USER'S GUIDE

MyStorage® Management Software

May 2006

Version 2.0

LSI LOGIC®

DB15-000308-03

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Preface

This book is the primary reference and user's guide for the LSI Logic MyStorage® management software. It contains a functional description of this software, as well as installation instructions.

Audience

This document assumes that you have some familiarity with Fibre Channel or SAS protocol and the SAN environment and related support devices.

Organization

This document has the following chapters:

- Chapter 1, **MyStorage Management Software Overview**, describes the MyStorage software features and benefits, and host adapter and operating system support.
- Chapter 2, **MyStorage Management Software Installation**, describes the installation details for the MyStorage management software.
- Chapter 3, **Getting Started with MyStorage Management Software**, provides an overview of how to operate the MyStorage management software.
- Chapter 4, **Operating Fibre Channel MyStorage Management Software**, provides an overview of how to operate the MyStorage management software for Fibre Channel host adapters.
- Chapter 5, **Operating SAS/SATA MyStorage Management Software**, provides an overview of how to operate the MyStorage management software for SAS/SATA expanders and host adapters.
- Appendix A, **Enable Boot Option for Fibre Channel HBAs**, describes how to enable the LSI host adapter so that the host computer may optionally boot OS code loaded on a Fibre Channel disk or RAID array.

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Related Publications

LSIFC929XL Dual Channel Fibre Channel I/O Processor Technical Manual, October 2005 (Document No. DB14-000272-01)

LSIFC949X Dual Channel Fibre Channel I/O Processor Technical Manual, November 2005 (Document No. DB15-000284-02)

LSIFC949E Fibre Channel I/O Processor Technical Manual, February 2006 (Document No. DB15-000345-00)

LSISAS1064 PCI-X to 4-port SAS/SATA Controller Technical Manual, October 2005 (Document No. DB15-000274-05)

LSISAS1068 PCI-X to 8-port SAS/SATA Controller Technical Manual, October 2005 (Document No. DB15-000287-04)

LSISAS1064E PCI-Express to 4-port SAS/SATA Controller Technical Manual, April 2005 (Document No. DB15-000331-00)

LSISAS1068E PCI-Express to 4-port SAS/SATA Controller Technical Manual, April 2005 (Document No. DB15-000330-00)

LSISASx12/LSISASx12A 3.0 Gbit/s SAS/SATA Expander Technical Manual, October 2005 (Document No. DB15-000277-04)

LSISASx28 28-port SAS/SATA Expander Technical Manual, October 2005 (Document No. DB15-000335-01)

LSISASx36 36-port SAS/SATA Expander Technical Manual, October 2005 (Document No. DB15-000334-01)

Fusion-MPT™ Device Management User's Guide, August 2002 (Document No. DB15-000186-01)

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Revision History

Document Number	Version/Date	Remarks
DB15-000308-03	Version 2.0 May 2006	Added new Fibre Channel and SAS product information. Updated Table 1.1 to indicate support for additional boards.
DB15-000308-02	Version 1.01 March 2004	Removed dynamic multipathing feature.
DB15-000308-01	Version 1.0 February 2004	Added “Remote Node Management” description in Section 4.2.
DB15-000308-00	Version 0.5 December 2003	Initial release of document.

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Chapter 1
MyStorage Management Software Overview

This chapter contains an overview of the LSI MyStorage management software. This chapter describes these topics:

- Section 1.1, “MyStorage Management Software Overview”
- Section 1.2, “MyStorage Benefits and Features”
- Section 1.3, “Host Adapter and Operating System Support”

1.1 MyStorage Management Software Overview

MyStorage management software is designed to simplify storage area network (SAN) management and reduce SAN installation time. MyStorage management software automates the task of configuring an LSI storage adapter and connecting to storage devices. Features include host adapter information screens, diagnostics, and statistics gathering.

MyStorage management software was written with the industry standard Java programming language, making it portable across multiple operating systems. LSI offers MyStorage management software for Windows and Linux environments.

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1.2 MyStorage Benefits and Features

Following are the key features and benefits of MyStorage management software:

- Easy to use – installation and configuration in just a few clicks
- Includes installation of compatible adapter OS driver
- Intuitive point-and-click management console
- Supports installation on a laptop for remote administration
- Use to update host adapter Controller Firmware
- Use to update host adapter BIOS
- Use to update host adapter F-code for Fibre Channel adapters
- Use to set Device persistence of Fibre Channel adapters
- Consolidated multi-node health check of Fibre Channel adapters
- One-click diagnostics to analyze server to storage connection
- Inspect event logs
- Retrieve adapter performance statistics
- Remote management
- SNIA API V2.0 compliant
- Industry Standard SAS CSMI .83, MPI 1.5, and SAS 05 compliant

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1.3 Host Adapter and Operating System Support

This document supports the MyStorage management software and operates in conjunction with any of the LSI FC host adapters shown in Table 1.1.

Table 1.1 LSI Host Adapter Compatibility

Supported LSI Host Adapter[1]	Description
LSI7102XP	Single-channel, 2 Gbit/s FC, PCI-X (64 bit, 133 MHz)
LSI7202XP	Dual-channel, 2 Gbit/s FC, PCI-X (64 bit, 133 MHz)
LSI7402XP	Quad-channel, 2 Gbit/s FC, PCI-X (64 bit, 133 MHz)
LSI7402EP	Quad-channel, 2 Gbit/s FC, PCI Express (x4)
LSI7104XP	Single-channel, 4 Gbit/s FC, PCI-X (64 bit, 133 MHz)
LSI7204XP	Dual-channel, 4 Gbit/s FC, PCI-X (64 bit, 133 MHz)
LSI7104EP	Single-channel, 4 Gbit/s FC, PCI Express (x8)
LSI7204EP	Dual-channel, 4 Gbit/s FC, PCI Express (x8)
LSI7404EP	Quad-channel, 4 Gbit/s FC, PCI Express (x8)
LSISAS3041X	4-port, Internal connectors PCI-X
LSISAS3442X	8-port, Internal and external connectors, PCI-X
LSISAS3443X	8-port, Internal and external mini-SAS connectors, PCI-X
LSISAS3080X	8-port, Internal connectors, PCI-X
LSISAS3800X	8-port, External connectors, PCI-X
LSISAS3801X	8-port, External mini-SAS connectors, PCI-X
LSISAS3041E	4-port, Internal connectors, PCI Express (x8)
LSISAS3442E	8-port, Internal and external connectors, PCI Express (x8)
LSISAS3080E	8-port, Internal connectors, PCI Express (x8)
LSISAS3081E	8-port, External mini-SAS connectors, PCI Express (x8)
LSISAS3800E	8-port, External connectors, PCI Express (x8)
LSISAS3801E	8-port, External mini-SAS connectors, PCI Express (x8)

1. The host server may be an Intel or AMD IA-32 hardware platform with appropriate expansion slots for PCI, PCI-X or PCI Express. The listed families of host adapters require PCI slots that supply 3.3 V to the PCI device.

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MyStorage management software is distributed on CD and may be installed on any of the operating systems shown in Table 1.2 and Table 1.3.

Table 1.2 MyStorage Fibre Channel OS Compatibility

Supported Operating System	Description
Windows Server 2003	Service pack 1 or greater
Windows 2000	Service pack 4 or greater
Linux SUSE Enterprise 9.0, SP1	Kernel v2.6.21-138
Linux Red Hat Enterprise Server (ES) 3.0	Kernel v2.4.21-4.EL
Linux Red Hat Enterprise Server 4.0	Kernel v2.6

Table 1.3 MyStorage SAS/SATA OS Compatibility

Supported Operating System	Description
Windows Server 2003	Service pack 1 or greater
Windows 2000	Service pack 4 or greater
Linux SUSE Enterprise 9.0, SP1	Kernel v2.6.21-138
Linux Red Hat Advanced Server (AS) 3.0	Kernel v2.4.21-4.EL
Linux Red Hat Enterprise Server 4.0	Kernel v2.6

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Chapter 2
MyStorage Management Software Installation

This chapter provides installation details for the LSI MyStorage management software. This chapter includes these topics:

- Section 2.1, “Introduction”
- Section 2.2, “Installation with Windows 2000/Windows Server 2003”
- Section 2.3, “Installation with Linux”
- Section 2.4, “Uninstalling MyStorage Management Software”

2.1 Introduction

LSI provides an InstallShield package to facilitate fast and accurate software installation. LSI distributes this package as an executable program available for each supported operating system. The InstallShield package loads all the components necessary to manage the LSI storage adapter.

2.2 Installation with Windows 2000/Windows Server 2003

Install the MyStorage management software using these steps for Windows 2000 or Windows Server 2003 operating systems.

Step 1. Boot your machine and log in as administrator. Insert the CD containing the MyStorage management software.

Note: If the Windows OS does not provide a “Found New Hardware Wizard” window (Figure 2.1), skip to Step 6.

Step 2. Click “Next”.

Step 3. The “Install software automatically”.

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Figure 2.1 Found New Hardware Wizard Window

Step 4. Win2000: Select “CD-ROM search location”.

Win2003: Proceed with next step.

Step 5. Accept whichever driver Windows suggests.

Note: Later the MyStorage installer auto-updates if necessary.

Step 6. The “Found New Hardware Wizard” window appears for each LSI adapter. Repeat steps 2 through 5 for each occurrence.

Step 7. Next click the MyStorage icon located in the top directory of the install CD.

The “MyStorage Installer” window appears as shown in Figure 2.2.

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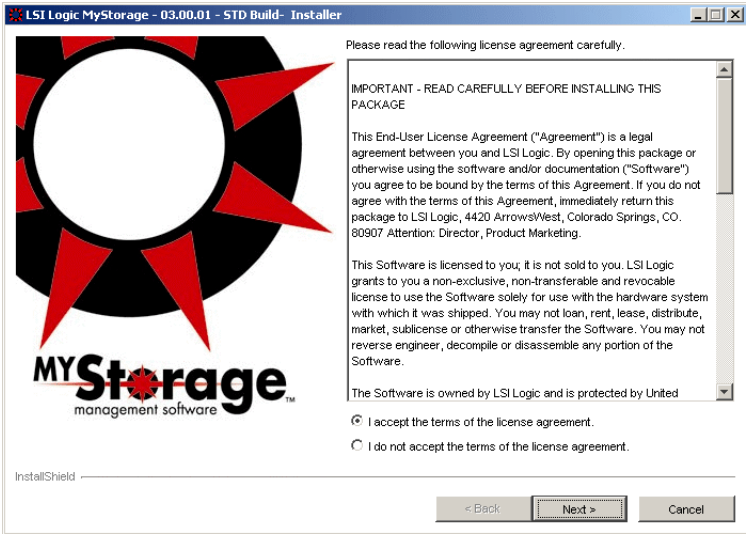
Figure 2.2 MyStorage Installer Window



Step 8. Review the license agreement. Choose “I accept...” and click “Next” if you intend to install the MyStorage software.

Step 9. Validate the default installation directory. Click “Next”.

Step 10. After several seconds, the installation completes. The installation process requires that you restart your computer before using the MyStorage management software, as shown in Figure 2.3. Select “Yes, restart my computer”; then click “Finish”.

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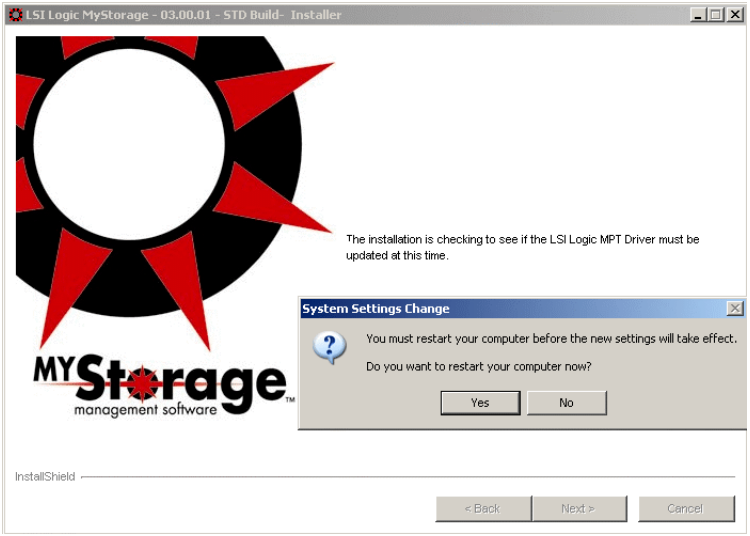
Figure 2.3 MyStorage Install Complete Window



Step 11. You are now ready to launch the MyStorage management software from your desktop.

Note: Several MyStorage functions require a security password. The default password for new MyStorage installations is (all lowercase):

`lsistorage`

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2.3 Installation with Linux

Install the MyStorage management software using these steps for Linux operating systems.

Step 1. Boot your machine and log in as root.

Step 2. If at the command console, type `startx`.

Step 3. Insert the CD containing the MyStorage management software.

Step 4. If the Linux OS does not automount the CD, open the terminal window and type:

```
# mkdir /mnt/cdrom
# mount /dev/cdrom /mnt/cdrom
```

Step 5. Determine the LSI driver version by typing:

```
# cat /proc/mpt/version
```

Compare the above version with the one supplied on the CD-ROM:

```
# cd /mnt/cdrom/drivers/linux
# ls
```

If the CD contains a newer Linux driver, install the driver compatible with your Linux OS. For example,

```
# cd /mnt/cdrom/drivers/linux
```

Choose the correct kernel.

Step 6. Install the source RPM (for Errata Kernel) by running

```
#rpm -ivh mptlinux-<version>-<release>.<arch>.src.rpm
```

Step 7. Go to the directory where the mptlinux.spec file was installed.

On Red Hat this is /usr/src/redhat/SPECS

On SUSE this is /usr/src/packages/SPECS

Step 8. To build the binary RPM, execute the command

```
rpmbuild -bb mptlinux.spec
```

from the directory where the mptlinux.spec file is located.

Note: SLES 8 users should replace “rpmbuild” with simply “rpm” in the above command.

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Step 9. RPM is located on the Red Hat OS at /usr/src/redhat/RPMS/i386 or on SUSE at /usr/src/packages/RPMS/i386.

Note: If you are creating the binary RPM on another architecture, substitute “i386” with your architecture. You can run

```
uname -m
```

to get the architecture. However, sometimes the binary RPM still appears in the i386 directory even if you are running on a different architecture.

Step 10. Installing the drivers from the created binary RPM: After the binary RPM has been created, it can then be installed. From the directory where the RPM was created, use the following command to install the RPM:

```
rpm -ivh mptlinux-<version>-<release>.<arch>.rpm
```

Step 11. Launch the MyStorage Installer for Linux (.bin) located in the top directory of the CD.

```
# cd /mnt/cdrom
# ./MyStorageInstaller_Linux_LSI_xxxxxxxxxxx.bin
```

Step 12. When the installation is complete, you can run the MyStorage management software from your computer by typing:

```
# cd /opt/LSILogic/MyStorage
# ./MyStorage
```

or by launching the MyStorage software directly from the application menu.

Note: Several MyStorage functions require a security password. The default password for new MyStorage installations is (all lowercase):

```
lsistorage
```


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2.4 Uninstalling MyStorage Management Software

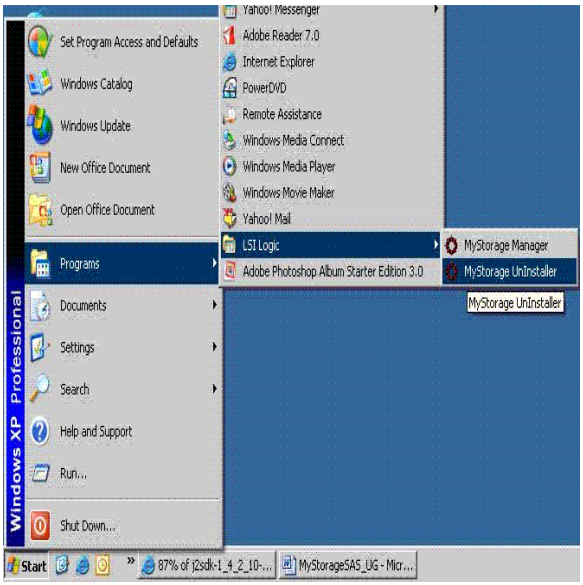
This section contains detailed instructions for how to uninstall MyStorage management software.

2.4.1 Uninstalling MyStorage Management Software in Windows

MyStorage management software can be uninstalled in two ways.

1. Go to Start>Programs>LSI Logic>MyStorage Uninstall. Launch the uninstaller as shown in Figure 2.4.

Figure 2.4 MyStorage Uninstaller from the Programs Menu



2. The second method is to go to Start>Settings>Control Panel. Run “Add/Remove Programs”, go to LSI Logic>MyStorage Uninstaller, select “LSI Logic MyStorage - 03.XX.XX STD Build” (Figure 2.5), and remove the installation of the MyStorage management software.

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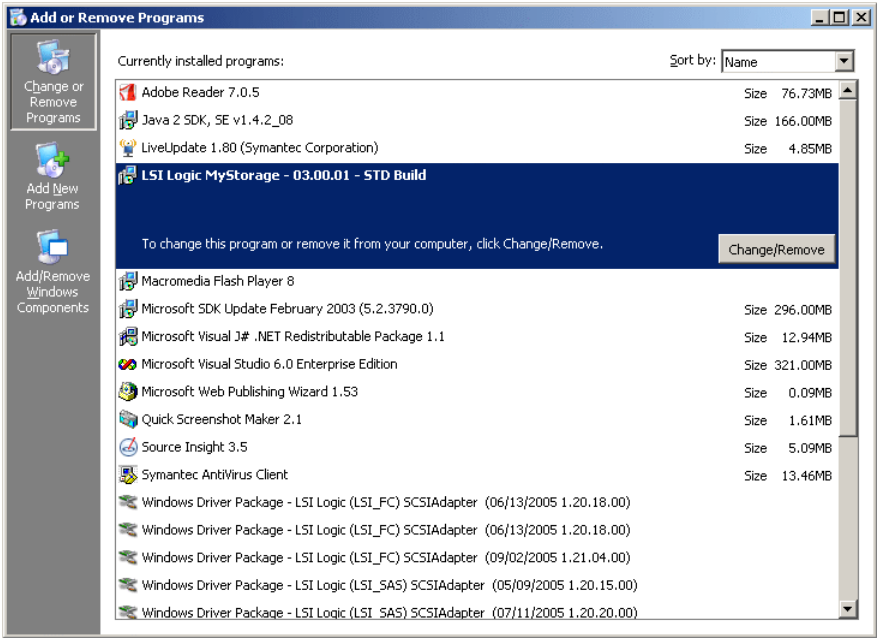
Figure 2.5 MyStorage Uninstall Using “Add or Remove Programs”



After the installation screen, click **Next** (see Figure 2.6). The automated uninstall begins. After the uninstall is complete, the uninstaller may ask for a system reboot.

