Sun Blade™ 6000 Disk Module Service Manual

Sun Microsystems, Inc.
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Preface

The *Sun Blade 6000 Disk Module Service Manual* contains information and procedures for replacing or upgrading the disk modules.

Before You Read This Document

It is important that you review the safety guidelines in the *Sun Blade 6000 Disk Module Safety and Compliance Guide, 820-1711.*

Product Updates

For product updates that you can download for the Sun Blade 6000 disk modules, visit the following site:

(http://www.sun.com/servers/blades/downloads.jsp#6000dm)

This site contains updates for firmware and drivers, as well as CD-ROM `.iso` images.

Related Documentation

For a description of the document set for the Sun Blade 6000 disk modules, see the *Where To Find Sun Blade 6000 Disk Module Documentation* sheet that is packed with your system and also is posted at the product's documentation site:

(http://docs.sun.com/app/docs/prod/blade.6000disk#hic)

Translated versions of some of these documents are available at the product documentation site in French, Simplified Chinese, and Japanese. English documentation is revised more frequently and might be more up-to-date than the translated documentation.

Typographic Conventions

Typeface	Meaning	Examples
`AaBbCc123`	The names of commands, files, and directories; on-screen computer output	Edit your `.login` file. Use `ls -a` to list all files. `% You have mail.`
`AaBbCc123`	What you type, when contrasted with on-screen computer output	`%` **`su`** `Password:`
AaBbCc123	Book titles, new words or terms, words to be emphasized. Replace command-line variables with real names or values.	Read Chapter 6 in the *User's Guide*. These are called *class* options. You *must* be superuser to do this. To delete a file, type `rm` *filename*.

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Sun Blade 6000 Disk Module Service Manual, part number 820-1703-13

CHAPTER 1

Introduction to the Sun Blade 6000 Disk Module

This chapter contains an overview of the Sun Blade 6000 Disk Module (also called a disk blade) and contains the following topics:

- Section 1.1 “Features of the Disk Module” on page 1-1
- Section 1.2 “Sun Blade 6000 Disk Module Orientation” on page 1-3
- Section 1.3 “CRUs and FRUs” on page 1-5
- Section 1.4 “What’s in This Document” on page 1-6

1.1 Features of the Disk Module

The Sun Blade 6000 Disk Module is a blade for the Sun Blade 6000 Modular System that contains disks. It communicates with server blades through Network Express Modules that support SAS, specifically the Sun Blade 6000 Multi-Fabric NEM and the Sun Blade 6000 10GbE Multi-Fabric NEM.

TABLE 1-1 summarizes the features of the disk module.

TABLE 1-1 Features of the Sun Blade 6000 Disk Module

Feature	Specifications
Disk Drives	Eight total with front panel access. The storage blade supports SAS or Solid State (SSD) disk drives.
Types	SAS (2.5 inch or 63.5 mm).
Disk Drive Bracket	Sun disk drive mounting bracket.
Management	2 Arm7-S Processors (SAS expander devices). 2MB SRAM code storage, 2MB FLASH, 8K Serial EEPROM.

TABLE 1-1 Features of the Sun Blade 6000 Disk Module *(Continued) (Continued)*

Feature	Specifications
Data Rates	1.5 and 3.0 Gbit/sec. SAS with auto-negotiation. Two 1x or one 2x wide connections into blade. 12 Gbit/sec total.
Protocols	SAS - Serial Attached SCSI - v1.0, v1.1. SSP - Serial SCSI Protocol. SMP - Serial Management Protocol. SES - SCSI Enclosure Services.
Indicators	SIS indicators: Activity and Fault for drives and blade. Locate for blade only.
Health	Voltage monitoring, temperature monitoring, disk fault detection, and blade fault detection.

TABLE 1-1 summarizes the physical specifications of the disk module.

TABLE 1-2 Sun Blade 6000 Server Module Physical and Environmental Specifications

Specification	Value
Width	12.87 inches (327 mm)
Height	1.7 inches (44 mm)
Depth	20.16 inches (512 mm)
Weight	17 pounds (8 kg)
Power	240W Max (estimated)
Environmental	Humidity: 10% to 90% non-condensing Temperature: 5 to 40 deg C operating (-40 to 70 deg C storage) Altitude: 0 to 10,000 ft (3,048 meters)
Power Supplies	3.3V_AUX from chassis backplane. 12V from chassis backplane. Other voltages generated on blade.
Cooling	Front-to-back forced air (no internal fans).
Regulatory	UL/CSA FCC part15 Class A

1.2 Sun Blade 6000 Disk Module Orientation

This section contains illustrations that you can use to become familiar with the Sun Blade 6000 disk module.

FIGURE 1-1 Interior of the Sun Blade 6000 Disk Blade

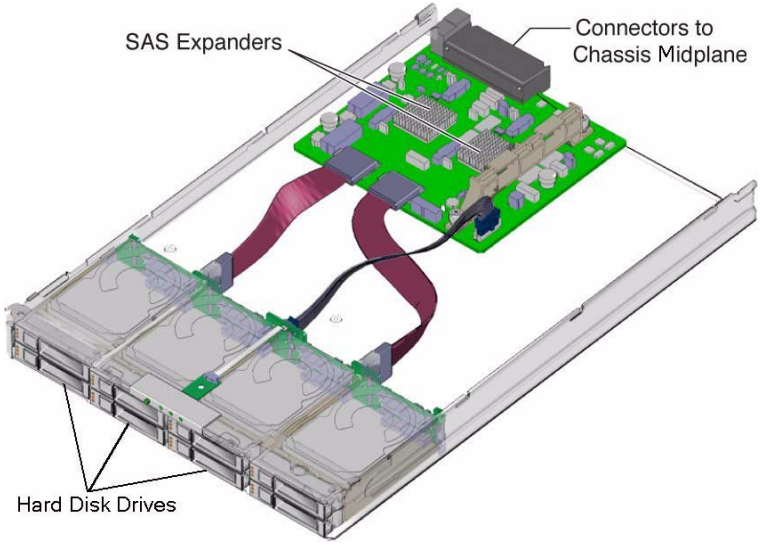


FIGURE 1-2 shows the features of the front panel.

FIGURE 1-2 Sun Blade 6000 Disk Module Front Panel

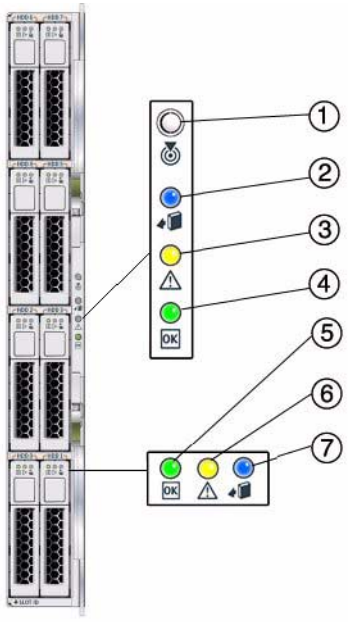


TABLE 1-3 Front Panel LED Functions

	LED Name	Description
1	Combined Locate button and LED (white)	This LED helps you to identify which system in the rack you are working on in a rack full of servers. • Push and release this button to make the Locate LED blink for 30 minutes. • When Locate LED is blinking, push and release this button to make the Locate LED stop blinking. • Hold down the button for 5 seconds to initiate a "push-to-test" mode that illuminates all other LEDs for 15 seconds. • This LED can also be made to blink from a remote system using the CMM ILOM. Refer to the *Sun Blade 6000 Disk Module Administration Guide* for details.
2	Ready-to-Remove LED (blue)	Not used.
3	Module Fault LED (amber)	This LED has two states: • On: An event has been acknowledged, and service action is required. • Off: Normal operation.

TABLE 1-3 Front Panel LED Functions *(Continued)*

	LED Name	Description
4	Module Activity LED (green)	This LED has three states: • Off: Module is offline. • On: Module is online. • Slow blinking (1 Hz at 50% duty cycle): Module is booting or configuring (firmware flash update in progress).
5	Disk Drive OK LED (green)	This LED has three states: • On: Power is on and disk is online. • Off: Disk is offline. • Blinking: Irregular blinking means normal disk activity; steady, slow blink means a RAID volume is rebuilding on this disk.
6	Disk Drive Fault and Locate LED (amber)	This LED has four states: • On: Disk fault. Service action required. • Off: Normal operation. • Slow blink: Disk failure predicted. • Fast blink: Locate function activated.
7	Ready-to-Remove LED (blue)	Not used.

The events that can cause a disk blade's Module Fault LED (amber) to turn on are:

- Temperature out of range.
- Voltage out of range.

Note – A severe over-temperature condition will shut down the disk blade.

1.3 CRUs and FRUs

For the Sun Blade 6000 Disk Module, the Customer Replaceable Units (CRUs) are the disks in the disk module. There is only one Field Replaceable Unit (FRU), which is the disk module itself.

