



SANsurfer FC HBA Manager User's Guide

Management Tool for
QLogic FC and FCoE Adapters

SN0054651-00 F

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Preface

The *SANsurfer FC HBA Manager User's Guide* describes the SANsurfer FC HBA Manager tool, used to configure and manage QLogic SANsurfer Fibre Channel (FC) host bus adapters (HBAs) and Fibre Channel over Ethernet (FCoE) converged network adapters (CNAs) within 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 graphical user interface (GUI)-based SANsurfer FC HBA Manager management tool.

NOTE:

For detailed information about the features and functionality not covered in this guide, refer to the help system (see [“Getting Help” on page 5-12](#)).

This preface 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 1 SANsurfer FC HBA Manager Overview](#) describes the features of SANsurfer FC HBA Manager.
- [Section 2 System Overview](#) outlines the hardware and software installation of devices controlled by SANsurfer FC HBA Manager.
- [Section 3 System Requirements](#) lists the hardware and software requirements needed for optimum SANsurfer FC HBA Manager performance.
- [Section 4 Installing SANsurfer FC HBA Manager](#) describes how to install and uninstall SANsurfer FC HBA Manager.

- [Section 5 Getting Started](#) describes how to customize the 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 6 Performing Diagnostics](#) provides details for setting up, running, and interpreting loopback and read/write buffer tests, as well as viewing adapter port SFF-DMI information.
- [Section 7 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.

Intended Audience

This guide is for system administrators who are responsible for installing, configuring, and managing QLogic adapters using the SANsurfer FC HBA Manager.

Related Materials

For additional help installing or using the SANsurfer FC HBA Manager, refer to the following related documents:

- *QLogic 2Gb–8Gb FC HBA Quick Start Guide, part number FC0054505-00*
- `readme.txt` – SANsurfer notes included with SANsurfer FC HBA Manager
- *SANsurfer FC HBA Manager Release Notes* – Details about the modifications since the previous version. There are separate release notes based on the operating system
- *QLE8042, QLE8042-SR Converged Network Adapter Installation Quick Start Guide, part number FE0154501-00*

Documentation Conventions

This guide uses the following documentation conventions:

- **NOTE:** provides additional information.
- ***CAUTION!*** indicates the presence of a hazard that has the potential of causing damage to data or equipment.
- ***WARNING!!*** indicates the presence of a hazard that has the potential of causing personal injury.
- 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 user interface and remote agent.
 - ❑ See **“Installation Checklist”** on page 3-6.
 - ❑ For more information, visit **www.qlogic.com**.
- Text in **bold** font indicates 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 *Courier* font indicates a file name, directory path, 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.
 - ❑ Enter the following command: `sh ./install.bin`
- Key names and key strokes are indicated with UPPERCASE:
 - ❑ Press CTRL+P.
 - ❑ Press the UP ARROW key.

- Text in *italics* indicates terms, emphasis, variables, or document titles. For example:
 - For a complete listing of license agreements, refer to the *QLogic Software End User License Agreement*.
 - What are *shortcut keys*?
 - QLA2xxx (where xxx is 440, 460, 462).
- Topic titles between quotation marks identify related topics either within this manual or in the online help, which is also referred to as *the help system* throughout this document.

License Agreements

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

Technical Support

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

Visit the QLogic support Web site listed in [Contact Information](#) for the latest firmware and software updates.

Availability

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

Training

QLogic offers training for technical professionals for all iSCSI, InfiniBand, and Fibre Channel products. From the main QLogic web page at www.qlogic.com, click the **Education and Resources** tab at the top, then click the **Education & Training** tab on the left. The QLogic Global Training Portal offers online courses, certification exams, and scheduling of in-person training.

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 training@qlogic.com.

Contact Information

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

Web <http://support.qlogic.com>

Email support@qlogic.com

The QLogic knowledge database contains troubleshooting information for the QLogic adapters. Access the data base from the QLogic Support Web page, <http://support.qlogic.com>. Use the Support Center search engine to look for specific troubleshooting information.

Notes

1 SANsurfer FC HBA Manager Overview

QLogic SANsurfer FC HBA Manager is a collection of device drivers and GUI-based device management tools for configuring and managing QLogic Fibre Channel (FC) and Fibre Channel over Ethernet (FCoE) adapters.

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.

Environments

SANsurfer FC HBA Manager is a client/server tool supported on multiple operating systems.

- 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, Novell SUSE[®] Linux Enterprise Server (SLES)
 - ❑ Solaris[®] SPARC[®], Solaris x86
 - ❑ Novell[®] NetWare[®]
 - ❑ Mac OS[®] X
 - ❑ VMware[®] ESX

NOTE:

For specific OS service packs (SP) and updates, refer to the descriptions where this software version is posted on the QLogic website http://support.qlogic.com/support/drivers_software.aspx.

- SANsurfer FC HBA Manager is a client/server tool. The networking capability of the tool allows for centralized management and configuration of QLogic Fibre Channel adapters and converged network adapters within the entire SAN. For scripting capabilities, use the SANsurfer Command Line Interface (CLI) tool.

Features

SANsurfer FC HBA Manager provides the following features:

- **Automatic 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.
- **Adapter asset and inventory 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 adapters 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 Fibre Channel adapters and converged network adapters.
 - Configure FC target 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).
 - Configure LUN path failover.

- ❑ Persistently bind targets—The adapter driver binds a target ID using a target's world wide port name (WWPN) or port ID, enabling the target ID to always connect to the WWPN or port ID across reboots regardless of SAN reconfigurations
- ❑ Update the adapter parameters, Flash, and adapter driver.

NOTE:

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

- **Statistics.** SANsurfer FC HBA Manager provides statistics for each host and adapter port. These statistics can be collected automatically or on request. You can reset statistics at any time. In addition, you can export the statistics to a comma separated values (CSV) file, which can be imported into other applications, for example, Microsoft® Excel.
- **Adapter diagnostics.** SANsurfer FC HBA Manager provides end-to-end diagnostics that enable you to test the adapters 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 adapter and its attached devices.
 - ❑ Perform a loopback test, which is external to the adapter, to evaluate the ports (transmit and receive transceivers) on the adapter and the error rate.
 - ❑ Perform a read/write buffer test, which tests the link between the adapter and its attached devices.
 - ❑ Run diagnostics on small form factor pluggable (SFP) transceivers per *SFF-8472 Specification for Diagnostic Monitoring Interface for Optical Xcvrs*, Revision 9.3 August 1, 2002.
 - ❑ View transceiver details.
- **Application event and adapter event notifications.** SANsurfer FC HBA Manager provides asynchronous notification of various conditions and problems through alarms and events. Alarm information includes severity, time, host, adapter, application, and description. Event information includes severity, time, and message. In addition, you can export the alarm and event information to a CSV file, which can be imported into other applications, such as Microsoft Excel. Alarm information can be sent automatically by email to a distribution list.

- **Wizards.** SANsurfer FC HBA Manager provides several easy-to-use configuration wizards. Each wizard provides a set of dialog boxes that walk you through the steps required to configure and update Fibre Channel devices.

Advanced Features

SANsurfer FC HBA Manager adds the following advanced features to its toolset:

- **N_Port ID Virtualization (NPIV).** NPIV (N_Port ID Virtualization) allows you to make the most of your server and Fibre Channel fabric. For instance, you can partition your server to support multiple operating systems at the same time, maximizing server utilization. By creating virtual ports from a single physical adapter port, you allow multiple initiators. SANsurfer FC HBA Manager facilitates creating multiple virtual ports from a single physical adapter port. It also lets you view virtual port statistics in real time.

NOTE:

NPIV is available for Windows operating systems and 4Gb and greater adapters only.

- **Quality of Service (QoS).** QoS refers to Service Level Agreement (SLA) to ensure business continuity when transmitting data over virtual ports by setting priorities and allocating bandwidth. The SANsurfer FC HBA Manager provides an easy-to-use interface that lets you assign QoS to virtual ports by setting priorities or allocating bandwidth to them.
 - Setting the QoS by *bandwidth* lets you allocate up to 80% of the number of gigabytes per second (Gbps) transmission speed of the physical port's capacity to its defined virtual ports (NPIV). Using this feature lets you guarantee a transmission rate for each port that requires a particular bandwidth to run mission-critical applications for business continuity using virtual ports. The setting for a given QoS can resolve bottlenecks that exist when Virtual Machines contend for port bandwidth.
 - Setting the QoS by *priority* lets you set the priority level for the physical port, as well as its defined virtual ports. This enables to you give preference to data transmissions for one virtual port over others by giving it a higher priority than the others. You can set the priority level on any port, regardless of the settings applied to other ports.

2 System Overview

SANsurfer FC HBA Manager is a collection of device drivers and management tools for configuring and managing QLogic FC and FCoE adapters in a SAN.

This section provides the following information:

- [“Configurations” on page 2-1](#) shows examples of several different configurations.
- [“Installation Checklist” on page 2-6](#) contains a checklist to help you properly install all hardware and software in the correct order.
- [“Non-Windows Configuration Parameters” on page 2-12](#) 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 adapters.

Configurations

This section illustrates and describes the following system configurations:

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

Single-Ported (Non-failover) Configuration

Figure 2-1 shows a simple single-ported (non-failover) configuration consisting of one host (X), two adapters (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 adapter 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.

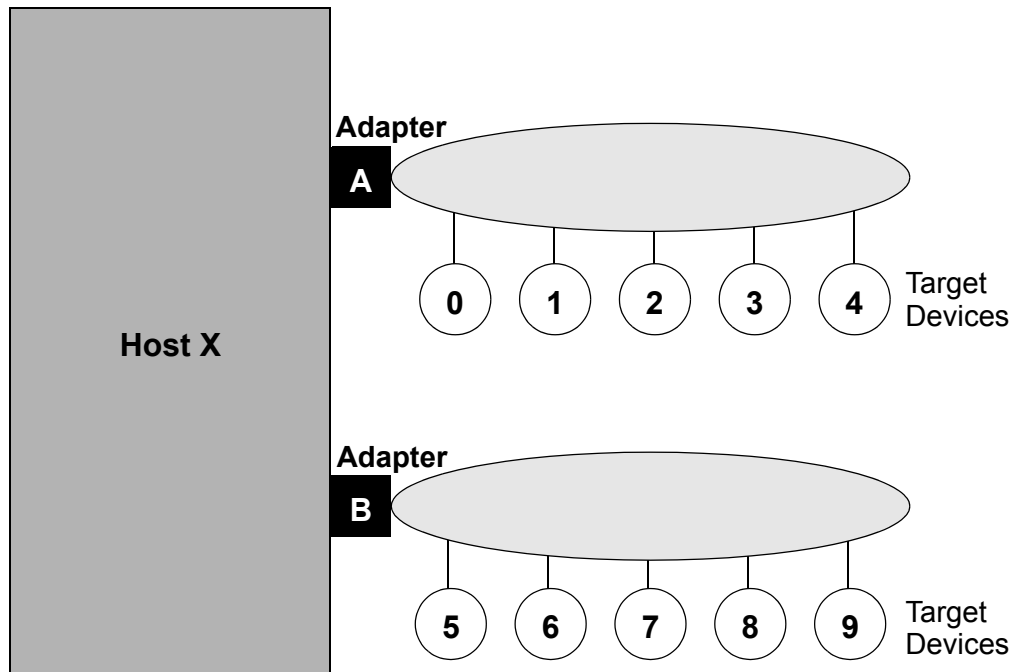


Figure 2-1 Single-Ported (Non-failover) Configuration

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 adapters are connected to which target devices. This is not a failover configuration; each target device is accessible through only one adapter.

Simple Failover Configuration

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

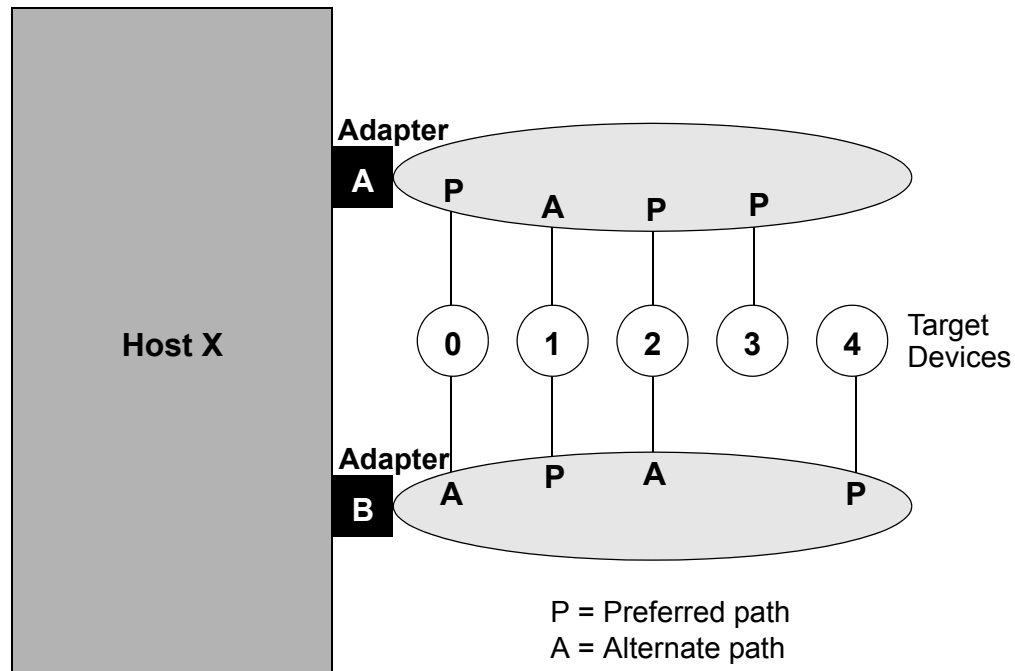


Figure 2-2 Simple Failover Configuration

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 2-3 shows a simple storage area network (SAN) configuration consisting of two hosts (**X** and **Y**). Each host has an adapter that connects to a common set of five target devices (**0–4**).

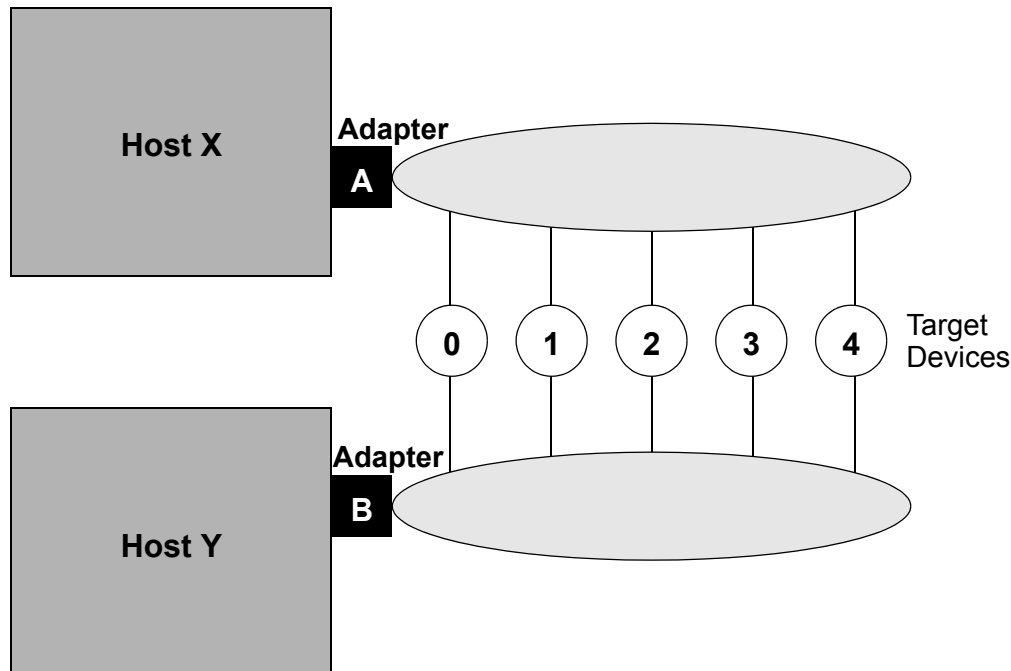


Figure 2-3 SAN or Cluster Configuration

If Figure 2-3 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 2-3 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 2-4 illustrates the interaction of an adapter 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.