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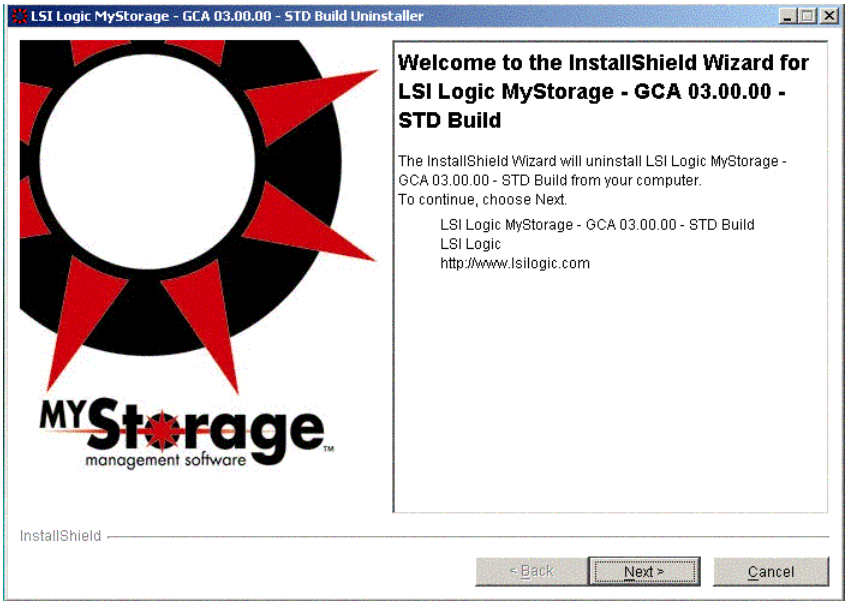
Figure 2.6 Automatic Uninstall



2.4.2 Uninstalling MyStorage Management Software in the Linux OS

To uninstall MyStorage management software in the Linux OS, run the uninstall.sh file:

```
# cd /opt/LSILogic/MyStorage
# ./uninstall.sh
```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Chapter 3
Getting Started with MyStorage Management Software

This chapter provides an overview of launching MyStorage management software, assigning remote hosts and security. This chapter includes these topics:

- Section 3.1, “Launching MyStorage Management Software”
- Section 3.2, “Remote Host Management”
- Section 3.3, “MyStorage Security and Passwords”

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3.1 Launching MyStorage Management Software

Windows Operating Systems – After installing the MyStorage software, locate the MyStorage icon (as Figure 3.1 shows) placed on the desktop during the installation process and double-click it.

Figure 3.1 MyStorage Management Icon

Linux Operating Systems – After installing the MyStorage management software, open a terminal window and type

```
# cd /opt/LSILogic/MyStorage
# ./MyStorage
```

This launches the MyStorage management software. From this screen, you can manage all the adapters installed in this computer. Alternatively, you can manage adapters installed in remote computers, if the computers are networked. MyStorage software must be installed on each computer system for its adapter(s) to appear in the MyStorage management screens. Figure 3.2 shows the screen that appears when MyStorage software is first launched.

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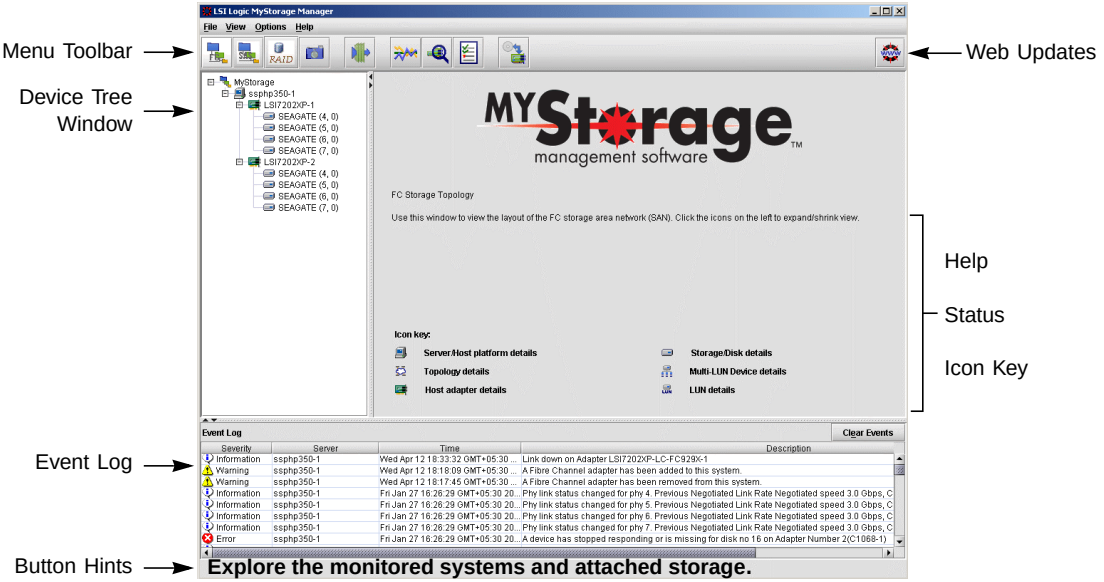
Figure 3.2 MyStorage Launch Window



Note: Press F5 to refresh/redraw ANY screen.

You may navigate through the various functions provided by MyStorage software using the icons across the top of the pop-up window. The Fibre Channel functions are summarized in Table 3.1. The SAS/SATA functions are summarized in Table 3.2.

Table 3.1 MyStorage Fibre Channel Functions

Icon	Function/Description
	Storage Topology. Click this icon to gather information about the LSI host adapters and the storage devices to which they connect. Refer to Section 4.1, “Storage Topology: LSI Fibre Channel Adapters,” page 4-1 and Section 4.2, “Storage Topology: Fibre Channel Storage Devices,” page 4-7 for details.
	Device Persistence. Click this icon to “lock” information about a Fibre Channel device into host adapter memory. Refer to Section 4.3, “Device Persistence,” page 4-11 for details.

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Table 3.1 MyStorage Fibre Channel Functions (Cont.)

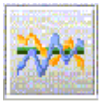
Icon	Function/Description
	Event Filter. Click this icon to filter events that are logged by the MyStorage management software. Refer to Section 4.4, “Event Filter,” page 4-14 for details.
	**Host Adapter Statistics.** Click this icon to gather performance statistics from the selected host adapter. Refer to Section 4.5, “Adapter Statistics,” page 4-15 for details.
	Host Adapter Diagnostics. Click this icon to perform host adapter diagnostics. Refer to Section 4.6, “Adapter Diagnostics,” page 4-17 for details.
	Consolidated Health. Click this icon to run comprehensive SAN diagnostics on all computers being monitored. Refer to Section 4.7, “Consolidated Health,” page 4-19 for details.
	Backup/Restore/Update Host Adapter Firmware. Click this icon to back up, restore, or update the software loaded on the LSI host adapter. Refer to Section 4.8, “Backup/Restore/Update Adapter Firmware,” page 4-22 for details.
	Launch Web Browser. Click this icon to open MyStorage product pages on the LSI web site. Refer to Section 4.9, “Launch Web Browser,” page 4-24 for details.

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Table 3.2 MyStorage SAS/SATA Functions

Icon	Function/Description
	Storage topology. Click this icon to gather information about the LSI host adapters and the storage devices to which they connect. Refer to Section 5.1, “Storage Topology: LSI SAS/SATA Adapters,” page 5-1; Section 5.2, “Storage Topology: LSI SAS/SATA Expanders,” page 5-7; and Section 5.4, “Storage Topology: Storage Devices,” page 5-12 for details.
	RAID Topology. Click this icon to view the layout of the RAID topology of the SAS adapters. Refer to Section 5.5, “RAID Topology: LSI SAS/SATA Adapters,” page 5-14 and Section 5.6, “RAID Topology: Storage Devices,” page 5-19 for details.
	Backup/Restore/Update Host Adapter Firmware. Click this icon to back up, restore, or update the software loaded on the LSI host adapter. Refer to Section 5.8, “Backup/Restore/Update Adapter Firmware,” page 5-23 for details.
	Launch Web Browser. Click this icon to open MyStorage product pages on the LSI web site. Refer to Section 5.9, “Launch Web Browser,” page 5-28 for details.

3.2 Remote Host Management

The MyStorage management software also can manage adapters in remote computers. The MyStorage software must have been previously installed on the remote computer.

3.2.1 MyStorage Options Menu

The Options pull-down menu (Figure 3.3) provides information about a remote host. In order to use remote management, an Ethernet (TCP/IP) connection must exist between the two servers. Upon clicking the “Remote Host” menu, the user can add or delete a remote host. For SAS adapters, a scan of the remote host system can also be performed.

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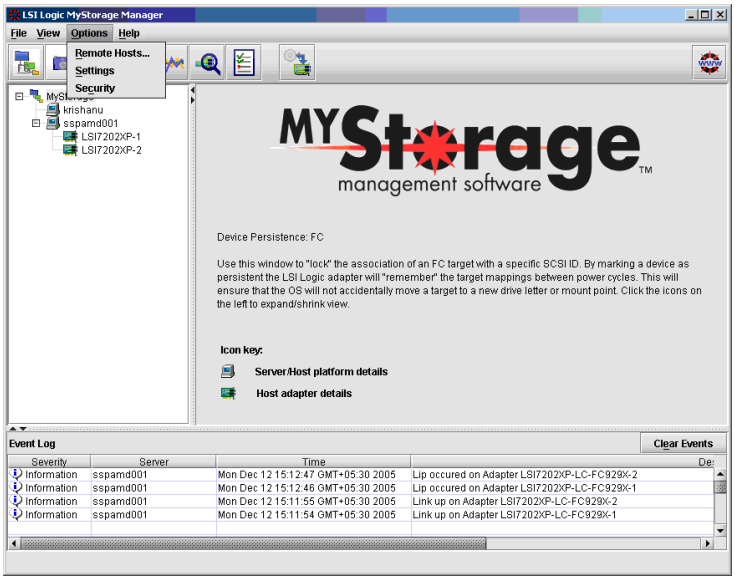
Figure 3.3 Remote Host Management Options



There are two options available for remote host management: “Remote Hosts...” and “Settings”.

3.2.2 Registering a Remote Host

Use the following steps to register a remote host.

Step 1. Select “Remote Hosts...” from the Options pull-down menu.

Step 2. In the “Remote Hosts...” window (Figure 3.4), click “Add”.

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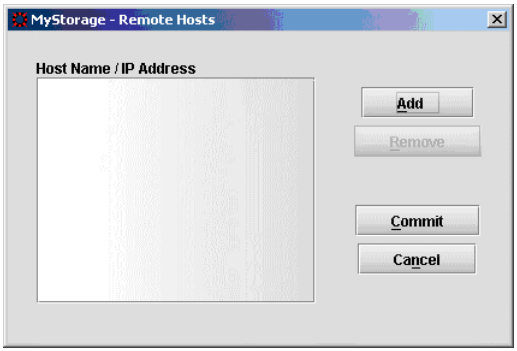
Figure 3.4 Remote Host Window



Step 3. Type the IP address or host name of the remote host you wish to register (Figure 3.5). Then click “OK”.

Figure 3.5 Entering the Remote Host Name

Step 4. With the remote host name or IP address highlighted in the “Remote Hosts” window, click “Commit” (Figure 3.6).

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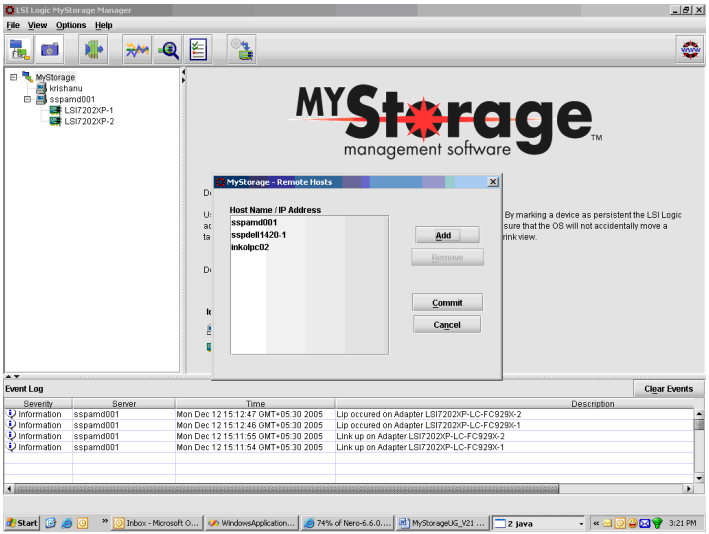
Figure 3.6 Adding the Remote Host



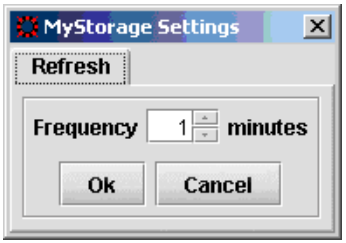
The remote host has now been added.

3.2.3 Setting the Discovery Interval

Use the following steps to set the refresh interval used for discovery on the network.

Step 1. Select “Settings” from the Options pull-down menu. The MyStorage management software displays a pop-up to set the discovery interval (as Figure 3.7 shows).

Figure 3.7 Discovery Interval



Step 2. Use the up-and-down arrows to select an appropriate interval.

Step 3. Click “OK”.

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3.3 MyStorage Security and Passwords

Several MyStorage functions require a security password. The default password for new MyStorage installations is (all lowercase):

```
lsistorage
```

3.3.1 Assigning a New Password

Users may individually assign a new password using the options menu.

Step 1. Select “Security” from the Options pull-down menu.

Step 2. A security window appears (Figure 3.8). Using the drop-down menu, chose a server for the new password assignment.

Figure 3.8 Security Window

Step 3. Click “Change Password”.

Step 4. Type both the new and old password as prompted.

Step 5. Click “OK”.

The new password is applied immediately to the computer identified in Step 2. All subsequent security-related operations require the new password.

3.3.2 Forgotten Password

Should the system administrator forget the current password, it is necessary to overwrite the existing password file. Accomplish this with the following steps:

Step 1. Go to the directory in which you originally installed the MyStorage management software. The Windows directory is

```
c:\Program Files\LSILogic\MyStorage
```


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The Linux default directory is

```
/opt/LSILogic/MyStorage
```

In that directory is the file “MyStorageOriginal.pwd”.

Step 2. Use the file “MyStorageOriginal.pwd” to overwrite the existing password file so that the password is set to the initial setting (`lsistorage`) using the following command:

In Windows:

```
copy c:\Program Files\LSILogic\MyStorage\MyStorageOriginal.pwd
%SYSTEMROOT%\system32\MyStorage.pwd
```

In Linux:

```
cp /opt/LSILogic/MyStorage/MyStorageOriginal.pwd /etc/MyStorage.pwd
```

Step 3. The password can then be reset as described in Section 3.3.1, “Assigning a New Password”.

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Chapter 4
Operating Fibre Channel MyStorage Management Software

This chapter provides an overview of how to operate the MyStorage management software for Fibre Channel Adapters and includes these topics:

- Section 4.1, “Storage Topology: LSI Fibre Channel Adapters”
- Section 4.2, “Storage Topology: Fibre Channel Storage Devices”
- Section 4.3, “Device Persistence”
- Section 4.4, “Event Filter”
- Section 4.5, “Adapter Statistics”
- Section 4.6, “Adapter Diagnostics”
- Section 4.7, “Consolidated Health”
- Section 4.8, “Backup/Restore/Update Adapter Firmware”
- Section 4.9, “Launch Web Browser”

4.1 Storage Topology: LSI Fibre Channel Adapters

This function provides an opportunity to explore the attributes of any LSI Fibre Channel host adapter installed in the computer, or remotely managed under the Options menu. After selecting the Storage Topology icon, highlight an LSI host adapter. The MyStorage management software provides detailed information in a series of five tabs. The first four tabs provide the following read-only information about the host adapter, as Figures 4.1 through 4.4 show.

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- Host Adapter Information Tab
- FC Port Information Tab
- PCI Microchip Information Tab
- Advanced FC Port Information Tab

Figure 4.1 Adapter Information Tab

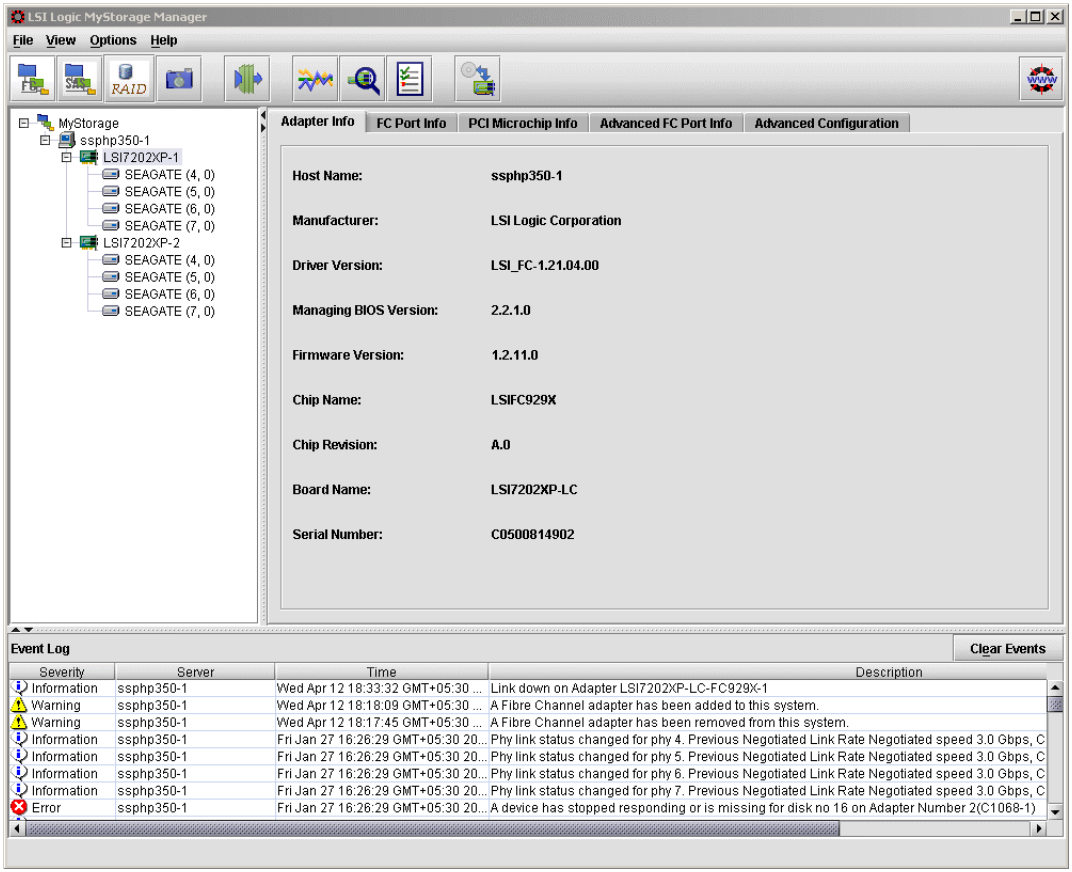

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Figure 4.2 FC Port Information Tab

