USER'S GUIDE

LSIUtil Configuration Utility

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LSI LOGIC®

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Preface

This manual is the primary reference for the LSI Logic LSIUtil configuration utility. You can use LSIUtil with all Fibre Channel, SAS, and SCSI LSI Logic host board adapters (HBAs). LSIUtil enables you to perform tasks such as updating board firmware, scanning for connected devices, viewing configuration page information, running diagnostic tests, and displaying current system events and statistics. You can run LSIUtil in text-based, menu-driven mode or in full-featured command line mode.

Audience

This document assumes that you are familiar with SAS, Fibre Channel, or SCSI hardware and configuration. Some LSIUtil options can impair the operation of HBAs if they are used incorrectly. You should be sure that you fully understand the options and the settings that they affect before you use them.

The people who benefit from this document are:

- Software engineers and software developers
- Software test engineers
- Hardware and manufacturing

Organization

This document has the following chapters:

- Chapter 1, **LSIUtil Overview**, lists supported operating systems and supported LSI host board adapters and explains how to install LSIUtil.
- Chapter 2, **Using LSIUtil in Menu-Driven Mode**, explains how to use the LSIUtilmenu-driven interface. It lists and explains all the

menu options for Fibre Channel, SAS, and SCSI host board adapters.

- Chapter 3, **Using LSIUtil in Command Line Interface Mode**, explains how to use the LSIUtil command line interface. It lists all command line options and provides examples of how to use them.

Related Publications

Fusion-MPT™ Message Passing Interface Specification, v1.5.3, Document Number: DB14-000174-06

Conventions Used in This Manual

Hexadecimal numbers are indicated by the prefix “0x”—for example, 0x32CF. Binary numbers are indicated by the prefix “0b”—for example, 0b0011.0010.1100.1111.

Text on the computer screen and the names of files and directories appear in courier font.

User input such as keys pressed and letters typed appear in boldface font.

For syntax descriptions, Angle brackets (< >) enclose variables and square brackets ([ ]) enclose optional items.

Notes, Cautions, and Warnings

The following types cautions, warnings, and advisory notes are used in this document:

Note: Notes are supplementary or explanatory text that may help the user to understand a concept or to follow instructions.

Caution: Cautions are used when the user risks losing data or damaging equipment if the instructions are not followed carefully.

Revision History

Document Number	Date/Version	Remarks
DB15-000367-00	Version 1.0 December 2006	Initial release of document.

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Chapter 1
LSIUtil Overview

LSIUtil is a powerful configuration utility that you can use with all LSI Logic Fibre Channel, SAS, and SCSI host board adapters. LSIUtil enables you to perform tasks such as updating board firmware, scanning for connected devices, viewing configuration page information, running diagnostic tests, and displaying current system events and statistics. You can run LSIUtil in text-based, menu-driven mode or in full-featured command line mode.

This chapter contains the following sections:

1.1 Operating System Compatibility

LSIUtil runs on the following operating systems:

- Microsoft Windows®: x32, x64
- Linux®: x32, x86_64, ia64
- Solaris™: x86 and SPARC
- DOS
- EFI: x32, ia64

1.2 Installing LSIUtil

Follow these instructions to install LSIUtil on the supported operating systems:

- For Microsoft Windows: Copy `LSIUtil.exe` to `%windir%\system32`.
- For Linux and Solaris: Copy `LSIUtil.exe` to `/usr/bin`.
- For DOS: Copy `LSIUtil.exe` to the desired directory. Also, `DOS4GW.exe` must be installed in the desired directory.
- For EFI: Copy `LSIUtil.exe` to the desired directory.

1.3 Host Bus Adapter Compatibility

LSIUtil is compatible with the following LSI host bus adapters:

- All SAS adapters
- Fibre Channel adapters: LSI720xXP-LC, LSI740xXP-LC, LSI740xEP-LC
- LSI53C1030 based adapters: LSI21320, LSI22320, LSI22320T-R, MegaRAID® 320-2XR
- LSI53C1020 based adapters: LSI20320, LSIU320-R

Note: LSIUtil can also be used with all LSI Fusion-MPT™ chips, regardless of the application.

1.4 LSIUtil Features

LSIUtil includes the following features:

- Easy-to-use menu-driven interface, described in Chapter 2, “Using LSIUtil in Menu-Driven Mode”
- Flexible, full-featured command line interface, described in Chapter 3, “Using LSIUtil in Command Line Interface Mode”
- Ability to select a host adapter for updating, if multiple adapters are installed

- Options for updating board firmware
- Configuration options
- Diagnostics options
- Debug tools

Chapter 2
Using LSIUtil in Menu-Driven Mode

This chapter explains how to use the menu-driven mode of the LSIUtil configuration program with LSI Fibre Channel, SAS, or SCSI host board adapters (HBAs). To start LSIUtil in menu-driven mode in any supported operating system, type **lsiutil** at the command prompt and press **Enter**.

Caution: LSIUtil is a powerful configuration tool. Some LSIUtil options can impair the operation of HBAs if they are used incorrectly! Be sure that before you use any option you fully understand the effect it will have on the HBA and its functionality.

This chapter contains the following sections:

2.1 Navigating LSIUtil Menus and Screens

To select any LSIUtil menu option, type the number or letter of the option and press **Enter**. Note that the **w** option (Enable logging) has three options — w, ww, and www — depending on what kind of logging you want. For more information on the logging feature, see page 2-17.

Some of the Main Menu options open sub-menus, which are navigated the same as the Main Menu. On any menu, you use the **0** option to move to the next highest menu level, from sub-menu to Main Menu, to Start-up screen.

To exit LSIUtil, enter **0** at the Start-up screen.

To redisplay the current menu at any time, press **Enter**.

The LSIUtil Main Menu can appear in either Expert Mode, which lists all available options for the selected type of HBA (FC, SAS, or SCSI), or non-Expert Mode, which lists a subset of the more frequently used options. LSIUtil always starts initially in non-Expert Mode. You use the **e** menu option to toggle between Expert and non-Expert mode.

The list of Main Menu options varies for Fibre Channel, SAS, and SCSI HBAs. The full options list for each technology is shown in Table 2.1 (FC), Table 2.2 (SAS), and Table 2.3 (SCSI).

In Paged Mode, LSIUtil displays only one screen of information at a time, so that text does not scroll off the top of the screen before you can read it. When you have read the text, you press **Enter** to view the next block of text. You use the **p** menu option to toggle Paged Mode on or off.

2.2 Using LSIUtil with Fibre Channel Adapters

This section explains how to use LSIUtil with LSI Fibre Channel HBAs.

2.2.1 Start-up Screen

Figure 2.1 shows a sample of the LSIUtil Start-up screen. If the appropriate drivers are installed, the Start-up screen lists all the HBAs installed in the computer. In this example, there are two LSI Logic FC949E adapters.

Figure 2.1 Start-up Screen: Port Selection

```
LSI Logic MPT Configuration Utility, Version 1.47.18, October 18, 2006

2 MPT Ports found

     Port Name         Chip Vendor/Type/Rev    MPT Rev  Firmware Rev  IOC
 1.  /proc/mpt/ioc4    LSI Logic FC949E A1       105      01030602     0
 2.  /proc/mpt/ioc5    LSI Logic FC949E A1       105      01030602     1

Select a device:  [1-2 or 0 to quit]
```

After you select a host board adapter, the Main Menu appears.

2.2.2 LSIUtil Menu Options for Fibre Channel

Table 2.1 shows the complete list of LSIUtil Main Menu options for Fibre Channel HBAs.