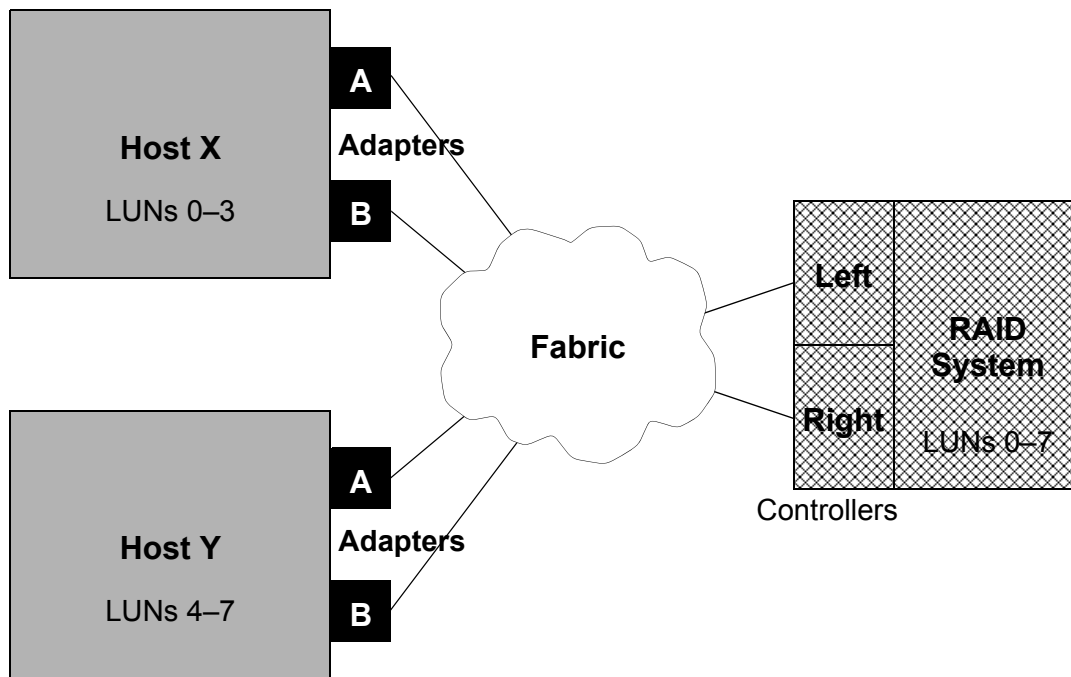


Figure 2-4 RAID Configuration and LUN Masking

Figure 2-4 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 adapters 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 the SANsurfer FC HBA Manager Agent 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 adapters. In SANsurfer FC HBA Manager, each target device is configured with one adapter as its preferred path and (optionally) one adapter 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, adapter 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 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 3-1). In all cases, some combination of the following is required:

- QLogic Fibre Channel adapters and converged network adapters.
- 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 3-2). [Table 2-1](#) lists QLogic software products required for the features you want to enable.

Table 2-1. Available Driver Features by Operating System

Function	Windows		Linux		Solaris		Mac	VMware	Windows, Linux, Solaris, NetWare, Mac, VMware
	Miniport	Storport	Enhanced Driver	Inbox Driver	Enhanced Driver	Inbox Driver	Enhanced Driver	Enhanced Driver	SANsurfer FC HBA Manager
Basic operation	X	X	X	X	X	X	X	X	
Fabric support	X	X	X	X	X	X	X	X	
Optimized operation (QLdirect-type filter driver)	X				X			X	X
Alternate path	X		X		X			X	X
Device selection and masking	X	X	X		X	X	X	X	X
Static load balancing	X		X		X			X	X

Table 2-1. Available Driver Features by Operating System (Continued)

Function	Windows		Linux		Solaris		Mac	VMware	Windows, Linux, Solaris, NetWare, Mac, VMware
	Miniport	Storport	Enhanced Driver	Inbox Driver	Enhanced Driver	Inbox Driver	Enhanced Driver	Enhanced Driver	SANsurfer FC HBA Manager
Device replacement (without rebooting)	X	X	X	X					X
Secure device access									X
Heterogeneous support (manages multiple host types: Windows, Linux, Solaris, Mac)									X
IP support	X					X			
Device SAN management		X							X

NOTE:

The SANsurfer FC HBA Manager has the following features disabled:

- Load balancing
- Failover watcher (current path)

Step 2: Install the Hardware

Refer to hardware installation guides to install adapters in host systems (see “[Related Documents](#)” on [page 1-4](#)). 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 adapters at power-up using the QLogic *Fast!UTIL* FC adapter BIOS utility. To access *Fast!UTIL*, press **ALT+Q** or **CTRL+Q** during power-up. *Fast!UTIL* allows you to perform basic adapter 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 adapters at power-up using `EFI-UTIL`.

Verification: On Solaris SPARC/Linux PPC-64 systems, before installing the device driver, verify the presence of adapters at power-up using FCode utility.

Step 3: Install the Enhanced Driver

Refer to the appropriate software installation guide (see “[Related Documents](#)” on [page 1-4](#)) 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 the 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 use failover.

CAUTION!

At this stage, a dual-port 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 adapters recognize target devices by using operating system device configuration utilities, or use the SANsurfer FC HBA Manager to display target devices found on an adapter.

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, or save this disk configuration.

- In Windows, use the computer management utility to view which target devices are configured on which adapters, 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 adapters. 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 adapters. Entries are also created for each adapter 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 adapters.

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 adapters 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 SANsurfer FC HBA Manager](#).

Step 5: Install and Run SANsurfer FC HBA Manager

SANsurfer FC HBA Manager is a management tool used to view, manage, and diagnose QLogic adapters. SANsurfer FC HBA Manager also configures adapters, target devices on the adapters, 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 4-1](#) 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 adapters. If you are using SANsurfer FC HBA Manager on a host system where adapters 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

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.

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.

Notes

3 System Requirements

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

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

Hardware Requirements

The minimum hardware requirements are as follows:

- QLogic QLx2xxx PCI to Fibre Channel adapters or QLE8042 converged network adapters (see “Supported QLogic Adapters” on page 3-4).
- Single-processor or multiprocessor server or workstation:
 - Pentium[®] III with 1GHz 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 the SANsurfer FC HBA Manager; 512 MB is recommended. Running with less memory can cause disk swapping, which severely affects 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 the 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, use the most current released version of one of the following Web browsers: Internet Explorer®, Netscape® Communicator, or Mozilla® Firefox®.
- One of the following operating systems:
 - Windows:
 - Windows 2000, 32-bit, Intel x86 Intel 64, AMD64
 - Windows Server 2003, 32-bit Intel x86, Intel 64, AMD64
 - Windows Server 2008, 32-bit Intel x86, Intel 64, AMD64
 - Windows XP Professional, 32-bit Intel x86, Intel 64, AMD64
 - Windows XP Professional, x64-bit Intel 64, AMD64
 - Windows Vista, 32-bit Intel x86
 - Windows Vista x64
 - Solaris:

- Solaris 9, 10 x86 32-bit, 64-bit Intel x86, Intel 64, AMD64
- Solaris 2.6, 7, 8, 9, and 10 SPARC 32-bit, 64-bit SPARC
- NetWare:
 - Netware 6.5 32-bit Intel x86, Intel 64, AMD64
- Apple Macintosh:
 - Mac OS X (Tiger/Leopard), 32-bit, 64-bit PowerPC/Intel
- Linux:
 - Red Hat RHEL AS/ES 5.0 32-bit, 64-bit Intel IA64, Intel 64, AMD64
 - Red Hat RHEL AS/ES 4.5 32-bit, 64-bit Intel IA64, Intel 64, AMD64
 - Red Hat RHEL AS/ES 4.0 32-bit, 64-bit Intel IA64, Intel 64, AMD64
 - Red Hat RHEL AS/ES 3.0 32-bit, 64-bit Intel x86, Intel 64, AMD64
 - Novell SLES 10 32-bit, 64-bit Intel IA64, Intel 64, AMD64
 - Novell SLES 9 32-bit, 64-bit Intel IA64, Intel 64, AMD64
 - Novell SLES 8 32-bit, 64-bit Intel x86, AMD64
- VMware ESX:
 - ESX 3.5 32-bit, Intel 64, AMD64

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 Adapters

The following supported QLogic adapters are collectively referred to as the QLA2xxx adapters throughout this guide (unless otherwise noted).

QEM2462	QLA2344	QLE2362	QLE2562
QLA200	QLA2344-P	QLE2440	QLE2564
QLA210	QLA2440	QLE2460	QLE8042
QLA2310	QLA2460	QLE2462	QSB2340
QLA2310F	QLA2462	QLE2464	QLE2562
QLA2340	QLE220	QLE2540	
QLA2342	QLE2360	QLE2560	

4 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 1-4](#), as applicable.

This section provides the following information:

- [“Initial Installation” on page 4-1](#)
- [“Web- and CD-Based Installation Updates” on page 4-20](#)
- [“Uninstalling SANsurfer” on page 4-26](#)

Initial Installation

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

- 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 a previous version, 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 4-1](#). Install the management tools appropriate for your configuration.

Table 4-1. 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 adapters.	SANsurfer FC HBA Manager user interface
This Red Hat/SUSE Linux (IA64, x64) or Solaris SPARC/x86 or Macintosh system locally monitors QLA2xxx adapters.	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 adapters 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 adapters only on remote systems on the same network.	SANsurfer FC HBA Manager user interface
The QLA2xxx adapters 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. Download the application from the QLogic Web site:
 - a. On the QLogic home page (<http://www.qlogic.com>), click the **Downloads** tab.
 - b. In the selection box (Figure 4-1), click **Fibre Channel HBAs** in the left column, your adapter model number in the middle column, and your operating system in the right column.

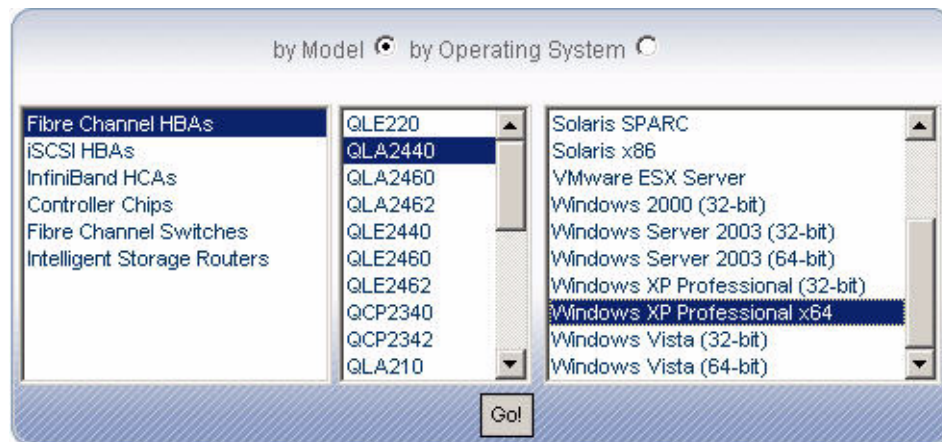


Figure 4-1 SANsurfer Download Selections (Example)

- 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. Unzip the package if necessary.
 - d. Type the following command at a command prompt, then press **ENTER**:

```
sh ./standalone_sansurfer5.x.xbxx_linux_install.bin
```

The InstallAnywhere® window prepares to install SANsurfer and opens the installation Introduction dialog box (Figure 4-2).

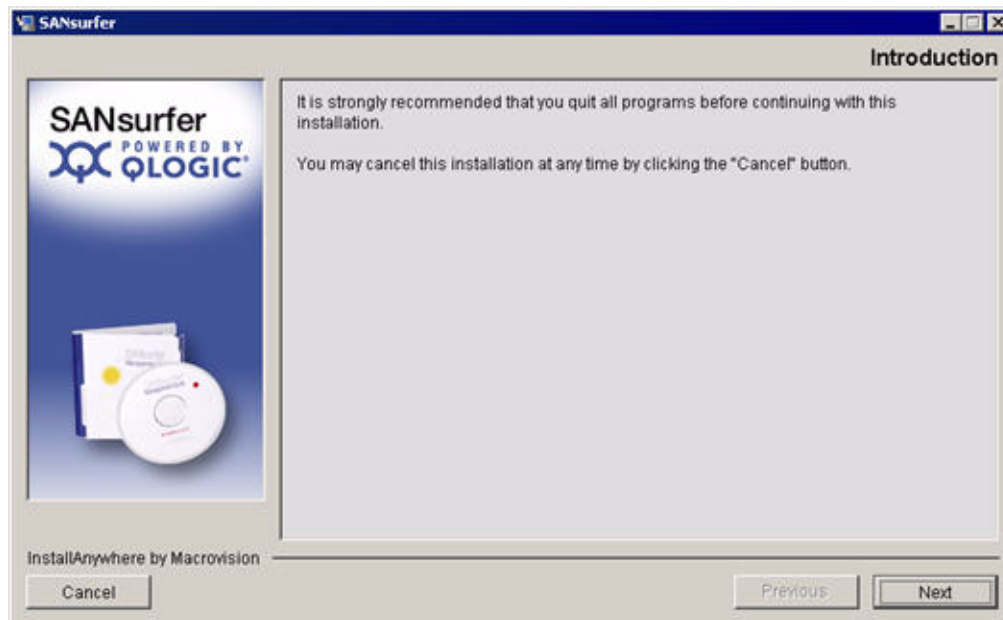


Figure 4-2 Install SANsurfer: Introduction

3. Click **Next**.

The Important Information dialog box opens (Figure 4-3).

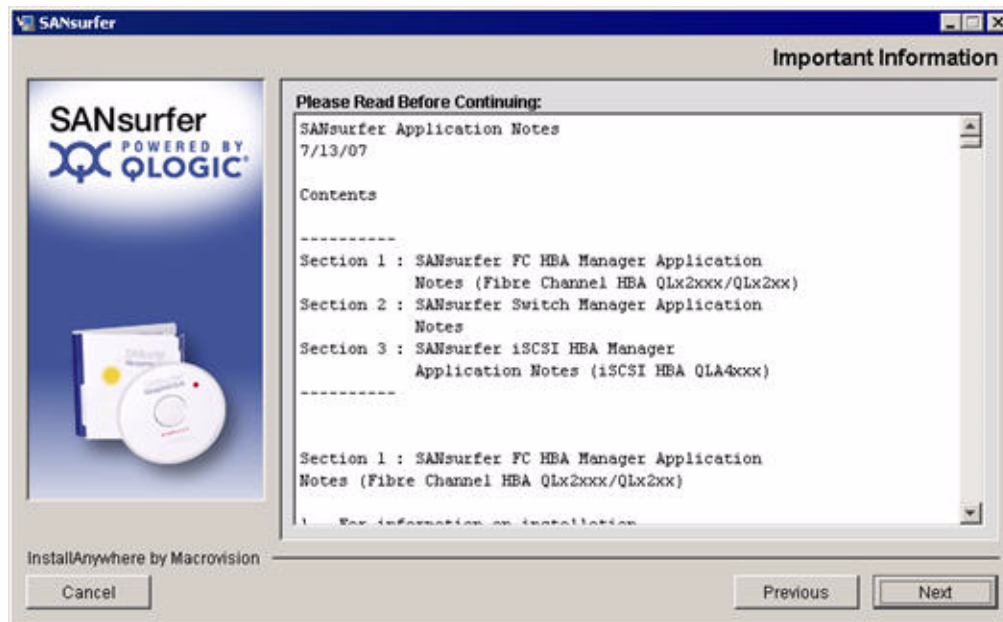


Figure 4-3 Install SANsurfer: Important Information

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 Corporation
- On Red Hat/SUSE Linux and Solaris SPARC/x86:
opt/QLogic_Corporation/SANsurfer

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

NOTE:

Except for the OS-specific agents, the feature options are the same for all operating systems: Windows, Red Hat/SUSE Linux, Solaris SPARC/x86, and Macintosh.



Figure 4-4 Install SANsurfer: Choose Product Features

SANsurfer FC HBA Manager supports both stand-alone and network configurations (see “Installation Options” on page 4-2).

5. Select one of the following installation sets, and then click **Next**.
 - For a Windows system:
 - FC HBA GUI and Agent** includes the SANsurfer FC HBA Manager and the FC Windows agent.
 - 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.
 - SANsurfer Windows Agent** includes the SANsurfer FC HBA Manager Windows 2000/2003/XP/Vista Agent.
 - SANsurfer FC HBA Manager** includes the SANsurfer FC HBA Manager user interface only.

- 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 4-5](#)):
 - FC HBA GUI and Agent** includes the SANsurfer FC HBA Manager user interface and the FC Power Mac OS X agent.
 - SANsurfer FC Mac OS X 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 4-5 Macintosh Installation: Choose Product Features

The Choose Install Folder dialog box opens (Figure 4-6).

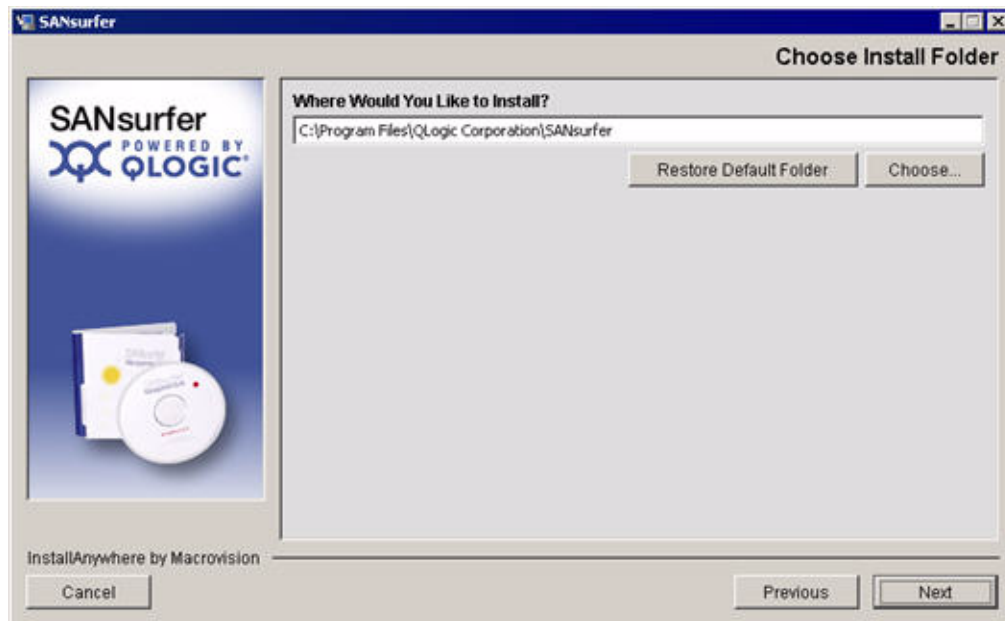


Figure 4-6 Install SANsurfer: Choose Install Folder

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 4-7).

