=.

# LAX.VERSION
# -----
# version of LaunchAnywhere that created this properties file

lax.version=4.5

```

Figure 9-4 SANsurfer.lax File Example

3. If you are using a Windows system, follow these steps to change the height of the screen buffer:
 - a. On the Windows **Start** menu, point to **Programs**, point to **Accessories**, and then click **Command Prompt**.
 - b. In the Command Prompt window, click the upper left corner of the title bar.
 - c. On the shortcut menu, click **Properties**. The “Command Prompt” Properties dialog box opens (Figure 9-5).

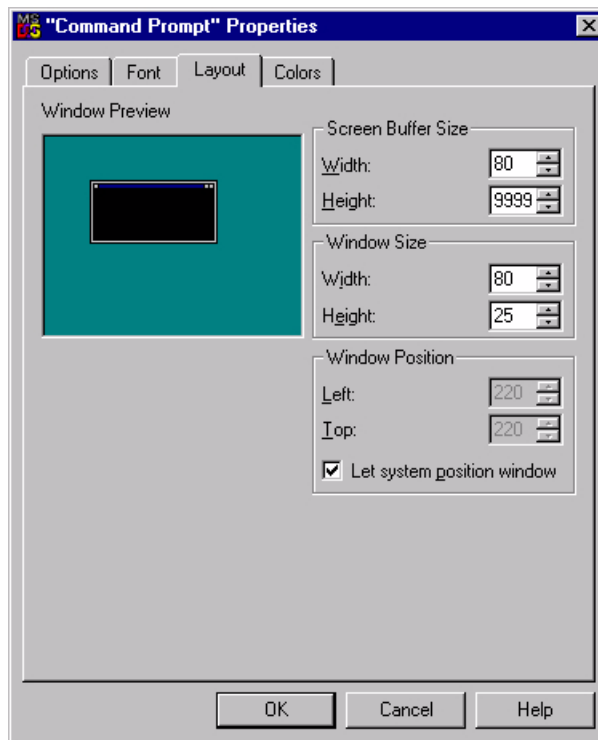


Figure 9-5 “Command Prompt” Properties Dialog Box

- d. Click the **Layout** tab to bring that page to the front.
 - e. Under **Screen Buffer Size**, click the **Height** box and type 9999. Click **OK**.
 - f. On the Apply Properties To Shortcut dialog box, click **Modify shortcut that started this window**, and then click **OK**.
4. Start SANsurfer FC HBA Manager. A new console window opens that displays SANsurfer FC HBA Manager user interface activity.

Exporting or Saving Agent Activity Logs

This section provides information about:

- [“Agent Logs by Operating System” on page 9-19](#)
- [“Exporting or Saving the Agent Logs” on page 9-19](#)

Agent Logs by Operating System

Agent activity automatically logs to one of the following. The name and location of the log differs, depending on the type of operating system:

- **Windows.** Event Viewer
- **Red Hat/SuSE Linux.** `/var/log/messages`
- **Macintosh.** Use the Utilities console application
- **Solaris SPARC/x86.** `/var/log/syslog`
- **NetWare.** `sys:\\etc\qlremote.log`

Exporting or Saving the Agent Logs

From a Windows system, follow these steps to save the current tool log from the Event Viewer.

To save the log from the Event Viewer on Windows:

1. Click the **Start** button, point to **Programs**, point to **Administrative Tools**, and then click **Event Viewer**.
2. On the **Log** menu, select **Save As**. Save the file using an appropriate name.

From a Red Hat/SuSE Linux or Macintosh system, follow these steps to export agent activity:

To export agent activity on Linux or Macintosh:

1. Open a terminal (for example, `xterm` or `eterm`).
2. Stop the currently running `qlremote` agent:


```
# killall -TERM qlremote
```
3. In the `agent.properties` file, add the following line:


```
node.agent.quiet.mode.enable=1
```
4. Start the agent, again, without forking into the background. Redirect the `stdout` and `stderr` properties to a file (see [Tracing SANsurfer FC HBA Manager User Interface Activity, Step 2](#)). Send the file to your authorized service provider.

For Red Hat/SuSE Linux:

```
# /usr/local/bin/qlremote > /AgentOutput.txt 2>&1
```

For Macintosh:

```
# /installation folder/qlremote > /AgentOutput.txt 2>&1
```

5. Open a second terminal to start the SANsurfer FC HBA Manager user interface. Connect to the host with SANsurfer FC HBA Manager.