Table 2.1 LSIUtil Menu Options: Fibre Channel Adapters

1. Identify firmware, BIOS, and/or FCode	42. Display operating system names for devices
2. Download firmware	43. Diagnostic Buffer actions
3. Upload firmware	44. Program manufacturing information
4. Download/erase BIOS and/or FCode	50. Dump MPT registers
5. Upload BIOS and/or FCode	51. Dump chip memory regions
6. Download SEEPROM	52. Read/modify chip memory locations
7. Upload SEEPROM	53. Dump FC trace buffer
8. Scan for devices	60. Show non-default settings
9. Read/change configuration pages	61. Restore default settings
10. Change IOC settings (interrupt coalescing, EEDP)	62. Update default PhyRegs settings
13. Change FC Port settings	63. Set personal WWNN/WWPN
14. Change IO Unit settings (multi-pathing)	67. Dump port state
15. Change persistent mappings	68. Port state summary
16. Display logged-in devices	69. Show board information
17. Show port aliases	80. Set port offline
19. Test configuration page actions	81. Set port online
20. Diagnostics	90. Send SCSI CDB
21. RAID actions	93. Send GIEL
22. Reset bus	94. Send GID_FT
23. Reset target	95. Send GA_NXT
24. Clear ACA	96. Send ELS request
30. Beacon on	97. Reset FC link, Maintain Logins
31. Beacon off	98. Reset FC link
32. Display SFP pages	99. Reset port
33: Erase non-volatile adapter storage	e Enable expert mode in menus
39. Force Firmware Download Boot	p Enable paged mode in menus
40. Display current events	w Enable logging
41. Display transfer statistics	

This section lists and defines all the LSIUtil Fibre Channel menu options, in numerical order.

Option 1: Identify firmware, BIOS, and/or Fcode

Use this option to display the current active firmware version and versions residing in flash.

Option 2: Download firmware

Use this option to download new firmware in order to update the Flash memory. When prompted, enter the firmware filename and path. Then enter **y** to continue, as shown in Figure 2.2.

You must reset the HBA by entering option 99 after the download is complete.

Figure 2.2 Downloading Firmware (Fibre Channel)

```
Main menu, select an option:  [1-99 or e or p or 0 to quit] 2

Enter firmware filename: /mnt/rand/firmware/949/fc949e.rom
Firmware image's version is LSIFC949E-1.03.06.02 Dev Build
  DO NOT RELEASE 8/30/2006 11:17

Do you want to continue?  [Yes or No, default is No] y

Downloading image...
Download succeeded

Main menu, select an option:  [1-99 or e or p or 0 to quit] 99

Resetting port...
```

Option 3: Upload Firmware

Use this option to save the firmware in Flash to a file. When prompted, enter the filename and path where you want to save the firmware image.

Option 4: Download/erase BIOS and/or FCode

Use this option to upgrade or erase the BIOS and/or the FCode. LSIUtil prompts you to input the BIOS filename to which you want to upgrade. If you press **Enter** without entering a filename, LSIUtil prompts you to keep

the existing image in Flash (if there is one) or erase it. When you have made your selection, LSIUtil repeats the same process for the EFI BIOS and FCode.

To activate the updated BIOS or FCode, you must reset the HBA by entering option 99.

Option 5: Upload BIOS and/or FCode

Use this option to save the BIOS/FCode in Flash to a file. When prompted, enter the filename and path where you want to save the BIOS/FCode.

Option 6: Download SEEPROM

Use this option to download new manufacturing information to the SEEPROM. When prompted, enter the SEEPROM filename and path.

Option 7: Upload SEEPROM

Use this option to save the SEEPROM information to a file. When prompted, enter the filename and path where you want to save the SEEPROM information.

Option 8: Scan for devices

Use this option to probe for connected devices by issuing an Inquiry command. Information about the connected devices is displayed, including port name, bus number, device type, and device name.

Option 9: Read/change configuration pages

Use this option to make changes to configuration pages. Refer to the *Fusion-MPT™ Message Passing Interface Specification* for specific information about the configuration pages. To make these changes, do the following:

1. Enter the page type, found in the *Fusion-MPT™ Message Passing Interface Specification*.
2. Enter the page number, found in the *Fusion-MPT™ Message Passing Interface Specification*.
3. Select NVRAM or current values.

At this point, LSIUtil prompts you to make changes to the selected configuration page. Changes are made according to the corresponding offset value and value desired.

Option 10: Change IOC settings (interrupt coalescing, EEDP)

Use this option to make quick changes to the interrupt coalescing and end-to-end data protection mode settings.

Option 13: Change FC Port settings

Use this option to make quick changes to the Link topology, Link speed, and other settings in FC Port Page 1, as shown in Figure 2.3. Refer to the *Fusion-MPT™ Message Passing Interface Specification* for more information about these settings.

To activate the new FC Port settings, you must reset the HBA by entering option 99.

Figure 2.3 Changing Fibre Channel Port Settings

```
Main menu, select an option:  [1-99 or e or p or 0 to quit] 13

Link topology:  [0=Auto, 1=NL_Port, 2=N_Port, default is 0]
Link speed:  [0=Auto, 1=1Gb, 2=2Gb, 4=4Gb, default is 0]
FCP Initiator protocol:  [0=Disabled, 1=Enabled, default is 1]
FCP Target protocol:  [0=Disabled, 1=Enabled, default is 1]
LAN protocol:  [0=Disabled, 1=Enabled, default is 1]
Assignment of Bus/Target IDs:  [0=SortByWWN, 1=SortByDID, default is 0]
Immediate Error Reply:  [0=Disabled, 1=Enabled, default is 0]
Maintain Logins:  [0=Disabled, 1=Enabled, default is 0]
Hard AL_PA:  [01 to EF, or FF for Soft AL_PA, default is ff]
Initiator Device Timeout:  [0 to 2047, default is 60]
Initiator I/O Pending Timeout:  [0 to 127, default is 8]

Main menu, select an option:  [1-99 or e or p or 0 to quit]99
```

Option 14: Change IO Unit settings (multi-pathing)

Use this option to quickly enable or disable multi-pathing. If multi-pathing is enabled, all paths to any device are displayed. If it is disabled, only one path to any device is displayed.

If you change the multi-pathing setting, you must reset the HBA by entering option 99.

Option 15: Change persistent mappings

Use this option to display the Persistence menu. The following options are available on this menu:

1. Show persistent mappings
2. Automatically add persistent mappings for ALL targets
4. Delete persistent mappings for ALL targets
99. Reset port

Option 16: Display logged-in devices

Use this option to view information directly from the configuration pages about devices that are logged in, as shown in Figure 2.4.

Figure 2.4 Displaying Logged-in Devices (Fibre Channel)

```
 FC949X's link is online, type is private loop, speed is 4 Gbaud

B___T        WWNN              WWPN        PortId
       200000062b0e1a8c  100000062b0e1a8c  0000e8
       200000062b0e19c4  100000062b0e19c4  0000ef
```

Option 17: Show port aliases

Use this option to view information about the `mptstm` Linux target driver. The information includes the number of aliases that have been requested and how many of them are active.

Option 19: Test configuration page actions

Use this option to perform configuration page tests. You can enter a filename that is preconfigured with the information needed, or you can choose to enter the test commands interactively. You can enter an output filename for the test results, or you can display the results on the screen. After you make these choices, a command line appears. The syntax is
`<Action> <PageType> <PageNumber> [<PageAddress>]`

The `<PageAddress>` is optional. For information about the command syntax, enter **?** to view a help screen, which is shown in Figure 2.5.

Figure 2.5 Help Information for Configuration Page Test

```
Valid input is:  <Action> <PageType> <PageNumber> [<PageAddress>]
 Action is:
   0 or H   display page Header only
   1 or RC  display page after Read Current
   2 or WC  enter page and do Write Current
   3 or D   set current page to Default values
   4 or WN  enter page and do Write NVRAM
   5 or RD  display page after Read Default
   6 or RN  display page after Read NVRAM
   RDWN     do Read Default then Write NVRAM
 PageType is a decimal number beteen 0 and 255
 PageNumber is a decimal number between 0 and 255
 PageAddress is an optional hex number
```

Option 20: Diagnostics

Use this option to perform various diagnostic actions on a specified target, and to display or clear port counters. When you select this option the Diagnostics menu appears, as shown in Figure 2.6.

Figure 2.6 Diagnostics Menu (Fibre Channel)

```
Main menu, select an option:  [1-99 or e or p or 0 to quit] 20

 1.  Inquiry Test
 2.  WriteBuffer/ReadBuffer/Compare Test
 3.  Read Test
 4.  Write/Read/Compare Test
 5.  Write Test
 6.  Read/Compare Test
 7.  Log Sense Test
 8.  Read Capacity / Read Block Limits Test
 9.  Mode Page Test
10.  Echo ELS Test
11.  Read Link Error Status ELS Test
12.  Display port counters
13.  Clear port counters
19.  Drive firmware download
20.  Trigger FC Analyzer With Echo ELS
21.  Read Logical Blocks
22.  Write Logical Blocks
23.  Verify Logical Blocks
30.  Inject media error
31.  Repair media error
99.  Reset port
 e   Disable expert mode in menus
 p   Enable paged mode in menus
 w   Enable logging

Diagnostics menu, select an option:  [1-99 or e/p/w or 0 to quit]
```

Option 21: RAID actions

Use this option to obtain RAID information and to perform many RAID related actions, such as Enable and Fail. When you select this option, the menu shown in Figure 2.7 appears.