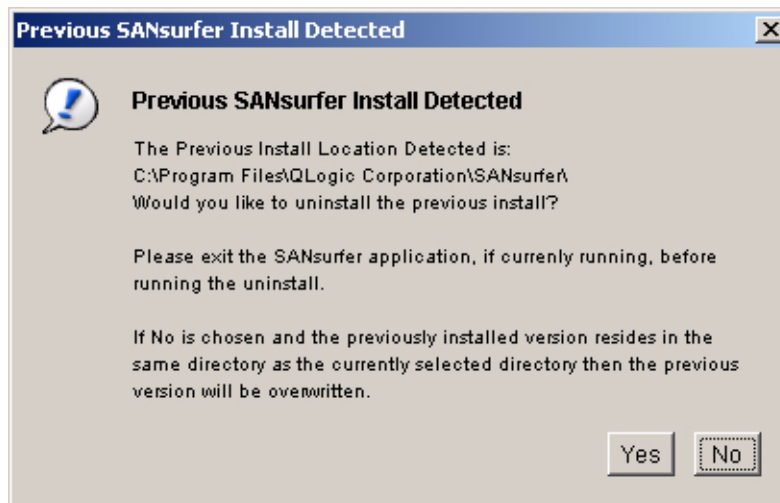


Figure 4-7 Previous SANsurfer Install Detected Message

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 (except Windows Vista or Windows 2008 Server), the Select Shortcut Profile dialog box opens ([Figure 4-8](#)).

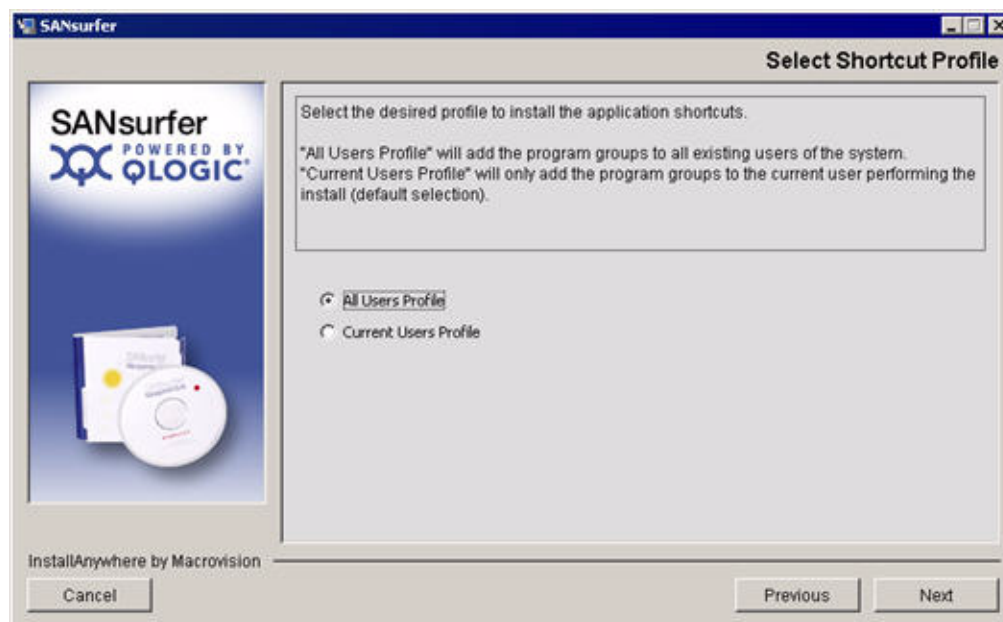


Figure 4-8 Install SANsurfer: Select Shortcut Profile (Windows Only)

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 (except Windows Vista or Windows 2008 Server), the Create Desktop Icon Selection dialog box opens ([Figure 4-9](#)).

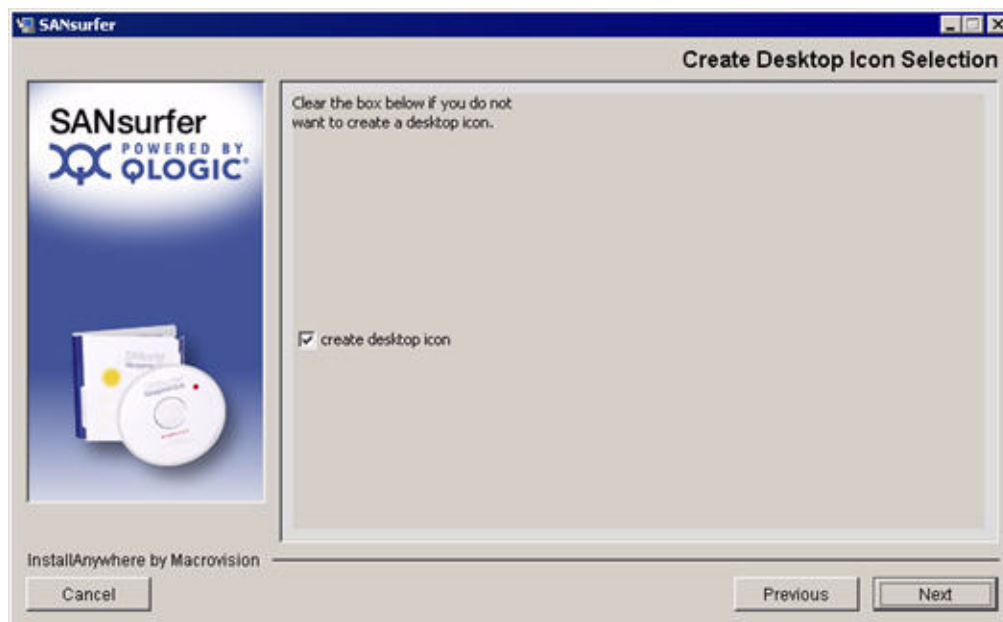


Figure 4-9 Install SANsurfer: Create Desktop Icon Selection (Windows Only)

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 on your previous selection in [Step 8](#).

The Pre-Installation Summary dialog box ([Figure 4-10](#)) opens.

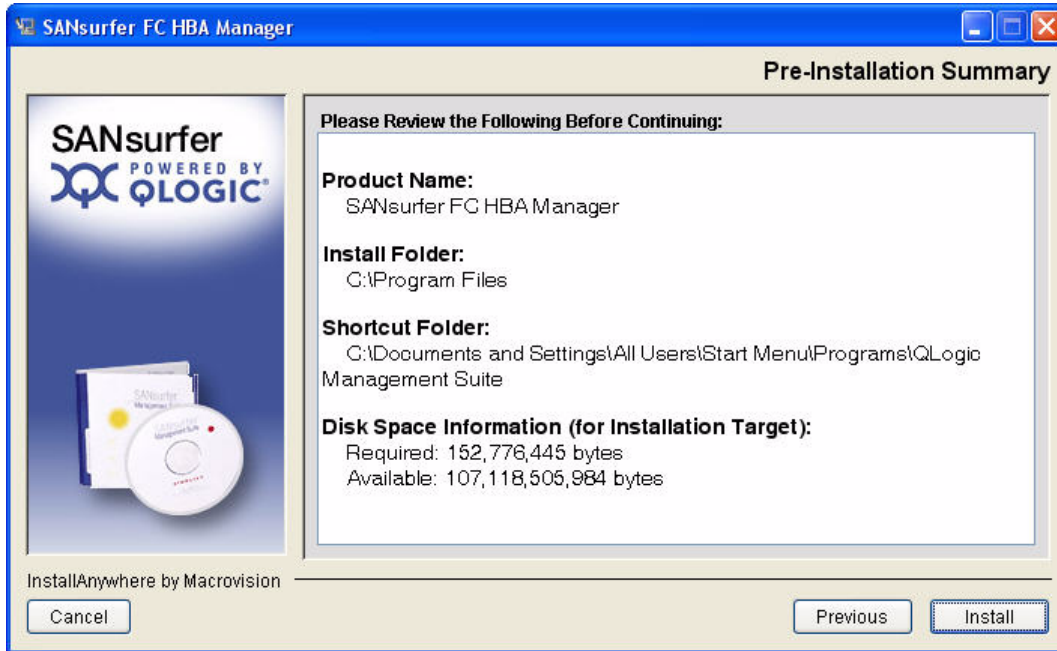


Figure 4-10 Install SANsurfer: Pre-Installation Summary

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 4-11](#)). Various messages inform you that the installation is progressing.

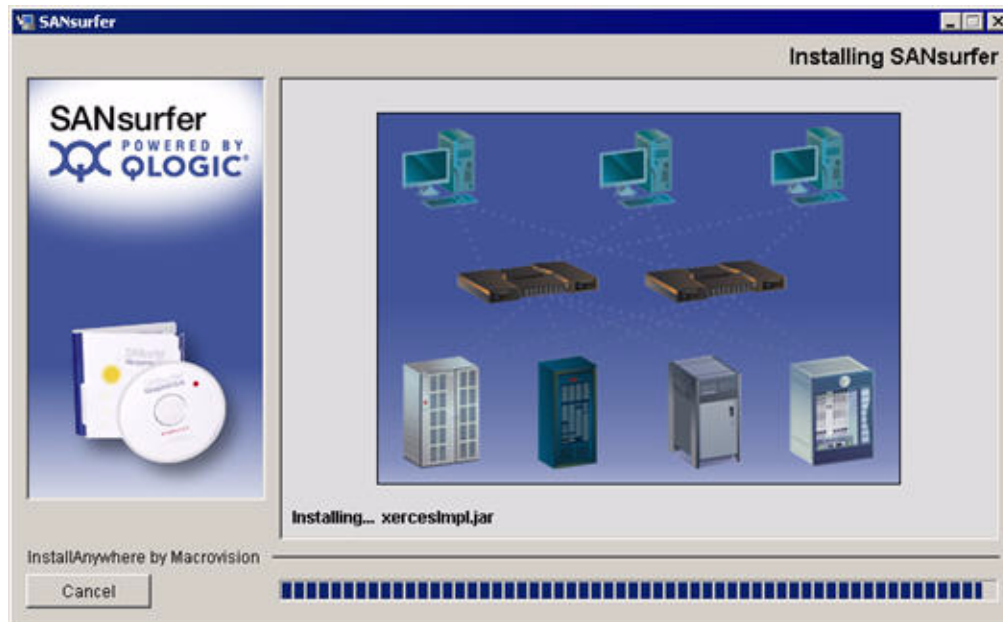


Figure 4-11 Install SANsurfer: Installing SANsurfer

If you are installing NetWare, the Novell NetWare Disk Selection dialog box opens (Figure 4-12).

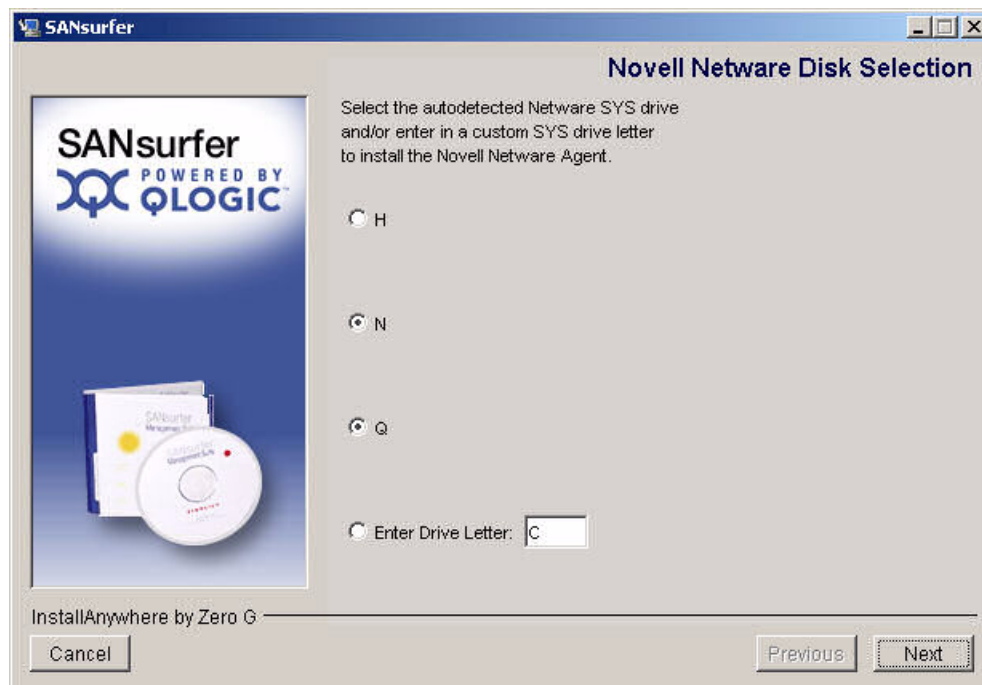


Figure 4-12 Install SANsurfer: Novell NetWare Disk Selection

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 4-12](#), 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 4-12](#), 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 Novell NetWare, Red Hat/SUSE Linux, or Sun Solaris system, the Default QLogic Failover Enable/Disable dialog box opens ([Figure 4-13](#)).

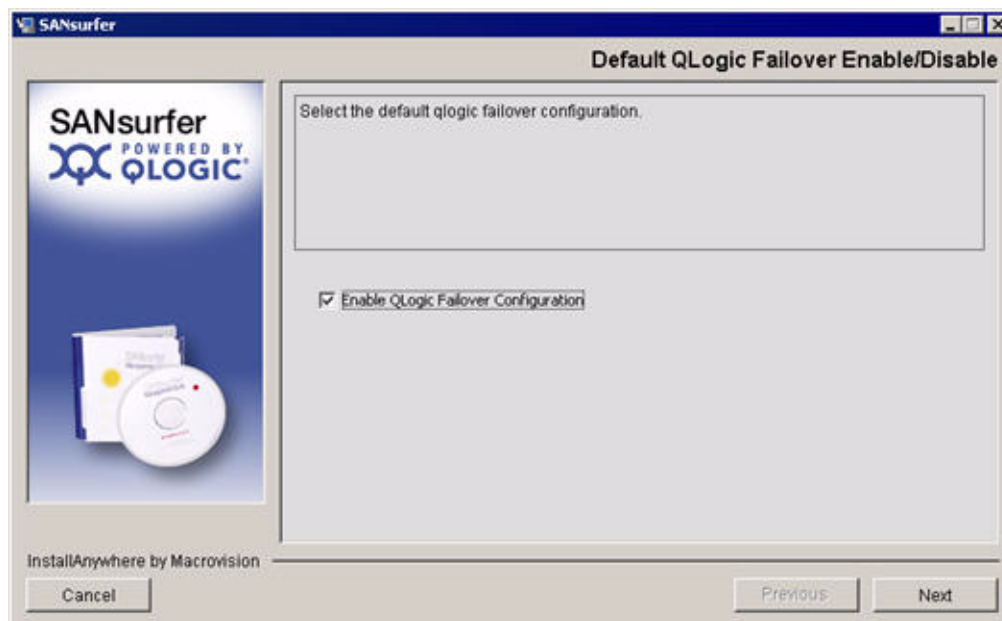


Figure 4-13 Install SANsurfer: Default QLogic Failover Enable/Disable

The failover path feature ensures data availability and system reliability by assigning alternate path and automatic adapter 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 4-14).

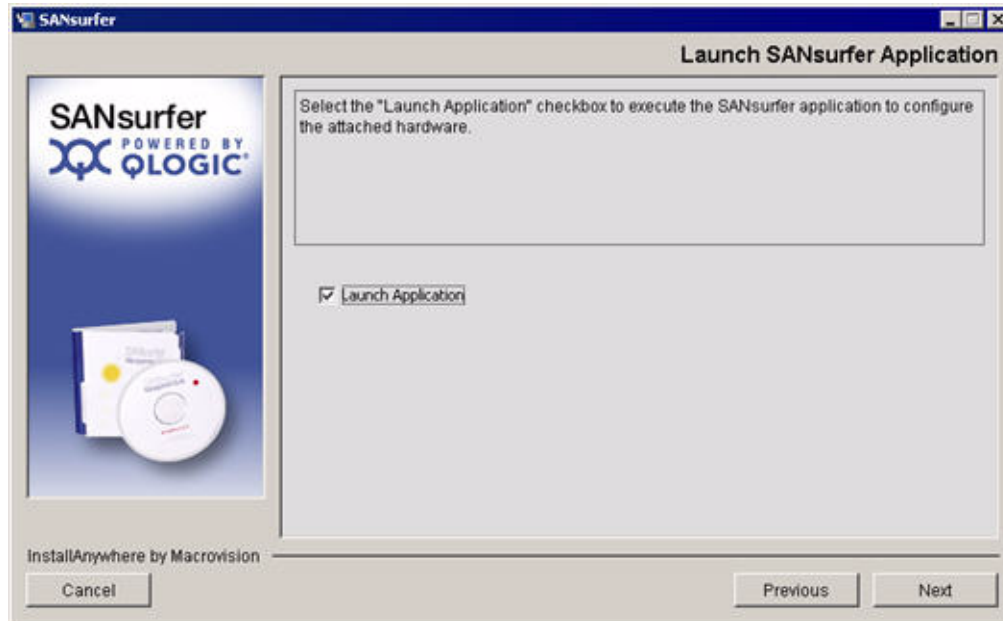


Figure 4-14 Install SANsurfer: Launch SANsurfer Application

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 4-15).