6. On the terminal you opened in [Step 1](#), press CTRL+C to stop the qlremote agent. This causes the agent to clean up and terminate.

From a Solaris SPARC/x86 system, follow these steps to export agent activity.

To export agent activity on Solaris:

1. Open a terminal (for example, xterm, or dtterm).
2. To stop the currently running qlremote agent, do the following:
 - a. To determine the process identifier (pid) of qlremote, type the following and then press ENTER:

```
# ps -ef | grep qlremote
```

The pid is shown, as in the following example. Note that in the example, the pid is 227.

```
root 227 1 0 15:59:55 ? 0:00 /opt/QLogic_Corporation/
SANsurfer/qlremote

root 410 409 0 16:01:46 pts/6 0:00 grep qlremote
```

- b. Type the following and then press ENTER:

```
# kill -TERM pid
```

NOTE:

The pid is the identifier returned in [Step a](#).

3. In the `agent.properties` file, add the following line:

```
node.agent.quiet.mode.enable=1
```
4. Start the agent again without forking into the background. Redirect the `stdout` and `stderr` properties to a file (see [Tracing SANsurfer FC HBA Manager User Interface Activity, Step 2](#)). Send the file to your authorized service provider.

```
# /installation folder/qlremote
> /AgentOutput.txt 2>&1
```

5. Open a second terminal to start the SANsurfer FC HBA Manager user interface. Connect to the host with SANsurfer FC HBA Manager.
6. On the terminal you opened in [Step 1](#), press `CTRL+C` to stop the qlremote agent. This causes the agent to clean up and terminate.

NOTE:

For a NetWare system, the `qlremote.log` is already exported.

Notes

A Frequently Asked Questions

Table A-1 lists some frequently asked questions (FAQs) about SANsurfer FC HBA Manager. For additional FAQs and other information, visit the QLogic support Web site, support.qlogic.com.

Table A-1. Frequently Asked Questions

Question	Answer
On what platforms does SANsurfer FC HBA Manager run?	The SANsurfer FC HBA Manager user interface runs on any platform that supports the Java JVM™ 1.4 specification. The agent runs only on Windows XP Professional/Windows 2000/Windows Server 2003/Windows Vista/Windows Server 2008, Solaris SPARC/x86, Red Hat/SuSE Linux, Macintosh OS X, and NetWare.
Can the SANsurfer FC HBA Manager user interface running on Red Hat/SuSE Linux talk to a Windows host running the agent?	The SANsurfer FC HBA Manager user interface running on any platform can talk to any other platform running the agent. The SANsurfer FC HBA Manager interface allows connections to different platforms at the same time.
What does the blinking heart on the connected host mean?	SANsurfer FC HBA Manager actively pings the agent at the specified broadcast interval. This allows SANsurfer FC HBA Manager to detect agent presence on all platforms (even if agent shutdown notification is not supported). It also allows the detection of agent crashes as soon as possible. During an agent crash, the notification may not have been sent to all the connected user interfaces.
Can the current contents of the alarm and event logs be saved to a file?	The alarm and event log files are stored in the SANsurfer FC HBA Manager install directory as a comma delimited list of entries (one per line). The alarm log file is <code>alarms.txt</code> and the event log file is <code>events.txt</code> .
Can SANsurfer FC HBA Manager be run as a Java applet?	No, SANsurfer FC HBA Manager currently does not run as a Java applet.
Does SANsurfer FC HBA Manager support SNMP?	No, SANsurfer FC HBA Manager currently supports only the RPC communication layer between the user interface and agent.

Notes

B Shortcut Keys

What are *shortcut keys*?

You can quickly accomplish tasks you perform frequently by using *shortcut keys*: one or more keys you press on the keyboard to complete a task. [Table B-1](#) lists the shortcut keys available SANSurfer FC HBA Manager and the purpose of each.