If either a disk or a disk module fails, you must replace it, because there are no replaceable subassemblies.

You can replace the disks and the disk blade yourself.

1.4 What's in This Document

The remainder of the document includes these topics:

Chapter 2: This chapter contains information and procedures for servicing the Sun Blade 6000 disk module hardware, including component removal and replacement procedures.

Chapter 3: This chapter describes the procedures for replacing a Sun Blade disk module.

Chapter 4: This chapter describes the procedures for replacing an LSI host bus adapter on a server blade that is paired with a disk blade and restoring its configuration. This includes replacing the server blade when the host bus adapter is embedded in it.

Appendix A: This appendix provides instructions for reactivating inactive RAID volumes.

Appendix B: This appendix provides instructions information on where to obtain the `lsiutil` software and how to use it.

CHAPTER 2

Replacing Disk Drives

This chapter contains information and procedures for servicing the Sun Blade 6000 disk module hardware, including component removal and replacement procedures.

The following topics are covered in this chapter:

- Section 2.1 “Replacing a Disk Drive” on page 2-1

2.1 Replacing a Disk Drive

On occasion, a disk drive might fail. The status of the drive is indicated by its LEDs, as shown in TABLE 2-1.

TABLE 2-1 Drive Status LED Indicators

LED Name	Description
HDD Activity LED (green)	This LED has three states: • On: Power is on and disk is present. • Off: Disk is offline or absent. • Blinking: Irregular blinking means normal disk activity. Steady, slow blink means a RAID volume is rebuilding on this disk.
HDD Fault and Locate LED (amber)	This LED has four states: • On: Disk fault. Service action required. • Off: Normal operation. • Slow blink: Disk failure predicted. • Fast blink: Locate function activated.
Ready-to-Remove LED (blue)	• Not used.

A single disk failure does not cause a data failure when disks are configured as a mirrored RAID volume. When there is no hot spare assigned to the mirror, the failed disk can be hot-swapped. When the new disk is inserted, the contents are automatically rebuilt from the rest of the array with no need to reconfigure the RAID parameters.

If the mirror was configured with a hot spare, the mirror is automatically rebuilt with the hot spare.

Caution – Possible data loss: You can remove the failed disk while the mirror is rebuilding to the hot spare, but you *must not* insert a new disk in its place until the rebuilding of the mirror is completed. While data is being rebuilt, the green LED on the remaining drives will blink slowly. The rebuild process can take a number of hours for large mirrors.

▼ To Replace a Disk Drive

The Sun Blade 6000 Disk Module disks can be replaced by users:

1. **Observe the amber Fault LEDs on the faces of the disks to identify the defective disk.**
2. **Execute the software commands appropriate to the software that you are using to prepare the hard drive for removal.**
3. **Press the button on the face of the disk to release the spring-loaded securing latch. See** FIGURE 2-1 **and** FIGURE 2-2**.**
4. **Grasp the securing latch and remove the disk from the drive bay.**

   Disks in the Sun Blade 6000 Disk Module are hot-pluggable, so you can remove a disk either when the disk module is installed in the chassis or when it is out of the chassis. See FIGURE 2-1 and FIGURE 2-2.

Caution – Slots should always contain either a disk drive or a filler in order to maintain adequate air flow. Do not operate the system with slots that are empty. Always insert a filler when you remove a hard drive from a slot.

FIGURE 2-1 Removing the Disk Drive With the Disk Module Removed From the Chassis

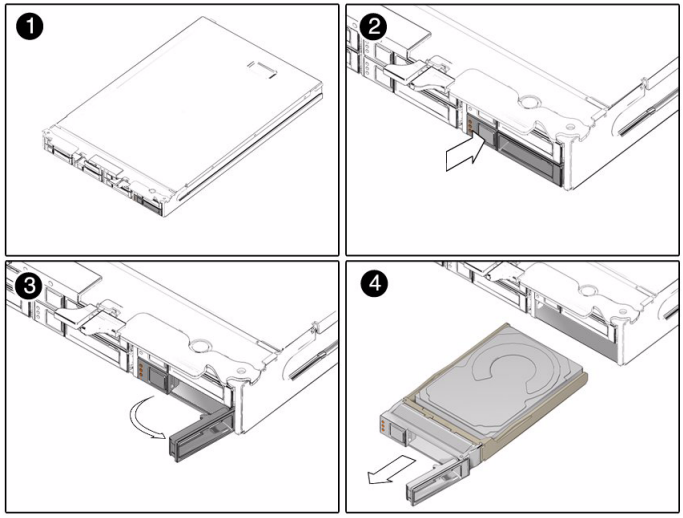
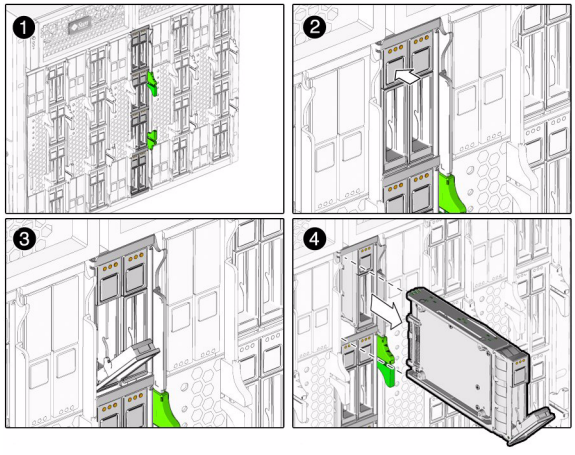


FIGURE 2-2 Removing the Disk Drive Without Removing the Disk Module From the Chassis



CHAPTER 3

Replacing a Sun Blade 6000 Disk Module

This chapter contains information and procedures for replacing the Sun Blade 6000 disk module.

- Section 3.1 “Replacing a Disk Module” on page 3-1
- “To Replace a Disk Blade When Its Paired Server Uses an LSI Host Bus Adapter and is Running Windows or Linux” on page 3-5
- Section 3.1.2 “To Replace a Disk Blade When Its Paired Server Uses an Adaptec Host Bus Adapter” on page 3-6

Caution – Several of the service procedures in this chapter require the use of the `lsiutil` application. `lsiutil` has many features and capabilities. Executing certain combinations of commands can place your system in an unrecoverable state. When you use this application, be sure you execute the procedures exactly as they are documented here, command by command. Do not skip commands or steps and do not add commands or steps that are not in the documented procedure.

3.1 Replacing a Disk Module

If your Sun Blade 6000 Disk Module fails, it must be replaced. The procedures for replacing the disk module vary, depending on two things:

- The type of SAS host bus adapter.
- The installed OS on the server blade that is paired with the disk blade.

In every case, you must remove the disks from the old disk blade and insert them into the same slots in the new disk blade.

3.1.1 Procedure for Server Blades Using LSI Host Bus Adapters

The SAS host bus adapters from LSI identify each disk in a disk blade using the unique "enclosure ID" of the disk blade (its World Wide Name, or WWN) and the number of the bay where the disk resides.

If you simply replace a disk blade, its enclosure ID changes. The SAS adapter may not recognize the new disk blade and may not be able to identify the disks as the same set, including the boot disk or boot volume.

For server blades running the Solaris OS, you must reconfigure the enclosure ID information in an LSI host bus adapter so that the disks can be correctly identified in a replacement disk blade. This procedure uses the `lsiutil` utility.

For server blades running Windows or Linux, you must reset the host bus adapter's persistence mappings. This procedure also uses the `lsiutil` utility.

Caution – When using `lsiutil` you must follow the steps in the documented procedures *exactly*. An untrained individual using `lsiutil` can potentially place the system in an unrecoverable state.

After you reconfigure the persistence mappings in the LSI host bus adapter, the adapter recognizes the new disk blade in the same way that it recognized the old one. Your system will operate the same as before the failure.

▼ To Replace a Disk Blade When Its Paired Server Uses an LSI Host Bus Adapter and is Running the Solaris OS

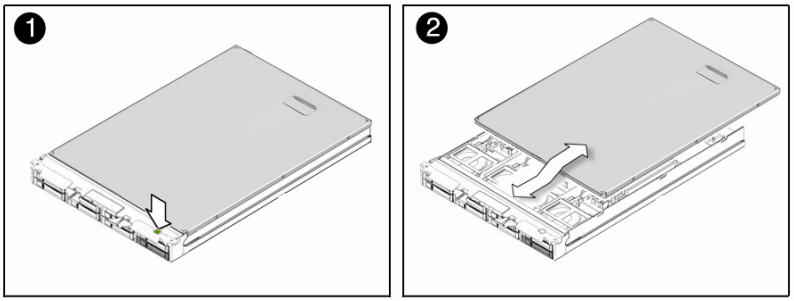
Caution – A SAS-NEM must be functioning in slot NEM 0 when you follow the procedure documented here.