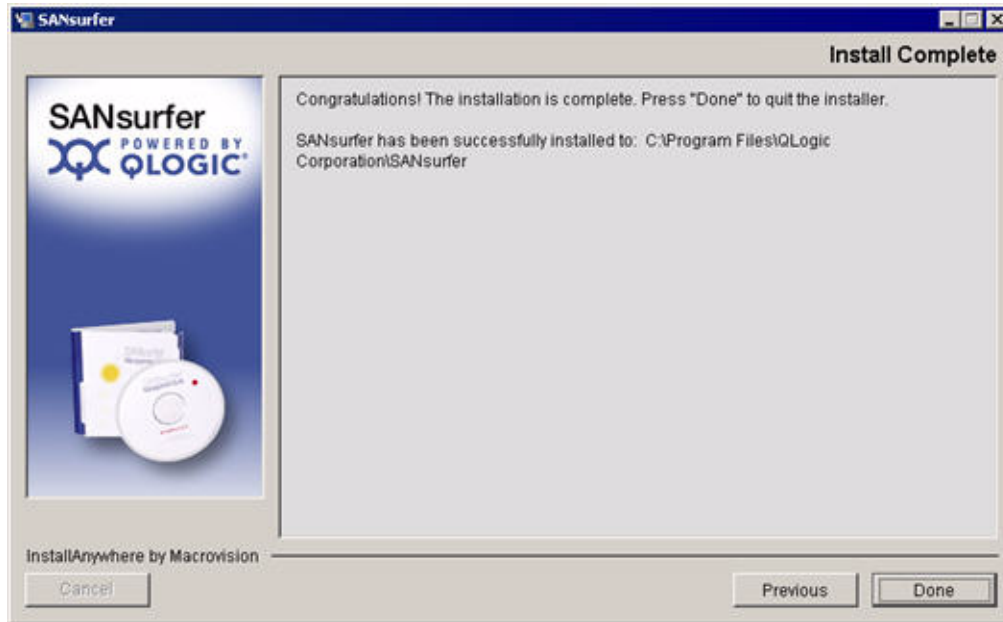


Figure 4-15 Install SANsurfer: Install Complete

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 5-1](#)).

Installation Instructions Using CLI

SANsurfer provides the ability to install the tool and its components using a command line interface (CLI). This section 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"`

Windows

Windows stand-alone installer command lines include the following:

- **Windows—To install SANsurfer FC HBA Manager interface only (adapter) without an 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

Linux stand-alone installer command lines include the following:

- **Linux—To install SANsurfer FC HBA Manager user interface only (adapter) without an 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

Solaris stand-alone installer command lines include the following:

- **Solaris—To install SANsurfer FC HBA Manager user interface only (adapter) without an 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"
```


Installation Instructions for VMware ESX 3.5

The VMware ESX 3.5 console does not support Xwindows, which is required to display Graphical User Interface (GUI) applications on UNIX platforms.

You can manage QLogic FC adapters from the SANsurfer FC HBA Manager application installed on a Windows system. The FC HBA Manager on Windows can connect remotely to the qlremote running on the ESX server and manage adapters on the ESX server.

To prepare your servers to manage the FC adapters remotely:

1. Install the FC HBA Manager on the ESX server using the following CLI command in silent mode:

```
sh ./standalone_sansurfer5.0.1bxx_linux_install.bin -i  
silent -DSILENT_INSTALL_SET="QMSJ_G_LA_x86"
```

where xx is the build number.
2. Start the portmap service on the ESX server. For example, enter the following command:

```
/sbin/portmap
```
3. Start qlremote on the ESX server. For example, enter the following command:

```
/usr/local/bin/qlremote
```
4. On a Windows server, install the SANsurfer FC HBA Manager (Windows 5.0.1bxx) client, as described for Windows installations. (See [“Initial Installation” on page 4-1.](#))
5. Start the FC HBA Manager on the Windows system and connect to the remote VMware ESX server. (See [“Starting SANsurfer FC HBA Manager on Windows” on page 5-2.](#))

NOTE:

For supported Windows servers, see [“Software Requirements” on page 3-2.](#)

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 4-20](#)
- [“Updating SANsurfer by Package Update” on page 4-23](#)

NOTE:

Using SANsurfer FC HBA Manager’s Web update feature requires an Internet connection because it downloads files 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 4-16).

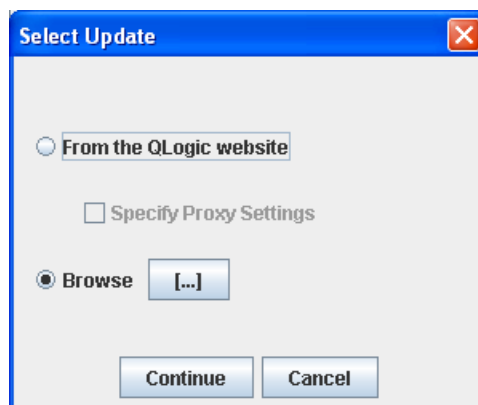


Figure 4-16 Update SANsurfer: Select Update Dialog Box

2. Depending on whether or not your network requires proxy settings, 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 4-16), 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 4-18). 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 4-16), click **From the QLogic website**.
2. Select the **Specify Proxy Settings** check box.
3. Click **Continue**. The Server Proxy Settings dialog box opens (Figure 4-17).

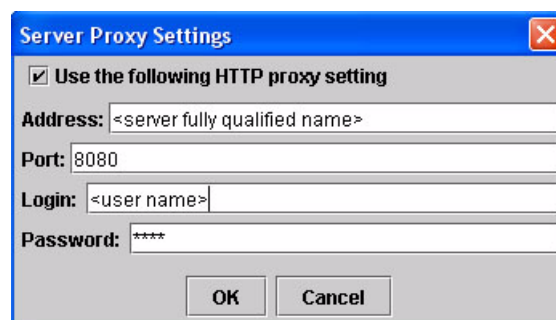


Figure 4-17 Update SANsurfer: Server Proxy Settings Dialog Box

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 4-18) showing available update information.

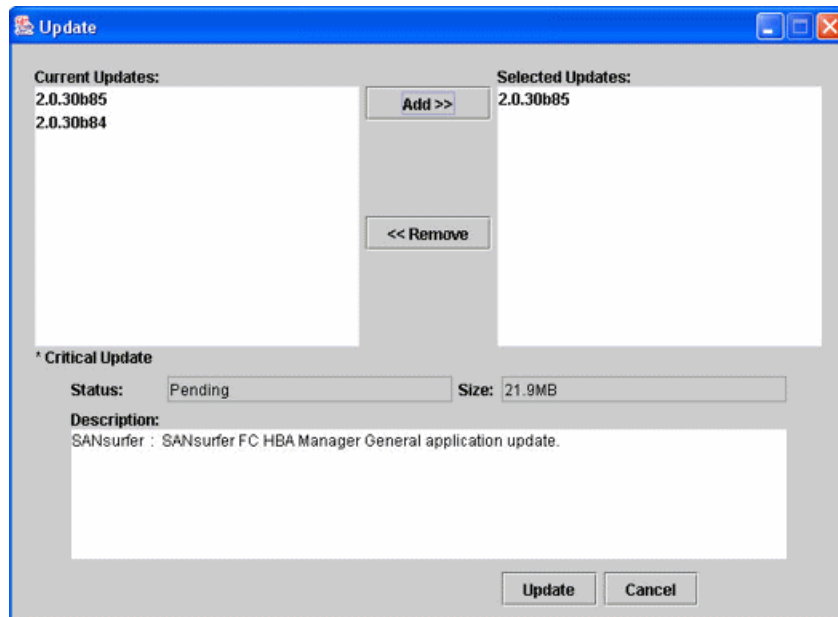


Figure 4-18 Update SANsurfer: Update Dialog Box

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 4-19).

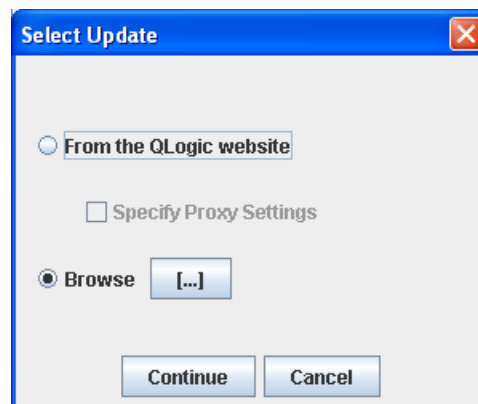



Figure 4-19 Update SANsurfer: Select Update Dialog Box

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 4-20).

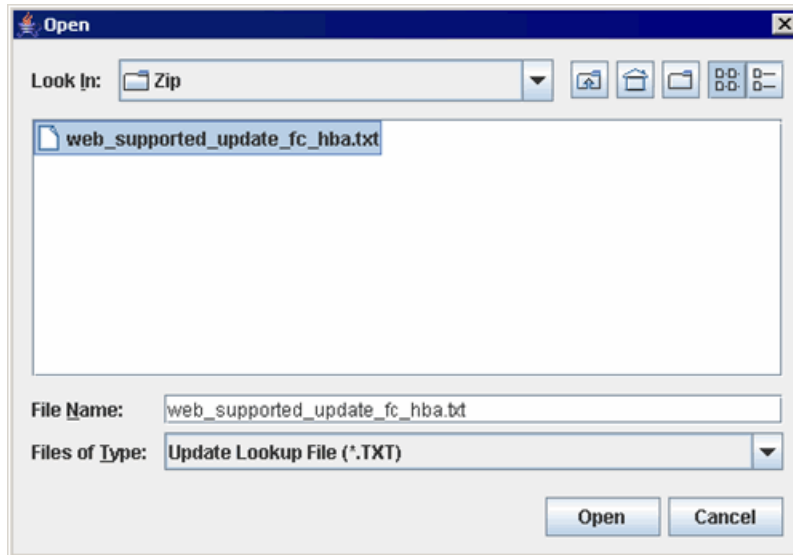


Figure 4-20 Update SANsurfer: Open Dialog Box

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 4-21), showing available update information.

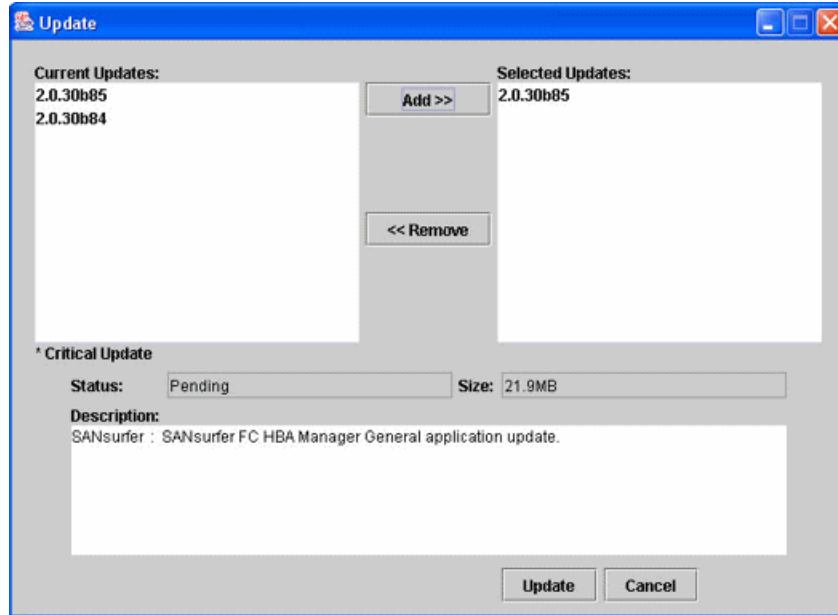


Figure 4-21 Update SANsurfer: Update Dialog Box

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. You must 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 4-22](#)).

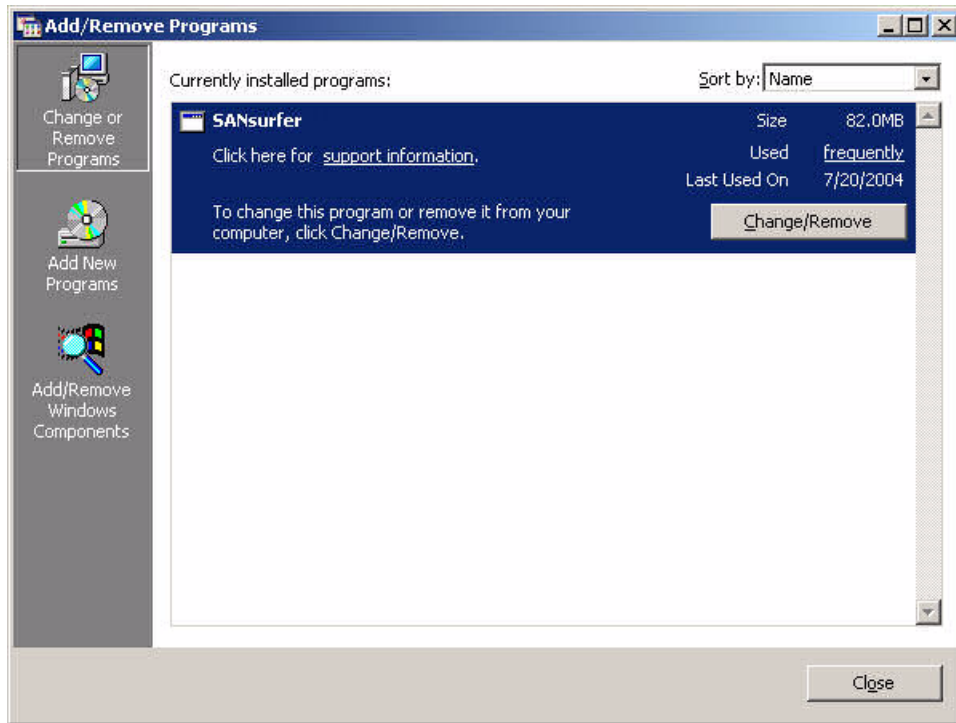


Figure 4-22 Uninstall SANsurfer: Add/Remove Programs (Windows 2000)

- c. In the left column, click **Change or Remove Programs** (default).
- d. Under **Currently Installed Programs**, select **SANsurfer FC HBA Manager**.
- 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
```

The Uninstall SANsurfer dialog box (Figure 4-23) opens with SANsurfer x.x as the program to be uninstalled.

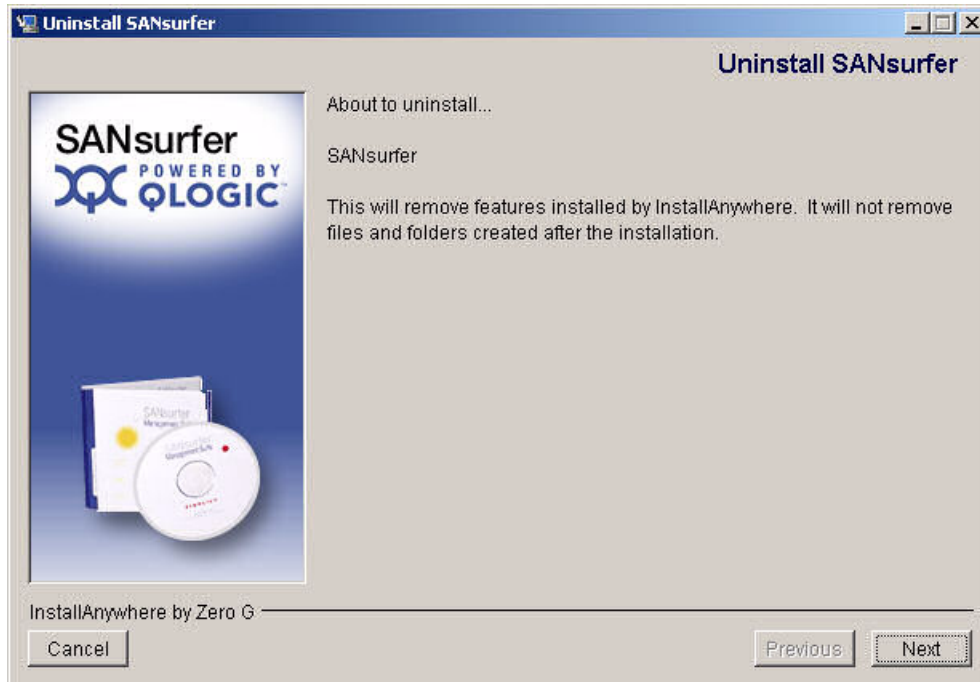


Figure 4-23 Uninstall SANsurfer: Uninstall SANsurfer

2. Click **Next** to continue.

The Uninstall Options dialog box opens (Figure 4-24).

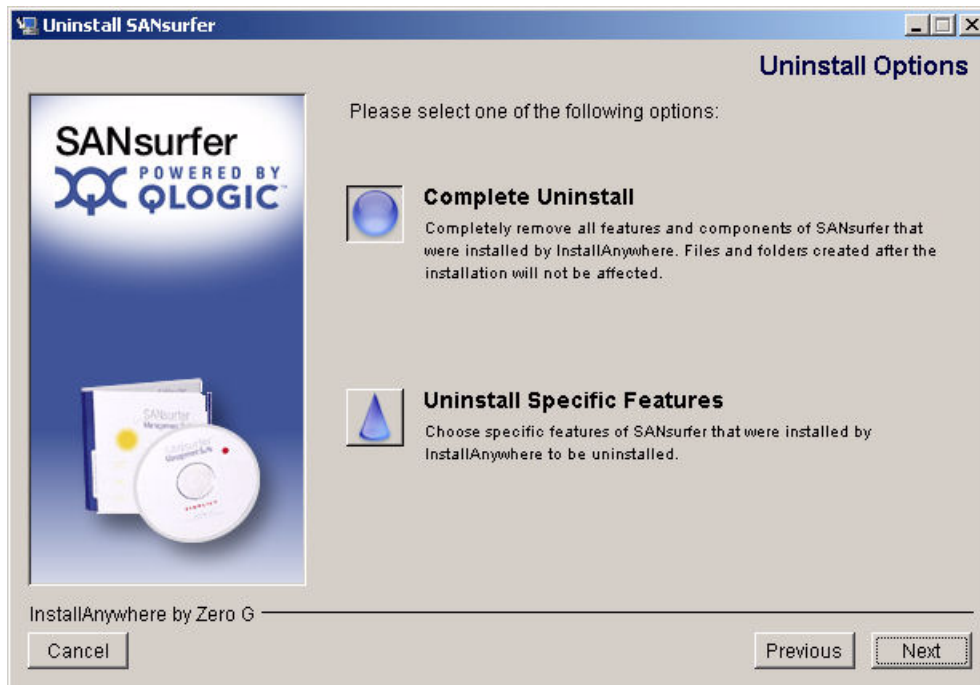


Figure 4-24 Uninstall SANsurfer: Uninstall Options

3. 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 4-25).