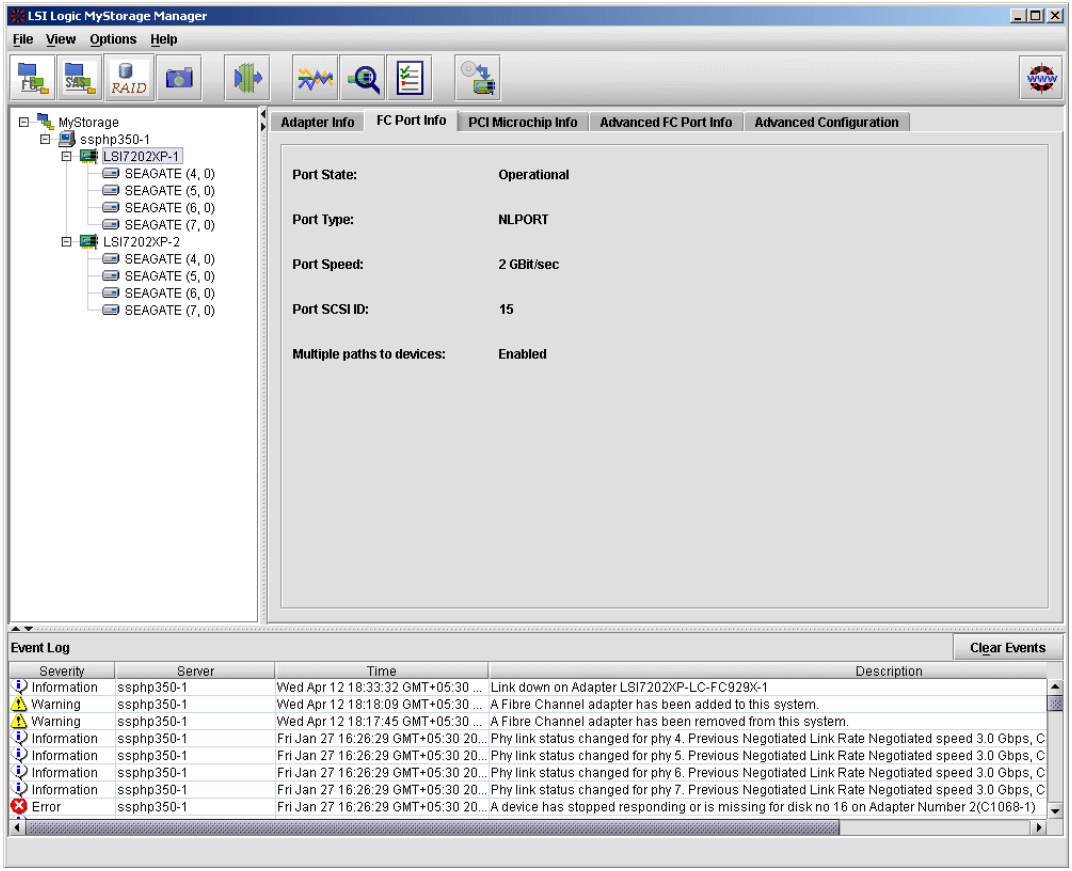

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Figure 4.3 PCI Microchip Information Tab

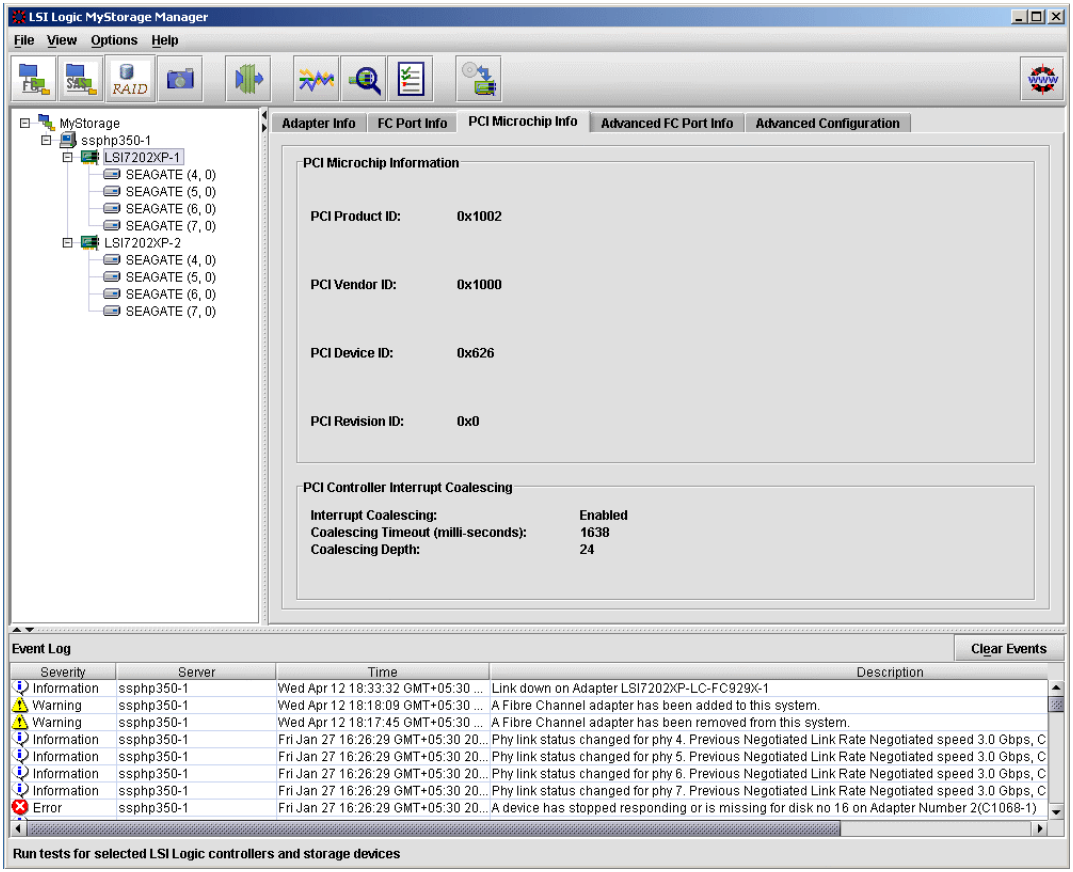

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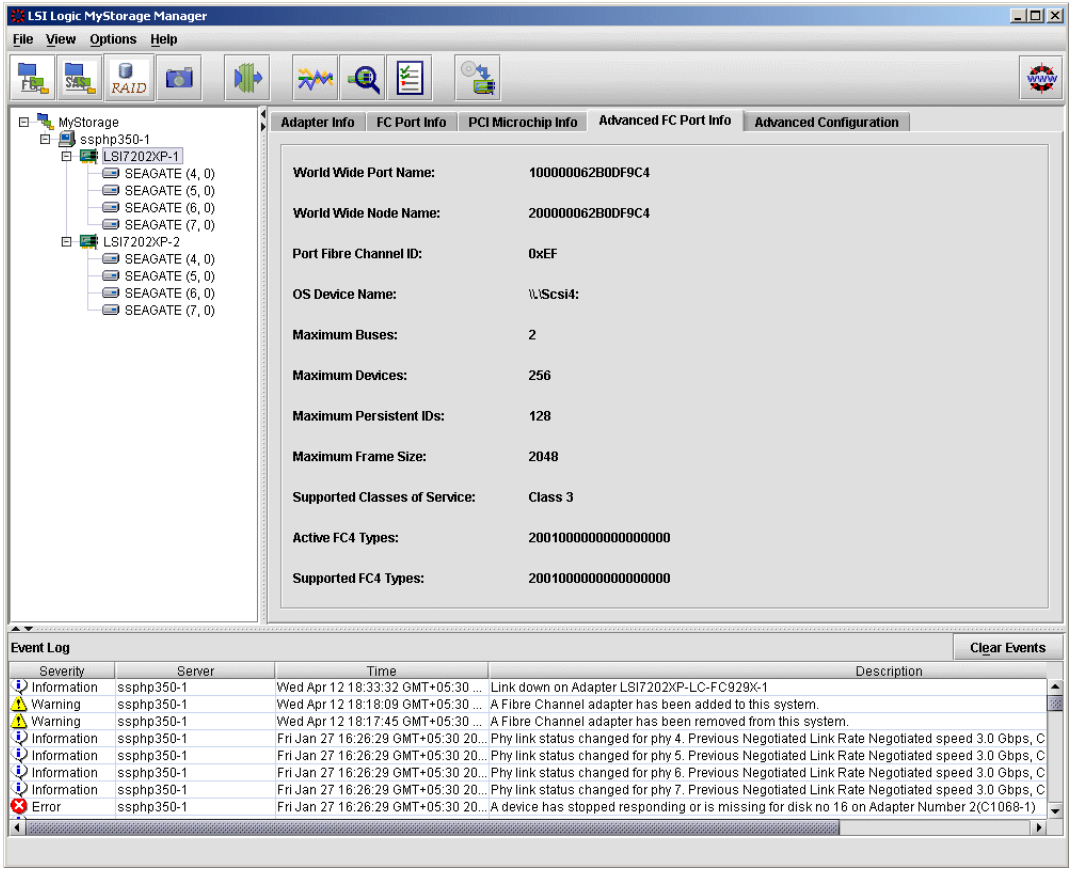
Figure 4.4 Advanced FC Port Information Tab



The fifth tab, labeled Advanced Configuration, provides an opportunity to adjust default settings of the LSI host adapter (as Figure 4.5 shows). The settings are described in the following sections.

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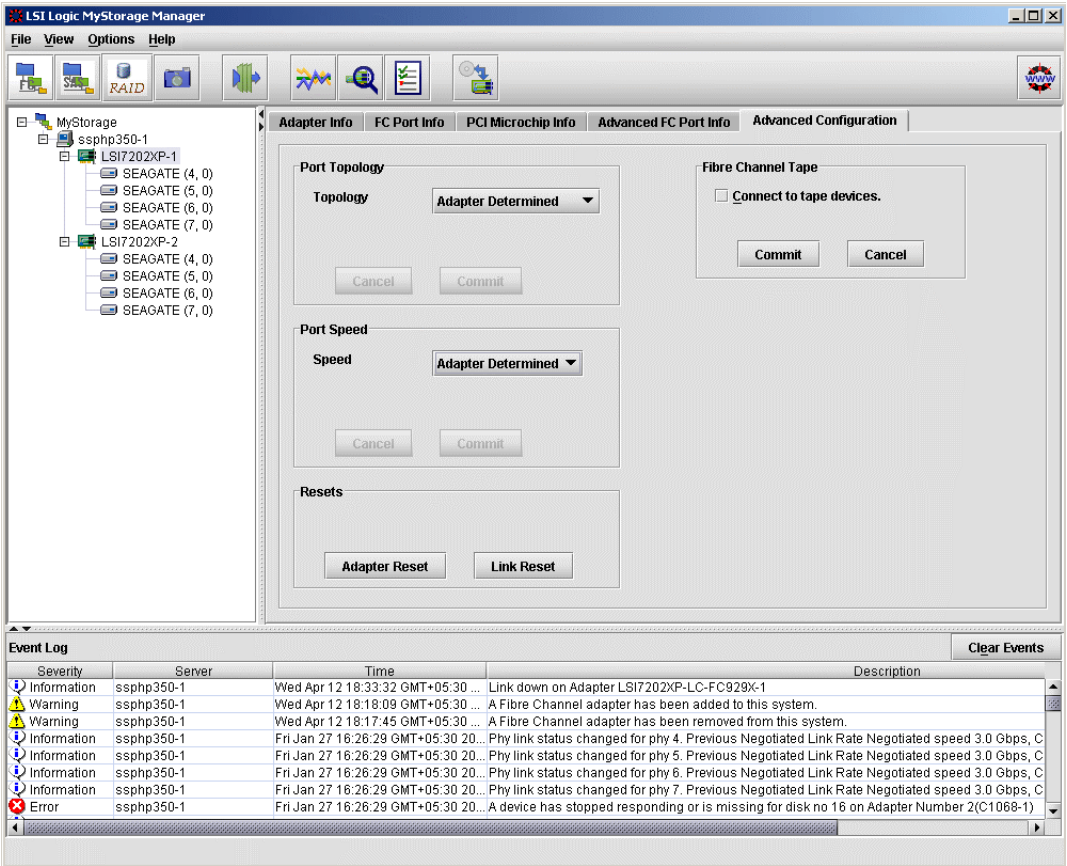
Figure 4.5 Advanced Configuration Tab



4.1.1 Topology

The Topology setting forces the host adapter to operate as “Point-to-Point or Fabric” or “Arbitrated Loop”. The default is to let the host adapter automatically detect and configure itself for either environment.
Factory default: Adapter Determined

4.1.2 Port Speed

The Port Speed setting configures the FC transmit and receive speed (1 Gbit/s, 2 Gbit/s, or 4 Gbit/s).
Factory default: Adapter Determined

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4.1.3 Adapter Reset

The Adapter Reset setting performs a complete host adapter reinitialization. The effect is to cycle power on the host adapter.

4.1.4 Link Reset

The Link Reset setting generates a link reinitialization sequence. This has an effect similar to unplugging the cable and reinserting it.

4.1.5 Fibre Channel Tape

If the adapter is connected to Fibre Channel tape drives, selecting this option enables enhanced connection management. This option instructs the LSI adapter to pay special attention when connecting to tape drives. Technically, the adapter operates to “maintain logins,” should link anomalies occur while tape backup or restore operations are in process.

4.2 Storage Topology: Fibre Channel Storage Devices

The MyStorage management software provides information about a storage device (target) in a series of three tabs as Figures 4.6 through 4.8 show. After you highlight the storage device, navigate the three tabs to view read-only information about that device.

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Figure 4.6 Target Information Tab

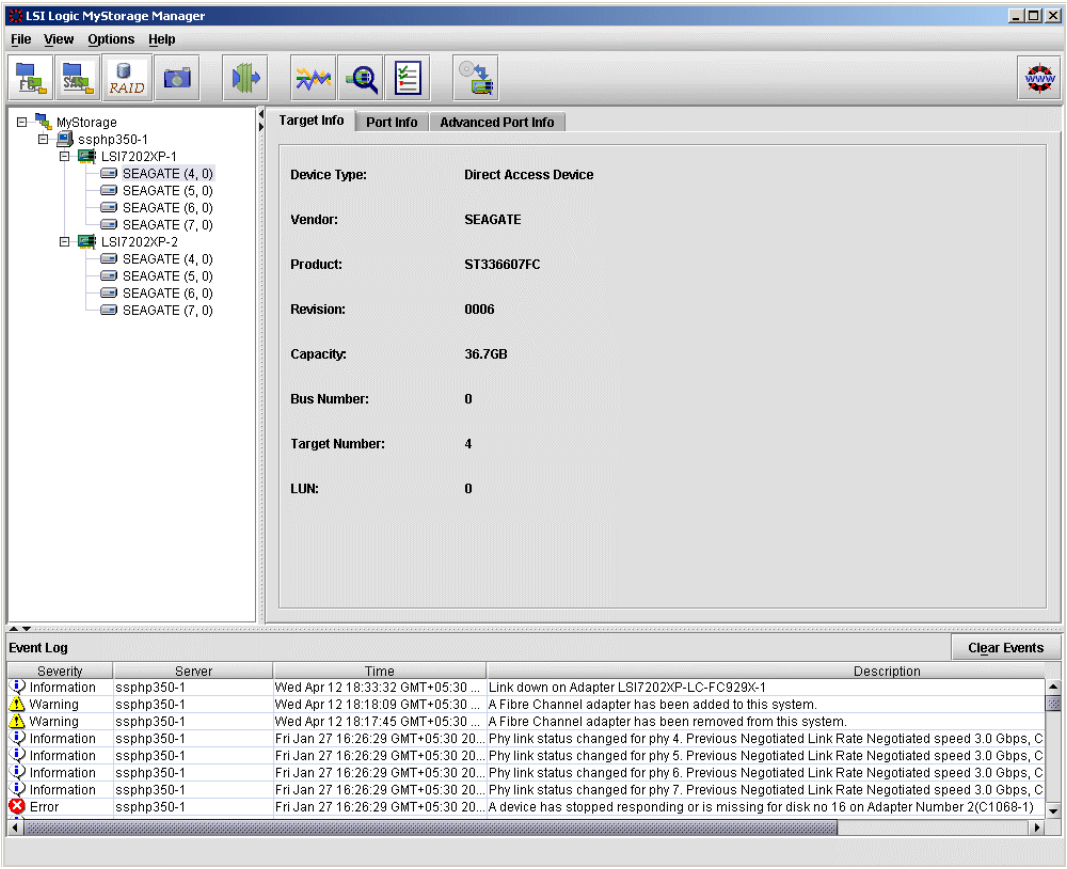

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Figure 4.7 Port Information Tab

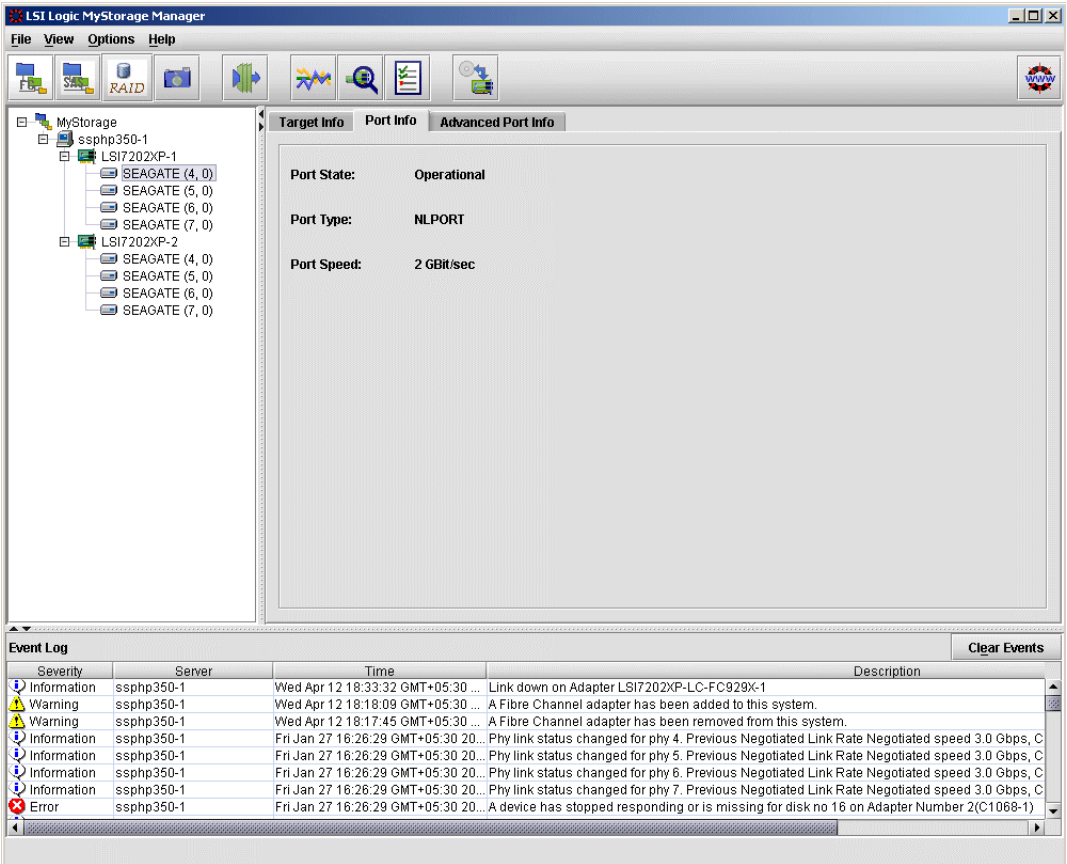

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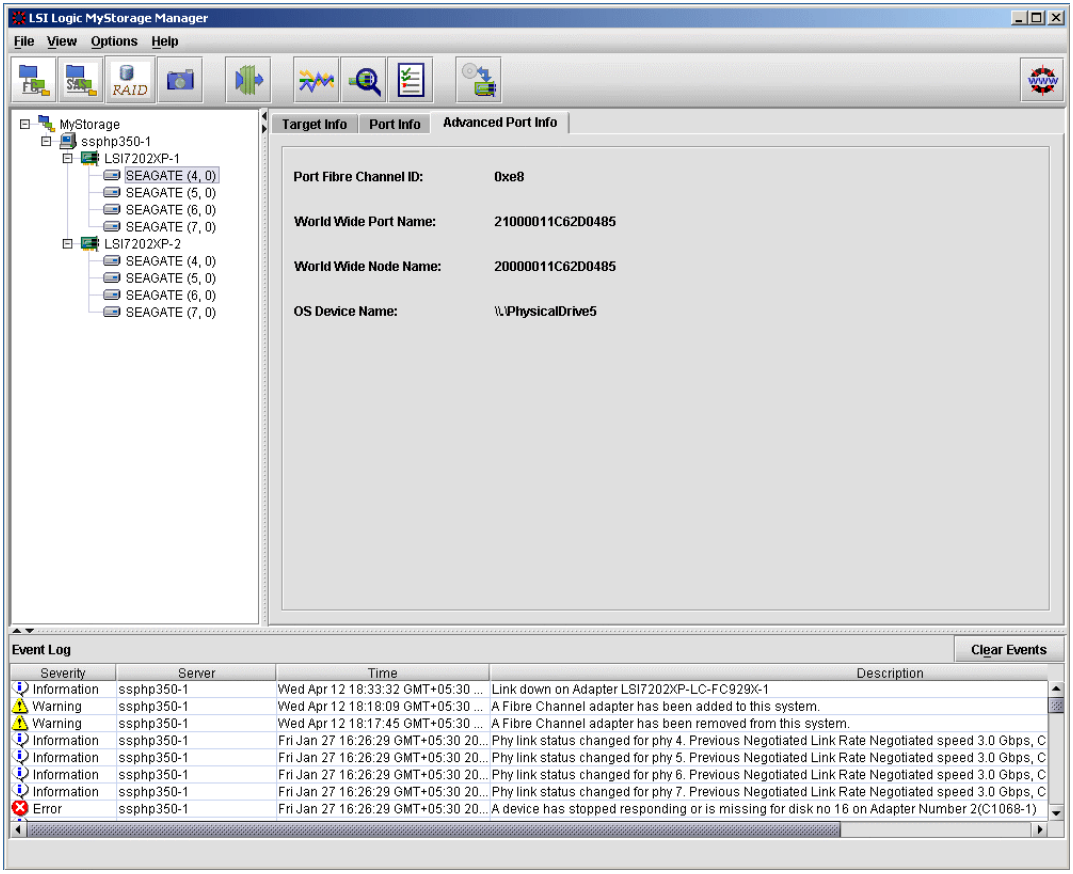
Figure 4.8 Advanced Port Information Tab