Figure 2.7 RAID Actions Menu

```
 1.  Show volumes
 2.  Show physical disks
 3.  Get volume state
10.  Disable volume
11.  Enable volume
12.  Inactivate volume
13.  Activate volume
20.  Offline physical disk
21.  Online physical disk
22.  Fail physical disk
23.  Replace physical disk
24.  Quiesce physical disk I/Os
25.  Unquiesce physical disk I/Os
30.  Create volume
31.  Delete volume
32.  Change volume settings
41.  Delete physical disk
42.  Change physical disk settings
50.  Create hot spare

RAID menu, select an option:  [1-99 or e/p/w or 0 to quit]
```

Option 22: Reset bus

Use this option to manually send a task management request, TaskTape = RESET_BUS.

Note: This option has the functionality of an initiator; initiator protocol must be enabled to perform this task.

Option 23: Reset target

Use this option to send down a reset to a specified target. When you enter this option, the following menu selections appear:

1. Target Reset
2. Logical Unit reset
3. Abort Task Set
4. Clear Task Set

Option 24: Clear ACA

Use this option to clear auto contingent allegiance (ACA). (ACA is a relationship between initiator and target that aids in error recovery.)

Option 30: Beacon on

Use this option to flash the LED on the currently selected HBA so you can visually identify it.

Option 31: Beacon off

Use this option to turn off the flashing LED on the HBA.

Option 32: Display SFP pages

Use this option to view the information in SFP Page 0 and SFP Page 1.

Option 33: Erase non-volatile adapter storage

Caution: Use with caution! This option lets you perform *invasive actions* that can make the HBA non-functional.

When you select this option, an Erase menu appears, as shown in Figure 2.8. Enter the number of the item you want to erase.

Figure 2.8 Erase Menu

```
Main menu, select an option:  [1-99 or e/p/w or 0 to quit] 33

 1.  NVSRAM
 2.  SEEPROM
 3.  FLASH
 4.  Bootloader
 5.  Firmware (backup copy)
 6.  Firmware (current copy)
 7.  Persistent non-manufacturing config pages
 8.  Persistent manufacturing config pages
 9.  Boot services (BIOS/FCode)

Select what to erase:  [1-9 or RETURN to quit]
```

Option 39: Force firmware download boot

Use this option to force a firmware download boot.

Note: This option works only on the DOS and EFI platforms.

Option 40: Display current events

Use this option to display firmware events passed to the driver in raw format.

Note: This option works only on the Windows, Linux, and Solaris platforms.

Option 41: Display transfer statistics

Use this option to display transfer statistics on a given port. The statistics include the following for each transaction: Tx Frames, Rx Frames, Tx MB, Rx MB, Total MB.

Note: The command line version of this option (**-m**) provides a greater degree of control.

Option 42: Display operating system names for devices

Use this option to display the names assigned by the operating system to connected devices, as shown in Figure 2.9.

Note: This option works only on the Windows, Linux, and Solaris platforms.

Figure 2.9 Operating System Names for Devices (Fibre Channel)

```
Main menu, select an option:  [1-99 or e/p/w or 0 to quit] 42

Scsi Port 2 is Lsi_sas1

 B___T___L  Type       Operating System Device Name
 0   3   0  EnclServ
 0   4   0  Disk       PhysicalDrive1      \Device\Harddisk1\DR160
 0   5   0  Disk       PhysicalDrive2      \Device\Harddisk2\DR161
 0   6   0  Disk       PhysicalDrive3      \Device\Harddisk3\DR162
 0   7   0  Disk       PhysicalDrive4      \Device\Harddisk4\DR163
 0  15   0  EnclServ

Main menu, select an option:  [1-99 or e/p/w or 0 to quit]
```

Option 43: Diagnostic Buffer actions

Use this option to provide debug information to LSI for certain specific customer issues. This option works only in conjunction with specific firmware.

> Note: This option works only on the Windows and Linux platforms.

Option 44: Program manufacturing information

Use this option to program the manufacturing information. This can be done via a filename, by scanner, or by keyboard.

For Fibre Channel HBAs, LSIUtil first prompts you for a manufacturing file. It then prompts for board tracer number, board assembly number, and board WWID.

Option 50: Dump MPT registers

Use this option to dump MPT registers: specifically, doorbell, diagnostic, interrupt status, and interrupt mask.

Option 51: Dump chip memory regions

Use this option to dump memory regions. LSIUtil prompts you for a starting address, ending address, and number of locations. It gives you the option to specify a filename in which to write the information.

Option 52: Read / modify chip memory locations

Use this option to read and modify specific chip memory regions. LSIUtil prompts you for an address, in which the utility will return the address and value. At this point you can change that value, if desired.

Option 53: Dump FC trace buffer

Use this option to dump the FC trace buffer. This option must be used in conjunction with the proper firmware image, for example, `fct949x.rom`. LSIUtil prompts you for an output filename.

Option 60: Show non-default settings

Use this option to display all non-default settings. To determine this information, LSIUtil reads each page twice, first reading NVRAM, then reading DEFAULTS. After comparing the two, it displays the settings that are different from the defaults.

Option 61: Restore default settings

Use this option to restore default settings. LSIUtil prompts you to determine if all persistent mappings should be removed.

Option 62: Update default PhyRegs settings

Use this option to update the PhyRegs settings.

Option 63: Set personal WWNN/WWPN

Use this option to manipulate the personal WWNN and WWPN.

Option 67: Dump port state

Use this option to display all information contained in the config pages related to the selected port, as shown in Figure 2.10.

Figure 2.10 Current Port State (Fibre Channel)

```
Current Port State
------------------
FC949X's link is online, type is private loop, speed is 4 Gbaud

Software Version Information
----------------------------
Current active firmware version is 01030b00 (1.03.11)
Firmware image's version is LSIFC949X-1.03.11 (11/7/2006)
  LSI Logic Corporation

Firmware Settings
-----------------
Link Topology:                  Auto
Link Speed:                     Auto
FCP Initiator protocol:         Enabled
FCP Target protocol:            Enabled
LAN protocol:                   Enabled
Assignment of Bus/Target IDs:   SortByWWN
Immediate Error Reply:          Disabled
Maintain Logins:                Disabled
Hard AL_PA:                     ff
Initiator Device Timeout:       59
Initiator I/O Pending Timeout:  8
Multi-pathing:                  Enabled
Interrupt Coalescing:           Enabled, timeout is 200 us, depth is 9

Persistent Mappings
-------------------
No persistent entries found
```

Option 68: Port state summary

Use this option to display a summary of settings for the selected port.

Option 69: Show board information

Use this option to display the Bus/Dev/Fun, board name, board assembly, and board tracer information.

Option 80: Set port offline

Use this option to tell the transmitter to stop.

Option 81: Set port online

Use this option to tell the transmitter to begin.

Option 90: Send SCSI CDB

Use this option to send down a SCSI CDB. LSIUtil prompts you to enter the bus number, target number, LUN number, and value of the CDB desired.

Option 93: Send GIEL

Use this option to send a GIEL (Get Interconnect Element List).

Option 94: Send GID_FT

Use this option to send a GID_FT command to get port identifiers.

Option 95: Send GA_NEXT

Use this option to send a Get All Next. This command is used to ask the name server for detailed information about all devices that it knows about.

Option 96: Send ELS request

Use this option to send an ELS request. LSIUtil prompts you to enter the ELS code, D_ID, payload length in words, and number of iterations.

Option 97: Reset FC link, Maintain Logins

Use this option to cause the firmware to either send a LIP or a LR. This sets a special flag that tells the firmware to not automatically log all devices out when the FC link is reset.

Option 98: Reset FC link

Use this option to cause the firmware to either send a LIP or a LR, to be determined by the type of topology that is currently active.