Table B-1. Shortcut Keys

Press	To
ALT+X	Exit SANSurfer
CTRL+N	Configure FC ports
F5	Refresh
Insert	Connect host
CTRL+O	Load from file
CTRL+S	Save to file
CTRL+T	Save to text file
CTRL+SHIFT+C	Compare host
Delete	Disconnect selected host
CTRL+SHIFT+BACKSPACE	Disconnect all hosts
CTRL+P	Display current path
CTRL+SHIFT+O	Open host group
CTRL+SHIFT+S	Save host group
CTRL+SHIFT+E	View tool event log
CTRL+SHIFT+A	View HBA event log
CTRL+SHIFT+H	Schedule tasks
CTRL+SHIFT+R	Generate reports
CTRL+SHIFT+Z	Collect config/logs

Table B-1. Shortcut Keys (Continued)

Press	To
CTRL+SHIFT+T	Set options
CTRL+SHIFT+M	Set e-mail
CTRL+SHIFT+B	Set broadcast
CTRL+SHIFT+P	Set policies
CTRL+G	Run General Configurations Wizard
CTRL+R	Flash Update Wizard (SAN)
CTRL+V	Driver Update Wizard (SAN)
CTRL+M	HBA Parameters Update Wizard (SAN)
CTRL+W	HBA Parameters File Update Wizard (SAN)
CTRL+I	iiDMA Settings Wizard (SAN)
CTRL+L	Run LUN Masking Wizard
CTRL+F	Run Failover Wizard
F1	Browse online help contents
F2	Set online help browser location
CTRL+U	Check for Updates Now

Glossary

adapter

See [HBA](#).

AL_PA

Arbitrated loop_physical address, a low-level address on the FC loop.

arbitrated loop

A non-point-to-point circular topology where two or more ports can be interconnected, but only two ports can communicate at one time. All communication is passed through all ports connected onto the loop.

BIOS

Basic input/output system. A QLA2xxx HBA's flash PROM contains the code that allows booting from the HBA at startup.

boot code

The first program to run when a system is powered on. This is also true for devices within a system, such as FC 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 (boot device) attached to the QLogic 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 hard disk that contains the operating system that the BIOS uses to boot from when the computer is started.

CRC

Cyclic Redundancy Check. A CRC is a type of check value designed to catch most transmission errors.

CSV file

Comma separated values (CSV) file.

device

A computer subsystem, such as an HBA card, which mediates data in a computer network. The term "device" is used interchangeably with "target" and "target device". See [target](#).

driver

Software that interfaces between the file system and a physical data storage device or network media.

The level structure for Windows drivers is as follows:

- **Class driver** is the highest driver level. There is a separate class for disk, Ethernet, etc. This level handles all generic aspects of operations for that class.

- **Port driver** is the middle driver level, which handles aspects of the operation specific to the port type; for example, there is a port driver for SCSI.
- **Miniport driver** is the lowest driver level and device specific. This level is usually supplied by the manufacturer as a companion to a physical device.
- **Monolithic driver** level combines the functions of different driver levels in the same driver to increase performance.
- **Adjunct driver** level works along side a driver at the same level to increase performance.

In NetWare, the required drivers include:

- **Host Adapter Module (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)** is 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.

In Red Hat/SuSE Linux, the driver layers include:

- **SCSI Upper Layer** is the device management layer. It handles device-dependent tasks for devices, such as disks and tapes.
- **SCSI Middle Layer** is the SCSI traffic handling layer. It directs requests between the kernel and the SCSI.
- **SCSI Lower Layer** is the SCSI HBA driver. It communications directly to the SCSI HBA.

The structure for Solaris SPARC/x86 drivers includes:

- **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** 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 QLA2xxx HBAs, disks, tapes, network HBAs, and frame buffers.

In Macintosh, the driver layers include:

- **Upper Layer** is the device management layer. It handles device-dependent tasks for devices, such as disks and tapes.
- **Middle Layer** is the SCSI traffic handling layer. It directs requests between the kernel and the SCSI.
- **Lower Layer** is the SCSI HBA driver. It communications directly to the SCSI HBA.

fabric

Consists of cross-connected FC devices and switches.

fabric switch

Connects multiple devices from independent FC-arbitrated loops (FC-ALs) and point-to-point topologies into a fabric.

failover path

Software feature that ensures data availability and system reliability by assigning alternate path and automatic HBA failover for device resources. This feature is available only in Windows 2000/Windows Server 2003/Windows Vista, Novell NetWare, and Red Hat/SuSE Linux. (Windows XP and Windows Server 2008 do *not* support failover.)

Fast!UTIL

QLogic *Fast!UTIL* FC HBA BIOS utility.

FCode

A type of boot code. It is designed for use on Sun's SPARC or Macintosh hardware platforms. See [boot code](#) and [Flash](#).

Flash

Non-volatile memory where the boot code is saved. At times, Flash and boot code are used interchangeably. See [boot code](#).

Flash BIOS

A QLA2xxx HBA's flash PROM contains the code that allows booting from the HBA at startup.