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4.3 Device Persistence

One of the most powerful benefits of SANs is scalability; the freedom to quickly add or delete storage components. To facilitate trouble-free SAN reconfigurations, use this window to save a device order list of devices currently connected to the host adapter. Later, if certain devices are powered off temporarily, the adapter ensures the remaining devices appear at the same drive letter mapping or Linux mount point. Technically, the LSI adapter locks the association of an FC target with an alias name reference. The LSI host adapter manages the details (for example, the World Wide Name (WWN) mapped to \\.\PhysicalDrive2). When the user marks a device persistent, the MyStorage management software permanently stores this mapping information on the LSI adapter.

4.3.1 Set Persistent Bindings

Use this tab to mark all the currently connected storage devices as persistent.

Step 1. Ensure that all devices in the SAN are powered on (tape drives and so on)

Step 2. Select the “Device Persistence” icon, and highlight the host adapter (as shown in Figure 4.9).

Step 3. Next, click the “Set Persistent Bindings” tab.

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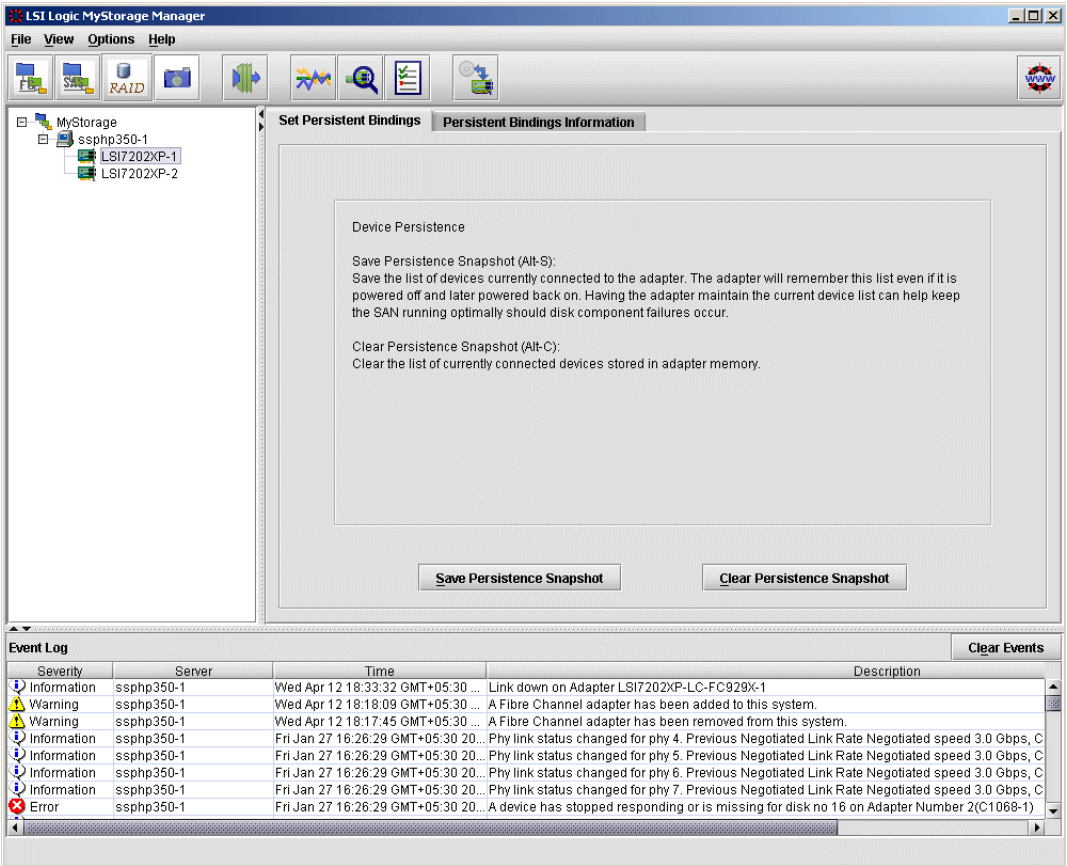
Figure 4.9 Setting Persistent Bindings Tab



Step 4. Click the “Save Persistent Snapshot” button.

Step 5. Click the “Persistent Bindings Information” tab to view the current Persistent Bindings Snapshot (as Figure 4.10 shows).

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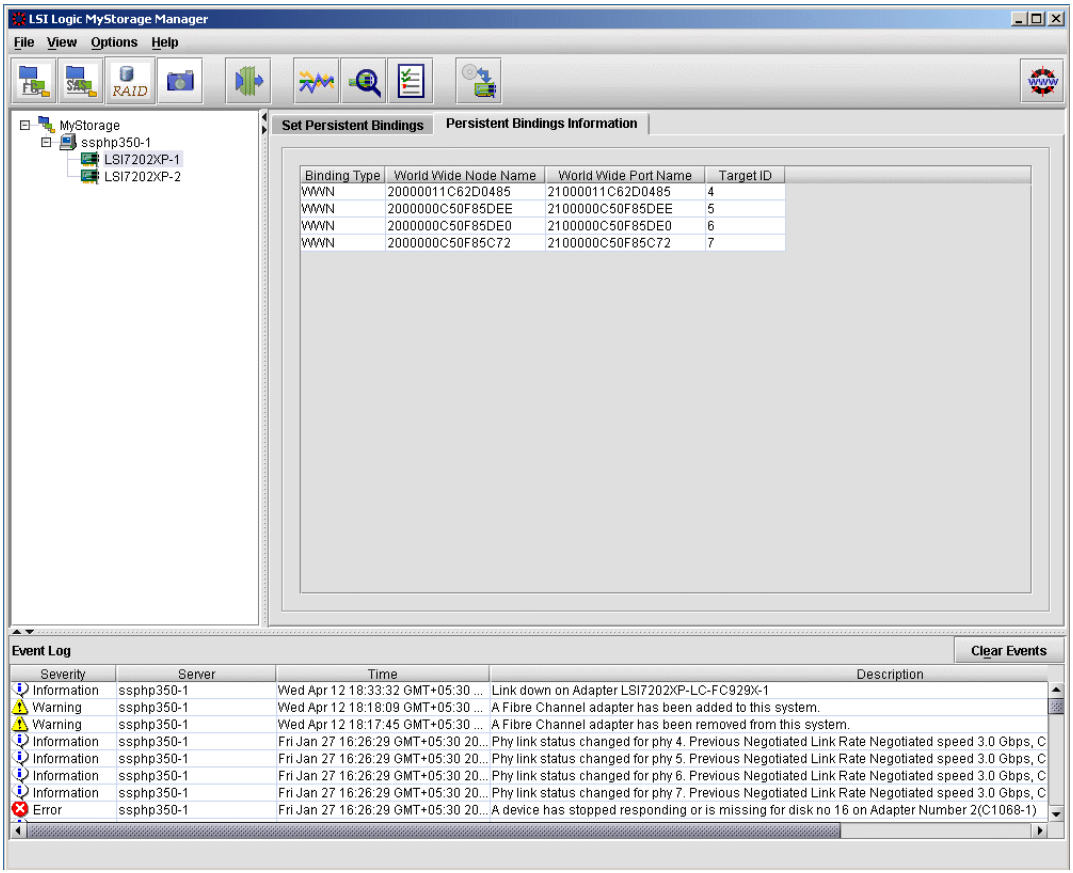
Figure 4.10 Persistent Bindings Information Tab



4.3.2 Remove Persistent Bindings

Use this tab to remove persistence for all storage devices.

Step 1. Select the “Device Persistence” icon and highlight the host adapter.

Step 2. Next, click the “Set Persistent Bindings” tab.

Step 3. Click the “Clear Persistent Snapshot” button.

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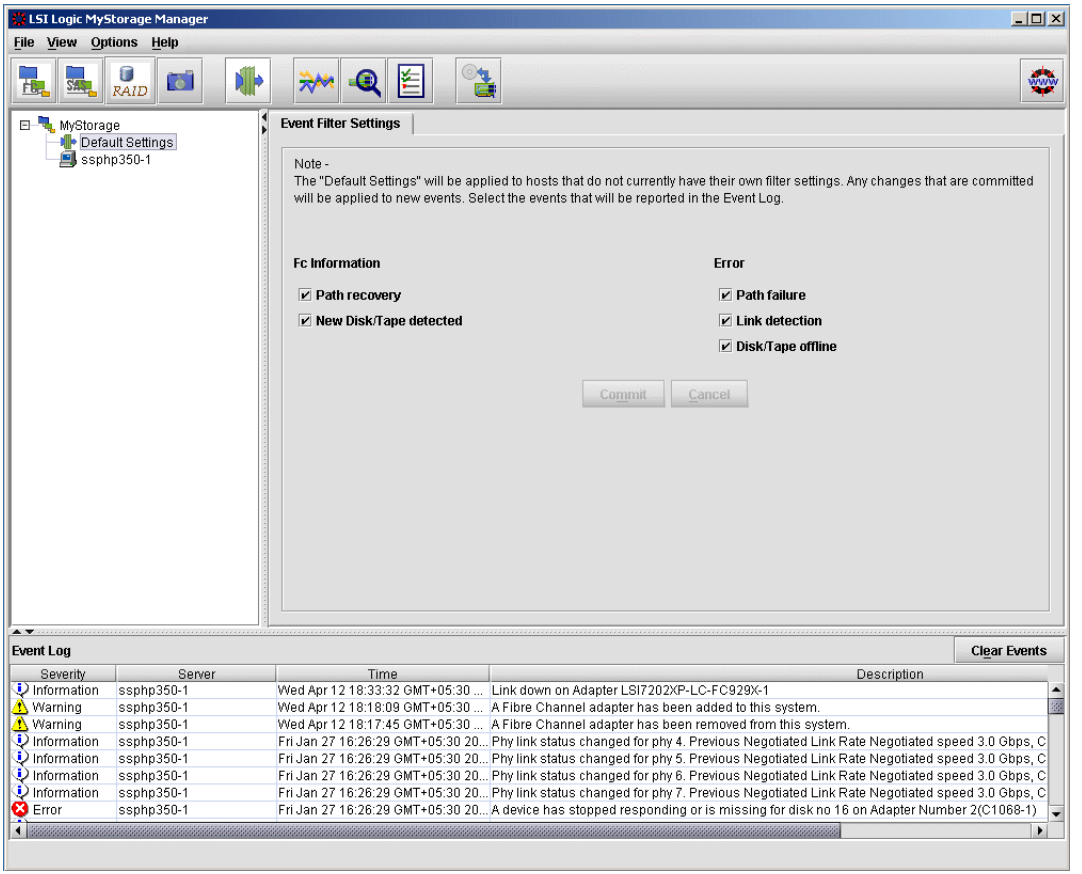
4.4 Event Filter

This menu allows the user to adjust the storage events logged by the MyStorage software. After the first installation, the MyStorage management software will log all storage events by default.

Figure 4.11 Event Filter Settings Tab



Using the event filter, the user may turn off event logging in any combination. Log events include those listed in Table 4.1 and Table 4.2.

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Table 4.1 Informational Log Events

Event	Description
New Disk/Tape Detected	Report when any new storage devices are detected.

Table 4.2 Error Log Events

Event	Description
Link Detection	Report all events related to the LSI adapter's physical Fibre Channel link circuit: Link down, link up, link messages.
Disk/Tape Offline	Report when a storage device is missing or powered off.

4.5 Adapter Statistics

This menu allows the user to inspect the performance statistics of a selected LSI host adapters. All statistics are reported as read-only values gathered since the last power-on sequence, the last host adapter reset, or the last "clear".

To view host adapter statistics, highlight the desired host adapter. The window immediately updates, showing statistics for the selected adapter.

Optionally, use either of the following two buttons for updates:

"Clear": Clicking this button zeroes all performance counters.

"Refresh": Clicking this button performs a real-time update of the port statistics screen (as Figure 4.12 shows) and all its counters. The MyStorage software queries the LSI Fibre Channel controller to retrieve statistics and update this display.

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Figure 4.12 Port Statistics Tab

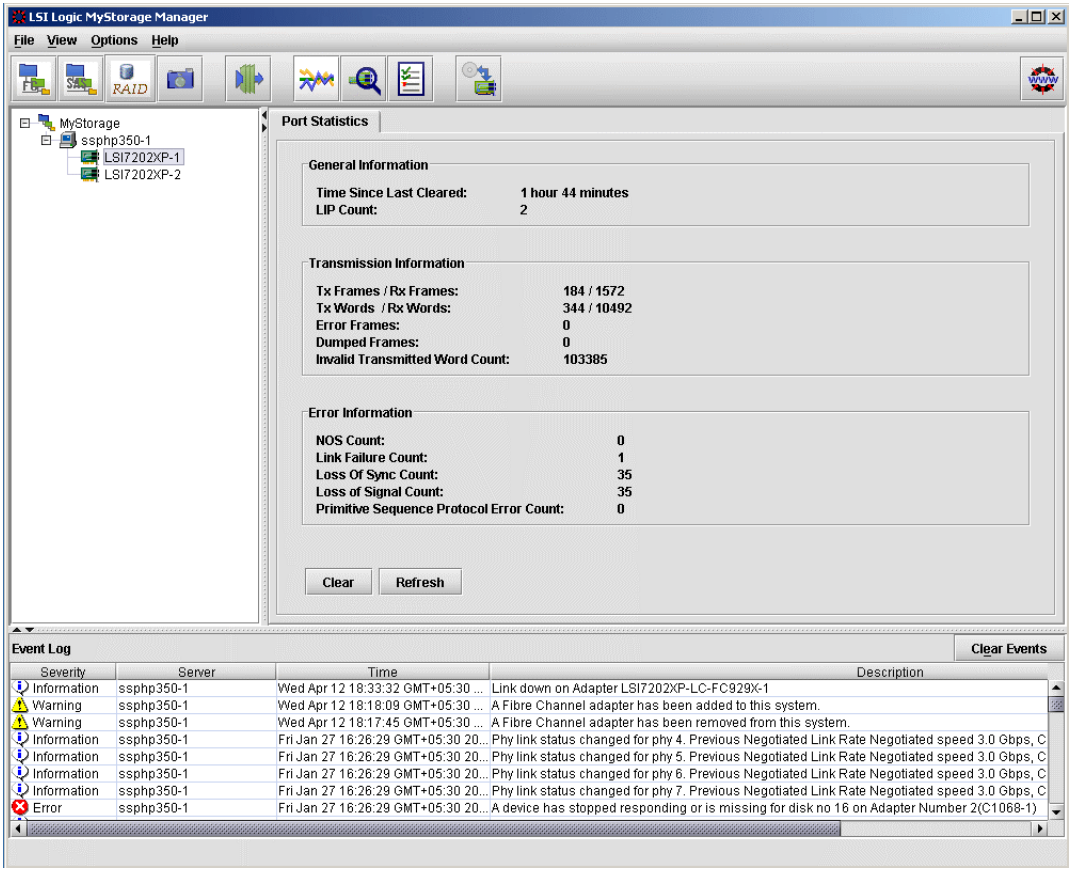

Table 4.3 defines the parameters listed in Figure 4.12.

Table 4.3 Definition of Performance Statistics

Parameter	Definition
LIP Count	The number of times this host adapter has been initialized.
Tx Frames/ Rx Frames	The number of FC frames transmitted/received.
Tx Words/ Rx Words	The number of FC words transmitted/received.
Error Frames	The number of frames received with incorrect CRC.
Dumped Frames	The number of frames dropped.

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Table 4.3 Definition of Performance Statistics (Cont.)

Parameter	Definition
Invalid Tx Word Count	The number of frames transmissions with invalid word counts
NOS Count	The number of times this host adapter has been in NOS (non-operational state).
Link Failure	The number of times the link failed.
Loss of Sync	The number of times synchronization (clock recovery) failed.
Loss of Signal	The number of times Loss of Sync signal was detected.
Primitive Sequence Error	The number of times a bad primitive sequence was detected.

4.6 Adapter Diagnostics

This menu enables you to run a predetermined series of diagnostics on a selected LSI host adapter and storage devices. Primarily, the testing seeks to determine the quality of the FC connection between the LSI HBA and the storage devices.

Step 1. After clicking the “Adapter Diagnostics” icon, highlight the host adapter to test (see Figure 4.13).