Option 99: Reset port

Use this option to force a reset of the chip.

Option e: Expert mode

Use this option to enable or disable Expert mode for Main Menu options.

Option p: Paging

Use this option to enable or disable Paging mode. In Paging mode, only one screen of data is displayed at a time, until you press **Enter** to display the next screen.

Option w: Log functionality

Use this option to enable log functionality, as follows:

- **w**: Logs only commands that affect non-volatile storage. PASS or FAIL into `lsiutil.log`.
- **ww**: Logs MPT requests and replies that fail into `lsiutil.log`.
- **www**: Logs all MPT requests and replies into `lsiutil.log`.

2.3 Using LSIUtil with SAS Adapters

This section explains how to use LSIUtil with LSI SAS HBAs.

2.3.1 Start-up Screen

Figure 2.11 shows a sample of the LSIUtil Start-up screen. If the appropriate drivers are installed, the Start-up screen lists all the HBAs installed in the computer. In this example, there are four LSI Logic FC949E adapters and one SAS1068E adapter.

Figure 2.11 Start-up Screen: Port Selection

```
Main menu, select an option:  [1-99 or e/p/w or 0 to quit] 0

     Port Name         Chip Vendor/Type/Rev    MPT Rev  Firmware Rev  IOC
 1.  /proc/mpt/ioc0    LSI Logic FC949X A1       105      01030b00     0
 2.  /proc/mpt/ioc1    LSI Logic FC949X A1       105      01030b00     1
 3.  /proc/mpt/ioc2    LSI Logic FC949E A1       105      01030901     0
 4.  /proc/mpt/ioc3    LSI Logic FC949E A1       105      01030901     1
 5.  /proc/mpt/ioc4    LSI Logic SAS1068E B2     105      000a0e00     0

Select a device:  [1-5 or 0 to quit]
```

After you select a host board adapter, the Main Menu appears.

2.3.2 LSIUtil Menu Options for SAS

Table 2.2 shows the complete list of LSIUtil Main Menu options for SAS host board adapters.

Table 2.2 LSIUtil Menu Options: SAS Adapters

1. Identify firmware, BIOS, and/or FCode	40. Display current events
2. Download firmware	42. Display operating system names for devices
3. Upload firmware	44. Program manufacturing information
4. Download/erase BIOS and/or FCode	45. Concatenate SAS firmware and NVDATA files
5. Upload BIOS and/or FCode	50. Dump MPT registers
6. Download SEEPROM	51. Dump chip memory regions
7. Upload SEEPROM	52. Read/modify chip memory locations
8. Scan for devices	60. Show non-default settings
9. Read/change configuration pages	61. Restore default settings
10. Change IOC settings (interrupt coalescing)	67. Dump port state
13. Change SAS IO Unit settings	68. Port state summary
14. Change IO Unit settings (multi-pathing, queuing, caching)	69. Show board information
15. Change persistent mappings	90. Send SCSI CDB
16. Display attached devices	95. Send SATA request
19. Test configuration page actions	96. Send SMP request
20. Diagnostics	97. Reset SAS phy
21. RAID actions	98. Reset SAS link
22. Reset bus	99. Reset port
23. Reset target	e Disable expert mode in menus
24. Clear ACA	p Enable paged mode in menus
33: Erase non-volatile adapter storage	w Enable logging
39. Force firmware download boot	

This section lists and defines all the LSIUtil menu options, in numerical order, for SAS HBAs.

Option 1: Identify firmware, BIOS, and/or Fcode

Use this option to display the current active firmware version and versions residing in flash.

Option 2: Download firmware

Use this option to download new firmware in order to update the Flash memory. When prompted, enter the firmware filename and path. Then enter **y** to continue, as shown in Figure 2.12.

You must reset the HBA by entering option 99 after the download is complete.

Figure 2.12 Downloading Firmware (SAS)

```
Enter firmware filename: 1068e_readytogo.fw
Firmware image's version is MPTFW-00.11.08.00-IT
  LSI Logic
  MPTSASFW-00.00.00.00            @(#)LSI Logic

Do you want to continue?  [Yes or No, default is No] y

Downloading image...
Download succeeded

Main menu, select an option:  [1-99 or e/p/w or 0 to quit] 99

Resetting port...
```

Option 3: Upload Firmware

Use this option to save the firmware in Flash to a file. When prompted, enter the filename and path where you want to save the firmware image.

Option 4: Download/erase BIOS and/or FCode

Use this option to upgrade or erase the BIOS and/or the FCode. LSIUtil prompts you to input the BIOS filename to which you want to upgrade. If you press **Enter** without entering a filename, LSIUtil prompts you to keep the existing image in Flash (if there is one) or erase it. When you have made your selection, LSIUtil repeats the same process for the EFI BIOS and FCode.

To activate the updated BIOS or FCode, you must reset the HBA by entering option 99.

Option 5: Upload BIOS and/or FCode

Use this option to save the BIOS/FCode in Flash to a file. When prompted, enter the filename and path where you want to save the BIOS/FCode.

Option 6: Download SEEPROM

Use this option to download new manufacturing information to the SEEPROM. When prompted, enter the SEEPROM filename and path.

Option 7: Upload SEEPROM

Use this option to save the SEEPROM information to a file. When prompted, enter the filename and path where you want to save the SEEPROM information.

Option 8: Scan for devices

Use this option to probe for connected devices by issuing an Inquiry command. Information about the connected devices is displayed, including port name, bus number, device type, and device name.

Option 9: Read / change configuration pages

Use this option to make changes to configuration pages. Refer to the *Fusion-MPT™ Message Passing Interface Specification* for specific information about the configuration pages. To make these changes, do the following:

1. Enter the page type, found in the *Fusion-MPT™ Message Passing Interface Specification*.
2. Enter the page number, found in the *Fusion-MPT™ Message Passing Interface Specification*.
3. Select NVRAM or current values.

At this point, LSIUtil prompts you to make changes to the selected configuration page. Changes are made according to the corresponding offset value and value desired.

Option 10: Change IOC settings (interrupt coalescing)

Use this option to make quick changes to the interrupt coalescing settings.

Option 13: Change SAS IO Unit setting

Use this option to make quick changes to the settings in SAS IO Unit page 1 and 2, as shown in Figure 2.13. Refer to the *Fusion-MPT™ Message Passing Interface Specification* for more details about these settings.

To activate the new SAS I/O Unit settings, you must reset the HBA by entering option 99.

Figure 2.13 Changing SAS I/O Unit Settings

```
SATA Maximum Queue Depth:  [0 to 127, default is 32]
Device Missing Report Delay:  [0 to 2047, default is 0]
Device Missing I/O Delay:  [0 to 255, default is 0]

PhyNum  Link      MinRate  MaxRate  Initiator  Target    Port
   0    Enabled     1.5      3.0    Enabled    Disabled  Auto
   1    Enabled     1.5      3.0    Enabled    Disabled  Auto
   2    Enabled     1.5      3.0    Enabled    Disabled  Auto
   3    Enabled     1.5      3.0    Enabled    Disabled  Auto
   4    Enabled     1.5      3.0    Enabled    Disabled  Auto
   5    Enabled     1.5      3.0    Enabled    Disabled  Auto
   6    Enabled     1.5      3.0    Enabled    Disabled  Auto
   7    Enabled     1.5      3.0    Enabled    Disabled  Auto

Select a Phy:  [0-7, 8=AllPhys, RETURN to quit] 0
Link:  [0=Disabled, 1=Enabled, default is 1]
MinRate:  [0=1.5 Gbps, 1=3.0 Gbps, default is 0]
MaxRate:  [0=1.5 Gbps, 1=3.0 Gbps, default is 1]
Initiator:  [0=Disabled, 1=Enabled, default is 1]
Target:  [0=Disabled, 1=Enabled, default is 0]
Port:  [0 to 7 for manual config, 8 for auto config, default is 8]
Persistence:  [0=Disabled, 1=Enabled, default is 1]
Physical mapping:  [0=None, 1=DirectAttach, 2=EnclosureSlot, default is 0]
```

Option 14: Change IO Unit settings (multi-pathing, queuing, caching)

Use this option to quickly enable or disable multi-pathing, SATA native command queuing, and SATA write caching. If multi-pathing is enabled,

all paths to any device are displayed. If it is disabled, only one path to any device is displayed.