HBA

Host bus adapter. An HBA is the board that interfaces between the host system and device. HBA is synonymous with *host adapter*, *adapter*, and *adapter board*. In SANsurfer FC HBA Manager documentation, the term *QLA2xxx HBA* is used.

HBA alias

A user-defined name for an HBA. You may use up to 256 characters when creating an HBA alias.

HBA port

A port on the HBA.

HBA port alias

A user-defined name for an HBA port. You may use up to 256 characters when creating an HBA port alias.

HBA port beacon

Flashing the HBA port beacon is a feature of SANsurfer FC HBA Manager that enables you to flash the 23xx/24xx HBA's LED to locate the HBA in your computer.

host bus adapter

See [HBA](#).

IOCB

I/O control block. An IOCB is a command structure in QLogic ISP architecture.

ioctl

Input/output (I/O) control. *ioctl* is a system call found on Unix/Linux systems, allowing an application to control or communicate with a device driver outside the usual read/write operations.

JBOD

"Just a bunch of disks."

JNLP

Java Network Launching Protocol (JNLP) is the protocol, defined in an XML file format, that specifies how Java Web Start applications are launched.

load balancing

A software feature that improves system performance by balancing device access between multiple QLA2xxx HBAs for maximum resource efficiency. This feature is available in Windows 2000/Windows Server 2003/Windows Vista, Novell NetWare, and Red Hat/SuSE Linux. (Windows XP and Windows Server 2008 do *not* support load balancing.)

loopback

A diagnostic tool where data is transmitted and received by the QLA2xxx HBA.

logical unit number

See [LUN](#).

LUN

Logical unit number. A LUN is the small integer handle that identifies a portion of disk storage. A LUN can consist of a single physical disk or many physical disks. A physical disk can be broken into multiple LUNs.

LUN masking

A software feature that assigns LUNs to specific servers or hides LUNs from specific servers for maximum access and availability control.

media

Carriers of information. FC supports several different physical media: copper, multimode optical, and single-mode optical, which differ mainly in the maximum cable length. All FC protocols are supported on all media.

NIC

Network interface controller. A computer circuit board or card that is installed in a computer so that it can be connected to a network.

nonvolatile random access memory

See [NVRAM](#).

NVRAM

Nonvolatile random access memory. HBA configuration settings are stored in NVRAM. You can configure HBA settings or restore them from a file. These settings are saved in NVRAM and are retained when power is removed.

ONC

Open network computing, a remote procedure call developed by Sun Microsystems.

open network computing

See [ONC](#).

path

A path to a device is a combination of a QLA2xxx HBA port and a target port. Note that this is distinct from any internal paths within the fabric network. A fabric network appears to the operating system as an opaque network between the HBA (initiator) and the target port.

Because a path is a combination of an HBA and a target port, a path 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 makes a difference 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

Two FC nodes directly connected (non-loop).

port

Access point in a device where a link attaches. The four types of ports include:

- **N_Port** is a FC device port that supports point-to-point topology.
- **NL_Port** is a FC device port that supports loop topology.
- **F_Port** is a port in a fabric where an N_Port can attach.
- **FL_Port** is a port in a fabric where an NL_Port can attach.

SAN

Storage area network, which consists of multiple storage units and servers connected by networking topology.

SCSI

Small computer system interface. The original SCSI specification was a hardware bus specification and a packet-oriented protocol specification for communicating on that bus. SCSI over FC uses the packet-oriented protocol to communicate with storage devices on the FC.

SPIFFI

Specification for platform-independent failover and failback integration. It is a cooperative effort that defines a non vendor-specific failover mechanism.

storage area network

See [SAN](#).

sysfs

A virtual file system provided by the 2.6 Linux kernel. Sysfs exports information about devices and drivers from the kernel device model to userspace, and is also used for configuration.

target

Devices, such as an HBA card, which mediate data in a computer network. The term *device* is used interchangeably with *target* and *target device*. See [device](#).

target binding

Refers to the process in which the HBA driver binds a target ID using a target's world wide port name (WWPN) or port ID. This enables the target ID to always connect to the WWPN or port ID across reboots regardless of SAN reconfigurations.