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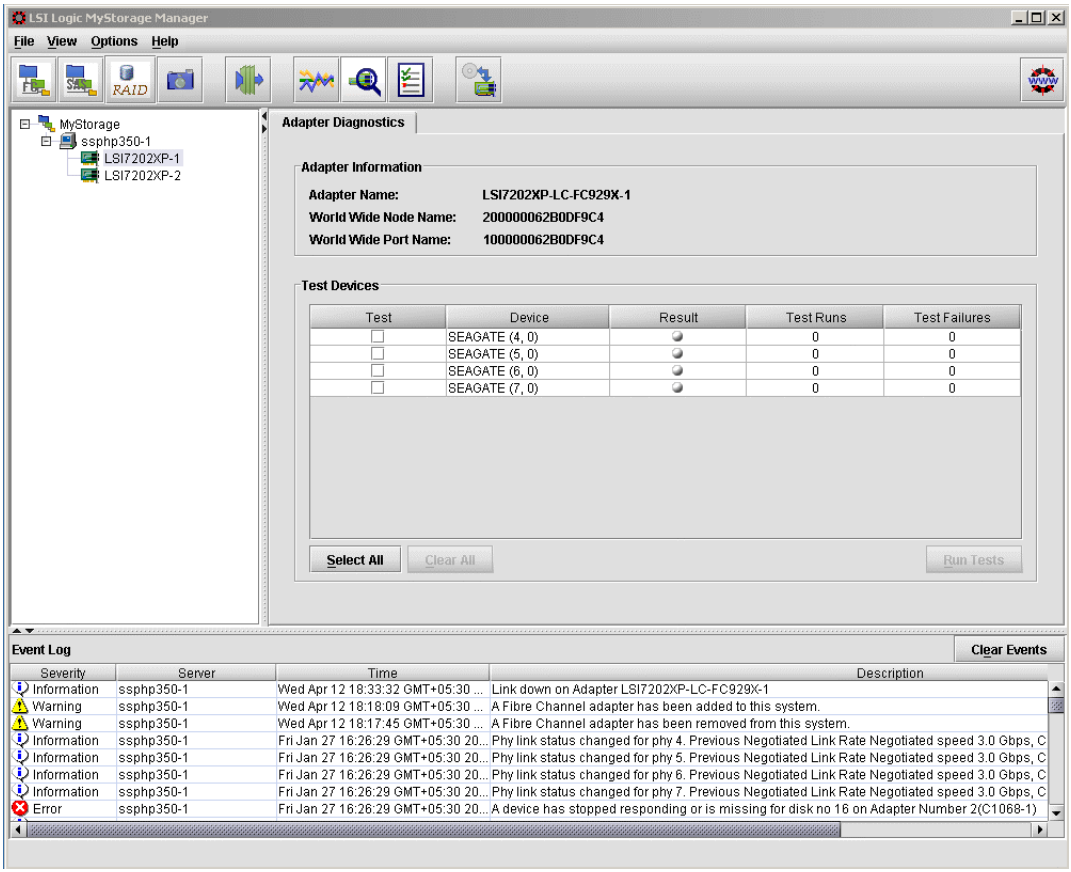
Figure 4.13 Adapter Diagnostics Tab



Step 2. A table of connected devices is presented. Select the storage device(s) to be tested. (Note: Click “Select All” to choose all connected devices.)

Step 3. Click Run tests.

Step 4. If prompted, enter the MyStorage security password. (See Section 3.3, “MyStorage Security and Passwords”.)

The MyStorage management software will perform a series of data pattern tests with each selected device. The diagnostic does not harm data stored on the drive. Diagnostic results are presented as color-coded icons (see Table 4.5) under the column labeled “Result”.

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Table 4.4 Diagnostics Definitions

Result Code	Diagnostic Definition
Green	Green is displayed next to each device that successfully passes all diagnostics. This indicates optimal connection quality between host adapter and tested storage devices.
Yellow	Yellow is displayed next to any device that fails some tests but passes others. For devices in this category, the user may consider cleaning the optical laser modules or reseating cables to improve the FC connection quality.
Red	Red is displayed next to each device that fails all portions of the diagnostic testing. If the device is otherwise functional, the results imply that the device does not support the particular test commands required of the test, and the diagnostic results may be ignored. Generally the failure of all tests indicates the storage device needs servicing.
Clear (colorless)	Clear is displayed next to each adapter that was not selected to participate in the diagnostic test.

4.7 Consolidated Health

This menu enables the user to monitor the health of FC SAN connections on both the local computer and on remote computers. The consolidated health screen presents a list of all computers whose SAN connections are being monitored. Users can add or delete remote computers by using the “Options” menu and selecting the “Remote Hosts...” option. (See Section 3.2, “Remote Host Management,” page 3-5 for details.)

4.7.1 Check Health Operation

Highlight the host adapter to inspect and the window immediately updates showing current system health (Figure 4.14).

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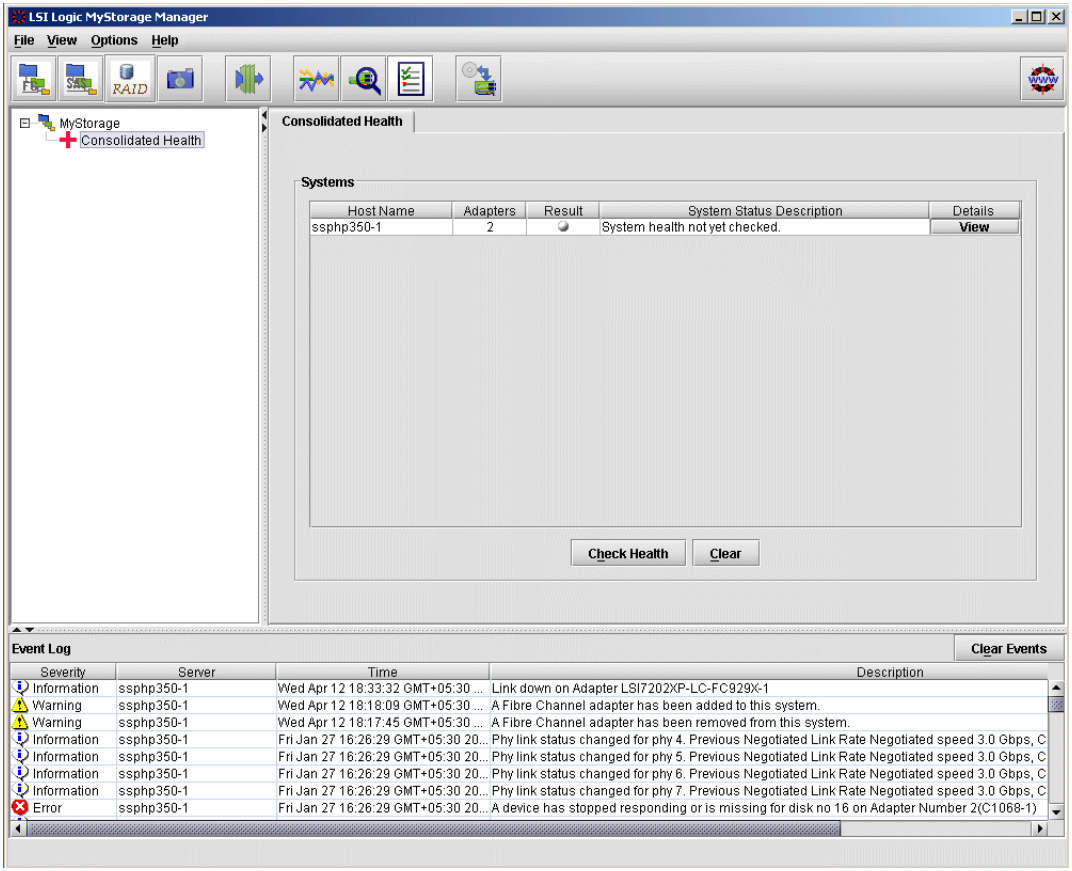
Figure 4.14 Consolidate Health Tab



Step 1. Click the “Consolidated Health” tab.

Step 2. Click the “Check Health” button.

This operation spawns SAN diagnostic tests on all computers being monitored. After several seconds, test results are gathered and listed in the column labeled “results”. Health results are presented as color-coded icons under the column labeled “results” (as shown in Table 4.5).

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Table 4.5 Consolidated Health Results

Result Code	Consolidated Health Definition
Green	Green is displayed next to each computer that successfully passed all SAN diagnostics. Click “View Details” for additional information.
Red	Red is displayed next to each computer that failed to pass all SAN diagnostics. Click “View Details” for additional information.
Clear (colorless)	Clear is displayed next to each computer that did not participate in the consolidated health test.

4.7.2 Check Health, Clear Results

Use the “clear” button that appears on the consolidated health screen to clear results currently presented. All displayed results codes subsequently appear clear color.

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4.8 Backup/Restore/Update Adapter Firmware

This menu enables you to update the firmware stored on the host adapter. LSI host adapters feature one or more Fibre Channel processors, which includes a powerful embedded CPU subsystem. Code for this CPU subsystem is stored in special memory components called Flash ROM located on the host adapter. With these menus, you can update the (1) firmware, (2) BIOS or (3) FCode stored on the Fibre Channel host adapter. The update process permanently stores the new firmware on the host adapter, which is not lost during power cycles.

To begin, you must first download new host adapter firmware component(s) from the LSI web site (www.lsilogic.com). Type the following address into your preferred browser:

```
http://drivers.lsilogic.com
```

The browser presents three drop-down menus. Make the following selections:

Step 1. Select *Host Bus Adapters*

Step 2. Select *Fibre Channel HBAs*

Step 3. Select *LSI7102XP-LC (or other appropriate LSI host adapter)*

Step 4. Check the box next to *BIOS/Firmware*. Then click the *Go* button.

This search locates the latest BIOS/Firmware available for your host adapter. Save the file to your hard drive. You may have to unzip this file.

You can update, back up, or restore the firmware from the Update/Backup Firmware tab shown in Figure 4.15.

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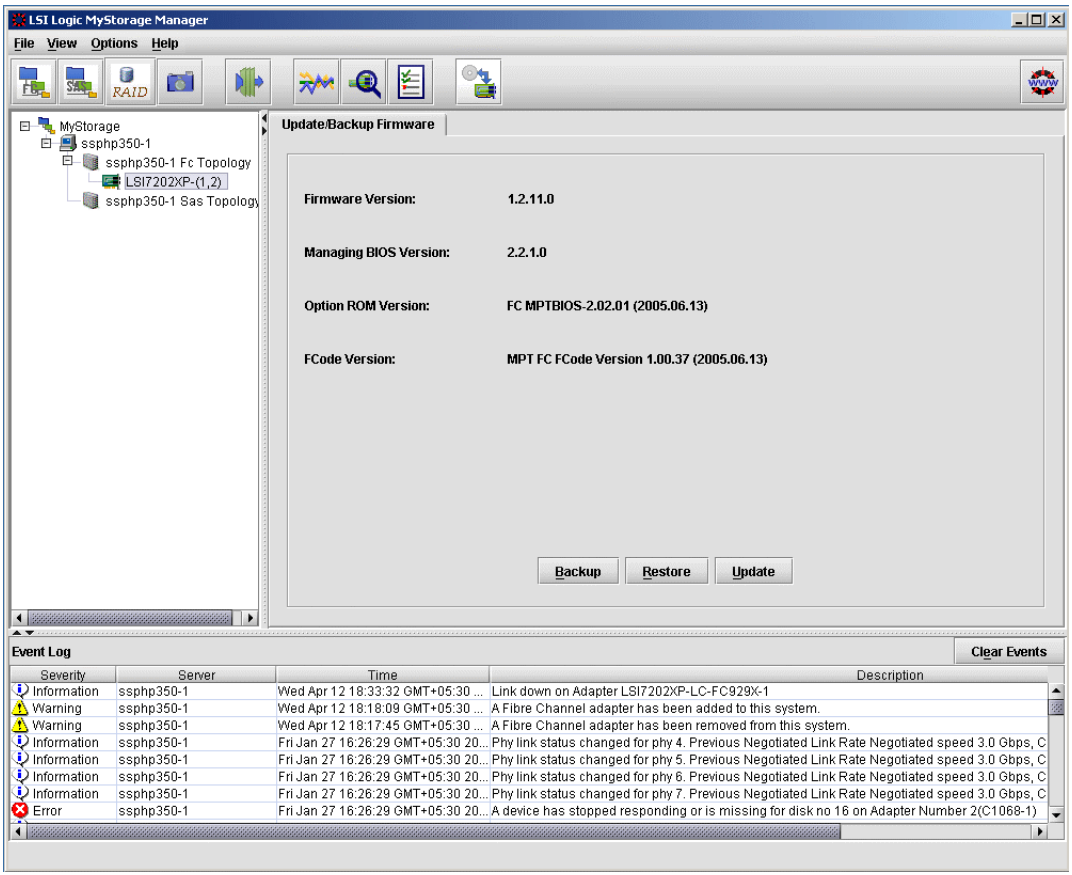
Figure 4.15 Update/Backup Firmware Tab



4.8.1 Update Host Adapter Firmware

Use this button to update the host adapter firmware.

Step 1. Highlight the host adapter that gets updated.

Step 2. Next, click the “Update” button.

Step 3. Enter the MyStorage security password for this computer.

Step 4. A pop-up file browser appears, identifying the new firmware component.

Step 5. Confirm, and the update commences.

Repeat these steps for each new firmware component.

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4.8.2 Backup Host Adapter Firmware

Use this button to back up the host adapter firmware.

Step 1. Highlight the host adapter selected for firmware backup.

Step 2. Next, click the “Backup” button. The system prompts you that you are about to back up all image files.

Step 3. Click “OK”.

Step 4. A pop-up appears, showing the location on the hard drive chosen to store a backup image.

Step 5. Confirm, and backup commences.

4.8.3 Restore Host Adapter Firmware

Use this button to restore host adapter firmware that was saved using the backup procedure described in Section 4.8.2, “Backup Host Adapter Firmware.”

Step 1. Highlight the host adapter that gets its firmware restored.

Step 2. Next, click the “Restore” button.

Step 3. A pop-up appears, listing all the backup images stored on disk. (Note: At least one image must have been previously created using the “Backup” button described in Section 4.8.2, “Backup Host Adapter Firmware.”).

Read the text descriptions, and choose the host adapter firmware image to restore.

Step 4. Confirm, and restore commences.

4.9 Launch Web Browser

The user can click this icon from the toolbar of the application to launch the default web browser set up in the system. This directs the user to a specific URL where you can manually download the latest driver/firmware corresponding to your card, if an update is available.

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Chapter 5
Operating SAS/SATA MyStorage Management Software

This chapter provides an overview of how to operate the MyStorage management software for SAS/SATA expanders and host adapters and includes these topics:

- Section 5.1, “Storage Topology: LSI SAS/SATA Adapters”
- Section 5.2, “Storage Topology: LSI SAS/SATA Expanders”
- Section 5.3, “Typical SAS/SATA Topologies”
- Section 5.4, “Storage Topology: Storage Devices”
- Section 5.5, “RAID Topology: LSI SAS/SATA Adapters”
- Section 5.6, “RAID Topology: Storage Devices”
- Section 5.7, “Event Logs”
- Section 5.8, “Backup/Restore/Update Adapter Firmware”
- Section 5.9, “Launch Web Browser”

5.1 Storage Topology: LSI SAS/SATA Adapters

This function provides an opportunity to explore the attributes of any LSI SAS/SATA host adapter installed in the computer or in a remotely managed computer. After selecting the Storage Topology icon, highlight an LSI host adapter. The MyStorage management software provides detailed information in a series of four tabs. These four tabs provide the following read-only information about the host adapter, as Figures 5.1 through 5.4 show.

- Host Adapter Information
- Adapter Phy Information

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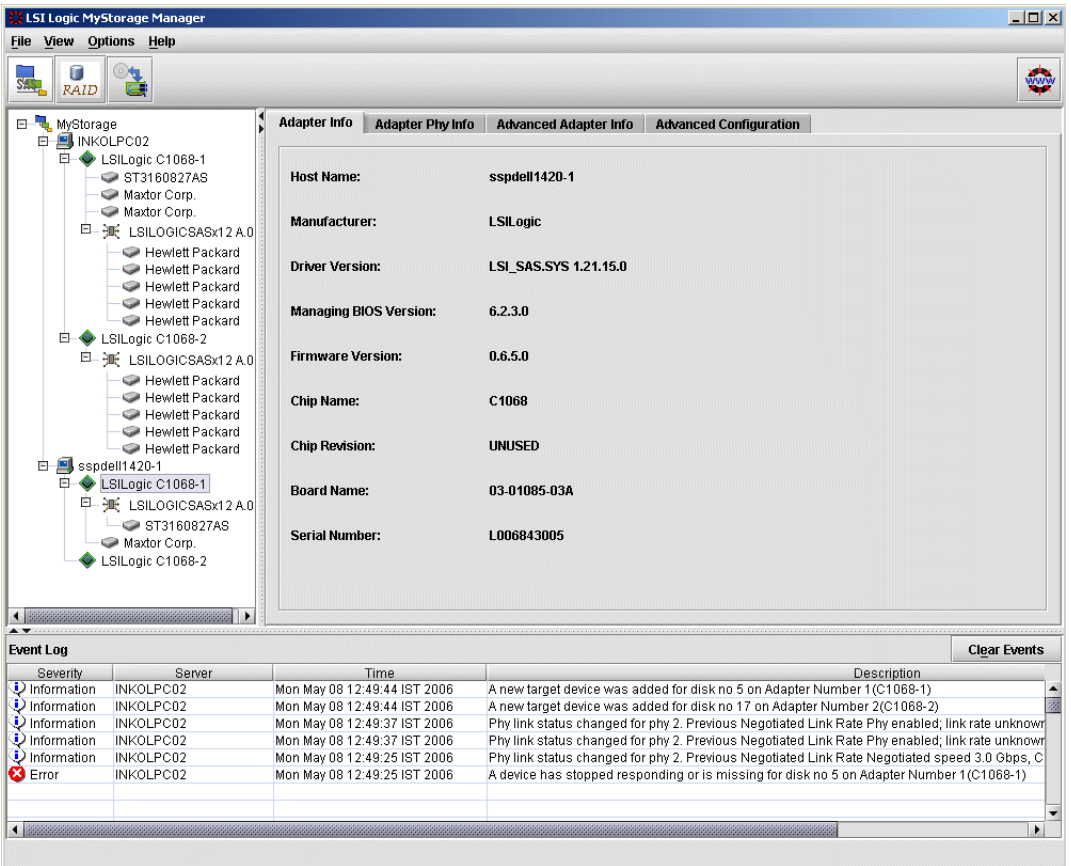
- Advanced Adapter Information
- Advanced Configuration

5.1.1 SAS/SATA Host Adapter Information

This tab gives the basic information about the adapter, such as the hostname of the computer on which the adapter is installed, manufacturer of the SAS adapter, driver version, managing bios version, firmware version, chip name, chip revision, board name and serial number about the adapter.