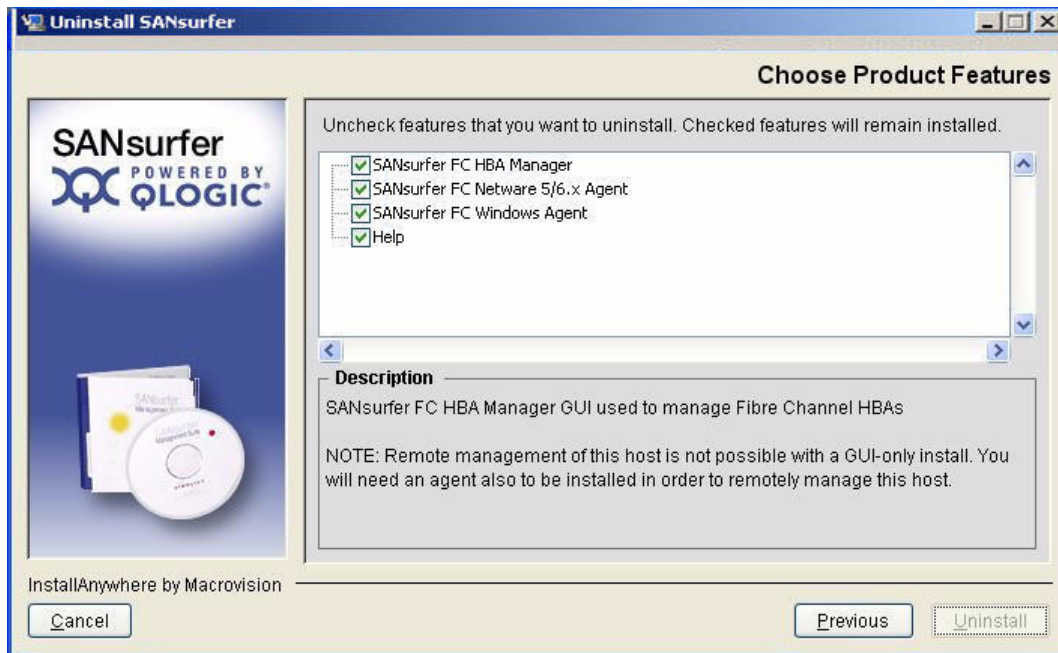


Figure 4-25 Uninstall SANsurfer: Choose Product Features

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.

4. Clear the check boxes for features that you want to uninstall. (Selected check boxes identify features that will remain installed.) Select from the following components (all components may not appear, and the order of the components may vary):
 - For a Windows system:
 - SANsurfer FC HBA Manager**
 - SANsurfer FC NetWare 5/6.x Agent**
 - SANsurfer FC Windows Agent**
 - Help**
 - For a Red Hat/SUSE Linux system:
 - SANsurfer FC HBA Manager**
 - SANsurfer FC Linux Agent**
 - Help**
 - For a Solaris SPARC/x86 system:
 - SANsurfer FC HBA Manager**
 - SANsurfer FC Solaris Agent**
 - Help**

5. Click **Uninstall**.

The Uninstall SANsurfer dialog box (Figure 4-26) lists the components to be uninstalled.

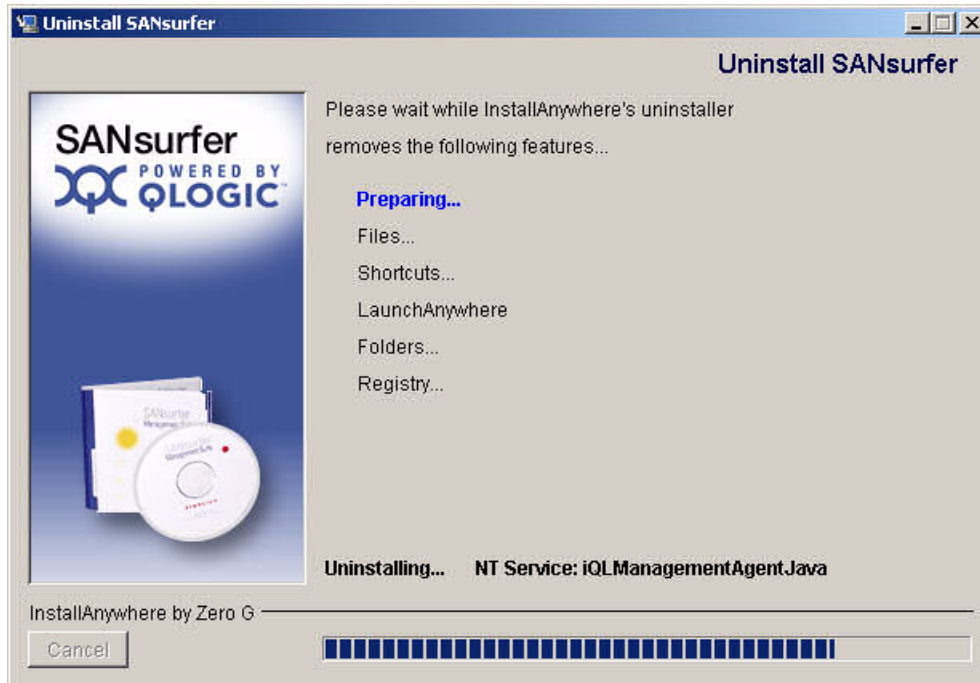


Figure 4-26 Uninstall SANsurfer: Uninstall SANsurfer

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 4-27).

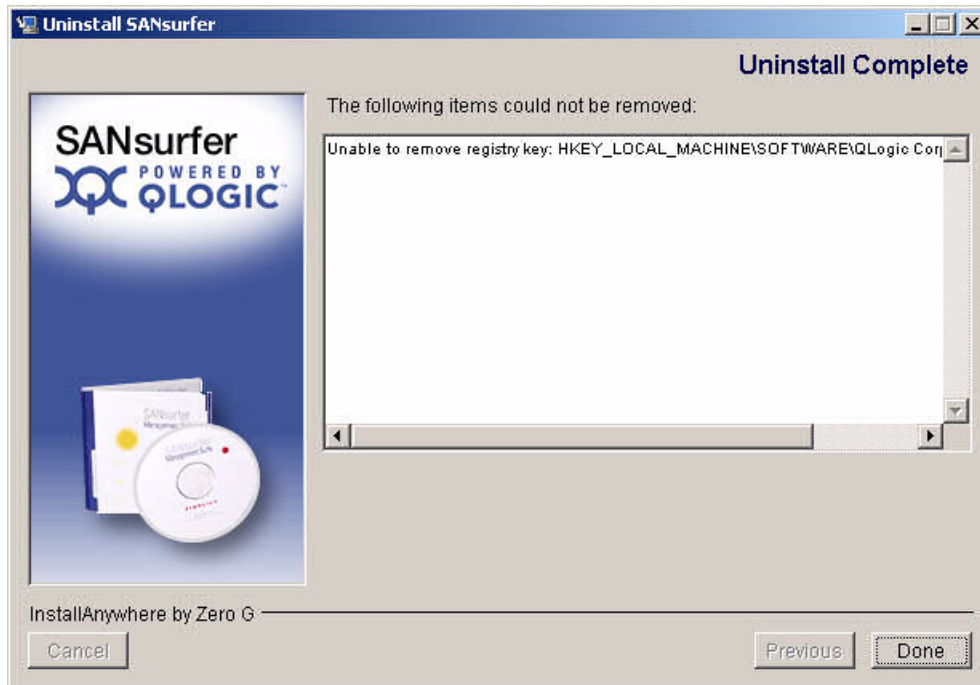


Figure 4-27 Uninstall SANsurfer: Uninstall Complete

6. Click **Done**.
7. If any components were not successfully uninstalled, manually remove them.

Some files and directories remain after uninstalling SANsurfer. You must delete these components 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
8. 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**.
 9. If prompted, reboot the system.

5 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 5-1
- “SANsurfer FC HBA Manager Main Window” on page 5-5
- “Exiting SANsurfer FC HBA Manager” on page 5-12
- “Getting Help” on page 5-12
- “Setting SANsurfer FC HBA Manager Security” on page 5-16
- “Setting the Warning Display Option” on page 5-18
- “Setting the Configuration Change Option” on page 5-19
- “Setting Application Event Log Options” on page 5-20
- “Setting the HBA Event Log Option” on page 5-21
- “Setting Up Automatic Notification by E-mail” on page 5-23
- “Setting the Configuration Policies” on page 5-24
- “Specifying the Adapter Driver Settings” on page 5-29
- “Refreshing the Host Configuration” on page 5-32

Starting SANsurfer FC HBA Manager

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

- Windows (see [page 5-2](#))
- Red Hat/SUSE Linux or Solaris SPARC/x86 (see [page 5-3](#))
- Macintosh OS X (see [page 5-3](#))

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 Application Help*.

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 5-3.

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 5-1](#)) 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 5-1 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, and then 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 5-5).

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 5-4.

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 5-5).

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 5-4.

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 5-5).

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 5-7](#)
- [“Host Icons and Text” on page 5-9](#)
- [“Adapter Icons and Text” on page 5-9](#)
- [“Adapter Port Icons and Text” on page 5-10](#)
- [“Device Icons and Text” on page 5-11](#)
- [“LUN Icons and Text” on page 5-12](#)

When the main window first opens, it displays the Topology page, which shows a traffic signal. The traffic signal indicates the status of the hosts, as shown in [Table 5-1](#).

Table 5-1. 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 adapter in one of the hosts in the system.
 Bad	All hosts in the system are down.

The SANsurfer FC HBA Manager window contains an FC/CNA 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 FC/CNA HBA tree lists all hosts—including IP addresses—with their connected adapters, ports, devices, and LUNs. When you click an item in the adapter tree, the status line shows additional information about the selection. When you hold your cursor over an adapter in the FC/CNA HBA tree for a few seconds, information about the adapter model appears. The FC/CNA HBA tree contains icons and text as visual indicators for the hosts, adapters, 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/CNA HBA** tab. **SANsurfer FC HBA Manager** shows in the title bar.
2. Connect to the host (for details, see the *SANsurfer FC HBA Manager Application Help*). The SANsurfer FC HBA Manager main window opens. [Figure 5-2](#) shows the elements contained on the main window.

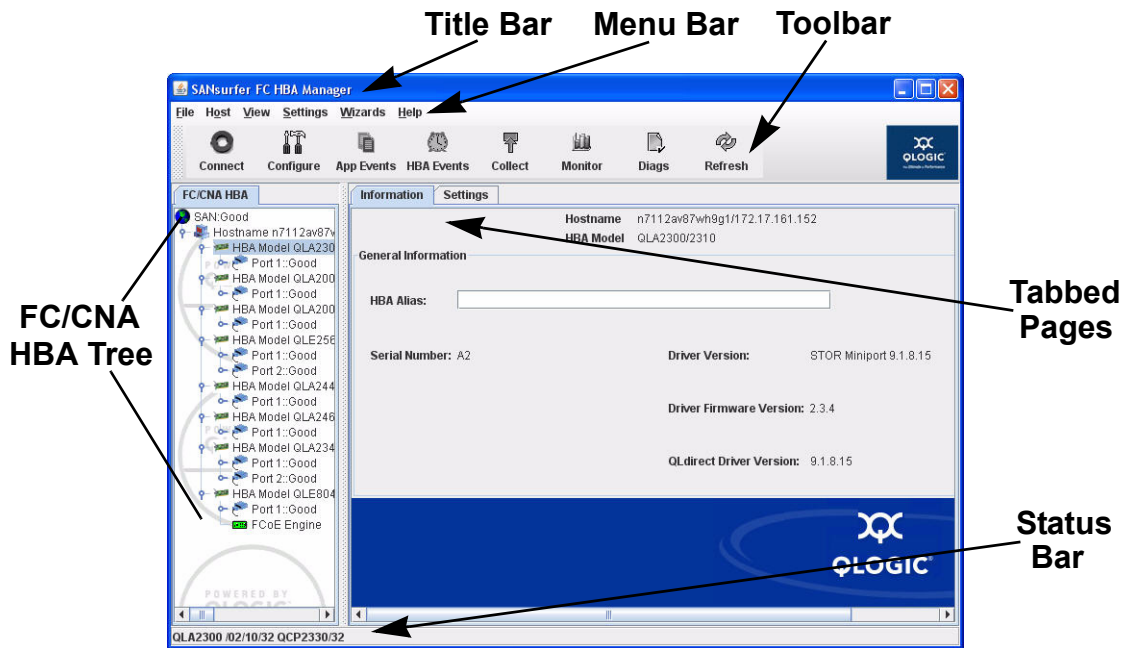


Figure 5-2 SANSurfer FC HBA Manager Main Window

Toolbar Buttons

The toolbar buttons in [Table 5-2](#) provide easy access to frequently used functions.

Table 5-2. Toolbar Buttons










Button	Purpose
 <p>App Events</p>	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 “Viewing and Managing the App Event Log” in the help system.
 <p>Connect</p>	Click the Connect button to attach the SANSurfer FC HBA Manager to a specific host or IP address. See “Connecting to Hosts” in the help system.
 <p>Configure</p>	Click the Configure button to open the Fibre Channel Port Configuration dialog box where you can configure the adapters on your host. See “Configuring Fibre Channel Devices” in the help system.

Table 5-2. Toolbar Buttons (Continued)

Button	Purpose
	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 “Viewing and Managing the App Event Log” in the help system.
	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 “Viewing and Managing the HBA Events Log” 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 “Using Collect” in the help system.
	Click the Monitor button to open the HBA Statistics dialog box and monitor the various functions of the adapter. See “Viewing and Updating Adapter Port Monitoring” 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 “Performing Diagnostics” on page 6-1.
	Click the Refresh button to query the host and update any information on the Adapters connected to the host. See “Refreshing the Host Configuration” on page 5-32.

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 FC/CNA 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).

Adapter Icons and Text






The FC/CNA HBA tree shows the following information about adapters:

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

Examples:

 HBA QLA2342:QLogic's HBA:Warning

 HBA QLA2342:Good

- **Adapter icons:**
 -  **Good.** No alarm.
 -  **Warning.** Warning alarm.
 -  **Loop Down.** No synchronization.
 -  **Bad.** Bad alarm.
 -  **Offline.** Adapter on offline host.


Adapter Port Icons and Text


The FC/CNA HBA tree lists the following information about adapter ports:

- **Adapter port number:** For example, Port *n*.
(or, for QLE8042 adapters, also **FCoE Engine**.)
- **Adapter port alias:** User-defined alias name (if assigned). For more information, see “Displaying Adapter Port Information” in the help system)
- **Beacon flashing–Flash Adapter Port Beacon:** Port LED flashing is enabled. For more information, see “Finding an Adapter Port” in the help system.
- **Adapter 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


 FCoE Engine


- **Adapter Port Icons:**

 Good

 Warning. Warning alarm

 Loop Down


 Bad. Bad alarm

 Offline. Adapter port on offline host

 SFP not installed (for 8Gb adapter)

 Beacon Flashing, Good

 Beacon Flashing, Warning

 Loop Down, Beacon Flashing

 Beacon Flashing, Bad


 FCoE Engine (for QLE8042)


Device Icons and Text


The FC/CNA 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 6-2](#).
- **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 FC/CNA 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 5-13](#)
- [“Specifying the Help Browser” on page 5-14](#)
- [“Viewing SANsurfer FC HBA Manager Tool Information” on page 5-15](#)

Viewing the Help System

You can view the application online help for the SANsurfer FC HBA Manager at any time using one of the following methods:

- To view the application help from the main window, point to the **Help** menu on the menu bar and click **Browse Contents**. The application help opens in the browser you selected using the **Set Browser Location** option (see [page 5-14](#)). The help window displays a navigation pane on the left and a topic pane on the right. From the navigation pane, select one of the following tabs to locate the information you want to display:
 - **Contents** – Displays a list of topics organized by task, much like the Table of Contents in this user's guide. This list also includes book icons that open and close to show and hide topics related to the book title. Click a closed book icon to open it and display its list of topics. Click an opened book icon to close it and hide its topics. Click the title of any book or topic to display its content in the topic pane.
 - **Index** – Provides an alphabetically arranged list of key words. To jump to a keyword, start typing it in the text field. Click any index entry to display a related topic in the topic pane. If a keyword has more than one topic associated with it, a pop-up menu opens, displaying a list of related topics you can select.
 - **Search** – Provides access to all topics contained in the application help using advanced search capabilities. Type one or more keywords in the text field, then press **ENTER**. The search tool lists all topics that meet your search criteria. Select any topic to display its contents in the topic pane.

NOTE:

The search tool accepts Boolean expressions (such as **AND**, **OR**, and **NOT**), as well as nested expressions. It also accepts exact strings entered between quotation marks. It does not support wild cards.

- To view help related to a specific wizard screen, click the **Help** button, located at the lower-right corner of the dialog box. The appropriate topic opens in a separate window. To view the navigation pane, click the **Show** button, located in the top-right corner of the topic pane. The page replaces the **Show** button with a **Hide** button, which you can click to close the navigation pane without closing the topic window.

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 5-13):

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 5-3](#)).