Notes

Index

A

About box 6-13
 access password
 changing 6-14
 default 6-14
 requirement for 6-14
 adapter, definition of [Glossary-1](#)
 adapter.properties file 9-9, 9-19, 9-20
 Add/Remove Programs dialog box 5-28, 5-34
 agent activity
 exporting (Linux or Macintosh) 9-19
 exporting (NetWare) 9-21
 exporting (Solaris) 9-20
 agent logs 9-19
 exporting (Linux or Macintosh) 9-19
 exporting (NetWare) 9-21
 exporting (Solaris) 9-20
 saving from Event Viewer (Windows) 9-19
 AL_PA, definition of [Glossary-1](#)
App Events button, reviewing host events 6-7
 Application Event Log
 options, setting 6-18
 service errors (Windows) 9-1
 Apply Properties to Shortcut dialog box 9-18
 arbitrated loop, definition of [Glossary-1](#)
 arbitrated loop_physical address, definition of [Glossary-1](#)
 asset reports, generating 7-2
 audience, intended 1-3
 autoexec.ncf file (NetWare) 3-10

B

BIOS, definition of [Glossary-1](#)
 boot code, definition of [Glossary-1](#)
 boot device, definition of [Glossary-1](#)
 Broadcast Settings dialog box 9-5
 Browse dialog box 6-2
 browser
 location, specifying for help 6-12
 supported versions 4-2
 Browser Location dialog box 6-12
 buttons
 embedded viewer toolbar 7-4
 main toolbar 6-7

C

CD-ROM based tool updates 5-25
 change options, setting 6-17
 Choose Install Folder dialog box (installation) 5-9, 5-10
 Choose Product Features dialog box (installation) 5-7
 Choose Product Features dialog box (uninstall options) 5-31
 CLI installation 5-18
 closing SANsurfer FC HBA Manager 6-11
 cluster system configuration 3-4, 3-5
Collect button, saving files 6-8
 “Command Prompt” Properties dialog box (Windows) 9-18
 configuration change option, setting 6-17
 configuration parameters. *See* driver parameters

- configurations
 - cluster system configuration 3-4
 - disk 3-10
 - examples of 3-1
 - networked 5-2
 - policies, setting 6-22
 - RAID and LUN masking 3-5
 - refreshing 6-30
 - SAN or cluster 3-4
 - simple failover 3-3
 - single-ported system configuration (non-failover) 3-2
 - stand-alone 5-2
 - system 3-1
 - Configure** button, configuring FC HBAs 6-7
 - Connect** button, attaching to host or IP address 6-7
 - connecting to hosts automatically
 - Linux, Solaris, or Macintosh 6-4
 - Windows 6-4
 - contact information 1-5
 - CRC (cyclic redundancy check), definition of [Glossary-1](#)
 - Create Desktop Icon Selection dialog box (installation) 5-12
 - CSV file, definition of [Glossary-1](#)
 - Current Path dialog box 9-10
- D**
- DDMI (Digital Diagnostics Monitoring Interface) 8-7
 - debugging user interface activity 9-14
 - Default Failover Enable/Disable dialog box (installation) 5-15
 - default password, location of 6-14
 - definitions of terms [Glossary-1](#)
 - Details** page (Transceiver Details, Diagnostics) 8-9
 - device
 - definition of [Glossary-1](#)
 - icons 6-10, 6-11
 - sharing policy 6-22
 - diagnostics 8-1
 - HBA port to test, finding 8-2
 - loopback connector, installing 8-4
 - loopback test
 - preparing for 8-3
 - running 8-5
 - normal HBA operations, preparing for 8-4
 - preparing for 8-2
 - read/write buffer test
 - preparing for 8-4
 - running 8-6
 - tests, running 8-1
 - transceiver details
 - Details page 8-9
 - General page 8-7
 - viewing for HBA port 8-7
 - Diags** button, running HBA diagnostic tests 6-8
 - Digital Diagnostics Monitoring Interface (DDMI) 8-7
 - disk
 - configuration 3-10
 - icons 6-11
 - space requirements 4-2
 - documents, related 1-3
 - downloading updates from Web 5-21
 - Driver File Details dialog box 9-11
 - driver parameters
 - Linux 3-11
 - Macintosh 3-11
 - NetWare 3-11
 - drivers
 - definition of [Glossary-1](#)
 - enhanced driver installation 3-8
 - HBA settings, specifying 6-27
 - inbox (NetWare) 3-11
 - IP communications driver, installing 3-11
 - QLdirect 9-9
 - RAID filter driver installation 3-9