Figure 5.1 Adapter Information



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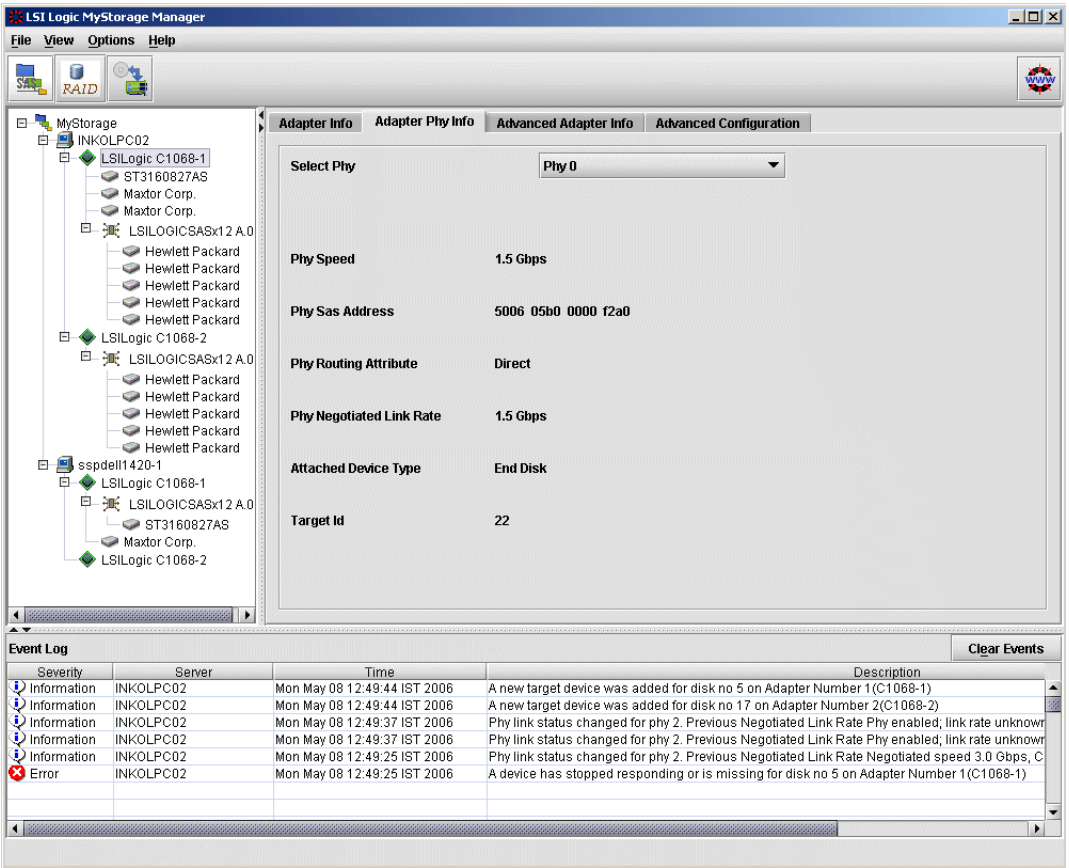
5.1.2 SAS/SATA Adapter Phy Information

This tab gives information about the Phy Speed, the address of the port on which the phy is connected, the routing type, and whether an expander or a storage disk is connected to it. If the attached device is an end-device this panel also shows the target id of the end device.

Figure 5.2 SAS/SATA Adapter Phy Information



5.1.2.1 Phy Speed

The phy speed is 3 Gbits/s if connected to a SAS end device or an expander phy. Phy speed is 1.5 Gbits/s if connected to a SATA device.

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5.1.2.2 SAS Address

The SAS address is a unique worldwide name assigned to a SAS initiator port, SAS target port, expander device, SAS initiator device, or SAS target device.

5.1.2.3 Phy Routing

There are three types of phy routing: Table Routing, Direct Routing and Subtractive Routing. A brief description of the different types of routing is given below.

Direct routing method: – The method the expander connection manager uses to establish a connection with an end device.

Table routing method: – The method the expander connection manager uses to route connection requests to an expander device using an expander routing table.

Subtractive routing method: – The method the expander connection manager uses to route connection requests not resolved using the direct routing method or table routing method to an expander device.

5.1.3 Advanced SAS/SATA Adapter Information

This tab gives the information about the advanced settings of the adapter. Information like adapter address, adapter chipset or name, number of supported buses and the maximum number of supported devices is provided by this tab.

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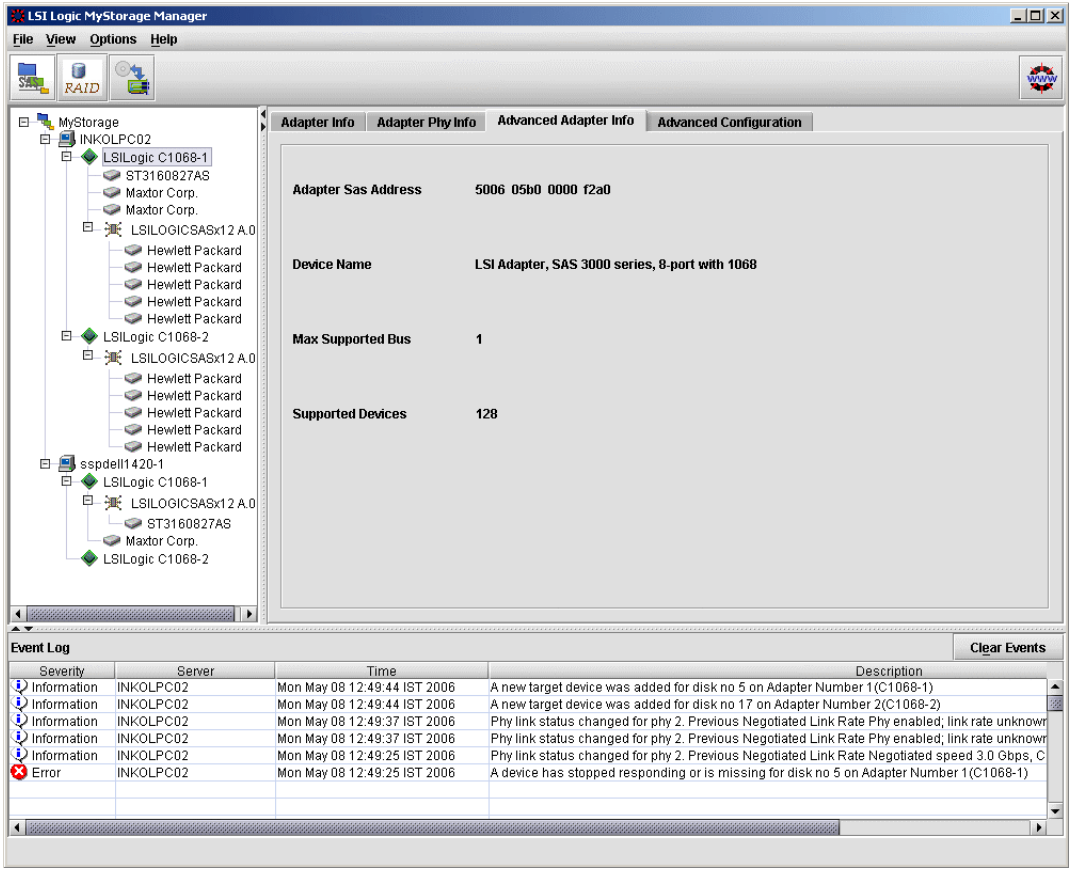
Figure 5.3 Advanced Adapter Information



5.1.4 Advanced Configuration

This tab provides information on the port width of the phys. Adapter reset and phy resets can also be performed under this tab.

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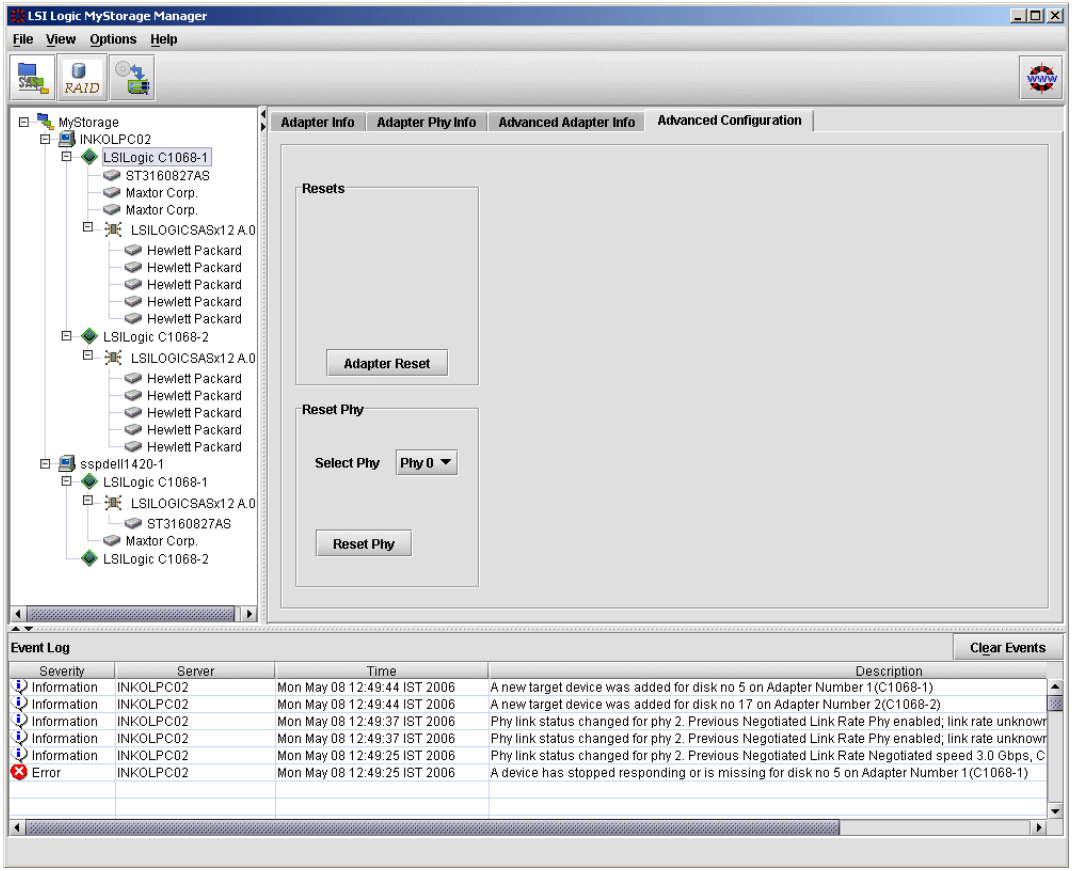
Figure 5.4 Advanced Configuration



5.1.4.1 Port Width of Phys

Port width of phys can be narrow or wide. A port is said to be narrow when only one phy connects two devices, i.e., one adapter and one expander is connected to each other by one phy. A port is said to be wide when two or more phys connect from the adapter to an expander or an expander to an expander. Note that end devices or hard disk drives are always connected via a narrow port, i.e., one single phy connects it to the adapter or expander.

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5.1.4.2 Adapter Reset

The Adapter Reset setting performs a complete host adapter reinitialization. The effect is to cycle power on the host adapter.

5.1.4.3 Phy Reset

The Phy Reset setting generates a phy reinitialization sequence. This has an effect similar to unplugging the cable and reinserting it. In this option the host connection which has to be reset can be selected. If the selected phy is among any one of the wide port then it resets all the phys of the wide port.

5.2 Storage Topology: LSI SAS/SATA Expanders

The MyStorage management software provides information about an expander under two tabs: “Expander Info” and “Expander Phy Info”. After you highlight the expander, navigate the two tabs to view read-only information about that device.

5.2.1 Expander Information Tab

This tab provides information on the number of phys, table entries, port width, and parent type.

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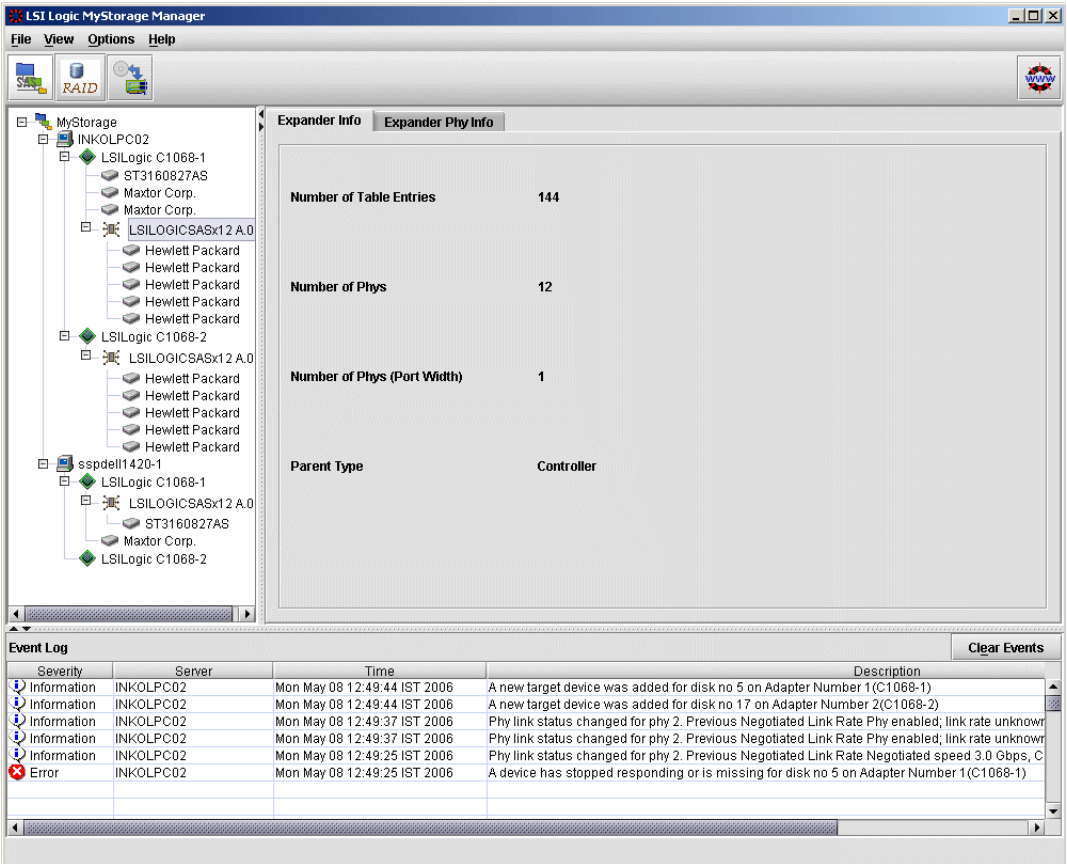
Figure 5.5 Expander Information



Number of Phys – This is the number of phys being reported by the device.

Port Width – The port width indicates whether the port is wide or narrow. A value of one indicates a narrow port. A value of two or more indicates a wide port.

5.2.2 Expander Phy Information Tab

This tab (Figure 5.6) gives information about the Phy connected to the expander. You can change the phy number from the drop down box beside the “Select Phy” label.

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Maximum Link Rate – Maximum link rate programmed in the Phy (generally 3 Gbits/s)

Minimum Link Rate – Minimum link rate programmed in the Phy (generally 1.5 Gbits/s).

Current Link Rate – The “Current Link Rate” is dependent upon the type of end device or hard disk that is connected to the adapter or expander. If a SAS end device or phy of another expander is connected to the adapter, then “Current Link Rate” is set to 3 Gbits/s where as in case of a SATA-type end device the “Current Link Rate” is set to 1.5 Gbits/s.

Routing Attribute – This gives the type of routing attribute for a port. As stated above it may be Table Routing, Direct Routing, and Subtractive Routing.

SAS Address – This is the address of the SAS port under consideration.

Attached Device Type – This is the device type connected to the specific port. It states whether the device is an expander or a hard disk/ end device.

SAS Address of the Attached Device – This is the address of the device connected to the SAS port under consideration.

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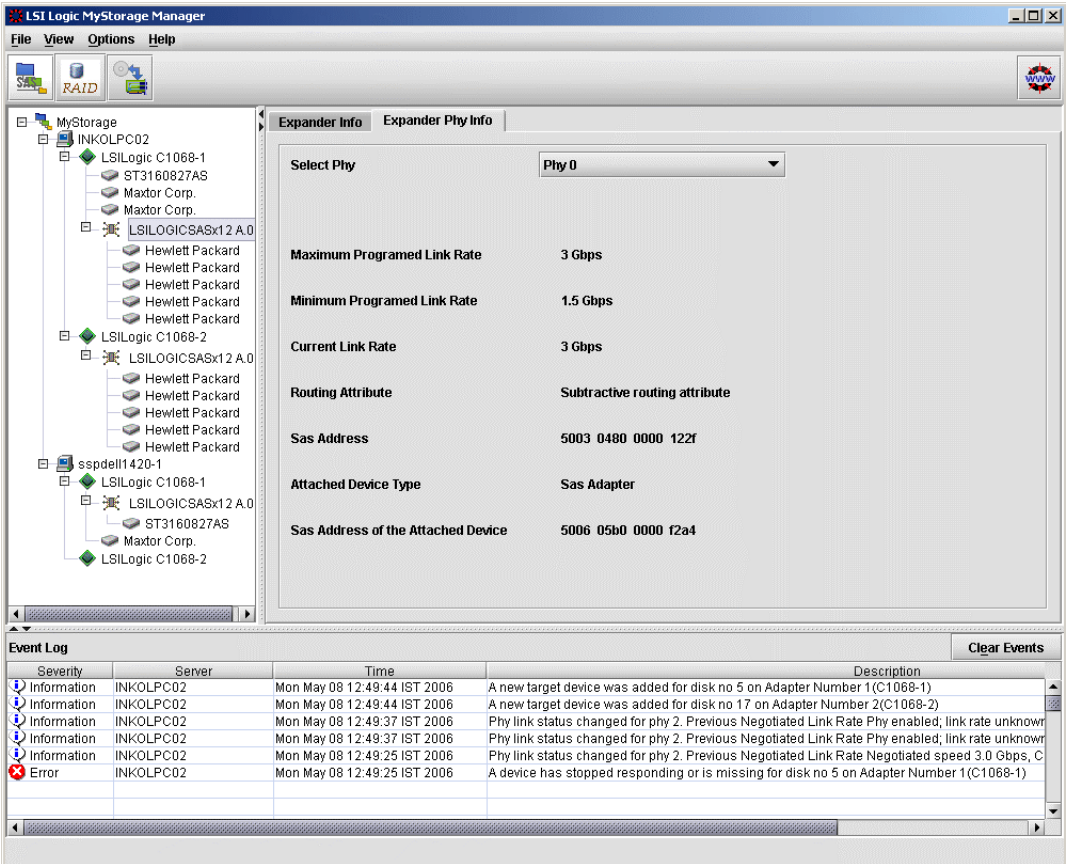
Figure 5.6 Expander Phy Information



5.3 Typical SAS/SATA Topologies

SAS domains support a wide variety of topologies. Following are some examples:

Figure 5.7 shows two different SAS HBAs connected to a single LSISASx12 expander.