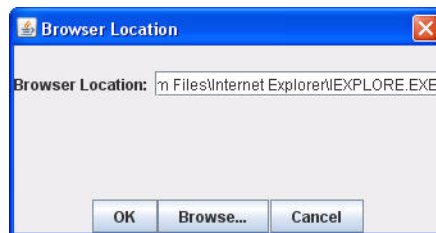


Figure 5-3 Browser Location Dialog Box

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 5-4](#)).

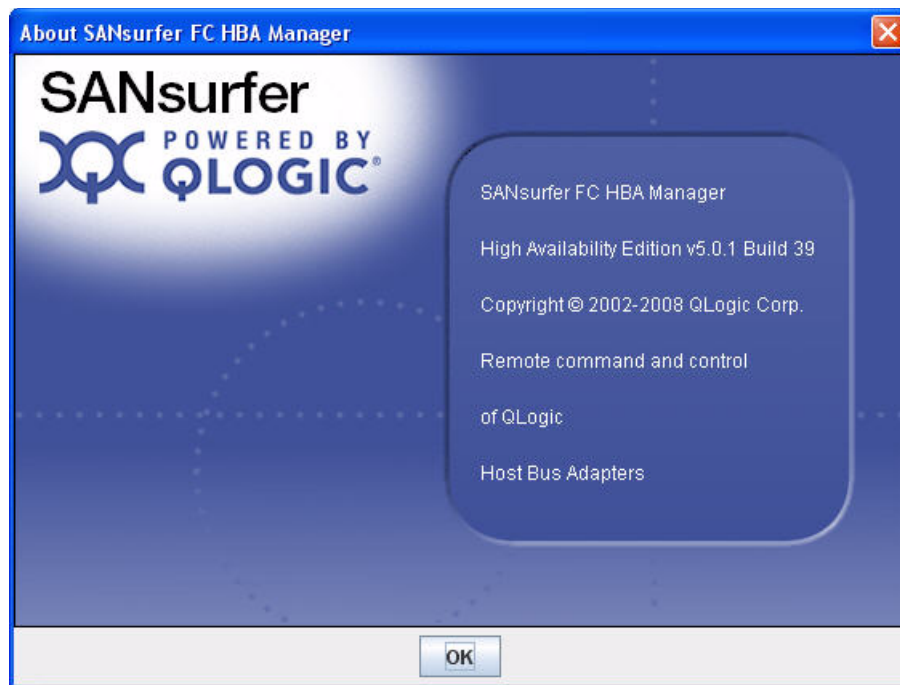


Figure 5-4 About SANsurfer FC HBA Manager Window

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

- Adapter parameters
- Flash BIOS
- Adapter 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 FC/CNA HBA tree, select the host for which you want to set the tool access password.
2. Click the **Security** tab. The Security page opens ([Figure 5-5](#)). The host name appears at the top of the page.

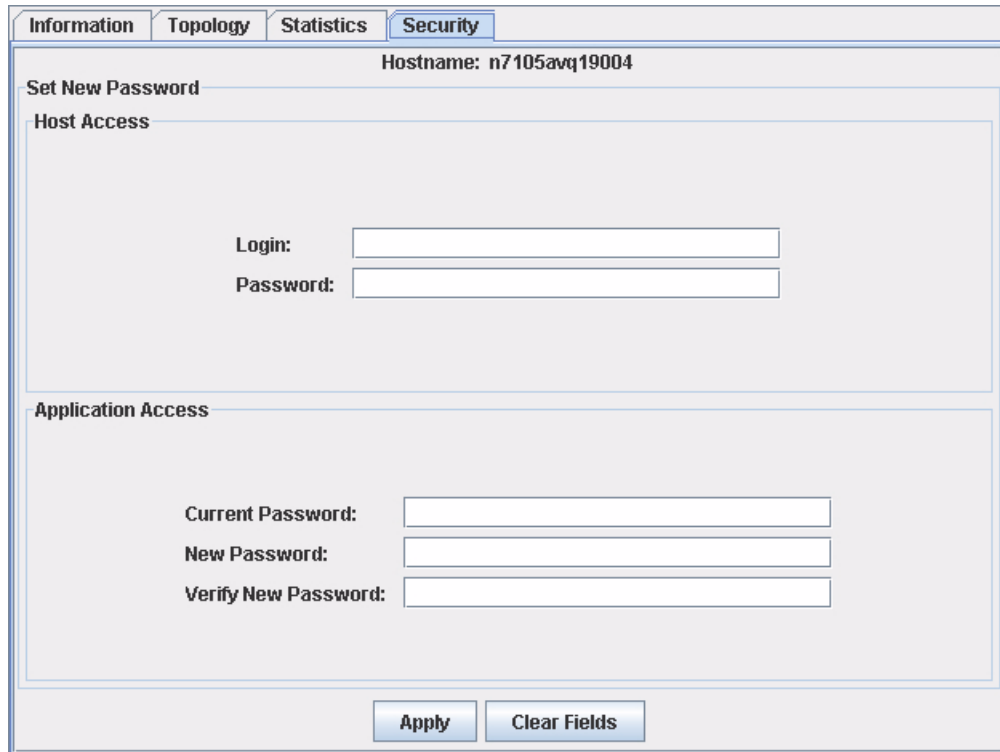


Figure 5-5 Security Page

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

The Options dialog box opens ([Figure 5-6](#)).

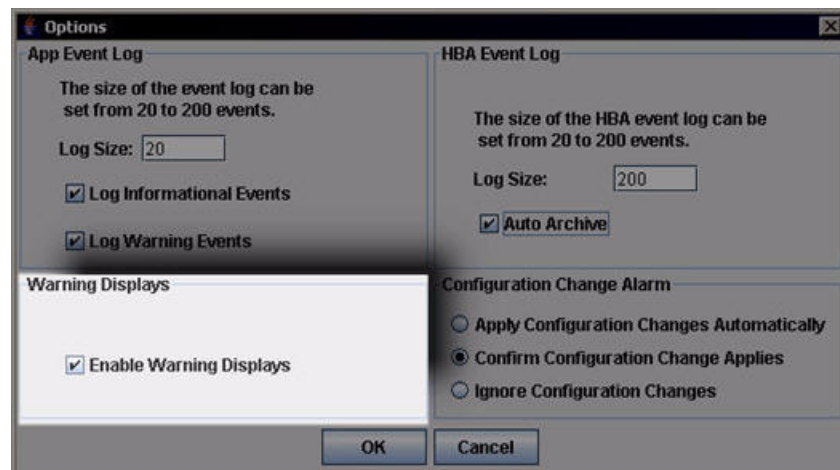


Figure 5-6 Options Dialog Box: Warning Displays

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 keeps current the devices and the LUNs that the adapter 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 FC/CNA HBA tree, and then on the shortcut menu, click **Options**.
 - Press **CTRL+SHIFT+T**.

The Options dialog box opens (Figure 5-7).

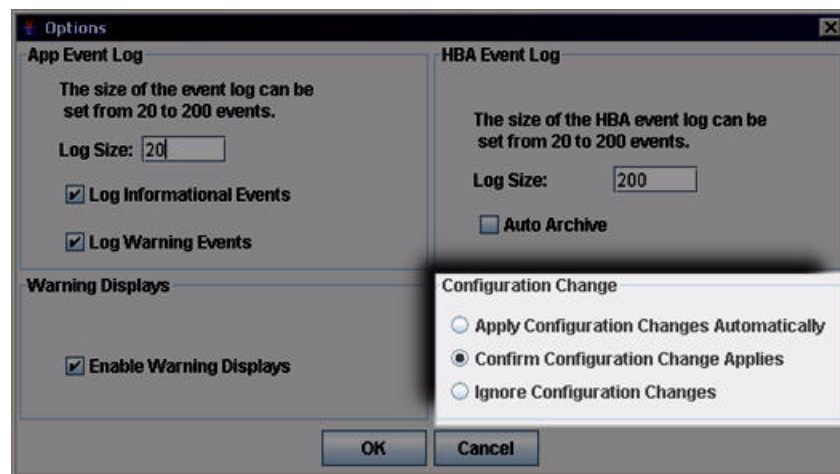


Figure 5-7 Options Dialog Box: Configuration Change

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, a message appears, stating "Would you like to refresh the Configuration for Hostname: <hostname/ip_address>." Click **OK**.
 - If you want to decide whether to update to the new configuration, click **Confirm Configuration Change Applies**.

If a configuration change occurs, a message appears, stating "Would you like to refresh the Configuration for Hostname: <hostname/ip_address>." 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 Application 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 Application Help* 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 FC/CNA HBA tree, and then on the shortcut menu, click **Options**.
 - Press **CTRL+SHIFT+T**.

The Options dialog box opens (Figure 5-8).

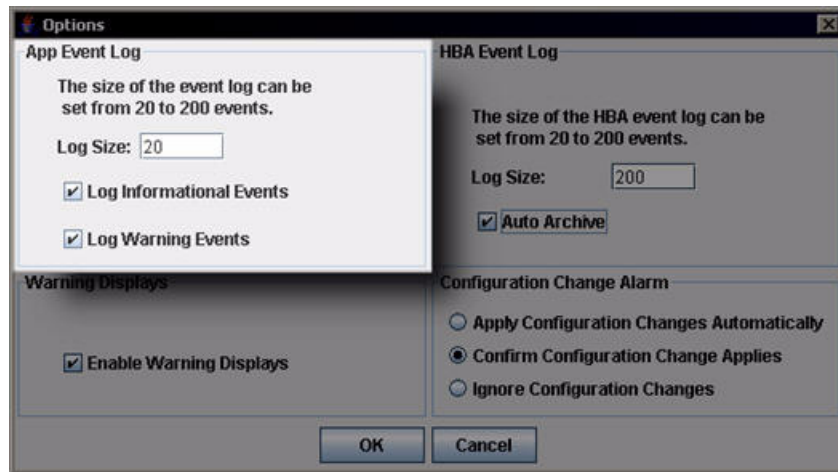


Figure 5-8 Options Dialog Box: App Event Log

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

The Options dialog box opens (Figure 5-9).

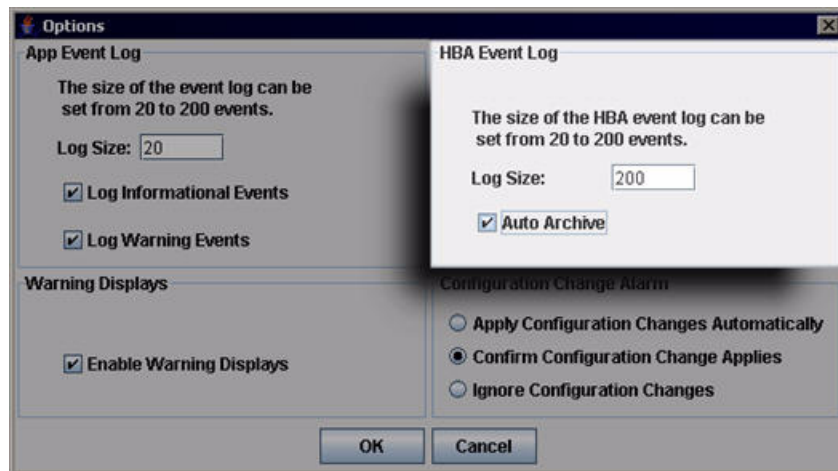


Figure 5-9 Options Dialog Box: HBA Event Log

2. Under **HBA Event Log**, type the number of adapter 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. Adapter event notification through e-mail is available only with servers running the SMTP agent.

NOTE:

For information about viewing notifications received by e-mail, see “Viewing an Adapter 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 5-10](#)).

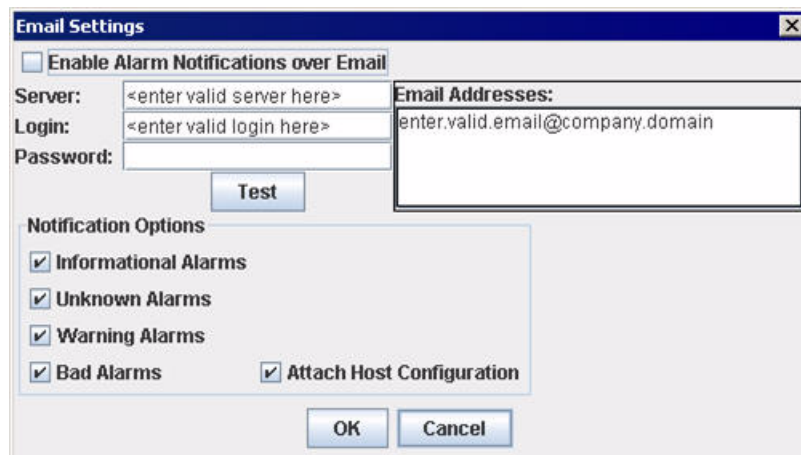


Figure 5-10 Email Settings Dialog Box

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 FC/CNA HBA tree has access to the device or LUN. Only hosts that appear in the FC/CNA 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 5-11](#)).

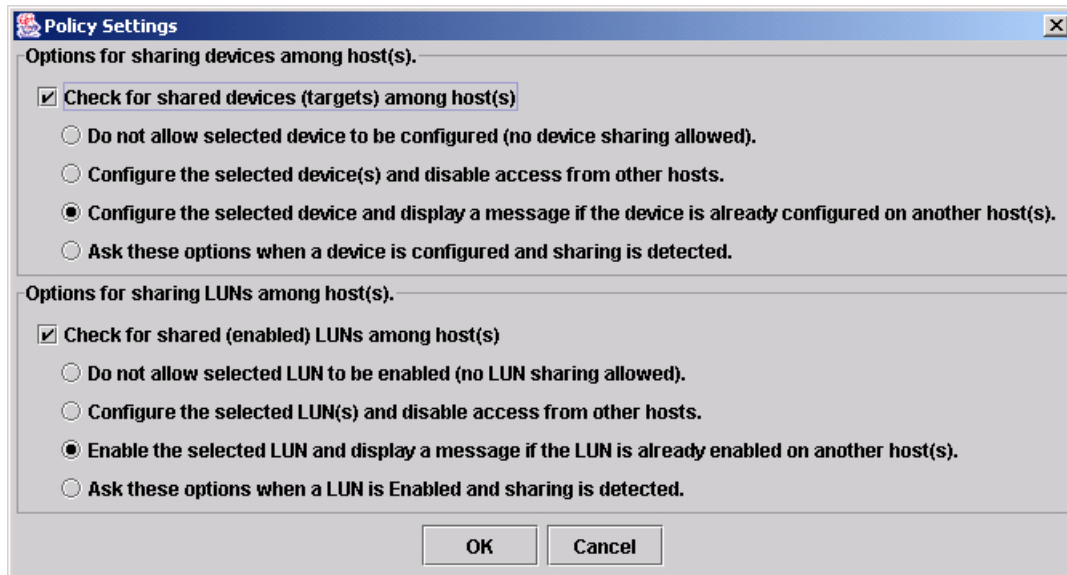


Figure 5-11 Policy Settings Dialog Box

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 FC/CNA 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 5-12) 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 5-11) 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 FC/CNA 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 5-12](#)). 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 5-12](#)).



Figure 5-12 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 5-13](#).

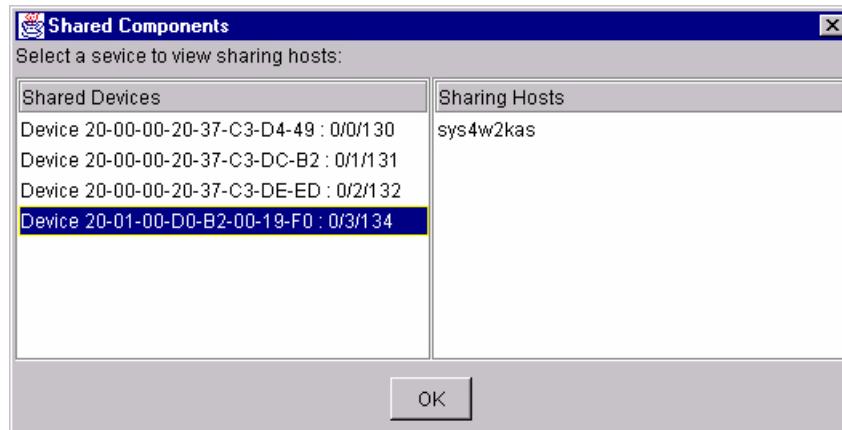


Figure 5-13 Shared Components Dialog Box

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 Adapter 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 adapter driver parameters, specify the following:

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

To set the adapter driver parameters:

1. In the SANsurfer FC HBA Manager main window FC/CNA HBA tree, select the adapter.
2. Click the **Settings** tab to open the adapter driver Settings page (Figure 5-14). (Figure 5-15 shows the same page for Linux only.)