To activate the new settings, you must reset the HBA by entering option 99.

Option 15: Change persistent mappings

Use this option to display the Persistence menu. The following options are available on this menu:

1. Show persistent mappings
10. Clear all persistent mappings
11. Clear all non-present persistent mappings
12. Change (enable/disable) persistence
99. Reset port

Option 16: Display attached devices

Use this option to view information directly from the configuration pages about devices that are logged in, as shown in Figure 2.14.

Figure 2.14 Displaying Logged-in Devices (SAS)

```
SAS1068E's links are down, down, down, down, down, down, down, down

B___T     SASAddress     PhyNum  Handle  Parent  Type
       500605b0000e1310           0001           SAS Initiator
       500605b0000e1311           0002           SAS Initiator
       500605b0000e1312           0003           SAS Initiator
       500605b0000e1313           0004           SAS Initiator
       500605b0000e1314           0005           SAS Initiator
       500605b0000e1315           0006           SAS Initiator
       500605b0000e1316           0007           SAS Initiator
       500605b0000e1317           0008           SAS Initiator

Type      NumPhys    PhyNum  Handle     PhyNum  Handle  Port  Speed
Adapter      8
```

Option 19: Test configuration page actions

Use this option to perform configuration page tests. You can enter a filename that is preconfigured with the information needed, or you can choose to enter the test commands interactively. You can enter an output filename for the test results, or you can display the results on the screen. After you make these choices, a command line appears. The syntax is `<Action> <PageType> <PageNumber> [<PageAddress>]`

The `<PageAddress>` is optional. For information about the command syntax, enter **?** to view a help screen, as shown in Figure 2.15.

Figure 2.15 Help Information for Configuration Test Page

```
Valid input is:  <Action> <PageType> <PageNumber> [<PageAddress>]
  Action is:
    0 or H   display page Header only
    1 or RC  display page after Read Current
    2 or WC  enter page and do Write Current
    3 or D   set current page to Default values
    4 or WN  enter page and do Write NVRAM
    5 or RD  display page after Read Default
    6 or RN  display page after Read NVRAM
    RDWN     do Read Default then Write NVRAM
  PageType is a decimal number beteen 0 and 255
  PageNumber is a decimal number between 0 and 255
  PageAddress is an optional hex number
```

Option 20: Diagnostics

Use this option to perform various diagnostic actions on a specified target or to display and clear Phy counters. When you select this option, the Diagnostics menu appears, as shown in Figure 2.16.

Figure 2.16 Diagnostics Menu (SAS)

```
Main menu, select an option:  [1-99 or e/p/w or 0 to quit] 20

 1.  Inquiry Test
 2.  WriteBuffer/ReadBuffer/Compare Test
 3.  Read Test
 4.  Write/Read/Compare Test
 5.  Write Test
 6.  Read/Compare Test
 7.  Log Sense Test
 8.  Read Capacity / Read Block Limits Test
 9.  Mode Page Test
10.  SATA Identify Drive Test
11.  SATA Clear Affiliation Test
12.  Display phy counters
13.  Clear phy counters
14.  SATA SMART Read Test
19.  Drive firmware download
21.  Read Logical Blocks
22.  Write Logical Blocks
23.  Verify Logical Blocks
30.  Inject media error
31.  Repair media error
32.  Set software write protect
33.  Clear software write protect
99.  Reset port
 e   Disable expert mode in menus
 p   Enable paged mode in menus
 w   Enable logging

Diagnostics menu, select an option:  [1-99 or e/p/w or 0 to quit]
```

Option 21: RAID actions

Use this option to obtain RAID information as well as perform many RAID related actions, such as Enable and Fail. When you select this option, the menu shown in Figure 2.17 appears.

Figure 2.17 RAID Actions Menu

```
 1.  Show volumes
 2.  Show physical disks
 3.  Get volume state
10.  Disable volume
11.  Enable volume
12.  Inactivate volume
13.  Activate volume
20.  Offline physical disk
21.  Online physical disk
22.  Fail physical disk
23.  Replace physical disk
24.  Quiesce physical disk I/Os
25.  Unquiesce physical disk I/Os
30.  Create volume
31.  Delete volume
32.  Change volume settings
41.  Delete physical disk
42.  Change physical disk settings
50.  Create hot spare
99.  Reset port
 e   Disable expert mode in menus
 p   Enable paged mode in menus
 w   Enable logging

RAID actions menu, select an option:  [1-99 or e/p/w or 0 to quit]
```

Option 22: Reset bus

Use this option to manually send a task management request, TaskTape = RESET_BUS.

Note: This option has the functionality of an initiator; initiator protocol must be enabled to perform this task.

Option 23: Reset target

Use this option to send down a reset to a specified target. When you enter this option, the following menu selections appear:

1. Target Reset
2. Logical Unit reset
3. Abort Task Set
4. Clear Task Set

Option 24: Clear ACA

Use this option to clear auto contingent allegiance (ACA). (ACA is a relationship between initiator and target that aids in error recovery.)

Option 33: Erase non-volatile adapter storage

Caution: Use with caution! This option lets you perform *invasive actions* that can make the HBA non-functional.

When you select this option, an Erase menu appears, as shown in Figure 2.18. Enter the number of the item you want to erase. LSIUtil prompts you for a filename in which to store manufacturing information and the SAS WWID.

Figure 2.18 Erase Menu

```
Main menu, select an option:  [1-99 or e/p/w or 0 to quit] 33

 1.  NVSRAM
 2.  SEEPROM
 3.  FLASH
 4.  Bootloader
 5.  Firmware (backup copy)
 6.  Firmware (current copy)
 7.  Persistent non-manufacturing config pages
 8.  Persistent manufacturing config pages
 9.  Boot services (BIOS/FCode)

Select what to erase:  [1-9 or RETURN to quit]
```

Option 39: Force firmware download boot

Use this option to force a firmware download boot.

Note: This option works only on the DOS and EFI platforms.

Option 40: Display current events

Use this option to display firmware events passed to the driver in raw format.

Note: This option works only on the Windows, Linux, and Solaris platforms.

Option 42: Display operating system names for devices

Use this option to display the names assigned by the operating system to connected devices, as shown in Figure 2.19.

Figure 2.19 Operating System Names for Devices (SAS)

```
Main menu, select an option:  [1-99 or e/p/w or 0 to quit] 42

Scsi Port 2 is Lsi_sas1

 B___T___L  Type       Operating System Device Name
 0   3   0  EnclServ
 0   4   0  Disk       PhysicalDrive1      \Device\Harddisk1\DR160
 0   5   0  Disk       PhysicalDrive2      \Device\Harddisk2\DR161
 0   6   0  Disk       PhysicalDrive3      \Device\Harddisk3\DR162
 0  15   0  EnclServ

Main menu, select an option:  [1-99 or e/p/w or 0 to quit]
```

Note: This option works only on the Windows, Linux, and Solaris platforms.

Option 44: Program manufacturing information

Use this option to program the manufacturing information. This can be done via a filename, by scanner, or by keyboard.

For SAS HBAs, LSIUtil prompts you for a filename containing the board tracer number, board assembly number, and board WWID. Alternatively, you can enter this information manually.

Option 45: Concatenate SAS firmware and NVDATA files

Use this option to concatenate SAS firmware with a particular NVDATA file. LSIUtil prompts you to supply the firmware name, NVDATA filename,

and an output name for the concatenated firmware file that LSIUtil will generate.

Option 50: Dump MPT registers

Use this option to dump MPT registers: specifically, doorbell, diagnostic, interrupt status, and interrupt mask.

Option 51: Dump chip memory regions

Use this option to dump memory regions. LSIUtil prompts you for a starting address, ending address, and number of locations. It gives you the option to specify a filename in which to write the information.

Option 52: Read/modify chip memory locations

Use this option to read and modify specific chip memory regions. LSIUtil prompts you for an address, in which the utility will return the address and value. At this point you can change that value, if desired.

Option 60: Show non-default settings

Use this option to display all non-default settings. To determine this information, LSIUtil reads each page twice, first reading NVRAM, then reading DEFAULTS. After comparing the two, it displays the settings that are different from the defaults.

Option 61: Restore default settings

Use this option to restore default settings. LSIUtil prompts you to determine if all persistent mappings should be removed.