You must know the enclosure IDs (World Wide Names, or WWNs) of both disk blades: the old one (the one you are replacing) and the new one. The enclosure ID is a 16-bit hexadecimal digit that is printed on a yellow sticker on the main circuit board of the disk blade.

1. **Remove the old disk blade from the chassis. Leave all the disks in it for the moment.**
2. **Insert a slot filler in the now-empty slot. *Do not* insert the replacement disk blade yet.**

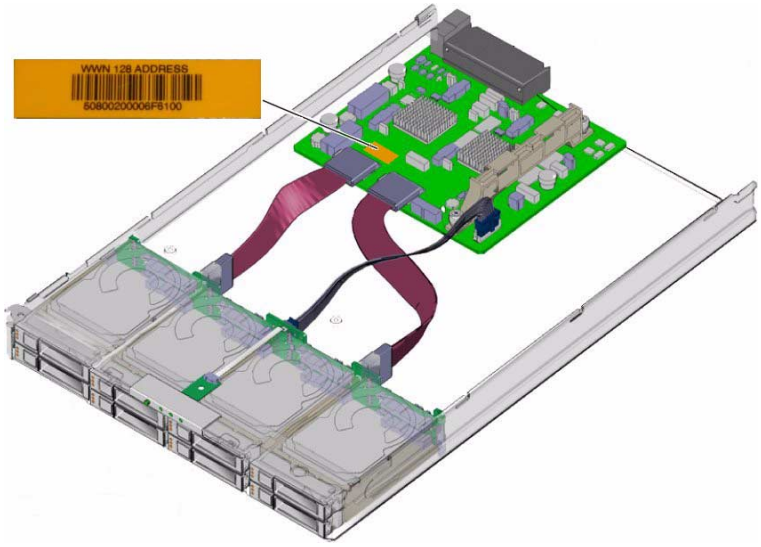
3. **Open the old disk blade. Press the green button and remove the top cover (see FIGURE 3-1).**

FIGURE 3-1 Removing the Sun Blade 6000 Disk Module Cover



4. **Record the old disk blade's World Wide Name (WWN 128 ADDRESS), which is the 16 bit hex number that is printed on a yellow label on the main circuit board (see FIGURE 3-2).**

FIGURE 3-2 WWN Label



5. **Open the cover of the new (replacement) disk blade and record the WWN printed on its yellow sticker.**

6. **Close the cover of the new disk blade and set it aside for the moment.**

7. **Run the following procedure on the server blade that is paired with the replacement disk blade.**

   In a terminal window, change your current directory to the directory where `lsiutil` is installed. Type in the following command and press Enter.

   `lsiutil -p1 -a 6,`*`oldEnclID`***`,`***`newEnclID`***`,,0,0 15`**

Caution – This command must be typed exactly as shown. If this command is typed incorrectly or not entered before replacing the disk blade, you must use the recovery procedure described below (see "To Recover From a Failed `lsiutil` Command When Replacing a Disk Blade" on page 3-4).

   Replace *oldEnclID* and *newEnclID* with the 16-digit hexadecimal numbers from the labels on the old and new disk blades respectively. Note that the second character in the -p1 argument is the digit '1' and not the letter 'l.'

8. **Remove the disks from the old disk blade and insert them in the new disk blade in the exact same slots that they occupied in the old disk blade.**
9. **Remove the temporary slot filler and put the new disk blade into the chassis in the same slot as the old one.**
10. **If the replacement disk blade contains any RAID volumes, reboot the server blade that is paired with the replacement disk blade.**
11. **Run `lsiutil` in interactive mode.**

    To open the interactive `lsiutil` menus, you must be logged in as `root`.

12. **Make and save a new persistence map for the server blade (running the Solaris OS) that is paired with the replacement disk blade, following the procedure out lined in** "To Save a Snapshot of Your Host Bus Adapter Persistent Mappings" on page B-7**.**
13. **If there are any hardware RAID volumes spanning disks in the disk blade, reboot the server that is paired with the disk blade.**

▼ To Recover From a Failed `lsiutil` Command When Replacing a Disk Blade

1. **Remove the replacement disk blade.**
2. **Reload the saved persistence map for the server blade that is paired with the replacement disk blade (see** "To Restore a Snapshot of Your Host Bus Adapter Persistent Mappings" on page B-11**.)**
3. **Continue the preceding disk blade replacement procedure beginning with Step 7.**

▼ To Replace a Disk Blade When Its Paired Server Uses an LSI Host Bus Adapter and is Running Windows or Linux

Caution – A SAS-NEM must be functioning in slot NEM 0 when you follow the procedure documented here.

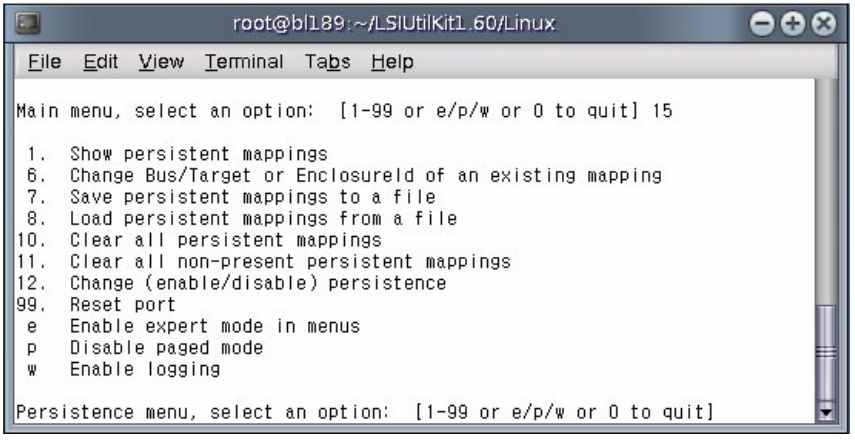
1. **Remove the old disk blade from the chassis. Leave all the disks in it for the moment.**
2. **Insert a slot filler in the now-empty slot. *Do not* insert the replacement disk blade yet.**
3. **Remove the disks from the old disk blade and insert them in the new disk blade in the exact same slots that they occupied in the old disk blade.**
4. **Remove the temporary slot filler and put the new disk blade into the chassis in the same slot as the old one.**
5. **Run `lsiutil` in interactive mode from a command line.**

   For Linux, you must be logged in as `root`.
6. **Type `1` and press Enter.**

   The basic interactive menu opens.

   You cannot see all the commands in the menu, but you can enter any command number if you know what it is. In our case, we want to open the Persistence menu. This is done with command 15.
7. **Type `15` and press Enter.**

   The Persistence menu opens.



8. **Type `10` and press Enter.**

   This clears any persistence map that is present in the host bus adapter.

9. **Type and enter `0` (zero) three times to exit the `lsiutil` application.**

3.1.2 To Replace a Disk Blade When Its Paired Server Uses an Adaptec Host Bus Adapter

The Adaptec host bus adapters do not rely on the enclosure ID of the disk blade to identify disks. This is true for any OS.

Therefore, if you are using an Adaptec adapter, you can simply change the disk module and continue to operate as before without any problems.

CHAPTER 4

Replacing a Host Bus Adapter

This chapter contains information and procedures for replacing an LSI host bus adapter.

The following topics are covered in this chapter:

- Section 4.1 "LSI Host Bus Adapter Failure and Replacement" on page 4-1
- "To Replace the LSI Host Bus Adapter on an x64 Server Blade Running Linux or Windows" on page 4-2
- "To Replace the LSI Host Bus Adapter on Any Server Blade Running the Solaris OS" on page 4-2
- "To Replace an Adaptec Host Bus Adapter" on page 4-4

Caution – The service procedures in this chapter require the use of a program named `lsiutil`. The `lsiutil` application has many features and capabilities. Executing certain combinations of commands can place your system in an unrecoverable state. When you use this application, be sure you execute the procedures exactly as they are documented here, command by command. Do not skip commands or steps and do not add commands or steps that are not in the documented procedure.

4.1 LSI Host Bus Adapter Failure and Replacement

If an LSI host bus adapter fails, you must replace it. In the case of the Sun Blade X6220 and T6300 server blades, the host bus adapter is embedded in the server blade so you must replace the entire blade. For other server blades that use a Sun Blade RAID 0/1 Expansion Module (REM), you need to replace the REM.

Note – The procedures below are equally valid whether you are replacing a REM or a server blade with an embedded adapter.