 - required 4-2
 - types of, defined [Glossary-1](#)

E

- EFI-UTIL utility 3-8
- e-mail
 - contacting QLogic 1-5
 - notifications, setting up automatic 6-21
- Email Settings dialog box 6-21, 6-22
- embedded viewer toolbar 7-4
- enhanced driver installation 3-8
- event IDs, searching knowledge base for 9-2
- event logging, HBA events 6-19
- Event Viewer, saving tool log 9-19
- eventlog.txt file 9-2
- examples of system configurations 3-1
- exiting SANsurfer FC HBA Manager 6-11
- exporting
 - agent activity (Linux) 9-19
 - agent activity (Macintosh) 9-19
 - agent activity (NetWare) 9-21
 - agent activity (Solaris) 9-20
 - HBA event logs automatically 6-20
 - qlremote.log file (NetWare) 9-21
- extended Application Event Logging 9-2, 9-3

F

- fabric switch, definition of Glossary-2
- fabric, definition of Glossary-2
- failover
 - driver 3-10
 - Macintosh (not supported) 3-10
- Failover API, Macintosh 3-11
- failover path, definition of Glossary-2
- FAQs A-1
- Fast!*UTIL
 - definition of Glossary-3
 - FC HBA BIOS utility 3-8
- FCode
 - definition of Glossary-3
 - utility 3-8
- features of SANsurfer FC HBA Manager 2-2
 - asset management 2-2
 - configuration management 2-2

- diagnostics 2-3
- event notifications 2-3
- statistics 2-3
- update management 2-2
- Fibre Channel Configuration dialog box 9-8
- Fibre Channel Port Configuration dialog box 6-7
- File Download dialog box 5-3, 5-4
- Flash BIOS, definition of Glossary-3
- FlashUTIL!, reflashing HBA parameters 9-9
- formats for reports 7-2
- frequently asked questions A-1

G

- General** page (Transceiver Details, Diagnostics) 8-7
- Generate Reports dialog box 7-2, 7-3
- generated reports, saving 7-2
- generating reports 7-2
- getting started 6-1
- glossary of terms Glossary-1
- graphics adapter, requirements 4-2

H

- .hst file (host group) 1-3, 6-4, 6-5
- hardware required for SANsurfer FC HBA Manager 3-6, 4-1
- HBA alias, definition of Glossary-3
- HBA Diagnostics dialog box 6-8
- HBA Event Log, configuration change events 6-17
- HBA Events** button 6-8
- HBA port, definition of Glossary-3
- HBA port alias, definition of Glossary-3
- HBA port beacon, definition of Glossary-3
- HBA Statistics dialog box 6-8
- HBA Support Matrix (Fibre Channel) 2-2
- HBA tree
 - HBA icons and text 6-9
 - host icons and text 6-8
 - viewing 6-6

HBA 6-9
definition of [Glossary-3](#)
driver settings, specifying 6-27
event log, setting 6-19
event notifications, setting 6-21
icons 6-9, 6-10
port icons 6-10
port transceiver details, viewing 8-7
supported versions 4-3

help system
browser, specifying location 6-12
viewing 6-12

hiding the toolbar 6-8

host
configuration, refreshing 6-30
connecting to automatically 6-4
events, viewing 6-7
icons, meaning of 6-9
status 6-9
status, viewing (**Topology** page) 6-5

host bus adapter. See HBA

host group file (.hst) 1-3, 6-4, 6-5

I

I/O control block, definition of [Glossary-3](#)

icons 6-9
device 6-10, 6-11
disk 6-11
HBA 6-9
LUN 6-11
SAFTE device 6-11
tape 6-11

Important Information dialog box
(installation) 5-6

inbox driver (NetWare) 3-11

input/output control (ioctl), definition
of [Glossary-3](#)

Install Complete dialog box (installation) 5-17

installation 5-1
checklist 3-6
CLI 5-18
configure disks 3-10

install enhanced driver 3-8
install hardware 3-8
install IP communications driver 3-11
install RAID filter drivers 3-9
install SANsurfer FC HBA manager 3-10
instructions 5-3
required hardware 3-6
required software 3-7

Installing SANsurfer dialog box
(installation) 5-13

installing updates from update package 5-25

intended audience 1-3

Introduction dialog box (installation) 5-5

introduction to SANsurfer FC HBA
Manager 1-1

IOCB, definition of [Glossary-3](#)

IOCTL module 3-11

ioctl, definition of [Glossary-3](#)

IP communications driver installation 3-11