Option 67: Dump Port State

Use this option to display all information contained in the config pages related to the selected port, as shown in Figure 2.20.

Figure 2.20 Current Port State (SAS)

```
Current Port State
------------------
SAS1068E's links are down, down, down, down, down, down, down, down

Software Version Information
----------------------------
Current active firmware version is 000a0e00 (0.10.14)
Firmware image's version is MPTFW-00.10.14.00-IT
  LSI Logic
x86 BIOS image's version is MPTBIOS-6.06.00.00 (2006.02.09)
FCode image's version is MPT SAS FCode Version 1.00.40 (2006.03.02)

Firmware Settings
-----------------
Multi-pathing:                  Disabled
SATA Maximum Queue Depth:       32
Phy Parameters for Phynum:      0    1    2    3    4    5    6    7
  Link Enabled:                 Yes  Yes  Yes  Yes  Yes  Yes  Yes  Yes
  Link Min Rate:                1.5  1.5  1.5  1.5  1.5  1.5  1.5  1.5
  Link Max Rate:                3.0  3.0  3.0  3.0  3.0  3.0  3.0  3.0
  SSP Initiator Enabled:        Yes  Yes  Yes  Yes  Yes  Yes  Yes  Yes
  SSP Target Enabled:           No   No   No   No   No   No   No   No
Interrupt Coalescing:           Enabled, timeout is 16 us, depth is 4

Persistent Mappings
-------------------
Persistent entry 0 is valid, Bus 0 Target 0 is PhysId 500000e010f59732
Persistent entry 1 is valid, Bus 0 Target 1 is PhysId 500000e010f51ca2
Persistent entry 2 is valid, Bus 0 Target 2 is PhysId 500000e010f58012
```

Option 68: Port State Summary

Use this option to display a summary of settings related to the selected port.

Option 69: Show Board Information

Use this option to display the Bus/Dev/Fun, board name, board assembly, and board tracer information.

Option 90: Send SCSI CDB

Use this option to send down a SCSI CDB. LSIUtil prompts you to enter the bus number, target number, LUN number, and value of the CDB desired.

Option 95: Send SATA request

Use this option to send down a SATA request. LSIUtil prompts you for the following:

Bus (where applicable)
Target number
ATA Word 00 Feature
ATA Word 01 Count
ATA Word 02 LBA H
ATA Word 03 LBA M
ATA Word 04 LBA L
ATA Word 05 Device
ATA Word 05 Command
Input data length in words
Output data length in words
SATA passThrough Flags

Option 96: Send SMP request

Use this option to send down an SMP request. LSIUtil prompts you to enter an SMP function code, handle, and frame length in bytes. LSIUtil then prompts you for changes to the value.

Option 97: Reset SAS Phy

Use this option to reset the SAS Phy. LSIUtil prompts you to enter the Phy number.

Option 98: Reset SAS Link

Use this option to reset the SAS link.

Option 99: Reset port

Use this option to force a reset of the chip.

Option e: Expert mode

Use this option to enable or disable Expert mode for Main Menu options.

Option p: Paging

Use this option to enable or disable Paging mode. In Paging mode, only one screen of data is displayed at a time, until you press **Enter** to display the next screen.

Option w: Log functionality

Use this option to enable log functionality, as follows:

- **w**: Logs only commands that affect non-volatile storage. PASS or FAIL into `lsiutil.log`.
- **ww**: Logs MPT requests and replies that fail into `lsiutil.log`.
- **www**: Logs all MPT requests and replies into `lsiutil.log`.

2.4 Using LSIUtil with SCSI Adapters

This section explains how to use LSIUtil with LSI SCSI HBAs.

2.4.1 Start-up Screen

Figure 2.21 shows a sample of the LSIUtil Start-up screen. If the appropriate drivers are installed, the Start-up screen lists all the HBAs installed in the computer. In this example, there are two LSI Logic 53C1030 single-chip adapters.

Figure 2.21 Start-Up Screen: Port Selection

```
LSI Logic MPT Configuration Utility, Version 1.48, November 7, 2006

2 MPT Ports found

     Port Name         Chip Vendor/Type/Rev    MPT Rev  Firmware Rev  IOC
 1.  /proc/mpt/ioc0    LSI Logic 53C1030 A0      102      01030600     0
 2.  /proc/mpt/ioc1    LSI Logic 53C1030 A0      102      01030600     1

Select a device:  [1-2 or 0 to quit]
```

After you select an adapter, the Main Menu appears.

2.4.2 LSIUtil Menu Options for SCSI

Table 2.3 shows the complete list of LSIUtil Main Menu options for SCSI host board adapters.

Table 2.3 LSIUtil Menu Options: SCSI Adapters

1. Identify firmware, BIOS, and/or FCode	33: Erase non-volatile adapter storage
2. Download firmware	39. Force firmware download boot
3. Upload firmware	40. Display current events
4. Download/erase BIOS and/or FCode	42. Display operating system names for devices
5. Upload BIOS and/or FCode	50. Dump MPT registers
6. Download SEEPROM	51. Dump chip memory regions
7. Upload SEEPROM	52. Read/modify chip memory locations
8. Scan for devices	60. Show non-default settings
9. Read/change configuration pages	61. Restore default settings
10. Change IOC settings (interrupt coalescing)	67. Dump port state
11. Change SCSI initiator settings	68. Port state summary
12. Change SCSI target settings	69. Show board information
19. Test configuration page actions	90. Send SCSI CDB
20. Diagnostics	99. Reset port
21. RAID actions	e Disable expert mode in menus
22. Reset bus	p Enable paged mode in menus
23. Reset target	w Enable logging
24. Clear ACA	

This section lists and defines all the LSIUtil menu options, in numerical order, for SCSI host bus adapters.

Option 1: Identify firmware, BIOS, and/or Fcode

Use this option to display the current active firmware version.

Option 2: Download firmware

Use this option to download new firmware in order to update the Flash memory. When prompted, enter the firmware filename and path.

To activate the new firmware, you must reset the HBA by entering option 99.

Option 3: Upload Firmware

Use this option to save the firmware in Flash to a file. When prompted, enter the filename and path where you want to save the firmware image.

Option 4: Download/erase BIOS and/or FCode

Use this option to upgrade or erase the BIOS and/or the FCode. LSIUtil prompts you to input the BIOS filename to which you want to upgrade. If you press **Enter** without entering a filename, LSIUtil prompts you to keep the existing image in Flash (if there is one) or erase it. When you have made your selection, LSIUtil repeats the same process for the EFI BIOS and FCode.

To activate the updated BIOS or FCode, you must reset the HBA by entering option 99.

Option 5: Upload BIOS and/or FCode

Use this option to save the BIOS/FCode in Flash to a file. When prompted, enter the filename and path where you want to save the BIOS/FCode.

Option 6: Download SEEPROM

Use this option to download new manufacturing information to the SEEPROM. When prompted, enter the SEEPROM filename and path.

Option 7: Upload SEEPROM

Use this option to save the SEEPROM information to a file. When prompted, enter the filename and path where you want to save the SEEPROM information.

Option 8: Scan for devices

Use this option to probe for connected devices by issuing an Inquiry command. Information about the connected devices is displayed, including device type, vendor, product, and negotiated speed and width.

Option 9: Read/change configuration pages

Use this option to make changes to configuration pages. Refer to the *Fusion-MPT™ Message Passing Interface Specification* for specific information about the configuration pages. To make these changes, do the following:

1. Enter the page type, found in the *Fusion-MPT™ Message Passing Interface Specification*.
2. Enter the page number, found in the *Fusion-MPT™ Message Passing Interface Specification*.
3. Select NVRAM or current values.

At this point, LSIUtil prompts you to make changes to the selected configuration page. Changes are made according to the corresponding offset value and value desired.

Option 10: Change IOC settings (interrupt coalescing)

Use this option to make quick changes to the interrupt coalescing settings.

Option 11: Change SCSI Initiator Settings

Use this option to make quick changes to the SCSI initiator settings, as shown in Figure 2.22.