▼ To Replace the LSI Host Bus Adapter on an x64 Server Blade Running Linux or Windows

1. **Remove the server blade that contains the damaged host bus adapter.**
2. **Replace the host bus adapter (or the entire blade for X6220 servers) and reinsert the server blade.**
3. **Boot an OS.**

   There are two possibilities:

   - (Preferred method in all cases) Boot from an external source. Use a bootable thumb drive or a network boot.
   - If the OS is installed on the server blade (on a single disk in the server blade or in a RAID volume where *at least one* of the member disks is in the server blade), you can boot from the server's boot drive. If the boot drive is a RAID volume, during the BIOS boot process you must activate the RAID volume using the LSI RAID configuration utility (see Section A.1 "Activating LSI RAID Volumes" on page A-1).
4. **During the BIOS boot process, enter the LSI RAID configuration utility and activate all foreign RAID volumes. (see** Section A.1 "Activating LSI RAID Volumes" on page A-1**).**

▼ To Replace the LSI Host Bus Adapter on Any Server Blade Running the Solaris OS

Prerequisites:

- You *must* have a saved snapshot of your old host bus adapter's persistence table and the snapshot file must be available to the OS that you boot initially.
- The OS that you boot initially in the following procedure must have the `lsiutil` application installed.

1. **Remove the server blade that contains the damaged host bus adapter.**
2. **Make sure that there is a SAS-NEM in slot NEM 0 and that it is functioning properly (the Fault LED is off).**

Caution – Make sure that multipathing at the OS level is enabled on *all* server blades that remain active in the chassis before you execute step 3. This ensures that the primary path to disks is not lost, which can cause an OS panic.

For servers running Windows 2003, which does not support multipathing, shut down IO to all disks on the disk module that are not in hardware RAID volumes.

3. **Remove the SAS-NEM in slot NEM 1, if there is one.**

   This step is required to make RAID volumes return with the same target ID.

Note – If you have a plain NEM, without SAS capability, in slot NEM 1 you can leave it there.

Caution – Unplugging the SAS-NEM causes the loss of all secondary network connections and the secondary paths to SAS disks.

4. **Replace the host bus adapter (or the entire blade for X6220 and T6300 servers) and reinsert the server blade.**

5. **Boot an OS.**

   There are two possibilities:

   - Boot from an external source. Use a bootable thumb drive (x64 only) or a net boot.
   - If the OS is installed on the server blade (on a single disk in the server blade or in a RAID volume where *at least one* of the member disks is in the server blade), you can boot from the server's boot drive. If the boot drive is a RAID volume, during the BIOS boot process you must activate the RAID volume using the LSI RAID configuration utility (see Section A.1 "Activating LSI RAID Volumes" on page A-1).

6. **Run `lsiutil` in interactive mode (see "To Restore a Snapshot of Your Host Bus Adapter Persistent Mappings" on page B-11). Type `1` and press Enter to open the main menu.**

7. **Type `15` on the main `lsiutil` menu, "Change persistent mappings," and press Enter.**

   The persistence menu opens.

8. **Type `8`, "Load persistent mappings from a file," and press Enter.**

   It prompts you for the filename.

9. **Enter the filename and path of your saved snapshot file.**

   The persistent map is loaded into the new blade.

10. **Reboot the server blade with its own OS.**

    Rebooting the blade causes it to use the persistent mapping information.

11. **Activate all RAID volumes (see** Section A.1 “Activating LSI RAID Volumes” on page A-1**).**

    At this point, the blade has been replaced, and all drives and RAID volumes have been configured correctly, thus the blade will be able to boot the OS.

12. **Reinsert the Multi-Fabric NEM in slot NEM 1.**

4.2 Replacing an Adaptec Host Bus Adapter

The procedure outlined for LSI host bus adapters is not needed for Adaptec host bus adapters.

▼ To Replace an Adaptec Host Bus Adapter

1. **Install the new RAID 5 Expansion Module.**
2. **Power on the server blade.**
3. **During boot the Adaptec configuration utility indicates that foreign arrays (volumes) are found.**
4. **Press Enter to accept the configuration change.**

   The boot process continues. No further steps are required.

APPENDIX **A**

Activating LSI RAID Volumes

When you need to activate an LSI RAID volume, you must temporarily remove the path through a SAS-NEM module in slot NEM 1.

This is required to make RAID volumes return with the same target ID that they had previously.

A.1 Activating LSI RAID Volumes

▼ To Do Before Activating an LSI RAID Volume:

1. **Make sure that there is a SAS-NEM in slot NEM 0 and that it is functioning properly (the Fault LED is off).**

Caution – Make sure that multipathing at the OS level is enabled on all server blades that remain active in the chassis before you execute step 2. This ensures that the primary path to disks is not lost, which can cause an OS panic.

For servers running Windows 2003, which does not support multipathing, shut down IO to all disks on the disk module that are not in hardware RAID volumes.

2. **Unplug the Multi-Fabric NEM in slot NEM 1 if there is one.**

Note – If you have a plain NEM, without SAS capability, in slot NEM 1 you can leave it there.

Caution – Unplugging one SAS-NEM causes the loss of all secondary network connections and the secondary paths to SAS disks.

Activate the RAID volumes by following one of these procedures:

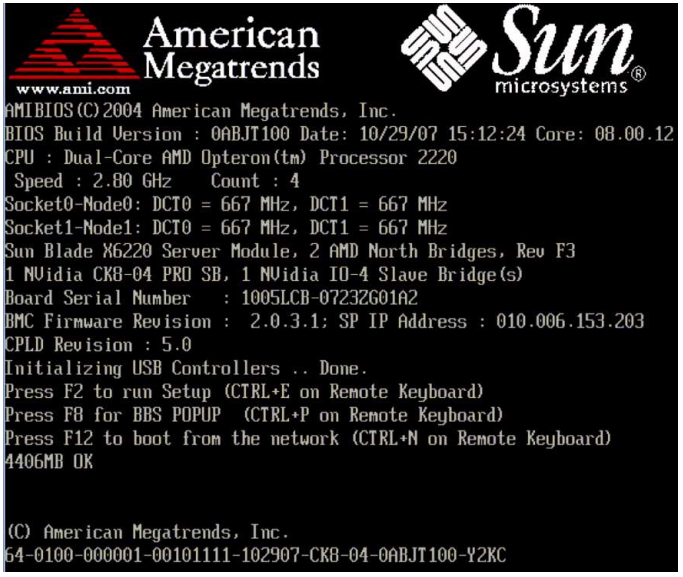
- "To Activate LSI RAID Volumes for x64 Server Blades" on page A-2
- "To Activate LSI RAID Volumes for SPARC Server Blades" on page A-3

When you have finished activating the RAID volumes, plug the SAS-NEM back into slot NEM 1, if you previously unplugged it.

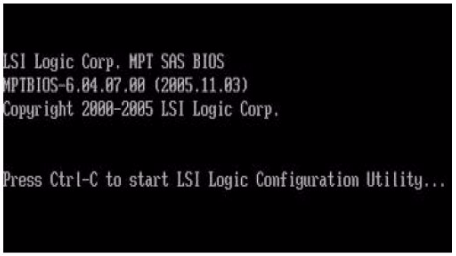
▼ To Activate LSI RAID Volumes for x64 Server Blades

The LSI RAID configuration utility that is entered from the server's BIOS is valid for all x64 server blades and all supported operating systems.

1. **Power-cycle your server module. The BIOS screen appears. Watch for the LSI Logic Corp. screen, soon after the opening screen.**



2. **When the BIOS screen shows the LSI Logic Corp. message, press Ctrl-C to start the LSI Logic Configuration Utility.**



The first screen of the utility appears after a short delay.

3. **With the LSI 1068E adapter highlighted in the first screen, press Enter.**

   The main screen of the utility opens.

4. **Use the arrow keys to select RAID Properties and press Enter.**

   If you have only one array, you get a new screen with a View Existing Array option.

5. **With View Existing Array highlighted, press Enter.**

   The View Array screen appears.

Note – If you have two RAID arrays (volumes) you come directly to this View Array screen when you select and enter RAID Properties in Step 4.

---

6. **With Manage Array highlighted, press Enter.**
7. **Use the arrow keys to select Activate Array and press Enter.**
8. **Return to the View Existing Array screen and press Alt + N to select your other array (if there is one)**
9. **Repeat steps 6 and 7 for your second array (volume), if there is one.**
10. **Exit the LSI RAID configuration utility by pressing Esc repeatedly to go back screen by screen until you can continue the boot process.**

▼ To Activate LSI RAID Volumes for SPARC Server Blades

1. **Go to the OBP prompt.**

2. **At the command line, set the** `auto-boot?` **and** `fcode-debug?` **variables to false and reset the system.**

```
ok setenv auto-boot? false
 auto-boot? = false
ok setenv fcode-debug? true
 fcode-debug? = true
ok reset-all
```

3. **Find the path to the controller.**

```
ok show-disks
a) /pci@0/pci@0/pci@2/LSILogic,sas@0/disk
b) /pci@0/pci@0/pci@1/pci@0/usb@1,2/storage@1/disk
q) NO SELECTION
Enter Selection, q to quit: q
ok
```

Note – You are looking for the path to the controller. For the T6320 and T6340 blades it contains the phrase "`LSILogic,sas@0`". For the T6300 blade, it contains the phrase "`scsi@0`".