J

Java Web Start, updating SANsurfer FC HBA
Manager 2-2

JBOD, definition of [Glossary-3](#)

JNLP (Java Network Launching Protocol),
definition of [Glossary-3](#)

K

keyboard shortcuts B-1

knowledge base, searching 9-2

L

Launch SANsurfer Application dialog box
(installation) 5-16

license agreements 1-3

Linux driver parameters 3-11

load balancing, definition of [Glossary-3](#)

local.properties file 9-14

logical unit number, definition of [Glossary-4](#)

loopback
connector, installing 8-4
definition of [Glossary-3](#)
test, running 8-5
LUN masking, definition of [Glossary-4](#)
LUNs
definition of [Glossary-4](#)
icons and text 6-11
sharing policy, setting 6-22

M

Macintosh
connecting to hosts automatically 6-4
driver layers [Glossary-2](#)
driver parameters 3-11
starting SANsurfer FC HBA Manager on 6-3
main window 6-5
media, definition of [Glossary-4](#)
memory requirement 4-2
messages file
Linux 9-2
Solaris SPARC/x86 9-3
miniport driver, error logging 9-2
modules.conf file 3-11

N

NetWare driver parameters 3-11
network interface controller, definition
of [Glossary-4](#)
networked configuration 5-2
NIC, definition of [Glossary-4](#)
nonvolatile random access memory, definition
of [Glossary-4](#)
Novell NetWare Disk Selection dialog box
(installation) 5-14, 5-15
NVRAM, definition of [Glossary-4](#)

O

offline host icon 6-9
ONC, definition of [Glossary-4](#)
online host icon 6-9
Open dialog box 5-25, 5-26
open network computing, definition
of [Glossary-4](#)
operating systems
requirements 4-2
service packs and updates 4-3
Options dialog box
application event log, setting 6-18
configuration changes 6-17
configuration changes, setting 6-17
HBA event log, setting 6-20
warning displays, enabling 6-16
OS service packs (SP) and updates 4-3
overview
SANsurfer FC HBA Manager 2-1
system 3-1

P

password
default 6-14
requirement for, setting 6-14
path, definition of [Glossary-4](#)
phone numbers, contacting QLogic 1-5
pid (process identifier), qlremote 9-20
point-to-point, definition of [Glossary-4](#)
policies, configuration 6-22
Policy Settings dialog box 6-22
port icons, HBA 6-10
port, definition of [Glossary-4](#)
Pre-Installation Summary dialog box
(installation) 5-13
process identifier (pid), qlremote 9-20
product
information, viewing 6-13

Q

QL2x00.cfg file 3-11
 QLdirect 3-8
 and Storport driver 3-8
 driver, troubleshooting 9-9
 QLogic
 contacting 1-5
 technical support 1-4
 technical support hours 1-4
 QLogic Fast/UTIL FC HBA BIOS utility 3-8
 QLogic SAN Interoperability Guide 4-1
 QLogicHBA23xx.conf file (Macintosh) 3-11
 QLogicHBA23xxConfig file
 (Macintosh) 3-11
 qlremote agent
 defined 9-1
 restarting 9-19
 stopping 9-20
 stopping (Linux) 9-19
 stopping (Macintosh) 9-19
 stopping (Solaris) 9-20
 troubleshooting 9-5 to 9-10
 QLxxx HBAs supported by SANsurfer FC
 HBA Manager 4-3
 questions and answers A-1

R

RAID configuration 3-5
 RAID filter driver installation 3-9
 RAM requirement 4-2
 read/write buffer test 8-6
 Red Hat Enterprise Linux
 connecting to hosts automatically 6-4
 starting SANsurfer FC HBA Manager on 6-3
 Red Hat/SuSE Linux, driver layers Glossary-2
Refresh button, updating host and HBAs 6-8
 refreshing the host configuration 6-30
 related documents 1-3
 remote procedure calls (RPCs) 3-10

reports 7-1
 formats 7-2
 generating 7-2
 options 7-1
 viewing 7-4
 requirements
 hardware 4-1
 software 4-2
 system 4-1
 RPC service (ONC/RPC portmapper) 3-10

S

SAFTE device icons 6-11
 SAN system configuration 3-4
 SAN, definition of Glossary-4
 SANsurfer FC HBA Manager
 exiting 6-11
 features 2-2
 installing 3-10, 5-3
 product information, viewing 6-13
 starting 6-1
 uninstalling 5-28
 SANsurfer.EXE 6-2
 SANsurfer.lax file, editing 9-15
 saving
 browser location 6-12
 files (**Collect** button) 6-8
 local properties to file 9-15