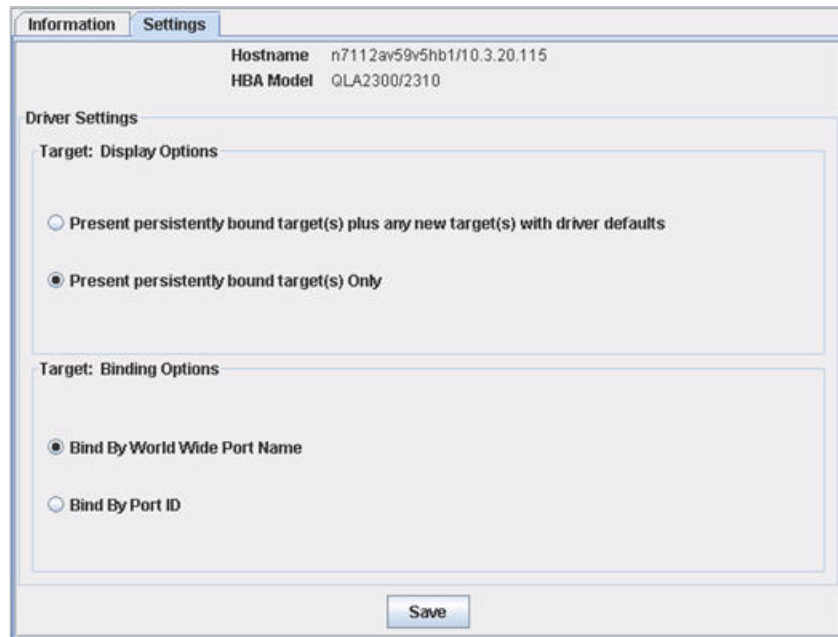


Figure 5-14 Settings Page (Adapter Driver)

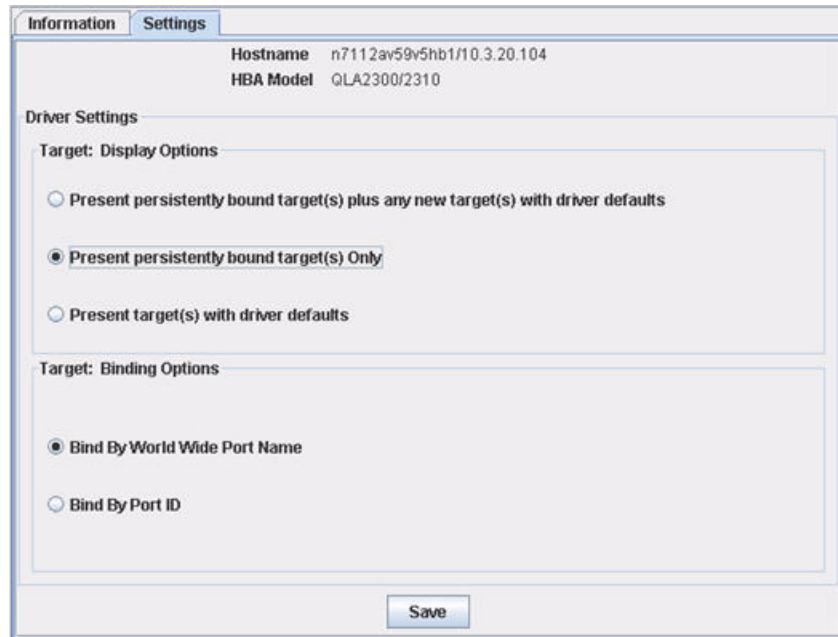


Figure 5-15 Settings Page (Linux Failover Driver Only)

The identifying information includes:

- **Hostname** is the name or IP address of the host connected to the adapter.
 - **Adapter Model** is the QLA2xxx adapter 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 failover driver 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 adapter driver settings.

Refreshing the Host Configuration

The host configuration (including the FC/CNA 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 FC/CNA HBA tree, and on the shortcut menu, click **Refresh**.
- Press **F5**.

6 Performing Diagnostics

SANsurfer FC HBA Manager provides end-to-end diagnostics that allow you to test adapters and the devices to which they are connected. Diagnostic tests include the following:

- The external loopback test, which evaluates the ports (transmit and receive transceivers) on the adapter and the error rate.
- 10-bit internal or 1-bit serial internal loopback test (available on 8Gb adapters, such as the QLE256x).
- The read/write buffer test verifies the link between the adapter and its attached devices.

This section contains the following diagnostic procedures:

- [“Running Loopback and Read/Write Buffer Diagnostic Tests” on page 6-1](#)
- [“Viewing Adapter Port Transceiver Details” on page 6-7](#)

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 page or by clicking the **Diags** button on the toolbar.

Before running a diagnostic test, consider the following:

- Because diagnostic testing interrupts normal adapter operations, you should run these tests when no other activities are required of the adapter.
- The adapter state reverts to pre-test conditions at the end of the testing process.
- Diagnostic tests read and write to sensitive areas on the adapter.
- Disruption of some diagnostic tests may require a complete update of the adapter'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 6-2](#)
- [“Running the Loopback Test” on page 6-6](#)
- [“Running the Read/Write Buffer Test” on page 6-6](#)

Preparing for Diagnostic Testing

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

NOTE:

The loopback test is disabled on all Linux inbox drivers.

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

- [“Finding the Adapter Port You Want to Test” on page 6-2](#)
- [“Preparing for the Loopback Test” on page 6-3](#)
- [“Preparing for the Read/Write Buffer Test” on page 6-5](#)

Finding the Adapter 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 2xxx adapter port’s LED to locate the adapter port in your computer.

NOTE:

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

To flash the adapter port's LED:

1. In the FC/CNA HBA tree, right-click an adapter 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 2xxx adapter port's LED begins to flash.

To stop the LED from flashing:

1. In the FC/CNA HBA tree, right-click the adapter port.
2. On the shortcut menu, click **Flash Beacon**.
The 2xxx FC/CNA HBA port's LED stops flashing.

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 Adapter Settings Connection Options Setting” in the help system).
2. Attach a loopback connector to the FC connector on the adapter port (see [“Installing a Loopback Connector” on page 6-4](#)).

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

- You have a 2xxx adapter that is connected to the fabric through a point-to-point connection (F_Port).
- The adapter is connected to a switch.
- Your operating system has one of the driver versions listed in [Table 6-1](#).

Table 6-1. 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 adapter 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 “Adapter Parameters” in the help system for information about viewing and modifying the setting.
4. Prepare for normal operations (see [“Preparing for Normal Adapter Operations” on page 6-4](#)).

Installing a Loopback Connector

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

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

NOTE:

Installing the connector stops normal adapter operations.

To install a loopback connector:

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

Preparing for Normal Adapter Operations

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

To resume normal adapter operations:

1. Remove the loopback connector from the adapter connector.
2. Reconnect the cable that you disconnected in [“Installing a Loopback Connector” on page 6-4](#).
3. Modify the adapter settings **Connection Options** back to its previous setting (see “Modifying the Adapter 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 adapter port is connected to at least one device by viewing the SANsurfer FC HBA Manager FC/CNA 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 adapter port or to specific devices attached to the adapter port.

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

1. In the SANsurfer FC HBA Manager FC/CNA HBA tree, right-click an adapter 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 adapter port.

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

1. In the SANsurfer FC HBA Manager FC/CNA 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 adapter. If the adapter port is in loop mode, you can run the loopback test with a loopback connector. If the adapter 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 6-3](#) for information.

The test evaluates the ports (transmit and receive transceivers) on the adapter. 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 6-2](#)).
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 adapter operations (see [“Preparing for Normal Adapter Operations” on page 6-4](#)).

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 6-1](#)).
- 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 adapter 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 6-2).
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 Adapter Port Transceiver Details

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

- The General page ([Figure 6-1](#)) shows an overview of the status data and inventory data from the optical transceiver device.
- The Details page ([Figure 6-2](#)) shows detailed digital diagnostic data from the optical transceiver device after running diagnostics (per *SFF-8472 Specification for Diagnostic Monitoring Interface for Optical Xcvrs*, Revision 9.3 August 1, 2002).

NOTE:

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

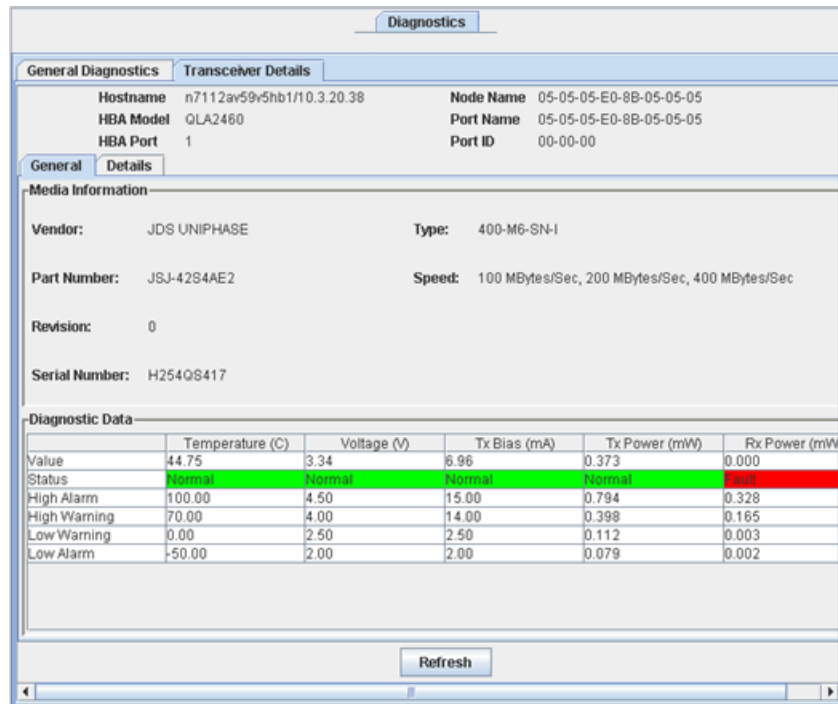
The following identifying information appears above the nested pages:

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

- **Port Name** indicates the World wide adapter port name.
- **Port ID** indicates the Port ID of the adapter port.

General Page

The General page (Figure 6-1) of Transceiver Details contains two sections: **Media Information** and **Diagnostic Data**.



The screenshot shows the 'Diagnostics' window with the 'Transceiver Details' tab selected. It displays various fields for Hostname, HBA Model, HBA Port, Node Name, Port Name, and Port ID. Below this, the 'Media Information' section lists Vendor (JDS UNIPHASE), Type (400-M6-SN-I), Part Number (JSJ-42S4AE2), Speed (100 MBytes/Sec, 200 MBytes/Sec, 400 MBytes/Sec), Revision (0), and Serial Number (H254QS417). The 'Diagnostic Data' section is a table with columns for Value, Temperature (C), Voltage (V), Tx Bias (mA), Tx Power (mW), and Rx Power (mW). The Status row is highlighted in green, indicating 'Normal' for all parameters. A 'Refresh' button is located at the bottom of the window.

	Temperature (C)	Voltage (V)	Tx Bias (mA)	Tx Power (mW)	Rx Power (mW)
Value	44.75	3.34	8.96	0.373	0.000
Status	Normal	Normal	Normal	Normal	Fault
High Alarm	100.00	4.50	15.00	0.794	0.328
High Warning	70.00	4.00	14.00	0.398	0.165
Low Warning	0.00	2.50	2.50	0.112	0.003
Low Alarm	-50.00	2.00	2.00	0.079	0.002

Figure 6-1 Transceiver Details Page: General Page

Media Information

On the General page, 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 6-2) of Transceiver Details shows detailed digital diagnostic data from the optical transceiver device.

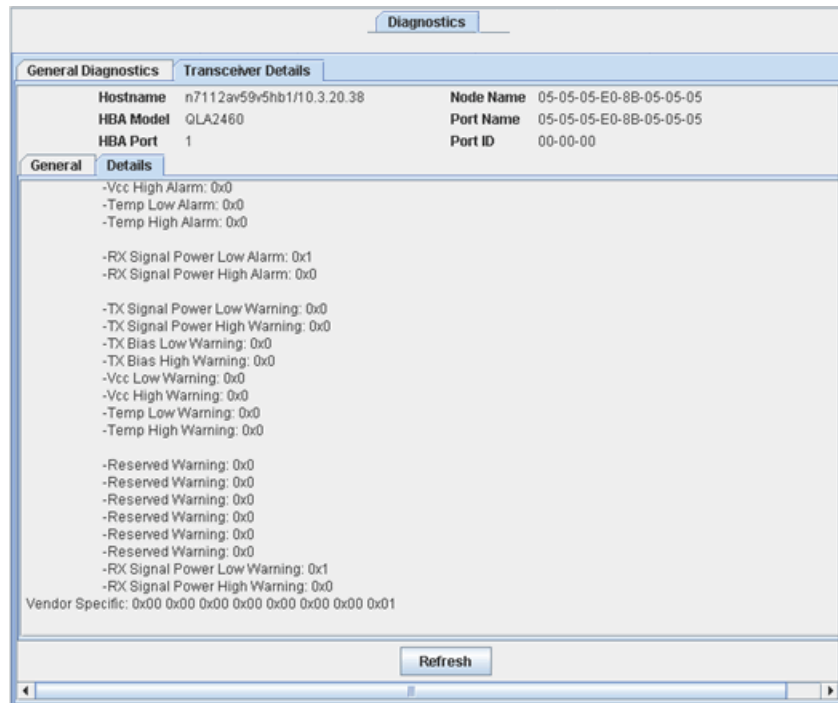


Figure 6-2 Transceiver Details Page: Details Page

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.

7 Troubleshooting

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

- [“Troubleshooting Tools” on page 7-1](#)
- [“Troubleshooting Problems and Solutions” on page 7-3](#)
- [“Verifying that the Adapter Driver is Installed” on page 7-10](#)
- [“Verifying that qlremote is Installed and Running” on page 7-12](#)
- [“Tracing SANsurfer FC HBA Manager and Agent Activity \(Debug\)” on page 7-14](#), 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 adapters.

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 Application Help*.

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 adapter, 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 adapter NVRAM, which you can modify using *Fast!UTIL* or the 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 Application Help*.

The Linux agent logs events for significant driver errors. In addition, you can configure the Linux agent to perform extended event logging for an adapter, 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 adapter parameters, which you modify using *Fast!UTIL* or the 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 Application Help*.

The Solaris agent logs events for significant driver errors. In addition, you can configure the Solaris agent to perform extended event logging for an adapter, 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 adapter parameters, which you can modify using *Fast!UTIL* (Solaris SPARC), *FCode* (Solaris x86), or the 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 adapter, loop topology information, loop error count information, and so on. SANsurfer FC HBA Manager shows target devices on an adapter 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 1-4). Problem categories include:

- “[Installation Issues](#)” on page 7-4
- “[User Interface and Remote Agent Issues](#)” on page 7-5
- “[Functional Issues](#)” on page 7-8

Installation Issues

[Table 7-1](#) lists problems that can occur when installing SANsurfer FC HBA Manager, and provides possible causes and solutions.

Table 7-1. 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 3-1 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 3-1 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 3-1 or the <code>readme.txt</code> file.</p>

User Interface and Remote Agent Issues

Table 7-2 lists problems related to the SANsurfer FC HBA Manager user interface and remote agent, and provides possible causes and solutions.

Table 7-2. 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 3-1 or the <code>readme.txt</code> file.</p>
SANsurfer FC HBA Manager user interface cannot connect to the local host.	<p>Cause: The adapter driver may not be installed.</p> <p>Solution: Verify that the adapter driver is installed; see “Verifying that the Adapter Driver is Installed” on page 7-10.</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 3-1 and “Initial Installation” on page 4-1 for network requirements. See the <i>SANsurfer FC HBA Manager Application Help</i> 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 7-2. Troubleshooting: User Interface and Remote Agent Issues (Continued)

Problem	Cause and Solution
SANSurfer FC HBA Manager user interface cannot disconnect from a remote host.	<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 7-12. ■ Verify that you can access the remote host through the network. Use the <code>ping</code> command to verify communication with the remote host name and IP address.
SANSurfer FC HBA Manager user interface does not find or show any adapters.	<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 <i>SANSurfer FC HBA Manager Application Help</i>).
SANSurfer FC HBA Manager user interface does not find or display any devices.	<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 <i>SANSurfer FC HBA Manager Application Help</i>).</p>
SANSurfer FC HBA Manager user interface reports that the adapter device driver is invalid or incorrect.	<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>
Unable to find <i>SANSurfer FC HBA Manager Application Help</i> .	<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 5-14). See “Software Requirements” on page 3-2 for supported browsers.</p>

Table 7-2. Troubleshooting: User Interface and Remote Agent Issues (Continued)

Problem	Cause and Solution
SANSurfer FC HBA Manager user interface does not automatically refresh.	<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 7-12). ■ For network requirements, see “System Requirements” on page 3-1 and “Installing SANSurfer FC HBA Manager” on page 4-1.
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 7-12). ■ 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 adapter 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 7-12). ■ Verify that no other application is causing SANSurfer FC HBA Manager to crash. ■ Verify that the operating system driver detects the adapter or device.
Host keeps disconnecting from and connecting to the FC/CNA 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 adapter or device was disconnected.</p>

Functional Issues

Table 7-3 lists functional problems that may occur with using SANsurfer FC HBA Manager, and provides possible causes and solutions.

Table 7-3. 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 adapters. ■ 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. When using a JBOD, you must individually configure and manually balance each device.</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 adapters in the FC/CNA 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 adapters in the FC/CNA 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 7-12).</p>

Table 7-3. Troubleshooting: Functional Issues (Continued)

Problem	Cause and Solution
Unable to display adapter Information, Adapter 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 7-12).</p>
Unable to display or modify the adapter parameters or the Utilities tab is missing.	<p>Cause:</p> <ul style="list-style-type: none"> ■ Adapter parameters are corrupted, or ■ Adapter Subsystem Identification/Subsystem Vendor Identification (SSID/SSVID) is missing from <code>adapter.properties</code>. <p>Solution: If the adapter parameters are corrupted, use FlashUTIL! to reflash the adapter parameters. If the SSVID/SSID 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 adapter.</p> <p>Solution: A loopback connector must be attached to the FC connector on the adapter. You must set the adapter parameter extended firmware Connection Options to 0 - Loop Only. For details, see “Preparing for the Loopback Test” on page 6-3.</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 7-3. Troubleshooting: Functional Issues (Continued)

Problem	Cause and Solution
Current Path dialog box does not display my saved configuration.	<p>Cause: The qlremote agent has not detected the saved configuration.</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 FC/CNA 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 FC/CNA 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 FC/CNA 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 FC/CNA 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 Adapter 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 adapter driver is installed. If the adapter driver is not installed, then install it (see the *SANsurfer FC HBA Manager Application Help* or the *QLogic Quick Start Guide*).