---

4. **Select the controller.**

```
ok select /pci@0/pci@0/pci@2/LSILogic,sas@0
```

5. **Show the volumes, looking for any that are inactive.**

```
ok show-volumes
```

6. **Activate the inactive volumes. Repeat the command to activate all inactive volumes. For example, to activate volume number 1 type:**

```
ok 1 activate-volume
```

Note – There might be more than two inactive RAID volumes, but you cannot activate more than two.

---

7. **Deselect the controller.**

```
ok unselect-dev
```

8. **Set the** `auto-boot?` **and** `fcode-debug?` **variables to** `true` **and reset the system.**

```
ok setenv auto-boot? true
 auto-boot? = true
ok setenv fcode-debug? true
 fcode-debug? = true
ok reset-all
```

APPENDIX **B**

Using the `lsiutil` Software

Some procedures in this manual require the use of a software program called `lsiutil`. This appendix provides information on where to obtain the software and how to use it.

Caution – The `lsiutil` software has many features and capabilities. Executing certain combinations of commands can leave your system in an unrecoverable state. When you use this software, be sure you execute the procedures exactly as they are documented here, command by command. Do not skip commands or steps and do not add commands or steps that are not in the documented procedure.

The following topics are covered in this chapter:

- Section B.1 “Where to Obtain the `lsiutil` Software” on page B-1
- Section B.2 “Installing `lsiutil`” on page B-2
- “To Use `lsiutil` From the Command Line” on page B-2
- “To Use the Interactive `lsiutil` Menus” on page B-2
- Section B.3 “Why Save LSI Host Bus Adapter Persistent Mappings?” on page B-6
- Section B.4 “When to Save LSI Host Bus Adapter Persistent Mappings” on page B-6
- “To Save a Snapshot of Your Host Bus Adapter Persistent Mappings” on page B-7
- “To Restore a Snapshot of Your Host Bus Adapter Persistent Mappings” on page B-11

B.1 Where to Obtain the `lsiutil` Software

To use `lsiutil` for the procedures in this appendix, you must have version 1.60 at minimum.

To obtain the latest `lsiutil` software, go to the disk blade download site:

(http://www.sun.com/servers/blades/downloads.jsp#6000dm)

B.2 Installing `lsiutil`

Download `lsiutil` and unzip it in a temporary directory. It will create operating system-specific subdirectories. If you are running `lsiutil` on a SPARC blade, use the `Solaris` subdirectory. Otherwise, use the `Solaris x86` subdirectory.

▼ To Use `lsiutil` From the Command Line

Several of the procedures in this appendix use the `lsiutil` software at the command line.

Caution – To avoid harm to your system, you must use the commands exactly as they are presented in this document.

To run an `lsiutil` command from the command line, log in as `root` and then follow these steps:

1. **Change to the directory where you extracted the lsiutil zip file. For example,**

   # **cd** *directoryname*

2. **Change to the subdirectory for your operating system. For example:**

   # **cd Solaris x86**

3. **Change the permissions (read and execute access) on the lsiutil file by entering the following command:**

   # **chmod 755 lsiutil**

4. **Enter the command with parameters. For example,**

   # **./lsiutil -p1 -a 0 8**

▼ To Use the Interactive `lsiutil` Menus

To open the interactive `lsiutil` menus, log in as `root` and then follow these steps:

1. **Change to the directory that contains the appropriate version of `lsiutil` for your application. For example,**

   # **cd** *directoryname*/**Solaris x86**

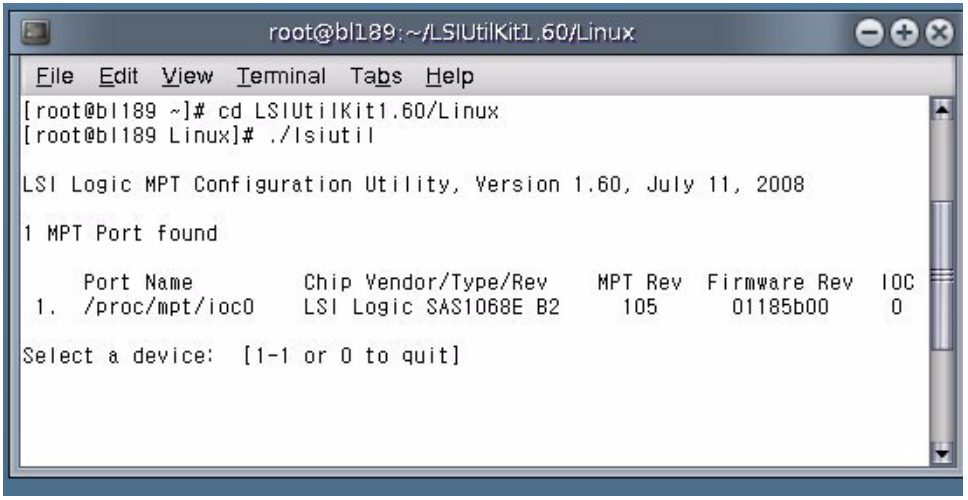
2. **If you have not done so already, change the permissions (read and execute access) on the lsiutil file by entering the following command:**

   # **chmod 755 lsiutil**

3. **Start `lsiutil` by entering the command:**

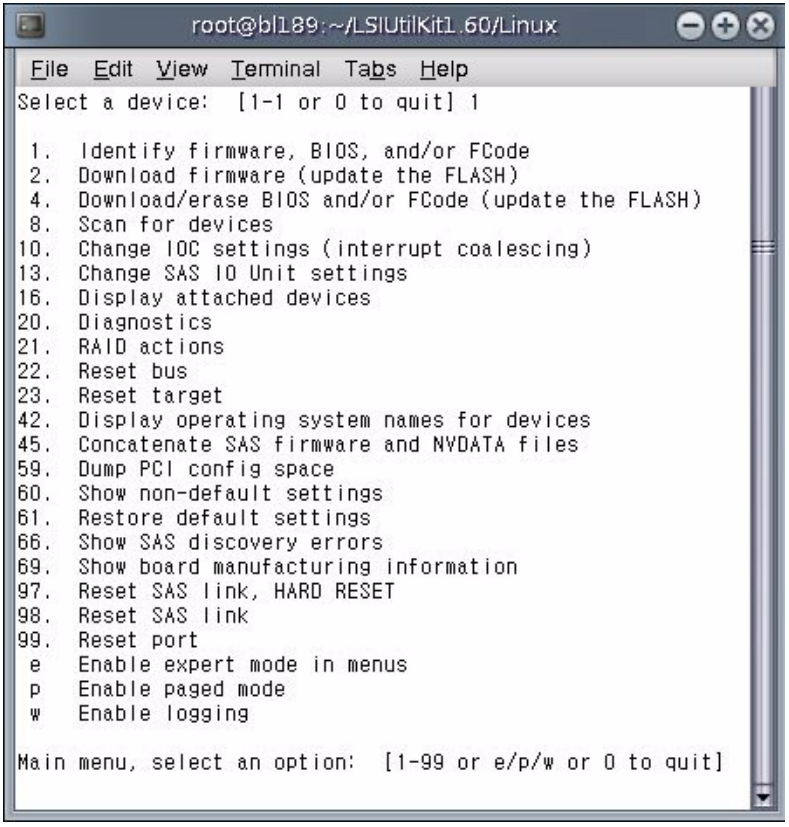
   # **./lsiutil**

   The opening screen appears.



4. **Type `1` and press Enter.**

   The main menu appears. Because there are so many menu items (100), not all the items are shown.