 product download 5-3
 reports, generated 7-2
 tool log from Event Viewer 9-19
 SCSI, definition of Glossary-5
Security page, setting access password 6-14
 security, setting 6-14
 Select Shortcut Profile dialog box
 (installation) 5-11
 Select Update dialog box 5-22, 5-25, 5-26
 Server Proxy Settings dialog box 5-22
Settings page, HBA driver settings 6-27
 Shared Components dialog box 6-26
 Shared Device Found dialog box 6-24, 6-26
 sharing devices and LUNs, policies for 6-22

- shortcut keys [B-1](#)
- simple failover system configuration [3-3](#)
- software required for SANsurfer FC HBA Manager [3-7](#), [4-2](#)
- Solaris SPARC
 - connecting to hosts automatically [6-4](#)
 - messages file [9-3](#)
 - starting SANsurfer FC HBA Manager on [6-3](#)
- Solaris SPARC/x86 driver
 - structure [Glossary-2](#)
- Solaris x86/AMD64
 - connecting to hosts automatically [6-4](#)
 - messages file [9-3](#)
 - starting SANsurfer FC HBA Manager on [6-3](#)
- SSID/SSVID missing [9-9](#)
- stand-alone configuration [5-2](#)
- starting SANsurfer FC HBA Manager [6-1](#)
- startup procedures [6-1](#)
 - Linux [6-3](#)
 - Macintosh [6-3](#)
 - Solaris [6-3](#)
 - Windows [6-2](#)
- Stats** button, viewing HBA statistics [6-8](#)
- status of hosts, viewing [6-5](#)
- storage area network, definition of [Glossary-4](#)
- Storport driver, limitations of [3-8](#)
- Subsystem Identification/Subsystem Vendor Identification (SSID/SSVID), missing [9-9](#)
- support. See technical support
- sysfs, definition of [Glossary-5](#)
- sysfs/IOCTL module [3-11](#)
- system configurations [3-1](#)
 - RAID and LUN masking [3-5](#)
 - SAN or cluster [3-4](#)
 - simple failover [3-3](#)
 - single-ported (non-failover) [3-2](#)
- system requirements [4-1](#)
- targets
 - binding options [6-30](#)
 - definition of [Glossary-5](#)
 - display options [6-29](#)
- technical support [1-4](#)
 - availability [1-4](#)
 - contacting QLogic [1-5](#)
 - knowledge base, searching [9-2](#)
 - training [1-4](#)
 - user forums, searching [9-2](#)
- telephone numbers, contacting QLogic [1-5](#)
- terms, definitions of [Glossary-1](#)
- tests
 - loopback [8-5](#)
 - read/write buffer [8-6](#)
 - running [8-1](#)
- tirpc.nlm file (NetWare) [3-10](#)
- tool event log
 - saving from Event Viewer (Windows) [9-19](#)
- toolbar
 - buttons described [6-7](#)
 - embedded viewer [7-4](#)
 - hiding from view [6-8](#)
- Topology** page, viewing host status [6-5](#)
- tracing tool activity [9-14](#)
- traffic signal, viewing host status [6-5](#)
- training, certification [1-4](#)
- transceiver details [8-7](#)
 - diagnostics [8-7](#), [8-9](#)
- troubleshooting tools [9-1](#)
 - agent logs [9-19](#)
 - agent logs, exporting or saving [9-19](#)
 - debugging user interface activity [9-14](#)
 - Linux messages file [9-2](#)
 - problems and solutions [9-3](#)
 - Solaris SPARC messages file [9-3](#)
 - Windows event log [9-1](#)

T

- tape icons [6-11](#)
- target binding, definition of [Glossary-5](#)

U

- Uninstall Complete dialog box [5-33](#)
- uninstall instructions [5-28](#)
- Uninstall Options dialog box [5-30](#)

Uninstall SANsurfer dialog box 5-30, 5-33
Update dialog box 5-22 to 5-27
Update Flash utility 9-9
updating SANsurfer FC HBA Manager 5-21
updating tool by Web 5-21
updating tool package update 5-25
user forums, searching 9-2

V

video card, requirements 4-2
viewing
 HBA tree 6-6
 help system 6-12
 main window (elements of) 6-5
 toolbar 6-8
 warning messages 6-16

W

warning display option, enabling 6-16
Web browser
 specifying for help 6-12
 supported versions 4-2
web_supported_update_fc_hba.txt
 file 5-26
Web-based tool updates 5-21
what's in this guide 1-1
window, viewing main 6-5
Windows
 connecting to hosts automatically 6-4
 driver level structure Glossary-1
 event log 9-1
 starting SANsurfer FC HBA Manager on 6-2