If you determine that the adapter 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 adapter driver.

To verify that the adapter 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 adapter port). On the shortcut menu, click **Properties**.
4. On the QLogic Fibre Channel Adapter Properties, click the **Driver** tab.
5. On the Driver 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 adapter port, as appropriate.

To verify that the adapter driver is installed on Netware:

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

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

To verify that the adapter 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 adapter driver is installed.

To verify that the adapter driver is installed on Macintosh:

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

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

To verify that the adapter 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 adapter 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 help system.

To verify that qlremote is installed and running on Windows:

1. Open the Computer Management/Services window (Figure 7-1).
2. Verify that the QLogic Management Suite Java agent service (**QLManagementAgentJava**) is running.

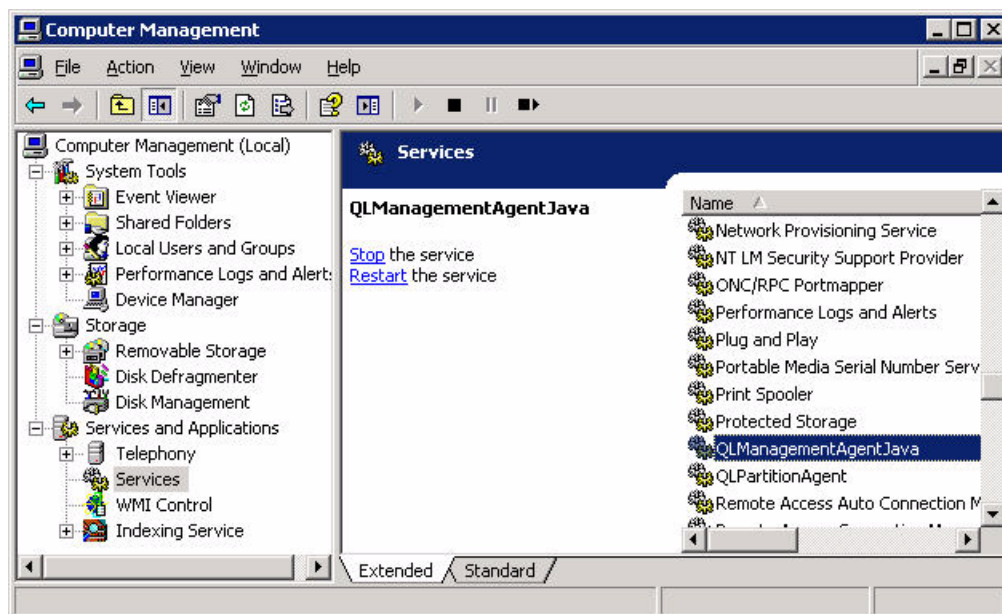


Figure 7-1 Windows: Services

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 the debug feature following the steps in this section, attempt to reproduce the problem to capture the SANsurfer FC HBA Manager and agent activity.

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:

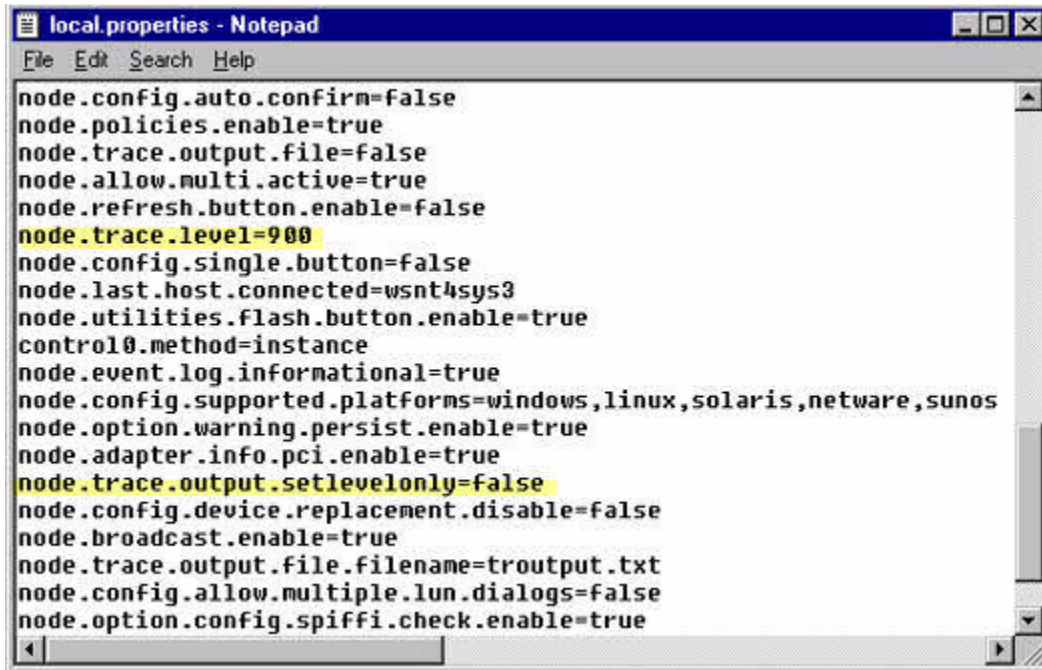
- [“Tracing SANsurfer FC HBA Manager User Interface Activity” on page 7-14](#)
- [“Exporting or Saving Agent Activity Logs” on page 7-19](#)

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: (See [Figure 7-2.](#))

```
node.trace.level=900  
node.trace.output.setlevelonly=false
```



```

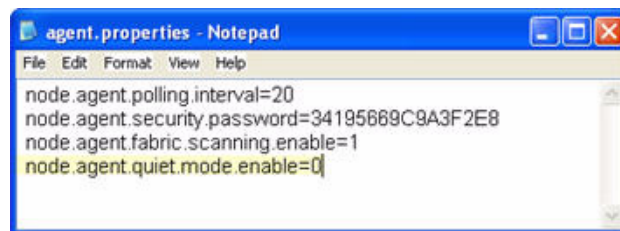
node.config.auto.confirm=false
node.policies.enable=true
node.trace.output.file=false
node.allow.multi.active=true
node.refresh.button.enable=false
node.trace.level=900
node.config.single.button=false
node.last.host.connected=wsnt4sys3
node.utilities.flash.button.enable=true
control0.method=instance
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 7-2 Local.properties File

2. Edit the `agent.properties` file, which is located where SANsurfer is installed. Change the following property: (See [Figure 7-3](#).)

```
node.agent.quiet.model.enable=0
```



```

node.agent.polling.interval=20
node.agent.security.password=34195669C9A3F2E8
node.agent.fabric.scanning.enable=1
node.agent.quiet.mode.enable=0

```

Figure 7-3 Agent.properties File

3. 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.

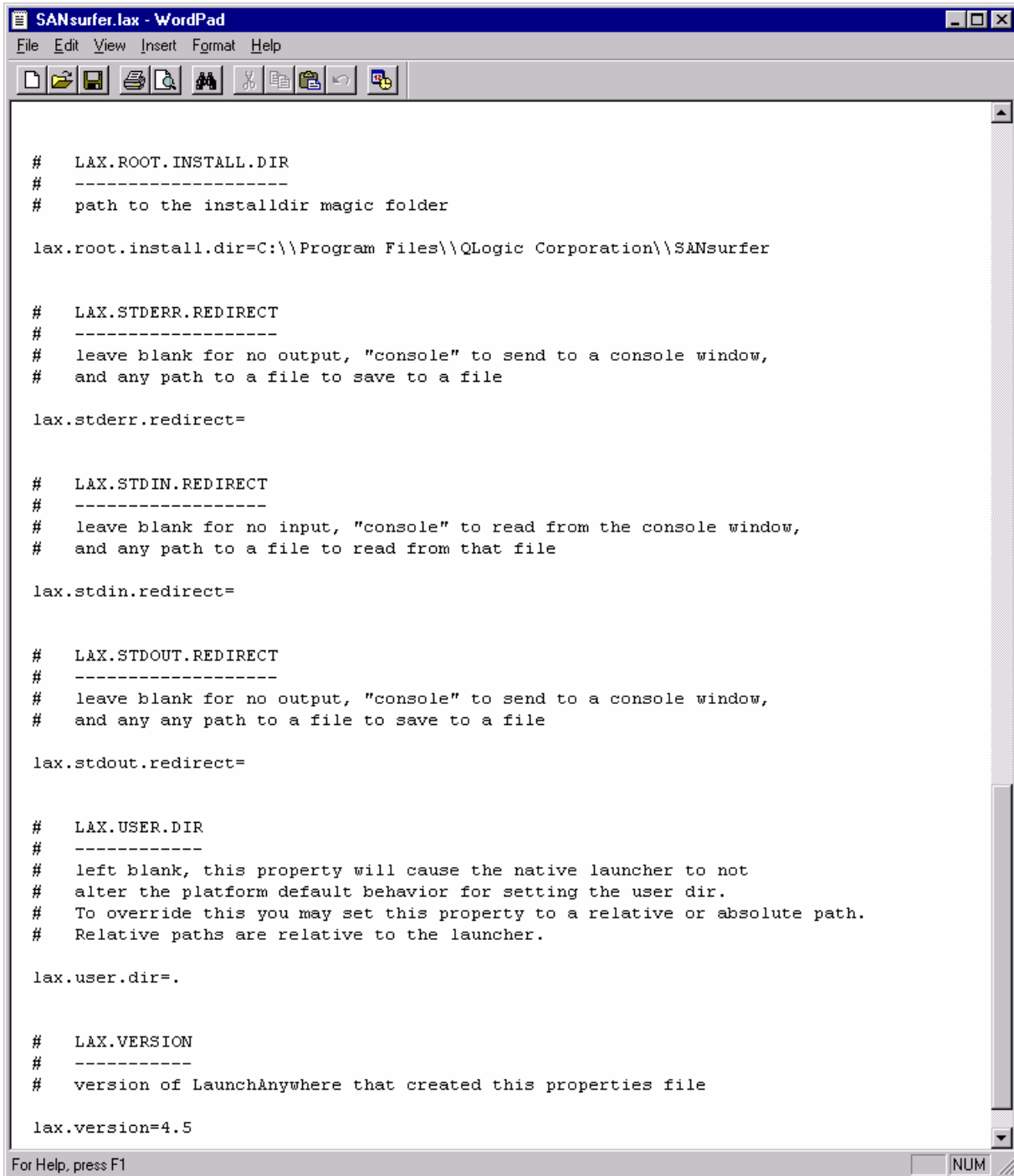
- Edit the file so that the information appears on the console. Change the following properties:

```
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 7-4 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

```

For Help, press F1

Figure 7-4 SANsurfer.lax File Example

4. 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 7-5).

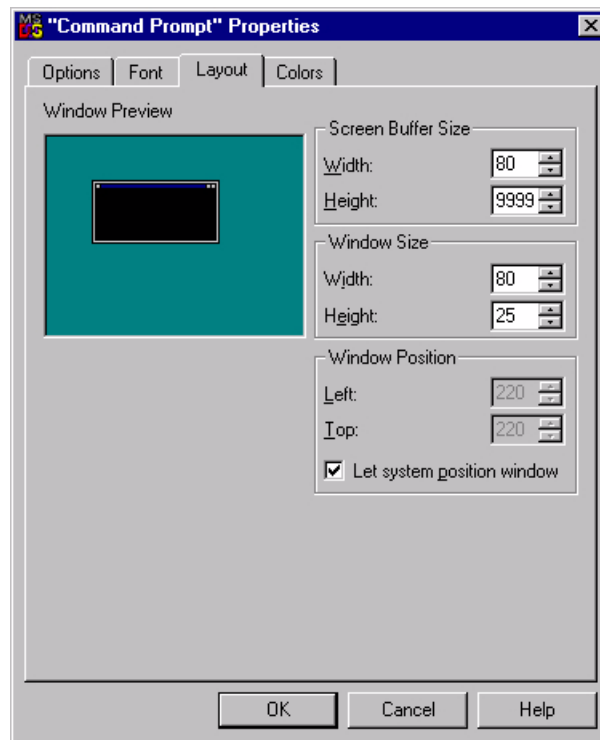


Figure 7-5 “Command Prompt” Properties Dialog Box

- 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**.
5. 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 7-19](#)
- [“Exporting or Saving the Agent Logs” on page 7-19](#)

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.** Use the 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 the steps below 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 3](#)). 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 the steps below 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 3](#)). 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 to 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+BACK-SPACE	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

Table B-1. Shortcut Keys (Continued)

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

Glossary

Adapter

See [HBA](#) and [CNA](#).

AL_PA

Arbitrated Loop_Physical Address. This is a low-level address on the [FC](#) loop.

Arbitrated loop

A non-point-to-point circular topology that connects two or more ports, but only two ports can communicate at one time. The network passes all communication through all ports connected onto the loop.

BIOS

Basic Input/Output System. An [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 adapters is required if the computer system is booting from a storage device (boot device) attached to the QLogic adapter.

The primary function of the boot code is communication with the external boot device before the operating system is up and running. The boot code can also perform secondary functions, including managing the setup for the adapter and initializing and testing the adapter's [ISP](#).

Boot device

The hard disk that contains the operating system that the [BIOS](#) uses to boot from when the computer is started.

CNA

Converged Network Adapter. CNAs support both data networking (TCP/IP) and storage networking (FC) traffic on a single I/O adapter using two new technologies: [Enhanced Ethernet](#) and [Fibre Channel over Ethernet \(FCoE\)](#).

CRC

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

CSV file

Comma Separated Values file.

DCBX

Data Center Bridging Exchange. A networking protocol that allows switches and their target devices to automatically exchange Ethernet parameters.

Device

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

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, and so on. 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 driver 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 adapter driver. It communicates directly to the SCSI adapter.

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 adapters.
- **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 adapters, disks, tapes, network adapters, 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 adapter driver. It communicates directly to the SCSI adapter.

Echo diagnostic test

Test that transmits a received signal back to the sender to verify the integrity of the device.

Enhanced Ethernet

New enhancements to the existing Ethernet standard that eliminate Ethernet's inherently lossy nature and make 10Gb Ethernet a viable storage networking transport. (Also called DataCenter Ethernet or Converged Enhanced Ethernet.)

Fabric

Consists of cross-connected [FC](#) devices and switches.

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.

FC

Fibre Channel. A high-speed serial interface technology that supports other higher layer protocols, such as [iSCSI](#) and [IP](#), which is primarily used in [SANs](#). ANSI standardized Fibre Channel in 1994.

FCode

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

FCoE

Fibre Channel over Ethernet. FCoE is a new technology defined by the T11 standards body that allows traditional FC storage networking traffic to travel over an Ethernet link by encapsulating FC frames inside Layer 2 Ethernet frames. For more information, visit www.fcoe.com.

Flash

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

Flash BIOS

Flash programmable read-only memory (PROM) that contains the code for booting from the adapter at startup.

HBA

Host Bus Adapter. The board that interfaces between the host system and device. HBA is synonymous with *host adapter*, *adapter*, and *adapter board*.

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 adapter port alias.

HBA port beacon

A SANsurfer FC HBA Manager feature that enables you to flash the adapter's LED to locate the adapter in your computer.

IOCB

I/O Control Block. A command structure in QLogic **ISP** architecture.

ioctl

Input/output (I/O) control. 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.

IP

Internet Protocol. A method by which data is sent from one computer to another over the Internet. IP specifies the format of packets, also called datagrams, and the addressing scheme.

iSCSI

Internet Small Computer Systems Interface.

ISP

Intelligent Storage Peripheral. QLogic trademark and family of Fibre Channel and iSCSI controller chips that replace network interface chips in network adapters, servers, and storage.

JBOD

Just a Bunch Of Disks.

JNLP

Java Network Launching Protocol. The protocol, defined in an XML file format, that specifies how Java Web Start applications are launched.

LIP

Loop Initialization Process. The initialization process in an arbitrated loop that occurs when the loop is powered up or a new device is added. One function of a LIP is to assign addresses. All data transmission on the loop is suspended during a LIP.

Load balancing

A software feature that improves system performance by balancing device access between multiple **HBA**s 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 **HBA**.

LUN

Logical Unit Number. 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 **LUN**s to specific servers or hides LUNs from specific servers for maximum access and availability control.

Media

Electronic 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.

NPIV

N_Port ID Virtualization. A Fibre Channel facility that allows multiple N_Port IDs to share a single physical N_Port. This allows multiple FC initiators to occupy a single physical port. (See [Port.](#))

NVRAM

NonVolatile Random Access Memory. Memory that stores [HBA](#) configuration settings. You can configure adapter 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.

Path

A combination of an [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 adapter (initiator) and the target port.

Because a path is a combination of an adapter and a target port, a path is distinct from another path if it is accessed through a different adapter and/or it is accessing a different target port. Consequently, when switching from one path to another, the driver might be selecting a different adapter (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.

QoS

Quality of Service. Service Level Agreement (SLA) that ensures business continuity when transmitting data over virtual ports by setting priorities and allocating bandwidth.

SAN

Storage Area Network. A high-speed network that interconnects multiple storage units and servers used by a larger network of users.

SCSI

Small Computer System Interface. 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. A cooperative effort that defines a non vendor-specific failover mechanism.

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.

T11

A subcommittee of the International Committee for Information Technology Standards (INCITS) that establishes the standards for Fibre Channel technology.

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

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](#) configurations.

WWPN

World Wide Port Name. A unique name assigned to a each port on a device. One [WWNN](#) (world wide node name) may contain multiple [WWPN](#) addresses.

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