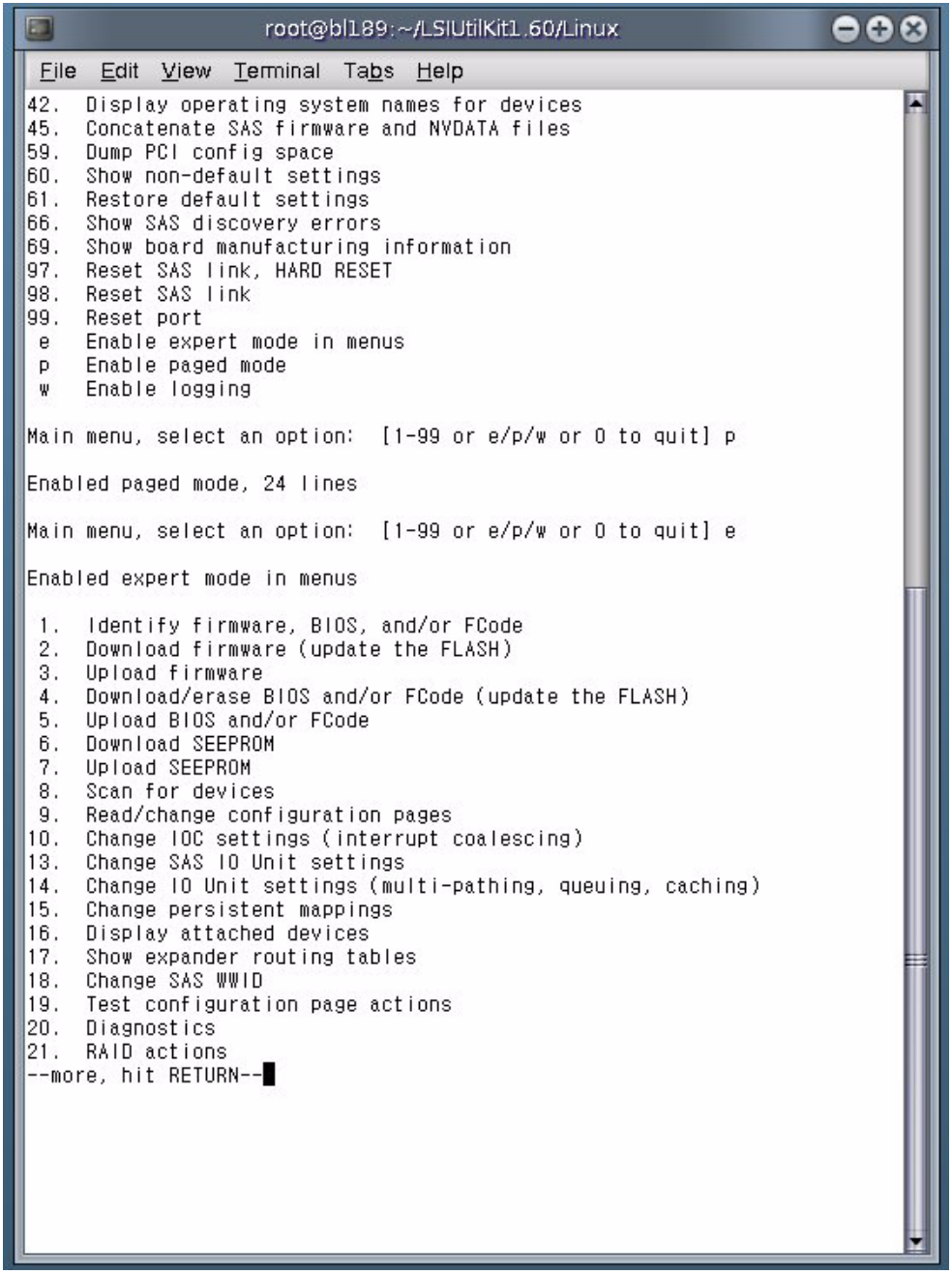


Tip – You do not have to see a command to enter it. If you know its number, just enter it. Alternatively, you can choose to see the entire menu if you want to, as shown in Step 4.

---

5. **Enter `p` to enable paged mode and `e` to enable the whole menu.**

   The complete menu appears in paged mode.



Each time you press Enter you will see a new page of menu items until you reach the end.

B.3 Why Save LSI Host Bus Adapter Persistent Mappings?

Replacing a failed LSI host bus adapter on a server blade running the Solaris OS can lead to significant downtime if your replacement adapter does not know how the old adapter was addressing the disks in its server blade and in the disk blade. Among other problems, your system will not know where your boot drive is located.

The `lsiutil` software is used to export a snapshot of the addressing configuration (persistent mappings) of a healthy LSI host bus adapter to a file. Then, if the adapter fails at a later date, the persistent mappings snapshot can be reloaded on the replacement adapter and your system will operate as before.

Caution – You need to keep a persistent mappings snapshot for the LSI host bus adapters on all server blades in your chassis that are running the Solaris OS. A copy of each file must be kept on *external* media.

B.4 When to Save LSI Host Bus Adapter Persistent Mappings

You need to keep a snapshot of the persistent mappings of your LSI host bus adapters under any of these conditions:

- A new server blade, running the Solaris OS and paired with a disk blade, has been added to the chassis.

  Make the snapshot of the LSI host bus adapter on this server blade after you have completed its installation and configuration. This means after you have finished creation of RAID volumes and chosen a boot volume or disk.

- You have replaced a disk blade in the chassis that is paired with a server blade running the Solaris OS.

  Make the snapshot of the LSI host bus adapter on this server blade after you have replaced the disk blade.

- You have replaced a SAS-NEM in your chassis and the chassis contains server blades running both CAM (or a CAM agent) and the Solaris OS.

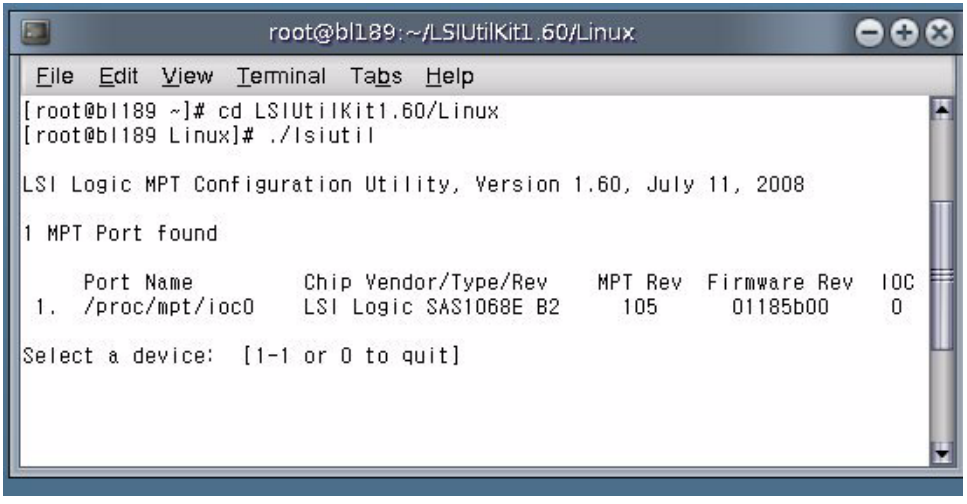
  Make the snapshot of the LSI host bus adapter on these server blades after you have replaced the SAS-NEM

B.5 Saving and Restoring a Persistence Map

You can use `lsiutil` to both save and restore a snapshot of your persistence mapping.

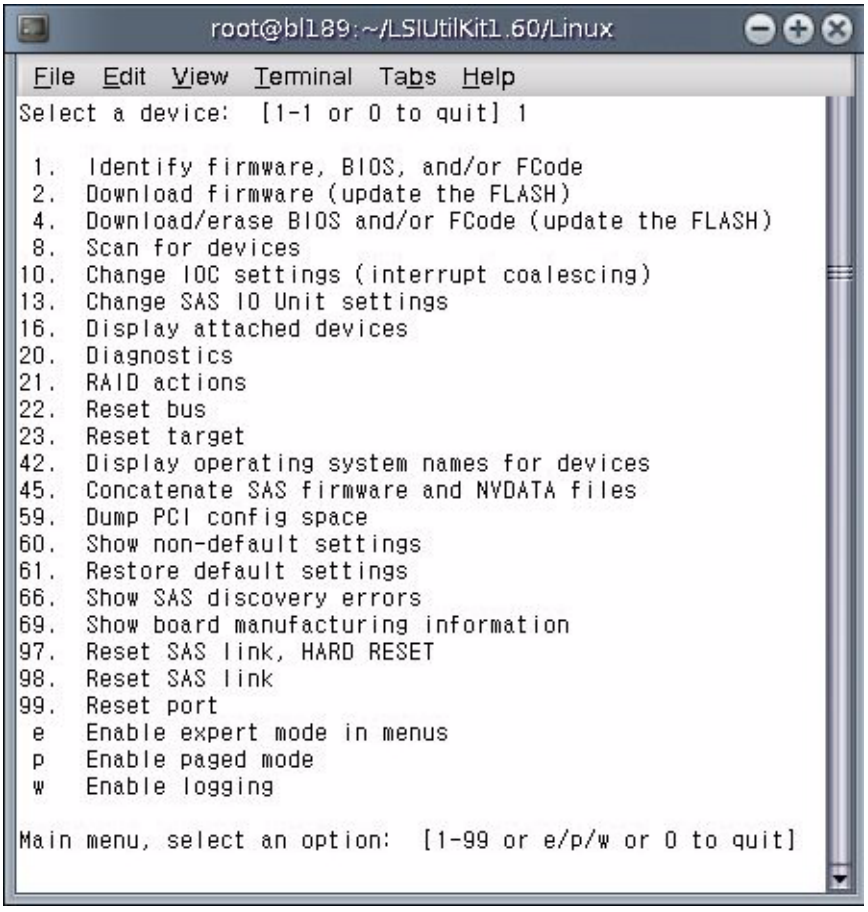
▼ To Save a Snapshot of Your Host Bus Adapter Persistent Mappings

1. **Run `lsiutil` in interactive mode (see** "To Use the Interactive `lsiutil` Menus" on page 2**).**



2. **Type 1 and press Enter.**

   The basic (incomplete) interactive menu opens.