Figure 2.22 SCSI Initiator Settings

```
Main menu, select an option:  [1-99 or e/p/w or 0 to quit] 11

Host SCSI ID:  [0-15, default is 7]
Bus scan order:  [0=LowToHigh, 1=HighToLow, default is 0]
Avoid SCSI bus reset:  [0=No, 1=Yes, default is 0]
CHS mapping:  [0=PlugAndPlay, 1=AlternateCHS, default is 0]
Removable media support:  [0=None, 1=BootDrive, 2=AnyWithMedia, default is 0]
Spinup delay (in seconds):  [0-15, default is 2]
```

Option 12: Change SCSI Target Settings

Use this option to make quick changes to the SCSI target settings, as shown in Figure 2.23.

Figure 2.23 SCSI Target Settings

```
Main menu, select an option:  [1-99 or e/p/w or 0 to quit] 12

Target MB/sec | MT/sec Wide ScanID ScanLUNs Disconnect Timeout QueueTag Boot
   0     320  |   160  Yes   Yes     Yes       Yes        10     Yes     No
   1     320  |   160  Yes   Yes     Yes       Yes        10     Yes     No
   2     320  |   160  Yes   Yes     Yes       Yes        10     Yes     No
   3     320  |   160  Yes   Yes     Yes       Yes        10     Yes     No
   4     320  |   160  Yes   Yes     Yes       Yes        10     Yes     No
   5     320  |   160  Yes   Yes     Yes       Yes        10     Yes     No

Select a Target:  [0-15, 7=AllTargets, RETURN to quit] 0

MT/sec:  [160, 80, 40, 20, 10, 5, 0=Async, default is 160]
Enable ScanID:  [0=No, 1=Yes, default is 1]
Enable ScanLUNs:  [0=No, 1=Yes, default is 1]
Enable Disconnect:  [0=No, 1=Yes, default is 1]
Timeout:  [0-255, default is 10]
Enable QueueTag:  [0=No, 1=Yes, default is 1]
Enable Boot:  [0=No, 1=Yes, default is 0]
```

Option 19: Test configuration page actions

Use this option to perform configuration page tests. You can enter a filename that is preconfigured with the information needed, or you can choose to enter the test commands interactively. You can enter an output filename for the test results, or you can display the results on the screen. After you make these choices, a command line appears. The syntax is `<Action> <PageType> <PageNumber> [<PageAddress>]`

The `<PageAddress>` is optional. For information about the command syntax, enter **?** to view a help screen, as shown in Figure 2.24.

Figure 2.24 Help Information for Configuration Page Test

```
Valid input is:  <Action> <PageType> <PageNumber> [<PageAddress>]
  Action is:
    0 or H   display page Header only
    1 or RC  display page after Read Current
    2 or WC  enter page and do Write Current
    3 or D   set current page to Default values
    4 or WN  enter page and do Write NVRAM
    5 or RD  display page after Read Default
    6 or RN  display page after Read NVRAM
    RDWN     do Read Default then Write NVRAM
  PageType is a decimal number beteen 0 and 255
  PageNumber is a decimal number between 0 and 255
  PageAddress is an optional hex number
```

Option 20: Diagnostics

Use this option to perform various diagnostic actions on a specified target or to display and clear Phy counters. When you select this option, the Diagnostics menu appears, as shown in Figure 2.25.

Figure 2.25 Diagnostics Menu

```
Main menu, select an option:  [1-99 or e/p/w or 0 to quit] 20

 1.  Inquiry Test
 2.  WriteBuffer/ReadBuffer/Compare Test
 3.  Read Test
 4.  Write/Read/Compare Test
 5.  Write Test
 6.  Read/Compare Test
 7.  Log Sense Test
 8.  Read Capacity / Read Block Limits Test
 9.  Mode Page Test
10.  SATA Identify Drive Test
11.  SATA Clear Affiliation Test
12.  Display phy counters
13.  Clear phy counters
14.  SATA SMART Read Test
19.  Drive firmware download
21.  Read Logical Blocks
22.  Write Logical Blocks
23.  Verify Logical Blocks
30.  Inject media error
31.  Repair media error
32.  Set software write protect
33.  Clear software write protect

Diagnostics menu, select an option:  [1-99 or e/p/w or 0 to quit]
```

Option 21: RAID actions

Use this option to obtain RAID information as well as perform many RAID related actions, such as Enable and Fail. When you select this option, the menu shown in Figure 2.26 appears.

Figure 2.26 RAID Actions Menu

```
 1.  Show volumes
 2.  Show physical disks
 3.  Get volume state
10.  Disable volume
11.  Enable volume
12.  Inactivate volume
13.  Activate volume
20.  Offline physical disk
21.  Online physical disk
22.  Fail physical disk
23.  Replace physical disk
24.  Quiesce physical disk I/Os
25.  Unquiesce physical disk I/Os
30.  Create volume
31.  Delete volume
32.  Change volume settings
41.  Delete physical disk
42.  Change physical disk settings
50.  Create hot spare

RAID menu, select an option:  [1-99 or e/p/w or 0 to quit]
```

Option 22: Reset bus

Use this option to manually send a task management request, TaskTape = RESET_BUS.

Note: This is functionality of an initiator; initiator protocol must be enabled to perform this task.

Option 23: Reset target

Use this option to send down a reset to a specified target. When you enter this option, the following menu selections appear:

1. Target Reset
2. Logical Unit reset
3. Abort Task Set
4. Clear Task Set

Option 24: Clear ACA

Use this option to clear auto contingent allegiance (ACA). (ACA is a relationship between initiator and target that aids in error recovery.)

Option 33: Erase non-volatile adapter storage

Caution: Use with caution! This option lets you perform *invasive actions* that can make the HBA non-functional.

When you select this option, an Erase menu appears, as shown in Figure 2.27. Enter the number of the item you want to erase. LSIUtil prompts you for a filename in which to store manufacturing information and the SCSI WWID.

Figure 2.27 Erase Menu

```
Main menu, select an option:  [1-99 or e/p/w or 0 to quit] 33

 1.  NVSRAM
 2.  SEEPROM
 3.  FLASH
 4.  Bootloader
 5.  Firmware (backup copy)
 6.  Firmware (current copy)
 7.  Persistent non-manufacturing config pages
 8.  Persistent manufacturing config pages
 9.  Boot services (BIOS/FCode)

Select what to erase:  [1-9 or RETURN to quit]
```

Option 39: Force firmware download boot

Use this option to force a firmware download boot.

Note: This option works only on the DOS and EFI platforms.

Option 40: Display current events

Use this option to display firmware events passed to the driver in raw format.

Note: This option works only on the Windows, Linux, and Solaris platforms.

Option 42: Display operating system names for devices

Use this option to display the names assigned by the operating system to connected devices, as shown in Figure 2.28.

Figure 2.28 Display Operating System Names (SCSI)

```
Main menu, select an option:  [1-99 or e/p/w or 0 to quit] 42

Scsi Port 2 is Lsi_sas1

 B___T___L  Type       Operating System Device Name
 0   3   0  EnclServ
 0   4   0  Disk       PhysicalDrive1      \Device\Harddisk1\DR160
 0   5   0  Disk       PhysicalDrive2      \Device\Harddisk2\DR161
 0   6   0  Disk       PhysicalDrive3      \Device\Harddisk3\DR162
 0  15   0  EnclServ

Main menu, select an option:  [1-99 or e/p/w or 0 to quit]
```

Note: This option works only on the Windows, Linux, and Solaris platforms.

Option 50: Dump MPT registers

Use this option to dump MPT registers: specifically, doorbell, diagnostic, interrupt status, and interrupt mask.

Option 51: Dump chip memory regions

Use this option to dump memory regions. LSIUtil prompts you for a starting address, ending address, and number of locations. It gives you the option to specify a filename in which to write the information.

Option 52: Read / modify chip memory locations

Use this option to read and modify specific chip memory regions. LSIUtil prompts you for an address, in which the utility will return the address and value. At this point you can change that value, if desired.

Option 60: Show non-default settings

Use this option to display all non-default settings. To determine this information, LSIUtil reads each page twice, first reading NVRAM, then reading DEFAULTS. After comparing the two, it displays the settings that are different from the defaults.

Option 61: Restore default settings

Use this option to restore default settings. LSIUtil prompts you to determine if all persistent mappings should be removed.

Option 67: Dump Port State

Use this option to display all information contained in the config pages related to the selected port.

Option 68: Port State Summary

Use this option to display a summary of settings related to the selected port.