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Figure 5.7 Two SAS HBAs Connected to an Expander

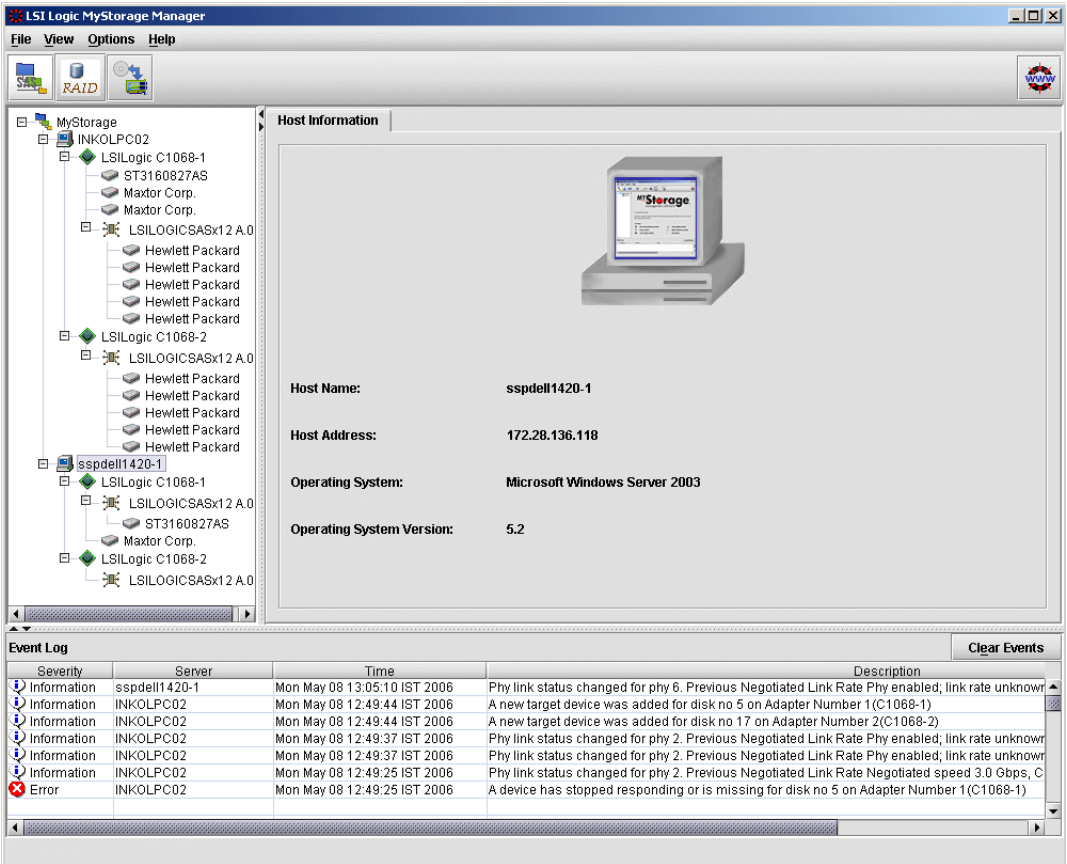

Figure 5.8 indicates a configuration called cascaded expander topology. In this case, the Hewlett Packard drives are connected through an LSISASx12 expander, then through another LSISASx12 expander to the LSISAS1068 controller.

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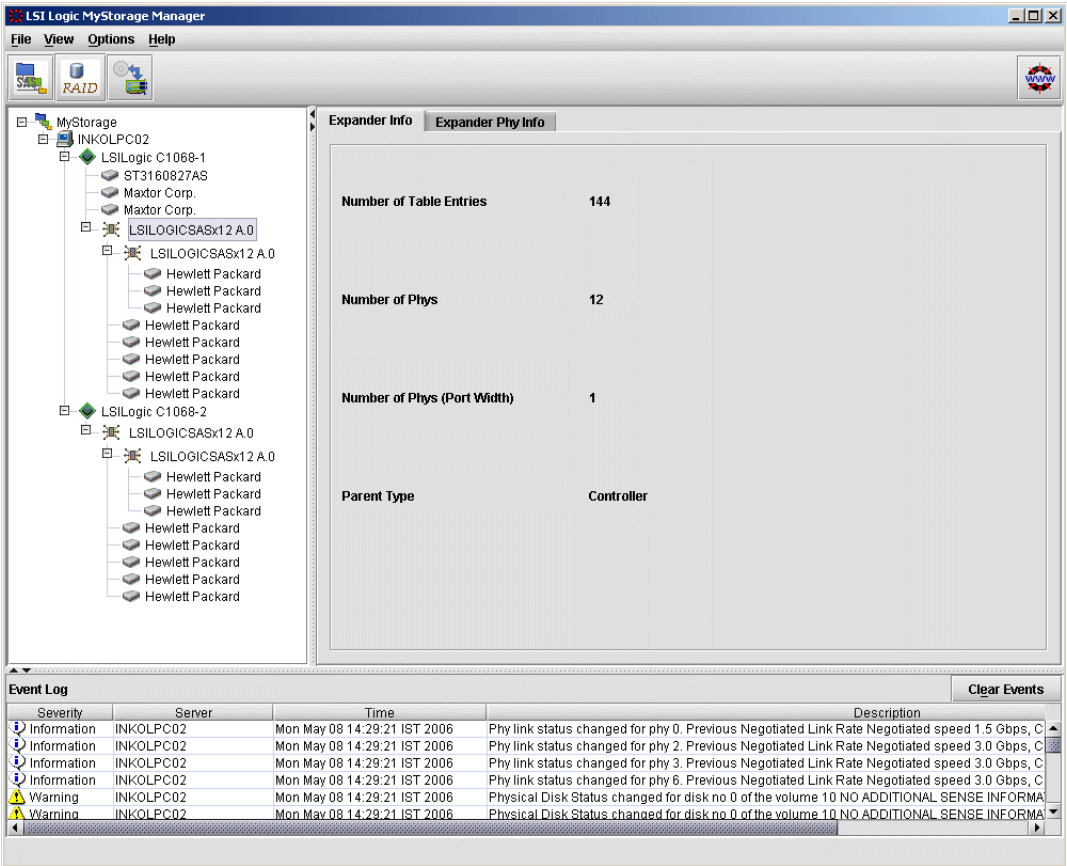
Figure 5.8 Cascaded Expander Topology



5.4 Storage Topology: Storage Devices

The MyStorage management software provides information about a storage device (target) in a single tab. After you highlight the storage device, navigate the only tab to view read-only information about that device.

This tab gives us information about the details of the target storage device including manufacturer, hardware name, serial number, capacity,

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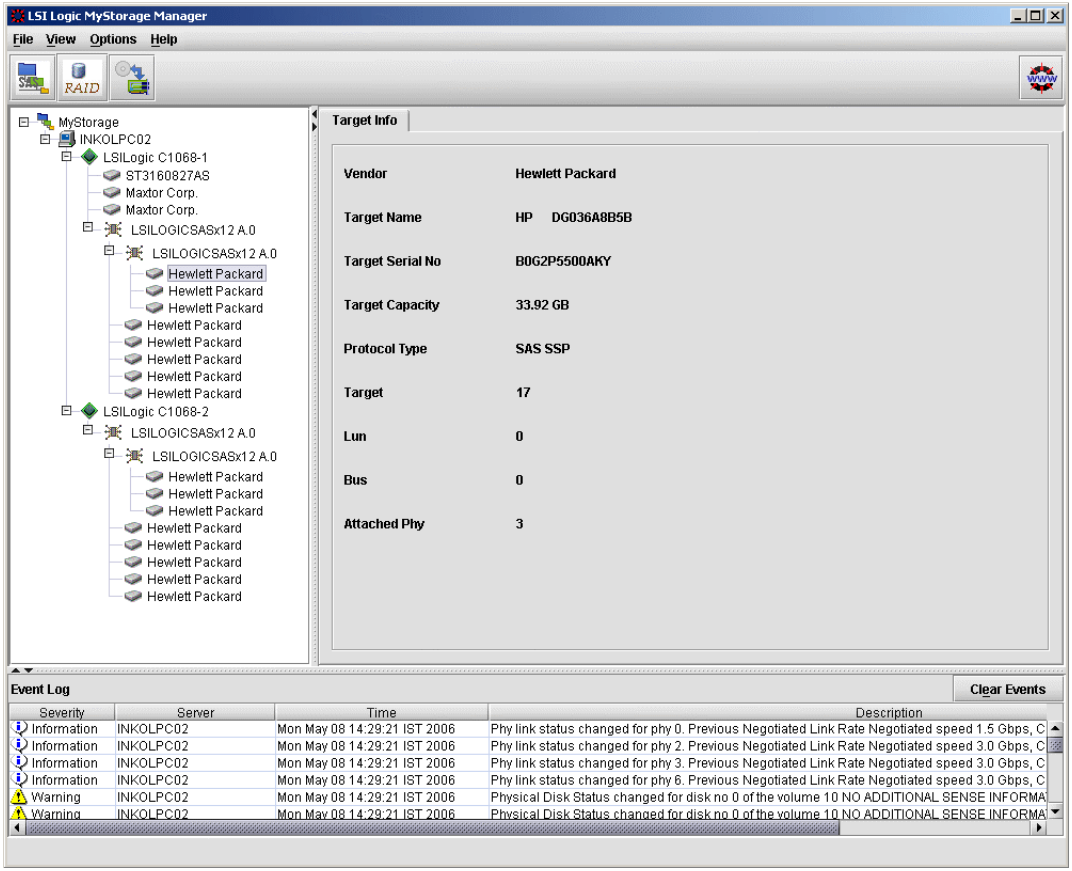
connector type or protocol (SAS, SSP, or SATA, depending on the disk type). The two most important pieces of information are the Target ID and the Attached Phy. The Target ID defines the SCSI address of the device. The Attached Phy defines the phy number of the expander or the adapter to which the end disk is connected (Figure 5.9).

Figure 5.9 Storage Target Device Information



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5.5 RAID Topology: LSI SAS/SATA Adapters

This tab enables the user to view the RAID topology configured on the LSI SAS adapter. LSI SAS adapters support RAID 0, RAID 1, and RAID 1E.

This tab gives the basic information about the different RAID capabilities supported by the SAS adapter: Striping, Mirror, and Mirror Enhanced. It also gives information on the number of RAID volumes configured, the number of active RAID volumes, and the number of inactive RAID volumes (Figure 5.10).

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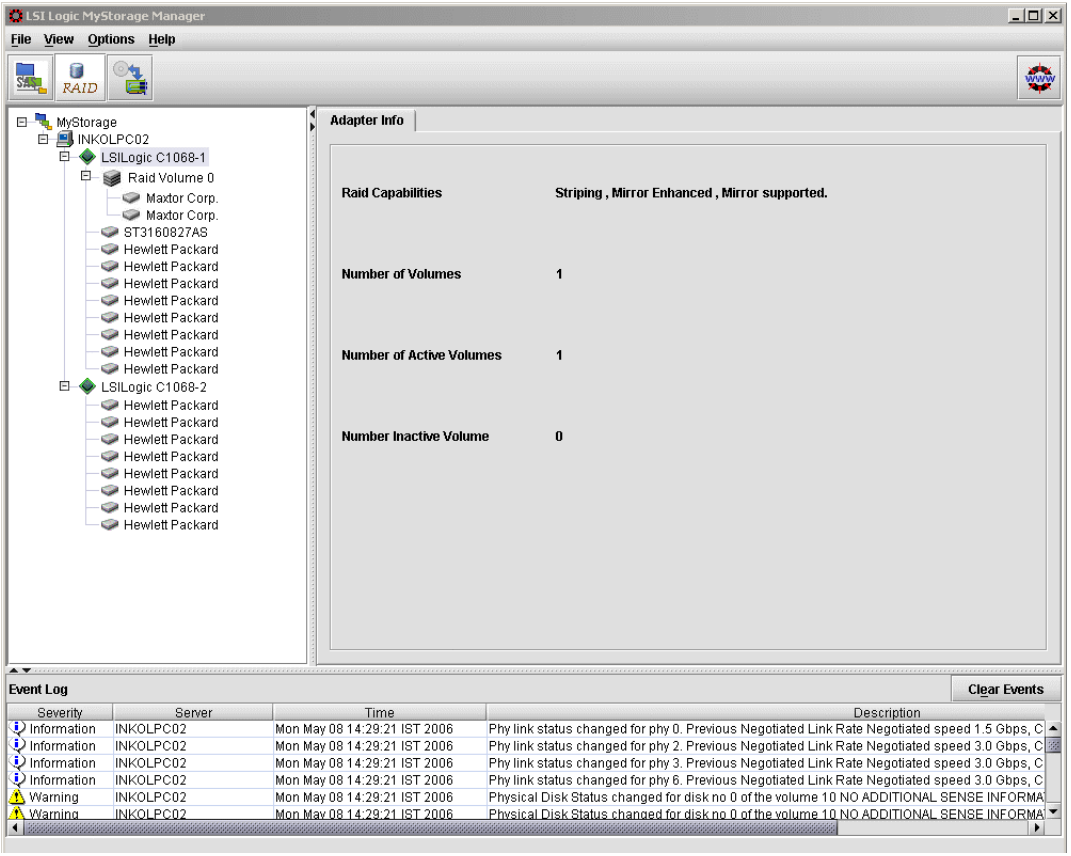
Figure 5.10 RAID Information



5.5.1 RAID Volume Information

This tab provides the basic information about a particular RAID volume. Figure 5.11 shows examples of the values that are typically displayed for an active RAID volume.

RAID Volume Target ID – This is the SCSI target ID of the RAID volume visible from the operating system.

Capacity – This provides the total volume size for the RAID volume.

Stripe Size – This is the stripe size of the disk block that is used for striping in an Integrated Striping™ (IS) or Integrated Mirroring Enhanced

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(IME) configuration. In an Integrated Mirroring™ (IM) configuration, this value is 0.

Status – Status provides the state of the RAID volume. States can be “OK”, “Degraded”, or “Rebuilding”.

Information – Information provides the status of the RAID volume, i.e. has a disk has failed or not.

Drive Count – Drive Count provides the number of hard drives in the RAID volume.

Estimated Time Left – This indicates the time left for the degraded RAID volume to be rebuilt.

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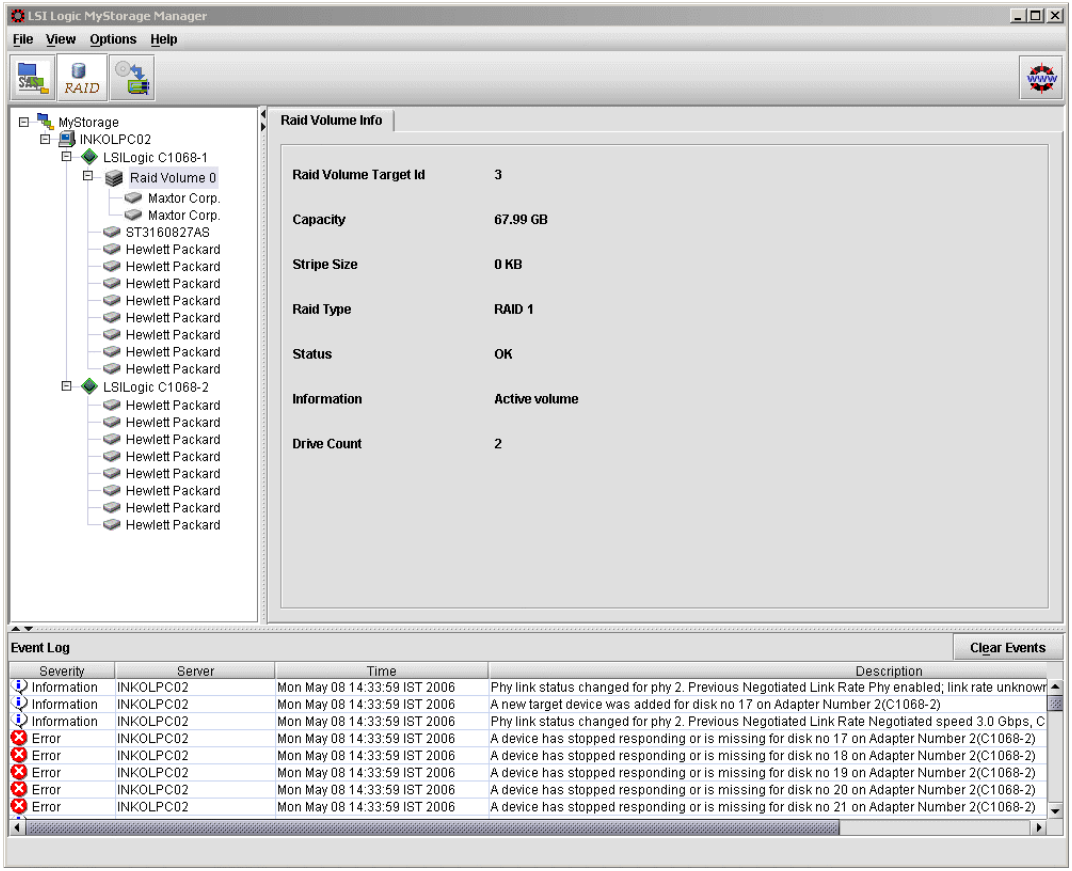
Figure 5.11 RAID Volume Information: Status OK



If the RAID volume has become degraded, multiple fields change, as illustrated in Figure 5.12.

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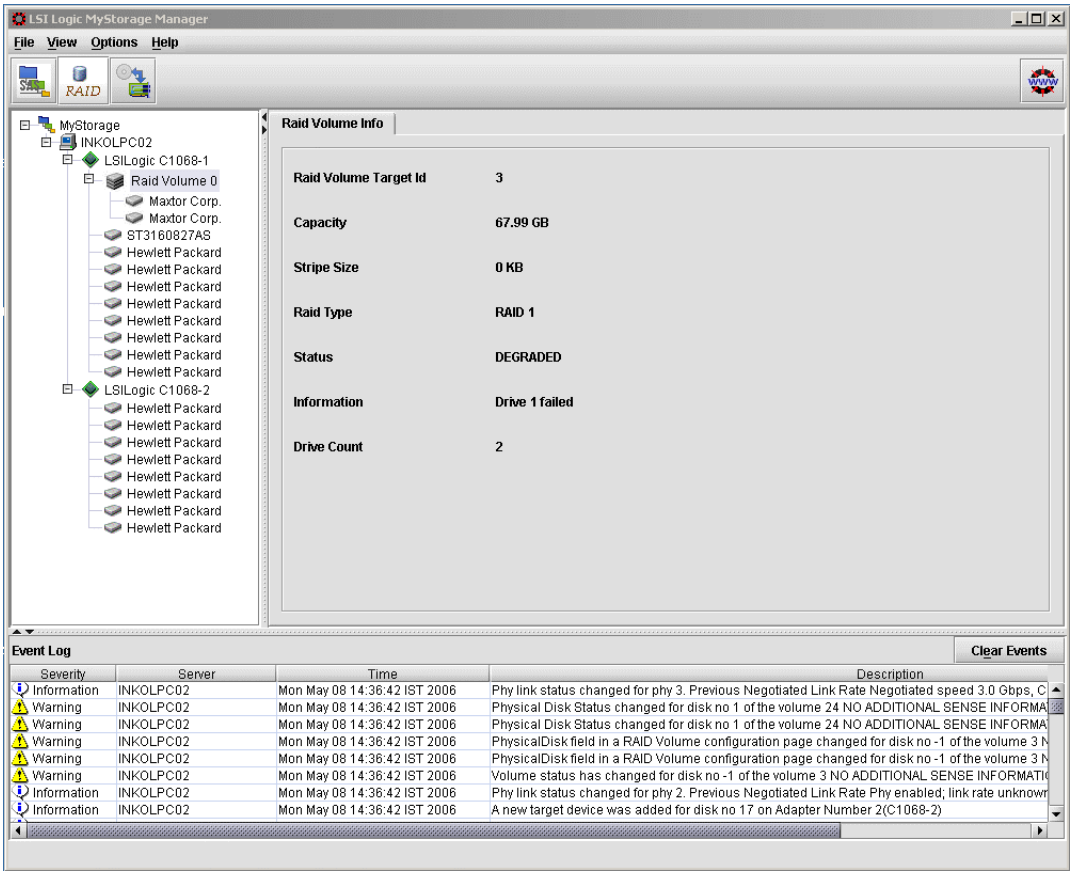
Figure 5.12 RAID Volume Information: Status Degraded



5.5.2 RAID Rebuilding

If a RAID volume is broken, i.e., the any one of the disks crash and needs replacement, then the RAID volume is automatically rebuilt as shown in Figure 5.13. While rebuilding, the “Information” heading shows the progress of rebuilding.