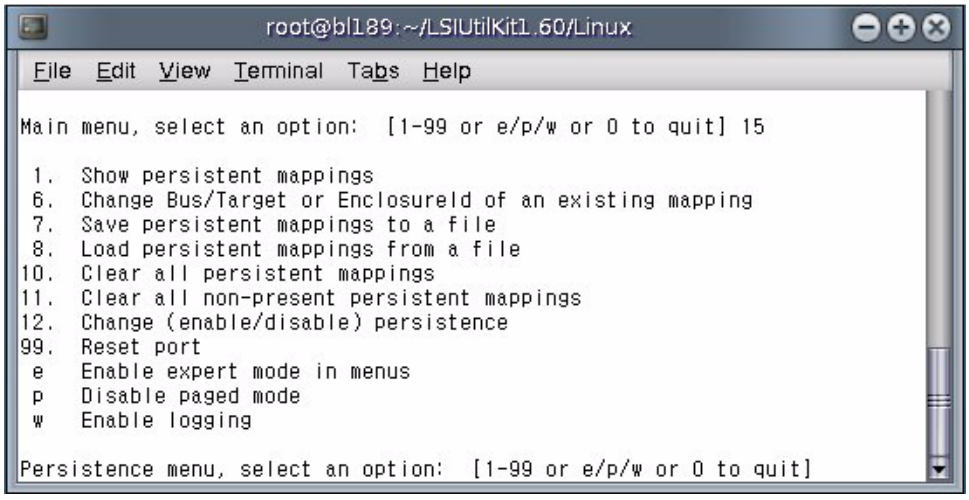


Tip – You cannot see all the commands in the menu, but you can enter any command number if you know what it is. In this case you want to open the Persistence menu. This is done with command 15.

---

3. **Type 15 and press Enter.**

   The Persistence menu opens.



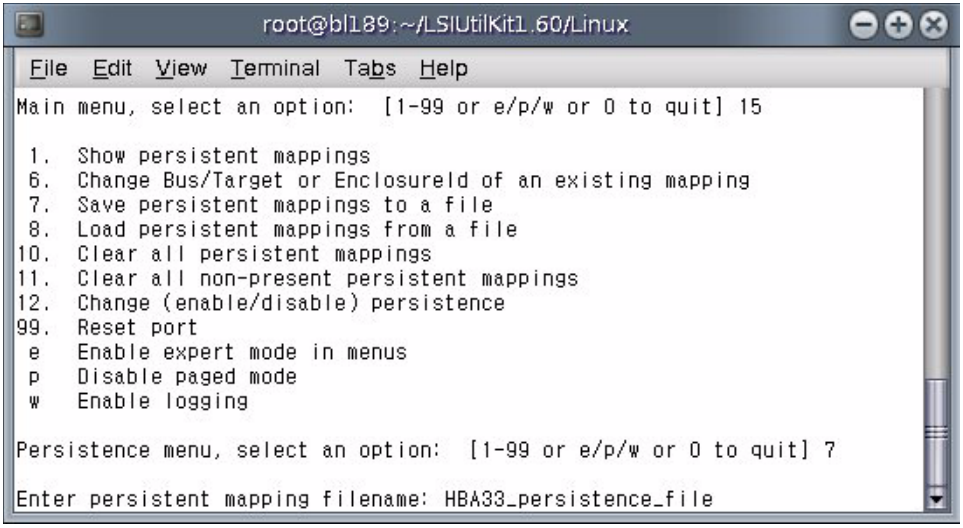
4. **Type 7 and press Enter.**

   You are prompted for the name of the file where you want to store the host bus adapter persistent mappings snapshot.

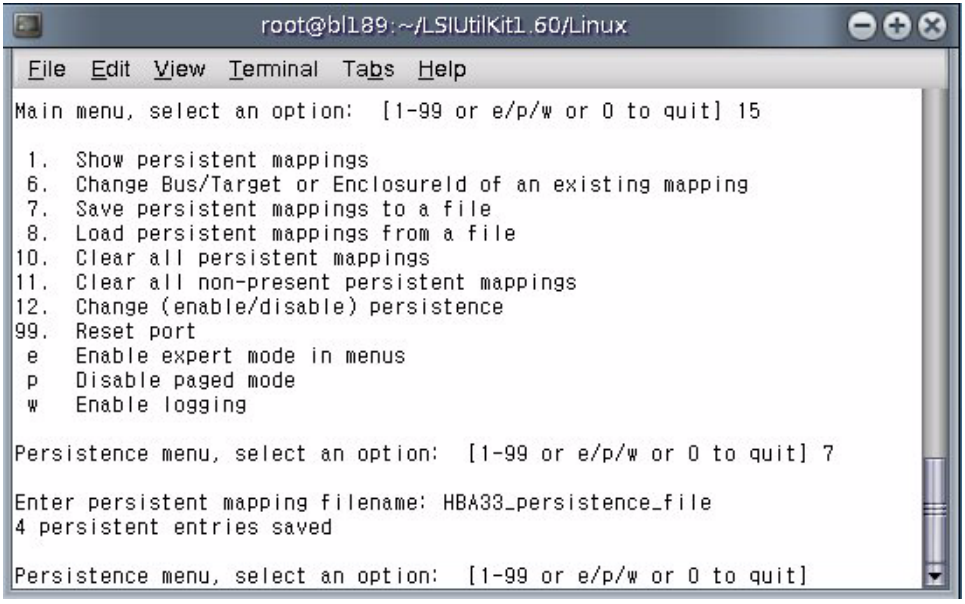
Note – If you expect to boot from DOS when you restore the persistent mappings snapshot, you must restrict the file name to 8 characters.

---

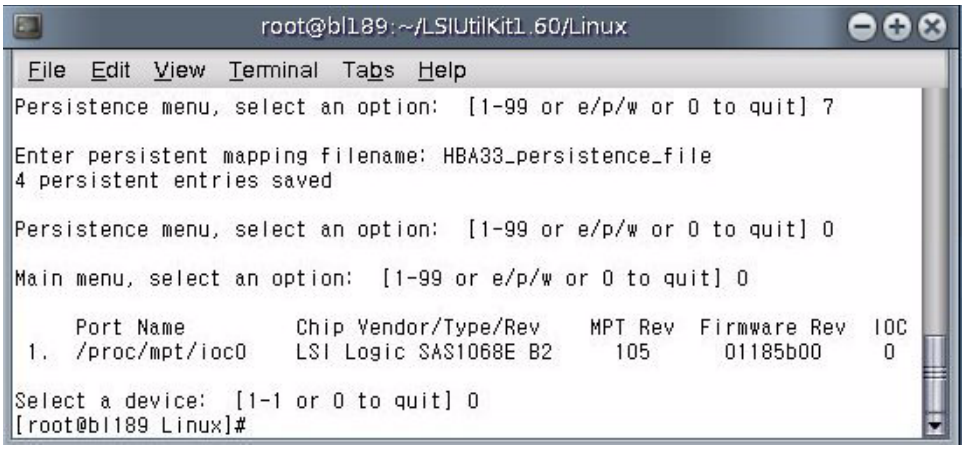
5. **Enter a file name. For example, `HBA33_persistence_file`.**



The file is saved to the current directory. `lsiutil` confirms this by displaying a statement of the number of persistent entries saved.



6. Type `0` (zero) and press Enter three times to exit `lsiutil`.



Caution – You *must* save the persistence table snapshot to external media as you will not be able to reinstall it from a local disk if your LSI host bus adapter fails.

You must have a snapshot for *every* server blade in the chassis. Label them carefully.