Option 69: Show Board Information

Use this option to display the Bus/Dev/Fun, board name, board assembly, and board tracer information.

Option 90: Send SCSI CDB

Use this option to send down a SCSI CDB. LSIUtil prompts you to enter the bus number, target number, LUN number, and value of the CDB desired.

Option 99: Reset port

Use this option to force a reset of the chip.

Option e: Expert mode

Use this option to enable or disable Expert mode for the Main Menu options.

Option p: Paging

Use this option to enable or disable Paging mode. In Paging mode, only one screen of data is displayed at a time, until you press **Enter** to display the next screen.

Option w: Log functionality

Use this option to enable log functionality, as follows:

- **w**: Logs only commands that affect non-volatile storage. PASS or FAIL into `lsiutil.log`.
- **ww**: Logs MPT requests and replies that fail into `lsiutil.log`.
- **www**: Logs all MPT requests and replies into `lsiutil.log`.

Chapter 3
Using LSIUtil in Command Line Interface Mode

LSIUtil has a powerful, full featured command line interface. In addition to the defined command line options such as -a and -b, LSIUtil also allows you to enter any menu-driven option on the command line, as long as the appropriate arguments are passed in correctly.

Caution: LSIUtil is a powerful configuration tool. Some LSIUtil options can impair the operation of HBAs if they are used incorrectly! Be sure that before you use any option you fully understand the effect it will have on the HBA and its functionality.

This chapter contains the following sections:

3.1 Command Line Options and Arguments

This section has an alphabetical listing of all LSIUtil command line options and arguments, including examples of how to use them.

Option a: Pass in menu option arguments

Use this option to pass in arguments that are required by any menu-driven option.

Example 1: `lsiutil -p1 -a 12,0,0,0 20 >log.txt`

-p1 selects port 1.

-a tells LSIUtil that the following arguments will be passed into the option at the end of the command.

12,0,0,0 represents input from the keyboard, as if you were entering the choices at the menu-driven prompts. Diagnostic option 12 is Display Port Counters. The three zeros are commands to exit the current menu or to exit the utility.

20 Option 20 (Diagnostics) is being executed.

>log.txt writes the output to this named file.

Note: The command syntax is organized in such a way that the arguments for the menu option (12,0,0,0) are entered first, followed by the option number itself (20 - Diagnostics).

Example: `lsiutil -p9 -a 60110004,,1,,,, -f creditcheck.txt 51`

-p9 selects port 9.

-a tells LSIUtil that the following arguments will be passed into the option at the end of the command.

60110004,,1,,,, -f creditcheck.txt 51 represents input from the keyboard, as if you were entering the choices at the menu-driven prompts. Option 51 is “Dump Chip Memory Regions,” **creditcheck.txt** is the filename to which the chip memeory regions will be dumped, and **-f** must precede the filename on the command line.

Option b: Output board information

Use this option to output information about the HBA.

Note: This option cannot be mixed with -l, -t, and -c (set options) or with -r and -z (reset options).

Option c: Edit coalescing values

Use this option to edit coalescing values. The arguments are:

Interrupt coalescing timeout, in microseconds
Interrupt coalescing depth

Example: `lsiutil -p1 -c 200,9`

Option d: Dump configuration page information

Use this option to dump configuration page information for the selected port.

Note: This option cannot be mixed with -l, -t, and -c (set options) or with -r and -z (reset options).

Option e: Toggle expert mode on or off

Use this option to toggle Expert Mode on or off for Main Menu options.

Option f: List filenames on command line

Use this option to list up to three filenames on the command line.

Example:
```
lsiutil -p1 -f
/mnt/rand/firmware/949/fc949x.rom -y 2 99
```

Option h: Display help screen

Use this option to display help information.

Option i: Output HBA information

Use this option to output the following information for each HBA present:

Board information
Current Port State
Software Version Information
Firmware Settings
Persistent Mappings

Example: `lsiutil -p1 -i -s`

Note: This option cannot be mixed with -l, -t, and -c (set options) or with -r and -z (reset options).

Option l: Change link speed

Use this option to change link speed (Fibre Channel only). The arguments are:

a auto

1 1 Gbyte

2 2 Gbytes

4 4 Gbytes

Example: `lsiutil -p2 -l 1`

This example changes port 2 link speed to 1 Gbyte.

Option m: Output counters for Tx, Rx, MB

Use this option to output counters for Tx and Rx frames transmitted, as well as for MB. (Fibre Channel only). The arguments are:

Monitoring interval, in seconds
Duration that the command runs before exiting, in seconds

Example: `lsiutil -p1 -m1,4 >log.txt`

Option n: Enable answer No on command line

Use this option to answer *no* on the command line, for certain commands that need confirmation and for which the default answer is *no*.

Option p: Toggle Paged Mode on and off

Use this option to toggle Paged Mode on and off.

Option r: Reset chip

Use this option to reset the chip on the selected port.

Option s: Display end device status

Use this option to scan all ports and display a brief status of each end device present.

Note: This option cannot be mixed with -l, -t, and -c (set options) or with -r and -z (reset options).

Option t: Change topology

Use this option to change the topology (Fibre Channel only). The arguments are:

a auto

1 NL_Port

2 N_port

Option u: Change command type to untagged

Use this option to change the type of command sent down, from tagged to untagged. All subsequent commands will be untagged until you restart LSIUtil.

Option w: Change logging options

Use this option to control the LSIUtil logging functionality during command line operations. The logging options are as follows:

-w logs only commands that affect non-volatile storage. PASS or FAIL into `lsiutil.log`.

-ww logs MPT requests and replies that fail into `lsiutil.log`.

-www logs all MPT requests and replies into `lsiutil.log`.

Option x: Concatenate SAS firmware

Use this option to concatenate SAS firmware. If filenames are not supplied in the command, LSIUtil prompts you to manually enter the names, or they can be passed in with a file.

Example: `lsiutil -x 6EIT__L.fw sas3442e.dat 1.fw`

Note: -x can be used only with -f, -n, and -y.

Option y: Enable answer Yes on command line

Use this option to answer *yes* on the command line, for certain commands that need confirmation and for which the default answer is *yes*.

Example:
```
lsiutil -p1 -f
/mnt/rand/firmware/949/fc949x.rom -y 2 99
```

Option z: Reset link

Use this option to reset the link. (Fibre Channel only)

Option 0: Skip operations on ioc0

Use this option to skip operations being performed on ioc0. The following operations will be skipped: 1, 2, 3, 4, 5, 6, 7, 14, 33, 44, 51, 52, 53, 62, and 99.

Option 1: Skip operations on ioc1

Use this option to skip operations being performed on ioc1. The following operations will be skipped: 1, 2, 3, 4, 5, 6, 7, 14, 33, 44, 51, 52, 53, 62, and 99.

Usage Notes for Command Options

- The -s, -i, -d, and -b display options cannot be mixed with -l, -t, and -c (set options) or with -r and -z (reset options).
- -x can be used together with -f, -n, and -y, only.

3.2 More Command Line Examples

This section provides more examples of how to use LSIUtil in command line mode.

- **Debug tool**

  ```
  lsiutil -p1 -f C:\COMMON_ERROR_LOG.txt -a 20,0 20
  ```

  Used with an analyzer set to trigger on an ECHO and Smash-n-Sg, which generates a `COMMON_ERROR_LOG.txt`. When the log file is created, LSIUtil sends down an ECHO, triggering the analyzer.

- **IOCInit Command for Use in a Script**

  ```
  lsiutil -p4 -a 9,0,0,y,0048,00000000,,y, 9
  ```

  In this example, the value 0x00000000 is written to offset 0x0048 in Manufacturing Page1, causing an IOCInit.

- **Command to get information concerning software on a selected port into a file**

  ```
  lsiutil -p1 1 >>PortR_L_FDA.txt
  ```

- **Magic 80 cable break (Fibre Channel only)**

  ```
  lsiutil -p9 -a 5,4,1,y,0004,deadbeef,0008,0000000a,,y,, 9
  ```

Together with Fibre Channel firmware, LSIUtil writes a particular value into a specific spot on the HBA. This causes the firmware to automatically turn the transmitter back on after a lsiutil 80. The duration of the cable break is configurable.

In this example, the value 0x0000000a is written to offset 0x0008, specifying a 10-second cable break.

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