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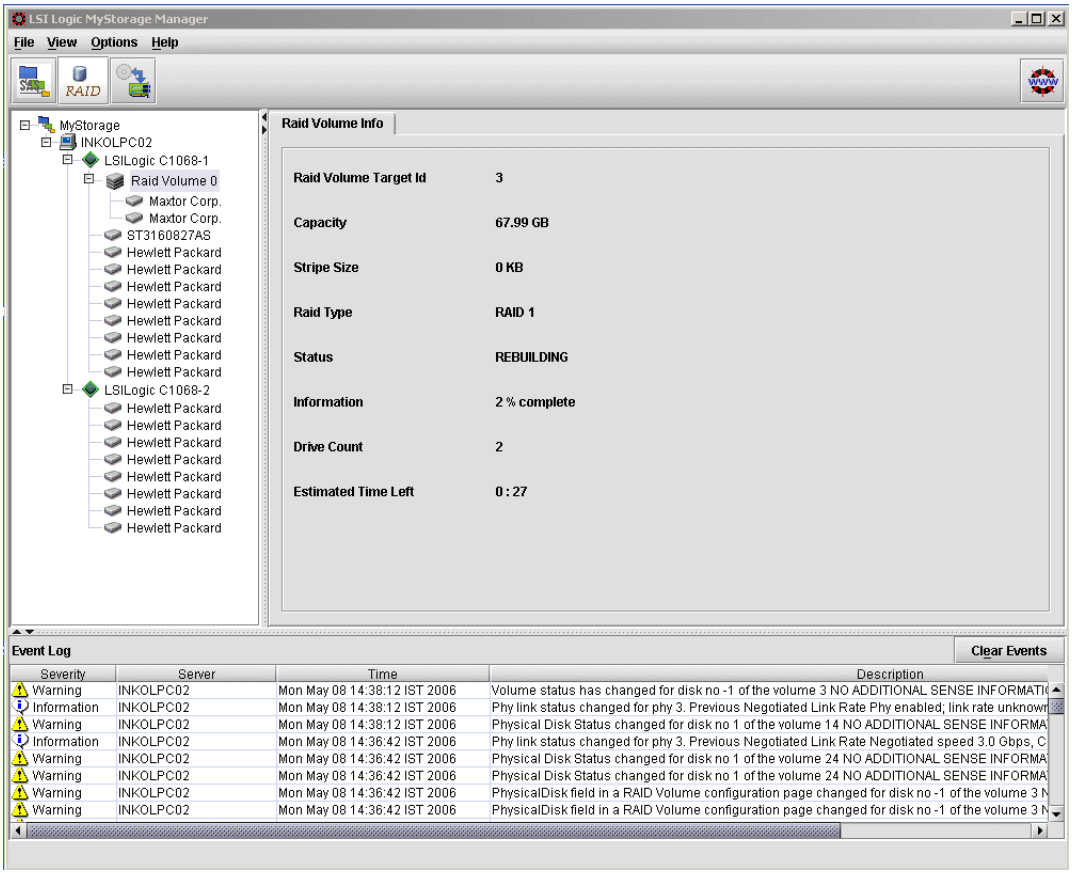
Figure 5.13 RAID Rebuild



5.6 RAID Topology: Storage Devices

This tab gives information about the types of storage devices in the RAID volume. There are two read only sub-tabs under each storage device. They are RAID drive information and RAID error information.

RAID Drive Information – This screen gives the basic information and status of a disk drive: OK, Failed, or Rebuilding (Figure 5.14).

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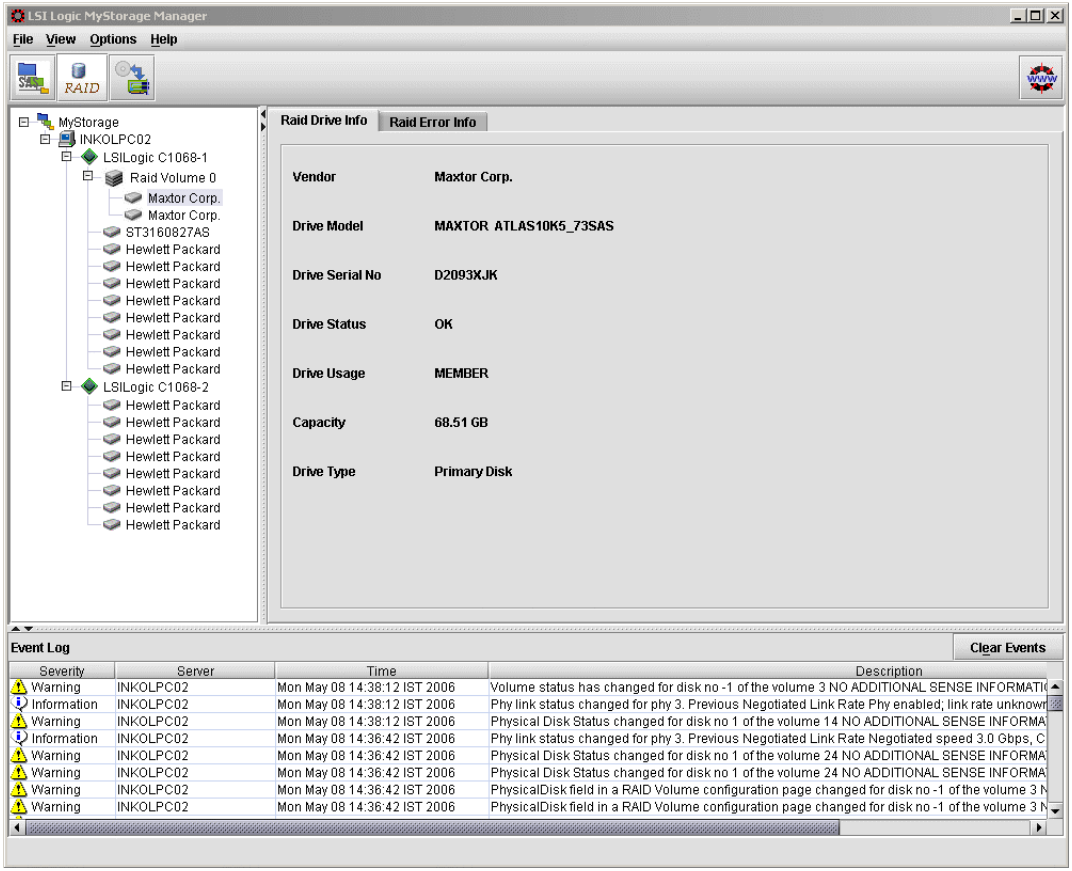
Figure 5.14 RAID Drive Information



RAID Error Information – SCSI smart errors are illustrated in Figure 5.15.

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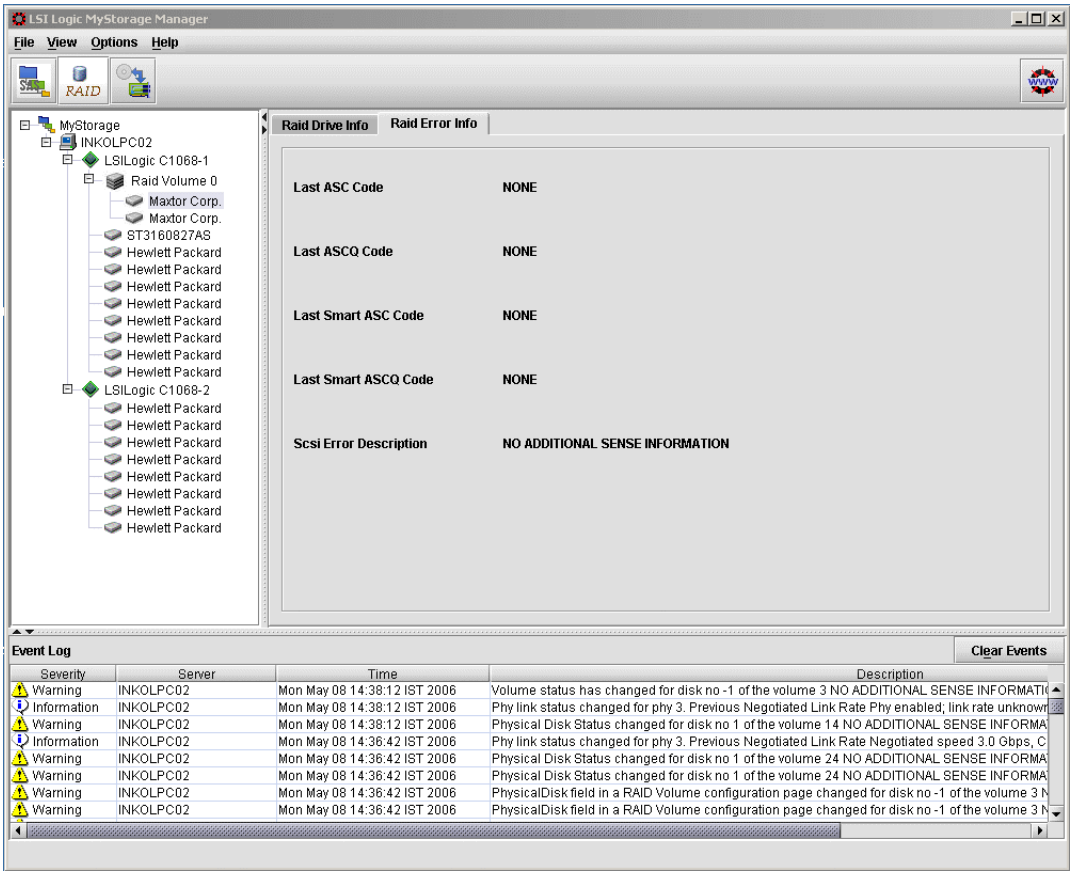
Figure 5.15 RAID Error Information Page



5.7 Event Logs

The event log screen traps and displays events as they take place in the SAS or RAID topology that is present in the system (Figure 5.16). It is also able to trace Discovery Errors. The event log panel has four attributes for pointing out an event: Severity, Server, Time, and Description.

Severity – This column shows the severity of the event. The severity is the extent to which a change in the topology effects the stability of the topology.

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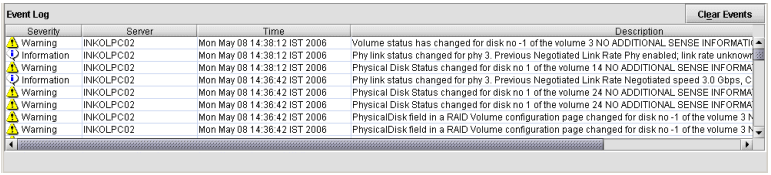
Server – This column indicates the computer on which the event occurred.

Time – This column gives the time at which the event occurred.

Description – This column gives the description of the event.

Figure 5.16 Event Log Panel



The event panel can trace three types of events: SAS events, RAID events, and Discovery events. The following events are reported by MyStorage management software.

SAS Events

- Loop Detected
- Unaddressable device found
- Multiple ports with same SAS address were detected
- Expander error
- SMP timeout
- Expander route table out of entries
- Route table index does not exist
- SMP function failed
- SMP CRC error
- Multiple subtractives detected
- Table-to-table detected
- Multiple paths detected

RAID Events

- An Integrated RAID™ volume created
- An Integrated RAID volume deleted

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- Volume settings changed
- Volume status changed
- Physical Disk field in a RAID Volume configuration page changed
- A new RAID Physical Disk Page created
- A RAID Physical Disk Page deleted
- Physical Disk Settings changed
- Physical Disk Status changed
- A new disk has been automatically added to an Integrated RAID volume
- SMART data has been received from an Integrated RAID Physical Disk
- The IOC processed a RAID Action Request message

Discovery Events

- A new target device was added
- A device has stopped responding or is missing
- SMART data has been received from a device
- A new target device was added, but without a persistent Bus and TargetID mapping
- An unsupported device was discovered

5.8 Backup/Restore/Update Adapter Firmware

This menu enables you to update the firmware stored on the host adapter. LSI host adapters feature one or more SAS/SATA processors, which includes a powerful embedded CPU subsystem. Code for this CPU subsystem is stored in special memory components called Flash ROM located on the host adapter. With these menus, you can update the (1) firmware or (2) BIOS stored on the SAS/SATA host adapter. The update process permanently stores the new firmware on the host adapter, which is not lost during power cycles.

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To begin, you must first download new host adapter firmware component(s) from the LSI web site (www.lsilogic.com). Type the following address into your preferred browser:

```
http://drivers.lsilogic.com
```

The browser presents three drop-down menus. Make the following selections:

Step 1. Select *Host Bus Adapters.*

Step 2. Select *SAS HBAs.*

Step 3. Select the appropriate adapter.

Step 4. Check the box next to *BIOS/Firmware*. Then click the *Go* button.

This search locates the latest BIOS/Firmware available for your host adapter. Save the file to your hard drive. You may have to unzip this file.

You can update, back up, or restore the firmware from the Backup/Update Firmware menu shown in Figure 5.17.

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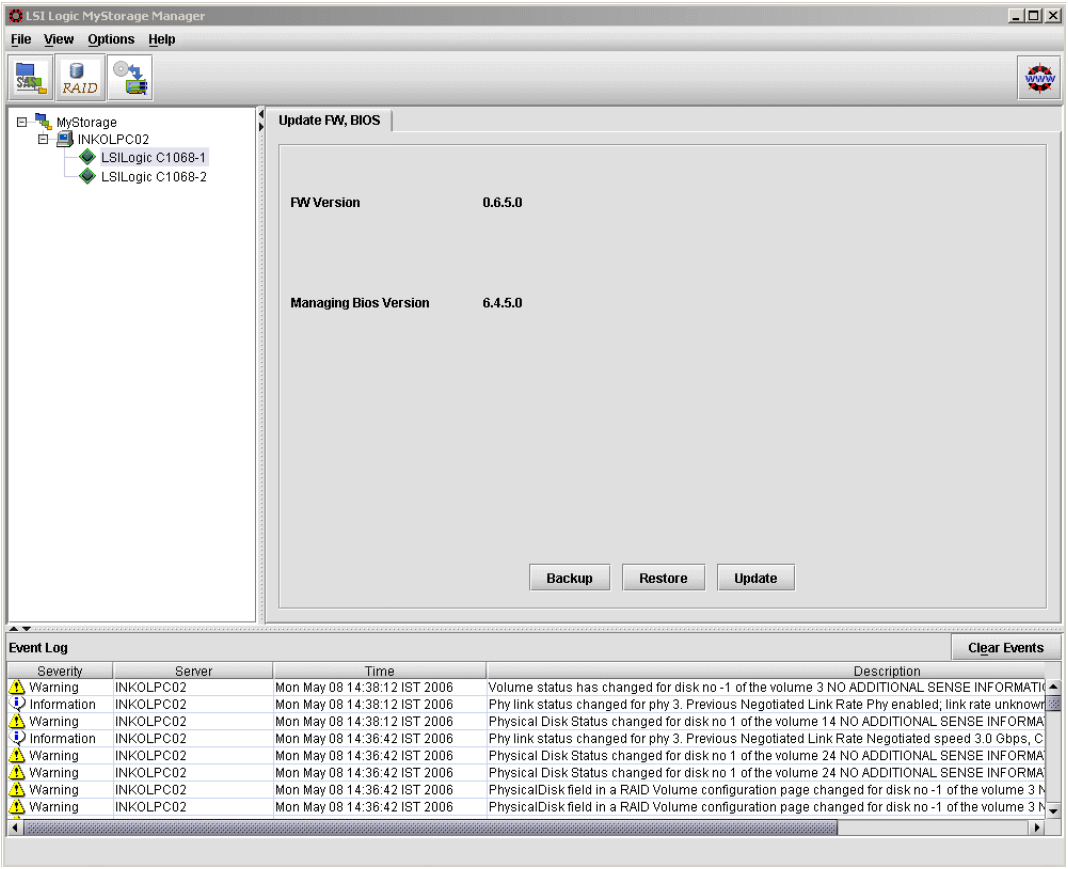
Figure 5.17 Backup/Update Firmware Menu



5.8.1 Update Host Adapter Firmware

Use this button to update the host adapter firmware.

Step 1. Highlight the host adapter to be updated.

Step 2. Next, click the “Update” button.

Step 3. A pop-up file browser appears identifying the new firmware and BIOS components.

Step 4. Confirmation is requested.

Step 5. When confirmed, a warning for heavy I/O load is given. Click OK to begin the update process.

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Step 6. Upon successful completion of the update, a confirmation appears.

Note: An update can fail due to wrong firmware/bios file or for mismatched product ID in firmware.

Repeat these steps for each new firmware component.

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5.8.2 Backup Host Adapter Firmware

Use this button to back up the host adapter firmware.

Step 1. Highlight the host adapter selected for firmware backup.

Step 2. Next, click the “Backup” button. The system prompts you that you are about to back up all image files.

Step 3. Click “OK”.

Step 4. Backup commences. Upon completion a confirmation message box appears.

Step 5. Upon successful completion of the backup, firmware and BIOS are stored under the installation directory of MyStorage management software at

```
\ImageBackup\ComputerName\
```

5.8.3 Restore Host Adapter Firmware

Use this button to restore host adapter firmware that was saved using the backup procedure described in Section 5.8.2, “Backup Host Adapter Firmware.”

Step 1. Highlight the host adapter to have firmware restored.

Step 2. Next, click the “Restore” button.

Step 3. A pop-up appears, listing all the backup images stored on disk. (Note: At least one image must have been previously created using the “Backup” button described in Section 5.8.2, “Backup Host Adapter Firmware.”).

Read the text descriptions, and choose the host adapter firmware image to restore.

Step 4. MyStorage management software will ask whether to reset the adapter.

Step 5. A heavy I/O load warning is given.

Step 6. Confirm, and restore commences.

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5.9 Launch Web Browser

The user can click this icon from the toolbar of the application to launch the default web browser set up in the system. This directs the user to a specific URL where you can manually download the latest driver/firmware corresponding to your card, if an update is available.

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Appendix A
Enable Boot Option for Fibre Channel HBAs

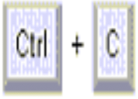
The LSI Fibre Channel host adapters ship to the customer with boot disabled. Boot is the mechanism of loading the computer's operating system (for example, Windows or Linux). Often, computers boot from a non-fibre channel local drive (ATA, IDE, SATA, and so on). The following procedure describes how to enable the LSI host adapter so that the host computer may optionally boot OS code loaded on a Fibre Channel disk or RAID array.

Step 1. Shut down the computer.

Step 2. Power-on the computer.

Step 3. Watch the monitor for this text message: “Press Ctrl-C to Start LSI Logic configuration Utility”.

Step 4. Simultaneously hold the



keys to launch the LSI BIOS utility.

Step 5. Press F2 and select “Boot Adapter List”.

Step 6. Use the Insert Key to Add an adapter to List.

Step 7. Highlight the adapter(s) you wish to add. Press Enter.

Step 8. In the Column labeled “Next Boot”, Toggle ON/OFF Using the + and - key.

Step 9. Press the Escape key when finished.

Step 10. Select “Save Changes”. Then exit this menu.

Step 11. Press the Escape key again to exit the screen.

Step 12. Select Exit from the configuration utility.

Step 13. Press any key to reboot.

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