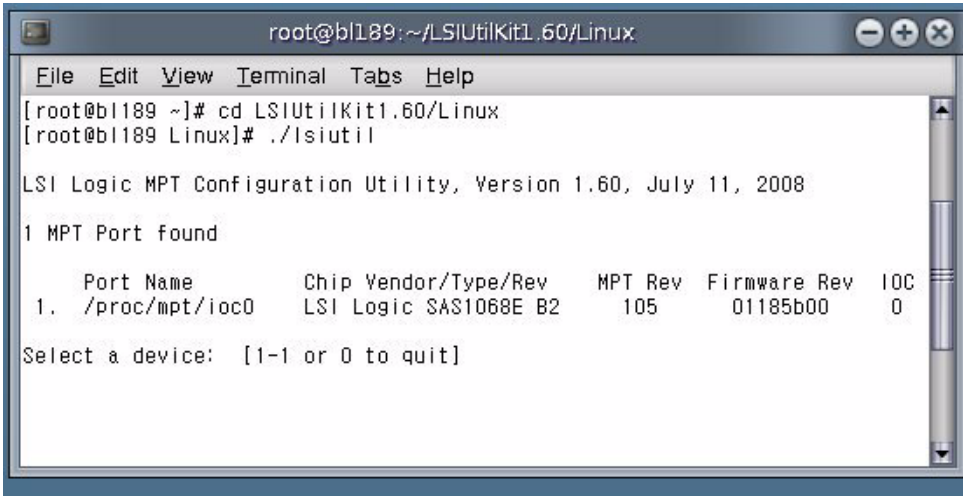
▼ To Restore a Snapshot of Your Host Bus Adapter Persistent Mappings

The stored snapshot files are used when a host bus adapter fails and must be replaced. They are not needed for any other purpose.

Note – Unless your OS is installed on a single disk on your server blade, or a RAID volume with at least one member disk installed on your server blade (always true for SPARC systems, for example), you need to reboot with an external OS (a bootable DOS disk is preferred, if possible) to perform this procedure.

To restore the persistent mappings from a previously saved snapshot file (`for example, HBA33_persistance_file`), do the following:

1. **Make sure that your saved the persistence mappings snapshot file in the same directory as the `lsiutil` software you are using. Copy the file from external media if necessary.**
2. **Run `lsiutil` in interactive mode (see** "To Use the Interactive `lsiutil` Menus" on page B-2**).**



3. Type 1 and press Enter.

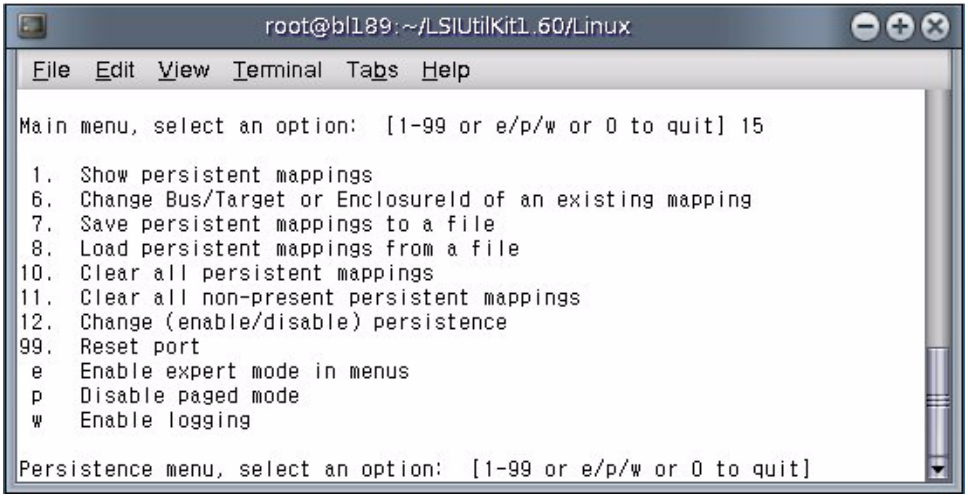
The basic (incomplete) interactive menu opens.

Tip – You cannot see all the commands in the menu, but you can enter any command number if you know what it is. In our case we want to open the Persistence menu. This is done with command 15.

---

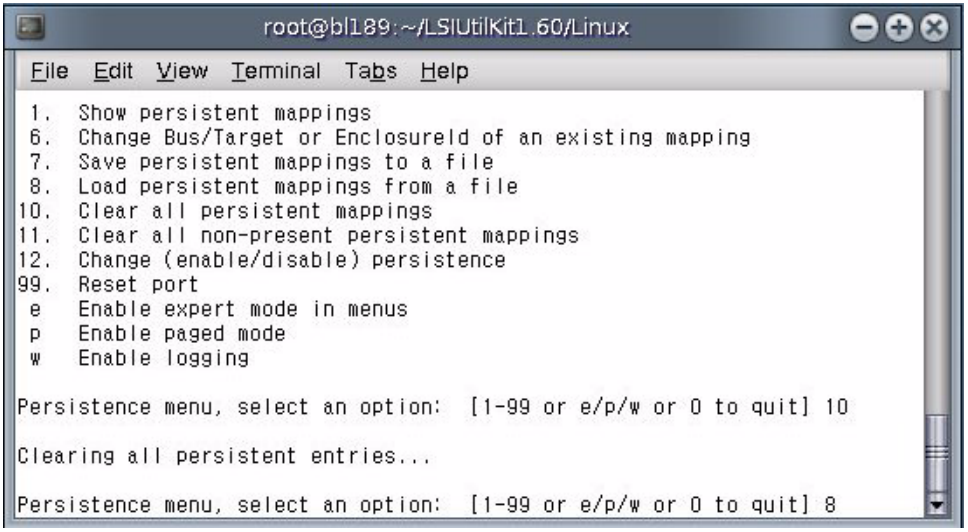
4. Type 15 and press Enter.

The Persistence menu opens.



5. **Type 10 and press Enter.**

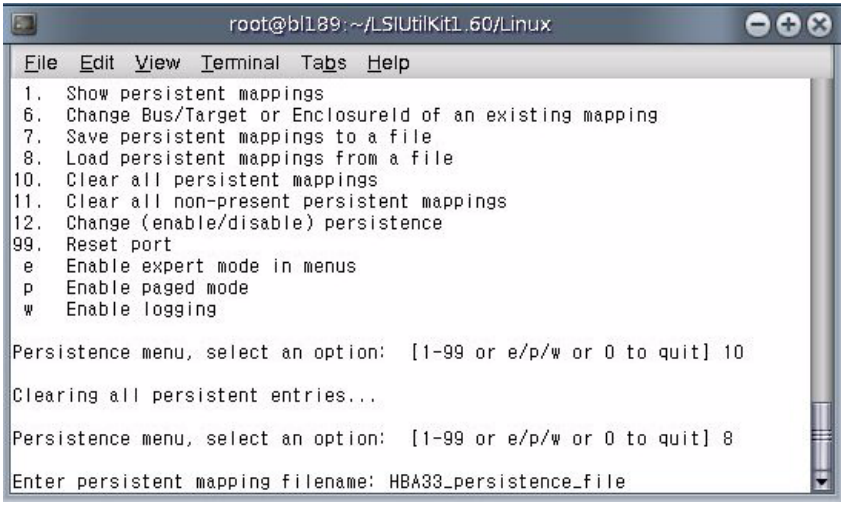
   This clears any persistence map that is present in the host bus adapter.



6. **Type 8 and press Enter.**

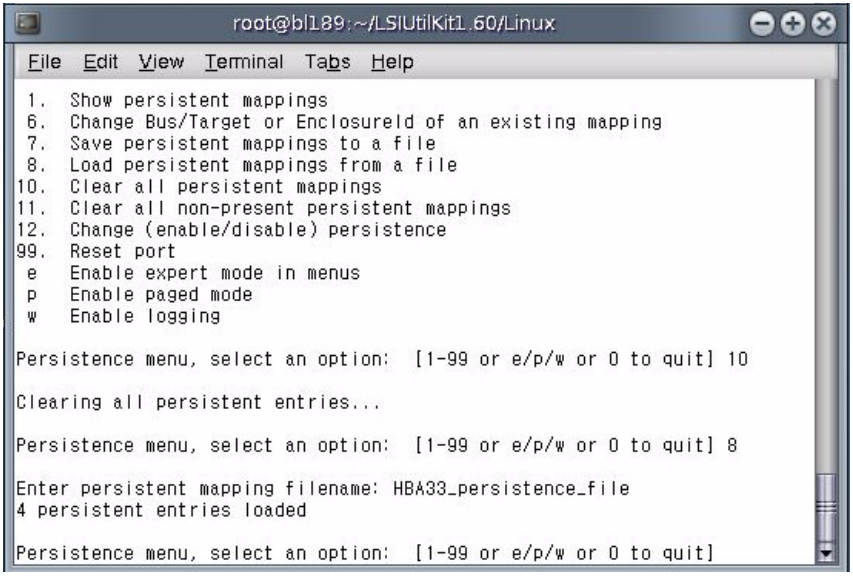
   You are prompted for the name of a persistent mappings snapshot file to load.

   Type the name of the snapshot file. For example, **`HBA33_persistence_file`**.



7. **Press Enter.**

   The persistence map is loaded. `lsiutil` confirms that four persistence entries were loaded.



8. Type `0` (zero) and press Enter three times to exit `lsiutil`.

Note – The adapter persistent mappings snapshot file you just loaded is *still valid*. Make sure that you save a copy of it on external media.

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